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Luboš Smutka**

SUSTAINABILITY

E-BOOK FOR STUDENTS

Bogucki
WYDAWNICTWO
NAUKOWE

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Bogucki Wydawnictwo Naukowe
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PREFACE

The topic of sustainability in business has gained significant attention in recent years, as organizations are increasingly being held accountable for their negative impact on the environment and society. One of the main challenges in addressing sustainability in business is the gap between the paradigm of eternal growth and the limitations of our environment. The traditional economic model of growth is based on the assumption of unlimited resources and the ability to continue to extract and consume them at an ever-increasing rate is very often referred to as predatory usage of resources. However, this paradigm is no longer defensible as humans begin to see the consequences of their actions for the planet. The famous naturalist David Attenborough said "We have a finite environment – the planet. Anyone who thinks that you can have infinite growth in a finite environment is either a madman or an economist."

What is more, it is unfortunate that many business universities do not focus enough on sustainability issues. On contrary, they explore the paradigm of eternal growth as they primarily teach students how to chase profits, increase consumption, gain market share, etc. In other words economics and management students are taught how to create a society of consumers that buy products they do not need, for money they do not have, in order to impress people they do not really care about.

In such circumstances, the (rather dramatic) question of whether business activity and customer behaviour can truly be sustainable is of paramount importance. And the answer is complex and multifaceted, requiring a deep understanding of various economic, social and environmental factors. On the one hand there is a tiny hope for a more sustainable future as it is becoming increasingly clear that sustainable business practices are not only morally and ethically justifiable, but they also make good economic sense and can lead to long-term success for organizations. Unfortunately, on the other hand

many companies engage in "greenwashing" – a practice of pretending to care for the environment in order to improve their public image, but not making any real changes in their operations. What is more, most of the consumers around the world buy more products than they need, associating a better, happier life only with material affluence. Thus producing thousands of tons of garbage and amounts of pollution that destroy our planet. So, are we lost, and will we be living on a hard-to-inhabit earth that will be our foe sooner than we think?

We hope not. And we also know that even the hardest and longest journey requires a first step. Even the tiniest one. This is why we have prepared this e-book. It is an attempt to change the mentality of students and thus future managers, company owners, policy makers, and so on, in the hope that they will adopt a more sustainable approach to business activity and consumption. Therefore it is intended to provide economics and management students with a comprehensive examination of sustainability in business and customer behaviour. The e-book is the result of an EU grant, more precisely: the Erasmus+ KA2 Strategic Partnerships project: 'Teaching Sustainability in Higher Education in the Field of Economics and Management' (SUSTA) No. 2020-1-PL01-KA203-081980 (31/12/2020-30/12/2023). The main objective of the E+ project was to create an involving concept of teaching sustainability for students of business-related studies which would contribute to raising awareness of and involvement in the problems of sustainability.

Since sustainability is global problem, this e-book has been created by an international team of authors:

- from Croatia: Mateja Brozović, Nikolina Dečman, Dario Dunković, Blaženka Knezević, Ana Rep and Nika Šimurina (University of Zagreb),
- from the Czech Republic: Lubomir Cívín, Pavel Kotyza and Luboš Smutka (Czech University of Life Sciences Prague),
- from Hungary: Josef Gal, Krisztian Kis and Sandor Nagy (University of Szeged),
- from Poland: Barbara Borusiak, Aleksandra Gawęł, Konstantinos Madias and Bartłomiej Pierański (Poznan University of Economics and Business),
- from Spain: Leontina Lipan, David B. López Lluch and Esther Sendra Nadal (Miguel Hernández University of Elche),
- from Slovakia: Jana Galova and Anna Mravcová (Slovak University of Agriculture in Nitra).

The e-book is divided into five chapters: Introduction to Sustainability, A Macroeconomic Approach to Sustainability, Sustainable Business Strategies, Sustainable Consumer Behaviour, and Disclosures in Sustainable Business Practices. It starts with a comprehensive introduction to sustainability (Chapter 1). Among other things, the chapter addresses such issues as: climate change, resource usage, and pro-environmental policy. The book also provides a macroeconomic approach to sustainability (Chapter 2), examining the economic and social dimensions of sustainability and their inter-linkages. It also covers sustainable business strategies (Chapter 3), which will help students understand how companies can engage in sustainable activities, such as introducing CSR principles or creating green supply chains. On the other hand, reprehensible practices such as greenwashing and social washing are also pointed out. Chapter 4 focuses on sustainable consumer behaviour, examining sustainable consumption patterns, minimalism and slow life. The last chapter (Chapter 5) explores the issue of disclosures in sustainable business practices, examining the various standards and guidelines that companies must follow when reporting on their sustainability performance.

All the subchapters are structured as follows: annotation, background, discussion questions, and tasks for students, as well as further reading. The material covered is based on the latest research and best practices in sustainability, and it has been carefully selected to provide students with a solid foundation of knowledge.

Sustainable business practices are essential for the long-term success of organizations and the well-being of society as a whole. This e-book aims to equip students with the knowledge and skills they need to make more eco-friendly decisions. We hope that this e-book will serve as a valuable resource for business students as they pursue their studies in sustainability. Whether you are a beginner or an advanced student, we are confident that you will find the information in this e-book to be helpful and informative.

And do not be a madman – be sustainable economist instead.

INTRODUCTION TO SUSTAINABILITY

THE CONCEPT OF SUSTAINABILITY IN HISTORY AND THE PRESENT

Lubomír Cívín

■ Summary

The subchapter deals with the theoretical and political roots of the sustainability concept and its changes over time. It identifies four main directions of theoretical, political, and business practice, whereby the relationship between economic growth and its environmental and socio-economic consequences were first identified, then gradually transformed into approaches focused on critical issues in the present. Each of these roots has some links to how economic and political thinking developed from the 1960s to the first decades of the 21st century and reflects the changing environment and approaches to their solution. The subchapter also points out that the actual result of these efforts has not yet been sufficiently reflected in most political and economic practice, despite many declaratory political acts.

Key words: Sustainability concept, Limits to Growth, Socio-economic indicators, Planetary Boundaries, Sustainable Development Goals.

1. Introduction

The concept of sustainability is a theoretical and political construct that historically comes from multiple sources of knowledge and practice. In essence, it can be said that primarily the academic sphere and some international non-governmental organizations worked their way towards its broader acceptance in previous decades. The reality of

economic life had been resistant to this concept for a long time. Their work gradually managed to exert ideological pressure on the political and business spheres, which finally had to promote the sustainability agenda (although slowly and with low efficiency) to the political level. The agenda also became accepted due to the pressure of some global intergovernmental and non-governmental organizations and some supranational institutions, especially the EU and the UN structure, which succeeded in including it into global economic and social programs implemented within their framework, including international financial strategy and policies for their application.

Finally, the business sphere and market participants groups (producers and consumers) gradually came to understand and accept the concept, as well as the necessity of reflecting this in their behaviour. Unfortunately, it is still not the dominant trend in economic thinking and convenient life, although it is growing in popularity. Sometimes, it is just a marketing slogan rather than the fundamental principle of responsible behaviour.

2. Mindset approaches to the topics of sustainability

Historically, the birth of the concept of sustainability within the global economy can be identified sequentially, from several directions:

- a) Within the theories of economic growth and development
- b) Within the perception of global problems representing the limits to economic growth
- c) Within the genesis of the understanding of the relationship between globalization and anti-globalization processes
- d) As a part of the search for and implementation of a political concept for the future development of the global economy.

2.1. Economic growth and development in the theory of the global economy

Economic growth and development are important aspects of the dynamics of the world economy and its structural change. Recently, there have been broad (not just theoretical) discussions around these two categories, which often have ideological and political undertones. In the debate, it is possible to identify the distinction between the two

categories, which reflects the ability of their proponents to objectively evaluate economic and social dynamism and its links with the power balance of the world economy.

In theory, economic growth deals with macroeconomics; it represents an abstract economic theory that contains several more specific approaches in the form of various growth models that take into account the varying importance of individual sources of economic growth and explore diverse aspects of it, including growth restrictions. The theoretical discourse started at the turn of the 18th and 19th centuries and continues until the present day. Compared to conventional purely theoretical concepts of economic growth, nowadays there are alternative approaches developed in terms of different growth dynamics, as well as their content and focus in a specific area of the global economy, namely: The theory of global infinite economic growth – The endogenous growth theory – The school of limits to growth – The concept of sustainable development – The concept of zero or even negative growth

The first two theoretical approaches are mostly connected with economic and political practice. Namely, in political terms today's society cannot function without growth, as this would lead to undesirable social phenomena. If GDP does not grow, society witnesses a decline in employment and a reduction in investment following the declining quality of public services and, more generally, living standards and quality of life. Economic growth is considered an endogenous, inherent parameter of societal progress.

In the real world, countries consider long-term growth an integral part of their national security and global status. Highly indebted countries, a group now including most developed economies, need to grow to recover from the current debt situation, developing countries need to leave their backwardness behind and overcome underdevelopment, and newly emerging market economies need growth to achieve their economic and political goals. However, continuing growth in its current form is also unsustainable, as desperate attempts at economic growth at any cost (including Keynesian stimulation) inflated real estate, increased commodity prices, led to other speculative bubbles, placed a disproportionate burden on the environment, and has caught states in a debt trap – all of which has resulted in recurring financial crises.

Beginning in the 1960s, there was growing awareness that the economic system operating within a global framework (the global economy) with limited resources cannot be sustained indefinitely, that it is not possible to maintain economic growth in accordance with the existing concepts, and that exponential growth is not sustainable. In the academic discourse, it is possible to identify the distinction between the two categories, which was trying to overcome differences in their objective content and links to the dynamics and the consequences for the world economy. This approach was at the beginning of the discourse connected primarily with measuring the real progress in society, in particular identifying growth factors and their results positively and negatively modifying societal development.

One of the key categories used in economic theory, including traditional approaches to the world economy, reflecting a change in approach to the classical concept of the paradigm of economic science (also within the theory of the world economy), is a change in the approach to the concept and indicator of economic growth, which traditionally uses dynamic changes in the gross domestic product (GDP). Historically, GDP has traditionally been associated with economic development and growth in the standard of living of both individual countries and the entire world economy.

At the end of the 1960s, however, many economists (including S. Kuznets, the father of the GDP gauge) began to question the great emphasis placed on measuring economic well-being or living standards on the narrow basis of GDP. This was also the result of the adverse effects of uncontrolled economic growth on the environment becoming apparent for the first time, and the search for a broader measure of well-being that was not solely based on the financial data of GDP began.

Even then, W. Nordhaus and J. Tobin from Yale University proposed and developed a broader indicator of progress than GDP, which they called the "Measure of Economic Welfare" (MEW. – Measure of Economic Welfare) (Nordhaus, Tobin, 1972). Although the indicator is based on the GDP concept, it was supplemented with some other aspects (free time, unpaid work). Gradually, the MEW concept was complemented by environmental damage caused by industrial production and some consumption parameters, which reduced the value of society's welfare derived from GDP.

A newer indicator was ISEW (Index of Sustainable Economic Welfare), developed initially in 1989 by ecological economist H. Daly and theologian J. B. Cobb (Daly and Cobb, 1989) in contrast to MEW (later, however, the authors added several additional “costs” to the definition of ISEW). Their later work eventually led to another more complex macroeconomic indicator, the Genuine Progress Indicator (GPI), developed in 1995. The GPI is an extension of the ISEW that highlights the real economic and social progress of society and seeks to monitor the economy’s well-being and environmental sustainability. ISEW and GPI summarize economic prosperity using a single number, following the same logic as GDP, which summarizes financial performance in a single number. In addition to economic issues, however, social and environmental issues are included in monetary terms. In the last three decades, searching for alternative indicators has accelerated. After all, this indirectly confirms the thesis on the increasing necessity to change the paradigm of economic science in the era of globalization.

The issue of a complex and multi-criteria approach to problems of growth and sustainable development, and their evaluation based on non-economic indicators, was already intensively discussed at the UN Summit in Rio de Janeiro in 1992, which had a positive effect on support for the concept of sustainable development and the introduction of monitoring of its indicators. This development was then followed by a whole series of initiatives, both at the global, regional, and national levels, which was reflected in the growth of introduced synthetic indicators of social development: in the 1990s only 2 indicators were in use, while at the beginning of the new millennium there were already more than 30.

Recently, several new proposals for indicators for comprehensive monitoring and comparison of the socio-economic development of the entire world economy and the economy of national economies have appeared. The Commission did important work on analyzing and popularizing the Measurement of Economic Performance and Social Progress (CMEPSP) under the leadership of J. Stieglitz, A. Sena, and J.-P. Fitoucci, who were appointed by the French president in 2007 to explore how the wealth and social progress of nations can be measured without relying on a unifying indicator of gross domestic product (GDP). The final report published in 2009 emphasized the need to supplement and partially replace GDP with differently constructed methodological instruments, as what and how wealth and

development is measured affects the subsequent political decisions. If the measurement results are wrong, the subsequent decisions and strategic development orientation can also be distorted. According to the report's authors, policies should be aimed at increasing social well-being, not GDP. (Stiglitz et al. 2009).

The new indicators include, for example, the Human Development Index (HDI), Gross Domestic Happiness (GDH), Happy Planet Index (HPI), Ecological Foot, World Happiness Index (World Happiness Index – WHI), World Happiness Database, etc. The construction of individual alternative indicators differs from each other. Still, their common feature is a multi-criteria approach, a combination of the use of non- economic and non-financial indicators and data, as well as some elements of behavioural economics, focused on a comprehensive view of development and progress rather than economic growth only. One of the last indicators confirming the change in the approach to economic growth to comprehensive societal sustainable development that respects limitations is the Sustainable Society Index (SSI). (Saisana et al., 2012). It was first created in 2006 and is updated every two years (2021, the last data issue). The index shows the level of sustainability on a scale of 1 to 10 in no less than 151 countries, covering over 99% of the world's population. It is still the only index that integrates human well-being, environmental well-being, and economic well-being, that covers many countries and is regularly updated. The latest update was published in May 2022 with some preliminary (and incomplete) data for 2019 up to 2021 (TH, 2022).

2.2. Sustainability as a perception of and solution to global problems

The theory of the limits to economic growth in the world economy represents a new and different way of thinking, which appeared at the turn of the 1960s and 1970s. It promotes the idea that indefinitely exponential growth in the system (the global economy) with limited resources and facing global problems cannot be sustained, and the possibility of maintaining permanent economic growth in accordance with the existing concepts is limited. One of the final conclusions of its representatives was the idea of zero growth, at least for advanced countries, to give the chance to less developed ones to catch up with the level of living standards of the developed world and to keep it.

Global attention should be turned to alternatives to economic growth – economic and social development allowing sustainability within existing limits.

The discourse on this topic started already in the 1960s and continues today. In the beginning, it was connected with the measurement of economic growth and development. Later on, the focus turned to critical issues in the global economy, which are characterized by two basic features – they are acting universally on all countries and societies in the world and have a global impact that is not limited by geographical and state borders. The approach from the point of view of the acuteness of specific global problems also appears gradually, especially in the area of ecological impacts of economic growth, in parallel with the problem of global demographic development and its consequences in relation to the production of food, as well as energy and raw materials depletion.

One of the first serious warnings emerged already in the early 1970s when the Club of Rome published its report known as “Limits to Growth” which focused on the mutual relationships between global problems and their impact on the future of the global economy. The MIT research team, using computer modelling of the global economic systems and their interconnections, reached an alarming conclusion: “If the present growth trends in world population, industrialization, pollution, food production, and resource depletion continue unchanged, the limits to growth on this planet will be reached sometime within the next one hundred years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity.” (Meadows et al., 1972, p.23).

The report presented not only a negative future forecast but also a message of hope: Human beings can create a society in which they can live indefinitely on the Earth on condition that they impose limits on themselves and their production of material goods, leading to a state of global equilibrium with population and production in carefully selected balance. This message can be understood as the first attempt to define sustainable development (even without describing it in exactly these terms).

Limits to Growth caused a stormy discussion on the future of the global economy: liberal economists mostly criticized it, while other groups welcomed it as the right step in identifying the need to change the approach to understanding economic development. The

model provided by Limits to Growth was verified 30 years later, by some of its authors (Meadows et al., 2004) and also by independent institutions like the Commonwealth Scientific and Industrial Research Organisation (CSIRO). They compared the original model with historical data since the 1970s and this supported the original findings. (Turner, 2008, 2014).

Planetary boundaries is another theoretical concept highlighting that in the past human societies thrived on comparatively stable Earth systems created by climatic and ecological conditions. (Rockström, 2015). Crossing planetary boundaries comes with the risk of abrupt irreversible environmental change. The concept is based on scientific evidence that industrialized societies in the last two centuries have become the main driver of global environmental change. According to the concept, "transgressing one or more planetary boundaries may be deleterious or even catastrophic due to the risk of crossing thresholds that will trigger non-linear, abrupt environmental change within continental-scale to planetary-scale systems." (Rockström, 2015).

2.3. Understanding the relationship between globalization and anti-globalization processes

Since the last third of the 19th century, the global economy has been subject to alternating waves of globalization and de-globalization processes as follows: – Primary globalization – (1860–1914) – Primary de-globalization – (1914–1945) – Secondary globalization (re-globalization) – (1948–1989) – Tertiary globalization (hyperglobalization) – (1989–2008) – Secondary de-globalization – (2008 –

Each phase responded to economic and political developments in the world at that time. The reason for the alternation between particular phases and the transition from globalization to de-globalization was given by the different ratios between positive and negative effects that the process of globalization brought its participants.

At the moment, the negative influences and effects have begun to outweigh the benefits, and the trend of globalization is reversing. A typical sign of globalization and interdependence is that it anonymizes the factors that are the source of negative effects on global development. However, at the moment when they accumulate and their source becomes visible, a deep crisis is manifested, often not

only economic but also social and subsequently political, which represents a reversal of the trend. They are most often a manifestation of the accumulation and prevalence of the negative effects of an impending global crisis (ecological, energy, financial, health, etc.), or even war conflicts with negative social impacts.

Strengthening globalization and interdependence requires the increased responsibility of countries by making advances in clean energy technology, and the sustainability of essential, limited resources, including agricultural production, with the aim of providing food security to ensure the welfare of the planet.

All the aspects of sustainability are due to the intricacies of the interdependencies that can be inferred. This allows us to state that even if globalization is inevitable, it is reversible because its factors are fragile and dynamic, and the extent to which it grows is finite. From this point of view, sustainability is considered as one of the critical factors and limits of globalization and at the same time the way to eliminate the negative effects of it.

2.4. A political concept for the future development of the global economy

The concept of sustainable development represents an alternative model of social development compared to the dominant industrial type of economy and the concept of permanent infinite economic growth reflecting the traditional paradigm of classical and neoclassic economic theory focused only on profit and the domination of financial markets over the real economy, ignoring the influence and impact of physical biological processes, and natural and environmental conditions, on human economic activity and vice versa, i.e. the influence of this activity on these processes, representing the natural limits of the possible development of civilization. The actual state of the concept is presented by UN projects within the program of SDG – Sustainability Development Goals (UN, 2022).

3. Discussion

3.1. Different understandings of the content of sustainable development

The concept of sustainable development is still predominantly a political approach reflecting the natural environmental limits of economic growth. This policy is based on the concept of promoting economic and social development in accordance with the capacities of the global ecosystem, the conservation of natural values and biodiversity for present and future generations, and an attempt to search for harmony between them. Representative of this approach on the global level are the different programs of United Nations and its institutions.

The UN Commission on Environment and Development's definition of sustainability actually sounds more sophisticated than the previous definitions. "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs" (UN, 2012, pp. 41). The basic needs of humankind are sufficient amounts of food, drinking water, adequate shelter, a basic level of medical and educational services, and a good environment. The content of sustainable development is often described with the 3 pillars model, in which the three components of socio-economic development are intertwined: economic, ecological and social. In some UN projects also a fourth element is added – culture. Sustainability is just a common element and the result of efforts within this comprehensive system.

Weak and Strong Sustainability

In economics, a distinction is made between weak and strong sustainability. Weak sustainability means that in the future there will be no reduction in the total economic value of resources and products derived therefrom. The concept accepts that primary, non-renewable resources cannot be tapped unless it some relevant replacement is made (i.e.

sources loss does not take place). The product thus obtained from non-renewable sources must be completely recycled after the end of its use to avoid losses.

Strong sustainability, which is currently being considered in the short and medium term, is difficult to implement, requires maintaining, not decreasing, the value of resources. A strong principle of sustainability means drawing only on renewable sources of energy; non-renewable use is not considered at all.

Green Growth

Economic growth can be to some extent transformed into green growth, which may still be within the planetary limits. There is also the term “eco-economic decoupling” (UNEP, 2011) documenting that the overall material consumption has increased until now, despite growing efficiency in the use of energies and materials. Decoupling in this sense is used in the context of economic production and environmental quality, referring to the ability of an economy to grow without incurring corresponding increases in environmental pressure. The United Nations SDGs are a group of long-term projects seeking to reduce economic reliance on environmentally destructive or harmful industrial practices (UN, 2015). This includes several provisions for “decoupling growth from resource generation,” i.e. exploring ways to achieve economic growth that do not deplete natural resources or cause environmental pressures.

Sustainable development critique – Degrowth

Degrowth (zero or negative growth) is the political, economic, and social movement based on the idea of ecological economics, anti-consumerist and anti-capitalist approaches. Its leaders promote the rationalization of production and consumption, resulting in the contraction of the economies where excessive consumption lies at the root of long-term environmental problems and social inequality. It has not been put forward in any comprehensive theory, however, and even its proponents do not agree on how to achieve the new system, and even what they mean by degrowth at all.

3.2. Questions and tasks for students and tasks for students

- Which of the theoretical sources of the sustainable development concept do you consider to be the most relevant for today? Explain the reasons.
- Discuss different concepts of sustainability from the perspective of a paradigm shift in economic science.

4. Further reading

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CLIMATE CHANGE

Anna Mravcová

■ Annotation

The climate change that humanity is facing with increasing intensity has thrown the world into a so-called climate crisis. We currently recognise many global environmental problems, that is, environmental problems that have a global impact. They are increasing in severity and their impact may not only limit human well-being in the future, but directly threaten the survival of all living organisms on the planet, including the human species. However, it is the climate change that has been evaluated by scientists and many studies as the most serious problem. It is climate change that will make many parts of the earth uninhabitable. At the same time, climate change will make the current way of producing food impossible in the future, and this will have far more serious consequences than the effects of other environmental problems. This, in turn, will inevitably be reflected, in particular, in a food and resource crisis and, consequently, in an economic, social and political crisis. We have already long since passed the point where a complete reversal of the catastrophic consequences for the future was possible. However, that future is now approaching more and more rapidly, which is why it is necessary to act really effectively, responsibly as well as globally, nationally and locally, to combat climate change and reduce its negative effects.

Key words: climate change, climate crisis, global actions, EU regulations, environment

1. Introduction

Climate change generally means long-term changes in temperature and weather. These changes can be natural, for example, due to

changes in the solar cycle. Since the 19th century, however, the main driver of climate change has been human activity, mainly due to the burning of fossil fuels such as coal, oil and gas (UN, n.d.).

The climate crisis, as a consequence of global climate change, represents the most serious global environmental problem today. This climate crisis, which the world has been facing for a long time and will continue to face, is due to the change in the chemical composition of the atmosphere, which has primarily been caused by humans. All regions of the world, although at different levels and to different degrees of severity, are facing this crisis. Many countries are already facing rising sea levels and extreme weather events, such as more frequent and intense heat waves, floods, droughts and storms. Wherever we are in the world, we have the opportunity to experience climate change in real life. It is therefore essential to address this problem at all levels, from the global to the regional to the national and the local. It is necessary to adopt effective strategies to reduce climate change, but at the same time to introduce various adaptation policies and measures, because we cannot avoid certain impacts. We can only work actively and act to mitigate them (more also in, EEA, 2020).

2. What exactly is climate change?

Climate change, although it is only one of the environmental threats that the world faces in the context of the climate crisis, is at the same time considered to be the most serious environmental problem. As R. St'ahel points out, climate change will make the current way of producing food impossible in the future, which will have more serious consequences than other impacts of the environmental crisis. In his view, this will manifest itself mainly as a food crisis, and later as an economic, social and political crisis. Thus, he sees environmental responsibility in the context of environmental security and understands it mainly as a political and legal category, not a moral one (St'ahel, 2015, 1–4). Its significance and the dangers it poses are obvious, so it is necessary to pay adequate attention to this issue. But what is climate change?

Climate change means a change in the statistical properties of the climate system that persists for several decades or longer – usually at least 30 years. These statistical properties include averages, variability

and extremes. It can be caused by natural processes, such as changes in solar radiation, volcanoes, or the internal variability of the climate system, or by human influences, such as changes in the composition of the atmosphere or in land use (AAS, 2022). Human activity is however considered to be the most active contributor to the climate change and is also directly influencing natural processes, thus even accelerating these changes. The most significant human contribution to climate change is the extreme use of fossil fuels. The burning of fossil fuels causes the emission of greenhouse gases, which act as a kind of blanket around the Earth, capturing the sun's heat and thus raising temperatures (AAS, 2022).

Examples of most important greenhouse gas (GHG) emissions that cause climate change are carbon dioxide and methane. These are produced, for example, when petrol is used to power cars or when coal is used to heat buildings. The clearing of land and forests can also release carbon dioxide. Landfills are a major source of methane emissions. Energy, industry, transport, buildings, agriculture and land use are among the main sources of emissions (UN,n.d.) (see also Figure 1).

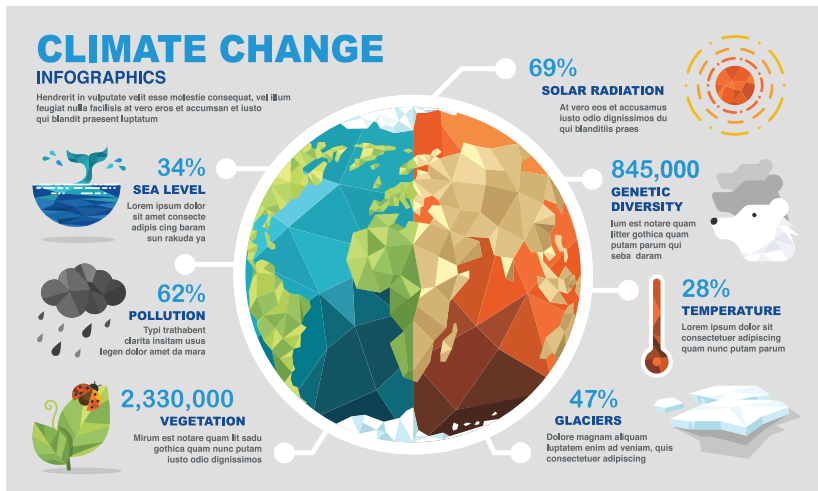


Figure 1. Climate change consequences.
Source: Dreamstime, 2022.

We have to underline that our civilisation is dependent on fossil fuels. Burning fossil fuels produces mainly water vapour and carbon dioxide in addition to energy – heat. Moreover, it is CO₂ that is one of

the most important drivers of the current climate change. The burning of fossil fuels releases fossil carbon into the atmosphere that has been stored underground for millions of years, upsetting the balance of the carbon cycle and increasing the concentration of CO₂ in the atmosphere. Since the beginning of the industrial revolution (i.e. over the last approximately 150 years) we have increased its concentration from about 280 ppm to the current 414 ppm (ppm = particles per million). That is to say, by about 40%. And that is the real problem. But CO₂ is not the only problematic GHG whose levels in the atmosphere are rising dangerously (Greenpeace Slovensko, 2020).

This accumulation of greenhouse gases in the atmosphere is a problem because they trap some of the heat, not allowing their energy to escape into space – so the heat is trapped in the atmosphere and heats it up. Greenhouse gases are, to some extent, essential for the maintenance of life on Earth. Without them, the temperature of the atmosphere would be about 33°C lower than it is today. The most important of the greenhouse gases is water vapour. Although it has the strongest greenhouse effect, the amount of CO₂ in the atmosphere is essential for climate change. Also, it needs to be noted that what we are witnessing today is not the first climate change that our species has experienced. As already stated, the climate is gradually changing all the time, even due to natural changes. This current change is, however, very rapid for nature and human society, unlike previous ones. The extent of the change and its speed make it virtually impossible for plants and animals to adapt naturally. Which is made even more difficult by our use of natural resources and the landscape (Greenpeace Slovensko, 2020).

For today's more than 7 billion people, this poses a risk on numerous levels. The several thousand years of stable weather on which we have built our agriculture is changing rapidly, with higher temperatures bringing more extreme weather, which means instability in the yields and harvests of the crops on which humanity depends. And the change in rainfall is both a problem for cultivation and leads to the problem of water scarcity. Both of these have probably been felt most clearly and visibly in summer 2022, when extremes of weather in the form of heat and drought have manifested themselves globally, resulting in poor harvests and water scarcity in many regions. However,

these problems are only going to worsen and intensify¹. The warming is affecting everything. It is also causing sea levels to rise (particularly through the melting of permafrost), which will gradually both salinise agricultural land and threaten to flood much of the current land, giving rise to a new category of migrants – ecological migrants. People will increasingly have to move inland. But climate change is also having a negative impact on the environmental stability of the oceans (Greenpeace, 2015).

The rise in temperature and the reduction in ocean pH due to higher atmospheric CO₂ concentrations have already destroyed much of the coral reefs on which human populations depend for food (Hoegh-Guldberg, 2010). The consequences of climate change are affecting all areas of human activity and are having a much more negative impact on countries in the global South, which, at the same time, do not have sufficient resources to adapt. However, it is the countries of the global North that are most responsible for greenhouse gas emissions.

We see that climate change affects our health, ability to grow food, housing, safety and work. Some are more vulnerable to climate impacts, such as people living in small island states and other developing countries. The aforementioned sea level rise and saltwater intrusion have already progressed to the point where entire communities have had to relocate. Prolonged droughts are also already threatening people with famine (see UN, n.d.).

Climate change cannot be stopped. However, the extent and impact of its effects (e.g. see Figure 1) will depend primarily on the effectiveness of the implementation of measures based on our global agreements to reduce greenhouse gas emissions, but also on efforts to put in place appropriate adaptation strategies and policies to reduce the risks from current and projected climate extremes (EEA, 2020). It is a reality that has to be combated, but at the same time adapted to, at least to a certain extent.

¹ Many scientists claim that humankind has entered the so-called Anthropocene, which means that the impact of humans on the environment is now so significant that it represents a new geological epoch, one that appears very unstable compared to the Holocene and its relative climatic stability, but which is only supposed to be a transitional epoch leading to a potentially much worse situation (see more in Ståhel, 2019).

2.1. Climate change – a huge challenge with many strategies and possible solutions

Climate change has many consequences, both for the planet's physical environment and for all living organisms on the globe. All changes in the physical environment of the planet affect the life of plants, animals and humans. Coral reefs, forests and coastal human communities are particularly vulnerable to climate change (Heshmati, 2020).

The climate change that we are observing is already having a significant impact on ecosystems, the economy, and people's health and well-being. As mentioned above, new temperature records are being set, sea level records are being broken, and the extent of sea ice in the Arctic is decreasing. Rainfall patterns are changing, generally making wet regions of Europe wetter and dry regions even drier. The volume of glaciers and snow cover is declining. At the same time, the frequency and intensity of the aforementioned climatic extremes – heatwaves, heavy rainfall and droughts – are increasing in many regions. Developed climate forecasts provide further evidence that many European regions will experience an even greater increase in these climate extremes in the coming decades (see also EEA, 2020).

The most effective solutions must be immediately addressed. Many that have already been proposed can bring economic benefits, and simultaneously improve the lives of people and protect the environment. There are global frameworks and agreements in place to guide progress, such as the Sustainable Development Goals (SDGs), the UN Framework Convention on Climate Change, and the Paris Agreement. They define three broad categories of action: reducing emissions, adapting to climate impacts, and financing the necessary adjustments (UN, n.d.).

An important potential solution is to switch energy systems from fossil fuels to renewable energy sources such as solar or wind power. This would significantly reduce climate change emissions. But we need to start now. Some damages are already irreversible, but mitigation work is needed to avoid even greater disasters that will seriously threaten life on earth.

The international community is committed to zero net emissions by 2050. However, about half of the emissions reductions must be made by 2030 to keep warming below 1.5°C. Fossil fuel production must fall by around 6% per year between 2020 and 2030, which is

not an easy goal. Adaptation, as we have said, is also very important in this process. Adapting to the impacts of climate change protects people, homes, businesses, livelihoods, infrastructure and natural ecosystems. It includes current impacts and those likely to occur in the future. Adaptation will be needed everywhere, but must be prioritised now for the most vulnerable people with the fewest resources to cope with climate risks. The rate of return can be high (for example, early warning systems for disasters save lives and property and can end up delivering benefits far in excess of the initial costs)(see also UN, n.d.).

2.2. Everyone can make a change

As we have already mentioned, some of the impacts of the climate crisis are already irreversible and are being felt more and more clearly all around the world. The global average temperature has already risen by more than 1°C. However, we can at least slow down this rapid increase and try to avoid the most catastrophic predictions of various scientists and studies.

The Paris Agreement (UN, 2015a) is an important document in this regard. The broad international community has signed up to it. They have agreed that global greenhouse gas emissions must stop rising by 2020 at the latest, and fall as quickly as possible to zero in the second half of the century. One of the most effective solutions is to abandon our dependence on fossil fuels. Finland has declared that it wants to be climate-neutral in 2035 (more in Majava et al., 2022); the whole EU is debating 2050. The European Green Deal (Fetting, 2020) also includes these targets. To effectively transform our energy system, we need to start from each individual. Political regulations are important, but we all need to be part of the change together and now (see e.g. Figure 2).

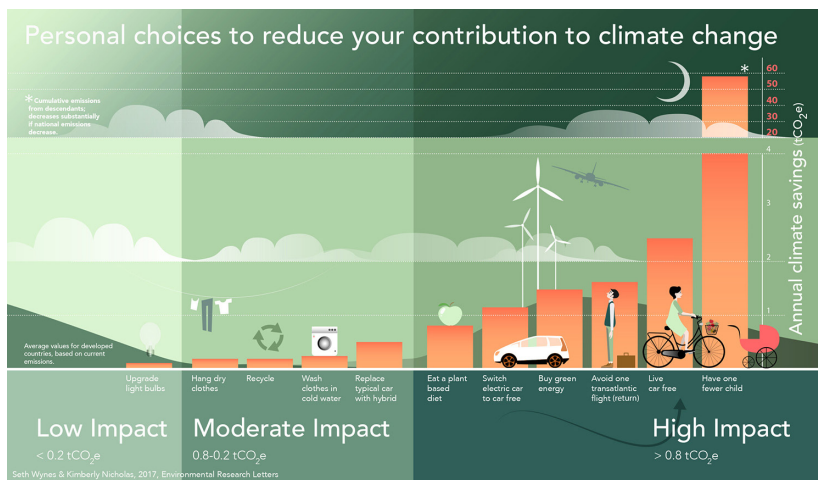


Figure 2. Reduce the consequences of climate change.
Source: Behind Energy, 2017.

A global approach is essential. But a common EU approach is also necessary. The EU is one of the most developed and wealthy parts of the world that also contributes very significantly to climate change. According to the Intergovernmental Panel on Climate Change (IPCC) data calculations, and based on Europe's historical responsibility for a large share of greenhouse gas emissions, the entire EU needs to be carbon neutral by 2040 to stop the rise in global average temperature to 1.5°C. According to the data, the necessary technology exists, and Europe also has the scientific capacity and millions of people demanding climate justice for all people, nature and future generations. But to make this happen, in addition to ambitious climate policies, there is a need to finally deliver real results (Greenpeace, 2015).

The fight against climate change is seen by many as the responsibility of national governments, but the responsibility lies with each individual. Although the overall impact of individuals on climate change is small, this does not release us from our responsibility and moral obligations in relation to climate change and the duty to promote collective action (see more in Fragnière, 2016) through active environmental citizenship (see more Mravcová, 2019). However, despite the fact that individuals do not have the necessary power to make

effective changes, their active approach is undeniably very important. Everyone can make a difference in different senses, by different ways.

2.3. UN and Climate change

United Nations Environment Programme

UNEP was established by a UN General Assembly resolution in 1972 as a follow up to the first UN Conference on Human Environment to meet the urgent need for a permanent institutional arrangement within the United Nations system for the protection and improvement of the environment. At the institutional level, UNEP has been a program, a subsidiary organ of the UN General Assembly. Over the four decades of its existence, UNEP has attained considerable success in galvanizing action on international environmental concerns, and laying down the threshold of environmental behaviour (Desai, 2017).

As stated by the United Nations, UNEP is the leading environmental body in the UN system, using its expertise to strengthen environmental standards and practices while helping to implement environmental commitments at the country, regional and global levels. UNEP's mission is to provide leadership and foster partnership in caring for the environment by inspiring, informing and enabling nations and people to improve their quality of life without compromising the quality of life of future generations (UN. Office of the Secretary-General's Envoy on Youth, n.d.).

UNEP has six main strategic focus areas and the first is climate change:

1. CLIMATE CHANGE – UNEP strengthens the capacity of countries to integrate responses to climate change by providing leadership on adaptation, mitigation, technology and financing. It focuses on facilitating the transition to a low-carbon society, improving understanding of climate science, facilitating the development of renewable energy sources, and increasing public awareness (Other areas are.
2. Post-Conflict and Post-Disruption Management.
3. Ecosystem Management.
4. Environmental Management.
5. Harmful Substances.

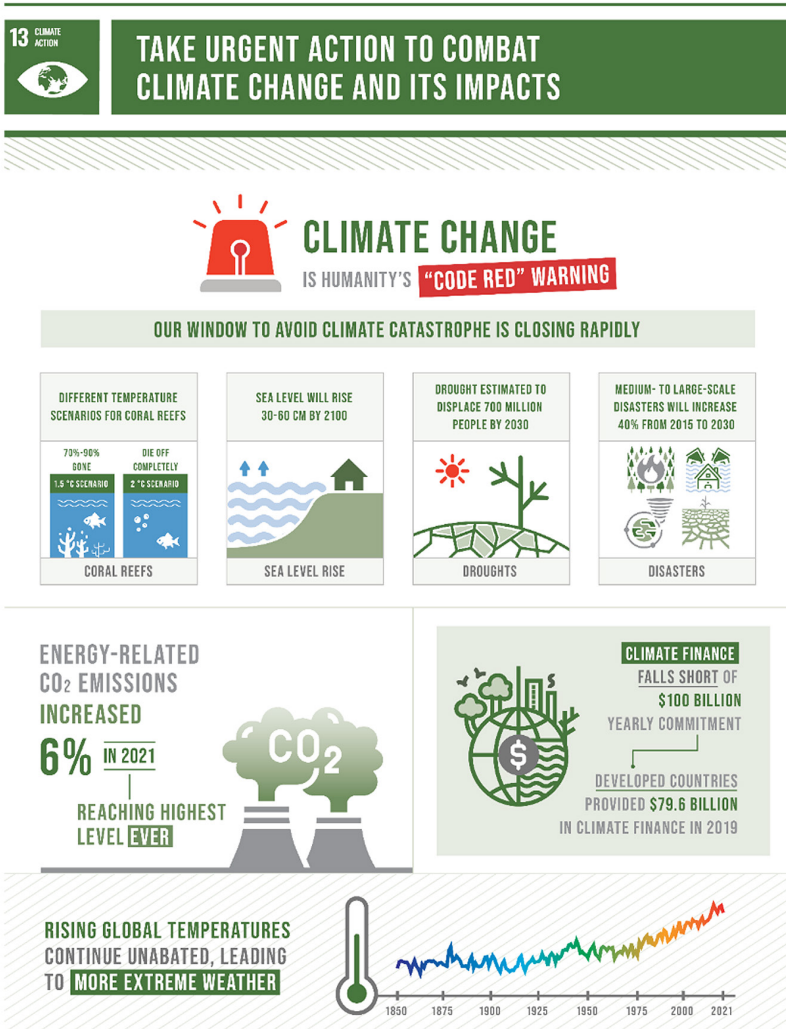
6. Resource Efficiency/Sustainable Consumption and Production (UN. Office of the Secretary-General's Envoy on Youth, n.d.).

UNEP is an international body whose mission is to promote sustainable development and the rational utilisation of the global environment. Through its core programmes on adaptation, forestry, energy efficiency and the transition to sustainable development, it is helping many countries achieve resilient low-carbon pathways. Its key activities include promoting investment in clean technologies to reduce emissions, protecting biodiversity and ecosystems, poverty alleviation, and ecosystem-based adaptation to reduce human vulnerability and strengthen resilience to the impacts of climate change. It works with the financial community to mobilise financial resources for investment in low-carbon and climate-resilient development; develops climate finance readiness and capacity building; and conducts policy and research analysis (Green Climate Fund, 2015).

Transforming our world: the 2030 Agenda for Sustainable Development and SDGs

The UN covers the issue of climate change and crisis under the 2030 Agenda for sustainable development and SDGs (for more about SDGs see subchapter 1.5). According to the 2030 Agenda, climate change is one of the greatest challenges of our time and its harmful impacts are undermining the ability of all countries to achieve sustainable development. Rising global temperatures, sea level rise, ocean acidification, and other impacts of climate change, are seriously affecting coastal areas and low-lying coastal countries, including many least developed countries and small island developing States. The survival of many of the planet's societies and biological support systems is threatened (UN, 2015b). That is why the Agenda states that the international community is determined to decisively address the threat posed by climate change and environmental degradation. The global nature of climate change requires the widest possible international cooperation to accelerate the reduction of global greenhouse gas emissions and to address adaptation to the adverse impacts of climate change (more in UN, 2015b).

Within the SDGs this issue is defined under the *Goal no. 13 – Climate action – Take urgent action to combat climate change and its impacts*. The UN and the entire global community take this very seriously.



THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2022: [UNSTATS.UN.ORG/SDGS/REPORT/2022/](https://unstats.un.org/sdgs/report/2022/)

Figure 3. UN and Climate action.
Source: UN, 2022.

As it said: “climate change is a real and undeniable threat to our entire civilization. Its effects are already clearly visible around the world and will have catastrophic consequences if we do not act now. Through education, innovation and compliance with our climate commitments, we can make the necessary changes to protect our planet from at least the most catastrophic consequences. But these changes also provide great opportunities to modernise our infrastructure, which will create new jobs and foster greater prosperity around the world” (The Global Goals, 2015b; SDG Tracker, 2018) (see also Figure 3).

Within goal no. 13, the UN has defined 5 Targets which are focused on the fact that everyone can help to make sure that we meet the Global Goals:

- **13.1 Strengthen resilience and adaptive capacity to climate related disasters:** Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
- **13.2 Integrate climate change measures into policies and planning:** Integrate climate change measures into national policies, strategies and planning.
- **13.3 Build knowledge and capacity to meet climate change:** Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
- **13.4 Implement the un framework convention on climate change:** Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible.
- **13.5 Promote mechanisms to raise capacity for planning and management:** Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities” (The Global Goals, 2015).

2.4. Paris Agreement

The Paris Agreement is an international treaty and one of the most important documents on climate change. It was adopted in 2015 and it covers climate change mitigation, adaptation, and finance. The Agreement was negotiated by 196 parties at the 2015 United Nations Climate Change Conference near Paris, France. As the climate change represents a global emergency that reaches the entire world, it requires the cooperation of the whole international community with coordinated solutions at all levels – global, regional, national and local.

Therefore, to tackle climate change and its negative impacts, world leaders at the UN Climate Change Conference (COP21)² in Paris achieved a breakthrough on 12 December 2015: and adopted Paris Agreement. It sets long-term goals to guide the nations all over the world:

- to substantially reduce global greenhouse gas emissions to limit the global temperature increase in this century to 2 degrees Celsius while pursuing efforts to limit the increase even further to 1.5 degrees;
- to review countries' commitments every five years;
- to provide financing to developing countries to mitigate climate change, strengthen resilience and enhance abilities to adapt to climate impacts (UN, 2021).

The Paris Agreement is a legally binding international treaty. It officially entered into force on 4 November 2016. Today, it has 193 Parties (192 countries plus the European Union) signatories. This Agreement is a very important document as it includes commitments from all countries to reduce their emissions and work together to adapt to the impacts of climate change, and calls on countries to strengthen their commitments over time. The Agreement provides a pathway for developed countries to assist developing nations in their climate mitigation and adaptation efforts while creating a framework for the transparent monitoring and reporting of countries' climate goals. It

² The UN Climate Change Conference is held regularly. The pandemic caused a short break, but in the second half of November 2022, COP27 was already held (in Sharmel-Sheikh, Egypt). The decision was adopted to establish and operationalize a fund to compensate vulnerable nations for "loss and damage" from climate-induced disasters. The UN Secretary-General also called for "a giant leap on climate ambition" stressing the need to "drastically reduce emissions now."

also represents the beginning of a shift towards a net-zero emissions world. Implementation of the Agreement is also essential for the achievement of the SDGs (see more in UN, 2021; European Commission, n.d.; Un, 2015a).

3. The EU tackling Climate change

The EU is also very active in combating climate change as it understands that it is involved and is highly co-responsible for the unfavourable developments. To tackle this huge problem, the EU formulates and implements its own policies and strategies, playing a leading role in international climate negotiations. The EU is also committed to the proper implementation of the Paris Agreement (Cifuentes-Faura, 2022).

Furthermore, the EU understands that climate change is currently one of the most serious problems and challenges (Kühne 2019; Melidis, Russel, 2020). Therefore, it is very active with its policies, with which it tries to reduce the negative impact on the environment, as it is affecting the health of humans, and the essential processes of many organisms (Cifuentes-Faura, 2022).

The EU measures to combat climate change

One of the most important measures is *limiting global warming* (the problem of the 2°C increase). According to the data, the world's average temperature has risen rapidly since the start of the industrial revolution. However, the period from 2010 to up to now was the warmest on record. Of the 20 hottest years, 17 were after 2000 (see more in News. European Parliament, 2022). As mentioned above, the summer of 2022 showed perhaps the most noticeable extremes and fluctuations, with several series of extreme heat waves leading to severe drought and lack of water, affecting crops and people's very lives.

So far, data (from Copernicus climate change monitoring) shows that 2019 was the warmest year on record for Europe, and this was due to an increase in greenhouse gas emissions as a result of human activity. The average global temperature today is between 0.944 and 1.20°C higher than at the end of the 19th century (in September 2022 it was 1.18°C (Copernicus, 2022). At the same time, according to scientists, an increase of 2°C compared to pre-industrial levels is

a catastrophic threshold for the climate and the environment. The international community therefore agrees that global warming must be kept well below 2°C (News. European Parliament, 2022).

An active and responsible EU approach is crucial for several reasons:

- The EU is one of the biggest producers of greenhouse gas emissions – according to the European Environment Agency, the EU is the world’s largest producer of greenhouse gases after China and the US, according to 2015 data. It must therefore take this issue seriously and bear the necessary responsibility (see Figure 4).

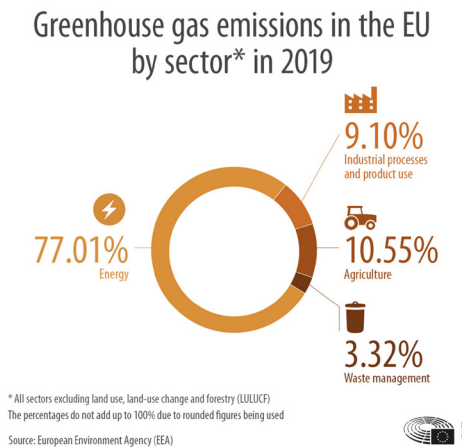


Figure 4. EU and the Greenhouse gas emissions.
Source: News. European Parliament, 2022.

- The EU is significantly contributing to climate change and is also strongly affected by climate change – and we are seeing the effects more and more clearly. Climate change is affecting Europe in different forms depending on the region, mainly by the loss of biodiversity, forest fires, declining crop yields, and higher temperatures. It is also affecting human health (News. European Parliament, 2022).

The EU has been portrayed as a leader in international climate change negotiations. We can say that it is also one of the important players in the UN climate change negotiations and, of course,

a signatory to the Paris Agreement. The Member States are thus co-ordinating their positions and setting common emission reduction targets at the EU level. At the COP27 UN Climate Change Conference (November 2022) the European Commission announced the ambition to make the goal of limiting global warming to 1.5 degrees achievable. European efforts helped reach a hard-won agreement to preserve the goals of the Paris Agreement (European Commission, 2022)

Under the Paris Agreement, the EU committed in 2015 to reduce EU greenhouse gas emissions by at least 40% below 1990 levels by 2030. However, this target was later changed to a reduction of at least 55% by 2030 and climate neutrality by 2050 as part of the adoption of the European Green Deal.

4. The European Green Deal and achieving net zero emissions by 2050

The European Green Deal was presented on 11 December 2019 by the European Commission. It presents a plan to make the EU economy sustainable by turning climate and environmental challenges into opportunities in all policy areas and making the transition fair and inclusive for all. It is Europe's structural response and new growth strategy to transform the EU into a modern, resource-efficient and competitive economy (European Commission, 2021).

Subsequently, in 2021, the EU made climate neutrality, or the goal of net zero emissions by 2050, legally binding in the EU. It also set an interim goal of a 55% reduction by 2030. The net zero emissions goal is also part of the Climate Act. The European Green Deal is an EU plan to achieve climate neutrality by 2050. Specific legislation to enable Europe to achieve the Green Deal goals is set out in the Fit for 55 package adopted by the Commission in July 2021, and it includes a review of existing legislation on emissions reductions and energy (see more in subchapter 1.5 – SDGs and EU policies).

The EU also focuses on establishing a circular economy by 2050, creating a sustainable food system and protecting biodiversity and pollinators. In order to fund the Green Deal, the European Commission also presented the Sustainable Europe Investment Plan in January 2020, which aims to attract public and private investment of at least €1 trillion over the next decade. Under the Investment Plan, the

Just Transition Fund is designed to support the regions and communities most affected by the green transition, such as regions heavily dependent on coal, etc. (see further sub-chapter 1.5; also e.g. News. European Parliament, 2022).

5. Discussion questions and tasks for students

Questions:

1. Which environmental problem do you personally perceive as the most serious and why?
2. What measures do you think can most effectively reduce the negative impacts of climate change?
3. What do you think – how do you personally contribute to climate change?
4. How can you personally make a positive contribution to tackling climate change and its consequences?

Activity 1

Identifying climate change as a major environmental problem – its impacts, challenges and solutions

Objective: On the basis of the materials studied in advance and the information obtained so far, using the world café method, critically analyse climate change and the crisis as a major environmental problem, assess its negative impacts and challenges, and identify possible solutions for the current international environment.

Materials: markers, flipcharts

Time: preparation at home + 60 minutes

Procedure: Students are asked to do research before class on the issue of climate change and the climate crisis. The teacher divides them into three groups at the beginning of the lesson. Each group will be given a flipchart paper containing one of the following slogans: IMPACTS, CHALLENGES, SOLUTIONS. Each group first chooses a permanent member to represent the slogan. The group members will write down everything they can think of related to the given environmental problem (20 minutes).

Then the groups will switch. They move to the next flipchart, with the permanent members staying with their slogans. These members

first present to the new group all the ideas they have written down, analyse them together and add what they think is still missing (10 minutes). The groups move again to the last flipchart. The permanent members stay again and present to the new group all the ideas they have written so far. The new group again adds anything that is not yet on the flipchart that they think is needed (10 minutes). The groups then sit together in a circle. The teacher instructs the permanent members to present their flipcharts and all the ideas that are on them. He/she then opens a discussion on each flipchart and its content, adding new insights if necessary. At the end, he/she will evaluate the activity with the students (20 minutes).

Activity 2

The climate crisis from the perspective of action in the Global North and Global South

Objective: to look at the climate crisis through a simulation of an international summit involving representatives of the Global North and Global South.

Materials: papers, pens, flipcharts, markers

Time: preparation at home + 80 minutes

Procedure: Before the lesson, the teacher divides students into two groups. One group will simulate representatives of countries of the Global North and the other group will simulate representatives of countries of the Global South. At the same time, the teacher will divide students into pairs and assign these pairs a specific country to represent. Their task will be to study in advance the available information on the urgency of the selected environmental problem – climate change – in these groups of countries as well as in the country they represent (also from the economic perspective).

During the lesson, the students will sit at a round table and the teacher will open a simulated summit on this environmental issue. At the meeting, the teacher first introduces the importance of climate change on a global scale and briefly outlines the issue from the perspective of both groups of countries (15 minutes).

The teacher then moderates the proceedings all the time. After the presentations, each pair will take the floor as the top representatives of the assigned countries, who will comment on the issue and

its importance in the represented country and present it from their point of view to the other colleagues (20 minutes).

After the presentation of each country's problems, the teacher assesses the interim status and writes down the results. The next task will be for the students to assess the seriousness of the problem based on the knowledge they have gained so far and the arguments they have heard, and to propose possible solutions to the problem within the framework of belonging to a group of countries of the global North or South (15 minutes).

The group representatives then present these suggestions to the others and the teacher opens a discussion on them. The aim of the discussion will be to arrive at common proposals for solutions to this environmental problem that are feasible in both groups of countries. The teacher continuously records these final proposals on a flipchart (15 minutes).

At the end, the teacher will present the results of the discussion to the whole plenary and together they will evaluate the whole activity, the solutions they have reached and their real applicability from the point of view of both groups of countries (15 minutes).

Activity 3

Ecological footprint and happy planet index

Objective: to understand the environmental impacts of consumption and lifestyle

Material and Aids: presentation, computers, possible availability of Wi-Fi so that students can connect to the internet

Time: 60 minutes

Procedure: The teacher will first give a short introduction to the subject with a prepared presentation introducing basic concepts such as ecological footprint, water footprint, Happy Planet Index³ and their interconnections (15 minutes). After this introductory presentation, the students will be asked to calculate their own ecological and water footprint (10 minutes). They will be divided into groups of 3–4 and will try to discuss the calculated values within the

³ Information on the Happy Planet Index is available on the internet: <http://happy-planetindex.org/about/>.

groups (5 minutes). In the group discussion, the teacher finds out what surprised the students, what values they achieved and they compare the values with the average values for the Happy Planet Index value for their country (10 minutes).

Then, again in groups, the students are asked to formulate together 5 measures they could take to reduce their ecological and water footprint (10 minutes).

Finally, the teacher summarises this in a group discussion and can it put into the context with the SDGs no. 13 – Climate action (10 minutes).

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RESOURCE USAGE, ZERO CARBON AND ZERO WASTE EMISSIONS

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Key words: resource usage, natural, Hotelling, zero carbon, zero waste

The first objective of this subchapter is to introduce readers to the different types of natural resources and the main way of using them in a sustainable way. Then it explores the concept of “zero carbon” including its three axes: zero material consumption; zero energy demand; and zero waste across the manufacturing system. Finally, “zero waste” concept is analysed looking at its global implications in an industry level.

1. Introduction

Natural resources are central to human wellbeing. Human beings cannot live without clean air, without the plants that are the basis for our diet, and without good quality water. Natural resources are required for buildings, houses and premises, and for guaranteeing life conditions. So they are essential for survival and for people to thrive.

The concept of natural resources refers to naturally occurring living and non-living elements of the Earth system, including plants, fish, and fungi, but also water, soil, and minerals. A useful way to think about natural resources is to look at them in terms of depletion risk: do they regenerate, and, if so, at what pace? Some resources, such as trees and plants, are renewable because they regenerate relatively

quickly. Others, such as copper and oil, take much longer to form and are considered non-renewable.

In this sense, pressure on natural resources and emerging environmental legislation are pushing society in general, and manufacturers, to adopt solutions that ensure their environmental impact is reduced, and thus to switch to a more sustainable producing paradigm, without losing competitiveness. One of the key concepts associated with environmental impact reduction is “zero carbon”.

Zero waste emissions, envisaging all the industrial inputs being used in final products or converted into value-added inputs for other industries or processes. In this way, industries are reorganized into clusters such that each industry's wastes / by-products are fully matched with the input requirements of another industry, and the integrated whole produces no waste of any kind.

2. Background

2.1. Resource usage

Natural resources are resources that are drawn from nature and used by humans for satisfying their needs. This comprises sources with valued characteristics, such as industrial and commercial use, cultural value, aesthetic value, and scientific interest. On Earth, it includes sunlight, atmosphere, water, land, all minerals along with all vegetation, and wildlife.

Natural-resource allocations can be at the centre of many economic and political confrontations both within and between countries. This is particularly true during periods of increasing scarcity and shortages (the depletion and overconsumption of resources). Resource extraction is also a major source of human rights violations and environmental damage. The Sustainable Development Goals and other international development agendas frequently focus on creating more sustainable resource extraction, with some scholars and researchers focused on creating economic models, such as the circular economy, that rely less on resource extraction, and more on reuse, recycling and renewable resources that can be sustainably managed.

It is possible to classify natural resources according to origin: biotic and abiotic. Biotic resources originate from the biosphere, comprising

all living beings that humans use (livestock, fisheries, flora, etc.) It also comprises fossils fuels (petroleum and coal, for example) as they are formed from organic materials. Abiotic resources originate from inorganic and non-living materials (land, water, metals, etc.).

Natural resources can also be classified according to their stage of development. Potential resources are those that exist but cannot be employed yet. This can be due the lack of the required technology. Actual resources are those that are currently being used. Their use depends on technology and the feasibility level. Reserves are actual resources that can be used in the future in a profitable way. Stocks are resources that are known to exist but cannot be used due to technological constraints.

Finally, natural resources can be classified looking at their degree of renewability/exhaustibility. Renewable resources are those resources that replenish naturally. Many of them (wind, air, solar energy, etc.) are always available and their quantity does not depend on human use. Others (wood, land, water, etc.) do not recover so fast and are susceptible to depletion by over-use. So in this category a crucial issue is the rate of replenishment/recovery exceeding the rate of consumption. Non-renewable resources cannot be renewed quickly, as they have been formed over a long geological time period in the environment. This category includes minerals and the main fossil fuels. Their consumption rate exceeds their recovery rate. Some of these resources can be recycled (minerals) but others cannot (coal and petroleum).

The main concerns about resources usage are focused on their renewability/exhaustibility. In this sense, Lord Lionel Robbins (1935) defined ECONOMICS as “the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses”. Following from this, NATURAL RESOURCE ECONOMICS is “the application of economics to manage naturally occurring resources for human needs/wants with efficiency as the primary goal”. EFFICIENCY may be defined in market or nonmarket terms, focused on the short or long run, relative to current or future generations, local or global in scope. DECISION CHOICES include maintaining the status quo, altering the status quo, or doing nothing, with a focus on relevant institutions. EVALUATION always includes the costs & benefits of a decision & to whom those costs & benefits accrue. Therefore, RESOURCE USAGE requires NATURAL RESOURCE MANAGEMENT (NRM) that is defined as “the management of natural resources such as land, water,

soil, plants and animals, with a particular focus on how management affects the quality of life for both present and future generations”.

Natural resources management involves identifying who has the right to use the resources, and who does not, for defining the boundaries of the resource. The resources may be managed by the users according to the rules governing when and how the resource is used, depending on local conditions, or the resources may be managed by a governmental organization or other central authority.

Non-renewable resources are undoubtedly essential for the functioning of the productive system. For this reason, the debate on their depletion and possible consequences of their reduced abundance in the future is of special importance for the future possibilities of humanity. For this reason, in the following section we will try to develop some economic elements to answer the question of how dramatic the problem of depletion of non-renewable resources is.

The first position, which we can describe as pessimistic, emphasizes the imminence of the physical depletion of known resource reserves. Here, scarcity is measured by the time remaining until the extinction of a specific resource. This is a relatively easy measure to construct if we know the reserves of the material and the amount that is extracted from it at a given moment. To illustrate this reasoning, let us briefly look at the Club of Rome report on the limits of growth, in which the problem of the depletion of non-renewable resources is dramatically posed. The basic data on which this pessimistic vision of the future is based are those found in Table 1. Thus, for example, according to statistics from the United States Bureau of Mines, in 1970 the known copper reserves were around 310 million tons, and given that world copper consumption reached the figure of 8.5 million tonnes that same year, we can conclude that, if copper demand had remained stable, the reserves available in 1970 would have been completely exhausted after 36 years. Although this conclusion was worrying, some authors considered it too optimistic. Indeed, according to the Club of Rome, copper demand was not likely to remain stable; on the contrary, it was more reasonable to think that in the future this demand would continue to grow at the rate observed in the last 70 years (that is, at 4.6 percent per year), which would have reduced the expected life of copper from 36 to 21 years. (Table 1). Of the 19 non-renewable resources listed in Table 1, using the exponential scarcity rate, only coal could have been expected to exist for more than 100 years.

Among the most dramatic cases, there is a long list of resources that, according to this type of forecast, would have been exhausted before the year 2000, including, apart from copper, gold, lead, mercury, natural gas, oil, silver, tin and zinc.

Fortunately, none of the pessimistic forecasts of the 1970s have come to pass. However, our interest in this part of the subchapter is not simply to show that the Club of Rome report made serious miscalculations that can be corrected in the light of new information. Rather, what we want to demonstrate is that the reasoning implicit in the scarcity measures is wrong. Basically, the mistake lies in conceiving scarcity as a physical phenomenon, when it is, as we will see, an economic and social phenomenon. This fact will help us to advance in the discussion of the criteria that should guide the management of non-renewable resources.

Table 1. Static and Dynamic Indices of Scarcity.

Resource	Known Global Reserves	Static Index (years)	Average Growth Rate (% per year)	Exponential Rate (years)
Aluminium	1.17x10 ⁹ t	100	6.4	31
Coal	5x10 ¹² t	2,300	4.1	111
Cobalt	4.8x10 ⁹ t	110	1.5	60
Copper	308x10 ⁶ t	36	4.6	21
Chrome	7.75x10 ⁸ t	420	2.6	95
Tin	4.3x10 ⁶ t	17	1.1	15
Natural gas	1.14x10 ¹⁵ cubic feet	38	4.7	22
Iron	1x10 ¹¹ t	240	1.8	93
Manganese	8x10 ⁸ t	97	2.9	46
Mercury	3.34x10 ⁶ jars	13	2.6	13
Molybdenum	10.8x10 ⁹ pounds	79	4.5	34
Nickel	147x10 ⁹ pounds	150	3.4	53
Gold	353x100 ⁶ ounces	11	4.1	9
Oil	455x10 ⁹ barrels	31	3.9	20
Platinum	1.17x10 ⁹ ounces	130	3.8	47
Silver	5.5x10 ⁹ ounces	16	2.7	13
Lead	91x10 ⁶ t	26	2.0	21
Tungsten	2.9x10 ⁹ t	40	2.5	28

(a) U.S.A. Bureau of Mines (1970) Mineral Facts and Problems, Government Printing Office.

- (b) Years it would take to consume the known global reserves at current levels of consumption.
- (c) Years it would take to consume the known global reserves if consumption continues to grow at the average rate.

Source: Meadows, D. et. to the. (1972) *The Limits of Growth: A Report for the Rome's Club on the Predicament of Mankind*. University Books.

2.1.1. What is scarcity?

The above analysis highlights the possibility of non-renewable resource depletion. Many of the confusion and forecasting errors can be avoided if we carefully distinguish between two interrelated concepts: available resources and known reserves. Reserves are defined as deposits with known quantities and qualities, of which, given available technology and political and economic conditions, it is profitable to extract minerals. For their part, the resources are potential sources of minerals that can be used in the future if changes in technology and economic, political and legal conditions allow it. Since economics, technology and politics are essential parts of this definition, mineral reserves can increase or decrease significantly without changing the amount available in the Earth's crust. For example, due to legal restrictions, while the treaty that reserves the territory of Antarctica for research purposes is in force, the existing mineral resources there cannot be counted as reserves.

Obviously, the greater the extraction of a mineral, the lower its future availability. However, the importance that this has for us and for future generations does not depend only on the amount of unexploited resources, but also on at least three additional factors whose nature is eminently social and historical. These factors are:

- firstly, our degree of knowledge about the quantity and physical quality of the resources and the reserves available,
- secondly, the technological capacity that we have to use such reserves productively,
- finally, thirdly, the value that such reserves have for the economic system.

Let's look at the three elements separately to illustrate their importance.

The information available

First of all, although we know more and more about the geology of the planet, our information about the available reserves is

incomplete. Even today, there is a significant degree of uncertainty about the quantity and quality of the remaining resources on the planet. For example, we do not know with certainty the amount of oil that exists under the seabed. In other cases, we know of the existence of some material deposits, for example in Antarctica, but until exhaustive exploration is carried out, we will not know their quantity and quality. In other areas, given the geological characteristics of the environment, we can deduce the probability that there are significant reserves, and we have the possibility of reducing such uncertainty through, for example, the study of magnetic fields or the drilling of exploratory wells.

Therefore, apart from an exclusively physical measurement, reserves must be measured based on our degree of knowledge of their quantity and quality. Actually, at the most general level, our certainties boil down to a global estimate of the total amount of each mineral existing in the Earth's crust. Thus, for example, from the composition of the Earth's crust, we can deduce that there are still 11,000 billion tonnes of unexploited copper left on Earth (11×10^{17} tonnes), which, if we were able to exploit them, would allow us to satisfy any foreseeable demand for several million years. This is a measure of the resource, or potential reserves. However, physical abundance has little to do with economic abundance. By contrast, highly concentrated copper deposits are extremely scarce, and according to 1992 data, copper reserves reached 550 million tons, indicating that with current prices and with our technological knowledge, we can only obtain one in every 22 million of the existing copper particles on the planet.

Figure 1 illustrates our knowledge about available reserves. The upper axis presents some useful concepts to define our degree of knowledge about the resources of a hypothetical mineral. It is therefore important to establish a clear distinction between the proven reserves of a mineral, the probable or inferred reserves, and those not yet discovered. The important thing is that, although the available resources are fixed, the boundary between proven, probable and inferred reserves changes over time, moving to the right in the diagram, with each new exploration discovery.

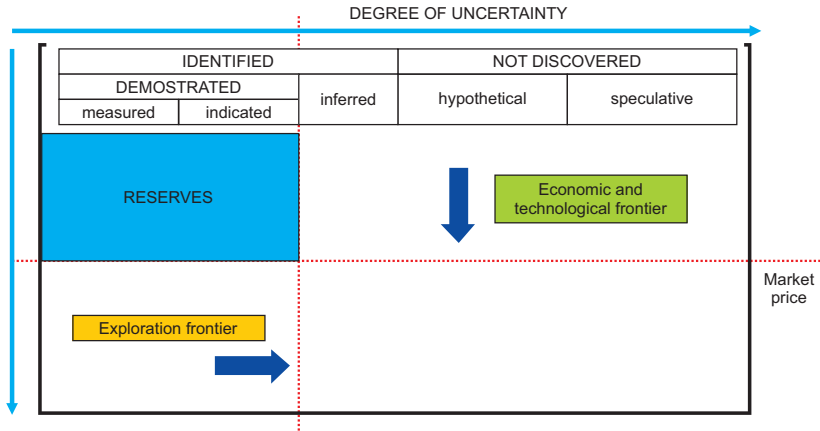


Figure 1. McKelvey's Box: Classification of Non-Renewable Resources.

The technology

Apart from the information available, in the definition of reserves it is also important to take into account the technological capacity that we have to produce well-being from non-renewable resources. Such capacity essentially depends on the technology available to exploit, use and recycle the materials we obtain from the Earth's crust. Innovations, driven by scarcity and the price increases that this entails, gradually increase the available reserves.

Technical progress can take multiple forms, depending essentially on the point in the life cycle of minerals at which technological innovations occur. Thus, technology can improve in the phase of exploration, extraction, transportation, production, consumption, or recycling of materials. Let's see some examples of each case.

First, our knowledge of how mineral deposits form has strongly affected the way we search for them. If we go back to the old explorer with his mule and his punt, we can gain some perspective on how far we've come. To a large extent, these fortune seekers, with their limited knowledge of geology or mineralogy, were looking for an environment favourable to mineralization, pursuing a certain type of stone or colour. Modern exploration does the same thing, but in a more sophisticated way. Recent advances in scientific knowledge about how and where mineral deposits form have given geologists intellectual tools their predecessors lacked. Theoretical and technical advances

in geochemistry and geophysics have made it possible to delimit and focus search tasks. As important as they are to the well-being and improvement of modern societies, mineral deposits occupy less than one percent of the Earth's surface. Since these are found only where the vagaries of geological processes have deposited them, the benefits of the new information obtained from exploration must be weighed against the costs of resources and alternative uses of land assigned to mining.

Secondly, scarcity, and the increase in prices that it entails, produces the necessary incentives to research and develop mineral extraction technologies. By way of example, it can be mentioned that the minimum concentration required for the profitable exploitation of a copper ore deposit fell from 3 percent in 1880 to 0.5 percent in 1960, and to 0.1 in 1985. In the same way, only twenty years ago the recovery factor of oil fields, that is, the amount that can be extracted profitably from a well, was 30 percent; today the average is around 45 percent and is likely to continue to increase in the coming years. All this has resulted in an effective increase in copper and oil reserves.

Thirdly, scarcity is also related to the processing technologies for materials obtained from nature. Most of the minerals and energy resources are only raw materials for the elaboration of more complex materials that are used for consumption or for the production of other goods. Thus, iron is used in the production of steel, and crude oil to obtain gasoline. In this secondary treatment process there are also important possibilities for technical progress and, consequently, for the conservation of the remaining resources.

As an example, we can once again use the oil industry. Crude oil, which is obtained directly from the subsoil, is a heterogeneous mixture of different hydrocarbons (that is, chains of different lengths from carbon to hydrogen atoms). The short chains, of up to four carbon atoms, are gases, those of intermediate length are liquids; the more viscous, the greater their length, from the shortest, such as gasoline, to the longest, such as waxes. Petroleum refining basically consists of the meticulous separation of hydrocarbons of the same length, forming homogeneous gases or liquids. This is how gasoline, kerosene, diesel oil, lubricants, etc. are obtained. The mix, and what can be obtained from it, is basically determined by the quality of the crude found in the reservoir, which poses a major economic problem. Gasoline, for example, is the product with the highest market value; but what to do

with the other by-products? The desire to increase the proportion obtained from the most valuable components of petroleum has served to produce important technological advances in the recent history of the sector. Thus, to avoid unwanted surpluses, the long chains are broken to form shorter chains that allow, at the same time, more gasoline to be obtained and by-product surpluses to be reduced through techniques known as catalytic cracking. In addition to this, it is not only possible to increase the amount of gasoline obtained from a barrel of oil, but also to increase its power; this is achieved through the so-called hydrocarbon molecule reforming techniques, which, through chemical processing using heat and catalytic agents, manage to reform the C8 hydrocarbon, called octane, into isooctane that burns more efficiently and reduces gasoline consumption in automobiles. None of these techniques make oil more abundant in nature, but they do make it less scarce for society; in other words, they increase the level of well-being that we can get from the same amount of crude oil.

Finally, in the definition of what we consider scarce or abundant, one must not lose sight of the fact that, at least in modern market societies, the production and commercialization of raw materials ultimately depends on the supply and demand of goods for whose elaboration these are used. Thus, for example, oil only became a commodity with economic value in the 19th century; precisely at a time when the whaling industry was beginning to be unable to provide enough oil to light the lamps of the world. In August 1859 Edwin Drake in Pennsylvania inaugurated a new era by digging the first oil well and a few years later the invention of the internal combustion engine made gasoline a vital element for transportation, and this demand has not stopped increasing ever since. Today, 70 million barrels are consumed daily in the world. However, as the demand grows, so does the technology of their use, with more efficient motors and lighter materials used in their construction. For all these reasons, with the exception of the 1970s, economically exploitable oil reserves have not stopped increasing, guided by exploration, the discovery of new technologies, and the substitution of materials.

Exploitation costs and market prices

In short, both the available information and the technological possibilities of exploiting and using the reserves must be reflected in the production costs and in the prices of the different resources.

As companies are forced to mine for lower concentration materials further from the surface, or in more hostile environments, the effects of resource depletion will be felt in rising extraction costs and higher prices. However, as we have seen, these effects can be offset by other positive factors. Mining companies will add exploration and discovery efforts, and technological advances will make such materials usable (through more sophisticated mining techniques or new processing methods that increase the economic quality of the materials). Additionally, the market will react to price increases by searching for and developing substitute goods (new materials, or new uses for available materials), more efficient use of resources, or recycling activities.

In general, the higher the market price, the greater the volume of reserves. For example, most of the oil fields currently in exploitation are between 900 and 5,000 meters deep; however, today it is possible to pump oil from 8 kilometres under the ground or the sea surface, as long as the better crude oil quality offsets higher pumping costs.

All these ideas can be summarized in Figure 1, which presents the basic elements of the economic theory of scarcity that we have developed in this section. The diagram is adapted from the so-called McKelvey Box, used to clarify the distinction between reserves and resources. If the resources are a physical measure of the potential remaining reserves, the reserves are a social measure that depends on our degree of knowledge (represented by the upper arrow) and the economic viability of exploitation of the different deposits (represented by the vertical arrow). The basic purpose of McKelvey's system is to order all the necessary elements for long-term planning of the use of non-renewable resources, taking into account the evolution of prices, the probabilities of new discoveries, etc. Thus, both reserves and resources are continually underestimated in light of new geological evidence, technological progress, reserve extraction, and economic and political circumstances. All of the interior divisions of the McKelvey box are mobile and their dynamics must be explained in light of changing economic and political conditions.

An overview

In this section we have moved from a pessimistic point of view, which we illustrated with some of the conclusions of the Club of Rome, to another that can justify a certain optimism. However, it is necessary to mention some reasons for caution that should warn us against the

danger of taking the optimism of our analysis scheme too far. McKelvey's box orders the available information, makes it possible to analyze with a certain logic what has happened in the past, and gives some clues about what will happen in the future. However, this scheme has limited claims to forecast the future. The relative success of the past is not a guarantee for the future. We cannot assume that technical progress in the future will occur at the same rate as in the past, or that all the problems of scarcity and the responses of society will be articulated in the years to come so harmoniously that there will be no shortage of materials and energy or severe environmental problems.

2.1.2. An analysis model

The important question in the economics of non-renewable resources is: at what rate should they be exploited? That is to say: what amount must be extracted each year for current uses? Or how much should remain in the subsoil as a reserve for future uses? This question leads to another, equivalent one: what is the price at which units of each resource should be sold and how should this price vary over time?

These issues are clearly normative; what interests us is knowing how resources should be used, and once we have a clear answer to this question, we will be able to judge the behavior of the market economy and assess the problems caused by the different property rights structures.

Below we will first explore the basic model of natural resource management using the concepts of static and dynamic efficiency.

Some basic principles

Unlike other productive sectors, in the extraction of minerals the production at a given moment is not independent of the production in the past or of what will be done in the future. For many reasons, in decisions to extract minerals or non-renewable energy resources, it is necessary to take into account the close interrelationship between past decisions, present decisions and the possibilities that we leave open for the future.

The cost of extracting a unit at present depends not only on the use of production factors, such as labour and energy, and on their prices, but also on the extractions carried out in the past and their impact on the current profitability of the products.

Similarly, current extraction decisions depend on those made in the past, as well as expectations about future costs and prices. The current extraction rate will affect the amount that can be obtained in the future, and not only because the remaining reserves in each deposit will depend on it, but also because the current rate of decline in reserves may be an incentive to increase exploration and the development of activities that may lead to an increase in the future level of reserves.

Furthermore, for a given level of currently known reserves, the decision to mine the deposits with lower extraction costs will leave only deposits with higher extraction costs for the future. Similarly, the reduction of the content of large ore deposits, and the tendency to concentrate exploration in the most accessible places, and where the richest deposits are most likely to be found, will lead to an increase in exploration costs in the future.

The basic analysis model for the management of non-renewable resources that we develop below aims to account for these complex intertemporal relationships, in order to resolve the basic question of the rate at which the reserves of a non-renewable resource should be used. To do this, we will concentrate the analysis on a specific resource, of which we know the reserves currently available and their uses by the productive system. Thus, our problem is reduced to finding out, at each moment in time, how much must be withdrawn and, consequently, how much must be reserved for future periods.

These decisions depend, first of all, on the existing demand in the economy for the resource in question. Non-renewable resources are basically productive inputs for the manufacture of other goods. Thus, iron ore is required to produce steel, which is then used for the manufacture of different machines and utensils. Crude oil is an input used to refine gasoline which, in turn, is required by others to meet the transportation needs of society. Consequently, the demand for non-renewable resources will depend on the value of the final consumer goods and the services that can be obtained from them. Given the technology of steel production, for example, it can be said that the iron and steel industry is more inclined to procure a larger quantity of minerals when the acquisition price is lower. We can then admit that the mineral demand function can be defined as a decreasing relationship between the market price and the quantity that firms are willing to buy. In addition to the usual reasons to justify the decreasing form

of the demand function, in the case of minerals there is an additional reason: the fact that as the price increases, the recycling processes become profitable and, consequently, the used material gradually becomes a profitable substitute for the original raw material.

The demand function allows us to explain why, at a certain moment, it is useful to extract minerals from the ground, but it does not tell us anything about the value of the reserves that remain buried, nor about the reasons that lead their owners to keep them.

Natural resource economics treats “the resources in the soil” as capital assets for society. Society as a whole has reasons to preserve much of the resources to meet future demands. However, in a market society, where most mineral deposits are privately owned, these conservation decisions depend on the individual owners of each vein or each deposit. If the reserves in the ground do not produce any return, the owners of the same would prefer to extract them in the shortest possible time to make a profit that can be invested in a more profitable activity. However, things do not happen this way; for businessmen, and for society as a whole, waiting before running out of resources in the shortest possible time is a desirable and profitable solution.

The reasons and incentives that exist to wait are the central argument of the basic model of the management of non-renewable resources. Let’s look at these reasons assuming that, as is usually the case, the resource in question is privately owned. For its owner, a well, a vein, or a deposit is an investment, an asset, that provides benefits, and, from their point of view, it is comparable to other investments that provide financial returns in the economy. However, unlike a machine, or other assets, the resources that remain buried do not produce any income until they are extracted and offered for sale. In a market economy, there is only one reasonable reason for the owner of a mineral deposit to decide to hold it, and that is for the asset to increase in value over time. The only reason to keep most of the reserves of non-renewable resources unexploited is that the financial return that can be obtained from them in the future is higher than the one that can be obtained at present.

The Basic Model

To keep things simple, let us assume that mineral reserves can be extracted at no cost and that no new reserves are to be discovered, nor is change in future mineral demand to be expected. In this case, the

only reason to save reserves for the future is the expectation that the sale price of the mineral will increase.

The amount that business people decide to extract will depend on their expectations regarding the increase in prices. But such expectations are far from being something immutable and, at all times, they must be reviewed and corrected based on the decisions that other business people are taking and, in short, on the evolution of the mineral market. For example, suppose that business people expect the price of mineral to rise very little, or not at all, over the next few years. In this case, it is logical that many of them will choose to extract and sell all their reserves as soon as possible, in order to transfer their capital to a more promising alternative. However, this reasonable decision will only create a situation in which everyone will be forced to modify their expectations and present decisions. The increase in production will create an excess supply in the market, which will momentarily decrease the sale prices of the ore, but will also make a shortage of minerals foreseeable in the following years, making a future increase in prices plausible. These effects, the decrease in current prices, the result of overproduction, and the expected increase in future prices, the result of greater scarcity, restore the incentives to conserve a greater quantity of minerals in the soil and will serve to adjust the patterns of production. In general terms, we can say that the above situation will be what happens when business people expect the price of minerals to grow at a lower rate than the interest rate in the economy.

We can also think of a completely opposite example to the previous one. Suppose that business people expect that, due to past depletion of known deposits, prices in the future will be much higher than today. If so, the logical decision for them would be to wait, keeping the unexploited minerals to sell in the future at a higher profit margin. However, as in the previous case, these decisions will not be stable and the market itself will be in charge of forcing companies to review them. If many reserves are left for the future it will not be reasonable to expect very high prices in subsequent years; on the other hand, the current market will be depressed and, consequently, the current price of minerals will increase. By increasing the current price and reducing the expectation of very high prices in the future, new incentives will be created to extract more resources in the present moment. This situation will be the one that occurs when business people initially

expect the price of minerals to grow at a higher rate than the interest rate in the economy.

Between the two extreme cases, there is an intermediate situation that can be maintained over time, extracting a sufficient quantity each year so that mineral prices grow at the same rate as the interest rate in the economy. This is the central idea of the so-called Hotelling's Rule: according to this rule, the optimal pattern of exploitation of a natural resource is characterized by the fact that, over time, the marginal benefit that can be obtained with the extraction and sale of the resource must grow at the same rate as the interest rate. In our simple model, since the extraction costs are zero, the profit is equal to the sale price.

To clarify the meaning of Hotelling's rule, we can see some of its more general consequences with the help of Figure 2. According to the demand curve, the only way to increase the price of the mineral is by decreasing the amount that is extracted year after year. For this reason, Hotelling's rule also means that, with our restrictive assumptions that we will clarify later, the amount of the mineral that is extracted each year is less than that of the previous year. This is illustrated in Figure 2, in which three fundamental elements are related to understand the pattern of exploitation of a non-renewable resource in a market economy:

- firstly, the demand for the resource, shown in panel (a);
- secondly, the price growth pattern, according to Hotelling's rule, in panel (b) and,
- thirdly, the two previous elements are related in panel (c) where the price pattern is represented, decreasing extraction over time.

In short, in the optimal pattern of resource extraction, as price increases, the quantity demanded gradually decreases, and with it decreases the amount of material removed from the soil.

Let us now complete the basic model with two important elements, the possibility that in the future we can do without a specific non-renewable resource and the total volume of reserves that we can exploit from it.

Regarding the first, the technological knowledge that we have makes it possible to think that, if the market price is high enough, some of the resources that today seem essential for the normal functioning of the economy could no longer be so. This is because there

are technologies that would make it possible to satisfy the demands of society in a more adequate way using some alternative resource.

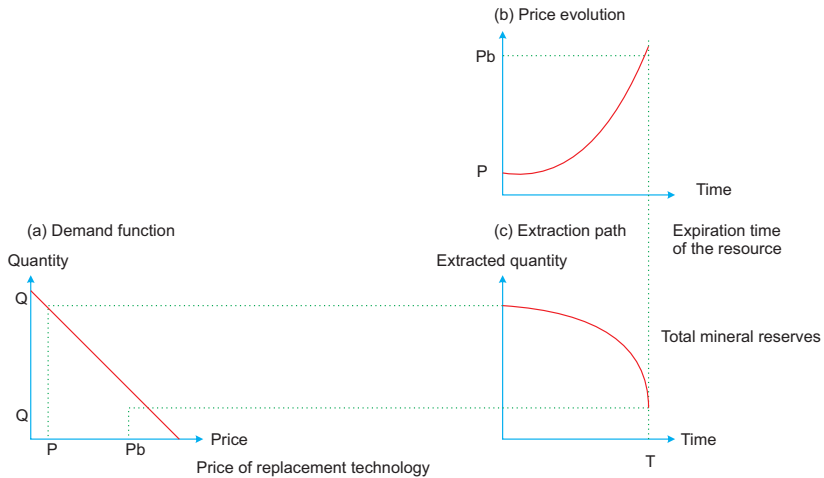


Figure 2. Hotelling's Rule: the basic model of non-renewable resource management.

These production processes, which make it possible to produce without a natural resource are known as replacement technologies. Many of them are known and have passed the test studies necessary for their development. Several renewable energies fall into this category, and other similar options have already been adopted by society in the past, such as the substitution of synthetic fibres for rubber, or of natural fertilizers for chemical fertilizers.

In the simple model of analysis, the replacement technology can be represented through a price, sufficiently high, which would make the demand for the mineral in question zero, as represented in panel (a) of Figure 2. This price, in practical terms, represents a threshold, beyond which the mineral deposit ceases to have value for its owner. Once replacement technology is activated and becomes widespread, resources that have not been exploited will become worthless. This allows us to qualify the first result of Hotelling's rule: mineral prices should grow at the rate set by the interest rate, and should approach the price of the replacement technology as the remaining reserves approach zero.

The Hotelling model aims to show us the optimal pattern for the extraction of a natural resource throughout its useful life. That is, during the entire period of time in which such a resource is used by the economy. The duration of that period of time will be determined, apart from the demand and the exploitation technology, by the amount of available reserves. These reserves will be equal to the sum of all the amounts that are extracted from the present moment until the moment in which the company can dispense with the resource, which is represented by the shaded area in panel (c) of Figure 2.

We already have the analysis model for the economic management of natural resources completed. If we had all the necessary information, we could say that as a non-renewable resource is used, prices must rise at the rate of discount, reflecting the increasing scarcity. At the same time, the rate of extraction must decrease as the resource is depleted and its price converges to that which allows a smooth transition to a new technology that makes it possible to do without it.

To develop our basic model we have made some restrictive and unrealistic assumptions, especially in an analysis period as long as the time it will take humanity to extract the last particle of iron or burn the last barrel of oil. We have assumed, first, that mining costs are zero, that current and future mineral demand can be represented by a stable curve over time, and that the interest rate, or discount rate, is stable. Second, we have implicitly assumed that there is a perfectly competitive market, which excludes monopolies and any other barriers to trade. Finally, we have also assumed that we have all the information on the amount of reserves available, and on the technologies of exploitation, use, and replacement of the non-renewable resource.

All the aforementioned assumptions allowed us to obtain a relatively simple answer to the question of how fast we should deplete a non-renewable resource and, in particular, the assumption of complete information, allowed us to deduce how much should be consumed each year and at what price it should be sold.

It would be naive not to recognize that these assumptions are wrong. However, the usefulness of our model is not that it faithfully represents the reality in which we live, but rather that it provides us with a basic analysis tool that, while offering us simple answers, we can expand in many directions by introducing all the complications that we have mentioned and for which there are answers in the most advanced texts on the subject.

The answer that our society can give to the problem of the depletion of natural resources will necessarily depend on the information that we currently have. This also means that our forecasts on the path of depletion of a non-renewable resource must be constantly revised whenever this information changes. For this reason, the efficiency path that we have defined is surprisingly vulnerable to any change in the starting conditions, for example, in the volume of known reserves, in the demand for minerals, or in replacement technologies. By way of illustration let us see what happens in the third of the mentioned cases.

Let's suppose there is a new discovery that makes it possible to find a way to replace gasoline as fuel for automobiles and that, although it is more expensive than the current market price of gasoline, it is cheaper than obtaining the same fuel with known coal liquefaction techniques. In other words, it will no longer be necessary for the price of a barrel of oil to reach the substitution price for us to decide on a massive change of fuel. What consequences will this circumstance have on oil reserves and extraction? The first consequence is that, although the physical quantity of oil in the subsoil is the same as before, oil will now be a less scarce resource than before; the effective possibilities of maintaining our well-being without oil are now greater than before.

This will necessarily have consequences that will affect the prices of a barrel of oil. If the current growth in prices continues, the time will soon be reached when we will not require oil to produce gasoline and, at that time, untapped reserves will be left in the ground that will be worthless to the owners of the oil wells. For that reason all forecasts will have to be revised, it will be necessary to speed up the rate of extraction, which will lead to a revision of current and future prices, and probably also reduce the useful life of the oil.

The example is only intended to illustrate a characteristic of Hotelling's rule: the path of exploitation of a non-renewable resource changes with each new circumstance and must be revised with each discovery of new reserves, of new technologies, or with each change in total demand.

2.2. Zero carbon

Carbon neutrality, zero carbon footprint, net zero or climate neutrality refers to achieving zero net carbon dioxide emissions by balancing the amount of carbon dioxide released into the atmosphere with an equivalent amount removed from the atmosphere, or fixed by plants, or by purchasing enough carbon credits. The term “carbon neutral” is used in the context of processes associated with the emission of carbon dioxide, such as transportation or energy production using fossil fuels (coal, oil or natural gas).

It should be clarified that in the context of climate change, energy, atmosphere, etc., when you say “carbon”, you are generally talking about carbon dioxide (CO_2), a chemical compound, gaseous at room temperature; while in other contexts (biology, organic chemistry), when one says “carbon”, one alludes to a chemical element, the sixth in the periodic table, with the symbol C, and with properties totally different from those of CO_2 .

The concept of carbon neutrality can be extended to include other greenhouse gases (GHGs) measured in terms of their equivalence to carbon dioxide (CO_2e) – the impact that a GHG has on the atmosphere expressed in the equivalent amount of CO_2 . For example, methane produces a greenhouse effect 21 times greater than CO_2 . Therefore, if some emissions consist of one tonne of CO_2 and one tonne of methane, they will add up to 22 tonnes of carbon dioxide equivalent (CO_2e).

The term climate neutral reflects the inclusion of other GHGs. Although CO_2 is the most abundant, other GHGs regulated by the Kyoto Protocol are methane (CH_4), nitrogen oxide (N_2O), hydrofluorocarbons (HFCs), fluorocarbons (PFCs), and sulphur hexafluoride (SF_6).

Best practice for organizations and individuals seeking to become carbon neutral involves first reducing or avoiding as many GHG emissions as possible, so that afterwards they only need to offset unavoidable emissions. Neutrality is generally achieved in two ways:

- Using only renewable energy, which does not produce carbon dioxide (this is also called a low-carbon economy, a decarbonized economy, or a post-carbon economy).
- Carbon offsetting – paying others to capture and store 100% of the carbon dioxide emitted into the atmosphere (for example by planting trees) or financing carbon projects that should lead to preventing future emissions, or buying

carbon credits, which, in practice, are rights to emit GHGs, and there are a limited number of them in the emissions market. If someone buys them, and does not emit those GHGs, the amount of GHGs emitted will be reduced by that amount. The practice of these offsets has received some criticism.

The term carbon neutrality was the 2006 word of the year for the New Oxford American Dictionary.

Carbon neutrality is typically achieved by the following steps (although they may vary depending on whether they are taken by individuals, businesses, organizations, cities, regions, or countries):

Commitment

For individuals the decision is likely to be straightforward, but for more complex ensembles it usually requires political leadership at the highest level and broad popular agreement on the validity of the effort.

Computation and analysis

Quantifying and analyzing the emissions that must be eliminated, and the options to do so, is the crucial step in the process, because it allows setting priorities for action – from the products that are purchased (some have a larger carbon footprint than others) to the energy production, use and transport – and beginning to measure progress. This can be achieved through a GHG inventory that answers questions such as:

- What operations, activities and units should be included?
- What sources should be included?
- Who is responsible for what emissions?
- What gases should be included?

For individuals, carbon calculators can make it easy for them to compile an inventory of their emissions. They typically measure electricity consumption in kWh, the amount and type of fuel used for heating and hot water, and how many miles the individual drives, flies, and rides in other vehicles. Individuals can also set various boundaries on the system where they move, e.g. personal GHG emissions, emissions from home, or what company they work for. Many carbon calculators are available on the Internet, which vary significantly in their usefulness and the parameters they measure. Some only take

into account cars, planes and household energy. Others also cover household waste and leisure.

In some circumstances, a goal is set to go beyond carbon neutrality (usually after a certain amount of time to achieve it) and begin to reduce carbon dioxide in the atmosphere, rather than just not increasing it. Although some individuals, companies or countries have reduced their emissions, even considerably, the concentration of carbon dioxide in the atmosphere continues to grow.

Action

To start moving towards climate neutrality, companies and local governments can use an environmental or sustainability management system (EMS) established by the international standard ISO 14001 (developed by the International Organization for Standardization, ISO). Another EMS framework is EMAS, the European Eco-Management and Audit Scheme, used by many EU companies. Many local authorities apply EMS to certain sectors of their administration, or even certify (i.e. they have all their operations examined by an independent auditor) against one of these standards.

Reduction

One of the strongest arguments for reducing GHG emissions is that it saves money. When energy prices engage in one of their frequent upward cycles (often fuelled by rising oil prices), it becomes more expensive to travel, heat and light homes and workplaces, and run a modern economy. So, it is both common sense and climate wise to use energy as sparingly as possible. Examples of actions to reduce GHG emissions are:

- Limit energy consumption and emissions from transport (using – instead of a private vehicle – bicycles, public transport or your own feet, avoiding plane journeys, using low-consumption vehicles), as well as from buildings, equipment, animals and processes.
- Get electricity and other energy from a renewable energy source (for example, a solar thermal installation), either directly by the end user of the energy (such as installing photovoltaic panels on the roof of your house), or by selecting a certified green energy supplier. Another proposed method is to use alternative low-emission fuels, such as sustainable

biofuels, but these are controversial because they can result in a net increase in emissions, as well as increased food prices and deforestation.

Compensation

The use of carbon offsets is intended to neutralize a certain volume of GHG emissions by financing projects—such as planting trees—that should result in lower emissions elsewhere. Under the “first reduce what you can, then offset the rest” premise, offsetting can be achieved by supporting a responsible carbon project, or by purchasing carbon offsets or carbon credits.

Carbon offsetting is also a tool for various local authorities around the world.

Compensation is sometimes seen as a contentious and biased issue (whoever talks about it belongs to a certain faction). For example, James Hansen describes the offset as “modern indulgences, sold to an increasingly emissions-conscious public to absolve its climate sins”. Indulgences are a mechanism of the Catholic Church to exempt recipients from the temporal penalties that sins entail. Its highly criticized abuse gave rise, along with other factors, to the Protestant schism.

Evaluation and repetition

This phase includes evaluating the results and compiling a list of proposed improvements, with the results documented and reported, so that experience of what works (and what does not) is shared with those who can put it to good use.

Finally, with everything completed, the carbon neutrality process begins again, this time incorporating the lessons learned. Science and technology advance, regulations (for example, on emissions) become stricter and the standards demanded by the population rise. So, the second cycle will go further than the first, and the process will continue, each successive phase building on and improving on the previous one.

2.3. Zero waste emissions

Zero waste refers to the principles that encourage the reuse of products so that they do not return to nature in the form of waste or garbage.

In this paradigm, the life cycle of objects would be lengthened by recycling, and it requires including in their composition as many biodegradable materials as possible that do not harm the planet. This is a very different model from that in which most products are wrapped in or made of plastic (which takes between one and four centuries to degrade) and other polluting substances.

According to the Zero Waste International Alliance (ZWIA), it is about achieving “the conservation of all resources through the responsible production, consumption, reuse and recovery of all products, packaging and materials, without burning them and without dumping them on the ground, water or air so that they do not threaten the environment or human health”.

For ZWIA, achieving that goal calls on producers and manufacturers when they decide whether or not to follow these principles, but it is also in the hands of each consumer, with regard to the commitments favourable to that cause. The change in habits and priorities calls for the whole of society to act, and institutions and governments play a key role in applying regulations related to zero waste, as well as tax incentives and support for less polluting activities.

The model is summarized in these concepts:

- Reject what is not needed.
- Reduce what is needed.
- Reuse all kinds of materials, packaging and containers (with the recommendation of consuming second-hand products).
- Recycle everything that cannot be rejected or reduced.
- “Rot”– the action of decomposing or composting organic matter to obtain natural fertilizer.

The problem is that, despite these initiatives, waste is increasing at a worrying rate. According to the World Bank, cities alone generated 2,010 million tonnes of solid waste in 2016 (0.74 kilos per person per day). If a global zero waste policy is not successfully promoted, that number would reach 3.4 billion tonnes by 2050.

2.4. Plastic recycling

How is plastic recycled and what is its purpose? This material poses a threat to ecosystems, especially to marine life. It is in the seas and oceans where the bulk of this type of waste is deposited, sometimes on the seabed in the form of microplastics. Reducing the consumption

of packaging, using recyclable bags, and recycling plastic is key to helping the planet.

What measures are being taken? For example, charging for plastic bags in stores and supermarkets to reduce their use, since they are among the objects that pollute the oceans the most, along with cigarette butts, food wrappers and plastic bottles, according to the Ocean Conservancy. Reducing the use of bags is also the goal of a European Parliament directive (from 2015) that includes industrial incentives to develop less polluting alternatives and the collection of 90% of plastic beverage containers (those for single use) by 2025.

Some countries legislate with the same objective. For example, Spain plans to ban “the use, marketing, import and export of utensils such as plates, glasses, cups, cutlery and disposable straws, designed to be removed after a single use, entirely made of any variety of plastic”. These utensils would have to be made with at least 50% biodegradable materials.

Information and the circular economy

Conservation associations such as Ecologistas en Acción call for improving product labelling so that consumers are aware of the environmental impact, including waste, of what they buy, and they warn that materials that are advertised as biodegradable turn out not to be so.

For example, biodegradable plastics have emerged, made from organic products such as cassava, corn or wheat, but the United Nations Environment Program (UNEP) has pointed out secondary effects, such as the difficulty of their degradation in the sea or the increase in the cultivation area necessary to cover the demand.

Therefore, in addition to the five R's in consumption, there should be a paradigm shift towards the circular economy: “The model of production and consumption that involves sharing, renting, reusing, repairing, renewing and recycling existing materials and products as many times as possible to create added value and extend the product life cycle”, as defined by the European Commission.

3. Discussion questions and tasks for students

1. ECO LABELS are symbols that identify the product that bears it as respectful of the environment. Search the Internet for

the ecological label or environmental ecolabel of the European Union and explain what it is used for. Give 2 examples of products on which we can find this label.

2. In August 2017, the new European regulation that affects the classification of energy labelling of energy-consuming devices, such as household appliances, came into force. This regulation will be applied progressively to all energy consuming equipment (domestic appliances); all products being labelled at this time have to follow this regulation before August 2030. Look for old energy labels for those with A+++, A++, etc. and also for the new labels that go from A to G and explain what the colours and letters of both labels mean.
3. List 3 incorrect practices in resource management and another 3 correct practices. For example, turning off the light when leaving a room.
4. Would you use the drains to dispose of oils or polluting products? Why/Why not?
5. What measures would you take at home and at work (or at your place of study) to save energy and natural resources such as water?
6. At the base of the containers we find some triangles with a number inside. These symbols indicate the type of plastic from which these products are made.



Look at home for 3 products made of plastic and indicate the type of product it is (for example, if it is a water bottle and the type of plastic it has, for example PET). If you can, attach a photo of the product where you can see the type of plastic it is.

7. Investigate what type of materials we can put in the microwave and what symbol these containers must have to contain food. What is better – a plastic or a glass container to heat food in the microwave? Give reasons for your answer.

4. Further reading

This link allows access to the data of the Environmental Sustainability Index of the World Economic Forum:

www.ciesin.columbia.edu/indicators/ESI

This link from the United Nations Division of Sustainable Development offers sustainable development indicators used by this institution:

www.un.org/esa/sustdev/natlinfo/indicators/isdms2001/table_1.htm

This Global Footprint Network link allows access to ecological footprint data by country and city: www.footprintnetwork.org

The Rio Declaration is available at this link:

www.un.org/esa/sustdev/documents/agenda21/spanish/riodeclaration.htm

The Agenda 21 document is available at this link:

www.un.org/esa/sustdev/documents/agenda21/spanish/agenda21sptoc.htm

This link allows access to everything that happened at the Johannesburg Summit and related documents: www.johannesburgsummit.org

International actions against climate change can be consulted at this link:

https://ec.europa.eu/clima/policies/international/negotiations/paris_es

To facilitate the search for environmental valuation applications, one of the existing valuation databases can be used:

Environmental Valuation Reference Inventory of Environment Canada:

www.evri.ec.gc.ca/evri

Valuation Source List (Department of Environment, Transport and the Regions): www.environment.detr.gov.uk/evslist

Australian and New South Wales Environmental Protection Agency Database: www.epa.nsw.gov.au/envalue

Economy and Environment Program for South Asia (EEPSEA):

www.geocities.com/valuasia

Multiple reports and data on sustainability can be accessed through the following websites of international institutions:

United Nations (UN): www.un.org

Food and Agriculture Organization of the United Nations (FAO):

www.fao.org

United Nations Environment Program (UNEP): www.unep.org
 United Nations Development Program (UNDP): www.undp.org
 Organization for Economic Cooperation and Development (OECD):
www.oecd.org
 World Bank: www.worldbank.org
 World Wide Fund: www.wwf.org
 World Economic Forum: www.weforum.org
 World Resources Institute: www.wri.org
 Document prepared by the United Nations Environment Program and
 Sustainability Ltd in which they show how environmental reports
 should be prepared and their usefulness in the company's environ-
 mental management: www.unep.org/business
 Link that allows you to find information on the preparation of environ-
 mental reports in the European Union: www.enviroreporting.com
 Detailed site with useful resources for all those interested in economic
 activities that promote sustainable development:
www.sustainablebusiness.com

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INSTITUTIONAL FRAMEWORK FOR SUSTAINABILITY

Pavel Kotyza

■ Annotation

Sustainable issues have been an important topic of international affairs for more than 50 years. Recently they have become a central part of the global policy agenda. The Rio+20 conference, Agenda 2030, and the Paris Agreement are just a few examples of documents which are shaping today's world. This chapter will introduce activities and agreements related to sustainable development and highlight some basic issues of global sustainability governance. Problems in global sustainable governance and sustainable financing are introduced, and some solutions are proposed. This chapter will serve as an initial guide for those who would like to gain some basic knowledge on global governance.

Key words: Institutions, UN system, sustainability governance, SDGs, financial support, RIO+20.

1. Introduction

Aligning governance with the demands of global sustainability is ranked as the top future problem whose solution will support the shift to a more sustainable development (Najam & Halle, 2010). Beginning with the Stockholm Conference on the Human Environment in 1972, the United Nations has long played a significant role in establishing the foundations for international sustainable development and environmental governance (EU, DG IPOL, 2012). Over the last 50 years, there has been a variety of important events through which the UN responded to the challenges of Sustainable Development (SD)

Governance. Also, from the international point of view, the UN has been the main driving institution which managed sustainable governance. Table 1 (see below) identifies the most important SD milestones. These events led to some substantial achievements: (i) a widespread expansion of Multilateral Environmental Agreements, (ii) the adoption of the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs), (iii) the businesses commitments to SD through Corporate Social Responsibility (CSR), (iv) the inclusion of civil society organisations and business in the decision process, (v) the engagement of local, regional and national institutions through the Agenda 21 initiative, and (vi) the creation of international scientific institutions such as the Intergovernmental Panel on Climate Change (IPCC) to shed light on global problems.

Table 1. Milestones for Sustainable Development governance.

1972	UN Conference on the Human Environment, Stockholm
	Creation of UNEP by the UN General Assembly
	Publication of the Limits to Growth by the Club of Rome
	UNESCO convention on the Protection of the World Cultural and Natural Heritage
1973	Convention on International Trade in Endangered Species (CITES)
1979	Convention on the Conservation of Migratory Species of Wild Animals (CMS)
1980	World Conservation Strategy launched by IUCN, UNEP and WWF
1982	United Nations Convention on the Law of the Sea (UNCLOS)
1985	Vienna Convention for the Protection of the Ozone Layer
1987	Publication of "Our Common Future" (the Brundtland report)
	Montreal Protocol on Substances that Deplete the Ozone Layer
1988	Setting up the Intergovernmental Panel on Climate Change (IPCC)
1989	Basel Conv. Transboundary Movement of Hazardous Wastes
1992	UN Conference on Environment and Development (Earth Summit), Rio De Janeiro
	Convention on Biological Diversity (CBD)
	UN Framework Convention on Climate Change (UNFCCC)
	Setting Up of the Commission on Sustainable Development (CSD)
1995	Setting up of the World Business Council for Sustainable Development
1997	Rio+5 Summit, New York
	Adoption of the Kyoto Protocol
1998	Aarhus Convention on Access to Information, Public Participation (...)
	Rotterdam Convention on the Prior Informed Consent (PIC)

2000	Millennium Declaration / Millennium Development Goals Cartagena Protocol on Biosafety
2001	Stockholm Convention on Persistent Organic Pollutants (POPs)
2002	World Summit on Sustainable Development, Johannesburg
2003	Marrakech Process on Sustainable consumption and production
2012	United Nations Conference on Sustainable Development, The future we want (Rio+20)
2015	UN Sustainable Development Summit, AGENDA 2030 COP 21, Paris Climatic Accords
2017	The Ocean Conference
2019	Strengthening Synergies Between the Paris Agreement and the 2030 Agenda for Sustainable Development
2022	International Conference on Sustainable Development Towards Stockholm+50: Fifty years of environmental policy

Source: (EU, DG IPOL, 2012), the author's own synthesis.

Today, it is almost impossible to identify all the actors involved in global sustainability governance. Sustainability issues are managed on local, regional, national, and supranational levels. From that perspective, the main aim of this chapter is to identify the main governance drivers of the sustainability agenda globally.

2. Background

Unfortunately, governance is a concept that has been defined in different ways and used for different purposes (Kemp et al., 2005). Also, Baker (2009) that of 'governance' and of 'sustainable development'. Attention is then turned to two very distinctive characteristics that are inherent in sustainable development as a policy objective: the scale of social transformation required and the multi-dimensional character of the steering logic involved. These two characteristics have significant implications for the governance of sustainable development and point to the specific governance requirements that are needed if society is to move along a more sustainable development trajectory. The paper focuses on the governance of sustainable development as it relates to the European Union (EU provides a broad definition of governance: It deals with *"managing, steering and guiding action in the realm of public affairs, especially in relation to public policy decision making"*). Also, it is important to mention that the Sustainable Development agenda

has a very multi-stakeholder nature and requires a multi-disciplinary approach. Success in SD governance could be only reached through the wide cooperation of formal and informal institutions (Kemp et al., 2005).

As Baker notes (2009) that of 'governance' and of 'sustainable development'. Attention is then turned to two very distinctive characteristics that are inherent in sustainable development as a policy objective: the scale of social transformation required and the multi-dimensional character of the steering logic involved. These two characteristics have significant implications for the governance of sustainable development and point to the specific governance requirements that are needed if society is to move along a more sustainable development trajectory. The paper focuses on the governance of sustainable development as it relates to the European Union (EU), the transition towards a sustainable future is a never-ending process, which at the same time is undertaken in a context of uncertainty. As explained in the earlier chapters, Sustainable Development as such is frequently mirrored in the economic (ending poverty), social (promoting health and education) and environmental (atmosphere protection, combatting global afforestation) challenges (UNCED, 1992). However, Steurer (2009) social or environmental policy challenges, but regarding its key implications for public governance. It shows that in terms of governance, SD requires horizontal integration of sectoral policies, closer co-operation between different tiers of government (vertical integration argues, that the SD is also concerned with shaping governance principles. From that perspective, SD is also expected to be a reform agenda for governance structures and processes (Steurer, 2009; UNCED, 1992) social or environmental policy challenges, but regarding its key implications for public governance. It shows that in terms of governance, SD requires horizontal integration of sectoral policies, closer co-operation between different tiers of government (vertical integration).

The major governance challenges called upon in Agenda 21 are (Jänicke, 2006; Steurer, 2009; UNCED, 1992):

- Increasing the coherence of policies between different jurisdictions
- Integrating environment and development in decision making
- Improving the role of major stakeholders

- Fostering knowledge and information decision making process
- Facilitating long-term strategic perspectives

As we can observe, some elements have been integrated as, for example, the long-term strategic perspective is utilised in Agenda 2030 (SDGs, see the following chapter), where long-term goals are involved, a wide range of stakeholders is included.

Nevertheless, Steurer (2009) social or environmental policy challenges, but regarding its key implications for public governance. It shows that in terms of governance, SD requires horizontal integration of sectoral policies, closer co-operation between different tiers of government (vertical integration provides 5 policy principles of governance integration, which shall be considered within the reform agenda for sustainable development governance (Tab. 2).

Table 2. Five normative governance principles of sustainable development.

Governance principle	Aspect of integration	Elements to integrate
Horizontal Integration	Policy fields/ Dimensions of SD	Economic, social, and environmental policies
Vertical Integration	Spatial scales	Local, national, and supranational levels of policymaking
Participation (Stakeholder integration)	Societal domains	State, businesses, and civil society
Reflectivity (knowledge integration)	Knowledge	Knowledge from different sectors, subjects and heuristic backgrounds and policymaking processes
Inter-generational equity (temporal integration)	Time scales	Short- and long-term time scales

Source: Steurer (2009).

Horizontal integration

Peters (1998) states that since governing structures are differentiated into ministries and departments, one organisation does not know what the other is doing and programmes tends to be contractionary or redundant. Similarly, Agenda 21 points out *'Prevailing systems of decision-making in many countries tend to separate economic, social and environmental factors at the policy, planning and management levels'* (UNCED, 1992). Recently, the agenda is becoming more

cross-cutting, and it does not fit into the ministerial 'offices' where governments tend to place policies (Peters, 1998). At the same time, the SD model requires a horizontal governing model which is able to integrate economic, social and environmental aspects (Steurer, 2009) social or environmental policy challenges, but regarding its key implications for public governance. It shows that in terms of governance, SD requires horizontal integration of sectoral policies, closer co-operation between different tiers of government (vertical integration). Similarly to the public agenda, horizontal integration is currently used in the private sector (see the Corporate Social Responsibility (CSR) section of this book). Horizontal challenges have never been really managed, as the RIO+20 outcome 'The Future We Want' still addresses them.

Vertical integration

Vertical integration of SD issues means that there shall be clear joint initiative of actors at different levels of policymaking. The SD agenda cuts across different vertical tiers, from global policy actors like the UN, through to national governments and local city halls. Thus, defined global challenges, for example climate change, depend on international agreements (such as the Paris Agreement), as much as on national energy taxes and local sources (Steurer, 2009) social or environmental policy challenges, but regarding its key implications for public governance. It shows that in terms of governance, SD requires horizontal integration of sectoral policies, closer co-operation between different tiers of government (vertical integration). The United Nations, in 'The Future We Want' document (United Nations, 2012), acknowledges the importance of the regional dimension to development and encourages the regional, national and sub-national bodies to develop sustainable policies and strategies that would provide access to all kinds of needed information.

Stakeholder integration

The SD is a broad concept effecting many different actors. Thus, '*One of the fundamental prerequisites for the achievement of sustainable development is broad public participation in decision making*' (UNCED, 1992). Stakeholder integration thus requires the widest possible participation of civil society and businesses in policymaking. The United Nations (2012) defines in articles 42–55 of the 'The Future We Want' publication how important stakeholders are for sustainability

management and policymaking. Stakeholders are a wide range of entities, including women, children and youth, indigenous peoples, non-governmental organizations, local authorities, workers and trade unions, business and industry, the scientific and technological community, and farmers, local communities, volunteer groups and foundations, migrants and families, older persons, persons with disabilities, and international organisations. All stakeholders shall be given access to information on the three dimensions of sustainable development. The UN encourages close cooperation between policymakers and stakeholders during decision-making, planning and implementing of policies and programmes.

Knowledge integration

Knowledge is crucial for current societies. Under the SD agenda, integration of different kinds of knowledge into the decision-making process is required for 3 different reasons. First, the knowledge integration enables the identification and implementation of a set of cross sectoral SD indicators used for horizontal policy integration (for example in Sustainability Impact Assessment). Second, as the relevant knowledge is spread among different actors (policymakers, businesses, scientists, NGOs or citizens) the issue of knowledge integration is closely related to participation. Agenda 21 identifies that with SD everyone could be a user and provider of data, information, experience and knowledge (UNCED, 1992). The third reason for knowledge implementation is a human subjective view of the SD agenda. As human needs changes over time, the long-term policy objectives themselves must be reformulated continuously, based on societal questioning. The UN (2012) also invites all agencies of the UN and other international institutions to support capacity building in developing countries, which would include (i) sharing sustainable practices; (ii) capacity building for disaster risk reduction; (iii) South-South and North-South cooperation; and (iv) the promotion of public-private partnership.

Temporal Integration

Wicked issues usually cross generation boundaries (Williams, 2002). As sustainable development aims to balance the needs of the present and future generations, the time frame is certainly important. The World Summit on Sustainable Development in 2002 in Johannesburg clarified that '*sustainable development requires a long-term perspective and*

broad-based participation in policy formulation, decision-making and implementation at all levels' (UNDESA, 2002). But, once the decision systems follow the electoral cycle, decisions do not fit the long-term perspective related to SD. From this perspective, integration of long-term decisions into the governance process is crucial (Steurer, 2009) social or environmental policy challenges, but regarding its key implications for public governance. It shows that in terms of governance, SD requires horizontal integration of sectoral policies, closer co-operation between different tiers of government (vertical integration. This issue is reflected in the United Nations document (2012) which (art. 102, 213) underlines the need to ensure the long-term commitments to sustainable development.

2.1. Governing arrangements for sustainable development at the United Nations

A document which defines the governance arrangements for sustainability at the global level has been accepted as a framework for the SDGs development. 'The Future We Want' identifies the importance of a strengthened institutional framework, which shall integrate all 3 dimensions in balanced manner, and shall coordinate and avoid duplication of efforts. As mentioned above, the governance shall be inclusive, coordinated, effective, knowledge-based, transparent, etc. The United Nations is recognised to play a central role. Under the UN system, the UN agencies, bodies and other international institutions are expected to exchange information, funds and programmes. (United Nations, 2012). The UN General Assembly is the main authority on global matters. As it is the chief policymaking and representative organ of the United Nations, the Assembly has to deal with sustainable topics in its agenda and high-level dialogues.

The Economic and Social Council is the main body that prepares policy review and recommendations on economic and social development. The council also plays a crucial role in the Millennium Development Goals follow-up activities, and it serves as the main mechanism for UN system coordination and supervision. The Council coordinates funds, programmes and special agencies to eliminate the duplication of mandates and activities. Also, the Council organises the major UN conferences and summits in the economic, environment, social and

related fields (United Nations, 2012). The UN system is depicted below (Figure 1).

The RIO+20 conference on Sustainable development established a new universal, intergovernmental, high-level organ which shall monitor the implementation of sustainable development. The Organ is called The High-Level Political Forum. It provides political leadership and recommendations for SD; enables dialogue and agenda-setting; reviews the process of SD implementation; and encourages the UN system, funds, and programmes to participate in SD activities. The Forum also enhances transparency, shares best practices, provides coordination, and supports evidence-based decision making at all levels (United Nations, 2012). Bierman et al (2017) questions whether the Forum could work as an 'orchestrator' in global sustainability. However, as mentioned on the UN website, the Forum adopts political declarations (United Nations, 2021a) and thus its real role is rather unclear.

Agenda 2030 (the SDG agenda), together with the RIO+20 conference, has presented a novel approach to global governance, as the goal setting was considered as a key strategy. The pre-SDG accords have been mostly market-based and regulation-oriented, the SDGs are non-legally binding goals defined by the UN members in agreement. Even though the SDGs are not legally binding and are overseen by a rather new and weak High-level Political Forum on Sustainable Development (see below), global goals are believed to be successful through its bottom-up, country-driven, stakeholder-oriented and non-confrontational aspects of governance (Biermann et al., 2017; Hajer et al., 2015). The earlier Millennium Development Goals were created by the UN Secretary (Sachs, 2012), while the SDGs have been agreed upon in a public process including at least 70 governments, as well as actors of civil society from both industrialised and developing countries. Also, according to Bierman et al (2017), the global governance through goals allows a great deal of flexibility for national preferences. Many of the defined targets (169) are qualitative and enable governments to determine their own ambitions in goal setting. Also, governments can rely on non-binding qualitative targets, so they could implement them if they chose to. Although 17 goals are defined, supported by 169 targets, they in many cases remain vaguely defined. The success of the SD governance could be supported by the UN Statistical Commission, which developed an expert group on

SDGs Indicators with a mandate to develop indicators and support its implementation. The data collection and target monitoring is divided among various institutions (see Table 3).

Table 3. Agencies responsible for data collection.

No	ACTORS
SDG1	ILO, World Bank, UN-Habitat, UNDRR, OECD, UIS
SDG2	FAO, UNICEF, WHO, OECD, WTO,
SDG3	WHO, UNICEF, UNAIDS, UNODC, DESA, WHO-FCTC, OECD
SDG4	UIS, UNICEF, UNESCO, OECD,
SDG5	UN-Women, OECD, WHO, UNICEF, UNSD, ILO, UNFPA, FAO, ITU, UNDP
SDG6	WHO, UNICEF, JMP, UN-Habitat, UNDS, UNEP, FAO, UNECE, UNESCO, Ramsar, OECD
SDG7	World Bank, WHO, UNSD, IEA, IRENA
SDG8	UNSD, ILO, UNEP, UNICEF, UNWTO, IMF, World Bank, OECD
SDG9	World Bank, UNIDO, IEA, UIS, OECD, ITU
SDG10	World Bank, OHCHR, ILO, IMF, DESA, IOM, UNHCR, ITC, OECD
SDG11	UN-Habitat, UIS, UNSD, WHO, UNODC,
SDG12	UNEP, FAO, UNESCO, UNWTO
SDG13	UNFCCC
SDG14	UNEP, UNESCO, FAO, DOALOS
SDG15	FAO, UNEP, UNCCD, UNODC, CITES, IUCN, WCMC
SDG16	UNODC, UNODA, WHO, OHCHR, UNICEF, OECD, World Bank, IPU, UNESCO, UNDP
SDG17	OECD, IMF, World Bank, UNCTAD, ITU, UNEP, PARIS21, UNSD,

Source: the author's own synthesis.

The SDGs are designed to be universal in application, however they are also expected to include local context. That is an important shift from the Millennium Development Goals, which were criticised as a 'one-size-fits-all' strategy (Andresen & Iguchi, 2017). At the same time, for SD governance the extent to which the goal will be met is important. For that reason, governance itself became one of the SDGs' aspects (Goals 17 and 18) with targets for governments to improve their performance in a measurable way (Biermann, Stevens, et al., 2017).

2.2. Financial arrangements for sustainable development

Sustainable development is to a large extent dependent on financial arrangements (Barua & Chiesa, 2019). If the goals defined are very

challenging, they could be poorly met if there is a lack of global funds. The status of SD financing and investing is less than what is needed, and there are no clear strategies on how to close this gap. According to the OECD, to achieve the UN sustainable goals by 2030, the addition of USD 4.2 trillion annually to the current financial expenditures would be needed in the 8 forthcoming years (over USD 33 trillion in total). Other authors estimate the need to invest annually at about USD 5–7 billion to meet sustainable goals (Boyd, 2022; ECOSOC, 2018). In the majority of countries there are insufficient resources to provide water and sanitation targets. The funds required to meet global climate targets are measured in trillions, while only about USD 600 billion is spent annually. The Boyd Report (2022) states that the total level of finance is not a problem. Countries and businesses were able to mobilise USD 17 trillion as a response to COVID-19 between 2020–2022; annually states spend USD 1.8 trillion on subsidies for fossil fuels, industrial agriculture, mining, deforestation, overfishing and other earth-unfriendly activities. Tax evasion and tax avoidance cost about USD 500 billion in corporate tax and USD 200 billion in personal income tax (Boyd, 2022). The COVID-19 pandemic was an additional issue which affected the financial gap. According to the OECD, just between 2019 and 2020 the total financial gap even increased, and once available finances shrank by USD 774 billion between 2019 and 2020.

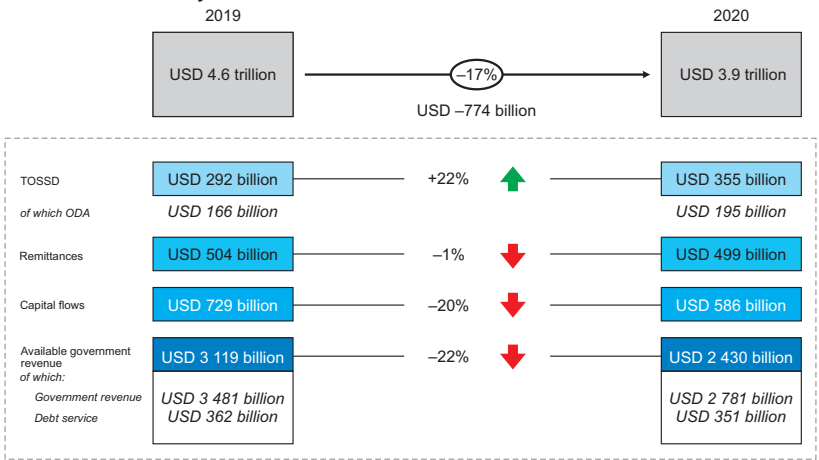


Figure 1. Available financing for sustainable development in developing countries (2019–2020).
Source: OECD (2022).

Wealthy countries (OECD members) agreed to allocate about 0.7% of GNI for Official Development Assistance (ODA), including 0.15 – 0.20% provided to the Least Developed Countries. This commitment has never been fulfilled, OECD countries only provide 0.33% of GNI, amounting to about USD 180 billion (Boyd, 2022).

At the same time, most of the investments are made from public resources, while private and financial institutions (banks, multinational enterprises, pension funds,) which are the main capital investors, remain small contributors to sustainable goal implementation (Barua, 2020).

The Boyd report (2022) proposed seven actions to close the sustainable financing gap. Those proposed actions would increase resources by USD 7 trillion to be invested in global climate action, and improvement of human rights (see Table 4 for more details).

Table 4. Agencies responsible for data collection.

New source of financing	Amount (USD)
Global wealth tax	2.5 trillion
Redirecting environmentally damaging subsidies	1.8 trillion
Global carbon tax	1.0 trillion
Reducing tax evasion and avoidance	0.6 trillion
Special drawing rights for climate action	0.5 trillion
Debt relief	0.4 trillion
Fulfilling official development assistance commitments	0.2 trillion
Total	7.0 trillion

Source: Boyd (2022).

Also, as the SD agenda is very decentralised, so it is very difficult to get a simple picture of the global financing streams towards SD activities. There is no comprehensive central tracking system providing a clear picture of sustainable financing (Barua, 2020).

An important picture in that field was elaborated by Barua (2020). Based on the conducted research, Barua was able to identify the values of financial streams, as well as challenges and strategies to eliminate problems related to financial issues. Those challenges and solutions to the financial gap are (Barua, 2020):

- **Lack of Cooperation** → Greater cross-country cooperation between developed and developing countries, this could help to mobilise a larger amount of finance.

- **Less engaged private sector** → Better cooperation between public and private actors. There is a large capacity of public sector to fill the investment gap, however the governments and international institutions need to come up with proper policies and incentives to mobilise the available private funds. Governments in developing countries could apply SD-oriented budget and fiscal policies / for example tax incentives for SDG-related investments might be implemented to attract socially and environmentally responsible FDIs.
- **Lack of proper planning** → Investment planning is difficult in a developing country. Thus, in cooperation with the UN, it is recommended that the countries have their own SD target planning departments which shall cooperate with finance ministries and banks.
- **Lack of stakeholder willingness** → As defined in this chapter, proper SD governance needs to incorporate stakeholders into the policymaking process. Improvement of stakeholders' participation is believed to be reached through new SD campaigns, workshops and communication programmes. Also, private companies are part of the stakeholder community, their priorities are still not taken into consideration in the SD goals.
- **Unavailability of reliable data** → Ensuring data availability would improve the decisions made by investors. Once the developing countries have a problem with the data availability, UN country offices are asked to develop SD data centres, which would provide trustworthy and reliable data.

3. Conclusions

The global sustainable development movement still has a long way to go. Globally societies are facing environmental issues, global climate change, problems with human rights, undernutrition, poverty, etc. Even though the global community agreed on the path towards sustainability more than 50 years ago, the goals and targets are still a long way off. The implementation of SD actions is not easy and will become a challenge to the international SD community also in the future. The goals defined by the SDGs (see the next chapter) are still

being challenged and in the current situation whether they will be met is rather uncertain. However, the global SD governance is undergoing certain innovations. Compared to Millennium Development Goals, the SDGs build on widely accepted goals which are agreed upon by the UN, countries and stakeholders. The position of wealthy (OECD) countries is crucial in meeting these goals. Unfortunately, developed countries are still not fulfilling their own commitments to support SD by 0.7% of Gross Domestic Product. The finance gap is at the same time increased by the reluctance of private capital, which still lags behind in its possibilities. Some solutions to close the financial gap are on the table and have been proposed by experts and scientists, however they are not easy to implement on the global level.

4. Discussion questions and tasks for students

- How is Sustainable Governance managed in your country? Which institutions are included in SD goal setting and monitoring?
- Can you find data on Sustainable Development for your country?
- How are SD activities managed and coordinated at the level of the EU?

5. Further reading

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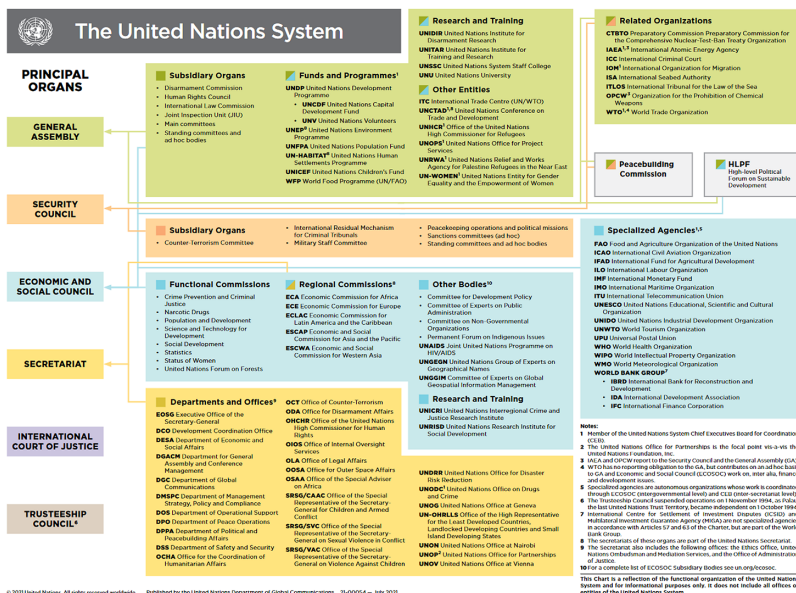


Figure 2. The United Nations System (appendix).
Source: United Nations (2021b).

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UN SDGS AND EU POLICIES

Anna Mravcová

■ Annotation

The current era of globalisation and the degree of interconnectedness of the world is not only contributing to the deepening of global problems, but it is also making us more aware of these problems, and more able to face them directly. Global problems are growing in intensity, however countries around the world are making increasing efforts to address and mitigate them, and they are coming together and creating various strategic documents and programmes with a view to achieving a sustainable development of the world in which the basic needs of future generations can also be met. Our aim will therefore be to present the Sustainable Development Goals (SDGs) adopted within the framework of the strategy for achieving global sustainable development, as well as the various EU policies that aim to achieve these goals.

Key words: global problems, sustainable development strategy, SDGs, EU policies, international community

1. Introduction

The concept of sustainable development is now becoming increasingly important, leading to ever more sophisticated strategies for achieving it, not only at the level of individual countries but also of the international community as a whole. The issue of sustainable development has made considerable progress since its first definition. Today, it is represented by various international documents, and in particular by the 2030 Agenda for Sustainable Development (UN, 2015c), which brings together all the experience of previous successful and even unsuccessful efforts to achieve sustainability. Sustainable development is

an essential requirement for all humanity to learn to act responsibly and to lead a sustainable way of life in order to make life on Earth possible for future generations. With the current, still insufficiently sustainable way of development, we are highly endangering future life (see more Suša – St'ahel, 2016).

Today's world is facing globalisation on such a scale that nothing is sufficiently far away. The same applies to global problems, which, thanks to globalisation, are not only deepening, but are becoming much more visible and widespread. That is why it is no longer possible today to close our eyes to them and distance ourselves from them. Global problems¹ affect the whole world to a greater or lesser extent and therefore they need to be addressed comprehensively. Solutions at the level of individual countries are not sufficient. They need to be addressed at all levels – individual, societal, national, regional and global.

However, given the fact that different problems affect different countries to different extents, and that differences can be seen particularly between the countries of the global North and the global South², it is necessary to take into account the priorities of these

¹ Global problems can be characterised as problems that affect the entire planet and potentially all the people who live on it. Thus, global problems are any social, economic, political or environmental issues affecting global society, to the point of possibly catastrophic outcomes.

² An important characteristic of globalisation is the increase in inequalities between rich and poor countries that accompanies the interconnectedness of the world. Today, therefore, it is in the context of the ongoing globalisation processes that we recognise a number of indications of the division of the world. Until recently, the most common one was the division into developed and developing countries. It was also common to divide them into the so-called rich North and the poor South – a division that is, however, very general, inaccurate and no longer relevant today. It is becoming increasingly common today to have a more precise and unambiguous demarcation that divides countries into the global North and the global South. We can say that in all the countries of the world there are certain visible boundaries that separate the faster from the slower, the rich from the poor, or those with developed economies from those with emerging economies. The new terms 'Global North' and 'Global South' therefore represent a much more appropriate definition, since the countries of the Global North, i.e. the richer and more developed ones, include, for example, Australia and New Zealand, which are, however, geographically part of the South. The countries of the Global South are thus mainly characterised by an unstable political and economic situation, complemented by demographic aspects (high population growth), ecological aspects (natural disasters: extreme droughts, famine, hurricanes, etc.), but also psychological aspects (man's natural desire to acquire, to learn new things, etc.). In contrast, the global North is characterised by political freedom, stability and, in general, prosperous economies in the countries concerned (Človek v ohrození, 2016).

groups of countries, but at the same time not to forget that all global problems need to be approached with serious concern and to try to resolve them both individually and collectively. Without this, the sustainable development of the world and its preservation cannot be achieved. Especially when it comes to environmental problems.³

In this subchapter, therefore, our aim will be to explore and analyse the growing importance of the Sustainable Development Strategy and the Sustainable Development Goals in the current era of globalisation and crises, as well as to identify the different EU policies and orientations in this direction, with a primary focus on the environmental dimension.

2. Background

2.1. The sustainable development concept – the path to SDGs

The concept of sustainable development is not new. Today, however, it is increasingly gaining significance and entering all spheres of society. Even the youngest children have to receive at least a basic understanding of global issues and the need to behave sustainably.

The concept of sustainable development has a relatively long history. Its origins go back to the 1970s. First in terms of sustainability as part of social development that respects natural conditions. Later, in terms of development as a process of change towards the harmonious use of natural resources, the direction of investment, the orientation of technological development and institutional change, and towards the growing potential for meeting the human needs of present and future generations. At the United Nations, the concept of sustainable development was first introduced within the UN General Assembly report 'Our Common Future' in 1987, which defines it as development that enables the needs of present generations to be met without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development).

Sustainable development is based on three main pillars – environmental, economic and social. All three are strongly interconnected,

³ Environmental problems are the harmful effects of human activity on the environment.

moreover, environmental problems themselves are not just about the destruction of the environment, but also have many other serious impacts, making life much more difficult for many people also in those other areas (e.g. by contributing to poverty, etc.). This is one of the reasons why the concept of sustainable development must take into account all the related aspects, namely economic, financial, environmental, ecological and social.

It can thus be argued that the term sustainability was chosen essentially as a kind of link between the environment and development. This idea of linkage was subsequently developed at the Rio de Janeiro International Summit on Development and the Environment in 1992. This meeting at the highest political level launched a series of international UN conferences. The Millennium Summit in 2000 was a turning point in this process, during a gathering of world political leaders to mark the new millennium and the adoption of the Millennium Development Goals (MDGs) (see Figure 1). This Summit and the MDGs created a new partnership between nations with the primary intention of making the world a sustainable place. Specifically, these eight goals were chosen as the most serious global problems that were to be solved by 2015. This was a major milestone in the efforts to achieve sustainable development. However, it was problematic that these goals contained many imprecise definitions (for example, they were too broadly defined; also, although the document defined the goals, it did not contain any strategy or method for how they should be addressed or achieved, nor did it reflect global social justice). Despite great efforts, these goals were far from being met by 2015. However, they laid a very important foundation for future achievements, taking into account the emphasis on the link between global challenges, sustainability and the principle of humanism (United Nations Information Service, 2015). They represented major progress on the road to sustainability.



Figure 1. Millennium Development Goals.
Source: United Nations Foundation, 2000.

It had been clear for a relatively long time before 2015 that the goals would not be achieved, and therefore the need for the international community to actively pursue these efforts became apparent. The result was presented at the UN Development Summit in September 2015, which resulted in the adoption of the new Sustainable Development Goals (SDGs) as part of the 2030 Agenda for Sustainable Development. The document contains 17 goals and 169 targets that reflect the global community's efforts to achieve sustainable development and, together with this sustainability agenda, the SDGs go much deeper than the MDGs, emphasizing in particular the universal need for development that is targeted at all countries in the world. The SDGs focus primarily on sustainable development, democratic governance, peacebuilding, as well as resilience to climate change and disasters in the world (UNDP, 2015). These 17 goals (see Figure 2), as well as the entire 2030 Agenda, represent one of the highest priorities of the global community today. We can say that the SDGs have built on the Millennium Goals in their content, but they are defined much more concretely and have a narrower specification. Also important in this context is the strong support and intense activity of the countries of the global South, as well as the efforts to eliminate regional inequalities. All of these goals are essential to achieving sustainable development in the world, and each is strongly linked to today's major challenges, which influence all countries (although differently).



Figure 2. Sustainable Development Goals.

Source: UN, 2015a.

Currently, due to the alarming state of the world, especially in the environmental sphere, there are increasingly intensive efforts to develop active and feasible sustainable development strategies and policies at different levels, from local to global. Similar to the UN, basically all major organizations, whether global, regional or national, focusing on environmental, social, political or economic areas are adopting this concept and defining it as a priority for their direction. The challenge for individual countries is thus the need to transform the principles of sustainable development into the daily lives of individuals, to assess all planned and implemented activities according to the principles of SD, and to evaluate progress towards sustainability using measurable indicators of sustainable development (Government Office of the Slovak Republic, 2011). "More than ever, development that respects the value of the natural environment is needed, especially for those who are vulnerable to poverty and whose natural resources are degraded by the adverse impacts of current patterns of economic and social activity and by inadequate protection from natural disasters" (Strachan – Vigilance, 2011: 1).

2.2. Environmental problems within the context of sustainability

In the context of the current global environmental crisis, we can say that it is essentially the result of the human strategy of surplus production, accumulation and consumption, the implementation of which is now reaching the limits of natural resources and of nature's ability to absorb the pollution generated by this surplus production and consumption. The environmental crisis threatens all species primarily as a consequence of population growth, which leads to an increase in production and thus to the depletion of natural resources, as well as to pollution (Sťáhel, 2016).

Therefore, when we look at the sustainable development concept and the individual goals set by the international community, we can see that environmental problems clearly dominate the scheme. The environment is severely threatened, and environmental problems can be considered the most acute ones. Because, unless we ensure the survival of the planet itself, solving the other problems will only help humanity to survive at some level until the environmental crisis completely absorbs us and the Earth's ecosystem collapses completely.

However, this would inevitably lead in one way or another to a deterioration in relations between nations, as these problems manifest themselves more in some places and less in others. Solving environmental problems is of the greatest importance not only for the survival of mankind, but also so that other global problems can be solved, and this is only possible if they are solved with the common interest and efforts of everyone (Mravcová, 2019).

Improving the state of the environment to ensure the sustainability of the planet has been a priority of the international community for decades. However, it must be remembered that the manifestations of these problems vary from country to country, and large differences in the intensity of their impact are also visible within countries. The manifestations of the environmental crisis are felt differently in the city, which is more associated with pollution or health problems, than in the countryside, where these problems affect agriculture and thus have a different impact on people and their activities. Similarly, the impact of environmental problems is very different in the predominantly agricultural countries of the global South than in the largely industrial countries of the global North. It is therefore necessary to address these problems comprehensively, but at the same time to look at their manifestations and impacts in the countries separately, and then to seek solutions together to mitigate them (Mravcová, 2018).

We can say that the environment is a kind of cornerstone of all development. Protecting the environment in an effective and comprehensive manner is not only a goal but also a fundamental requirement. Therefore, the environment and its protection are inevitably linked to a set of regulations, institutions and practices that define the parameters for the sustainable use of natural resources, with the simultaneous ensuring of security of existence and an adequate quality of life (Sarkar – Chakrabarti, 2007).

All human activities are always carried out in a particular ecosystem, which consists of, for example, soil, water resources, air, etc. Mindless human activities accompanied by intensive agriculture, as well as the impact of urbanization and industrialization, lead to global environmental degradation and thus threaten very intensely not only the future of humanity on our planet, but also the existence of our planet as a whole. All these activities have brought with them many negative impacts on nature, human health and the overall quality of

Table 1. Sustainable Development Goals focused on the environment.

Goal	Call	Targets
2 Zero hunger	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters, and that progressively improve land and soil quality
3 Good Health and Well-being	Ensure healthy lives and promote well-being for all at all ages	3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
4 Quality education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development
6 Clean water and sanitation	Ensure availability and sustainable management of water and sanitation for all.	Mainly: 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity. 6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes. 6.a By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

Goal	Call	Targets
7 Affordable and clean energy	Ensure access to affordable, reliable, sustainable and modern energy for all.	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.
		7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology. 7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support.
8 Decent work and economic growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead.
9 Industry, innovation and infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.

Goal	Call	Targets
11 Sustainable cities and communities	Make cities and human settlements inclusive, safe, resilient and sustainable	<p>Mainly: 11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage.</p> <p>11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality, and municipal and other waste management.</p> <p>11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels.</p> <p>11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials.</p>
		<p>12.1 Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries.</p> <p>12.2 By 2030, achieve the sustainable management and efficient use of natural resources.</p> <p>12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.</p> <p>12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse</p> <p>12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.</p> <p>12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production.</p> <p>12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities.</p>
12 Responsible consumption and production	Ensure sustainable consumption and production patterns	

Goal	Call	Targets
13 Climate action	Take urgent action to combat climate change and its impacts	Mainly: 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries. 13.2 Integrate climate change measures into national policies, strategies and planning. 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning. 13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities * Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change..
		Mainly: 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution. 14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans. 14.3 Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels. 14.4 By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics. 14.7 By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism. 14.c Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of The Future We Want.
14 Life below water	Conserve and sustainably use the oceans, seas and marine resources for sus- tainable development	

Goal	Call	Targets
15 Life on land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Mainly: 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.
		<p>15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally</p> <p>15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.</p> <p>15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.</p> <p>15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.</p> <p>15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species.</p> <p>15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts.</p> <p>15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystem.</p> <p>15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.</p>

Goal	Call	Targets
16 Peace, justice and strong institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	16.b Promote and enforce non-discriminatory laws and policies for sustainable development
17 Partnerships for the goals	Strengthen the means of implementation and revitalize the global partnership for sustainable development	Mainly: 17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed. 17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation. 17.14 Enhance policy coherence for sustainable development. 17.16 Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries.

Source: the author's own evaluation according to UN, 2015b.

life.⁴ Essentially, all these problems are the result of careless human activity and interference in the environment, and therefore only human activity can bring about real change. Although not everything can be fixed and some environmental damage is unfortunately irreversible, we can at least try to stop or mitigate it.

To this end, however, it must be stressed that sustainability must be understood in a multidisciplinary context. It must encompass all the necessary areas, and therefore not only the sustainability of the biosphere, but also the viability of the social, cultural, economic and political systems of the human population. However, despite the multidisciplinary context, we must emphasise again that development can only be sustainable if it does not seriously damage the environment. Therefore, the environment and natural resources are clearly one of the most important dimensions of sustainable development.

The international community has a similar vision. Countries in both the Global North and the Global South agree that most of the world's problems that will threaten sustainability are environmental. Therefore, most of the SDGs are linked to the environment, either directly or through other goals. In the following table (Table 1), we identify the different SDGs and targets in which the environment and its associated problems have a significant place.

We see that of the 17 SDGs, up to 14 are linked to environmental problems and the need to address them.

3. EU sustainable policies

The European Union has been a very active player in efforts to achieve sustainable development. However, when we look at the individual EU policies and the most important documents aimed at achieving sustainability, we can see that practically all of the most important ones

⁴ Today, we recognise some of the most serious environmental problems plaguing the world that also pose a challenge to ensuring sustainable development. Among the most significant are the problems of air, water and soil pollution; global warming; the overpopulation of the Earth; the depletion and waste of natural resources; the problem of waste disposal; climate change; and the decline or loss of biodiversity; forest degradation and deforestation; loss of cultivable land due to desertification; land degradation and declining agricultural productivity; ocean acidification; ozone depletion and emissions; acid rain; urbanisation; decreasing supplies of clean drinking water.

are primarily focused on the environmental area and then, through the environment, they also address the other two pillars of sustainability, namely the social and economic pillars and the issues and challenges associated with them.

So, although the EU (more precisely European Communities) was founded primarily for economic reasons and only started to address environmental issues much later, after 1972 it became one of the main international actors in the field of environmental protection. Today, the European Union is at the forefront of the global fight for the environment and has already set itself the official goal of acting for the sustainable development of the planet in the Treaty of Lisbon (2009). The precise organisation and contours of environmental policy are also defined in Articles 191 to 193 of the Treaty on the Functioning of the European Union (Mathis, 2020).

The European Union has also been committed to the 2030 Agenda from the very beginning. To this end, the European Commission has presented an ambitious policy agenda to achieve sustainability in the EU and beyond. At the same time, the SDGs are an integral part of all policy guidelines and are at the heart of policy-making in internal and external action in all sectors. The 2030 Agenda and its goals are thus at the heart of the whole.

The Commission has identified concrete actions that will deliver demonstrable progress in areas related to the SDGs. All 17 goals are part of one or more of the six headline targets announced in the policy guidelines, as shown in Figures 3 and 4:



Figure 3. European Commission Priorities.

Source: European Commission, n.d.



Figure 4. SDGs Whole government approach.

Source: European Commission, n.d.

As we can see, the SGDs are an integral part of the EU's political agenda, and various transformation programmes and policies are also focused on their implementation.

The EU has some of the highest sustainability and environmental standards in the world (see also, Selin – VanDeveer, 2015) as it also perceives their importance in the sustainability scheme and their mutual interconnectedness with other sustainability pillars. It has many policies that reflect its efforts to reduce environmental problems. These policies also aim to help achieve the 17 SDGs, which call for action to end poverty, protect the planet, and improve the lives and well-being of citizens (for more examples, see Barbier – Burgess, 2017; Fonseca et al., 2020).

Therefore, Environmental Policy is also of the utmost importance in this grouping. Environmental policy helps the EU economy to become more environmentally friendly, to protect natural resources and to preserve the health and well-being of citizens. EU environmental policy and legislation protects the air and contributes to water remediation, ensures waste disposal and helps businesses move towards a sustainable economy.

3.1. The EU environmental policy

The European environmental policy dates back to 1972, when the Heads of States and Governments of the then European Community (following the first UN Conference on the Environment) declared the need for a Community environmental policy to accompany economic expansion and called for an action programme. The Single European Act of 1987 introduced a new "Environmental Title" which provided the first legal basis for a common environmental policy to preserve environmental quality, protect human health and ensure the rational use of natural resources. Subsequent revisions of the Treaties have reinforced the Community's commitment to environmental protection. The Maastricht Treaty (1993) made the environment an official EU policy area. The Treaty of Amsterdam (1999) made it obligatory to integrate environmental protection into all EU sectoral policies in order to promote sustainable development. The Lisbon Treaty (2009) made "combating climate change" a specific objective, as well as sustainable development in relations with third countries. Legal personality has enabled the EU to conclude international agreements (Kurrer, 2021).

European environmental policy is based on Articles 11 and 191 to 193 of the Treaty on the Functioning of the European Union (combating climate change is an explicit objective of Article 191). Sustainable development is a key objective of the EU, which is committed to preserving, protecting and improving the quality of the environment (EU, 2012)). Article 191 of the Treaty on the Functioning of the European Union promotes the EU's participation in the UN climate negotiations and defines the EU's environmental objectives, principles and policies. This article refers to action at the international level to tackle environmental problems, in particular the fight against climate change, and cooperation with other countries and international organisations is one of the main objectives of EU environmental policy (more in EU, 2012).

The EU's environmental policy was already established in 1973 with the "Action Programme for the Environment". The policy has subsequently evolved to cover a broad background of different topics agreed over many decades.

EU environmental policy has been formulated in individual Environmental Action Programmes since the early 1970s. Successive programmes have been set out to determine future legislative proposals and environmental policy perspectives. The aim of these programmes is to set out the future objectives to be achieved in the field of environmental protection. So far, eight such programmes, called Environment Action Programmes, have been adopted. The Environment Action Programmes set the framework for future action in all areas of environmental policy. They are integrated into horizontal strategies and taken into account in international environmental negotiations (Halmaghi, 2016, p. 87, 90):

- The Environment Action Programme (1973–1976)
- The Second Environment Action Programme (1977–1981)
- The Third Environment Action Programme (1982–1986)
- The Fourth Environment Action Programme (1987–1992)
- The Fifth Environment Action Programme (1993–2000)
- The Sixth Environment Action Programme (2002–2012)
- The Seventh Environment Action Programme (2014–2020)
- The Eighth Environment Action Programme to 2030 (WE-COOP, 2022).

3.2. The 8th Environmental Action Programme 2030

This document supports the environmental and climate objectives of the European Green Deal. It provides an opportunity for the EU as a whole to repeat our commitment to the vision of the 7th Environment Action Programme 2050: to ensure prosperity for all while staying within the planet's limits. The latest Action Programme calls for the active involvement of all stakeholders at all levels of governance to ensure the effective implementation of EU climate and environmental legislation. It forms the basis for the EU to achieve the 2030 Agenda and its SDGs.

The 8th EAP aims to accelerate the transition to a climate-neutral, resource-efficient and regenerative economy that gives back to the planet more than it takes from it. It recognises that human well-being and prosperity depend on the ecosystems in which we operate being healthy.

Building on the European Green Deal, it has the following six priority objectives:

1. Achieving the 2030 greenhouse gas reduction target and climate neutrality by 2050;
2. increasing adaptive capacity, building resilience and reducing vulnerability to climate change;
3. moving towards a regenerative growth model, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a circular economy;
4. pursuing the ambition to achieve zero pollution, including in air, water and soil, and protecting the health and well-being of Europeans;
5. protecting, preserving and restoring biodiversity and enhancing natural capital (in particular air, water, soil and forest, freshwater, wetland and marine ecosystems);
6. reducing environmental and climate pressures related to production and consumption (in particular in the areas of energy, industrial development, buildings and infrastructure, mobility and the food system) (Kurrer, 2021).

European environmental policy is based on the principles of precaution, prevention and remediation of pollution at source, and on the polluter pays principle. Multiannual Environmental Action

Programmes set the framework for future action in all areas of environmental policy. They are embedded in horizontal strategies and taken into account in international environmental negotiations. Environmental policy was recently the centre of attention in EU policy-making when the European Commission presented the European Green Deal as a key driver of its economic growth strategy (Kurrer, 2012).

3.3. European Green Deal

Climate change and environmental degradation are perceived as an existential threat to the world. The EU is at the forefront of international efforts to promote economically, environmentally and socially sustainable development in order to tackle the planet's crisis and, in particular, to combat climate change. The European Green Deal was presented on 11 December 2019 by the European Commission. It presents a plan to make the EU economy sustainable by turning climate and environmental challenges into opportunities in all policy areas and making the transition fair and inclusive for all. It is Europe's structural response and new growth strategy to transform the EU into a modern, resource-efficient and competitive economy in which there is:

No net greenhouse gas emissions by 2050:

- economic growth will be decoupled from resource use;
- natural capital is protected, sustainably managed and restored;
- the health and well-being of citizens is protected from environmental risks and impacts;
- no person and no place is left behind (European Commission, 2019).

Main goals of the European Green Deal:

- **A climate neutral Europe:** the EU will strive for net zero greenhouse gas emissions by 2050. It is an update of the EU's 2030 climate ambition, aiming for a 55% reduction in greenhouse gas emissions, replacing the previous 40% target.
- **Circular Economy:** A new Circular Economy Action Plan was adopted in March 2020 as part of the EU's broader industrial strategy. It includes a sustainable products policy with rules on how to make things so that less materials are used and

products can be reused and recycled. One of the goals is to prepare for “clean steel production” using hydrogen by 2030 and a new legislation was also introduced in 2020 to ensure that batteries can be reused and recycled.

- **Building renovation:** a key goal is to at least double or even triple the renovation rate of buildings, which is currently very low.
- **Zero pollution:** to achieve a pollution-free environment by 2050, whether it is air, land or water. New initiatives include a chemical strategy for a toxic-free environment.
- **Ecosystems and biodiversity:** A new biodiversity strategy was presented in March 2020. Europe wants to lead the way with new measures to tackle the main drivers of biodiversity loss. This includes measures to tackle soil and water pollution as well as a new strategy for forests. New labelling rules will be put forward to promote deforestation-free agricultural products.
- **Farm-to-table strategy:** The new strategy will focus on a greener and healthier farming system. It includes plans to significantly reduce the use of chemical pesticides, fertilisers and antibiotics.
- **Transport:** the current target is to reach zero CO₂ emissions sometime in 2030. Electric vehicles will be promoted with the aim of introducing 1 million public charging points across Europe by 2025. Every family in Europe shall be able to drive their own electric car without having to worry about the nearest charging station. *Sustainable alternative fuels* (biofuels and hydrogen) will be promoted in aviation, shipping and heavy road transport, where electrification is currently not possible.
- **Financing:** The European Commission proposes a fair transition mechanism to help the regions most dependent on fossil fuels, with the target of leaving no one behind. The ambition is to mobilise €100 billion for the most vulnerable regions and sectors.
- **Research and development and innovation:** under the 2019 agreement, 35% of EU research funding will be dedicated to climate-friendly technologies.

- **External relations:** EU diplomatic efforts will be mobilised in support of the Green Deal. One measure is the proposal for a carbon border adjustment (tax). As Europe raises its climate ambitions, it expects the rest of the world to do the same. But if this does not happen, Europe will protect its industry from unfair competition (WECOOP, 2022).

In 2019, an initial plan of key policies and actions needed to advance the European Green Deal has been developed as part of the actions to implement the SDGs. Elements of this green plan (Figure 1) include financing towards a green transformation, empowering European industry and small and medium-sized enterprises, strengthening the circular economy, creating a sustainable food system and preserving biodiversity, and transitioning to greener mobility (more in Cifuentes-Faura, 2022).

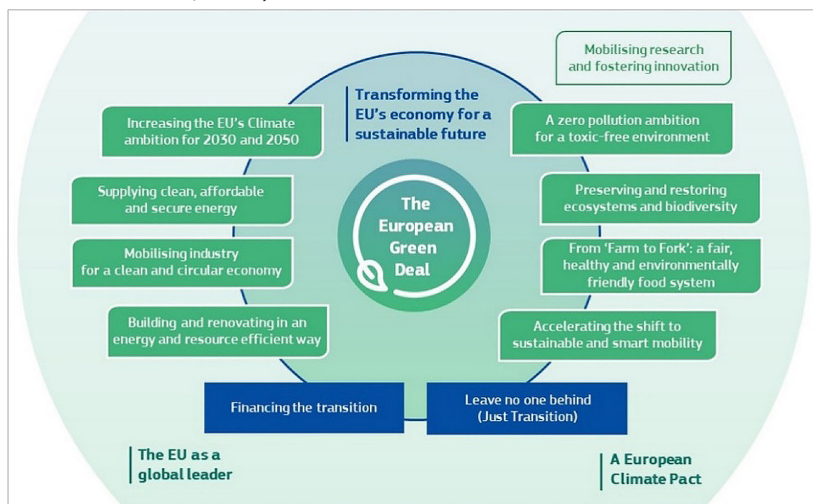


Figure 5. Transforming the EU's economy for a sustainable future.
Source: Cifuentes-Faura, 2022.

3.4. Progress through the European Climate Law

The European Climate Act sets a target of reducing greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. It aims to ensure that all EU policies contribute to the 2050 climate neutrality

target and that all sectors of the economy and society play an appropriate role in achieving this (Fleming – Mauger, 2021; Levoyannis, 2021).

The main objectives of this law are:

- To set a long-term direction for achieving the 2050 climate neutrality goal across all policies in a socially equitable and cost-effective manner;
- Set a more ambitious EU 2030 target to put Europe on a responsible path to climate neutrality by 2050;
- Establish a system to monitor progress and take further action where necessary;
- Ensure predictability for investors and other economic actors;
- Ensure that the transition to climate neutrality is irreversible.

The Climate Act includes measures to monitor progress, such as regular reporting by the European Environment Agency, a process for managing EU Member States' national energy and climate plans, and scientific evidence on climate change and its impacts. Progress will be reviewed every 5 years in line with the global assessment under the Paris Agreement (Oberthür–Dupont, 2021; Pouikli, 2021).

The Climate Act includes not only the Union's legal goal of achieving climate neutrality by 2050, but also the need to strengthen carbon capture in the EU through more ambitious regulation (Rietig, 2021; Teevan, et al. 2021), through the 2040 climate target setting process, the commitment to achieve negative emissions beyond 2050, and the creation of a European Scientific Advisory Committee on Climate Change.

<https://link.springer.com/article/10.1007/s11869-022-01156-5>

4. Discussion questions and tasks for students

Questions:

1. In your view, which SDGs pose the most acute threat for humanity and why?
2. Do you think that the European political framework for achieving sustainability is sufficient?
3. Do you think that any important issues are missing in the defined SDGs?

4. How would you strengthen environmental protection politically at the EU level?

Activity 1. Sustainable Development Goals (SDGs)

Objective: to present and evaluate the sustainable development priorities set in 2015, to critically assess their relevance and definition in comparison with the Millennium Development Goals, and to attempt to define the students' own priorities for achieving sustainable development.

Materials: pencils, markers, papers

Time: home preparation + 45 minutes

Procedure: Students will learn in detail about the Sustainable Development Goals from 2015 as well as the Millennium Development Goals from 2000 at home before doing the activity. At the beginning of the activity, students will first discuss these goals, where they will critically present their views on the SDGs and the progress they see in them compared to MDGs (15 minutes).

The students are then divided into groups of 3–5 members. Each group will be asked to draft their own Sustainable Development Goals on separate piece of paper, as well as suggest ways of achieving them (20 minutes). Finally, the groups will present their proposals and then they will discuss the presented proposals together, evaluate them and finally create one collective proposal for the whole group of students (10 minutes).

Activity 2. Environmental citizen

Objective: through selected case studies and small group work, the aim is to analyse the strategy of sustainable development from an environmental perspective and to put forward proposals for possible citizen action to ensure the sustainability of the environment and life on Earth for future generations.

Materials: case studies on global environmental issues, papers, pens, markers

Time: 45 minutes

Procedure: A central topic will be presented to the students to address, namely the notion of the "environmental citizen". Students

will be divided into small groups of 3–4 members and each group will be given one case study on an environmental issue from different parts of the world. The task of each group will be to read the given study, analyse it thoroughly and define the possibilities of implementing environmental citizenship specifically to the given global environmental problems and then formulate suggestions on how each citizen of the world can actively work towards eliminating or at least mitigating these problems (25 minutes).

Each group then chooses a speaker. The speaker will present the group's results, which will then be discussed by the students (10 minutes). Finally, they evaluate the results and draw conclusions together, which they write on the paper (10 minutes).

Case Studies for groups:

AIChE. 2015. *Case Studies on Environmental Issues*. Available at: <https://www.aiche.org/conferences/aiche-ccps-asia-pacific-conference/2015/events/case-studies-on-environmental-issues>.

UBC. n.d. *Complex Environmental Problems Case Studies*. Available at: <https://environment.geog.ubc.ca/complex-case-studies/>.

Activity 3. Think globally act locally

Objective: to explore and analyse, on the basis of a simulation of a special municipal council meeting, how to promote pro-environmental behaviour and to promote a sustainable way of developing the world at the local political level.

Materials: created material for the meeting agenda, paper, pens

Time: home preparation + 60 minutes

Procedure: Before the activity, students will be asked to study how a municipal council meeting is run. At the same time, they will choose three volunteers from among themselves – one will be in charge of the whole activity and will act as a sort of mayor, the other will act as deputy mayor and will help the first student to coordinate the activity – to run the meeting. The third one will be the recorder in charge of compiling the minutes. The selected “mayor” and “deputy mayor” will prepare the agenda of the special council before the activity, in which the main point will be to ensure the dissemination of sustainable development priorities and pro-environmental behaviour within the municipality. At the beginning of the activity,

the students will sit at a simulated round table where they will introduce the representatives of the municipality – the councillors – as the legislative branch of government, which includes the deputy mayor. The selected mayor represents part of the executive branch of government. Together with the deputy mayor, they will run the entire council according to the agenda. At the beginning, the mayor will open the simulated session and first appoint the drafting committee and the verifiers, and introduce the recorder. The role of the recorder will be to record all important findings and conclusions. Then, based on the knowledge gained about global environmental issues and the need to act proactively with a positive environmental local and global impact, the Mayor and deputy Mayor will present the need to implement proactive action towards solving environmental problems also at the local political level (20 minutes).

Then the individual members will take the floor and, as representatives of the municipality, they will comment on the issue. They will first be asked to evaluate the importance of achieving sustainable development and pro-environmental behaviour on the basis of the mayor's arguments as well as their own ideas (10 minutes). Then, on the basis of the proposals and ideas presented, the students will work together to find ways to effectively implement the priorities of sustainable development and the ideals of pro-environmental behaviour in the life of the municipality within the framework of the necessity to raise public awareness of environmental issues, as well as to look together for ways to implement them in real life within the municipality (10 minutes).

At the end of the meeting, the recorder will read out all the findings and suggestions from the meeting. The mayor will open the discussion on the proposals and the recorder will add the necessary ideas. Then everyone will work together to draft a resolution from the meeting with specific goals, ideas and outcomes (10 minutes). Once finalized, the Mayor will then instruct the members of the drafting committee to put the proposal to a vote. Students may vote yes, no, or abstain. After the vote has been taken, the recorder will record the results and the verifiers will sign the proposal. Together, they draw up the results and the Mayor closes the meeting (10 minutes).

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A MACROECONOMIC APPROACH TO SUSTAINABILITY

SUSTAINABLE DEVELOPMENT

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains two key concepts within it:

- The concept of 'needs', in particular, the essential needs of the world's poor, to which overriding priority should be given; and
- The idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

World Commission on Environment and Development, Our Common Future (UN, 1987)

1. Sustainability

Commonly used schematics of the tripartite description of sustainability: Left, typical representation of sustainability as three intersecting circles. Right, alternative depictions: literal 'pillars' and a nested circles approach (Purvis et al., 2019).

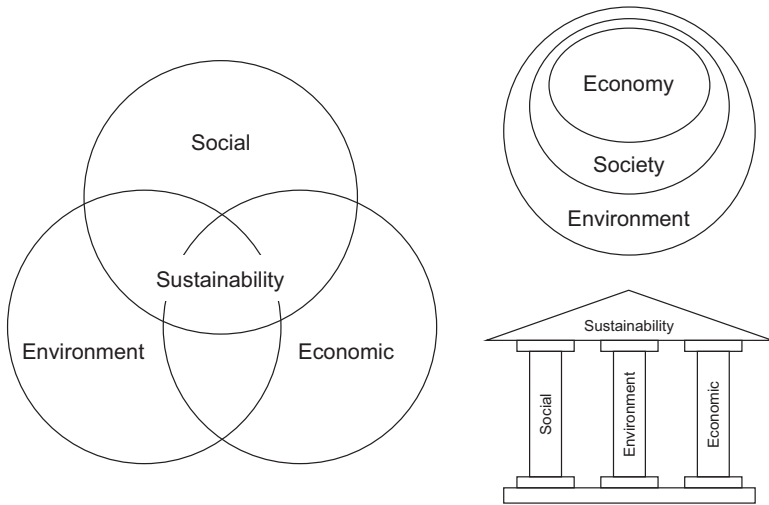


Figure 1. Sustainability concept.

Source: Purvis et al., 2019.

Sustainability is a societal goal that broadly aims for humans to safely co-exist on planet Earth over a long time. Specific definitions of sustainability are difficult to agree on and therefore vary in the literature and over time (Ramsey, 2015; Purvis et al., 2019). Sustainability is commonly described along the lines of three dimensions (also called pillars): environmental, economic and social (Purvis et al., 2019). This concept can be used to guide decisions at the global, national and individual levels (e.g. sustainable living) (Berg, 2020). In everyday usage of the term, sustainability tends to be focused mainly on the environmental aspects. The most dominant environmental issues since around 2000 have been climate change, loss of biodiversity, loss of ecosystem services, land degradation, and air and water pollution. Humanity is now exceeding several “planetary boundaries”. Reducing these negative impacts on the environment would improve environmental sustainability (Daly, 1992).

Sustainable development is an approach to economic planning that attempts to foster economic growth while preserving the quality of the environment for future generations. Despite its enormous popularity in the last two decades of the 20th century, the concept of sustainable development proved difficult to apply in many cases, primarily because the results of long-term sustainability analyses depend on

the particular resources focused upon. Sustainability was the focus of the 1992 Earth Summit and later was central to a multitude of environmental studies (Duignan, 2022).

Although numerous international environmental treaties have been concluded, effective agreements remain difficult to achieve for a variety of reasons. Because environmental problems ignore political boundaries, they can be adequately addressed only with the cooperation of numerous governments, among which there may be serious disagreements on important points of environmental policy. Furthermore, because the measures necessary to address environmental problems typically result in social and economic hardships in the countries that adopt them, many countries, particularly in the developing world, have been reluctant to enter into environmental treaties (Cheever, Campbell-Mohn, 2022).

The global economy and sustainability issues are interconnected. The growth of economic performance is not possible to achieve without efforts being made to ensure long term social and environmental stability. Sustainability is not only an environmental problem, but it is also a problem related to social issues – we need to set up a better balance of living standards and comfort. The problem of stable growth is connected to better and more effective income and wealth redistribution. It is not possible to discuss sustainable growth without taking into consideration the fact that 50% of the poorest people living all around the world have less than 8.5% of global household incomes and 2% of wealth (OECD, 2022)

As the world economy starts to emerge from the COVID-19 crisis, the time will soon come for leaders to look beyond safeguarding lives and livelihoods and to set their sights on a more profound challenge: bettering them. This societal challenge might be ten times as big as the pandemic and last ten times as long. The three goals we have in mind – growth, sustainability, and inclusion – buttress one another yet do not always pull in the same direction; we see powerful reinforcing as well as counteracting loops among them (see Figure 2). And so, while many might broadly agree on the aspirations, there's a very tough question lurking in the background: How do we go about building a future that delivers growth and sustainability and inclusion? (Sternfels et al, 2022).

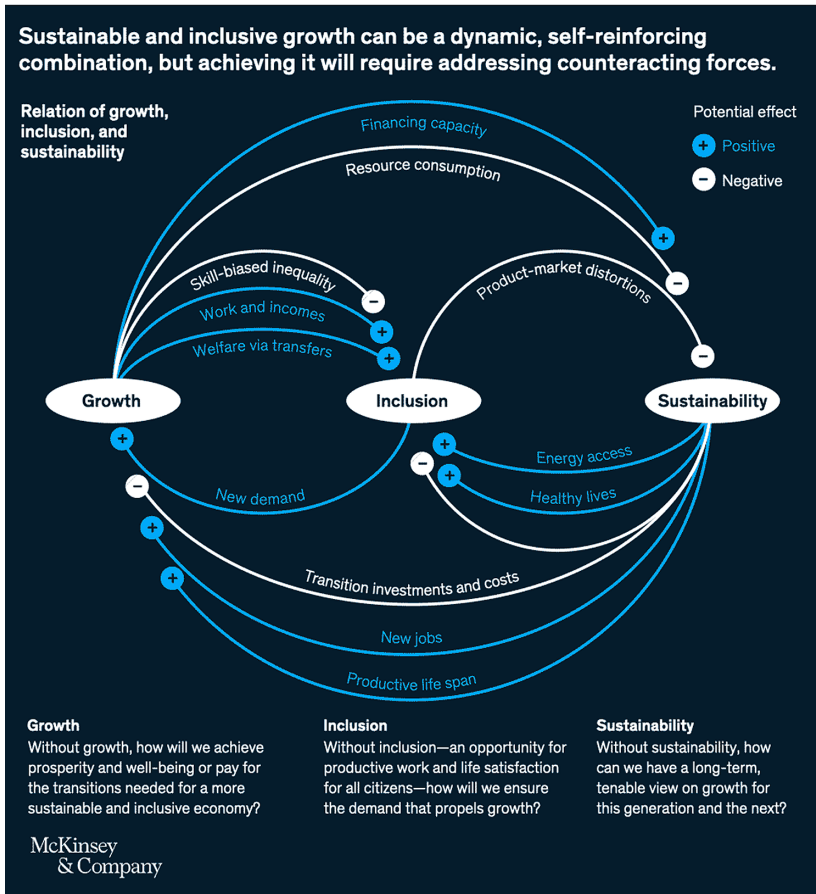


Figure 2.
 Source: McKinsey & Company, 2022.

Full disclosure: we're not going to offer an answer. Instead, we propose a way for changemakers in business, government, and society to explore the problem, a mental model that might offer the best chance to reach the answer. It starts like this: we believe the ends are crucial and that they are in fact the means to the end. The three elements of growth, sustainability, and inclusion are deeply connected and cannot be viewed as trade-offs. Consider this: without growth, how could we achieve prosperity and well-being or pay for the transitions needed to

make the economy more sustainable and inclusive? Without sustainability, how could we fashion growth for the current generation and the ones to follow? Without inclusion – an opportunity for productive work and a satisfying life for all citizens – how could we ensure the demand needed to propel growth? Indeed, getting to and – moving to a world in which growth and sustainability and inclusion form a powerful dynamic – is the imperative for the next era of business (Sternfels et al, 2022).

But before we get to the challenge of *and*, let's face facts: hastening growth, sustainability, and inclusion are incredibly difficult challenges in their own right. Fortunately, thinkers, strategists, activists, and many others around the world – dreamers and doers – are working on it. We are too. In our view, the world will need to confront three problems simultaneously (Sternfels et al, 2022):

- **Growth is elusive.** In the mature G-7 economies, GDP growth has halved to 1 percent per year on average since the 2008 global financial crisis (IMF, 2021). It's the same story in emerging economies: despite some exceptions, such as China and India, growth in emerging economies overall has been lower recently than in the early 2000s.
- **Poverty is still endemic,** despite the progress made. More than 600 million people still lived in extreme poverty as of 2017. And in 2020, another 100 million or so people joined them as a result of the COVID-19 pandemic. This will persist unless today's leaders create sufficient jobs with decent wages, as well as a robust social contract that ensures access to affordable housing, healthcare, and energy for the bottom one to three quintiles of the population, depending on the country. Meanwhile, a new threat to personal income is mounting: the rise of technology-driven changes in the ways we work, which the pandemic has accelerated. We estimate that more than 100 million people will need to make occupational transitions by 2030 in a set of eight advanced and emerging economies.
- **Ensuring a sustainable future will require massive investment.** For example, the International Energy Agency estimates that net-zero emissions might require investments of almost \$5 trillion each year by 2030, and \$4.5 trillion per year by 2050 (IEA, 2021). The annual bill equates to about half of global

corporate profits in 2019, or about one and a half times the annual increase in public debt over the preceding 15 years. Additional investments needed for decarbonization in agriculture, transportation, and other sectors could nearly double the bill. While many of these investments would produce a return, their financing or pricing is not yet set up.

And that's just the start: as we explain in this subchapter, even if the global economy were to get these three goals notionally right, there are contingencies among them that, if left unresolved, could wreck any progress made (Sternfels et al, 2022).

Here, we seek to frame the debate about achieving sustainable, inclusive growth in a clear-eyed way, laying out the aspirations but also the toughest problems that need to be solved to achieve this growth, with some illustrations as to their size. Good strategy should always start with asking the right questions. For today's leaders, the questions are vast and profound – *and* soluble (Sternfels et al, 2022).

2. The virtuous cycle starts with growth

What do we mean by sustainable, inclusive growth? There are many ideas associated with these words. We aim for broad rather than narrow interpretations (McKinsey & Company, 2022):

- In **growth**, we include the ambition of increased prosperity and well-being, including economic-profit growth for companies, GDP growth for nations – as well as measures such as life satisfaction for citizens – derived in part from dignity of work (while recognizing that measurable definitions of well-being are still evolving).
- In **inclusion**, we consider equality of opportunity and broad-based progress of outcomes for all – especially sufficiency of living standards – and the narrowing of inequalities among genders, ages, ethnicities, family backgrounds, and places of residence.
- In **sustainability**, we aim for environmental resilience, which starts with reducing climate risk but also includes much broader preservation of natural capital as well as intergenerational fairness, all considered in terms of economic and societal costs and benefits. (McKinsey & Company, 2022)

These three goals are daunting. Fortunately, they can strengthen and reinforce one another (McKinsey & Company, 2022):

- **Growth supports inclusion, part 1: Creating meaningful jobs and lifting incomes.** High-growth emerging economies have delivered powerful proof that growth supports inclusion, by reducing the global share of those living in extreme poverty by two-thirds – to less than 10 percent of the world's population – and by welcoming hundreds of millions to the middle class. This applies in advanced economies too: from the early 1990s to 2005, before the global financial crisis, GDP per capita rose by 2 to 4 percent per year and real median household market incomes also rose.
- **Growth supports inclusion, part 2: Correcting labour-market inadequacies.** In growing economies, government transfers and tax policies can help support incomes for large swaths of the population. Research from the McKinsey Global Institute found that real market incomes were flat or fell for just 20 to 25 percent of households, after taxes and transfers; before these transfers, some 60 to 70 percent of households saw incomes decline. During the pandemic, while US median household income dropped 2.9 percent in 2020, the share of people living in poverty declined, after accounting for government aid (US Census, 2021)
- **Growth enables sustainability by encouraging investment.** Economic growth strengthens consumer confidence, spending, and demand, all vital elements of a healthy investment climate – which the energy transition is going to need. And as our research on outperforming emerging economies has shown, the capital deepening that results from greater investment spurs productivity and, with it, wages and growth.
- **Greater inclusion and sustainability promote growth through new demand and investment opportunities.** Sustainability drives new business opportunities in domains such as clean technologies. India, for example, could more than quadruple its renewable-energy capacity by 2030; we estimate that this could generate some \$90 billion in GDP and support about two million jobs in 2030. And inclusion has similarly powerful effects on growth. We estimate that more inclusive access to healthcare could add 0.4 percent

to the world's GDP growth by 2040. More broadly, inclusion spurs demand, as a burgeoning middle class is a key driver of consumption. Africa has about 200 million young people of working age and will have close to a billion by 2050. Youth training and development, especially of digital skills, can vault this group into the middle class – and help close skill gaps in the rest of the world.

- **Sustainability reinforces both inclusion and growth through the 'energy prize.'** The energy transition will yield a prize of two cross-cutting benefits: lower costs that make energy more accessible, and more productive lives. Over the past ten years, the cost of electricity from renewables fell about 50 to 85 percent (International Renewable Energy Agency, 2021). Renewables are now gaining ground in developing economies. In sub-Saharan Africa, a region with the lowest energy-access rate in the world, decentralized renewable solutions such as rooftop solar are taking root (Jan Corfee-Morlot et al., 2019). Lower emissions and reduced air pollution can improve health and allow more people to participate productively in the economy. History has some instructive lessons: after passage of the Clean Air Act in the United States, in 1970, reduced pollution increased the labour-force participation rate for affected individuals and had a positive long-run impact on wages (Isen et al., 2014).

2.1 Growth's counteractions

Growth imposes two major challenges. First is the persistent rise in inequality, which could worsen with growth. Already, 70 percent of the global population live in countries where inequality is mounting. Second is rising resource consumption and emissions (McKinsey & Company, 2022).

Growth affects inclusion through skill-biased inequality – and its magnitude is set to rise with trends accelerated by the COVID-19 pandemic. Growth in the knowledge-based economy has stoked demand for higher-level cognitive, technological, and socioemotional skills – a demand not matched by the supply of workers with such skills. As a result, a skill-biased inequality in many countries has sprung up. In the United States, for example, wages for middle-income jobs grew by

1.1 percent between 2000 and 2018, whereas wages for high-pay and low-pay workers grew much faster, at 7.3 and 5.3 percent, respectively. As the pandemic accelerated digitization and automation, almost all growth in labour demand could begin to occur in high-wage occupations. The number of workers who would need to make occupational transitions by 2030 in order to stay employed would increase by up to 25 percent, including – for the first time – many low-wage workers (UN, 2019)

Growth counteracts sustainability through greater resource consumption. The global “material footprint” – that is, the raw materials used to make the goods that we consume – rises in correlation with GDP growth. As growth expands in emerging countries, the problem of an increasing global material footprint could get worse. According to the World Bank, about 10 percent of the world’s population still has no access to electricity, and 2.6 billion people lack access to clean cooking solutions. If increased demand from a globally expanding consuming class is not accompanied by improvements in resource efficiency, this will place an even heavier burden on the planet (WB, 2021).

2.2. Sustainability’s counteractions

Trillions of US dollars in capital are needed for energy investment to achieve the goal of net-zero emissions by 2050. If consumers and businesses shoulder the burden, near-term growth and inclusion could suffer, even though the longer-term benefits are clear. If costs are passed on to consumers, energy prices could rise well before the gains are eventually reaped, and if costs are passed on to businesses, the profitability of whole sectors could suffer (McKinsey & Company, 2022).

This dynamic sets up the potential for two counteractions: uneven distribution of impact and a challenge to the goal of inclusion.

The energy transition could affect some countries and sectors severely. Oil- and natural-gas-producing economies could see their annual per capita income from these products fall by about 75 percent by the 2030s, according to the International Energy Agency (2021). Lower-income countries will be disproportionately exposed because they have a higher share of emissions-intensive sectors and will also need to make higher investments relative to their GDP. Those sectors

include power, automotive, construction, and others, all of which will be intensely affected, as will supply chains (IEA, 2021)

Lower-income households are disproportionately vulnerable. In Europe – the vanguard of the energy transition – recent rises in energy prices are falling heavily on low-income households, prompting some governments, including in Spain, to provide subsidies (BBC, 2021). And while the transition could lead to some 18 million more jobs in the green economy, according to International Labour Organization estimates, many people, especially lower-income workers, will need to retrain to qualify for these new jobs (ILO, 2018).

2.3. Inclusion's potential counteractions

The positive spillovers of inclusion are indisputable and well documented: greater workforce participation, higher creativity, more capital allocated to children's needs. However, poorly conceived measures to boost inclusion can have unintended negative consequences that can include distorted product markets, reduced investment, or faster environmental depletion. For example, in developing economies, the free or highly subsidized nonvolumetric pricing of electricity used to pump water can lead to groundwater depletion. Efforts to achieve equality can also backfire if they become a box-ticking exercise, or a quota-driven program, which may fail to address the root causes of inequality. As a result, the goal of achieving a fairer workplace or society may not be achieved, and outcomes may even worsen for certain groups (Shifraw, 2021).

3. What is economic sustainability?

Economic sustainability is a broad set of decision-making principles and business practices aimed at achieving economic growth without engaging in the harmful environmental trade-offs that historically accompany growth. Ideally, sustainable development creates operational systems that consume natural capital (also known as natural resources) slowly enough that future generations can also use those resources. (MasterClass, 2022)

Sustainable practices can tackle the problem of humans' collective ecological footprint in several ways. They can focus on reducing the

depletion of the natural environment, or they can come at the issue from the other direction by finding ways to reduce waste, limit carbon emissions, and utilize solar energy. The unifying principle behind economic sustainability is rejecting wasteful short-term processes and embracing the planet's long-term well-being. (MasterClass, 2022)

3.1. Why Is Economic Sustainability Important?

A sustainable economy is essential for various reasons, with justifications ranging from high-minded environmentalism to corporate interest. (MasterClass, 2022)

The longevity of the global economy: The worldwide reliance on unsustainable practices has a necessary end date since the planet's natural resources are not infinite. Developing new processes and investing in different resources is essential for any commercial activity to continue for the long haul.

The preservation of human life: Climate change caused by the overuse of fossil fuels has created a dire situation for Earth and humans' ability to inhabit it. By trying to limit energy consumption and adjusting the approach to food production, humans have the opportunity to preserve the planet for posterity.

Unrealized discoveries: The natural environment has long been a source of discovery and innovation. Therefore, the constant degradation of natural surroundings jeopardizes the opportunity to unearth new compounds and processes that could serve as the basis for new products or other economic benefits. (MasterClass, 2022)

3.2. Economic Sustainability Examples

Economic sustainability can take many forms depending on how an organization adapts, including (MasterClass, 2022):

Devising less wasteful systems: Innovating ways to reduce land use or make supply chains more efficient cuts down on the resources needed to produce a good or bring it to market.

Prioritizing low-impact economic development: Investing time and money in sustainable businesses to create a waste-free world is necessary for shifting concentrations of capital and momentum for the future economy.

Switching to renewable energy sources: Converting operations to run on energy produced by solar or wind power rather than fossil fuels is one way an organization can prioritize the future. (MasterClass, 2022)

3.3. How to Implement Economic Sustainability

Creating the infrastructure for economic sustainability is a complex process that involves the full cooperation of both the private and public sectors. On the individual level, however, retail investors can direct their money toward companies whose values and practices align with their own. Citizens can also encourage their elected officials to create economic plans that include sustainable development goals and caps on greenhouse gas emissions. Ultimately, it's only through large-scale action and an overhaul of the financial systems that constitute the global economy that society can achieve environmental sustainability. (MasterClass, 2022)

4. Sustainable development index

The Sustainable Development Index (SDI) measures the ecological efficiency of human development, recognizing that development must be achieved within planetary boundaries. It was created to update the Human Development Index (HDI) for the ecological realities of the Anthropocene.

The SDI starts with each nation's human development score (life expectancy, education and income) and divides it by their ecological overshoot: the extent to which consumption-based CO₂ emissions and material footprint exceed fair shares of planetary boundaries. Countries that achieve relatively high human development while remaining within or near planetary boundaries rise to the top.

The SDI results for 2019 can be found in the map and table below. While some countries score reasonably well, none reach over 0.9. Results for 1990–2019 can be found on the time series page. Disaggregated data can be viewed on the bubble charts page.

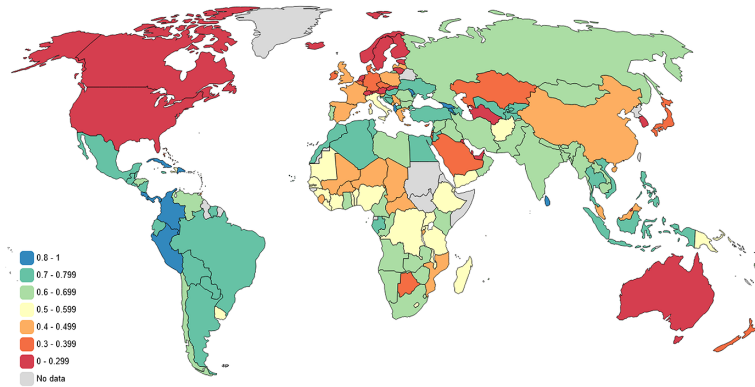


Figure 3. The Sustainable Development Index.
Source: <https://www.sustainabledevelopmentindex.org/>, 2019.

4.1. Measuring human development in the Anthropocene

The Human Development Index (HDI) has long been criticized for not taking account of ecological sustainability. This limitation is becoming increasingly problematic given a growing crisis of climate change and ecological breakdown in the 21st century. All of the HDI top performers are notable for dangerously high levels of ecological impact, which is driving a global crisis. We can see this relationship by plotting the HDI series against the per-capita CO_2 emissions and material footprint (or resource use) for each nation:

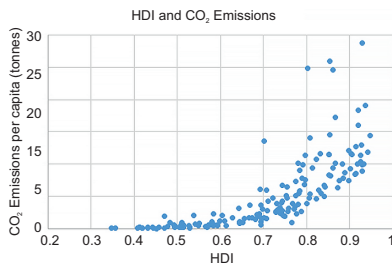


Figure 4. The human development index and CO_2 emissions.
Source: <https://www.sustainabledevelopmentindex.org/>, 2019

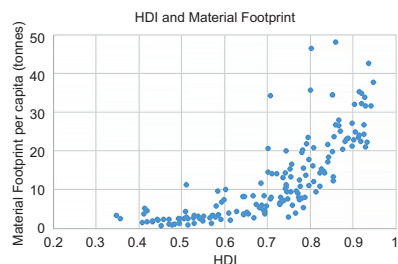


Figure 5. The human development index and material footprint.
Source: <https://www.sustainabledevelopmentindex.org/>, 2019.

There are two problems to consider here. First, HDI celebrates the very nations that are contributing most to climate change and other forms of ecological breakdown, in terms of their per capita emissions and material footprint. In doing so, it promotes a model of development that is empirically incompatible with ecology. The average material footprint of nations with “very high” HDI scores is 26t per capita (four times over the sustainable boundary), while their average CO₂ emissions is 11t per capita (six times over the boundary). It is not ecologically possible for all nations to consume at this level. In other words, the pursuit of development according to HDI requires that the world “develops” to the point of ecological collapse. This is not a tenable approach for the 21st century.

The second problem is related to the first. The countries of the global South suffer disproportionately from the negative impacts of climate change and ecological breakdown, with significant costs to human economies and living systems; indeed, climate change is now beginning to reverse key development indicators in some regions, as agricultural yields decline and hunger rates rise. In this sense, HDI embodies a contradiction whereby the process of generating high levels of development in some nations constrains development – and even drives de-development – in other nations. For a development indicator that purports to be universal, such a contradiction is indefensible.

Any ecologically rational vision for human development needs to respect the principle of planetary boundaries. In other words, resources should be mobilized to improve human development, but without violating the parameters of ecological sustainability. The objective is to accomplish both human development and ecological sustainability at the same time. This aim is now widely accepted, and is officially enshrined in the Sustainable Development Goals. It is time to update the human development index accordingly.

The Sustainable Development Index (SDI) addresses these concerns by focusing on the ecological efficiency of nations in delivering human development. It starts with the base components of the HDI (life expectancy index, education index, and income index modified with a sufficiency threshold) and divides it by ecological overshoot: the extent to which consumption-based CO₂ emissions and material footprint exceed per-capita shares of planetary boundaries). For the details of the methodology, see [here](#). Countries that have high human development with low ecological impact rise to the top of the

SDI. Countries with low human development, and countries with high human development but high ecological impact, fall to the bottom of the SDI.

In this way, the SDI promotes a new vision for progress in the 21st century – one compatible with the ecology of our planet. To succeed in terms of SDI, poor nations must significantly improve human development while keeping their ecological impact within planetary boundaries, while rich nations must maintain or enhance human development while significantly reducing their ecological impact down to sustainable levels.

One of the pitfalls of using a composite index is that it obscures important information that only becomes visible when disaggregated. The scatterplots below depict each nation in terms of their human development score and their ecological impact. Users can toggle between material footprint and CO2 emissions with the radio buttons at the bottom of the charts. The per capita planetary boundary is included in the charts for reference. Circle size represents population. The goal is for nations to get into the bottom right-hand corner, achieving over 0.8 on the human development score while remaining within sustainable thresholds for material use and emissions.

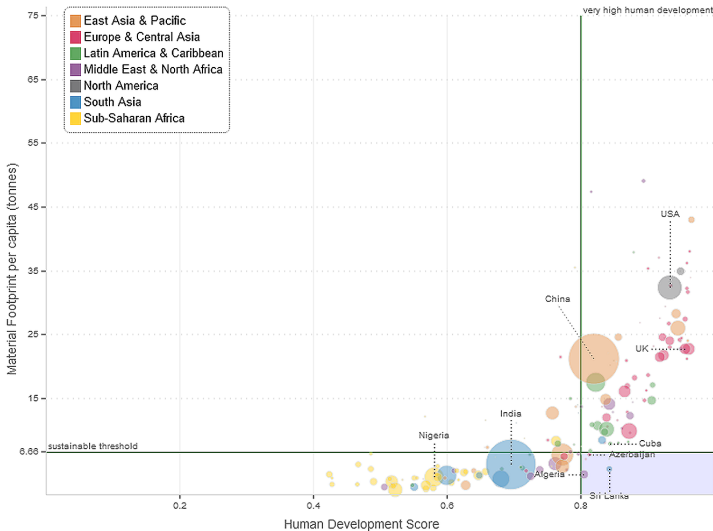


Figure 6. Human development vs ecological impact – 2019 data
Source: <https://www.sustainabledevelopmentindex.org/>, 2019.

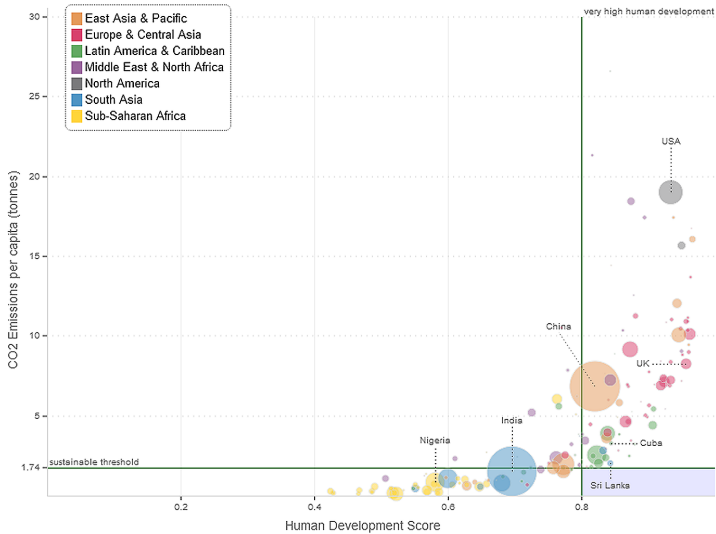


Figure 7. Human development vs ecological impact – 2019 data
Source: <https://www.sustainabledevelopmentindex.org/>, 2019.

4.2. SDI – methodology and data (<https://www.sustainabledevelopmentindex.org/>)

The Sustainable Development Index is an efficiency metric, designed to assess the ecological efficiency of nations in delivering human development. It is calculated as the quotient of two figures: (1) a “development index” based on the Human Development Index, calculated as the geometric mean of the life expectancy index, the education index, and a modified income index; and (2) an “ecological impact index” calculated as the extent to which consumption-based CO₂ emissions and material footprint exceed per-capita shares of planetary boundaries. For a full description of the SDI methodology and rationale, see (Hickel, 2020). This page offers an overview of the basic principles.

The SDI formula can be described as follows:

$$\text{SDI} = \frac{\text{Development Index}}{\text{Ecological Impact Index}}$$

4.2.1. Development Index

The development index follows the base formula of the Human Development Index (HDI), with a sufficiency threshold on income. The formula and its components can be described as follows:

$$\text{Development Index} = \sqrt[3]{\text{Life Expectancy Index} * \text{Education Index} * \text{Income Index}}$$

$$\text{Life Expectancy Index} = \frac{\text{LE} - 20}{85 - 20}$$

$$\text{Education Index} = \frac{\text{MYSI} + \text{EYSI}}{2}$$

$$\text{Income Index} = \frac{\ln(\text{GNlpc}) - \ln(100)}{\ln(20,000) - \ln(100)}$$

In the education index, the Mean Years of Schooling Index (MYSI) = MYS / 15. The maximum value is 15 years of schooling, which is the projected maximum for 2025. The minimum value is 0 years of schooling.

The Expected Years of Schooling Index (EYSI) = EYS / 18. The maximum value is 18 years of schooling, which is equivalent to achieving a master's degree in most countries. The minimum value is 0 years of schooling.

The income index here differs from that used in HDI in that it incorporates a sufficiency threshold below the HDI's maximum value of \$75,000 (2017\$ PPP). This is because to achieve an income of \$75,000 per capita is empirically incompatible with planetary boundaries. Nations with an income per capita over \$60,000 have an average material footprint of 35t per capita (more than five times over the planetary boundary) and CO₂ emissions of 19t per capita (eleven times over the planetary boundary). These levels of ecological impact are highly destabilizing and cannot be universalized. In this sense, the HDI income index effectively precludes nations from achieving very high HDI while at the same time remaining ecologically sustainable. (Hickel and Kallis, 2019; O'Neill et al., 2018).

The data for the components of the development index are derived from the United Nations Development Programme, using the same dataset that underlies HDI.

4.2.2. Ecological Impact Index

The ecological impact index can be described as follows:

$$\text{Ecological Impact Index} = 1 + \frac{e^{\text{AO}} - e^1}{e^4 - e^1}$$

if $\text{AO} > 4$, then $\text{EII} = \text{AO} - 2$

$$\text{AO} = \sqrt[2]{\left(\frac{\text{MF}}{\text{boundary}} \geq 1 \right) * \left(\frac{\text{CO}_2}{\text{boundary}} \geq 1 \right)}$$

Average overshoot (AO) is calculated as follows. Material footprint and emissions values are each divided by their respective per capita planetary boundary (which varies by year depending on population size) to determine the extent of boundary overshoot (or undershoot). This also standardizes the units. If the result of either division is less than 1 (undershoot) it is rendered as 1. Then the results are averaged using the geometric mean. This method ensures that a country cannot compensate for overshooting one boundary by undershooting the other. Overshoot of either boundary will yield average overshoot of greater than 1.

The planetary boundaries are calculated as follows. For material use, the sustainable threshold is regarded as about 50 billion tonnes per year (Bringezu et al. 2015). Dividing this by the global population in any given year renders the boundary in per capita terms. For 2019, the boundary is 6.52t per person. For CO₂ emissions, we can use the IPCC's 2018 SR15 report to estimate the carbon budget for a 67% chance of staying between 1.5C and 2C, and render this budget in per capita terms. For 2019, the boundary is 1.58t per person per year.

In the ecological impact index, AO is indexed on a natural exponential scale. Given the uncertainties around the precise definition of the planetary boundaries, this allows some leeway for small amounts of overshoot. Adding 1 ensures that the minimum result is 1 (no overshoot). For countries that have no overshoot, their development index is therefore unaffected. Once overshoot reaches four times the planetary boundary the ecological impact index registers 2, thus cutting the development index in half. Thereafter a linear function applies. This method ensures that the SDI is an indicator of strong sustainability. Countries cannot use low ecological impact to compensate for

poor performance in human development. And strong performance in development cannot compensate for high ecological impact.

Material footprint and CO₂ emissions are rendered in consumption-based terms; in other words, they account for international trade by adding the materials and emissions embodied in imports (including the upstream materials and emissions involved in producing and shipping imported goods) and subtracting that which is embodied in exports.

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THEORETICAL FRAMEWORK FOR SUSTAINABLE DEVELOPMENT (ENGEL'S LAW, ETERNAL GROWTH CRITICISM, FAILURE OF A COMMON GOOD)

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Key words: consumption, income level, expenditure, growth, society well-being, equality, finiteness, freedom, responsibility.

Sustainable development applies to the organizing principle that aims to achieve human development objectives while sustaining the capacity of natural systems to provide the natural resources and ecosystem services on which the economy and society depend, considering – very especially- the preservation of historical and cultural sites. The desired outcome is a societal situation where living conditions and resources are used to continue to meet human needs without undermining the integrity and stability of the natural system. It can also be defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This chapter looks at basic economic theoretical concepts that are required for a fully understanding of sustainable development paradigm to be applied.

1. Introduction

In the 19th century, Engel stated that “the poorer an individual, a family or a town is, the greater must be the percentage of their income necessary for the maintenance of their physical subsistence and, in turn, the greater the percentage that You must dedicate yourself to food”.

Engel’s law indicates that as income increases, the expenses dedicated to the consumption of articles also increase, but in a different proportion: in the articles of first necessity the expenses are decreasing, while in the goods of relative luxury and for luxury itself, expenses are increasing.

Engel’s law can be generalized to all families in a country, so both the spending of its citizens and the type of products they demand tend to be directly related to the average level of income and to the variations that this level of income goes experimenting over time.

The main consequences of all of the above are that spending on certain primary products will decrease relatively as the country manages to reach higher levels of development. On the other hand, the demand for goods with which to satisfy needs will tend to diversify, turning more and more to products that were previously considered unattainable.

Due to their primary nature, food products are relegated, according to Engel’s Law, to the background when income increases occur. However, it must be taken into account that the food market has experienced the second aspect of the effect stated by Engel, given that an increasing percentage of food consumption is carried out through the hotel and restaurant channel. This means that the proportion of household consumption has been offset by a greater share of food consumption outside the home.

In the first part of this subchapter, we will analyse the implications of the evidence in sustainable development.

Growth is an objective rooted and undisputed in the conventional economic ideology. In economics and management studies, the consumption and production formulas are analysed, assuming that their maximization is a desirable objective, since it means maximizing the well-being of society, without the possibility (or time) to open a debate on the reality of this equality. The concept of growth, the reason

for it, or the criticism of what it implies are issues that are not tackled throughout economics and management degrees, which is why it is important to analyse the concept of growth, its meaning and the impact that it currently has on the well-being of the population.

The objective of the second part of this subchapter is to point out the defects of the growth system from the point of view of human well-being and to analyse the consequences that they have on it. To do this, it begins by explaining the relationship between GDP and well-being through utilitarian theory and analysing this relationship from three points of view: inequality in the distribution of income, the reality of the GDP = well-being equality, and the relationship between growth and the environment, with special emphasis on natural resources and their finite nature.

Finally, in this chapter, we will have a look at the tragedy of the commons. This is a dilemma described by Garrett Hardin in 1968 and published in *Science*. It describes a situation in which several individuals, motivated only by personal interest, and acting independently but rationally, end up destroying a limited shared resource (the common) even though for none of them, either individually or collectively, is it in the best interest for such destruction to happen. Hardin also argues that resources managed at the community level are more vulnerable to excessive and irrational use, so governments need to establish regulations. In other words, the only way to avoid the overexploitation of resources is the transformation of communal property into private property or state property.

Hardin uses this example to analyse the relationship between freedom and responsibility. Even though his work has been harshly criticized by other authors, its publication began a broad debate on the analysis of human behaviour in the areas of economics, psychology, game theory, politics, sociology, the environment, etc.

The dilemma is considered to represent an example of a social trap in which a social conflict over the use of common resources is emphasized by implying a contradiction between the interests or benefits of individuals and common or public goods.

2. Background

2.1. Engel's Law

Engel's law is an empirical observation. Ernst Engel (1821–1896) observed that, with a given set of tastes and preferences, if income increases, the percentage of expenditure devoted to food decreases regardless of whether food expenditure increases in absolute terms.

In other words, the income elasticity of demand for food is less than 1.

This implies that, contrary to what happens with other goods and services, those from agriculture are generally in very rigid demand. Ultimately, this limitation is due to the saturation of needs (we cannot eat more than what fits in our stomach).

This supposes that, in the consumption of all human food, sooner or later negative income elasticities appear. The most direct and obvious consequence is the appearance of surpluses, one of the agricultural paradigms of the European Union.

From a theoretical point of view, Engel curves are defined as the functions that relate the expenditure on goods and services that a certain family disburses, with its income or total resources received, as well as other variables that characterize the composition of the family, given the fixed prices.

Microeconomic theory does not determine any specific functional form for Engel curves but establishes criteria that it must meet in accordance with consumer theory, from which a certain specification can be made.

In the 19th century, Engel stated that "the poorer an individual, a family or a town is, the greater the percentage of their income necessary for the maintenance of their physical subsistence and, in turn, the greater the percentage that must be devoted to food".

In other words: "As per capita income rises, the percentage of total spending devoted to food consumption falls".

Engel's law indicates that as income increases, the expenses dedicated to the consumption of articles also increase, but in a different proportion: with the articles of first necessity the expenses are decreasing, while in the goods of relative luxury and for luxury itself, expenses are increasing.

Engel's law can be generalized to all families in a country, so both the spending of its citizens and the type of products they demand tend to be directly related to the average level of income and to the variations that exist.

The main consequences of all the above are that the spending on certain primary products will decrease relatively as the country manages to reach higher levels of development. On the other hand, the demand for goods with which to satisfy needs will tend to diversify, turning more and more to products that were previously considered unattainable.

As was mentioned, according to Engel's Law, food products are relegated, due to their primary nature, to the background when income increases occur. However, it must be kept in mind that the food market has experienced the second aspect of the effect stated by Engel, given that an increasing percentage of food consumption is carried out through the hotel and restaurant channel. This means that the proportion of household consumption has been offset by a greater share of food consumption outside home.

This interesting reflection explains the growth experienced by the food service sector in the last twenty years in Spain. Although this sector is promising when it comes to long-term development (in the United States 50% of food consumption occurs outside the home) we are currently facing a reduction in consumption in hotels and restaurants due to the economic crisis.

The disposable income of Spanish consumers has decreased, so they have stopped spending on the food service sector and have gone back to consuming at home or buying in conventional channels in order to prepare food at home before taking it with them to eat away from home.

Engel's law does not imply that food spending stays the same as income increases, but rather suggests that consumers increase their food spending proportionately less than their income increases.

One consequence of this law is the decrease in the importance of agriculture as a country becomes richer, when the demand for food products does not grow at the same rate as the national income.

A highly controversial statistical application of the percentage of spending devoted to food is to treat it as a reflection of a country's standard of living. If the Engel Coefficient ratio is high, it means that

a country is poor. On the contrary, if this coefficient is low, it means we are dealing with a rich country.

In economics, the Engel curve shows the relationship between the quantity demanded of a good or service and the consumer's income; that is, how the quantity demanded varies when their income changes.

Graphically, the Engel curve is represented in the first quadrant of the Cartesian coordinate system (because neither quantity demanded, nor income can be negative). Income is shown on the y-axis and the quantity demanded of the selected good or service is shown on the x-axis.

For normal goods and superior goods, the Engel curve slopes upward. That is, as income increases, the quantity demanded also increases.

For inferior goods, the Engel curve slopes downward. This means that when consumers have more income, they will reduce their consumption of inferior goods (even by not buying them altogether), because they can afford to buy better goods. Public transportation is another typical example of an inferior good.

2.2. Eternal growth criticism

The objective of economic growth is not an abstract concept of economic growth. When politicians and economists currently refer to it, they measure it using very specific quantitative indicators. Therefore, to arm yourself with arguments in the debate, you must know these indicators and their deficiencies, focusing mainly on the criticisms that have to do with the problems of resource depletion and environmental degradation.

The main indicator of growth today is the Gross National Product (GNP). Of course, this indicator has not always existed but was consolidated after the Second World War based on certain conventions established by the United Nations. Initially its objective was purely descriptive: to measure the level of economic activity as a whole.

The GNP starts from a very narrow definition of economic activity. With some exceptions, it basically registers the activities that cost money and generate income, whether sold in the global market or paid by the public sector. To produce is therefore to generate income. A professor hired by the private or public sector is productive because he/she costs money, just as a military or an advertising company is

productive. On the other hand, the activity of cooking or caring for people – which is primarily done by women – is not, if it is done at the home level.

National Product (NP) is then equivalent to National Income. The NP or NR was quickly used as an indicator of economic success (to measure whether things are getting better or worse economically) – growing 3% is undoubtedly considered a better result than growing by 1% – and, furthermore, countries tend to be ordered according to their National Income per capita to give an initial idea of whether they are better off or worse off economically.

There are many critics of the NP, and especially of its normative-evaluative use, and here we will focus on three considerations that have to do with the fact that the economy belongs to a broader system: nature or the biosphere.

In the first place, the National Product counts the same activities based on the exploitation of non-renewable natural resources or on the exploitation of renewable resources. So, we speak, for example, of producing oil as of producing wheat or potatoes even though all extraction of oil has as a counterpart a lower future availability. There is also no distinction between exploiting renewable natural resources in a sustainable or unsustainable way: the contribution of fishing to the NP only depends on the monetary value of the catches regardless of whether or not fish stocks are declining, which is the basis of the exercise.

Anyone who has studied economics knows that National Accounts is concerned with distinguishing between Gross National Product and Net National Product. The difference is that to calculate the Net Product, amortization is discounted – the estimated value of wear and tear and depreciation of machines, buildings, work tools, etc. It is implicitly assuming that the only condition to maintain the level of production indefinitely is to deal with this depreciation. This is what any macro-economics textbook says: *if you deal with the depreciation of capital, production can continue indefinitely at the same level; if gross investment exceeds depreciation, output will grow*. It is assumed that the flow of natural resources is assured, that it is a “free” resource. This is a curious assumption when it is possible, for example, that the oil we have already extracted may or may not be far from half of all that we will be able to exploit. So, we should not be surprised when reputable

economic growth manuals do not even contain the words energy or natural resources.

A second consideration is that in the NP we assess the value of the goods and services that we produce and consume, but we forget that often the counterpart of production and consumption activities is environmental degradation that also affects our health and quality of life and that of future generations, and may even endanger survival. We count the "economic" goods and services (which are supposed to be goods because they generate money without going into analysing what they are used for) but we forget the "associated ills". This does not mean that it is best to subtract these evils. We could only do this by measuring everything in monetary terms and the remedy could be worse than the disease. But it does mean that there are some "hidden costs" that we should not forget but bring to the fore.

But there is still a third line of criticism. It is that environmental problems themselves often generate monetary expenses in efforts to try to avoid or reduce these problems – expenses that have been called compensatory or defensive. Thus, more waste and more problems can lead to more money being spent on their management; more oil accidents, more money spent on clean-up and restoration. These expenses are incurred not to get better, but so as not to get worse, to protect oneself from the ills of economic activities, and, therefore, conceptually they are costs of production and consumption activities. However, when they are shouldered by public administrations or by citizens, they appear as assets and not as liabilities: as new services that we did not have before and that generate employment and income and, consequently, increase the NP and NR.

As we can conclude from above, the first criticism of identifying more growth with more economic well-being is forgetting the costs associated with growth that affect current and future living standards. These are ecological and economic costs, as well as other social costs. Growth sometimes comes at the cost of more working hours, greater mobility, more aggressive competition between people, etc.

There is also another essential aspect. When income growth is sought at all costs, not only are the costs associated with it forgotten, but the benefits it entails are also greatly exaggerated. In rich societies, growing consumption does not generally satisfy the excessive aspirations it generates. In these societies so focused on consumption, the economic element that seems to influence the greater or

lesser sensation of satisfaction or happiness is not so much absolute consumption as relative consumption with respect to other people.

This evidence is now quite fashionable among some economists. There is even talk of the “economics of happiness” – but it has been many decades since some authors had pointed it out; like Fred Hirsch, who at the beginning of the 1970s spoke about the growing importance of positional consumption – a complex concept that encompassed, among other aspects, this idea of the importance of the relative level of consumption.

2.2.1. Criticism of the concept “sustainable development”

The concept of “sustainable development” gained relevance just 20 years ago with the famous Brundtland Report of the United Nations – our common future – and since then it has had an extraordinary diffusion. This is positive insofar as it reflects the growing concern about resource depletion and environmental degradation.

However, much of the success of the term sustainable development is due to its ambiguity and, even more so, to the fact that “economic development” had traditionally been identified with “economic growth” so that the term sustainable development was identified – and is identified – with sustainable growth. Even the term sustainable is similar to sustained, and it was easy to think that there was no great contradiction between the objective of sustainable development and the traditional one of sustained growth, when in reality nothing is more contradictory to putting environmental sustainability problems in the foreground than upholding the objective of maintaining growth rates. This frequent identification between the terms sustainable development and sustainable growth has two very negative consequences.

The first negative consequence is that it prevents us from seeing what the real roots of the current ecological crisis are. The current ecological crisis has a dimension that cannot be fully understood if the scale factor is not considered. The economy has grown, taking over more and more space from nature; to use Herman Daly’s metaphor, we have gone from a world relatively empty of human activity to a world relatively full of it.

This means occupation of space in the strict sense (urbanized space, infrastructure, space transformed for crops and plantations, etc.) but also space in a more figurative sense (most of the water flow

that moves the hydrological cycle channelled for human uses, greater appropriation of the primary production of plants, greater occupation of the atmosphere with waste, etc.).

There are many quantitative indicators of the increase in the occupation of "environmental space" which, however, it is difficult to summarize in a single figure despite the well-intentioned – but methodologically unconvincing – attempts to calculate the "ecological footprint" of different societies. This index has played an enormous role in spreading the idea that our societies have exceeded ecological limits, but at most it should be considered a very imperfect indicator, along with others.

Only by referring to the increase in scale, can we understand the global and not only local character of the environmental changes (and, mainly, the capacity to change the atmospheric composition with its effect on the global climate). This increase in the size of the economic system has been due to the demographic growth of the population but also – or above all – to the growing consumption of resources per capita, especially in parts of the world that have experienced economic growth. We could say that the problem is not only the population of people but also the population of cars, cattle, air conditioners, machines, consumer goods, etc.

The second negative consequence of the identification between sustainable development and sustainable growth is what has been named "the fetish of economic growth". What requires urgent review is the role of economic growth (that is, of the increase in magnitudes such as the PN or the RN) as basic indicators of economic success.

Does this mean that we must completely renounce the concept of development? Not necessarily, obviously. Developing is a term that can mean many things and it can also be equated with evolving for the better, meeting the basic needs of those who do not have them covered, and increasing human capabilities. This, of course, will normally imply that very poor people will consume more food, have more drinking water, use more energy, have access to more medicines, etc., but the rich can have their basic needs met and can develop as people consuming much less energy, water, materials, etc.

It is imperative to do this if we think that we already use too many resources, especially if we think that we must leave "space" for others to improve their situation.

The relationships between economic growth – as it is measured and environmental sustainability are, therefore, tremendously conflictive but they are also complex, and we must not forget this. Economies change over time – in technologies and the weight of the different economic sectors – so it cannot be ruled out a priori that the growth of the NP is accompanied in some places and historical moments by less use of natural resources and less environmental impacts. We can look at two examples in this regard.

Let's suppose that taxes are increased in such a way that a group of people sees their disposable income decrease and let's suppose that with this money the government hires workers for home care for the elderly population. The NP will increase since there will be a new service, but the environmental problems will not necessarily increase. People hired will perhaps spend an amount similar to what those of us affected by the new taxes deduct from our consumption. The impacts of the new consumption will not be identical, but we do not know in which direction they will move.

Let's go to the second example. If a device breaks down and I decide to fix it instead of buying a new one, this will also generate income that is added to the NP. In fact, if the repair was more expensive than the production of a new device (which, of course, makes the repair improbable) the repair would entail a higher NP than the new production.

The conclusion is that the level of the NP is a certain key to environmental impacts, but its composition and the technologies used are also extremely important. That said, it is entirely true that historical experience shows that growth generally more than offsets possible partial improvements. In other words, efficiency improvements are easily offset by the scale factor.

A "sectoral" example is that of cars. Today's cars are on average lower energy consumers (although 4x4s have also proliferated) than those of decades ago, but the increase in the number of cars and kilometres travelled has meant that energy consumption and CO₂ emissions in the transport sector have not stopped increasing (sometimes the very efficiency improvement in the use of a natural resource is one of the factors that stimulates its greater use because the price of the service we obtain decreases: this is the so-called "the rebound effect").

The empirical evidence at the aggregate level is also compelling: there are no signs that rich economies are “dematerializing”. The tons of materials that are mobilized as the basis of these economies do not decrease in absolute terms, but in general the opposite happens (even though sometimes the movements of materials that they generate are “hidden” by globalization as they occur in other countries). When people are richer, they could spend their money on non-material things, but the fact is that they drive more, travel more by plane, have more second and third homes, eat more meat, have more air conditioners, etc., and this causes more impacts that are rarely fully offset by technological improvements.

2.2.2. Some considerations on “decrease” as a target

On the one hand, the idea of degrowth (and even more that of “growth objectors”) is very interesting as it entails radical opposition to the current ideology on the goodness of growth, an ideology shared by those who speak of “sustainable growth”. The conclusion is: why not decrease if our levels of consumption of many things are clearly excessive?

But, also, decrease means decrease of the PN. It is still a slogan trapped in a certain way in the same universe of macroeconomic accounting where very aggregate and partial indicators become indicators of whether things are going well or not. It is not necessarily true that the most radical response to the NP’s ideology of growth is the defence of degrowth.

Perhaps the most radical response is to say that we don’t really care if the NP grows or doesn’t grow. What matters to us is to cover the basic needs of the whole world, that economic activities make us happier and not less, and that we do not jeopardize the satisfaction of the needs of future generations and other populations. For this, rich countries must radically reduce the “environmental space” that we occupy and at an economic level many things must decrease – the ownership and use of cars, construction, advertising, etc. – but others must grow – public transport services, the care for the elderly, repairs, recycling, etc.

Would the NP be less in a more sustainable society that put human needs in the foreground and not obtaining benefits? In all probability, but in any case, this is the least of it. The NP can increase for good or bad reasons, and it can also decrease for good or bad reasons.

2.3. The tragedy of the commons

The controversy over the issue of common resources has a long history in the social disciplines. We are not going to make a systematic description here of how this problem has been dealt with over time. Suffice it to say that common property, or the forms of communal appropriation of resources, have accompanied man throughout his entire history. In this sense, if we consider the long biography of man as a hunter-gatherer; private property, as understood by the Western world, is a new arrival in the context of the forms of appropriation of nature.

This communal appropriation has been hit especially hard by various forms of privatization in modern and contemporary Western history. One of the classic examples of this process is the phenomenon of the expulsion of the British peasantry from their lands. For example, Marx, in *Capital*, in his chapter dedicated to the problem of original accumulation, clearly describes the way in which English peasants, from the 16th century, were gradually and without remedy stripped of their property and communal lands, to which they had as much right as the lords. As Marx says:

"...the great feudal lord (...) created a much larger proletariat [than that generated by the dissolution of the feudal retinues] by violently expelling the peasants from the land, over which they had the same feudal legal rights as himself, and by usurping their communal lands. In England the direct impetus for these actions was given particularly by the flowering of the Flemish wool manufacturing and the consequent increase in the price of wool. The great feudal wars had annihilated the old feudal nobility; the new one of hers was the daughter of her time, and for her money was the power of all powers. Her slogan, then, read: transform the farmland into sheep pastures" (Marx, *Capital*, Book 1, Vol. 3, p. 898).

Sheep raising is less labour intensive than farming, and this process drove multitudes of dispossessed peasants from the English countryside, who would become proletarians who could only sell their labour power.

In our century, the problem of common resources would be approached in a very different way. Some authors tried not to analyze the problems that the dispossession of these resources generates in the populations, but to raise the danger that the common use implies

for the conservation or for the efficient economic exploitation of the resources. In this sense, in the 1950s, various works addressed this new vision of the problem, such as Gordon's (1954) and Scott's (1955). In 1968 this theme would be taken up by Garrett Hardin, in an article entitled "The Tragedy of the Commons". Years later, the controversy over Hardin's text and the concepts used in it gave rise to an interdisciplinary academic discussion, which persists today. The debate has taken its name precisely from this article by Hardin: "The Tragedy of the Commons".

We can look at the case of two countries A and B that fish in international waters without any control, that is, under free access. Under a free access fishery resource management scheme, both countries decide to fish intensively, because any ton of fish caught by one of the countries is no longer available to the other country. Both countries then decide to catch fish at the highest level of intensity possible and in the shortest amount of time possible.

This problem in the light of game theory can be analyzed considering a non-cooperative and a cooperative solution. In the case of the first, there would be a solution where each country decides on a strategy that represents the best for itself without considering what the other country does, that is, the two countries do not cooperate. In this case, the free access scheme that follows the management of fishery resources in the presence of non-cooperation would lead us to a game outcome similar to the prisoner's dilemma for this specific example of fishing between two countries. On the other hand, in the case of a cooperative solution, the game between the two countries would develop in coordination in such a way that both countries would take joint actions for the efficient management of fishing resources in such a way that together they achieve the best possible result.

So, let's first study the free access game and how the prisoner dilemma game originates.

This game can be developed in a coordinated way when several trips are decided by mutual agreement between the two countries in which the balance between the growth rate of the fish is equal to the rate of their capture. Or, on the contrary, if there is no control on the number of fishing trips, the resource will be used intensively, that is, the capture rate will be greater than the growth rate of the fish population (Table 1).

Table 1. Fishing without cooperation.

		COUNTRY B	
		Cooperate	Not cooperate
COUNTRY A	Cooperate	30, 30	10, 40
	Not cooperate	40, 10	15, 15

Notice in this game that if country A cooperates, country B does better if it doesn't cooperate (B earns €40 instead of €30 when it cooperates). While if country B decides to cooperate, country A should not cooperate (A earns €40 instead of €10). If both countries consider that it is best not to cooperate, then the solution of this game is (not cooperate, not cooperate) and both countries are left with the smallest profits from open sea fishing, €15 for country A and €15 for country B. If this were not the result, but rather (cooperate, cooperate), both countries would gain €30 and they would have the largest profits together as well, profits of €60 compared to €30 when they decide not to cooperate. The outcomes (40, 10) and (10, 40) are dominant strategies for country A and country B, respectively. It can also be verified that the strategy "not cooperate" dominates the strategy cooperate (€40 greater than €30 and €15 greater than €10 for the case of country A and for country B, (respectively)).

The Nash equilibrium (In a two-player game, I have a Nash equilibrium for myself and another player when I choose my best possible strategy, in view of the best strategy the other player takes and when the other player chooses the best possible strategy for him, taking into account the best strategy that I have chosen) is generated when neither of the two countries unilaterally change their decision "not cooperate", giving rise to the Nash equilibrium: not cooperate, not cooperate.

Now, what if the two countries decide to develop the game under cooperation? In this situation we now have the following game (Table 2).

Note that now, under the coordinated game between both countries, the gains derived from coordinated fishing (derived from defining the optimal number of trips and without cheating) are the greatest

gains both at the individual level and at the societal level (total gains between the two countries). Each country earns €50 and jointly both countries earn €100. Now we have the Nash equilibrium when we have the result (cooperates, cooperates), and this equilibrium is preferred by both countries.

Table 2. Fishing with cooperation.

		COUNTRY B	
		Cooperate	Not cooperate
COUNTRY A	Cooperate	50, 50	10, 40
	Not cooperate	40, 10	15, 15

The tragedy of the commons can only be avoided through cooperation and clear rules. If this does not happen, common resources tend to disappear.

3. Discussion questions and tasks for students

Look for information about demand and the price elasticity of food, analyze which products tend to have more elasticity, and try to explain why. Relate these facts with what is understood to be a healthy diet. Have consumption patterns change in the 2020–2024 period? Why?

Look at information about global growth figures in your area. Relate them to the employment rate and standards of living. Are they related? Do a similar analysis with environmental and pollution rates.

Analyze the use of energy for heating in a building (instead of wearing a jacket) using the tragedy of the commons model explained above, considering the cost of the energy. Should we wear a jacket? Do a similar analysis for public transport vs private transport.

4. Further reading

This link provides access to the data of the Environmental Sustainability Index of the World Economic Forum:

www.ciesin.columbia.edu/indicators/ESI

This link from the United Nations Division of Sustainable Development presents the sustainable development indicators used by this institution:

www.un.org/esa/sustdev/natlinfo/indicators/isdms2001/table_1.htm

This Global Footprint Network link provides access to ecological footprint data by country and city: www.footprintnetwork.org

The Rio Declaration is available at this link:

www.un.org/esa/sustdev/documents/agenda21/spanish/riodeclaration.htm

The Agenda 21 document is available at this link:

www.un.org/esa/sustdev/documents/agenda21/spanish/agenda21sptoc.htm

This link allows access to everything that happened at the Johannesburg Summit and related documents: www.johannesburgsummit.org.

International actions against climate change can be consulted at this link:

https://ec.europa.eu/clima/policies/international/negotiations/paris_es

To facilitate the search for environmental valuation applications, one of the existing valuation databases can be used:

Environmental Valuation Reference Inventory of Environment Canada:

www.evri.ec.gc.ca/evri

Valuation Source List (Department of Environment, Transport and the Regions): www.environment.detr.gob.uk/evslist

Australian and New South Wales Environmental Protection Agency Database: www.epa.nsw.gov.au/envalue

Economy and Environment Program for South Asia (EEPSEA):

www.geocities.com/valuasia

Multiple reports and data on sustainability can be accessed through the following websites of international institutions:

United Nations (UN): www.un.org

Food and Agriculture Organization of the United Nations (FAO):

www.fao.org

United Nations Environment Program (UNEP): www.unep.org

United Nations Development Program (UNDP): www.undp.org

Organization for Economic Cooperation and Development (OECD):

www.oecd.org

World Bank: www.worldbank.org

World Wide Fund: www.wwf.org

World Economic Forum: www.weforum.org

World Resources Institute: www.wri.org

Document prepared by the United Nations Environment Program and Sustainability Ltd in which they show how environmental reports should be prepared and their usefulness in the company's environmental management: www.unep.org/business

Link that allows you to find information on the preparation of environmental reports in the European Union: www.enviroreporting.com

Detailed site with useful resources for all those interested in economic activities that promote sustainable development:

www.sustainablebusiness.com

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RESPONSIBLE AND CIRCULAR ECONOMY

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Key words: Circular economy, reducing, recycling, responsible, waste, energy

Until now we have applied linear production models, that is, we extract, produce, consume and dispose. The society in which we live means that the pace of consumption is accelerating; it is a fast but unsustainable model for the planet.

The circular economy establishes a more sustainable production and consumption model, in which raw materials are kept longer in the production cycles and can be used recurrently, thereby attempting to generate much less waste. As its name indicates, the essence of this model lies in ensuring that resources are kept in the economy for as long as possible, promoting that the waste we generate can serve as raw material for other industries.

This chapter explores this concept.

1. Introduction

The generation of waste, as a result of economic activity and consumption generated in homes, is one of the biggest problems facing the planet. According to a report by the World Bank (2018), in the OECD countries alone, which is where the consumer society plays a key role, 572 million tonnes of garbage are produced per year, 44% of the total generation. These figures, although enormous, pale in comparison when viewed in terms of the planet as a whole: more than 3.5 million

tonnes of waste are produced every day in the world, which amounts to about 1,300 million tonnes per year (Figure 1).

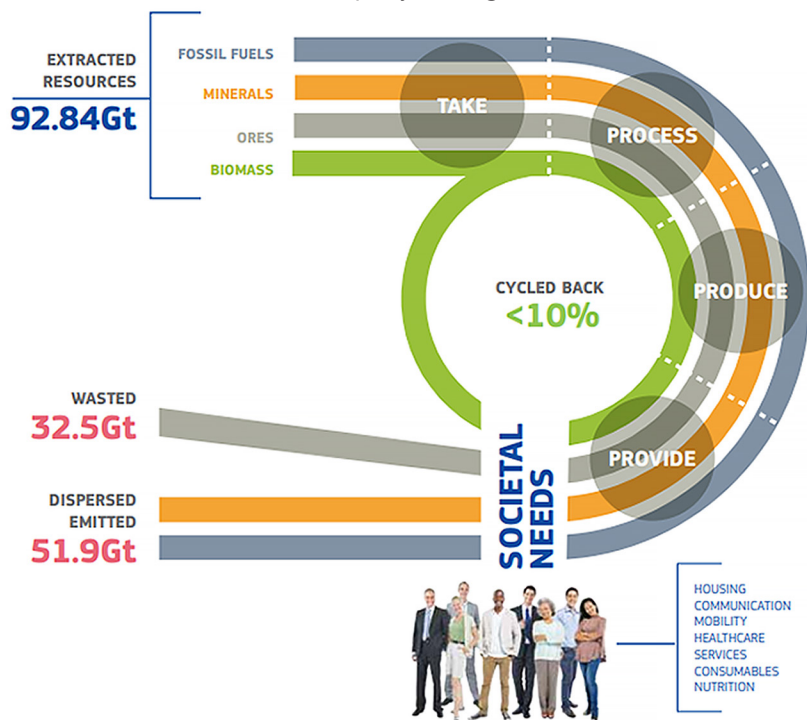


Figure 1. Current patterns of economic activity.

Source: European Commission (2020) Liderar el camino hacia una economía circular mundial: situación actual y perspectivas.

https://ec.europa.eu/environment/international_issues/pdf/KH0220687ESN.pdf

The world population is projected to increase from 7.5 billion people in 2017 to 10.2 billion people in 2060. According to the Organization for Economic Co-operation and Development (OECD), living standards will continue to rise in all countries and, gradually, they will converge towards those of the most advanced countries. According to projections, between 2017 and 2060 the average gross domestic product (GDP) per capita of emerging and developing economies will reach the current level of GDP in OECD members. The projected increase in the world's population and per capita income levels would mean that world GDP would more than triple. The rise of the middle

class in emerging and developing economies, coupled with rapid urbanization, is expected to have a strong impact on the environment, aggravate climate change, increase exposure to climate change and disaster risks, and intensify competition for certain raw materials.

If the material resource demands of a growing world economy and population were met by current patterns of production, consumption, and related policies and infrastructure, as projected by the International Resource Panel (IRP), the global use of materials would more than double between 2015 and 2060, reaching 190 billion tonnes. This means that the use of resources would increase from 11.9 tonnes per person in 2015 to 18.5 tonnes per person in 2060. The OECD projections differ somewhat, but they refer to a challenge of similar dimensions. In the OECD baseline scenario, raw material use is projected to nearly double from 89 billion tonnes in 2017 to 167 billion tonnes in 2060, while world GDP is projected to quadruple between 2011 and 2060. Countries and regions that already enjoy higher material standards of living are faced with the challenge of demonstrating that the same needs can be met with fewer material resources.

Both the IRP and the OECD stress that this scale of growth in the use of material resources – without improvements in the management of the impact linked to their extraction, cultivation, regeneration, use and disposal – would produce considerable additional stress on resource systems and the supply of resources, as well as unprecedented pressure and impact on the environment. Currently, the IRP already estimates that the extraction and transformation of the world's material resources account for more than 90% of the impact on global biodiversity and water stress, approximately half of the emissions responsible for global climate change (not including climate impact related to land use), and about a third of the health impact due to particulate matter.

The circular economy is based on an awareness of production processes and proposes reusing, repairing or recycling, as well as increasing sustainable manufacturing and consumption. In this way, in addition to reducing waste, energy would be saved and would contribute to avoiding the irreversible damage caused to the climate and biodiversity, and by air, soil and water pollution, due to the use of waste resources at a rate that exceeds the Earth's capacity to renew them.

To mitigate the possible environmental consequences, it is necessary to minimize the generation of waste and encourage policies that

will ensure products, materials and resources remain in the economy for as long as possible. These are the bases of the so-called circular economy, which seeks a new model of production and consumption of goods and services linked to sustainability.

Society as a whole can and must contribute to making the circular economy a widely extended reality. The UN, for example, through the Sustainable Development Goals, fights for responsible production and consumption (goal 12). These goals, of which there are 17 in total, are ambitious and universal, and represent a call to action to address the main environmental, social and economic challenges facing the planet. Putting the expression 'nothing is lost, everything is transformed' into practice is a good way of contributing our little grain of sand.

The phases of the circular economy are: ecodesign, production / reworking, distribution, consumption, repair / reuse and recycling.

A Europe that uses resources efficiently is an initiative that is part of the Europe 2020 strategy aiming to generate smart, sustainable and inclusive growth. With the support of the European Parliament and the Council, it is currently the main European strategy to generate growth and employment, and its main objectives are:

- to improve economic results while reducing the use of resources;
- to identify and create new opportunities for economic growth and boost innovation and EU competitiveness;
- to guarantee the security of supply of essential resources;
- to fight against climate change and limit the environmental impacts of resource use.

2. Background

2.1. A new economic paradigm?

The world's resources are limited, but we live as if they are not. Our production and consumption system is based on taking precious and increasingly scarce resources from the natural environment, creating products with short-lived utility and discarding them to later buy new ones. This situation is simply not sustainable. Many mineral resources are over-exploited and the sinks (vegetation, soil, oceans) to assimilate

the waste we generate have collapsed. This is a suicidal approach that leads us to a vicious circle, as has been warned about since 1972 in the report *The Limits to Growth*, commissioned by the Club of Rome and subsequently corroborated by many other reports.

The economic metabolism works by employing linear industrial processes that extract raw materials, to manufacture, transport and consume goods, and finally to generate garbage of all kinds, along a dispersed and delocalized chain throughout the planet. The consumer society is a fundamental element in this situation and is characterized by a growing demand for objects and services, especially in developed countries.

For some years now, efforts have been made to make this excess visible and raise awareness among the population through proposals such as Overshoot Day, or the date of the year in which we globally consume all the resources that the planet has the capacity to regenerate annually, according to data from the Global Footprint Network. The date does not stop moving forward, in 2020 it was set at August 22, counting on the fact that the global Ecological Footprint contracted by almost 10% due to COVID19. The conclusions are that currently globally we consume resources as if we had 1.6 Earths. In the Spanish case, the data is even more alarming, since the date would be brought forward to May 27, and universalizing our consumption patterns would require more than two planets. The continuity of this model over time is simply impossible.

We need to redesign the current model, promoting circular metabolic processes that are closely articulated (relocating production and consumption as much as possible), that reintegrate waste into nearby ecosystems and that aim at a substantial reduction in the use of materials and energy. A transition towards a cyclical economy requires structural changes of a systemic nature, which we could symbolically propose in the leap towards the 8Rs: Revalue, Reconceptualize, Restructure, Redistribute, Relocate, Reduce, Reuse and Recycle.

The economic system is a subsystem of society and this, in turn, is a subsystem of the biosphere. Therefore, everything used by society and the economy comes out of the biosphere, a closed system of materials and therefore subject to limits. It is important to support the idea of the circular economy because we cannot base our entire strategy on end-of-pipe solutions that manage waste (even if we achieve high recycling percentages); instead, what we must focus on

is how to use fewer resources, how to develop partnerships that will foster sustainable consumption, with the aim of reducing the current socio-ecological impact, which is leading us to a situation of unprecedented overreach in the history of our species.

We need to be inspired by how nature works, for example in biomimicry, and redesign our socioeconomic models by imitating such phenomena. Some key strategies would be operating based on renewable energy, maximizing biodiversity and ecosystem relationships, moving in proximity, internalizing limits and operating without the notion of waste. And the latter would be the one that most directly connects with the circular economy. All the products generated by the various vital reactions are reintegrated into the metabolic pathways of nature; each product generated is an input or food for another organism. Everything works in a closed circuit in which the elements flow through the great biogeochemical cycles.

The circular economy is a strategy that aims to reduce both the need for raw materials that enter the economic process and the generation of waste, in addition to maximizing its recovery and integration back into the cycles of use. Two basic types of waste can be distinguished, some biological or natural, that must be integrated into nearby ecosystems (food scraps, pruning, fodder...) and others of a technical nature that will be integrated into industrial processes (minerals, fibres – synthetic and natural, rubble...). To achieve the closure of cycles, human societies require working in interrelation with the other ecosystems, ensuring that the products dumped in them are biodegradable, which implies that the economy must minimize the manufacture of thousands of toxic and/or non-biodegradable products.

From an integral perspective, the practical example of industrial ecology is the business park in the Danish city of Kalundborg. This is an exercise in industrial ecology or industrial symbiosis, where companies associate to improve the use of raw materials and reduce the generation of waste, in a joint way. Through this cooperation, the exchange of energy, water and products derived from the different production processes is facilitated so that material cycles are closed in the most efficient way possible and energy flows are used, minimizing waste of all kinds.

This industrial park hosts a variety of companies, including a refinery, a chemical factory, a pharmaceutical manufacturing facility,

a paper mill, a biomass plant, a power plant, a refinery, a sulfuric acid plant and a pharmaceutical plant, pig farms, and aquaculture and cultivation areas that exchange resources and work harmoniously. In addition, the city itself has a close relationship with the business park due to both the creation of local employment and the marketing of the goods it produces.

The power plant sells steam to the refinery and the pharmaceutical manufacturing facility, and the heat obtained from the generators is used to heat buildings in the city, as well as to heat greenhouses and aquaculture farms. In turn, the refinery sells gas and cooling water to the power plant, and the sulphur it produces is sent to the sulphuric acid plant, while the paperboard industry uses the calcium sulphate sent by the power plant and the fuel gas from the refinery; at the same time the pharmaceutical plant generates a biological sludge that is used as fertilizer in the farms, and the yeast mixture in the production of insulin is used as a supplement to feed pigs.

The circular economy must start from a holistic approach and have a mission to restore and regenerate in response to environmental damage. In addition, it is necessary to critically evaluate the need to exploit resources (especially non-renewable ones), given the over-reaching situation in which many of them find themselves; to generate clean industrial processes; to minimize the transportation of raw materials and products; and to promote sustainable consumption and generate only waste that can be reintegrated into nearby ecosystems or into industrial circuits as products of a technical nature.

A campaign to promote information and awareness among the population about the logic and operation of a circular economy would be a measure of great importance. More than a technical, engineering or technological challenge, the practical development of a circular economy is a cultural challenge. Significant progress on these issues will require, beyond political regulations and business transformations, an active commitment by citizens to sustainable consumption. A commitment that goes beyond decisions to purchase goods and services, and forces us to articulate new, more communal lifestyles, with the implementation of collective alternatives based on a culture of sufficiency and that are part of a more local economy – one that is sustainable, social and based on solidarity.

2.2. Circular economy strategies in the EU

The circular economy proposal emerged in the 1960s, together with the birth of modern environmentalism and the development of new knowledge and scientific proposals to move towards sustainability. However, it is in recent times that it has been gaining presence in the political agendas focused on its implementation. Given this situation, it is timely to think about some elements that should be considered from the various circular economy strategies, in order to achieve ambitious and transformative objectives. A circularity strategy that is developed behind the back of a global model that works linearly and whose objective continues to be unlimited growth cannot be understood. Associating the circular economy exclusively with proper waste management, packaging recycling and energy efficiency will not solve the serious ecological and social crisis in which we find ourselves.

At the level of the European Union, two basic proposals have been developed on this issue: Closing the circle: an EU action plan for the circular economy of 2015 and A new Circular Economy Action Plan for a cleaner and more competitive Europe 2020, in line with the European Green Deal. In the aforementioned Action Plan, the circular economy is included in the new European agenda, where one of the objectives is sustainable growth and competitiveness. And this is where one of the main problems arises, since continuous growth is not viable, no matter how green it may be, on a planet subject to limits and finite resources. In this sense, the narrative of the circular economy has been absorbed by the dominant economic discourse according to a mercantilist vision of the environment.

The important report *Decoupling debunked – Evidence and arguments against green growth as a sole strategy for sustainability*, presented in 2018 at the Conference on Post-Growth in the European Parliament and endorsed in an open letter signed by thousands of scientists, investigates this crucial issue. The conclusion is resounding: the idea of decoupling environmental impacts and economic growth does not stand up empirically. To date, the only absolute decouplings have been observed for short periods of time, depending on certain resources or impacts, in specific countries and with very small mitigation indices.

The conclusions are based on at least 7 reasons that will foreseeably tend to neutralize eventual reductions in the consumption of

resources and associated impacts in the future: progressive increase in energy prices, rebound effect (efficiency improvements promote the consumption of the same product or of others via a domino effect in the economy), replacing one problem with another (for example, reducing greenhouse gas emissions by increasing pressure on land or mineral extraction), the underestimated impact of the service sector (with a high environmental footprint, as is the case with “the cloud”), limited recycling potential (with high energy requirements, subject to thermodynamic limits and which can only partially compensate for the extraction of raw materials in a system in permanent expansion), insufficient and inappropriate technological change (usually pursuing the objectives of reducing costs and improving the service, and not of sustainability), and the exchange bio costs (export of impacts and waste from North to South countries through international trade).

These conclusions were confirmed in another scientific study, *Is green growth possible?*, carried out by the Goldsmiths University of London and the Institut de Ciència i Tecnologia Ambientales of the Universitat Autònoma de Barcelona ICTA-UAB, and published in the journal *New Political Economy*. The study examined green growth policies as articulated in major World Bank, OECD and United Nations Environment Program reports, and tested this policy strand against existing empirical evidence and models of the relationship between GDP and the material footprint and CO₂ emissions.

The researchers’ findings indicate that the empirical projections do not show the feasibility of an absolute decoupling on a global scale between growth and environmental impacts, even under highly optimistic conditions. They also indicate that while some models show that it could be achieved in high-income countries under highly optimistic conditions, this could not be sustained in the long term. This affects the set of policies based on this idea of Green Growth, from the Green Pact of the European Union to the United Nations Sustainable Development Goals.

The new Circular Economy Action Plan is hostage to these Green Growth postulates, announcing initiatives throughout the entire life cycle of products, improving their design, promoting more efficient industrial processes, and enabling the resources used to be maintained in the EU economy for as long as possible. However, it does not propose a strategy for evaluating the economic metabolism of

the EU, with the aim of minimizing the ecological impact with a waste reduction and prevention strategy.

National and regional governments, supranational entities, large consultancies and multinationals are jumping on the bandwagon of a circular economy plan that does not substantially reduce their business forecasts or business as usual. Reduce and reuse continues to remain, to a large extent, in the rhetoric of papers, while recycling plans focus on the easiest waste to recycle, and with rather unambitious rates.

In addition, a large amount of European funds, public subsidies and tax aid promote a model of production and consumption that makes the bulk of the economy markedly linear and unsustainable, in a framework of a global economy that develops behind the back of the challenges imposed by the ecological and social crisis.

2.3. Strategic circularity options

In terms of the transition towards the circular economy, the strategic options can be grouped into two large blocks:

1. Circularity actions in the resource-waste cycle, focusing on priority issues, which are mainly related to recycling and waste treatment. This is a reconversion approach in the short and medium term.
2. Circular transition processes in order to achieve less consumption of natural resources, fewer environmental effects and better socioeconomic development, with the generation of sustainable employment. For its part, this approach obeys a vision of systemic change in the longer term.

Circularity priorities on the R's scale

The expansion of the typology of the three Rs (reduce, reuse, recycle) is a notable conceptual contribution of the circular economy. In accordance with the expanded "R-typology" (10 R's), a range of strategies can be presented ordered from high circularity to low circularity, which allow accelerating, to a greater or lesser degree, the success of the transition processes for the purposes of reducing the consumption of natural resources and materials, and minimizing the production of waste. A "rule of thumb" for circularity is often accepted, which is that materials remain in the chain for a longer period and can be reapplied

after a product is discarded, preferably retaining its original quality (Figure 2).

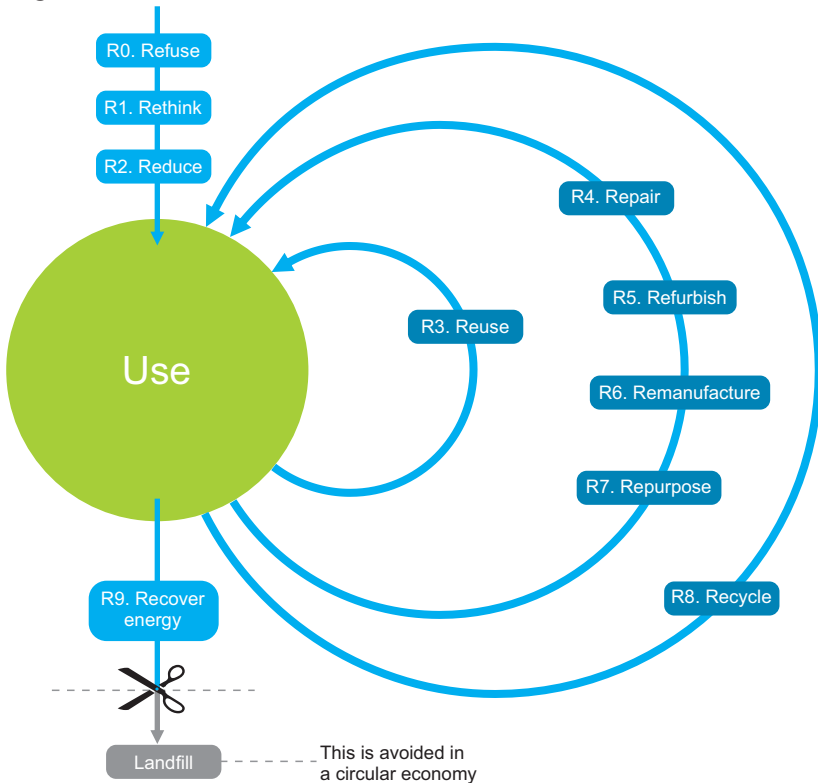


Figure 1. Current patterns of economic activity.

Source: EurFigure 2. Order of priority in circularity strategies

Source: PBL (2017), Netherlands Environmental Assessment Agency *Circular economy: Measuring innovation in the product chain*. English translation of the report 'Circulaire economie: Innovatie meten in de keten', The Hague, 2017 PBL publication number: 2544.

The next option is the extension of the useful life of the product and its components (reuse R3, repair R4, renew R5, remanufacture R6 and rework R7). The less circular option (closer to the linear economy) is based on the recycling of R8 materials and R9 recovery (energy revaluation).

From a strategic point of view, the greatest ability to preserve product value lies in giving preference to the 'inner circles', which

provide greater added value and product integrity, than the outer circle of material recycling.

2.4. A final thought

The transition towards a Circular Economy requires simultaneously addressing new scenarios for the dematerialization, de-energization and decarbonization of the economic system, guaranteeing, in the first instance, economic-environmental decoupling. Undoubtedly, priority must be given to efficient management of the resource-waste cycle, but it is essential to go beyond simplistic and reassuring options based on "super-recycled".

The governance of the transition involves promoting and channelling the essential "systemic drivers" and the complementary socio-institutional changes so that long-range disruptive processes can be created. In other words, structural transformations typical of a systemic change are necessary, instead of consolidating incremental solutions aimed at optimizing and improving the efficiency of the dominant linear model, which, despite everything, continues to have powerful cultural mechanisms, powerful interests and a strong inertia that resists the modernization of the economy with a closed metabolism.

The definitive solutions involve rationally controlling the forms of material consumption and readjusting the lifestyles of societies that aspire to live well and fairly within environmental limits.

3. Discussion questions and tasks for students

Choose two products and analyse the entire production-distribution-consumption process, including raw materials, energy, transport, waste, etc., that have been employed. Propose strategies to reduce impacts and to convert the process into a circular economy.

4. Further reading

This link provides access to the data of the Environmental Sustainability Index of the World Economic Forum:

www.ciesin.columbia.edu/indicators/ESI

This link from the United Nations Division of Sustainable Development offers sustainable development indicators used by this institution:

www.un.org/esa/sustdev/natlinfo/indicators/isdms2001/table_1.htm

This Global Footprint Network link provides access to ecological footprint data by country and city: www.footprintnetwork.org

The Rio Declaration is available at this link:

www.un.org/esa/sustdev/documents/agenda21/spanish/riodeclaration.htm

The Agenda 21 document is available at this link:

www.un.org/esa/sustdev/documents/agenda21/spanish/agenda21sptoc.htm

This link allows access to everything that happened at the Johannesburg Summit and related documents: www.johannesburgsummit.org

International actions against climate change can be consulted at this link:

https://ec.europa.eu/clima/policies/international/negotiations/paris_es

To facilitate the search for environmental valuation applications, one of the existing valuation databases can be used:

Environmental Valuation Reference Inventory of Environment Canada:

www.evri.ec.gc.ca/evri

Valuation Source List (Department of Environment, Transport and the Regions): www.environment.detr.gob.uk/evslist

Australian and New South Wales Environmental Protection Agency Database: www.epa.nsw.gov.au/envalue

Economy and Environment Program for South Asia (EEPSEA):

www.geocities.com/valuasia

Multiple reports and data on sustainability can be accessed through the following websites of international institutions:

United Nations (UN): www.un.org

Food and Agriculture Organization of the United Nations (FAO):

www.fao.org

United Nations Environment Program (UNEP): www.unep.org

United Nations Development Program (UNDP): www.undp.org

Organization for Economic Cooperation and Development (OECD):
www.oecd.org

World Bank: www.worldbank.org

World Wide Fund: www.wwf.org

World Economic Forum: www.weforum.org

World Resources Institute: www.wri.org

Document prepared by the United Nations Environment Program and Sustainability Ltd in which they show how environmental reports should be prepared and their usefulness in the company's environmental management: www.unep.org/business

Link that allows you to find information on the preparation of environmental reports in the European Union: www.enviroreporting.com

Detailed site with useful resources for all those interested in economic activities that promote sustainable development:
www.sustainablebusiness.com

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IMPACT OF DIGITALIZATION ON SUSTAINABILITY

Bartłomiej Pierański, Blaženka Knežević

■ Annotation

Digital transition and transformation have been taking place in various industries since the early 1980s. There are numerous examples of digital technologies implemented to enhance the performance and effectiveness of business activities and foster competitive abilities in various business areas. From the 1990s onwards, we can observe significant changes in consumer behaviour due to the usage of the Internet, mobile technologies, and social networks (since the 2000s) in various aspects of their activities. This shift motivates companies to intensify investments in digital technologies and to develop new business models to retain and enlarge their consumer base. The aim of this chapter is to explain how digitalization contributes to sustainability.

Key words: digital transformation, digitalization, sustainability, EU

1. Introduction

Although digitalization has a long history, yet it is since the 1980s, when the first PCs appeared on the market, that significant transformational effects have become visible, especially with the advent of the Internet. Due to the numerous advantages of digital distribution channels, customers, especially those from Generations Z and Y, and those who are even younger, tend to accept technologies very quickly and they utilize a huge number of digital technologies to search for, buy, and review products and services. According to (Rangaswamy et al., 2021; Shankar et al., 2021) convenience is an important factor

that motivates consumers to utilize digital technologies for gathering information and purchasing products and services. The possibility to get valuable purchasing information and to buy products from the comfort of their own home is very attractive to a significant number of consumers worldwide. Thus, consumer habits and behaviour changed significantly in the last three decades. Moreover, with the rise of the Web 2.0 approach based on social network technology since the 2020s, consumers are becoming more involved and engaged in information searching and content providing prior to, during, and after purchasing. The consumer today is not a person who only searches through previously prepared data on the official web page of a certain company that promotes and sells products and/or services, but rather he or she obtains information via various social media in an active way in a real-time conversation with other consumers. He or she pays attention to review ratings prior to definite purchasing decisions. After the purchase, he or she is willing to share his or her opinion on products and services both on official web pages and on various social media platforms (Sorcescu et al. 2011; Wang et al., 2012; Hajli, M. N., 2014).

In Table 1 data on current usage of the Internet and utilization of e-shopping in the European Union is shown just to illustrate that the majority of European citizens are digital customers and that digital technologies have to be considered when it comes to doing business, from both macro and micro perspectives.

Table 1. Percentage of Internet users and E-shoppers in the EU (2021).

Region	Internet users	E-shoppers
EU Total	91%	75%
Western Europe	95%	86%
Northern Europe	97%	86%
Central Europe	90%	75%
Eastern Europe	75%	46%
Southern Europe	86%	65%

Source: European E-Commerce Report (2022).

Due to the change in consumer behaviour based on the utilization of digital technology, the classic roles of companies have changed as well. Many traditional functions and processes are now performed by customers themselves. For example, customers can contribute to product development by reviewing products and sending suggestions

regarding improvements. On the other hand, through own intensive search for products and services worldwide via digital communication channels, customers can circumvent traditional distribution channels in various industries. With the use of social networks and digital platform technologies, customers can form buying tribes or groups, and then they can use their new negotiation power to lower the purchasing prices of goods and services. (Kauffman & Wang, 2001; Chen *et al.*, 2015).

The digitalized consumer approach requires major changes in business procedures and business strategies in all industries (Doherty, Ellis-Chadwick, 2010). The consequences of the described changes are visible at both the macroeconomic and microeconomic levels. The focus of this chapter will be on the effects of digitalization on society and its consequences for sustainable development.

The subchapter is structured as follows. Firstly, we will clarify the difference between digitization, digitalization, and digital transformation. Secondly, based on secondary data we will discuss areas in which the digital economy contributes to sustainability, and thirdly, we will draw attention to the necessity of global action to use ICT in a proper way to achieve SDGs (sustainable development goals). We will describe DESI (the digital economy and society index) as a measurement of digital development and its relation to SDGI (the sustainable development goals index). In the last part we will discuss the WSIS Matrix (World Summit on the Information Society) as a tool to promote sustainable development based on ICT application at a global level.

2.2 Background – digitalization and digital development

Digital technology transforms industries, economies and societies. There are several terms that refer to the implementation of digital technologies in business and society, namely (Vrana, Singh, 2021; Verhoef *et al.*, 2021; Gong, Ribiere, 2021; Zimmermann *et al.*, 2021; Izzo *et al.*, 2022):

- Digitization
- Digitalization
- Digital transition
- Digital transformation

All these terms are correlated, but they also differ significantly in their range and scope.

In the process of digitization, various kinds of information (such as datasets, texts, images, audio, and video) are converted into a digital format i.e. bits, and are organized as bytes, which are the basis for storing, accessing, processing, and sharing digital information via various digital equipment.

On the other hand, digitalization is the use of digital information and digital technologies to change a business model and to provide new value-creation opportunities. Usually, digitalization is the application of digital business procedures in companies and various types of organizations.

Digital transition refers to a continuous process of improving business practice in companies and various institutions by converting analogue information and processes into digital equivalents, suited to the utilization of contemporary digital information technologies. It can also refer to continuous improvements in the usage of information technology i.e. the conversion from older to newer versions of digital technologies in companies and institutions.

Finally, digital transformation is the strategic term including the integration of digital technology into all areas of a business. Through digital transformation, companies or institutions fundamentally change their everyday operations and the way in which they create value for customers. Not only does digital transformation refer to the change of business models based on the implementation of digital technologies, it also addresses changes in the company's culture, mission, vision, and overall business strategy.

The correlation between the implementation of digital technologies in business and sustainable development is a widely analysed topic in the scientific literature (Ahmed, 2021; Imran et al., 2022; Jiao, Sun, 2021). However, the influence of digital technology on sustainability is still not completely clear. It could have both positive and negative impacts. Some positive impacts are as follows:

- Digital technologies can enable more efficient and sustainable practices, such as smart cities, connected transportation, and digital supply chains.
- Digitalization can help to increase transparency and accountability in sustainability efforts, by providing data and information to track and measure progress.

- Digital tools and technologies can help to optimize resource use, reduce waste, and increase recycling, thus positively impacting the environment.
- Digitalization can also help to increase access to information, education, and services for people, which is key for sustainable development.

On the other hand, some negative impacts are:

- The environmental impact of digital technologies, such as the energy consumption of data centres and the production of electronic devices can be significant and contribute to climate change. This area of digitalization's impact on sustainability seems the most paradoxical. On the one hand, it is widely believed that technological development is supposed to make us more 'green,' but on the other hand, the production and utilization of modern products has a very negative impact on the environment. This is because all modern products contain rare earth metals in them. This includes, for example: batteries (installed in electric cars, smartphones, laptops, smartwatches, etc.), solar panels, wind turbines, etc. Rare earth element extraction, on the other hand, is devastating to the environment. The situation is similar with the utilization of high-tech products.
- Digitalization can lead to increased inequality, as those without access to digital technologies may be left behind in terms of job opportunities and access to services and quality education (Habibi, Zabardast, 2020; Lopez-Sintas, Lamberti, Sukphan, 2020; Matthess, Kunkel, 2020).
- Digitalization can lead to job displacement, as automation and artificial intelligence technologies can replace human labour.
- Digitalization can also lead to an increasingly sedentary lifestyle and decreased face-to-face interaction, which can have negative impacts on mental health and well-being.
- It can also lead to overconsumption and an increase in e-waste, which can have a negative impact on the environment. In other words, electronic devices generate e-waste (unwanted electronic products, not working, and nearing or at the end of their "useful life") that is hardly recycled (Ahirwar, Tripathi, 2021; Dhir et al., 2021).

3. Digital economy development and sustainability

The digital economy can be defined in a narrow or broad sense. In recent years, the explosion of new technologies and their rapid application have spurred another wave of discussion on the digital economy. The narrow definition refers to the ICT sector only, including telecommunication, the Internet, IT services, hardware, and software, etc. The broad definition includes the ICT sector, and parts of traditional sectors that have been integrated with digital technology. For instance, G20 uses this broad concept and has defined the digital economy as “a broad range of economic activities that includes using digitized information and knowledge as the key factor of production, and modern information networks as the important activity space” (Imran et al., 2022).

The digital economy has permeated almost all spheres of life, and this includes sustainable development issues. Because of that, the digital economy’s relationship with sustainable development should be highlighted. The development of a digital economy will have a major impact on the sustainable development of an economy and society (Ahmed, 2021).

According to UNESCO, sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. The digital economy could be treated as an instrument to extend economic growth (Lait-sou, Kargas, & Varoutas, 2020), which, in turn, is part of the sustainable development concept and stability.

There are plenty of scientific studies on the indirect linkage between the digital economy and sustainable development (Chauhan et al., 2022; Jiao, Sun, 2021; Wu, Yu, 2022), almost all of them state that the digital economy promotes sustainable development. To find a more direct relation between the digital economy and sustainable development, some scientists investigate how the digital economy and society index (DESI) and the sustainable development goals index (SDGI) are correlated as digital economy and sustainable development measurement factors.

The Digital Economy and Society Index (DESI) is a universal scoring system that has been developed for measuring the preparedness and progress of digital transformation among EU countries. There are five

dimensions of DESI (see Figure 1), namely: connectivity, human capital, the use of internet services, the integration of digital technology, and digital public services (Banhidi et al., 2020).

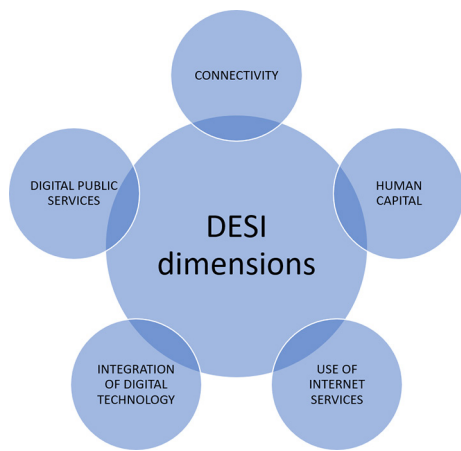


Figure 1. Five dimensions of the Digital Economy and Society Index (DESI).
Source: the authors.

Each dimension of DESI can be broken down into certain sub dimensions in order to more precisely define its essence (see Table 2).

Table 2. Dimensions and subdimensions of DESI.

Dimensions of DESI	Subdimensions of DESI
Connectivity	Fixed broadband, mobile broadband, and prices
Human Capital	Internet use, basic and advanced digital skills (ICT specialists and ICT graduates)
Use of Internet Services	Citizens' use of content, communication, and online transactions (news, social networks, online courses, online banking, and online shopping)
Integration of Digital Technology	Business digitalization and e-commerce (social media, selling online)
Digital Public Services	eGovernment (pre-filled forms and digital public services for businesses) and eHealth

Source: <https://digital-agenda-data.eu>.

The typical use of the DESI measurement system is the grouping and ranking of countries, which is considered as a comparison of EU countries in terms of their digital transformation (see Figure 2).

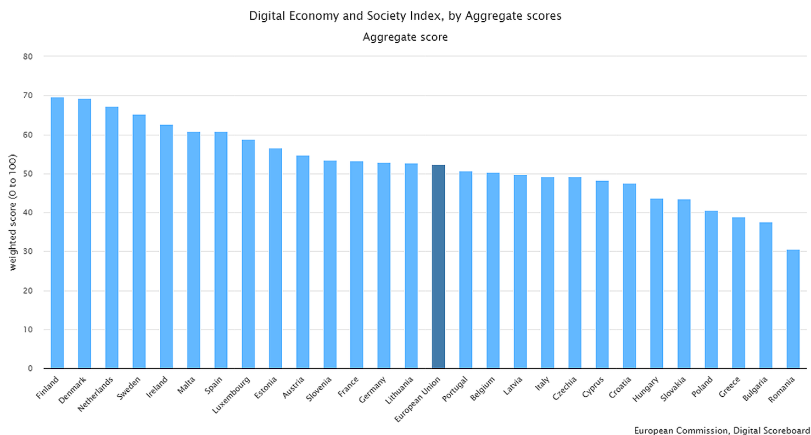


Figure 2. DESI level across EU countries in 2022.

Source: <https://digital-agenda-data.eu>.

As studies have shown, the relationship between DESI and SDGI confirms that the digital economy influences sustainable development, and that influence is positive in some areas, but not in absolutely all areas of sustainable development (Imran et al., 2022).

Regarding the first dimension of DESI – connectivity – two sub-dimensions are positive in terms of the effect on SDGI. They are network coverage and mobile broadband take-up. On the other hand, overall fixed broadband take-up and fixed very high-capacity network (VHCN) are significant but negatively affect SDGI.

The second dimension of DESI is human capital. Here, surprisingly, ICT specialists and ICT graduates negatively influence SDGI. This is the most controversial result of the study as the standard view is that ICT positively contributes to sustainable development. However, these results should be taken into account by EU countries when preparing sustainable development strategies, as the role of ICT in sustainable development is often overestimated. One of the subdimensions, female ICT specialists, significantly and positively affects SDGI. This shows that women play an inevitable role in promoting SDGIs if they are good at ICT.

The third DESI dimension analysed was the use of Internet services. The two subdimensions (news and social networks) have a positive impact on SDGI, whereas online courses, online banking, and online shopping have a negative impact. This could be explained by

the fact that news and social networks are part of communication channels, positively affecting people's well-being. At the same time, online courses, banking, and shopping do not promote socialization, which could cause issues with individuals' mental health.

The fourth dimension is integration of digital technology, where two closely related and significant variables – social media and selling online – influence SDGI negatively. There is apparent conflict here, as social networks are mostly devoted to constant communication, while selling online is in its essence communication without feedback. As a result online sellers should focus more on the customers' communication needs and, based on that, develop user-friendly content. In this case, the direction of online selling effect could change into a positive impact on SDGI.

The last investigated DESI dimension is that of digital public services. Its significant sub-dimensions are pre-filled forms and digital public services for businesses; and both have negative influences on SDGI. This could be because not all the investigated countries manage the public services provided via the Internet appropriately. Still, both individuals and legal entities need personal contact as the transition to the digital economy is faster than the transition to online communication.

4. Sustainable development goals and digitalization

As it is recognized that digital technology has an impact on the achievement of sustainability goals, the United Nations has initiated a wide range of global debates on the possible contributions of ICT to the achievement of global Sustainable Development Goals (SDGs) with the aim of giving directions and recommendations on how digital technologies can contribute to sustainable development. UNESCO as coordinator, in cooperation with ITU, UNDP, and UNCTAD, organizes the World Summit on the Information Society (WSIS). As part of this initiative, a dozen global WSIS Forums have been held to date with the aim of including as many stakeholders as possible in the design and implementation of action plans for the development of information and communication technology (ICT) to achieve the UN SDGs (for more information see: <https://www.itu.int/en/itu-wsis/Pages/default.aspx>).

After the WSIS Forum held in 2015, the General Assembly of the UN adopted Resolution A/RES/70/125 on December 16, 2015. This resolution formally supports the conclusions of the WSIS Forum and points out several facts regarding ICT development and its role in achieving SDGs:

- Increased connectivity, innovation, and access played a critical role in enabling progress on the SDGs.
- The digital divide between countries and between men and women is still present, and it is an obstacle to sustainable development.
- The information society has to be built as a people-centered, inclusive, and development-oriented information society in which everyone can create, access, utilize, and share information and knowledge.
- Information and knowledge sharing should enable individuals, communities, and people to achieve their potential in promoting their sustainable development and improving their quality of life.
- Information development should fully respect and uphold the Universal Declaration of Human Rights.
- Stakeholders (such as Governments, the private sector, civil society, international organizations, and the technical and academic communities) have to partner and work together in developing such an information society.
- Particular attention should be paid to addressing the specific ICT challenges facing children, youth, persons with disabilities, older persons, indigenous peoples, refugees, internally displaced persons, migrants, and remote and rural communities.

The resolution comprises the following areas of global interest and necessary actions in achieving sustainable development based on ICT implementation:

1. Information and communications technology for development
2. Bridging digital divides
3. Enabling environment
4. Financial mechanisms
5. Human rights in the information society
6. Building confidence and security in the use of ICT

7. Internet governance

In Table 3 the areas and main points of the resolution are outlined.

Table 3: Areas of sustainable digital development according to UN Resolution A/RES/70/125.

ICT for development	Bridging digital divides
<ul style="list-style-type: none"> • ICT should be used to achieve 17 SDGs. • All stakeholders should integrate ICT to implement SDGs. • ICT enables innovation and contributes to poverty reduction and the achievement of economic, social, and environmental benefits. • ICT creates a new generation of businesses, increases efficiency, and integrates all sectors. • Digital economy is connected to GDP increase, all countries, especially developing ones, should be involved in digital economy development. • ICT contributes to social benefits and inclusion, a larger number of people have better access to services (in education, health, science, agriculture, etc.). • ICT changes ways of interaction among individuals and among communities, which can have a positive and negative influence on human health and society. • ICT is important in response to a humanitarian crisis and various hazards. • ICT supports cultural diversity and contributes to the development of cultural and creative industries and enables better preservation of cultural heritage. • ICT creates positive and negative environmental impacts; thus it is necessary to monitor and foster energy efficiency and implement e-waste management. 	<ul style="list-style-type: none"> • The digital divide still exists in many forms (especially between developed and developing countries and between males and females) • Digital divides are linked with education level and existing inequalities. • There is a concern that new digital divides can emerge in the future which will slow sustainable development. • Digital divides are the outcome of the availability of high-speed broadband and difference in the individual capability to use and create ICT. • There is a need to shift from an information society to a knowledge society. • Local content and a variety of language formats should be accessible to all people. • Multilingualism in an information society ensures linguistic, cultural and historical diversity. • It is necessary to build capabilities and capacities to improve media, information, and digital skills. • Interoperable and affordable open-source and free software can contribute to the shrinkage of the digital divide. • Universal and affordable access to the Internet should be available to all. • Women and girls' access to ICT and education should be significantly improved to enable them to become users, content creators, employees, entrepreneurs, innovators, and leaders.

Enabling environment	Financial mechanisms
<ul style="list-style-type: none"> • Identify and implement best and emerging practices for establishing education, innovation, legal, and investment frameworks for ICT implementation. • Free flow of information and knowledge. • ICT as mainstream in school curricula. • A lack of access to affordable and reliable technologies and services remains a critical challenge in many developing countries. • Efforts should be deployed to reduce the price of ICT and broadband access. • The radio frequency spectrum should be managed in the public interest and in accordance with legal principles. • Actions that improve the enabling and expand related education and capacity-building opportunities should be taken. 	<ul style="list-style-type: none"> • Total public and private spending on ICT increased and new financing mechanisms emerged. • There is a greater need for sustainable investment in infrastructure and services, capacity-building, promotion of joint research and development, and transfer of technology on mutually agreed terms. • There is a need for efficient public resource allocation to the deployment and development of ICT across all sectors, especially education. • There is a potential to improve connectivity, especially in remote and rural areas, through universal service funds and publicly funded network infrastructure. • Official development assistance and other concessional financial flows for ICT can make significant contributions to development outcomes, in particular where they can reduce the risk of public and private investment and increase the use of ICT to strengthen good governance and tax collection. • The private sector is critically important in investments in ICT and governments should create legal and regulatory frameworks conducive to increased investment and innovation. • Public-private partnerships, universal access strategies, and other approaches are also important in ICT investments. • There are challenges in implementing the Digital Solidarity Fund, as an innovative financial mechanism of a voluntary nature.

Human rights in the information society	Building confidence and security in the use of ICT
<ul style="list-style-type: none"> • ICT has the potential to strengthen human rights by enabling access to information, freedom of expression, and freedom of assembly and association. • The same rights that people have offline must also be protected online. • There are serious threats to freedom of expression and plurality of information, and protection of journalists, media workers, and civil society space is necessary. • Everyone has the right to freedom of opinion and expression, and this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers. • There is a need to respect the independence of media. • Everyone everywhere should have the opportunity to participate, and no one should be excluded from the benefits that the information society offers. • No person shall be subjected to arbitrary or unlawful interference with his or her privacy, family, home, or correspondence, consistent with countries' obligations under international human rights law. • Countries should review their procedures, practices, and legislation regarding the surveillance of communications, as well as their interception and collection of personal data, including mass surveillance, with a view to upholding the right to privacy. • Everyone has duties to the community in which alone the free and full development of his or her personality is possible. • Everyone shall be subject only to limitations as are determined by law solely for the purpose of securing due recognition and respect for the rights and freedoms of others. • Promote an information society in which human dignity is respected. 	<ul style="list-style-type: none"> • Confidence and security are drivers for economic and social innovation. • There are significant efforts by Governments, the private sector, civil society, the technical community, academia, and numerous associations and institutions on national and international levels to build confidence and security in the use of ICT. • In cybersecurity matters relating to national security Governments have the leading role. • Building confidence and security in the use of ICT should be consistent with human rights. • International law also has an important role. • There are certain growing uses of information and communications technologies that threaten security and development benefits, including the use of such technologies for terrorist purposes and cybercrime. • The promotion of a global culture of cybersecurity is necessary and measures should be implemented in cooperation with all stakeholders and international expert bodies. • Cooperation on transnational issues of ICT and its usage is necessary as well. • There is a need for a renewed focus on capacity-building, education, knowledge-sharing and regulatory practice, as well as promoting multistakeholder cooperation at all levels. • Raising awareness among users of ICT, particularly among the poorest and most vulnerable.

Internet governance

- The private sector is taking the lead in day-to-day operations and with innovation and value creation at the edges.
- Most of the people, residing in developing countries, still remain offline.
- Management of the Internet includes multilateral, transparent, democratic, and multi-stakeholder processes, with the full involvement of governments, the private sector, civil society, international organizations, technical and academic communities, and all other relevant stakeholders in accordance with their respective roles and responsibilities.
- The management of the Internet encompasses both technical and public policy issues and should involve all stakeholders and relevant intergovernmental and international organizations, within their respective roles and responsibilities.
- There is a need to promote greater participation and engagement in the Internet governance discussions of relevant stakeholders from developing countries, least developed countries, countries in situations of conflict or post-conflict, countries affected by natural disasters etc. For such countries to be strengthened, stable, transparent, and voluntary funding mechanisms to are needed.
- Some countries implemented important regulatory and legislative processes regarding the open Internet in the context of the information society and they are invited to share information on benefits and challenges.
- The Internet Governance Forum is recognized as a multi-stakeholder platform to discuss Internet governance issues.

Source: the authors (adapted from UN Resolution A/RES/70/125).

Moreover, the WSIS initiative and WSIS forums have resulted in an overview of the connection between ICT and the SDGs known as the WSIS-SDG matrix. WSIS proposed 11 action lines regarding ICT development and linked them to 17 UN SDGs (see Table 4). Namely, the 11 WSIS action lines are:

- C1. The role of governments and all stakeholders in the promotion of ICTs for development
- C2. Information and communication infrastructure: an essential foundation for the Information Society
- C3. Access to information knowledge
- C4. Capacity building
- C5. Building confidence and security in the use of ICTs
- C6. Enabling environment
- C7. ICT Applications:
 - i. E-government
 - ii. E-business
 - iii. E-learning
 - iv. E-health
 - v. E-employment

- vi. E-environment
- vii. E-agriculture
- viii. E-science
- C8. Cultural diversity and identity, linguistic diversity, and local content
- C9. Media
- C10. Ethical dimensions of the Information Society
- C11. International and regional cooperation


Table 4. WSIS-SDG Matrix.
SUSTAINABLE DEVELOPMENT GOALS \ WSIS ACTION LINES LINKAGES

	C1	C2	C3	C4	C5	C6	e-gov	e-bus	e-lea	e-hea	e-emp	e-env	e-agr	e-sci	C8	C9	C10	C11
SDG 1																		
SDG 2																		
SDG 3																		
SDG 4																		
SDG 5																		
SDG 6																		
SDG 7																		
SDG 8																		
SDG 9																		
SDG 10																		
SDG 11																		
SDG 12																		
SDG 13																		
SDG 14																		
SDG 15																		
SDG 16																		
SDG 17																		

Source: <https://www.itu.int/net4/wsis/sdg/>.

The document “WSIS-SDG Matrix Document” describes how each SDG can be supported by taking one of eleven WSIS action lines and concrete recommendations on how to use ICT in that particular case. To illustrate this, in Table 5 we outline one excerpt regarding achieving SDGs. In the given example, we can observe how the WSIS C1 action line is related to SDGs 1, 3, 5, 10 and 16. For each contribution there is an exact clarification of how a particular action line contributes to achieving given SDG. In this way, all other WSIS action lines are described in this document. Because of this, we can say that this document, developed on a global scale, is one of the most comprehensive and most concrete descriptions and guidelines on how we can use ICT to achieve sustainable development on local and global scales.

Table 5. WSIS action line C1 and clarification of its contribution to SDGs.

WSIS Action Lines	Sustainable Development Goals	Rationale/Clarification
 C1: The role of governments and all stakeholders in the promotion of ICTs for development	1: End poverty in all its forms everywhere	Increased Internet use can reduce poverty and create jobs through increased efficiency and transparency in government, the growing number of broadband connections and household Internet penetration. ICTs allow the private sector to create jobs that contribute to the poverty reduction.
	3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.	ICT can be used for creation of various data banks on diseases and can also assist decision makers in health planning, human resources needs' assessment, medicines' procurement and infrastructure construction
	3.d: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.	ICT can be used to bring together people in danger and specialists as well as monitor the spread of a disease. Databases and storage of good practices can be maintained too.
	5: Achieve gender equality and empower all women and girls.	ICT can be used for online training programmes, to include women in policy-making through e-voting, e-learning and enhance their ability to take surveys, to anonymously, to make complaints and to participate in discussion forums
	10.c: By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent	ICT can give people access to formal banking, e-banking and m-banking since reports show that there is a very high level of informal remittances flow.
	16.5: Substantially reduce corruption and bribery in all their forms	Development of the justice system that can provide: practical information for use by citizens, online forms, and the news about law and justice, information required to promote the national reconciliation.

Source: WSIS-SDG Matrix Document. https://www.itu.int/net4/wsis/sdg/Content/Documents/wsis-sdg_matrix_document.pdf.

5. Conclusion

Digitalization is a process resulting in the development of the digital economy and information society. In such a society, ICT is intensively used in each sphere of human life. The usage of ICT can have positive and negative impacts on sustainable development. In scientific studies, it is examined to which extent it really contributes to achieving SDGs. As described in the chapter, not each SDG is equally influenced. Nonetheless, all studies conclude that there is an effect of ICT usage on sustainability issues. Moreover, most of the studies conclude that positive impacts exceed negative ones. On the other hand, recognizing the rise of digitalization and the development of information society, the UN and its organizations address the issue of sustainable digital development and the contribution of ICT to the achievement of global sustainable development goals. This initiative is now known briefly as WSIS. Several documents derived from WSIS Forum are now considered as the basis of sustainable ICT and digital development. As the initiative each year gathers important stakeholders in the field to

discuss and recommend further actions in the field, it is necessary to follow their outputs and to observe how new emerging topics in ICT are addressed in global sustainable development.

6. Discussion questions and tasks for students

Discussion question 1. How can digital technologies contribute to reducing poverty as one of the SDGs?

Discussion question 2. In the field of SDGs concerning human health and well-being, there are numerous challenges when we intensify the usage of ICT tools. Discuss the pros and cons of the implementation of digital technology on human health. When discussing the topic, try to give some practical examples to illustrate your statements.

Discussion question 3. Do you think artificial intelligence will make the economy more sustainable? Justify your answer.

Discussion question 4. Do you think your future profession could be replaced by artificial intelligence? Explain your opinion.

Discussion question 5. How often do you shop online? What do you think – what are the positive and what are negative environmental and societal impacts of e-commerce? Are those impacts the same for each product category that you purchase online?

Discussion question 6. Is there any green-oriented digital transition or transformation initiative or project taking place in your market? Describe it briefly and outline the main stakeholders and their roles in the described initiative, project, or business model.

Discussion question 7. How can governments support sustainable digital transition or digital transformation? Is there a space to improve government involvement in your country?

Discussion question 8. Please refer to Figure 2: DESI level across EU28 country and say if you see any tendencies in the ranking of countries – if so, what do you think are the reasons for this? Has the position of any country/states surprised you (if so, which country/states and why)?

Task 1. Work in teams of 2 or 3 students. Open WSIS – SDG Matrix website: <https://www.itu.int/net4/wsis/sdg/>, find and download WSIS-SDG Matrix Document (Complete). Scroll the document to the “ANNEX I: WSIS Action Lines and SDGs Matrix with Rationale”. From columns 1 and 2 of this table, choose 2 WSIS Action Lines (C1 to C11).

For chosen action, read the proposed solutions based on ICT from this table. As a team, try to suggest some digital solutions to fulfil the proposed aim given in the table. Describe how a computer or mobile application should look, and what functionalities it should include. If you know some existing application that resolves this particular problem, refer to it and briefly describe it.

Task 2. In groups of 2 or 3 students do some research on the metrics of digital economy development. Outline your findings on indicators and their dimensions and briefly describe which countries or regions are most developed by at least one of mentioned indicators of the digital economy. Then investigate and comment on the position of the same countries regarding the SDG Index.

7. Further reading

Broadband Commission documents:

<https://www.broadbandcommission.org/publications/>

European Commission – documents in strategic priority Digital Age: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en

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SOCIAL ASPECTS OF SUSTAINABLE DEVELOPMENT (POVERTY REDUCTION, GENDER INEQUALITY REDUCTION, INCLUSIVE EDUCATION)

Aleksandra Gaweł

■ Annotation

To reach sustainability as a developmental principle, the social aspects should also be considered. All people should have equal opportunities and rights, but at the same time all kinds of inequality should be reduced. The most fundamental issue is to reduce poverty and all types of deprivations, which are often related to some kinds of inequalities. Next, gender equality should be reached, which will empower people and allow the whole population to use their potential, without any form of gender discrimination. The next aspect of the social pillar is related to inclusive education, which will allow all children, youth and adults to participate in the mainstream schools or regular education system.

Key words: social pillar of sustainability; social equality; poverty alleviation; gender equality; inclusive education

1. Introduction

The critiques of economic growth programmes in the 1960s and 1970s considered social problems and noticed that economic growth not only failed to solve social difficulties but even it caused them (Purvis et al., 2019). These critiques and discussions on the importance

of fulfilling people's basic needs led to the development of the social pillar as one of the core and intertwined pillars of sustainability.

As economic growth was believed to perpetuate inequalities (Purvis et al., 2019), the sustainability concept is based on the pursuit of equality, which became one of the common values for European Union Member States.

The 10th Sustainable Development Goal (SDG10) aims for the reduction of all inequalities "based on income, sex, age, disability, sexual orientation, race, class, ethnicity, religion and opportunity (...) within and among countries"¹.

The idea of the social pillar of sustainability assumes that all people should have equal opportunities and rights. There are several aspects of social inequalities, overlapping each other to some extent, among which inequalities related to income and leading to poverty, gender inequalities, and access to education, are of the highest importance.

2. Poverty reduction

Poverty is a multidimensional phenomenon, which results in many definitions, with absolute poverty and relative poverty as the most important concepts. Absolute poverty is observed when an individual faces severe negative outcomes due to their living in some subsistence communities, such as reduced life expectancy or high infant mortality rate (Hipsher, 2016). This kind of poverty is often measured in income per day (Brau de, Suryanarayana, 2015; Hipsher, 2016), and the level of extreme poverty line in 2022 was \$1.9 per day according to the World Bank². The World Bank data shows that over 650 million people were living in absolute poverty in 2018³.

Relative poverty is observed across the world and it is characterized by social problems and inequality (Hipsher, 2016). Poverty is related to having a level of income, assets or resources which leads to following deprivations (Dzingirai, 2021):

¹ https://ec.europa.eu/international-partnerships/sustainable-development-goals_en, access: 30/06/2022

² <https://pip.worldbank.org/home>, access: 30/06/2022

³ <https://pip.worldbank.org/home>, access: 30/06/2022

- material deprivation: lack of necessities, such as food, shelter, clean water, clothing etc.,
- nonmaterial deprivation: lack of social rights, security, social and political participation etc.

The United Nation Development Program (UNDP) calculates and publishes the Multidimensional Poverty Index (MPI), which measures the proportion of poor people in the population using 3 dimensions of poverty: health (nutrition and child mortality), education (years of schooling, school attendance), and standard of living (cooking fuel, sanitation, drinking water, electricity, housing, assets), adjusted to the intensity of the deprivations⁴. The data on MPI in 2020 (Table 1) show that Europe and Central Asia are the least impacted by poverty, whilst Sub-Saharan Africa – the most. The contribution of poverty dimensions is also different in different world regions. In the poorest regions (South Asia and Sub-Saharan Africa), the standard of living is the most impacted dimension of poverty (over 40%), while health gets its highest contribution in the least poor regions (Europe and Central Asia).The differences in contribution of education are not so high, it impacts about one third of poverty.

Table 1. Multidimensional Poverty Index (MPI) and its contribution in 2020

Regions	MPI	Contribution of deprivation		
		Health	Education	Standard of living
	Value	%	%	%
Arab States	0.071	26.3	34.6	39.1
East Asia and the Pacific	0.023	27.6	35.5	36.9
Europe and Central Asia	0.004	52.8	24.8	22.4
Latin America and the Caribbean	0.030	36.3	26.3	37.4
South Asia	0.131	29.0	28.6	42.3
Sub-Saharan Africa	0.286	21.9	29.5	48.6

Source: The United Nation Development Program (UNDP).

Before the COVID-19 crisis, the success of poverty alleviation had been observed, however, not equally across the world (Hipsher, 2021). Poverty and its alleviation is not only the concern of developing nations, but also in the richest and advanced nations (Hassan et al. 2022).

⁴ <https://hdr.undp.org/content/2021-global-multidimensional-poverty-index-mpi>, access: 30/06/2022

Poverty reduction is one of the most crucial aspects of economic development (Lenagala, Ram, 2010), as economic growth is believed to decrease the level of poverty (Hipsheer, 2016). Even with the belief in the possibility of self-escape from poverty through individual efforts, policy support is needed to facilitate poverty reduction (Alam, 2017).

A bibliometric analysis made by Hassan et al. (2022) indicates 5 main areas discussed as sources of poverty reduction:

- Financial development, economic growth, and international aid and donation,
- Income diversification and raising engagement in employment,
- The impact of urbanization, industrialization, entrepreneurship and private investment,
- Improvement of agriculture sector and technology,
- Good governance aimed at poverty reduction.

The first, natural aspect of poverty reduction is related to the economic growth associated with growth of incomes. Intuitively, the growth of income level should result in people having better economic situations, and in consequence a reduction of poverty. However, this relationship between poverty and growth is complex, multidimensional and influenced by levels and changes in inequality (Adeosun, Tabash, 2022). The problem is not only the level of income, but also the distribution of income, as growth of income might not be equally distributed to all members of society.

To estimate the impact of national income growth on poverty reduction, the elasticity of poverty with respect to real GDP per capita is measured. In the long-term perspective, the elasticity of poverty declines, entailing the weakening effect of income growth on poverty reduction over time. Elasticity differs depending on the poverty line, and the effect of income growth on poverty reduction declines with higher poverty levels (Lenagala, Ram, 2010).

Based on the potential impact of economic growth on the reduction of poverty, there are some paths of growth, ranging from “neutral” growth to pro-poor and inclusive-growth (Adeosun, Tabash, 2022).

Pro-poor growth is characterized by several dimensions (Adeosun, Tabash, 2022):

- Growth benefiting the poor,
- Growth leading to a decline in poverty,

- Growth giving a disproportionate rise in the income of the poor, meaning higher income growth rate of the poor than the whole population,
- Growth causing the inequality reduction.

An even more sophisticated category is inclusive growth, which involves the following characteristics (Adeosun, Tabash, 2022):

- participatory growth when it comes to the poor,
- sharing the benefits of growth outcomes,
- growth and equality are incorporated in the pace and distribution of economic growth.

Not all kinds of income growth can reduce the level of poverty; in order to achieve this aim growth should be inclusive. Inclusive and pro-poor growth means that its benefits are shared between all, and poverty reduction is achieved through the more equal income distribution and job creation (Adeosun, Tabash, 2022).

Another problem is related to the structure of economies. The reduction of poverty is rather observed in countries with more diverse economies and the development of modern industry and service sectors (Mustapha et al., 2015).

One of the aspects of economic growth is financial development, however, there are conflicting views and rationales which explain its potential impact on poverty (Sehrawat, Giri, 2016). Access to financial markets as source of growth is limited to a particular category of companies and individuals based on their possibilities, and the poor are practically excluded access to credits, making them unable to invest (Kaidi, Mensi, 2017).

On the one hand, financial development can reduce poverty by allowing the poor easier access to financial services (Sehrawat, Giri, 2016). On the other hand, financial market imperfections can perpetuate poverty or even increase it due to unequal distribution of income and wealth, which gives the benefits of financial growth only to the rich (Sehrawat, Giri, 2016). In general financial development does not support poverty reduction, however, this relationship depends on the country characteristics (Kaidi, Mensi, 2017).

Microfinance programs are a way of reducing monetary poverty. The participants who get higher loans, also gain higher benefits, mostly through the perspective of income growth, which is smaller in terms of consumption expenditure (Elsafi et al., 2020).

Poverty is affected not only by the level of average income or income growth, but also by the distribution of income and inequality related to this distribution. In the case of existing inequalities, economic growth may lead to an increase in poverty due to the unequal distribution of benefits in society (Mustapha et al., 2015). For the poor, social transfers are a crucial source of income, mainly in the form of non-contributory social grants for such groups as the elderly, children and people with disabilities. Social security systems are significant tools in poverty reduction (Gomo, 2019).

There are some direct pro-poor interventions which lead to poverty reduction, such as interventions that focus on the improvement of food security, including the quality of diet, as well as on fulfilling other essential needs (Brauw de, Suryanarayana, 2015). Another special manner of poverty reduction is the increase of entrepreneurship, meaning engagement in self-directed business initiatives, which impacts the poverty alleviation directly through income generation, food security and lowering the costs of food, and indirectly through the employment creation and skill transfer (Dzingirai, 2021).

There are also international programmes supporting the developing countries, such as the programme Trade for Aid, developed by World Trade Organization, aiming directly at the development of trade via economic infrastructure development, trade policy and regulation etc., and indirectly at poverty reduction⁵ (Roy, Xiaoling, 2022).

3. Gender inequality reduction

Within the discussion on poverty reduction it should be realized that women are disproportionately burdened by poverty in countries at all stages of development due to their employment inequity and wage discrimination (Fotheringham, Saunders, 2014).

Gender inequality is seen in several aspects, however, the most important is pay gap or wage discrimination (Ravazzini, Chesters, 2018), as on average females earn around 80% of male salaries (Fotheringham, Saunders, 2014). Women also face employment discrimination related to the under- or overrepresentation of females in certain

⁵ https://www.wto.org/english/tratop_e/devel_e/a4t_e/aid4trade_e.htm, access: 30/06/2022.

sectors, they still remain a minority of board members and are under represented in positions of leaders (Soare et al., 2022).

Looking at the data presented in Table 2, Gender Inequality Index (GII), calculated by The United Nation Development Program (UNDP) and integrated with three dimensions (reproductive health, empowerment, and the labour market), varies across the globe. The GII can take values between 0 and 1 and its interpretation shows the potential human development lost due to gender inequality. Europe and Central Asia are regions where the 25.6% of potential lost due to gender inequality is the lowest, whilst in Sub-Saharan Africa, the Arab States and South Asia, gender inequalities cause over 50% of human potential development lost.

Table 2: Gender inequalities in 2019.

Regions	Gender Inequality Index	Share of seats in parliament	Participation in labour force	
	Value	% held by women	% among women	% among men
Arab States	0.518	18.0	20.7	73.0
East Asia and the Pacific	0.324	20.2	59.2	76.5
Europe and Central Asia	0.256	23.1	45.0	70.0
Latin America and the Caribbean	0.389	31.4	52.1	76.9
South Asia	0.505	17.5	23.2	77.0
Sub-Saharan Africa	0.570	24.0	63.3	72.7

Source: The United Nation Development Program (UNDP).

Another aspect of gender inequality is the low female representation in positions of power. The data in Table 2 show that on average about 20% of seats in parliament are held by women, with the highest share of 31.4% in Latin America and the Caribbean, and the lowest share of 17.5% in South Asia.

Women also far less often participate in labour markets (Table 2). Around the world, over 70% of men participate in the labour force, while female participation is far lower and with significant differences between countries. Sub-Saharan Africa is the region with the highest female participation in the labour force (63.3%), while the Arab States are countries with the lowest (20.7%).

There are several theoretical explanations for gender inequality. The first one is based on the human capital theory, according to which

the position of women in the labour market reflects their level of skills, competences, education, experience etc. (Cutillo, Centra, 2017). Following this theory, the gender pay gap does not reflect any inequality, but reflects the differences in human capital. Evidence shows that this theory fails to show the real relationships as gender inequalities are observed also in the cases of well-educated and highly experienced women.

Another way of explaining gender inequality is related to institutional theory, which assumes the impact of formal and informal institutions on the market (Reichborn-Kjennerud, Svare, 2014). In some countries, formal institutions, such as legal regulation, education etc., indicate the limited access of women to ownership of any assets, their lack of ability to make independent economic decisions or engage in education, which puts females in an unequal situation compared to males. However, even more influential are informal institutions such as social norms, values, beliefs, stereotypes, culture etc. In most societies around the world, females are stereotyped as family-caring individuals who do not achieve any professional-related goals. The cultural point of view prevents women not only from developing their careers and ensuring equal treatment at work, but also from acquiring the most prestigious education and entering the best paid jobs. A lot of research results confirm the impact of institutional frames on gender inequality (Munir Sidani, 2013).

Another way of explaining gender inequality stems from the dual labour market theory or segregation theory. This theory assumes the existence of two kind of markets, namely primary and secondary ones, which are different in terms of the employment conditions, level of wages, possibilities of promotion, social prestige etc. (Kovalenko, Mortelmans, 2014). Primary labour markets are those with the highest social prestige, excellent conditions of work, high level of salaries, and professional development possibilities. The primary labour markets are reserved for privileged individuals, regarding such social features as sex, colour of skin, belonging to some religious, social groups or castes etc., depending on the characteristics of a given society. Secondary labour markets are the opposite, as they offer far worse working and pay conditions. All across the world, it is women who are most often pushed to enter the secondary labour markets by culture, stereotypes, social pressure, etc., resulting in their unequal position in society (Karamessini, Ioakimoglou, 2007; Jamali et al., 2008). Research

results demonstrate the existence of dual labour markets, as well as the overrepresentation of women in secondary labour markets and underrepresentation of women in primary ones (Munir Sidani, 2013; Aidis, Weeks, 2016;).

There are several political and social tools to make the world more gender equal. The most obvious way is to make all legal rights of citizens equal, no matter their gender, and this already exists in many countries, however not in all. It is far more difficult is to change the cultural perception of female roles in society, as culture is formed over centuries, but effort should be made via social companies, activities of businesses, non-profit organizations, activists, influencers and all people.

One of the legal ways to reduce the gender inequality is the introduction of quota regulations in the legal framework of a country to ensure the gender diversity of boards (Soare et al., 2022). Quota regulations assume that a certain number of women should be represented on boards of directors, which reflects the agency theory argument that the board of directors is a central mechanism in sustaining the interests of all shareholders (Boadi et al., 2021).

International development tools such as for example Trade for Aid, developed by the World Trade Organization, are also proven to be effective in gender inequality reduction (Roy, Xiaoling, 2022).

4. Inclusive education

One of the reasons for gender inequality is the lack of access to education. In fact, for centuries women were not allowed to freely participate in education and the gender gap in this area used to be observed. However, equal access to education is a wider problem, not only related to gender issues.

Across the world, the average number of schooling years varies greatly. Sub-Saharan Africa is the region where the number of average schooling years is the lowest (less than 6 years), which naturally impacts also the lowest share of females (28.8%) and males (39.8%) with at least secondary education. Europe and Central Asia are by contrast in the best situation in this aspect, as on average people spend over 10 years in schooling, which results in the highest share of people with at least secondary education (79.9% of women and 88.1% of men). It

is also worth noticing that in most regions there is a gender gap in education as the share of females with at least secondary education is much lower than the share of males. The only region with education equality is Latin America and the Caribbean.

Table 3. Participation in education in 2019.

Regions	Mean years of schooling	Population with at least some secondary education	
	years	% of females	% of males
Arab States	7.3	49.3	55.8
East Asia and the Pacific	8.1	69.4	76.5
Europe and Central Asia	10.4	79.9	88.1
Latin America and the Caribbean	8.7	60.4	59.7
South Asia	6.5	31.3	48.4
Sub-Saharan Africa	5.8	28.8	39.8

Source: The United Nation Development Program (UNDP).

The significance of education results from the fact that it shapes human capital, which is one of the driving forces of economic, social and technological development. To fulfil this hope, education should both be inclusive and equally accessible for all people, and of good quality.

There were several waves of education reforms, and shifts in paradigms of quality education. The first wave involves internal quality assurance, focusing on the effectiveness of achieving planned goals. The second wave focuses on the interface quality related to the satisfaction of internal and external stakeholders with education processes and outcomes. The third wave of education reforms is based on future quality, reflecting the relevance of education to the future needs at multiple levels: of society at the global level, community at the local level and individuals (Cheong Cheng, 2003).

Quality assurance and quality improvements are two aspects of quality education. Quality assurance refers to the determination of education standards, supported by the evaluation process which assesses the extent to which education practices fulfil standards (Ashraf, 2019).

Inclusive education is believed to be a basic human right which leads to a fair society (Bodhi et al. 2022). Inclusive education refers to the necessity to have equal education opportunities for all children, youth and adults in mainstream schools or the regular education

system, regardless of their disabilities and exceptionalities. In most Western countries, the system of inclusive education means a combination of segregated and mainstream schools into one system (Correia, Teixeira, 2017).

Inclusive education refers mostly to the disabilities of learners, however, it also means respect for the diverse cultural, linguistic, physical, mental and cognitive complexities of all students. Such an understanding extends the perspective on education to include all kinds of special needs, including those needs related to economic, political, social, cultural and technological inequalities (Landorf, Nevin, 2007).

Inclusive education is enriching for students with and without special educational needs, as they have more opportunities to develop their skills and competences, and to become more altruistic and familiar with human diversity (Correia, Teixeira, 2017).

As all children, youth and adults should feel welcomed, valued and supported in inclusive education. It is based on 5 key principles (Landorf, Nevin, 2007):

- “(1) zero reject philosophy;
- (2) self-determination;
- (3) empowering language;
- (4) invention of programs to support appropriate education in classroom environments; and
- (5) valuing as the preferred response to diversity”.

Quality education requires professionally developed teachers using effective teaching styles (Odhiambo, 2008). Teachers’ positive attitude towards inclusive education, shaped by their intrinsic spiritual views, feelings of satisfaction and happiness, is one of the key elements as it impacts the classroom learning environment (Bodhi *et al.* 2022).

Shifting to inclusive education is a challenge as well, as it requires adapting the school systems, by including such attitudes as co-teaching, co-planning, feedback and re-teaching, new approaches to teaching, collaboration with families, in order to accept the values and voices of families and students (DeMatthews, 2021).

5. Discussion questions and tasks for students

Discussion question 1. In your opinion, which of the inequality areas is the most important to reduce nowadays? Please explain your point of view.

Discussion question 2. In your opinion, which of the theories explaining the inequalities is the most appropriate nowadays? Please explain your point of view.

Task 1. Check the level of income inequality index (for example GINI index) in your country over last 10 years. What are the trends in the level of income equality? How would you explain that trend? Use for example EUROSTAT as the source of data.

Task 2. Check the level of the gender pay gap in your country over the last 10 years. What are the trends in the level of the gender pay gap? How would you explain that trend? Use for example EUROSTAT as the source of data.

Task 3. Check the scale of early leavers from education in your country over the last 10 years. What are the trends in the level of early leavers from education? How would you explain that trend? Use for example EUROSTAT as the source of data.

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SUSTAINABLE BUSINESS STRATEGIES

CORPORATE SOCIAL RESPONSIBILITY

Jana Gálová

■ Annotation

Corporate Social Responsibility (CSR) is becoming increasingly important in business practice. It refers to the three pillars of sustainability and therefore encompasses all environmental, economic and social aspects of corporate activity. After all, if an organisation sets a good example and acts in a sustainable and environmentally friendly way, its moral and ethical commitment enhances its reputation with its customers, partners, the general public and employees. One thing is certain: businesses that act not only economically, but also socially and environmentally, receive considerably more support in all areas, resulting in economic benefits too. On the other hand, the concept of CSR can be difficult to grasp. Many businesses are barely aware of what lies behind it, misuse it for purely promotional purposes, or are overwhelmed by its implementation.

Key words: corporate social responsibility, CSR, responsible business conduct, RBC, economic pillar, social pillar, environmental pillar

1. Introduction

The actions of companies have significant impacts on the lives of citizens all around the world. This is not just in terms of the products and/or services they offer or the jobs and opportunities they create, but also includes working conditions, human rights, health, the environment, innovation, education and training. Therefore, it is rightly expected that companies understand both their positive and negative impacts on society and the environment. In addition, they should

prevent, manage and mitigate any negative impact that they may cause, even within their global supply chain. These duties are commonly known as corporate social responsibility (CSR) or responsible business conduct (RBC). It is essential to highlight that public authorities have an important role in supporting and encouraging companies to conduct their business responsibly. In recent years, a mix of voluntary and mandatory actions have been introduced to promote CSR/RBC (EC, 2022b, 2019).

The chapter aims to describe CSR and RBC in detail, discuss the three pillars of CSR (economic, social, environmental) and provide examples from the practice of organisations.

2. Background

Corporate social responsibility (CSR) is part of the corporate culture of every modern and strong business company. These are activities financed from profit or by employees' voluntary work. However, companies can also demonstrate CSR within their business activities, at no additional cost, while achieving their business objectives (MŠVVaŠ SR, 2022).

While the term “sustainable development” mainly started to be used in the 1980s, the framework of CSR had already been established in the 1950s and 1960s (Borusiak, 2021). In 1953, Bowen contributed to the definition of CSR as an obligation to pursue policies for making decisions and following the lines of action compatible with societal objectives and values (Natale et al., 1994). While currently there is still no single generally accepted definition of CSR, the concept usually encompasses business decision-making processes linked to ethical values, compliance with legal requirements, as well as respect for people, communities and the environment (Douglas et al., 2004).

The European Commission (EC, 2022b; 2011) defined CSR as the responsibility of enterprises for their impact on society and, because of that, it should be company led. Companies can achieve being socially responsible by:

- integrating concerns related to social, environmental, ethical, consumer, and human rights into their strategy and all operations; and
- following the law.

Public authorities play a supporting role in this process through voluntary policy measures and, where necessary, complementary regulation.

The OECD introduced responsible business conduct (RBC) as an alternative term to CSR, formed in cooperation with business, trade unions and NGOs. It is defined as making a positive contribution to economic, environmental and social progress towards achieving sustainable development, as well as avoiding and addressing adverse impacts which are related to all of an enterprise's direct and indirect operations, products or services (EC, 2019).

CSR indicates that a business identifies its stakeholder groups and incorporates the needs and values within both the strategic and operational decision-making (Hartman et al., 2007).

Stakeholders are both external and internal: external stakeholders are broader societal actors in the surrounding society, and internal stakeholders are within the corporation (e.g. employees) (Macassa et al., 2020, 2017). CSR/RBC is important for:

- Enterprises: benefits in terms of risk management, cost savings, access to capital, customer relationships, HR management, sustainability of operations, ability to innovate and eventually profit;
- The EU economy: making companies more sustainable and innovative, which contributes to a more sustainable economy;
- Society: offering a set of values on which a more cohesive society can be built and the transition to a sustainable economic system can be based (EC, 2022b).

Involving internal and external stakeholders of companies and institutions in common channels of communication enables companies and institutions to better anticipate and take advantage of the rapidly changing expectations of society and the environment.

Corporate sustainability starts with a company's value system and a principles-based approach to doing business by (at least) meeting fundamental responsibilities in 4 areas: human rights, labour, the environment and anti-corruption. Responsible businesses stick to their values in each sphere, and know that good practices in one area do not lead to harm in another. By incorporating the Ten Principles of the UN Global Compact (UNG, 2022) into strategies, policies and procedures, companies not only uphold their responsibility to people

and the planet, but also set the stage for long-term success. These Principles are derived from:

- **The Universal Declaration of Human Rights – UDHR** (UN, 2021): a milestone document in the history of human rights, proclaimed by the UN General Assembly in Paris in 1948, inspired the adoption of more than 70 human rights treaties (all containing references to it in their preambles);
- **Declaration on Fundamental Principles and Rights at Work** (ILO, 2022): the International Labour Organization’s Declaration, adopted in 1998 and amended in 2022, is an expression of commitment by governments, employers’ and workers’ organizations to uphold basic human values vital to our social and economic lives;
- **The Rio Declaration on Environment and Development**: the 1992 document intended to guide countries in future sustainable development;
- **The United Nations Convention Against Corruption** (UN ODC, 2021): the only legally binding universal anti-corruption instrument.

Human rights represent an increasingly important aspect of CSR/RBC, especially in regards to global supply chains. The *UN guiding principles on business and human rights* (UNGPs) define what companies and governments should focus on in this field so businesses don’t have a negative impact. These principles were approved by the UN Human Rights Council in 2011 (EC, 2022b), and in 2015, the EU endorsed them in its action plan on human rights and democracy, committing to supporting their implementation. A number of guiding materials were published, too, which promoted the development of national action plans (NAPs).

Furthermore, the *G20/OECD Principles of Corporate Governance* (OECD, 2022), first published in 1999, help policy makers evaluate and improve the legal, regulatory, and institutional framework for corporate governance, with a view to supporting economic efficiency, sustainable growth and financial stability. The OECD Corporate Governance Committee launched a review of the Principles in November 2021, to be completed in 2023. The overall objective of the review is to update the Principles in the light of recent evolutions in capital markets and corporate governance policies and practices.

In 2011, the European Commission (EC) adopted its renewed strategy for CSR, which combines horizontal approaches to promote CSR/RBC with more specific approaches for individual sectors and policy areas. Within it, the importance of enhancing the visibility of CSR and disseminating good practices is highlighted, through the integration of CSR into education, training, and research. Improvements of self and co-regulation processes and companies' disclosure of social and environmental information are also included. The strategy was followed by the publication of a staff working document SWD (2019) 143 in March 2019, which gives an overview of the EC's and the European External Action Service's (EEAS) progress that has been made on implementing CSR/RBC and business and human rights since the 2011 CSR Strategy (EC, 2022b, 2019). The outcome and summary of the EU's activity involves:

- Acting to respect and protect human rights, providing adequate access to remedy for victims of business-related abuses, when those rights are infringed;
- Encouraging companies to carry out appropriate due diligence, with respect to human rights protection along their supply chains;
- Increasing transparency and promoting sustainable finance, by providing greater information on non-financial conduct of companies;
- Encouraging socially and environmentally-friendly business practices, including through public procurement (in compliance with EU public procurement rules);
- Promoting the implementation of CSR/RBC as well as UN-GPs on Business and Human Rights outside the EU through EU trade and development policies and programmes, engaging in multilateral fora, also through bilateral cooperation with third countries;
- Developing dedicated approaches for specific sectors or company types;
- Pursuing horizontal approaches, and within that working with Member States on NAPs (EC, 2019, p. 9).

On 23 February 2022, the EC adopted a proposal for a Directive on corporate sustainability due diligence (EC, 2022a). Its aim is to foster sustainable and responsible corporate behaviour throughout global value chains, both inside and outside Europe. Table 3.1 shows the

benefits of these rules. Companies play a key role in creating a sustainable and fair economy and society, but they need support in the form of a clear framework. EU-level legislation in this field will advance the green transition, and protect human rights in Europe and beyond (EC, 2022c, 2022d).

Table 1. Benefits of the rules in the proposal for a Directive on corporate sustainability due diligence.

For	Citizens	Companies	Developing countries
Benefits	<ul style="list-style-type: none">• Better protection of human rights, including labour rights• Healthier environment (for present and future generations)• Increased trust in businesses• More transparency enabling informed choices• Better access to justice for victims	<ul style="list-style-type: none">• Harmonised legal framework in the EU, creating legal certainty and a level playing field• Greater customer trust and employee commitment• Better awareness of companies' negative environmental and human rights impacts• Better risk management and adaptability• Increased attractiveness for talent, sustainability-oriented investors and public procurers• Higher attention to innovation• Better access to finance	<ul style="list-style-type: none">• Better protection of human rights and the environment• Increased stakeholder awareness of key sustainability issues• Sustainable investment• Improved sustainability-related practices• Increased take-up of international standards• Improved living conditions for people

Source: the author's own synthesis based on EC (2022a, 2022c).

Corporate sustainability due diligence brings some estimated costs for companies such as:

- The costs of establishing and operating these new procedures;
- Transition costs, including the expenditure and investments to change the operations and value chains to comply with the new obligation, if needed (EC, 2022a).

Table 2 presents an overview about which companies the new EU rules will apply to. SMEs (small and medium-sized enterprises) are the most common type of businesses in the EU. While they may not use

the term CSR/RBC directly, they often have a naturally responsible approach to business through close relations with their employees, the local community, and their business partners. For most SMEs, the process by which they meet their social responsibility goals is likely to remain informal and intuitive. Nevertheless, the European Commission promotes CSR/RBC among them by developing CSR handbooks and manuals (EC, 2022b).

Table 2. Companies to which the new EU rules will apply.

Company type		Large EU limited liability companies	Non-EU companies	SMEs
Group 1	500+ employees and net 150 million+ EUR turnover worldwide.	+/- 9,400 companies	+/- 2,600 companies	Micro companies and SMEs are not directly affected by the proposed rules. However, the proposal provides supporting measures for SMEs, which could be indirectly affected.
Group 2	250+ employees and net 40+ million EUR turnover worldwide, and operating in defined high impact sectors (e.g. textiles, agriculture, extraction of minerals). The rules start to apply two years later than for group 1.	+/- 3,400 companies	+/- 1,400 companies	

Source: the author's own synthesis based on EC (2022a, 2022c).

The fact that many companies are already putting in place corporate sustainability tools was highlighted in the *"Study on due diligence requirements through the supply chain"* published by the EC (2020). It focused on due diligence requirements to identify, prevent, mitigate and account for abuses of human rights. One-third of the 334 business survey respondents across all sectors indicated that their companies undertake work in this area, and a further one-third undertake such work but limited to certain areas. However, the majority focus only on their first tier suppliers.

Based on the 2020 consumer survey by IBM (2020), as consumers increasingly embrace social causes, they consciously seek products and brands that align with their values. 57% of respondents are willing to change their shopping habits in order to help reduce negative environmental impact. Nearly 8 in 10 respondents indicated that

sustainability is important for them. And from those who stated it is very/extremely important, 71% would pay a premium price for brands that are sustainable and environmentally responsible.

CSR and Environmental, Social and Governance (ESG) are covered under the same sustainability umbrella, but they are not the same. CSR is a company’s framework of sustainability plans and responsible impact, whereas ESG presents the assessable outcome of a company’s overall sustainability performance, usually based on publicly available information. Put simply, CSR is a general sustainability framework, mainly used by companies, while ESG is a measurable sustainability assessment, providing useful data for investors, which became popular over the past few years. Typically, ratings agencies round up ESG performance as a score, based on data (Polley, 2022).

As an example, *S&P Global ESG Scores* are formed based on a combination of verified company disclosures, media and stakeholder analysis, and in-depth company engagement via data intelligence by the *S&P Global Corporate Sustainability Assessment (CSA)*. These scores (see Figure 3.1) comprise material environmental, social and governance criteria scores for up to 30 focus areas across sub-industries; question-level scores covering 130 sustainability topics; and up to an additional 1,000 underlying data points per company (S&P Global, 2022).

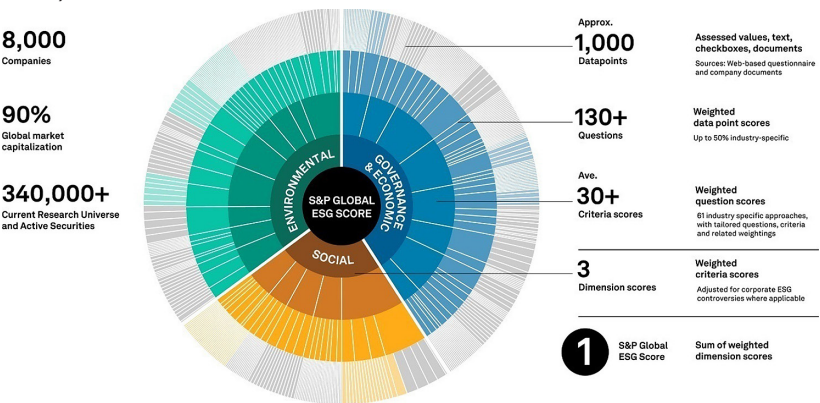


Figure 1. S&P Global ESG Score layers.

Note: Exclusive disclosure from companies and via the S&P Global CSA Coverage as of September 2021. The 2021 methodology cycle will cover 11,500+ companies (99% of global market capitalization) once it concludes.

Source: S&P Global (2022).

The KPMG International – Survey of Sustainability Reporting (first published in 1993) presents a detailed look at global trends in sustainability reporting and offers insights for business leaders, company boards and sustainability professionals. It aims to provide support for those with a responsibility for assessing and preparing their organization's sustainability reporting. It also serves as a guide to investors, asset managers and ratings agencies who now factor sustainability or ESG information into their assessment of corporate performance and risk (KPMG International, 2020).

The KPMG International – Survey of Sustainability Reporting 2020 was the 11th edition, when KPMG professionals reviewed sustainability reporting from 5,200 companies in 52 countries and jurisdictions (on the basis of publicly available information disclosed by companies in CSR reports, annual financial reports and on websites). This latest report shows that the current world leaders in CSR reporting are Japan and Mexico, where all the largest companies report activities related to their impact on the environment and business sustainability (KPMG Slovensko, 2020). Key global trends identified are:

- 80% of companies worldwide now report on sustainability, while this rises to 96% among the world's largest 250 companies;
- North America has the highest regional sustainability reporting rate (90% of companies), followed by Asia Pacific (84%), Europe (77%), and the Middle East & Africa (59%);
- The 10 countries with the highest rates of rates of sustainability reporting are: Japan, Mexico, Malaysia, India, US, Sweden, Spain, France, South Africa and the UK;
- Third-party assurance of sustainability information in corporate reporting is now a majority business practice worldwide;
- GRI (a modular system of interconnected standards) remains the dominant global standard for sustainability reporting (KPMG International, 2020).

In the overall ranking, Central and Eastern European countries have been lagging far behind Western Europe. Most of them, however, have seen an increase in the number of companies reporting CSR activities compared to the last survey in 2017. Slovakia even ranked among the top three countries in the world that showed the most significant increase compared to the last KPMG survey on this topic (increase for Kazakhstan by 34%, Slovakia by 21%, and Germany by

19%). Many of the top 100 companies by turnover surveyed for Slovakia are part of international corporations that issue their CSR reports centrally, including data for Slovakia. The high increase in Slovakia may be due to the fact that legislation has introduced the obligation to report on non-financial activities as well. Another explanation is that companies are increasingly taking reputational considerations into account, since customers are beginning to pay attention to this aspect in their purchases.

Among the V4 countries, Hungary ranked the best, as 26th in the world (with 83% of companies reporting on other than financial indicators, too), Poland was 38th (77%), Slovakia ranked 40th (76%) overall, and the Czech Republic was 42nd (66%) out of the 52 countries surveyed.

An example of the positive impact of companies on society is employment, payments of taxes and levies. Negative ones include waste accumulation, endangering groundwater, air pollution, and traffic congestion around the factory (KPMG Slovensko, 2020).

The KPMG survey revealed a very positive finding – up to 80% of the world's largest companies now issue their own reports on sustainability activities. For the first time in the history of the survey, all sectors surveyed were above the average level of reporting on socially responsible activities (65%).

Global trends in CSR reporting are based on a study of the top 100 (N100) largest companies by revenue in each of the 52 countries surveyed, while the G250 sample comprises the top 250 companies from the Fortune Global 500 ranking for 2019.

In 2020, at least 70% of N100 companies reported on sustainability in all industries except for the retail sector by a small margin, similarly as in 2017 (see Figure 3.2). Traditionally, the highest activity was recorded in the sectors that have the greatest environmental and social impact. The same six sectors led in both years compared: technology, media & telecommunications; mining; automotive; oil & gas; chemicals; and forestry & paper. Among the G250 group, four sectors showed 100% reporting rates in 2020 (technology, media & telecommunications; retail; oil & gas; and healthcare) (KPMG International, 2020, p. 16).

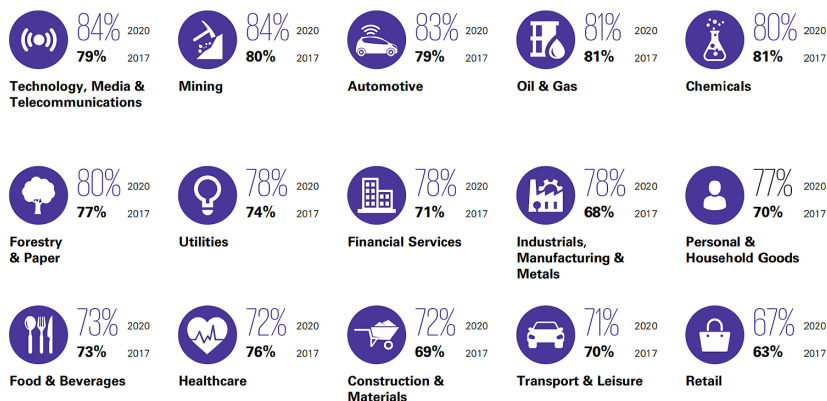


Figure 2. Sustainability Reporting Rates (N100 by sector) based on the KPMG Survey of Sustainability Reporting 2020.

Source: KPMG International (2020, p. 16).

There is still ongoing discussion on what aspects of business responsibility should be taken into account. While no CSR model is perfect, one of the most well-known ones is the pyramid of corporate social responsibility (depicted in Figure 3.3), which portrays the four main components/obligations of CSR for any business according to Carroll (2016; 2015; 1991):

- economic responsibility – the basic building block – the obligation to make money;
- legal responsibility – respecting laws and regulations, which are society's codification of acceptable and unacceptable behaviour;
- ethical responsibility – doing what is right, just and fair and avoiding or minimizing harm to all the stakeholders (employees, consumers, the environment, others);
- philanthropic responsibility – being a good citizen, voluntary activity to contribute resources to the communities by participating in social activities not mandated.

Nowadays, it is necessary to highlight environmental responsibility, which in face of the current climate situation, must be considered.

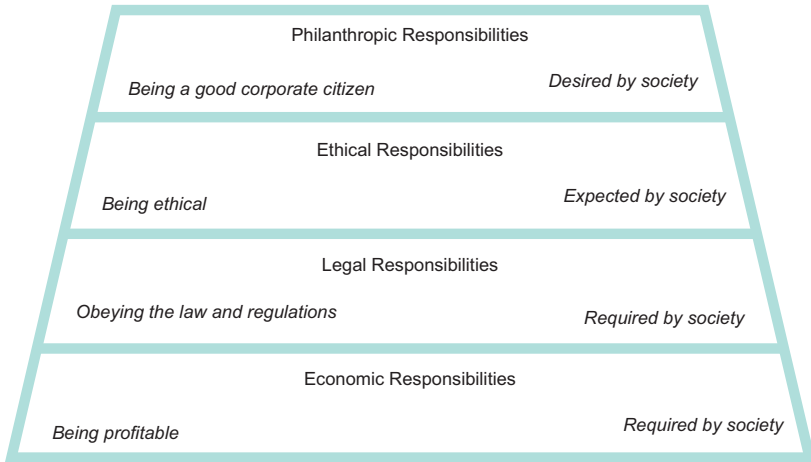


Figure 3. The pyramid of corporate social responsibility by Carroll.

Source: the author's own synthesis based on Carroll (2016; 2015; 1991).

It was only in the beginning of the 21st century that the CSR concept began to take shape as we know it today. In its first decade, it was characterised by the integration of responsible business principles into strategic management, extending stakeholders, and also moving away from philanthropy towards a Triple Bottom Line concept. It is when a responsible business commits to focus as much on social (people) and environmental concerns (planet) as it does on creating economic value (profit).

At its core, CSR is the management of an organisation's activities in three interlinked areas, the 3 pillars of CSR – economic, social and environmental. The basic principles include, in particular, voluntariness, initiating activities beyond those required by the relevant legislation, overall improvement of the quality of life, sustainable development, regular communication with stakeholders, and integration of social and economic values and parameters into the common corporate practice. In terms of areas and examples where CSR is used, the following three areas are of particular relevance:

Economic pillar: focuses on improving the quality of public services provided, addressing corruption, supplier-customer relations, as well as the organisation's proactive approach to addressing the public interest, etc. This area is part of every organisation and is considered to be the most sophisticated aspect of CSR. Among the most

common tools are the adoption of principles of responsible behaviour at the level of the organisation, such as an employee code of ethics or anti-corruption procedures (transparent selection procedures, etc.). Creating added value for customers, innovation and sustainable growth are also challenges in this case. Minimising possible economically negative consequences also belongs to this pillar.

Social pillar: develops the organisation's human capital, which is considered the internal customer. The organisation directly influences the social sphere, i.e. the human resources are influenced by working conditions and relationships. Employee and family care programmes, benefits, work-life balance and training opportunities can be effective. The challenge in this area is to increase the competence of employees, but also to involve them in activities with a charitable dimension, or to choose activities aimed at supporting or helping the community and society. Other examples are corporate philanthropy, protection of special groups of employees, equal opportunities policies, and even assistance to redundant employees.

Environmental pillar: concerns every organisation, as each has a greater or lesser impact on the environment. Furthermore, each organisation must comply with certain environmental legislation in addition to regulations such as financial control, transparency or occupational health and safety regulations for employees. A socially responsible organisation protects and cares for natural resources and the environment, e.g. by taking measures to conserve resources and establish effective waste management, using environmentally friendly materials and goods, utilising alternative energy sources, or engaging in various activities/projects aimed at environmental protection. Reducing and minimising the negative impacts and effects on the environment is also part of this pillar.

By committing to behave in a socially responsible manner, the organisation takes responsibility for the impact of its decisions on the organisation itself, society and the environment, thus being active in all three of the above areas/pillars of social responsibility (CAF Centrum, 2020; Podnikam.sk, 2022; MPSVaR SR, 2022).

Even if the business already made CSR efforts, it can be helpful to take a fresh look at the motivation behind it and reassess the commitment. This can help to focus and classify efforts to see which measures are actually being implemented at the moment and how. Each organisation wishing to introduce or already implementing CSR

should ask itself what are its reasons for doing so and what they want to achieve with it. These reasons can be linked to the main benefits of CSR for organisations, which according to the Business Leaders Forum (BLF, 2022) hosted by the Pontis Foundation in Slovakia incorporate:

- Increased sales (profits) = economic objectives: the aim is to differentiate the company from its competitors, attract new customers and tie customers to the organisation, including proper management of suppliers in the supply chain from a CSR perspective, resulting in offering responsible products and services and a better reputation;
- Increased attractiveness to investors = intrinsic motivation: particularly in SMEs, personal motivation to engage with others or sustainability issues is key;
- Increased loyalty of existing employees = employee motivation: in the battle for the best employees, it certainly pays off to be presented as an attractive employer;
- Cost reduction: thanks to efficient measures in operations and production;
- Improved risk management = compliance with regulations: thanks to cooperation with suppliers or health and safety programmes;
- Improving reputation and gaining a positive image among the general public = extrinsic motivation: CSR has become a necessity for many companies in recent years, since the public, customers and stakeholders now expect a certain level of commitment.

In Slovakia, based on [Podnikam.sk](https://podnikam.sk) (2022), companies are engaged in CSR activities such as:

- Recycling and waste management, especially waste collection within the company;
- Helping socially disadvantaged groups in the region;
- Helping the region, e.g. financially supporting projects with benefits for the public;
- Social rights for employees and clients;
- Supporting international challenges and projects, e.g. promoting certain types of organic products;
- Assisting in animal-welfare and nature conservation, or providing financial support for projects aimed at the protection of habitats, fauna and flora within Slovakia;

- Supporting the restoring of historical monuments and important sites.

If an organisation has difficulties deciding which area of CSR to choose to be involved in, reviewing the United Nations 17 Sustainable Development Goals (SDGs) is a good place to start (UN, 2022). While most goals such as the Good Health and Well-Being (No. 3), Gender Equality (No. 5), Decent Work and Economic Growth (No. 8) or Responsible Consumption and Production (No. 12) can apply to most businesses, there are also specific goals relevant to select industries (e.g. water technology or energy providers).

As an example, Microsoft, the multinational technology corporation, stated in its 2020 Microsoft Corporate Social Responsibility Report that it believes in its shared responsibility as a business to apply its unique assets in the global effort needed to achieve the SDGs. It highlighted its commitment to working with governments, civil society, and other companies, in order to achieve more progress together, by focusing its efforts on four key commitments: support inclusive economic opportunity, protect fundamental rights, commit to a sustainable future, and earn trust (Microsoft, 2020).

Good CSR inspiration for any business can be taken from 6 examples provided by Reckmann (2022) of companies practicing CSR on a large scale:

- The toy company LEGO: invests in reducing waste and alternative energy, with efforts focused on reduced packaging, and using sustainable materials.
- The footwear company TOMS: donated one-third of its net profits to charities that support physical and mental health as well as educational opportunities.
- The multinational corporation Johnson & Johnson: the brand focuses on investing in alternative energy sources, and globally, to provide clean, safe water to communities.
- The multinational chain of coffeehouses Starbucks: implemented a socially responsible hiring process for workforce diversification (hiring more veterans, young career-starters, and refugees).
- The multinational technology company Google: they are investing in renewable energy sources and sustainable offices.
- The multinational pharmaceutical corporation Pfizer: focused on healthcare initiatives, including spreading

awareness and providing accessible health services to women and children in need.

When implementing CSR, its incorporation into the overall business strategy, followed by operational realization and communication of this commitment are key success factors. Furthermore, the willingness to engage in dialogue is necessary, as well as the ability to adapt and learn. Particular attention should be paid to the following aspects:

Lived values: organisations with value-driven CSR leadership are more successful. Personal contact between the management and employees creates the basic conditions for the application of the company's own values.

Authentic communication: CSR communication should be summarised in an understandable way, but on the other hand, it should not use just empty promotional phrases published in a glossy brochure. Traditional public relations, social media channels and word of mouth can ensure that the right message is spread.

CSR as part of the business strategy: CSR is not feasible without the support of senior management in order to comprise the values that ultimately differentiate the organisation from the others. Activities that are close to the actual core business are often the most decisive, and commitment to the region has a lasting impression on the public perception.

Measuring CSR success: to be successful in the long term, talking about measures and keeping track of activities is imperative. Monitoring key indicators during management and planning enables making CSR success more visible and communicating it more efficiently.

While self-assessment of CSR efforts is essential for the company, a trusted way to achieve public recognition for these activities is to undergo a third-party assessment and achieve CSR certification, such as B Corp certification, ISEAL code compliance or SASB standards.

B Corp certification: B Lab attests that a business is meeting high standards of verified performance, accountability, and transparency on different factors every three years, which range from employee benefits and charitable giving to supply chain practices and input materials. Patagonia, TOMS, Ben and Jerry's are examples. To be certified, a company must:

- Demonstrate high social and environmental performance by achieving a B Impact Assessment minimum score of 80

and passing the risk review (multinational corporations must also meet baseline requirement standards).

- Make a legal commitment by changing their corporate governance structure to be accountable to all stakeholders (rather than only shareholders), and achieve benefit corporation status if available in their jurisdiction.
- Exhibit transparency by allowing information about their performance measured against B Lab's standards to be publicly available on their B Corp profile on B Lab's website (B Lab, 2022).

ISEAL code compliance: ISEAL Alliance (International Social and Environmental Accreditation and Labelling Alliance) is a global organization for credible sustainability standards, with members such as Fairtrade International, Gold Standard, Alliance for Water Stewardship etc. Their assessment is carried out by an independent third-party verification provider, which determines meeting the Codes of Good Practice and can be considered ISEAL Code Compliant as a reputable seal of approval (Reckmann, 2022).

SASB standards: As of August 2022, the International Sustainability Standards Board (ISSB) of the International Financial Reporting Standards (IFRS) Foundation assumed responsibility for the Sustainability Accounting Standards Board (SASB) Standards. These identify the subset of ESG issues most relevant to financial performance, covering 77 industries, and enable organisations to provide industry-based sustainability disclosures about the financial impact, risks and opportunities that affect enterprise value (IFRS, 2022).

For businesses and organizations, the application of the voluntary ISO 26000:2010 *Guidance on Social responsibility* international standard is increasingly viewed as a way of assessing their commitment to sustainability and their overall performance. It provides guidance rather than requirements (therefore, as such, it cannot be used for certification, unlike some other ISO standards) (ISO, 2022), for all types of organizations, on:

1. Concepts, terms and definitions related to social responsibility (SR);
2. Background, trends and characteristics of SR;
3. Relating principles and practices;
4. SR core subjects and issues;

5. Integrating, implementing and promoting socially responsible behaviour throughout the organization, its policies and practices, within its sphere of influence;
6. Identifying and engaging with stakeholders;
7. Communicating commitments, performance and SR related information (ISO, 2018).

Today's challenges are making all types of organisations aware of the dangers of irresponsible use of resources and capital. The drive to demonstrate the ability to deliver products and services with regard to the needs and expectations of society as a whole is becoming more prevalent. Social responsibility is now seen as an important competitive advantage for organisations and countries. Last but not least, social responsibility is not just a private sector issue or concern; responsible behaviour also applies to the public sector. By introducing CSR in general, businesses should not pursue only their own economic interests. However, in recent years, such efforts have attracted a great deal of public attention and have been viewed critically, often followed by suspicions of greenwashing (see chapter 3.4).

3. Discussion questions and tasks for students

1. Find CSR statements or reports from your country for the following types of businesses: food retailer, fast-fashion retailer, manufacturer, university/education institution, provider of services in the tourism sector, IT company, automobile manufacturer. Use databases such as <https://www.csrwire.com/reports>, <https://www.responsibilityreports.com/>, or <https://www.corporateregister.com/>
2. Find examples on how the idea of CSR is included in companies' strategies (e.g. vision, mission, goals) in your country.
3. Use Carroll's model to discuss what it means to take economic responsibility.
4. Use Carroll's model to discuss what it means to take legal responsibility.
5. Use Carroll's model to discuss what it means to take ethical responsibility.
6. Use Carroll's model to discuss what it means to take philanthropic responsibility.

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PRODUCT STRATEGIES BASED ON THE SUSTAINABLE DEVELOPMENT PARADIGM (LIFE CYCLE MANAGEMENT, GREEN PRODUCTS AND ECO-INNOVATIONS)

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■ Annotation

The core purpose of any business is to deliver value to consumers through products to meet their needs and wants, and thereby generate profits. However, in the context of sustainable development, we need to stress that businesses must look beyond their short-term business interests and strive for long-term results. Accordingly, they must offer products that take into account not only the requirements of their customers, but also the environment and society. By adopting sustainable product strategies and creating sustainable products, businesses can deliver social and environmental benefits. The use of life cycle management provides an opportunity to differentiate in the market through sustainability performance. Businesses can reduce the environmental impact of their products and operations by developing green products and eco-innovations.

Key words: businesses, product strategy, sustainability, quality, innovation, value, eco-innovation, green products, life cycle thinking

1. Introduction

As our world becomes more complex due to social and economic development, humanity faces ever greater environmental and social challenges. The achievement of sustainability as a societal goal requires the implementation of decisions and activities that are in line with the concept of sustainable development. In this respect, all actors, including businesses and customers, as well as all stakeholders, have major responsibilities and tasks.

One of the most important preconditions for the transition towards sustainability is that actors recognise their responsibility in this matter. Everyone must realise that of the triad of environment, society and economy, the environment is the only one that can be understood independently of the other two, while society and the economy can only function in conjunction with the environment and each other.

Therefore, change is needed because time is short. The limits to growth, overshoot or unsustainable development are terms that everyone knows, but to avoid disaster we must act now. This draws attention to the urgent need for a new way of thinking, a paradigm shift that integrates the continuous development of human societies and environmental sustainability. In this respect, it is positive that more and more consumers are aware of environmental issues and want businesses to take steps to preserve and protect the environment. Businesses must therefore adapt and align their operations to sustainable development. But it is not enough to look 'green' – businesses have to act accordingly.

To achieve this, businesses need to make decisions and carry out activities that go beyond short-term business success and aim for long-term achievements, which is about moving from output to outcome. This leads businesses to shift from the concept of "the business of business is business" to the concept that "the business of business is more than just business".

Our intention is to provide a better understanding and insight into some of the key issues in the context of businesses, which are very important in greening the economy and providing more benefits for customers and society as a whole, to make social and economic development more sustainable. As you go through the chapter, you will discover and become more familiar with some very important aspects

of business, and get answers to the question of how businesses can become greener in their operations, and provide environmental benefits to customers and society while generating profits. The chapter introduces the reader to the basic context of business through fundamental terms and concepts, and then discusses the operationalisation of sustainable development through the issues of sustainable products and product strategies, life cycle management, green products, and eco-innovation.

2. Setting the scene: Key terms and contexts

Before we go on to discuss the main topic of the chapter, a couple of important terms and their contexts should be clarified.

2.1. Businesses and products

The term 'business' refers to a specific organisation, however, it is also the term for all the activities involved in developing, creating and exchanging products.

Products can be anything that can be sold or bought in a market. A product is "anything that can be offered to a market for attention, acquisition, use, or consumption that might satisfy a want or need" (Kotler, Armstrong, 2011). Alternatively, a product is anything that can be offered to a market for attention, acquisition, use or consumption that might satisfy a want or need.

Concerning the term product we should make an important distinction. The term 'product' includes goods and services, which means that some businesses can produce and sell goods while others can provide services. Goods are physical items, so they are tangible and can be touched, while services are actions or tasks that are performed, and they are intangible, and cannot be touched (Dansby et al., 2017). ISO defines a product as an output of an organization that can be produced without any transaction between the organization and the customer, while adding that hardware and processed materials that are tangible are often referred to as goods. ISO defines a service as an output of an organization, with at least one activity necessarily being performed between the organization and the customer. ISO notes

that the dominant elements of a service are predominantly intangible (ISO, 2015).

Accordingly, a business is any activity that provides goods or services to consumers for the purpose of making a profit (Collins, 2012). Alternatively, a business is an entity that offers goods and/or services to customers in order to make a profit (Fuhrmann, 2019). Thus, the core purpose of any businesses is to provide goods or services to consumers to satisfy their needs and wants in order to make a profit. Profit is the difference between the revenue earned by selling products and the costs incurred during the business operation.

To be successful, businesses must focus on the customers in order to meet their needs, and satisfy their wants. Why is this so crucial? Why must businesses be focused on customers? Because the satisfaction of needs and wants is a prerequisite for the profitable operation of a business. Without satisfied customers, a business could not continue. This is the reason why a business focuses on satisfying customers as the means of achieving profit goals. And if the business makes a profit, it can continue to operate. Consequently, the core purpose of any business is to satisfy consumer needs and wants while making a profit. Profit is the key to the survival and long-term, sustained success of a business.

2.2. Utility, value and quality

Businesses must produce products and services that are of utility and value to consumers. Thus, a major task of businesses is to provide utility or to create value, which in business terms describes the characteristics and features of a product that satisfy customers' wants and needs.

In general, value refers to the usefulness of someone or something. Everything that contributes to the satisfaction of human needs represents value.

Products produced by companies are of value to consumers because they can satisfy some of their needs. However, the value is not inherent in the product, i.e. the creation of the product does not equate with the creation of the value. Value is the customer's subjective opinion or value judgement about the extent to which a product meets his or her expectations or requirements. That is, the customer's assessment or perception of the usefulness of a product. Usefulness

in this respect means utility or value to the customer because it satisfies his or her needs and wants.

The key is therefore to achieve customer satisfaction, which is the degree to which customers are pleased with the products provided by a business (Dansby et al., 2017). In short, we can say that value is the benefits a customer receives from a product, or at least the benefits perceived by the customer.

Products produced by businesses represent value for consumers because they can satisfy a need. By creating a product, the business offers a solution to a customer need or demand. For this offering to be a real solution for the customer, it is necessary to understand customer expectations and customer satisfaction. In the seller-buyer relationship, the object of exchange is in fact an intellectual content, the promise of a solution, and the product is the carrier, a medium of this content.

The product therefore does not represent value to the customer in itself. Ergo, producers and service providers do not create value directly, but make a value proposition. A successful value proposition requires that businesses know the needs and requirements of their customers, which enables them to define the parameters, product, process and operational characteristics that customers value.

When we talk about utility or value, we should always talk about quality, which is in fact the value delivered to the customer. Bearing this in mind, a business focused on quality can deliver value through fulfilling the needs and expectations of customers and stakeholders. According to the official definition given by ISO 9000:2015 standard, quality means the degree to which a set of inherent characteristics (distinguishing features) of an object, an entity (e.g. product, process, and organization) fulfils requirements (ISO, 2015). This definition refers to the needs and expectations of all parties concerned, and with this definition in mind, we can consider the quality of an organization as a whole, on the one hand, and the quality of the entities being exchanged between the organization and its stakeholders on the other (Antilla and Jussila, 2017). It is important to highlight that quality usually distinguishes one organization or a product from another (Dale, 2003). The quality of a product can be derived from a collection of characteristics which are the distinguishing features of that product, and provide satisfaction to the customer.

Kano (2005) highlights the need to offer products that take into account not only the customer but also the environment, and emphasizes the necessity of understanding the needs and expectations of stakeholders. In terms of quality, we need products and services that consider the interactions between the organization and its environment, given the expectations of consumers and the environment, in order to achieve development that does not leave a negative legacy for future generations (Kano, 2005).

2.3. Stakeholders, social and environmental responsibility

The concept of stakeholders goes beyond focusing merely on the customer, and stakeholder identification is an important part of understanding the context of the organization. Businesses need to integrate into the environment in which they operate, and it is a steadily changing milieu, an ever-changing world. In the course of their operations, businesses interact with different entities, and it is of paramount importance for businesses to consider their interests and needs as well. According to the stakeholder approach, businesses are not isolated entities but are embedded in a broader environment, and therefore, they can only achieve their objectives if they meet stakeholders' requirements and expectations. A stakeholder can be defined as an entity "that can affect, be affected by, or perceive itself to be affected by a decision or activity" (ISO, 2015). Stakeholders, in a broader sense, can refer to individuals, organizations, and businesses, groups of people, systems, ecosystems, or even members of the future generations. All of this means that, for the sake of their long-term successful operation, businesses must take into account the needs and interests of other stakeholders in addition to the expectations of customers.

Over the past decades, the number and range of stakeholders has increased in the context of social and economic development and globalisation, and the growing environmental challenges have led to people becoming more environmentally conscious and increasingly expecting businesses to protect and preserve the environment.

It is important to stress that businesses are not just economic units or merely market participants, but also social factors and entities that are influencing the natural environment. For this reason, compliance with social norms and ethical expectations is also an important aspect of business operation. To meet the expected and latent needs of

customers, but also the requirements of society and the natural environment, is a fundamental issue for any businesses today, and even more so in the future (Kis, 2021).

Thus, it is a key challenge for companies to understand how they can become more sustainable and how they can reconcile and align profit motivation and social responsibility in their strategic decisions and day-to-day operations. Businesses that are strategically practicing corporate social responsibility, can earn a profit and make the world a better place at the same time (Falck – Helbrich, 2007). Hence the popular saying: “doing well, by doing good”. Social responsibility is a way of doing business that incorporates social and environmental expectations into the operation. In this way, businesses create social and environmental benefits in addition to economic benefits. Thus, it is a way for both businesses and society as a whole to benefit and prosper. As Mischke et al. write (2021), “social responsibility and sustainable profit go hand in hand, now more than ever”. This is because consumers are increasingly willing to pay even more for products that meet their environmental expectations, and often hold companies in higher esteem when they act responsibly and pursue environmentally friendly policies.

That is the reason why businesses should focus on every aspect of their operation to keep the customers and stakeholders satisfied, because that is the key to long-term profit. To incorporate environmental considerations into business activity is crucial, but it’s not enough to look green – businesses also have to act accordingly.

2.4. Competitiveness and innovation

Utility, value and quality are essential factors for the competitiveness of businesses. So, businesses should keep up with customers’ expectations, as their needs continue to grow and evolve, so they require products that are more advanced for one or more features. However, other stakeholders and their needs and interests have emerged and become important, and these need to be recognized and fulfilled.

It is important to emphasize that businesses need to adapt to their environment, while they are meeting the growing needs of customers and other stakeholders in a more competitive way than other businesses. In order for businesses to maintain and improve their competitiveness, the expectations of customers and stakeholders must be

integrated into their operations, which gives them the opportunity to distinguish themselves from other businesses and gain competitive advantages over their rivals. Gutner and Adams (2009) point out that quality remains a key factor in maintaining the competitiveness of companies, while several trends and circumstances are forcing companies to redefine and communicate their values in order to keep pace with market needs.

Developing an appropriate and relevant product offer is key in this respect, as customers are increasingly requiring businesses to take reasonable steps to save our planet if they want their products to be bought. Acting and behaving in accordance with environmental and social responsibility can contribute to increasing the competitiveness of the business and to the promotion of sustainable development. For these reasons, social responsibility is an increasingly important aspect of the business adaptation process.

Competition as a market force is an important factor in the economic system. Competition is an action between two or more businesses trying to attract the same customers. Businesses can compete to sell goods and services and decide what to produce, how to produce, and for whom to produce. (Dansby et al., 2017).

Businesses need to compete to survive, and this is a very diverse and multifaceted challenge for them. In this respect, it is the capabilities of the business that are decisive, i.e. the characteristics of the business that determine its efficiency and effectiveness in meeting environmental challenges.

Business competitiveness is a capability of a business to sustainably fulfil its double purpose, in other words, satisfying customer needs at profit. This capability is realized through offering on the market goods and services which customers value more highly than those offered by competitors while complying with social responsibility requirements (Chikán, 2008). Capability is the ability of a business to realize a product that will fulfil the requirements for that product (ISO, 2015).

Competitiveness requires businesses to continuously develop their competences that give them a competitive advantages, adapting to changes in the environment. Competitiveness therefore requires, in addition to the ability to maintain continuous operation, the ability to change, i.e. to maintain proactive adaptability, which together can

lead to performance that is recognised by the environment (Chikán, 2006).

An important attribute of a competitive business is that it produces and sells a competitive product to its customers. In this context, the main question is what customers' problems are, and what benefits they are looking to acquire from the business's product. By creating a product, the company offers the consumer a solution to a specific problem or need. In this respect, an unsatisfied, unfulfilled need generates the problem. In general, we talk about a problem when the perceived current situation (state or condition) is different from the desired one.

Consumers become aware of a problem when they have a need or want to be satisfied (Dansby et al., 2017). Making a profit by solving a problem, or contributing to a solution to a problem that customers have, may be a very important goal for businesses, but making a contribution to the welfare of society may also be important (Fuhrmann, 2019). Thus, it is an important task of businesses to create offerings that provide value to customers, stakeholders and society at large. That is value proposition, which seeks to solve customer problems and satisfy customer needs (Osterwalder&Pigneur, 2010). So, value proposition is about providing utility, value and quality.

Utility can be derived from bundles of attributes that provide satisfaction (Worthington et al., 2005). Creating value for the customer means offering products that solve customers' problems and fulfil their wishes and needs (Fuhrmann, 2019). The benefits for the customer may be, for example, the physical, sensory, behavioural, temporal, ergonomic and functional characteristics of the product. Quality refers to the ability of a product to satisfy customer needs by the totality of its characteristics and features (Collins, 2012). Adding utility or adding value means enhancing a feature or service to motivate customers to make a purchase (Dansby et al., 2017), and an innovation occurs when a new or changed entity realizes or redistributes value (ISO, 2015).

As the product is the key element of the market offering, product innovation – creating new and better products – plays a crucial role in contributing to the competitiveness of businesses. In other respects, competition forces businesses to innovate in order to maintain and improve their market position.

This enables businesses to create a better market offering. So for a business to secure its competitive advantage over the competitors, it needs to innovate continuously. Innovation activity seeks to deliver value to customers and stakeholders, while the business remains competitive. Businesses need to adapt to changes in their environment, thus innovation can be understood as a continuous response to those changes which contribute to the creation of products, and this enables businesses to deliver greater customer satisfaction and improved socio-environmental performance.

3. Product strategy

In a general sense, strategy can be understood as the definition of objectives and the means and activities needed to achieve them over a longer period of time. Put slightly differently, strategy means deciding what we want to do and how best to do it. Typically it involves analysing the current situation, hypothesising about what we think will happen, setting some goals, looking at options, deciding what we are going to do, and documenting it all in a plan (Product Focus, 2022). In other words, strategy can be understood as a “plan to achieve a long-term or overall goal” (ISO, 2015). Strategy can also be interpreted as the incorporation of the company’s goals and operating conditions into a long-term framework, which provides an answer to the question of how the company will achieve its core purpose (Chikán, 2000).

Businesses should determine which products they will offer to meet customer needs. Related activities can include developing new goods or services or improving a current one by adding new features.

Product strategies include decisions about quality, quantity, size, colour, features, technical support, packaging, warranties, brand name, and image (Dansby et al., 2017). According to Deschamps (1993), a product strategy is much more than just a list of specific product activities over time. It is an explicit roadmap designed to guide the business’s efforts to develop and market products that deliver a sustainable competitive advantage and meet growth and profit objectives. A good product strategy maximizes both customer satisfaction and profits while articulating the business’s priorities. Deschamps (1993) proposed a model with the central question of “How to grow our business profitably?”, this is what the product strategy

should respond to. The business strategy has at least four interrelated components, which are:

- The product/market strategy (the two elements usually being inseparable);
- The technology strategy, which directly supports the product strategy;
- The manufacturing strategy;
- The marketing/distribution strategy – the last but most critical element in the value creation process.

The product strategy should serve two main objectives: the optimization of perceived product quality, and the maximization of profits. These objectives will determine the content of the strategy.

In another approach, product strategy reflects the mission of the business and the business environment it is in, and relate to such matters as the number and diversity of products, product innovations, product scope, and product design. Product strategies, in conjunction with marketing strategies, focus on identifying market needs that can be served by different product offerings. Following the marketing concept, product strategy should bear a close relationship to the market strategy of the business (Jain& Haley, 2010).

Marketing activities are aimed at the customer, and consist of activities that create offerings that have value for customers, other stakeholders, and society at large, while making a profit. In the context of the former, the marketing concept is an approach to business that focuses on satisfying customers as the means of achieving profit goals. The three pillars of the marketing concept are customer satisfaction, total company approach, and profit (Dansby et al., 2017).

Product strategy should include a vision for the product: the market segments, geographic and technological areas in which the business will compete; the role of partners and suppliers; differentiation and positioning; as well as timing and financial justification for the proposed strategy (Product Focus, 2022).

Developing a product strategy should cover at least the following steps: (1) understanding the facts and trends about the marketplace, (2) decide on implications, (3) set product objectives, (4) develop a strategy that can deliver on these objectives, (5) convert strategy into a plan with a set of actions that will bring the strategy to life (Product Focus, 2022).It is particularly important when designing

a product strategy to assess stakeholders' perceptions of the strategy and how they will support it (Product Focus, 2019).

But what makes a product sustainable? And how is this reflected in the product strategy? – we may ask. Sustainable products can be described as “offerings that satisfy customer needs and significantly improve the social and environmental performance along the whole life cycle in comparison to conventional or competing offers” (Belz&Peattie, 2012). Another definition refers to sustainable products as “products that provide environmental, social and economic benefits while protecting public health and environment over their whole life cycle, from the extraction of raw materials until the final disposal” (Wikipedia, 2022). The term ‘sustainable’ in relation to products indicates a broad concept that includes social and environmental issues. Products certified as Fairtrade provide good examples of sustainable products (Oates, 2021).

There are six characteristics that define a product as sustainable (Belz&Peattie, 2012; Oates, 2021): (1) customer satisfaction, (2) focus on both environmental and social issues, (3) consideration of the whole product life cycle, from raw materials extraction and sources to product disposal, (4) providing significant improvements in the particular environmental and/or social issue the product addresses, (5) continuous improvement in response to changes such as new technologies and environmental problems, and (6) the product's ability to maintain its position against competitors' offerings.

Based on Gbadamosi et al. (2013) we can describe a sustainable product strategy as a systematic and organised approach to embedding and integrating ethical and environmental considerations into all activities related to the creation of sustainable products, from raw materials extraction to waste disposal. The essence of sustainable products strategy, which can be derived from the definitions above, is threefold: (1) meeting customer needs, (2) business objectives are met, and (3) compatibility with sustainable requirements, that means a product deliver social and environmental benefits.

Sustainable products and sustainable product strategies are associated with efforts to change business orientation from merely responding to consumer and market needs to developing a more responsible approach that promotes markets for sustainable products and builds sustainable societies (Sheth& Parvatiyar, 2021). The sustainable product strategy gives customers the opportunity to reduce

their impact by buying and using sustainable products. At the same time, it helps businesses to secure their place in the market for the years to come. A sustainable product strategy enhances reputation and credibility among customers and stakeholders, and it opens doors to new customers and untapped opportunities (Kennedy, 2013).

Life-cycle thinking provides an important perspective to guide the development and adoption of sustainable product strategies, as it can identify trade-offs between production, use and end-of-life impacts, and it is therefore essential for businesses to integrate this perspective into their decision-making process (Fava et al., 2000). The main objectives of life cycle thinking are to reduce the resource use of a product and its emissions to the environment, and to improve its socio-economic performance throughout its life cycle (Remmen et al., 2007).

4. Life cycle management

In order to serve sustainability goals businesses need comprehensive and effective methods and techniques to help decision-makers identify the solutions that best support sustainable development. Numerous different methods and tools are available to manage sustainable products that require continuous evaluation of various social, ecological, and economic factors.

Life cycle management (LCM) is an approach which links sustainability issues and life cycle thinking in practice (Ny et al, 2006), or we can say that LCM is based on the principles of sustainable development and life-cycle thinking (LCT) (Bey, 2018). LCM is then a concept that enables the operationalisation of sustainability within organisations by putting life cycle thinking into business practice (Sonnemann & Margni, 2015).

LCM can be defined as an integrated concept for managing the entire life cycle of products towards more sustainable production and consumption. LCM provides a systems-oriented platform for implementing a preventive and sustainability-oriented management approach to product systems (life cycle). LCM uses different analytical tools for different applications and integrates economic, social and environmental aspects in an institutional context (Itskos et al., 2016). LCM is a management concept used to improve products while

enhancing the overall sustainability performance of businesses and their value chain. In this respect, LCM provides an opportunity to differentiate in the market through sustainability performance. LCM is applied beyond short-term business success and seeks long-term results, minimising environmental and socio-economic impacts while maximising economic and social value. (Sonnemann & Margni, 2015). Based on the essential elements of the LCM concept, the following definition can be given: "Life Cycle Management is a practical and integrated approach to minimize the environmental burdens associated with a product or service over its life cycle. It is a concept which may be useful in ensuring a sustainable development. It is also a way of linking environmental improvements with economic efficiency" (Hunkeler et al., 2004).

The role of LCM can be summarised as (Rebitzer, 2015):

- Expanding the scope to also address upstream and downstream activities along the supply chain;
- Addressing not only environmental but also social and economic aspects throughout the life cycle of products;
- Linking sustainability management and performance of organizations and products to business value and value creation.

LCM can be specifically adapted and gradually introduced in any organization, such as businesses, regardless of their size, activity, complexity, business model, markets and supply chain positions. It is important to underline that LCM is not a single tool or methodology, and it is not a 'one-size-fits-all' approach. It is rather a framework of concepts, policies, programs, methods and tools, and it is always up to the given business to decide what tools to include in their LCM approach. A wide range of concepts, approaches, methods and tools can be used in LCM, from which the organisation selects the specific set that leads to the tailored LCM approach. The so-called LCM toolbox can comprise the following components (Bey, 2018; Hunkeler et al., 2004; Sonnemann et al., 2015): Life Cycle Assessment (LCA), Social Life Cycle Assessment (SLCA), Environmental Life Cycle Assessment (ELCA), Life Cycle Costing (LCC), Eco-design/Life Cycle Design (LCD)/ Sustainable Product Design (SPD), Design for Recycling/Circularity, Stakeholder Analysis, SWOT analysis, Footprinting (Water Footprint, Carbon Footprint), Cost Benefit Analysis (CBA), Material Flow Analysis (MFA), Environmental Risk Assessment (ERA), Supply Chain

Management (SCM), Eco-labeling, Design for Environment, Green Procurement, Circular Economy, Sustainable Consumption, Eco-certification, Environmental Communication etc.

All these tools, policies, strategies and programs are part of LCM, and businesses should select those that fit best to their environment, goals and ambitions. Figure 1 gives a comprehensive overview of the optional policies, strategies, systems, programs and different types of tools that can be applied in LCM.

Figure 1. Elements of LCM.

Source: Sonnemann et al., 2015.

LCM, as an integral part of a management system, provides a framework for operationalising sustainability issues and sustainable development into business operation. LCM is a dynamic and voluntary process which is best implemented through a step-by-step process. Special attention should be given to activities that can secure continuous improvement. The particular managerial tasks of LCM, according to the PDCA cycle, can be divided into four types (Bey, 2018):

- Setting (measurable) targets – for the entire organisation or for parts of it;
- Executing the plan;
- Tracking execution and performance; and
- Taking corrective actions or setting new targets – depending on the performance.

Life cycle management is for companies that are ready to extend the traditional focus on the production process by incorporating different management aspects of the product throughout its life cycle (Remmen et al., 2007).

Lifecycle management takes time, requires learning processes for different and new ways of thinking for all involved actors. At the same time, LCM also brings benefits. LCM contributes to increasing knowledge of the organisation's own processes and life cycle chains. LCM may also reduce risk and increase opportunities, as well as improve the ability to respond early to new legislation and market trends in the field. In this respect, LCM generally increases the resilience of the organisation that practices LCM (Bey, 2018).

5. Green products

Green products fit into the sustainable product philosophy and the sustainable product strategy approach, as well as the life cycle management concept. Green products represent a holistic view that allows businesses to differentiate and thus to gain competitive advantage while reducing the environmental burden of products throughout their entire life cycle.

The following questions arise: "What is a green product?", "What are the characteristics of green products?". It is not surprising that there is no uniform definition of green products in the literature. This is important because different understandings and interpretations of the notion and characteristics of green products in academia, business, customers and stakeholders lead to different assessments, conclusions, decisions and actions, which can have serious consequences for all parties concerned.

The holistic definition of green products is proposed by Sdrolia & Zarotiadis (2019) who argues that "green is a product (tangible or intangible) that minimizes its environmental impact (direct and indirect) during its whole life cycle, subject to the present technological and scientific status." The definition is holistic, because it takes into consideration the life-cycle thinking and environmental impacts (rather than the thinkable negative effects) and it includes of both tangible goods and intangible services. The definition highlights the dynamic dimension of green products as it takes into account the

relative nature of greenness according to the present technological and scientific status (Sdrolia & Zarotiadis, 2019).

By offering green products, businesses can reduce their environmental impact while creating new opportunities in new markets. 'Greening' creates greater value for customers by providing a new value proposition where environmental benefits are key. Green products as new or disruptive offers provide increased environmental benefits compared to conventional products. This is very important for businesses that seek to meet the changing needs and wants of customers since, as Mazar & Zhong (2010) point out, customers' choices reflect not only price and quality preferences but also social and moral values.

6. Eco-innovations

In response to changes, businesses must change to be able to create and deliver value to customers and other stakeholders. This requires that businesses striving for sustained success must address social and environmental issues alongside competitive challenges. Innovation, as an essential tool for adaptation, contributes to the creation of greater social and economic value by businesses. Innovation is the creation of something new or improved (e.g. product, process, model, organisation) that creates value by meeting the needs and expectations of customers and stakeholders.

The term eco-innovation generally refers to innovations that contribute to a sustainable environment through ecological improvements. Eco-innovation includes the development and diffusion of more ecologically sound products, processes, organisational models and systems that can lead to improved living conditions for current and future generations (Halila & Rundquist, 2011). As defined by the Competitiveness and Innovation Framework Programme 2007–2013, eco-innovation refers to all forms of innovation (technological and non-technological), and new products and business practices, that create business opportunities and benefit the environment by preventing or reducing environmental impacts and optimising the use of resources, including energy (CIP). According to the Eco-Innovation Report carried out by the Technopolis Group, eco-innovation is the creation of novel and competitively priced products, processes,

systems and procedures that aim to meet human needs and provide a better quality of life for all, while minimising the use of natural resources (materials, including energy and land) per unit of output and minimising the emission of toxic substances throughout the life cycle (Reid & Miedzinski, 2008).

Eco-innovation focuses on innovation aimed at sustainable development by developing products and technologies that lead to reduced environmental impact and changes in consumption and production patterns. It is important to note that eco-innovation can be developed not only by businesses but by any actor.

Eco-innovations are all actions by all relevant actors (e.g. businesses, policy makers, associations, households) (Rennings, 2000) which:

- Develop, apply or introduce new ideas, behaviours, products and processes; and
- Contribute to reducing environmental burdens or to achieving ecologically defined sustainability objectives.

7. Questions and tasks

- How would you define a sustainable product and a product strategy?
- What is the role of eco-innovation in sustainable development? Give examples of successful eco-innovations.
- How do utility, value and quality relate to sustainability issues?
- What are the competitive advantages of green products?
- How can businesses become greener in their operations and provide environmental benefits to customers and society while generating profits?
- What is life cycle management and how can it contribute to improving the environmental performance of products?
- Choose products with the same function from two or more companies and compare them in terms of sustainability. Make conclusions.
- Select a company of your choice and present its actual and possible social and environmental impacts created and generated by the organization.

- What do you think are the most important factors influencing the future of a product or a business? Explain and justify your answer.
- What do the concepts of “doing well by doing good” and “the business of business is more than just business” mean to you? What are your expectations in a specific case?
- Select a company of your choice and examine and present how successful it is in delivering environmental benefits. Explain and justify your answer.

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SUSTAINABLE SUPPLY CHAINS

József Gál, Sándor Nagy, Krisztián Kis

■ Annotation

A sustainable supply chain is one of the biggest challenges of our time. While we encounter the positive results of globalization, as a result of which cost-effective production is realized, at the same time distribution activities become much more complex. The planning and operation of supply networks involve a significant amount of work. In the case of long distances, rapidly increasing energy prices mean ever-increasing costs. However, regional production organization puts less burden on the natural environment and its effects on society are also appreciated. For the sake of sustainability, one should not only focus on minimizing costs. Sustainability must appear in all 5 parts of the supply chain, therefore the appropriate supply chain model must be used when performing the given task. We shape the students' perspective with the help of a case study. In the case of sustainable development, it is necessary to define both short- and long-term goals, as well as to measure them against the plans.

Key words: sustainability, logistics, supply chain, environmental protection

1. Introduction

In recent years, in our globalized world it has been seen that more and more companies and their related supply chains and networks have made progress with regard to sustainability and improved their environmental performance (Zhu et al., 2008), largely in response to customer needs and social expectations. In general, it can be said that in our globalized world supply chains and industry could not function without logistics services, which create significant added value for the

company, also at the global economic level. At the same time logistics services also cause a significant environmental burden, largely in the form of greenhouse gas emissions. In the European Union, after the energy industry, passenger and freight transport is responsible for the second largest amount of greenhouse gas emissions (EC, 2017).

The trend of increasing emissions will most likely continue, despite the crisis caused by the coronavirus epidemic, because of the movement of goods. At the same time, the recovery from the crisis caused by the epidemic also offers a long-term sustainable way to meet environmental constraints and, taking social expectations into account, it would require the development of business processes and operations. (Diófási-Kovács, 2020)

That is why the improvement of environmental performance and the internalization of their externalities are expected to also be issues for logistics service providers. In terms of the economic aspects of the environmental benefits, competitiveness also emerges as a factor (Vörösvárczki, 2015).

2. Supply chain management

Supply chain management (SCM) is the management of the flow of goods and services and includes all processes that transform raw materials into final products. (Figure 1) It involves the active streamlining of a business's supply-side activities to maximize customer value and gain a competitive advantage in the marketplace. These goals must be kept in focus, because sustainability is our future and is becoming more and more important for each participant of economy.

Supply chain management (SCM) is the centralized management of the flow of goods and services and includes all the processes that transform raw materials into final products.



Figure 1. Supply chain management.
Source: Daniel, D., 2022.

By managing the supply chain, companies can cut excess costs and deliver products to the consumer faster and more efficiently.

Good supply chain management keeps companies out of the headlines and away from expensive recalls and lawsuits.

The five most critical elements of SCM are developing a strategy, sourcing raw materials, production, distribution, and returns.

A supply chain manager is tasked with controlling and reducing costs and avoiding supply shortages. (Fernando, 2022)

2.1. The changing logistics environment

As the competitive context of business continues to change, bringing new complexities and concerns for management generally, it also has to be recognized that the impact of these changes on logistics can be considerable. Indeed, of the many strategic issues that confront the business organization today, perhaps the most challenging are in the area of supply chain management and logistics (Christopher, 1998). This is complemented by the increasingly strong social expectation that, in order to protect the natural environment, only economic activity that takes into account the requirements of sustainability can be carried out.

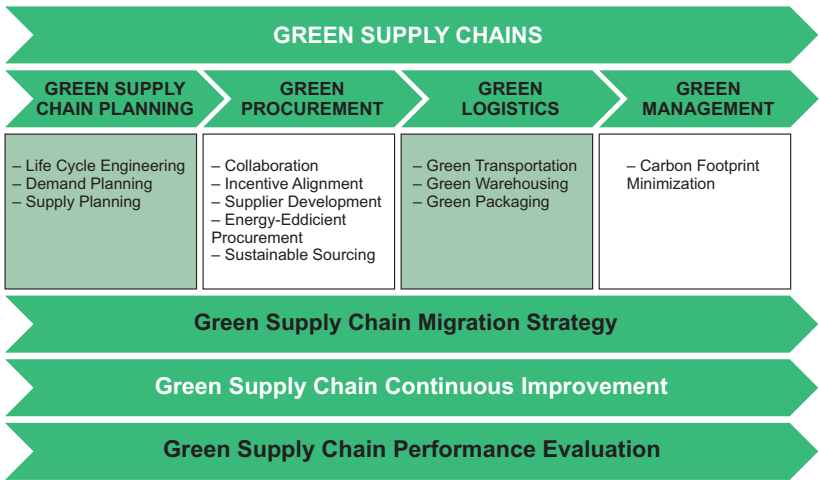


Figure 2. Green supply chains.
Source: Green Supply Chain, 2022.

Logistics processes, which connect economic actors, play a major role in a sustainable supply chain. The aim is to divide the centralized factories of the global producer market. Despite the significant transport distances, the specific freight charges per product unit were favourable, however, nowadays we are facing rising fuel prices and supply difficulties. The role of local, regional producers is coming to the fore again, so the risk and costs of the supply – under the current conditions – can already be more favourable.

2.2. How Supply Chain Management (SCM) Works

Supply chain management (SCM) represents an effort by suppliers to develop and implement supply chains that are as efficient and economical as possible. (Figure 3) Supply chains cover everything from production to product development to the information systems needed to direct these undertakings.

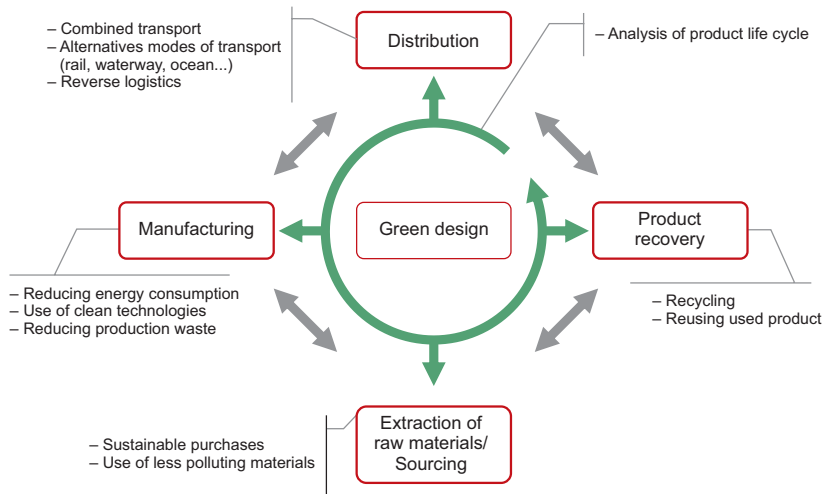


Figure 3. Delimiting the Green Supply Chain.

Source: Supply Chain Monitor, 2008.

Typically, SCM attempts to centrally control or link the production, shipment, and distribution of a product. By managing the supply chain, companies can cut excess costs and deliver products to the consumer faster. This is done by keeping tighter control of internal inventories, internal production, distribution, sales, and the inventories of company vendors.

SCM is based on the idea that nearly every product that comes to market results from the efforts of various organizations that make up a supply chain. Although supply chains have existed for ages, most companies have only recently paid attention to them as a value-add to their operations.

2.3. Five parts of Supply Chain Management

The supply chain manager tries to minimize shortages and keep costs down. The job is not only about logistics and purchasing inventory. According to [salary.com](https://www.salary.com), supply chain managers “oversee and manage overall supply chain and logistic operations to maximize efficiency and minimize the cost of organization’s supply chain.” (Supply Chain Manager, 2022)

Productivity and efficiency improvements can go straight to the bottom line of a company. Good supply chain management keeps companies out of the headlines and away from expensive recalls and lawsuits. In SCM, the supply chain manager coordinates the logistics of all aspects of the supply chain. In the next five subsections, the topic will be discussed according to Fernando’s model, as updated in 2022. (Fernando, 2022)

2.3.1. Planning

To get the best results from SCM, the process usually begins with planning to match supply with customer and manufacturing demands. Firms must predict what their future needs will be and act accordingly. This relates to the raw materials needed during each stage of manufacturing, equipment capacity and limitations, and staffing needs along the SCM process. Large entities often rely on ERP system (Enterprise Resource Planning) modules to aggregate information and compile plans. In such cases, it is possible to search for market alternatives and search for cost-effective solutions. In addition to their immediate short-term business interests, businesses must pay attention to the criteria of sustainability, which cannot be limited only to the natural environment.

2.3.2 Sourcing

Efficient SCM processes rely very heavily on strong relationships with suppliers. Sourcing entails working with vendors to supply the raw materials needed throughout the manufacturing process. A company may be able to plan and work with a supplier to source goods in advance. However, different industries will have different sourcing requirements. In general, SCM sourcing includes ensuring:

- the raw materials meet the manufacturing specification needed for the production of goods,

- the prices paid for the goods are in line with market expectations,
- the vendor has the flexibility to deliver emergency materials due to unforeseen events,
- the vendor has a proven record of delivering goods on time and in good quality.

Supply chain management is especially critical when manufacturers are working with perishable goods. When sourcing goods, firms should be mindful of lead time and how well a supplier can comply with those needs.

2.3.3. Manufacturing

At the heart of the supply chain management process, the company transforms raw materials by using machinery, labour, or other external forces to make something new. This final product is the ultimate goal of the manufacturing process, though it is not the final stage of supply chain management.

The manufacturing process may be further divided into sub-tasks such as assembly, testing, inspection, or packaging. During the manufacturing process, a firm must be mindful of waste or other controllable factors that may cause deviations from original plans. For example, if a company is using more raw materials than has been planned and sourced, due to a lack of employee training, the firm must rectify the issue or revisit the earlier stages in SCM.

2.3.4 Delivering

Once products are made and sales are finalized, a company must get the products into the hands of its customers. The distribution process is often seen as a brand image contributor, as up until this point, the customer has not yet interacted with the product. In strong SCM processes, a company has robust logistic capabilities and delivery channels to ensure timely, safe, and inexpensive delivery of products.

This includes having a backup or diversified distribution methods should one method of transportation temporarily be unusable.

2.3.5 Returning

The supply chain management process sometimes concludes with support for the product and customer returns. Its bad enough that a customer needs to return a product, and its even worse if it's due

to an error on the company's part. This return process is often called reverse logistics, and the company must ensure it has the capabilities to receive returned products and correctly assign refunds for returns received. Whether a company is performing a product recall or a customer is simply not satisfied with the product, the transaction with the customer must be remedied. (Fernando, 2022)

Many consider customer returns as an interaction between the customer and the company. However, a very important part of customer returns is the intercompany communication to identify defective products, expired products, or non-conforming goods. Without addressing the underlying cause of a customer return, the supply chain management process will have failed, and future returns will likely persist.

2.4. How to manage to green supply chain?

A supply chain is the network of individuals, companies, resources, activities, and technologies used to make and sell a product or service. A supply chain starts with the delivery of raw materials from a supplier to a manufacturer and ends with the delivery of the finished product or service to the end consumer.

SCM oversees each touchpoint of a company's product or service, from initial creation to the final sale. With so many places along the supply chain that can add value through efficiencies or lose value through increased expenses, proper SCM can increase revenues, decrease costs, and impact a company's bottom line.

3. Types of Supply Chain Models

Supply chain management does not look the same for all companies. Each business has its own goals, constraints, and strengths that shape what its SCM process looks like. In general, there are often 6 different primary models a company can adopt to guide its supply chain management processes. (Fernando, 2022) It noted that each model provides an opportunity for the extensive incorporation of sustainability requirements and their practical application.

3.1. Continuous Flow Model

One of the more traditional supply chain methods, this model is often best for mature industries. The continuous flow model relies on a manufacturer producing the same good over and over and expecting that customer demand will undergo little variation.

3.2. Agile Model

This model is best for companies with unpredictable demand or customer-order products. This model prioritizes flexibility, as a company may have a specific need at any given moment and must be prepared to pivot accordingly.

3.3. Fast Model

This model emphasizes the quick turnover of a product with a short life cycle. Using a fast chain model, a company strives to capitalize on a trend, quickly produce goods, and ensure the product is fully sold before the trend ends.

3.4. Flexible Model

The flexible model works best for companies impacted by seasonality. Some companies may have much higher demand requirements during peak season and low volume requirements in others. A flexible model of supply chain management makes sure production can easily be ramped up or wound down.

3.5. Efficient Model

For companies competing in industries with very tight profit margins, a company may strive to get an advantage by making their supply chain management process the most efficient. This includes utilizing equipment and machinery in the most ideal ways in addition to managing inventory and processing orders most efficiently.

3.6. Custom Model

If any model above doesn't suit a company's needs, it can always turn towards a custom model. This is often the case for highly specialized industries with high technical requirements such as an automobile manufacturer. (Fernando, 2022)

4. Importance of Supply Chain Models

With increasing globalization and easier access to different kinds of alternative products in today's markets, the importance of product design in generating demand is more significant than ever. In addition, as supply, and therefore competition, among companies for the limited market demand increases and as pricing and other marketing elements become less distinguishing factors, product design likewise plays a different role by providing attractive features to generate demand. In this context, demand generation is used to define how attractive a product design is in terms of creating demand. In other words, it is the ability of a product's design to generate demand by satisfying customer expectations. But product design affects not only demand generation but also manufacturing processes, cost, quality, and lead time. The product design affects the associated supply chain and its requirements directly, including manufacturing, transportation, quality, quantity, production schedule, material selection, production technologies, production policies, regulations, and laws. Broadly, the success of the supply chain depends on the product design and the capabilities of the supply chain, but the reverse is also true: the success of the product depends on the supply chain that produces it.

Since the product design dictates multiple requirements on the supply chain, as mentioned previously, then once a product design is completed, it drives the structure of the supply chain, limiting the flexibility of engineers to generate and evaluate different (and potentially more cost-effective) supply-chain alternatives. (Gokhan, Mehmet, Needy, Norman, 2010)

5. Discussion questions and tasks for students

Case Study

According to this learning material, find the best solution. Present your answer in a slide show. Write your reasons about your answer, describe it. A minimum of 10 slides. There is no one correct answer.

Situation nowadays:

- We need feed for our animals.
- We've bought the same feed from a company for years.
- The seller is a domestic company.
- The costs of storing is a fixed amount in a warehouse.
- Transport costs are included in the price.

A company has appeared from a different country outside of the EU,

- which offers a 30% lower price if we buy double the quantity at the same time,
- but transport is not included and
- storage is necessary (we have enough capacity).

Do we accept the new offer or refuse it and use the original supplier? Say why or why not. Do not forget sustainability!

6. Further reading

The Sustainable Development Goals were “a great gift to humanity” when they were adopted, but much work is still needed to develop science-based pathways to show how they can be effectively and equitably implemented. Rather than setting goalposts for 2030 and then trying to decipher how to meet them, the TWI2050 team (The World in 2050) delineated what constitutes a sustainable 2050 in a broad sense: environmentally, economically, socially, and governmentally. They then began working backward, or “backcasting,” to develop sustainable development pathways to guide actions, policies, and shifts in attitudes and norms that must be adopted today to reach that desired future. (Crowell, 2020) Most integrated assessment models aren't currently designed to examine the multitude of factors influencing the achievement of the full suite of SDGs, although modelling teams

associated with The World in 2050 are working toward that goal. (The World in 2050, 2022)

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GREENWASHING AND SOCIAL WASHING

Jana Gálová

■ Annotation

The good news is that sustainability is starting to be a decisive factor in many cases in customer purchasing decisions. The bad news is that phrases such as “sustainability”, “green” and “eco-friendly” are often used as marketing ploys that focus on increased sales rather than on real action to eliminate the negative impact on the planet. This concept is called “greenwashing” and it means misleading the customer with slogans and advertising to make them feel good about their purchase, despite the fact that the brand itself does not do enough to reduce its carbon impact or improve the working conditions of those who make the products. The concept of social washing is similar: satisfying the demand of both the public and investors by presenting them a misleading picture of the company, in this case, regarding social and human rights issues; with its variations such as pink washing, rainbow washing and blue washing.

Key words: greenwashing, green marketing, social washing, pinkwashing, rainbow washing, blue washing

1. Introduction

Caring about the planet is increasingly becoming an essential focus point of everyday life and consumer behaviour, resulting in seeking ways to make environmentally responsible purchases. However, all these efforts to purchase from companies that boast of making better choices for the environment might not have the benefits that people believe they do.

Nowadays, both businesses and consumers are more and more alert to misleading or even false claims about the environmental, eco-friendly and societal performance of organisations.

The days of publishing broad statements about what companies do to protect people and the planet without being challenged are over.

Decades ago the term “green washing” was introduced – when companies overstated or even lied about their environmental practices, focusing on aspects such as sustainable sourcing or carbon reduction. There are many types of the so-called “washing” we hear about these days, often referred to by the phrase social washing.

The aim of this chapter is to present and discuss the use of greenwashing, and to make a detailed comparison with green marketing activities, as well as social washing, pink washing and blue washing by businesses.

2. Background

In order to be able to identify why greenwashing sustainability claims are so effective in attracting people’s attention, it is important to start by stating a few facts from CSR (corporate social responsibility) reporting about consumer attitudes towards sustainability.

In October 2015, the Nielsen Global Survey of Corporate Social Responsibility and Sustainability published a report entitled *“The Sustainability Imperative: New Insights On Consumer Expectations”*. According to the report, 66% of global consumers say they are willing to pay extra for a sustainable product (up from 55% in 2014 and 50% in 2013). The survey polled more than 30,000 consumers in 60 countries throughout Asia-Pacific, Europe, Latin America, the Middle East, Africa, and North America. There is a huge amount of money in green alternatives and, as green products are often identical to conventional ones, the costs are comparable (Nielsen, 2015; de Freitas Netto et al., 2020).

On the other hand, *“The Sustainability Imperative”* report by Ipsos from November 2020 states that in the USA, 35% of consumers say that they find it difficult to follow through on their sustainability principles and 41% say that sustainability is “just one more thing” they

have to worry about, so it sometimes falls to the bottom of their list (Ipsos, Lacey & Long, 2020).

GreenPrint (a PDI company) is a global environmental technology company, offering sustainability as a service. According to their 2022 Business of Sustainability Index, Americans want eco-friendly products, but 78% aren't sure how to identify them. 70% of Gen X consumers would spend more on a sustainable brand, and that figure jumps to 80% for Gen Z and 79% among millennials. At the same time, only 38% believe companies when they make environmental claims.

The Business of Sustainability Index published in June 2022 was conducted in collaboration with Directions Research through an online survey fielded in March 2022, among a demographically balanced nationally representative sample of 1,062 U.S. adults (data weighted by variables: sex, age, geographic region, race/ethnicity, and education) (GreenPrint, 2022).

In general, when people are asked what they look for in a sustainable brand, usually the answer is eco-friendly materials and environmentally friendly production processes. Sustainability, however, goes well beyond these aspects. It is also meant to extend to how sustainable a business is when operating on its social and humanitarian fronts. Similarly, when we talk about greenwashing, it tends to take different forms, as companies try to camouflage various problematic practices (Valecha, 2021).

2.1. Greenwashing

The term greenwashing is derived from the word whitewashing, which is a deliberate attempt to conceal unpleasant or incriminating facts about someone or something. The reason for using the colour green in the term greenwashing is that we typically associate this colour with nature and a happy, healthy planet. In any advertising campaign focused on the environment, green is the predominant colour, and we already subconsciously associate advertising statements containing this colour with the idea that the product protects the planet. However, toilet paper with a picture of a dense coniferous forest and a meadow in bloom may be as non-environmentally friendly as any other, but can evoke the impression that we are doing a good thing by buying it. The same is true for the very words green or ecological. Greenwashing therefore means misleading customers and public opinion about

a company's environmental goals and activities. Some companies try to profile themselves as environmentally responsible and make it clear to the public that they are committed to improving their impact on the environment, when in fact they invest only minimal resources in protecting and mitigating their impact on it (e.g. they invest only in the advertising costs of promoting green activities instead of actually implementing environmentally positive changes). Since greenwashing is all around us and everyone has encountered it, whether we perceive it consciously or not, let us look at this concept in detail.

Greenwashing is when an organization spends more time and money on marketing itself as environmentally friendly than on actually minimizing its environmental impact. It is a deceitful marketing tactic intended to trick consumers who prefer to buy goods and services from environmentally conscious brands (Edwards, 2022). While a nice "green" billboard may not yet convince a customer to buy a certain product, it may just be the aspect that makes the difference between a "green" product and a "non-green" competitor.

As a whole, greenwashing refers to adopting a controversial practise of providing misleading information about sustainable business practices of companies and brands in order to create a false perception and/or mask unsustainable and harmful practices and methods, often ones that are detrimental to the environment. Today, it has taken many forms, helping companies camouflage not just environmental but also socially problematic practices (Valecha, 2021; ESG Analytics, 2022).

The flaunting of environmentalism began in the 1960s, an era when the sustainability movement started to gain momentum and since then there's been a global rise in concern for the environment (Green Business Bureau, 2021).

The term greenwashing was first used by the American journalist and activist Jay Westerveld in 1986 in his critical essay about hotels that offered guests the choice of whether or not the staff would change their towels every day. Although the latter choice had a positive impact on the environment, reducing costs and cutting down on the washing of linen (claiming it to be a company water conservation strategy), the hotels did not actually do anything else beneficial for the environment, e.g. they did not address waste recycling at all (Globálnevzdelávanie, 2019; de Freitas Netto et al., 2020).

Greenwashing practices were first used in the mid-1980. Back then, the well-known oil company Chevron ran a series of very expensive TV and print advertisements. The aim was to convince people that even though they were an oil company, they cared about nature and the environment.

The now-infamous campaign (titled People Do) featured bears, butterflies, sea turtles and other cute animals – to create the impression of perhaps the most environmentally friendly company of the year. Interestingly, the commercials even won an Effie advertising award in 1990. On the other hand, they became notorious among environmentalists, who have proclaimed them the gold standard of greenwashing. While the campaign ran, Chevron was actively violating the Clean Air Act 42 U.S.C. §7401 et seq. (1970, which establishes standards to protect public health and public welfare and to regulate emissions of hazardous air pollutants), and the Clean Water Act 33 U.S.C. §1251 et seq. (1972, which establishes pollution control programs and quality standards for surface waters), as well as spilling oil into wildlife refuges (Edwards, 2022; EPA, 2021 & 2022; Watson, 2016).

In 1989, the chemical company DuPont announced its brand new double-hulled oil tankers with ads featuring marine animals prancing in chorus to a full orchestral score of Beethoven's Ode to Joy. However, it turned out that that year the company was the largest corporate polluter in the USA, as the environmental nonprofit Friends of the Earth pointed out in its report *Hold the Applause*, when it reported the company had discharged more than 348 million pounds of pollutants to land, air and water with its subsidiaries (Doyle, 1991; Watson, 2016).

Since then, more and more companies have been using greenwashing practices, and a lot of people are falling for them.

It is essential to highlight that offering falsely labelled green products can have dangerous consequences in that it distracts from the real systemic changes the society needs to make to mitigate the climate change and environmental crisis. It often manipulates citizens and exploits their ecological sensitivities in order to create profit for businesses. Such practices therefore create a non-transparent market situation and can undermine people's trust in truly green products. In many cases, those labelled 'green' may even be more harmful than their alternatives. Thus, in spite of their goodwill, consumers might choose a solution that does not help the planet.

In addition, not all companies practice greenwashing maliciously, but they do so despite having good intentions. Often, it is as much a misunderstanding on the marketers' end as it is for customers. Even so, unintentional greenwashing still spreads false information about being sustainable and can convince well-meaning customers to make bad choices.

The fact that people increasingly care about green issues is well-known by marketers. Greenwashing as a not so new marketing practice is therefore increasingly being used by various companies and corporations in the form of environmentally friendly electric cars, pretty clothes made from recyclable plastics, or green and sustainable food concepts sold worldwide.

Companies can offer green products of all kinds, and more and more companies are starting to claim they are green in their advertising communications: they use eco-friendly packaging, don't use plastic cutlery, or have lots of special certificates. Coffee in cafés is suddenly green, even cosmetics, petrol and electricity are green, as well as disposable food packaging. While in many cases this is a real effort to help the environment, some companies are making these changes just to make themselves more attractive to environmentally conscious customers, while in reality they are doing little to help or are even harming the planet.

Misleading consumers about a company's environmental practices or the environmental benefits of a product or service – this is the definition provided by TerraChoice (acquired by UL), which first came up with defining the sins of greenwashing and looking for their presence on specific American products. In 2007, they conducted research on more than a thousand proclaimed eco-friendly products and compiled a list of the six most common sins. In 2009, they added a seventh one (Green Business Bureau, 2021; UL Solutions, 2022; Globálnevzdelávanie, 2019; Fandlová, 2021; Noyes, 2021). They are the following:

1. **Sin of the hidden trade-off:** a company emphasizes one aspect of a product but conceals the other ones or the negative impacts associated with any phase of their life cycle (i.e. extraction and processing of materials, production, distribution, consumption or disposal), which often outweigh the positives; *e.g. the aforementioned laundering of towels and*

bed linen in hotels, which otherwise does nothing to protect the environment.

2. **Sin of no proof:** a claim that cannot be further verified, or is difficult to verify (by available supporting information or a reliable third-party); some companies even award their products their own certifications instead of seeking objective assessments from independent organisations; e.g. the claim that the product is “not tested on animals” without a credible certificate, or that a certain percentage of the product comes from recycled materials, but not backed up by data.
3. **Sin of vagueness:** the use of phrases that cannot be properly defined as to what they actually mean because they are too vague or general for the customer to understand; e.g. “all natural”, “sustainable”, “eco” or “environmentally friendly” – but not everything natural is “green”, after all arsenic and mercury are also natural.
4. **Sin of worshiping false labels:** using false labels that look like they are approved by a third party, but in fact they officially are not.
5. **Sin of irrelevance:** companies make claims that might sound good but no longer have meaning and do not relate to established practice; e.g. stating the claim “CFC-free” even though CFCs (chlorofluorocarbons) have long been banned.
6. **Sin of lesser of two evils:** comparing a product to another one in the same, problematic category; while a product may be better in comparison, the entire category is environmentally problematic or ethically questionable; e.g. organic cigarettes, light versions of soft drinks, or SUVs.
7. **Sin of fibbing:** a company makes a claim that is simply not true and is outright false; e.g. goods falsely claiming to be ENERGY STAR® certified.

2.1.1 Greenwashing examples

Companies in the energy sector are in general most often among those considered to have the worst environmental records and to be the most frequent practitioners of greenwashing to polish their public image.

An infamous example of greenwashing is BP, the oil company. In 2001, BP introduced its rebrand strategy from "British Petroleum" to "Beyond Petroleum," pledging to hold emissions constant and to be a steward to the planet, complemented with an advertising campaign. The use of the phrase would suggest that BP's activities are no longer based only on oil, but also extend further afield, namely into the field of renewable energy sources. Nevertheless, at the time the campaign was launched, the reality was that renewables accounted for less than 1% of BP's revenues. BP's rebranding included a new logo design that features a green and yellow Helios sun symbol to represent the brand's renewed environmental awareness and green growth strategy. Environmental activists commented that even the rebranding exercise of the company was another attempt to greenwash and shift focus from its poor environmental record. A number of parodies of the campaign were made at the time, further damaging BP's reputation and complicating the already crisis situation. The company completely failed to live up to its new image, the campaign was the target of much criticism and BP's further oil incidents did not help either. BP is famous for the Prudhoe Bay Oil Spill in 2006 near Alaska and a similar incident in the Caspian Sea in 2008. However, it was in 2010 that they became notorious for the Deepwater Horizon Oil Spill, when their drilling rig exploded in the Gulf of Mexico, resulting in up to 780 million litres (4 to 5 million barrels) of oil leaking into the sea. After extensive clean-up work, BP officials declared that all was well again and no environmental damage had been caused by the disaster. This bold claim, however, was contradicted by the considerable lack of transparency that had come with the whole case (neither the public nor the media was allowed to approach the area and, according to sources, no official scientific research had even taken place to confirm that the state of the ecosystem in the Gulf of Mexico was back to normal). With hindsight, nonetheless, more and more facts were coming to light that were clear evidence that the effects of the oil disaster were greater than anyone ever thought – from to the fatal pollution of the marine area, to the death of its fauna, to unemployment, morbidity, and even the deaths of local workers and residents. Despite these indisputable facts, BP continues to proclaim itself as green – it communicates its oil trading as an environmental venture that is moving towards renewables. In 2019, ClientEarth, the environmental law charity and its lawyers complained that BP's adverts on billboards,

newspapers and television in the UK, US and Europe as well as on social media and online, described gas as “cleaner burning” and that it is “working to make energy cleaner”, when in fact the vast majority of its planned capital investment was still in oil and gas. The company was using misleading advertising to greenwash its image again (Globálnevzdelávanie, 2019; Carpenter, 2020; ESG Analytics, 2022; GALTON Brands, 2021; Chapman, 2019).

A careless attitude towards the environment is rather typical for the practices of other oil majors, too, such as Chevron, Total, Royal Dutch Shell. In 2020, the Italian oil giant Eni was given the highest possible €5 million fine for greenwashing palm-oil based diesel as green by Italy’s Competition Regulator.

Amazon is among the global corporations that are criticised, too. The online trading giant needs a huge amount of energy to run its servers, which are not generated from clean sources. This makes it different from companies such as Microsoft or Google, which have made the supply of clean energy one of their priorities. In 2018, Amazon decided to buy 20 thousand vehicles, none of which were electric, which was also described as a significantly non-environmental decision. That was one of the moments when Amazon could have moved in an eco-friendly direction towards sustainability, but it didn’t do so. Moreover, the company also does not issue a sustainability report showing what green steps it has taken (Ivančák, 2022).

Another global tech giant, Apple, strives to have a positive public image as a green company. They announced in 2020 that the iPhone 12 would come without a wall charger or earbuds in order to cut down on e-waste, which is a growing problem in this case. While this measure could certainly be considered as a step in the right direction, critics saw it only as a way to save money while deflecting attention to the company’s problematic planned obsolescence. The brand’s phones are also expensive to repair and developers’ support stops only a few years after release (Noyes, 2021).

If we look at the big corporations that produce fast-moving consumer goods (FMCG), we find that, for example, all packaged food is ultimately produced by about a dozen large food companies. However, these firms own an elaborate network of subsidiaries, each of which owns dozens and dozens of brands, which then fill the supermarket shelves. If the parent company is known for producing food with the help of modern slavery (which is more common than it seems) and for

helping to deforest the Amazon rainforest (also a common thing), but suddenly one of their sub-brands has become perfectly organic – one can assume something is not right here.

In the rankings and published lists of the least environmentally friendly companies that are regularly issued year after year, the same names often appear in unflattering positions. The reasons for their inclusion on these lists vary, but most often are related to the production of plastics or plastic waste, air pollution or the unsustainable use of water and natural resources.

The #breakfreefromplastic (BFFP) movement in its *"BRANDED Volume IV: Holding Corporations Accountable for the Plastic & Climate Crisis"* revealed the Top 10 Corporate Plastic Polluters of 2021. The foundational brand audit methodology was designed by the Global Alliance for Incinerator Alternatives (GAIA), Mother Earth Foundation, Citizen consumer and civic Action Group (CAG), and Greenpeace Philippines, but the report relies on self-reported data submitted by diverse participants from all over the world. The 2021 report was a collaboration of 11,184 volunteers who conducted 440 brand audits across 45 countries in Asia, Europe and North America. The analysis found that the top plastic-polluting corporations of 2021 were: The Coca-Cola Company, PepsiCo, Unilever, Nestlé, Procter & Gamble, Mondelēz International, Philip Morris International, Danone, Mars, Inc., and Colgate-Palmolive (Break Free From Plastic Movement, 2021).

In 2019, the global fast food chain McDonald's received unwanted headlines due to its paper straw controversy, when it admitted that the cardboard straws introduced to replace the plastic ones are actually non-recyclable (Akepa, 2021).

One of the most famous examples of greenwashing in the food and beverage industry is the Coca-Cola company. The brand was ranked number one as the company that produces the most plastic worldwide by an expert jury of the aforementioned study for five consecutive years since the study's launch. The brand produces a whopping 3,400 plastic bottles per second. Despite the terrifying figure, Coca-Cola still claims in its communications that it is selling more and more bottles that can be recycled. The company even faced a lawsuit in 2021 from the Earth Island Institute for misleading advertising about sustainability and environmental friendliness (Fandlová, 2021; Ivančák, 2022). It also claims that its goal is to make 100% of their packaging recyclable globally by 2025 and using at least 50% recycled

material in their packaging by 2030, as well as collecting and recycling a bottle or can for each one they sell by 2030 (The Coca-Cola Company, 2022).

By comparison, the rival beverage brand Evian pledged to adopt a circular model and become a circular brand by transforming their packaging to make all their plastic bottles (excluding label and cap) from 100% recycled PET (rPET) by 2025 (Evian, 2022).

Another one of the most criticised companies in the long-term is the Swiss food and drink giant Nestlé. Environmental organisations and activists point out that Nestlé is one of the world's biggest producers of plastic waste, which often ends up in fragile ecosystems such as the seas and oceans. It has also caused a great many environmental scandals. The conglomerate is accused of being a contributor to the deforestation of rainforests due to palm oil extraction since 2010. In addition, Nestlé faced criticism for the death of a large number of fish in a town in France near to its factory in Challerange in 2020. There is also considerable outrage, among other things, at the fact that the company is pumping millions of litres of water daily from several springs in Florida. Although Nestlé argues that this can do no harm to the ecosystem, there have been threats of partial overdraft at the site in the past. Furthermore, the company has been accused of using child labour in cocoa growing nations, unethical production methods, and misleading marketing strategies on numerous occasions, therefore it tries to address these issues with programs within its sustainability initiatives.

Nestlé's campaign for the chocolate Študentská pečat' (Student Seal) in Slovakia and the Czech Republic used the slogan "S přírodou hráme fér – We play fair with nature", which aimed to evoke the feeling that the chocolate comes from the fair-trade market, which is not true. Nonetheless, in their advertising, Nestlé pointed out that their cocoa is 100% sustainably sourced (Ivančák, 2022; Fandlová, 2021; Assoune, 2022b).

In the UK, the advertising watchdog Advertising Standards Authority (ASA), banned a high-profile marketing campaign by Swedish alt-milk brand Oatly in 2022, due to its misleading green claims. In paid-for ads on social media, the company claimed that following a diet without dairy and meat products would reduce a person's environmental impact more than reducing their flights, car rides, and other transportation combined. However, the ASA investigation found

that Oatley had overstated the emissions of the meat and dairy industry by not taking into account emissions covering the full life cycle of transport, only emissions when a vehicle is driven (Sweney, 2022).

Partial greenwashing was observed by an environmentalist and member of the ecological civic association Pestrec in the case of the retailer Lidl and its campaign “Voda pre stromy – Water for the trees” in Slovakia. Simply put, the principle of the campaign was that for every 1.5 litre bottle of a particular mineral water sold, 0.01 EUR will be spent on planting a tree in a forest. The campaign specifically targets the High Tatras mountains’ forests where an infamous wind calamity occurred in 2004, uprooting or breaking 12,000 hectares of woods in a belt of more than 30 kilometres. The company reportedly managed to plant more than a million trees during the lifetime of the campaign. Although the idea is great, since tree planting is an essential mitigation measure against climate crisis, too, the problem here is that to plant a tree you have to buy a plastic bottle, which is not a product that has no negative effect on the environment (Kutlík, 2021).

Another industry where greenwashing is rather often used is the fast fashion clothing industry, which produces large quantities of clothing in a less than environmentally friendly and sustainable way, while polluting nature and violating human rights as well. It is considered to generate more emissions than the entire airline industry combined.

The H&M Group produces approximately three billion pieces of clothing a year and presents 12–16 collections a year. However, this well-known brand often uses greenwashing practices. Using the UK Competition and Markets Authority (CMA)’s new guidelines on green claims, the study “*Synthetics Anonymous*” by Changing Markets Foundation published in June 2021 on brands of fast fashion, luxury fashion and online retailing found that 39% of the products studied were accompanied by a sustainability claim, while of these, 59% violated green-claims guidelines in some way. Although brands’ scores varied significantly, H&M fared worse, with 96% of the claims flouting the guidelines in some way (e.g. it was 89% for ASOS and 88% for M&S). On the other hand, the brands not found to be greenwashing tended not to make sustainability-related claims.

Adding to the greenwashing effect is the rise of sustainability claims and standards set up by brands themselves, as reported in the Changing Markets Foundation’s publication “*License to Greenwash*”

from March 2022. This is the case of H&M's Conscious Collection launched in 2019, with claims that all products are sustainably and responsibly produced, without any steps towards third-party verification. Other examples include Inditex's Join Life or Primark Cares. Simply put, fast-fashion products, even if they were made of more sustainable and recycled materials, will never be sustainable.

In fact, the Norwegian Consumer Authority (CA), in close collaboration with the Norwegian Broadcasting Corporation (NRK), found that H&M's portrayal of this collection's sustainability credentials breaches Norwegian marketing laws by providing insufficient information about the exact sustainable nature of the collection (NRK & Mykleost, 2019).

An alliance of major fashion brands announced in mid-June 2022 that it is pausing its use of a sustainability index tool to measure clothes' sustainability after critics described it as greenwashing. Until then, customers could check on H&M's website the environmental impact of 655 garments, as rated by the Higg Materials Sustainability Index (MSI), which includes tools launched in 2021 by a global non-profit alliance, the Sustainable Apparel Coalition (SAC). This happened after the Norwegian Consumer Authority (NCA) warned the H&M group that if they do not cease using this tool by 1 September, it would risk economic sanctions. The investigation of Norway's consumer watchdog was carried out on the Norwegian outdoor brand, Norrøna which also used the same index on its website, with the conclusion that the data was misleading and the claims unsubstantiated (Britten, 2022).

The major fashion retailer & Other Stories (a Swedish clothing, accessories and beauty brand, owned by the H&M group) used to make false production claims, pretending its products were created in Swedish factories under labour protection laws. In reality, they are designed in Sweden, France and the USA, but produced in China, Bulgaria, and Bangladesh (Assoune, 2022b).

Much like in the case of H&M's Conscious Collection, Zara (a Spanish apparel retailer, part of the world's largest apparel retailer, the Inditex group) is also using materials like organic cotton, recycled wool, and Tencel, which is not enough to have a significantly lower environmental impact (Assoune, 2022a).

Primark (an Irish fast-fashion retailer) had been under public scrutiny many times over child labour and forced labour scandals. The

brand can offer very low prices because it employs workers from the poorest countries of the world, such as India and Cambodia, and under terrible working conditions (Assoune, 2022b).

But greenwashing is far from being limited to the aforementioned industries. In 2022, Unilever upped its efforts to appear eco-friendly. The TV adverts of its cleaning brand Persil, entitled, “Dirt is Good”, were banned by the UK Advertising Standards Authority (ASA) for unsubstantiated claims that its products were “kinder on the planet” with no explanation of how exactly this was the case.

The cosmetics giant L’Oreal failed to combat modern slavery in its supply chains. It has been criticized for not disclosing how it mitigates risks in its operations to ensure its supply chains are free of child labour and modern slavery (Assoune, 2022b).

Eco-Business called out 11 businesses and governments in 2021 and criticised them for making dubious sustainability claims (Hicks, 2021):

- *Saudi Arabia* announced in March 2021 that it would be planting 50 billion trees as part of a plan to achieve net-zero greenhouse gas emissions by 2060. However, there was little detail given about how this reforestation would work in a country with limited water resources, and where the economy is based on fossil fuel extraction.
- The *Alliance to End Plastic Waste (AEPW)*, a Singapore-based non-profit launched in 2019 by 30 oil and chemical companies, claimed to be spending US\$1.5 billion on cleaning up plastic waste in developing countries. In reality, they were planning to largely ramp up plastic production, thus fuelling the plastic pollution crisis. Greenpeace has called AEPW a “distraction” from Big Oil’s expansion plans.
- An ad of the *Metals Company*, a Canadian mining company promoted deep-sea mining as a better alternative to land-based mining, but experts warned about the large number of concerns connected with it and even requests a ban, because of the environmental impact of mining on such little-known ecosystems.
- The Korean cosmetics brand *Innisfree*’s face serum packaging had “Hello, I’m a Paper Bottle” written on the side, but it was revealed to have a disguised plastic lining.

- At the start of 2021, *oil companies* started branding their oil barrels carbon neutral because they claimed to have bought sufficient carbon offsets to account for the carbon emissions of their hydrocarbons.
- *Adidas*, the German sportswear brand, was found guilty of making false and misleading sustainability claims by an advertising ethics jury in France in September 2021, when its “50% recycled” claims for its classic Stan Smith shoe were found to be vague.
- The Australian oil major *Santos* was taken to court in August 2021 over its claims about producing “clean energy” and aiming to achieve net-zero emissions by 2040 – all this by relying on unproven carbon capture technology.
- The *aluminium can industry* wants consumers to believe that aluminium is greener than plastic, with a raft of new canned water brands making claims that aluminium is “infinitely recyclable” and so is better for the environment than plastic bottled water. Nevertheless, the major problem is that there is not enough recycled material to meet demand, and mining the materials needed to produce aluminium is extremely energy and water intensive.
- National Australia Bank (NAB) described its AU\$515 million (US\$374 million) loan awarded to the world’s largest coal export terminal, Port of Newcastle in New South Wales, as “sustainable”, since it came with incentives for hitting certain environmental and social targets. Nonetheless, it ignored the fact that 95% of the facility’s exports are thermal coal.
- Norway’s state-owned oil major *Equinor* announced a 2050 net-zero target in November 2020, committing to align with the Paris Agreement as a “leader in the energy transition”. In Q1 2021, almost half of the firm’s revenue came from selling off wind farm development projects, but for the same period, of the total energy sold, just 0.54% was zero carbon.

The year 2022 in general did not bring any major changes in this respect. Companies that are sincere about their ecology and sustainability philosophy have continued the trends they have set, trying to be as environmentally friendly as possible. However, the behaviour of companies at the other end of the scale in terms of their approach to the environment and sustainability has not changed much either.

2.1.2 Greenwashing monitoring

The European Commission (EC) regularly coordinates sweeps, which are a set of yearly checks to identify breaches of EU consumer law in a particular sector. These website-screenings are carried out simultaneously by national consumer protection authorities in participating countries. For the most recent release of results in January 2022, authorities of 26 Member States, Iceland and Norway checked 223 major websites for misleading consumer reviews (EC, 2022b).

But it was in 2021 that for the first time ever, the sweep focused on greenwashing. After a broader screening, 344 seemingly dubious green online claims were analysed from various sectors such as garments, cosmetics and household equipment. In more than half of the cases, there was no sufficient data provided to judge the claim's accuracy. In fact, 37% of cases included vague and general statements and 59% were without easily accessible evidence to support the claim. Furthermore, the authorities had reason to believe that in 42% of cases the claims were false or deceptive and could potentially be considered unfair commercial practices under EU rules. National authorities were to contact the companies concerned to point out the issues detected and to ensure that these are rectified where necessary (EC, 2021b).

This was one of the initiatives of the Commission's commitment to empowering consumers to play an active role in the green and digital transitions and fighting greenwashing as part of the New Consumer Agenda launched by the EC in November 2020 (EC, 2020).

In addition, in March 2022 the Commission also proposed to update the aforementioned EU consumer rules to empower consumers for the green transition, including the ones to strengthen consumer protection against untrustworthy or false environmental claims, banning greenwashing (EC, 2022a).

The UK's regulator of advertising, the Advertising Standards Authority (ASA) is conducting a series of inquiries into the environmental advertising claims and practices across various sectors, too. The aim is to support global efforts to reduce carbon emissions as well as battle the climate crisis. At the beginning of 2022, the watchdog expanded its investigation to look at the accuracy of green claims concerning waste (e.g. labelled as biodegradable, recyclable or a plastic alternative). Later in 2022, the spotlight would turn to meat and

food sustainability advertising (e.g. beef products as a hugely carbon intensive industry) (Sweney, 2021).

The ASA, for example, banned an ad campaign by Ryanair after accusing it of greenwashing due to the misleading claim that the airline has the lowest carbon emissions of any major airline in Europe, while failing to substantiate this claim. The budget airline was in fact named as one of Europe's top 10 carbon emitters in an EU report in 2019 (Sweney, 2020).

The Ministry of Environment and Food of Denmark – Environmental Protection Agency conducted extensive research and in 2018 compiled an assessment of the environmental impacts of the production, use and disposal of different types of shopping bags available in Danish supermarkets in 2017 (from low-density polyethylene bags to organic cotton). The research proved that exponentially more resources are needed to produce a shopping bag from fabrics compared to cheap polyethylene. The report also analysed how many times you would need to use each type of bag to make up for the resources put into it. While you would have to use paper and reusable plastic bags between 35 and 85 times, in the case of cotton it is up to 7,100 times and for organic cotton (the seemingly most eco-friendly bag) a whopping 20,000 times in its lifetime. Of course, if you're already stocked up on shopping bags made of any fabric or organic cotton, the best thing you can do is to keep using them (Ministry of Environment and Food of Denmark – Environmental Protection Agency, 2018).

2.2. Greenwashing vs green marketing

There are many ways to convince customers that a product is much greener than it really is. Therefore, with any marketing claim that the ordinary consumers perceive, it is essential to monitor whether it is greenwashing or otherwise misleading the customer. Investing time in building a better understanding of the companies whose products we buy most often is a good place to start. In the case of a company with a history of environmental and social transgressions, their new eco-chocolate bar is probably just an image enhancement effort and has nothing to do with real change. However, if the company has been investing in sustainability for years, the chances are they would not throw away their work just for a few ads – and they can therefore be trusted more.

A large number of international companies and well-known brands are now trying to run their production and manufacture products in

an environmentally friendly and sustainable way. There are several initiatives and guidelines created to advise companies on how to steer clear of potential greenwashing.

The *Guide Against Greenwashing* was developed in Norway by the organisations Skift – Climate Business Leaders, Zero, Future in our hands and WWF Norway. It can help companies avoid using inflated claims about their sustainability credentials and prevent criticism from increasingly sceptical consumers, as it defines greenwashing as a term that applies the UN's 17 Sustainable Development Goals (SDGs) (Guide Against Greenwashing, 2022; Hicks, 2020). The 10 principles of the guide for companies are the following:

1. Be honest and accountable.
2. Make sure that the sustainability efforts are not limited to just communications.
3. Avoid talking about the importance of sustainability, nature, the climate and ethical trade, if there were no serious efforts made on these issues.
4. Do not under-communicate emissions and negative impacts on the climate, nature and human lives.
5. Be careful using a big share of the marketing budget on small measures that do not affect the footprint of the company significantly.
6. Avoid buying a clean conscience through climate quotas or by letting others clean up ocean plastic.
7. Use established labelling, or work towards the establishment of good labelling mechanisms if the industry lacks them.
8. Be careful using terms such as "better for the climate, nature, and the environment".
9. "Cherry Picking" from the UN SDGs can lead astray.
10. Donations and sponsorships are good, but no proof of working on sustainability-issues.

It is often difficult for consumers and market actors to make sense of the many environmental labels and initiatives focused on the environmental performance of companies. Currently, there are more than 200 environmental labels active in the EU, and more than 450 worldwide, with some being reliable, some not. To tackle the issue of greenwashing within the European Commission's initiative on substantiating green claims, the European Green Deal states that "*companies making 'green claims' should substantiate these against a standard*

methodology to assess their impact on the environment". Furthermore, the 2020 Circular Economy Action Plan (CEAP) commits that *"the EC will also propose that companies substantiate their environmental claims using Product and Organisation Environmental Footprint methods"*. This initiative is linked to other policies within CEAP: the revision of EU consumer law to empower consumers for active participation in the green transition, a sustainable product policy initiative and the farm to fork strategy (EC, 2021a).

Many companies base their green campaigns on certificates. They are using claims such as certified organic, certified to protect rainforests, uses certified wood, etc. However, not all certificates actually mean something, and many are even created by the companies themselves, e.g. through dubious associations of which they are members. Another category is the misuse of certificates issued by well-known organisations such as Greenpeace, whose members had helped to set the criteria for many certificates, but that is where their activity stops. To this day, however, some companies boast that they are Greenpeace certified.

We have already seen cases where companies invested heavily in their main and most famous product by putting multiple certifications around it and investing huge amounts of money in promoting green solutions to improve its image. However, hundreds of their other products remained just the same.

Although there are numerous green labels worldwide, not all eco-labeling is greenwash. Many certifications and labels offer practical guidance and resources for selecting products and services that really are produced in a more sustainable fashion.

One of them is Ecolabel Index (available at <http://ecolabelling.org/>), which is the largest global directory of ecolabels, tracking 456 ecolabels in 199 countries and 25 industry sectors in 2022. The site explains what products the label is used for and the steps that must be followed to obtain certification. Here is an overview of some of the most well-known certificates that can be found on truly green products:-



Ecocert® is awarded by an independent certification body for cosmetics, textiles, detergents, agri-food and forestry products in France. The certificate is a guarantee that the manufacturer ensures high environmental standards in every step of production. It recycles, prefers eco-friendly materials, and minimises water consumption and the use of chemicals. The information can be found in the form of a logo, the inscription "certified by Ecocert" or the code "ISO, country code, BIO-154".



GOTS (The Global Organic Textile Standard) is one of the best known eco textile certifications. It includes quality control and organic process control of all steps of production, from harvesting the crop, to the use of chemicals, to the environmentally and socially responsible production process.



NaTrue (The International Natural and Organic Cosmetics Association) is a Swiss quality label that certifies producers of natural and organic cosmetics. The certificate is a guarantee that the products do not contain artificial colours, perfumes, preservatives and at least 95% of the product's ingredients come from organic farming.



Ecogarantie® gives a stamp of approval to organic cosmetics manufacturers for protecting the environment, not using genetically modified raw materials, perfumes, petroleum derivatives or artificial colours.



OCS (The Organic Content Standard) guarantees that the product has 95–100% organic ingredients.



ROC™ (Regenerative Organic Certified™) guarantees the highest quality soil, animal welfare and farmworker fairness.



Fair Trade Certified™ is the mark of good and ethical living for all those who have been involved in the production of a product so labelled.

There is a fine line between green marketing and greenwashing. Within green marketing, companies sell products and/or services

based on legitimate environmental positives. It is transparent in the following criteria (Edwards, 2022; Noyes, 2021):

- Manufactured in a sustainable way;
- Free of toxic or ozone-depleting substances;
- Recyclable or manufactured from recycled materials;
- Produced from renewable materials;
- Not using materials harvested from a protected area, or negatively impacting threatened or endangered species when harvested;
- Avoiding slave labour or abusing workers who are not fairly paid;
- Not using excessive packaging;
- Designed to be repairable rather than disposable.

Here are some examples of interesting brands for which transparency is an added value for the customer and more than just a marketing strategy.

Unlike most companies, outdoor clothing retailer Patagonia does not sugarcoat its use of chemicals or the fact that it leaves a footprint. The company's sustainability mission is incorporated on its website stating that they cannot present the company as the model of a responsible company, since they don't do everything a responsible company can do, nor does anyone else they know. However, they are honest about how they came to realize their environmental and social responsibilities and then began to act on them. Thus, instead of boasting about all their brilliant sustainability efforts as if it is enough, they acknowledge that it is not the case, since accountability is one way to avoid greenwashing. In 2011, they even placed an ad in the New York Times for Black Friday telling buyers "Don't Buy This Jacket", with a message asking people to only buy what they need and disclosing the environmental cost of producing the jacket. Their Worn Wear program includes a set of tools to help customers partner with Patagonia to take mutual responsibility to extend the life of its products. It provides resources for responsible care, repair, reuse and resale, and recycling at the end of a garment's life (Dhanani, 2022; Edwards, 2022).

The HundHund clothing brand originates from Berlin and uses a strategy of radical transparency in pricing. Their products are made in Poland and Romania to reduce emissions from transportation and they use high quality, or upcycled, materials for their production. They

focus on minimalist timeless design that should last longer than current trends. To gain a competitive advantage in an environment of other brands that share these principles, they introduced a radical dismantling of the product price, where the customer can see all the input costs that went into the production of the product.

The Everlane clothing retailer also bet on radical transparency and went one step further. The brand honestly chooses the factories it wants to work with for production, and their transparency makes it easy for the customer to see how much of the price of the product actually goes to the manufacturers. All the factories they work with are even traceable on their website for customers to see.

Sheep Inc. has even dared to claim that it is a carbon negative brand and uses transparency in the production of their Merino wool sweaters to the point where the customer is able to keep an eye on the welfare of every single sheep from which the wool is sourced. Through the Connected Dot NFC technology, the customer is connected with a real sheep from New Zealand, which they are able to access with tracking equipment. The brand declares that the yarn is produced in a 160-year-old mill that runs on 100% renewable energy. They use zero waste knitting machines and ensure decent working conditions and living wages for all workers involved.

créème is an emerging brand in Slovakia that prioritizes quality, healthy and environmentally friendly products, so their strategy is to openly share these values with their customers. The organic cotton underwear brand has GOTS certification and in the future they plan to share more information from their production process and product lifecycle.

Dr. Bronner's produces cruelty-free products for body, hair and home using the highest quality organic and fair trade, environmentally responsible ingredients and most of them are vegan and certified to the same organic standards as food.

2.3. Social washing, pink washing, rainbow washing and blue washing

Over the last few decades, companies have come under increasing pressure to adopt environment-friendly policies and run their business more sustainably. In addition to greenwashing, other forms of misusing sustainability claims have come to the fore, such as social washing,

including pink washing, rainbow washing and blue washing. These practices have become rather popular in the decades since the 1980s.

Social washing is an umbrella term that covers all manner of ethical (in)activity related to the treatment of human capital and includes labour and human rights (of employees and broader communities), gender inequality, racial discrimination, modern day slavery and more. Despite the heightened awareness of the public, there are still plenty of examples of companies trying to appear more socially responsible than they actually are and mislead consumers on all manner of environmental, social and governance (ESG) standards. The term has gained new prominence as society evaluates corporations' responses to the sudden challenges presented by the COVID-19 pandemic, since it has provided consumers the rare opportunity to assess the legitimacy of a company's commitments to social good and its priorities (Qach, 2020; Moreau-Chick, 2020).

Organisations have frequently been scrutinised on these issues, and thankfully, some genuinely consider the rights of their employees and stakeholders. Unfortunately, others have adopted methods of tricking consumers and misleading the public with false claims that they are focused on the well-being of all the stakeholders without actually doing anything to support them, with employees and the community presented as the top priority.

Companies that are social washing make it more difficult for consumers to understand the impacts of their purchasing decisions as they are making it difficult to differentiate between the numerous valid and invalid claims (Assoune, 2022b).

Social washing is made use of with the aim of increasing sales and the position of both the brand and company in a better light for economic gains and public image. While it is present across the globe, the social impact of some industries is worse than others, including mining (in fact, mining has both poor environmental and social record) resource extraction, and farming. Products often affected by this practice include fashion, food, automobiles, consumer electronics, and personal care.

Harmful working conditions have been a topic of concern, following incidents like the Rana Plaza building collapse in 2013 in Bangladesh (housing five garment factories) and reports of forced labour and human rights violations being perpetrated on the Uighur community

in the Xinjiang region of north-western China in public works projects as well as factories (Valecha, 2021).

Pink washing and rainbow washing refers to the case when a state or business is making deceptive claims about supporting the LGBTQ+ community to boost its own image. The difference here is that pink washing is generally associated with a country, state (or nation), province, or government, while rainbow washing is typically connected to corporations or businesses adding rainbow colours and/or images to the advertising, apparel, accessories, landmarks etc. In both cases, only surface-level support is actually offered to the community, with few meaningful changes (Garlin, 2022).

The Obama administration was considered by some to use pink washing to distract the public from its other controversial policies. Companies also like to sign up to sponsor pride events while their LGBTQ+ employees often face discrimination at work. Cases of creating false impressions include names such as Amazon, Ikea, Barclays, JC Penney (ESG Analytics, 2022).

A common pink washing practice is creating a rainbow collection, usually for Pride month (June). However, often it is unclear whether or not any real support was provided. In 2018, the charity Stonewall and the retailer Primark were accused of rainbow washing over their range of T-shirts to promote Pride made in Turkey, a country with a poor record on LGBTQ+ rights. The “think before you pink” charity campaign against the Ford Motor Company in 2018 claimed their “Put the brakes on breast cancer” campaign was pink washing since there are links between the disease and car emissions (Achilles, 2022).

Blue washing is when organisations become members of the United Nations Global Compact (UNGC) in order to use this association to enhance their image as an ethical company and potentially to shift attention from controversial business practices. The UNGC (2022) program is the world’s largest corporate sustainability initiative and it encourages companies to:

- Do business responsibly by aligning their strategies and operations with Ten Principles on human rights, labour, the environment and anti-corruption; and
- Take strategic actions to advance broader societal goals, such as the UN Sustainable Development Goals (SDGs), with an emphasis on collaboration and innovation.

As it is in the case of other practices mentioned in the previous subchapters, sometimes, there is an intentional effort to mislead, whereas at other times there is a lack of awareness or complacency. Eventually, the public, business customers or NGOs find the worst offenders and then it can mean irreparable harm to their reputation and finances (Achilles, 2022).

Some of the violators of environmental law and human rights include BP, Eni, Royal Dutch Shell, Rosneft, and BHP – all of them have participated in the UNGC for several years without any improvement in their business practices. Alas, many corporations signed up without any intention of ever following the 10 principles or the SDGs. Vedanta, an Anglo-Indian mining company, was reported for mining deaths, environmental destruction, and spreading carcinogens in the local communities in India for almost a decade. Amnesty International criticized the company in 2010, and when 13 protesters against its Sterlite copper smelting plant were killed in police firing, the plant was shut down in 2018 (over environment concerns by the local government). Vedanta continued to claim that it adhered to the highest industry safety standards and is committed towards SDGs (ESG Analytics, 2022).

As it was mentioned in this chapter, the demand for environmentally friendly and socially responsible products is rising. Conscious consumers want to purchase from companies they believe in, without being targeted to misleading claims or marketing messages. The consequences of adopting social washing include damage to reputation and fewer sales. We are currently witnessing a critical moment in re-defining the role of business in society, with the improvement of the environmental and social reputation not being the end goal, but instead contributing to building a sustainable future (Assoune, 2022b).

3. Discussion questions and tasks for students

1. Find examples of greenwashing in your country from various industries.
2. Find examples of green marketing in your country from various industries.

3. Find examples of social washing, pink washing, rainbow washing and blue washing in your country from various industries.
4. The European Green Deal states that *"companies making 'green claims' should substantiate these against a standard methodology to assess their impact on the environment"*. What proposals, rules and laws have been introduced in this respect?
5. The 2020 Circular Economy Action Plan (CEAP) promises that *"the Commission will also propose that companies substantiate their environmental claims using Product and Organisation Environmental Footprint methods"*. Look up initiatives adopted under this action plan for substantiating green claims.

4. Further reading

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European Commission website – section about Sustainable Development.

European Commission website – section about The European Green Deal, including the 2020 Circular Economy Action Plan (within initiatives on substantiating green claims).

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SUSTAINABLE CONSUMER WARRANTY ON DURABLES

Dario Dunković

■ Annotation

Warranties on consumer durable goods were first introduced as a common marketing strategy to attract customers. Subsequently, their role was upgraded as a consumer policy tool for expanding consumer rights and now they are also beneficial in implementing sustainable consumption policy. This chapter elaborates on warranty theories, the current European guarantee policy on durables and most importantly, features of warranties which can help to achieve sustainable goals. The problem lies in the fact that a significant proportion of consumers replace a functional product with a modern one before its useful lifetime expires or when a failure occurs, which is not in line with the guidelines of sustainable consumption. The further regulation of consumer warranties can lead to more sustainable outcomes.

Key words: consumer warranty; European regulation; warranty policy; durable goods; sustainable consumption

1. Introduction

Warranties on durable goods became a common marketing strategy aimed at achieving competitiveness in the 1970s. After that, their role was extended as a consumer policy tool for expanding consumer rights, and now they are also a tool for implementing sustainable consumption policy. A longer warranty period on consumer durable goods can encourage consumers to use devices longer and conserve valuable resources. After-sales product warranty is an important

contribution to realising sustainable consumption, as it offers the consumer the choice of free repair in the early period of use.

Many households change devices and appliances, even though their functionalities are still appropriate and in good condition, just to have more modern ones, which is contrary to environmentally friendly behaviour. Consumers use, repair, replace and buy new durables every day. They use them in the household, for communication, and transportation, and are completely dependent on them. Usually, the value of durable goods is significant, and consumers purchase them with the intention of using them for several years. In the market, durable goods are categorized into four groups:

- white goods: free-standing kitchen appliances,
- grey goods: desktop computers and computer peripherals, mobile phones,
- brown goods: in-home consumer electronics like TV, Hi-Fi,
- cars.

If a defect is found after the purchase or a malfunction occurs that the consumer is not able to remedy in a simple way, disappointment and the desire to make a claim will occur. By providing warranties, manufacturers and traders promise the consumer the reliability of the product by committing during the warranty period to bear the cost of repairing the fault if it is found to be the result of a failure in the production process or poor quality of the materials used in the production (i.e. hard of functional failure), due to or premature performance degradation (e.g. battery exhaustion). Without the ability to fix the defect, consumers would face a significant repair cost or would have to get rid of a valuable product and replace it with a new one. This would be an act contrary to the concept of sustainable consumption. In this chapter, the aim is to demonstrate how the design of the consumer warranty on durables can contribute to sustainable consumption¹.

In the European Union, durable consumer products are sold together with a minimum legal guarantee of two years, however, many retailers are offering upgraded extended warranty covered by third-party insurance policy (i.e. commercial warranty), by means of

¹ The terms "warranty" and "guarantee" are often used synonymously. The distinction is that a guarantee is defined as a pledge or assurance of something; a warranty is a particular type of guarantee, namely a guarantee concerning goods or services provided by a seller to a buyer.

which they send signals of quality and reliability as a marketing strategy for attracting customers.

2. Background

The warranties in marketing strategy have a promotional and protective character (Lutz, 1996). Their purpose is to promote the reliability and quality of the product because longer and better warranty conditions imply a more reliable product. Consumers cannot fully test product quality at the time of purchase so warranties can mitigate a moral hazard. The warranty protects the consumer from the product malfunctioning during the coverage period, which reduces the risk of repair costs or purchasing a new one. Warranty risk is defined as the likelihood of the occurrence of a hazardous event during the warranty period.

Several theoretical standpoints on consumer warranty can be found in the literature. After the appearance of standardized guarantees at the end of the 19th century and until the beginning of the 1970s, the exploitation theory was valid. According to this theory, there is no negotiation of warranty terms between the seller and the consumer, thus the consumer is exploited because the seller imposes their interests from their more powerful bargaining position (Priest, 1981). Manufacturers should reduce their contractual obligations on the quality of products towards consumers as much as possible, and avoid warranty risk coverage since they cannot predict the effects. The consumer, as a less powerful party in the transaction relationship, has no choice but to accept the offered terms.

The second is the signalling theory, which claims that warranty conditions reveal information to consumers about the reliability of the product. Consumers use signals about product properties when choosing a product. The consumer finds it prohibitively expensive to engage in detailed product reliability testing at the time of purchase by directly inspecting the product. Thus, the consumer considers the warranty promotion as a signal of reliability. The more reliable the product, the lower the cost of warranty coverage for the manufacturer. Even though the consumers have no experience or knowledge about the product, they can make conclusions about the reliability only by reviewing the terms of the warranty (e.g. period of validity).

The most recent warranty theory is the investment theory elaborated by Priest (1981). It sees the warranty as both an insurance policy and a repair contract. As an insurance policy, the warranty stipulates that if the product or part of the product becomes defective within a certain period, the manufacturer will compensate the consumer for the loss by repairing, replacing, or refunding the purchase price. As a repair contract, the warranty obliges the manufacturer to provide for a certain period, free of charge, the services necessary to repair the defect to extend the useful life of the product. The customer views the warranty as an investment that reduces the risk of incurring costs in the event of an early failure. In terms of the warranty, the manufacturers exclude themselves from repairs if the problem is caused by inappropriate use, and they are obliged to cover the repair costs within a certain period from the day of purchase. The goal is to extend the product's service life by highlighting the responsibility of the manufacturer and the consumer. If the manufacturer succeeds in developing a product repair policy, then the opportunity for creating a long-term relationship with consumers increases even after the warranty period has expired.

In conditions where many manufacturers compete with competitors who produce similar products incorporating similar technology, after-sales support becomes an important advantage in attracting customers. Basic and commercial warranties with an insurance policy have become an integral part of the post-sale service strategy (Murthy & Blischke, 2006). The cost of warranty servicing depends on the reliability of the product, ease of use, and maintenance and care of the product. The product will be more reliable if better quality materials are used in production and more thorough testing is carried out, all of which increase production costs. The basic warranty is mandatorily included in the retail price, while extended warranties may be offered to consumers for free, under condition (e.g. online registration, maintenance at the authorized service) or separately at an extra price (e.g. 20 euros for an additional year). The extended warranty covers a longer period or free repair beyond what is specified in the basic warranty. Manufacturers and retailers offer them to generate an opportunity for an additional source of profit.

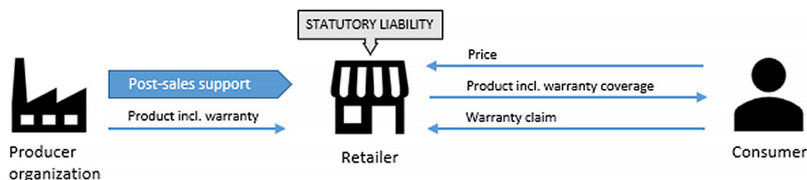


Figure 1. Warranty concept.

Source: the author.

The warranty concept includes three parties (Figure 1). The producer organization includes the manufacturer and its distribution and service network responsible for spare parts, maintenance, and repairs. The legislation of the European Union regulates the liabilities and rights of parties in warranty contracts, whereby the retailer bears the statutory liability to manage the consumer's claim while the warranty contract is valid. In today's conditions where environmental protection and sustainable consumption attract increasing attention, the establishment of a sustainable system of consumer warranties is becoming more important and it seeks to establish warranty chain management to better manage the entire process from sales and repairs to recycling and disposal of products (Liao, 2022). With emerging products hitting the market and growing in volume, as well as the rise of environmental awareness, it is expected that the lifespan of durables will be extended, which will increase the size of the warranty market.

2.1. Warranty policy in Europe

Valuable resources are invested in durable consumer products (e.g. vacuum cleaners, computers, bathroom boilers, bicycles) that are not easy to give up. Various valuable materials, technology and know-how have been built into them, tests have been carried out, and therefore they are expected to serve their purpose and function for many years. However, there are common problems encountered by consumers and affecting their behaviour, which consumer policy recognizes and seeks to mitigate:

- Complexity of product assembly and the high costs of repairing mean that product replacement is the only solution.

- Inability to repair a durable product due to lack of spare parts.
- Inadequate marketing strategies that pre-programme the occurrence of product failure and deliberately shorten the product lifetime.
- Installation of parts made of poor-quality materials.
- Marketing advertising generally convinces consumers that “they need a new product and that the existing one is out-dated”, although it is still functional.

These everyday problems affect the faster replacement of existing products, which creates pressure on the exploitation of valuable resources. One example of public encouragement for the repair of durable products is the voucher provided to Vienna residents. They may present it to a repair service company whereby money is drawn from the special fund to cover the cost, and the maximum subsidy equals 100 euros. Their motto is: “Repairing rather than throwing away is one of the simplest forms of sustainable consumption. With the Vienna Repair Voucher, we motivate people to give their products a second life”.

The European consumer policy regulates the duration of the mandatory warranty period for consumer durables as two years. With such regulation in the EU, market sellers are obliged to provide consumers with a valid cost-free guarantee from failure or defects when selling durables. There are four “R” legal options for parties provided by the regulator: repair the product; replace it (e.g. the repair is too expensive); reduce the price, or reimburse in full.

The peculiarity is that in the first six months the burden of proof is on the merchant, and after that, the consumer must prove that the defect existed at the time of purchase. In some countries, such as Sweden or Slovenia, three years have been introduced. Spain and Sweden have introduced an obligation to maintain repair parts and technical services for 10 years. Sweden extended the period for proving the non-conformity by the retailer from 6 months to 1 or 2 years depending on the product category. These extensions indicate the policy direction towards the longer product lifetime.

The Consumer Sales and Guarantees Directive (1999/44/EC) was the basic regulatory act for guarantees on consumer products until mid-2019 when the Directive on certain aspects relating to contracts for the sale of goods entered into force (2019/771). The mandatory

warranty period of two years has been maintained, but the definition of goods has been expanded, which now includes “goods with digital elements”. The new regulatory framework precisely specifies the manufacturer’s liabilities for digital aspects of electronic devices (e.g. mandatory provision of software upgrades).

According to data from Figure 2, most failures in the EU market occur in the first six months (71 percent) within which the burden of proof of non-conformity is on the seller, and 96 percent of all claims occur in the first two years. This situation demonstrates there is no technical justification for extending the mandatory warranty period in the EU market.

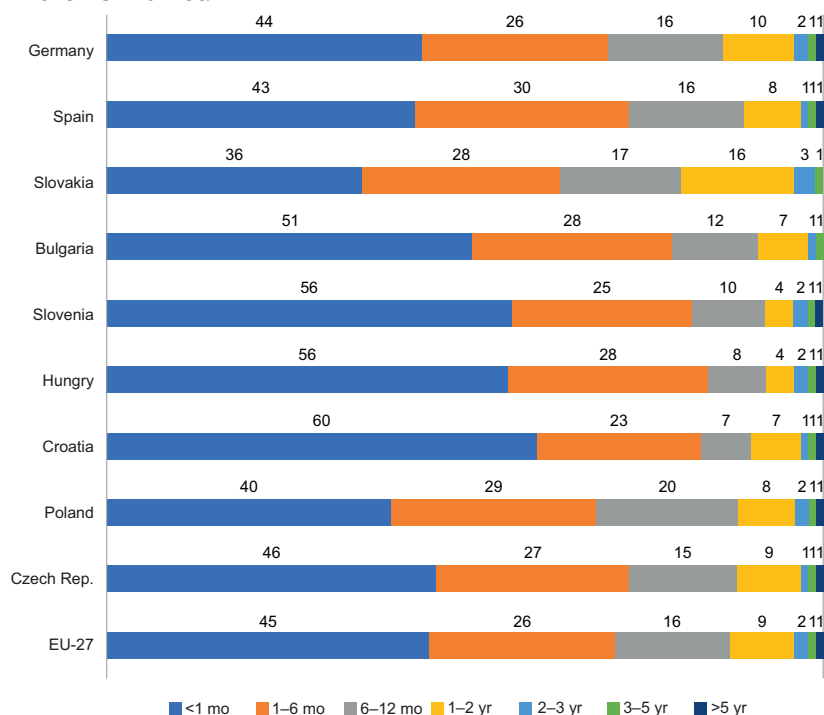


Figure 2. Age of the most recent case of a defective product.

Source: ICF Consulting (2017, 25).

The Directive barely supports sustainable consumption patterns because it only mandates that it is important to ensure longer durability of goods to achieve sustainable consumption and circular economy goals. A durability label is expected to be introduced for individual products or groups of products so that consumers can objectively assess their lifetime and value (European Commission, 2018). Durability is the ability of a product to maintain its necessary functions and efficiency through normal use. The goods should possess durability common to goods of the same type that the consumer can expect. When determining the durability of a product, it is necessary to consider relevant circumstances, such as the price of goods and the frequency or intensity of the use of the product. Consumers could rely on durability information when they have any kind of product request.

The extended warranty mechanism ultimately targets greater repair options and thus extended product lifetime to reduce the likelihood of replacement (European Commission, 2018). Building the perception among consumers that they can have a longer period to claim a free repair should prolong the use of the product and thereby encourage sustainable consumption. The consumer's choice between repair and replacement should only be limited where the option chosen would be illegal or impossible or would impose costs on the seller that would be disproportionate compared to the other options available. For example, it might be disproportionate to request the replacement of goods due to a minor scratch, if such a replacement would create considerable costs and the scratch could easily be repaired.

2.2. Functions of warranties in sustainable consumption

Producers are building their brands more and more in line with sustainability because this will become even more important to their customers in the future. This is already an important business strategy for the majority because they advertise and label the products as ready for recycling, with energy-saving features etc. However, the responsibility for recycling in most cases falls on consumers and depends on how much effort they want to invest in disposing of a product in an environmentally friendly way. Consumers are motivated to dispose of fast-moving consumables (e.g. plastic packaging) but the situation with durables is very different. When durables are in question,

regulation can be improved by using the consumer warranty institute. In the future, it can be expected that consumers will react within the warranty period even when they consider that the product's properties and quality do not correspond to environmental sustainability. That means if a product consumes more energy (e.g. water or electricity) than declared it may be a reason for a warranty claim.

The installation of spare parts within the warranty period from discarded devices positively affects sustainable consumption (Reike et al., 2017) because it extends the technical functionality of the product without the need to invest in new material resources for repairs. Refurbishment of used parts from discarded devices contributes to saving resources that would be used to produce new parts. Such an approach would reduce both the costs for manufacturers during the warranty period and the cost of repairs for consumers when the warranty expires. According to a study (IFC, 2017), up to 61 percent of consumers would decide to repair the product if the cost of repair amounts to less than 20 percent of the price of a new product. In most spare parts stores or service centres, the sale of refurbished parts is not common or even allowed.

The circular economy business model aims for a zero rate of emissions and waste, whereby damaged products and materials that are considered no longer needed are recycled or reused as raw materials for a new production cycle. There are three concepts of the circular economy: Circular Advantage – Accenture Model; Ellen MacArthur Foundation Model; and European Union Horizon 2020 “R2π – Linear to Circular Program” and all include the extension of product lifetime.

When buying a product, customers are not sure how long it will last, however, they can be sure that it will last at least as long as the promoted warranty lasts. It would be encouraging to regulate the information on the product label so that it will state a kind of minimum product lifetime expectancy. Such information would help in planning for maximum durability and would facilitate product valuation before making a purchase decision. Longer durability of the device would signal not only better built-in technology and materials for consumers but would probably also be an opportunity for the traders to increase the retail price. It could also be considered a marketing strategy in line with sustainability policy goals.

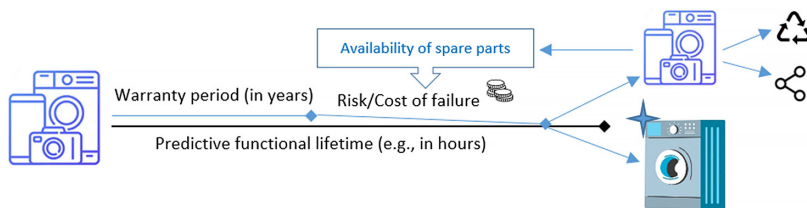


Figure 3. Consumer durables lifetime concept.

Source: the author.

There are several reasons why consumers decide to buy a new product even though the existing one is still functional and in good condition. The most common reasons are technological innovations and the desire for a new device. The modern warranty concept should not make it difficult for consumers who want to purchase new products before the end of the predicted functional lifetime (Figure 3). However, their obligation to manage disposal must be different, with a greater contribution towards sustainability, from the obligation of those consumers who will use the product even after the end of the predicted lifetime. The minimum product lifetime is not a warranty to the consumer, however, to maintain a reputation in the market, the trader will make sure that the consumer has support for the product, such as spare parts during this period. Such an instrument may also facilitate the exchange of products on the secondary market.

The regulated concept of a digital product passport² should enable such a proposition for electronic products. Online product registration methods are already present on the market, where some basic information is available to consumers (e.g. where to buy spare parts), as well as specific information on product upgrades.

Policymakers need to make sure that the products that are put on the market are designed to be durable and repairable. According to the new Ecodesign for Sustainable Product Regulation,³ the long-anticipated Digital Product Passport will be introduced, helping to allow easy and convenient access to and sharing of product data (i.e. each product will have an ID number readable via QR code). This

² Euroactiv Special Report: Product passports: The new trend in EU policymaking. Available at: <https://en.euractiv.eu>

³ Proposal for a Regulation establishing a framework for setting ecodesign requirements for sustainable products. Available at: <https://eur-lex.europa.eu>

will require products placed on the market to be equipped with a machine-readable passport and to be uniquely identified.” This data will provide access to valuable information for improving ecological efficiency and, above all, extending the life of products, making durable and repairable products ‘the norm’ in the EU’s single market. Adisorn et al., (2021) argue the collection of data during the use phase will remain extraordinarily challenging, though probably more relevant for high-value products with longer product lifetime compared to others.

According to opinion poll results (European Commission, 2020), only 10 percent of surveyed consumers were not interested in the durability of their digital devices (e.g. smartphones, TVs). One-third of consumers do not consider changing their device for at least five years, and this is the prevailing period in most countries, eight percent of them intend to use the device for at least seven years, and 26 percent of them for at least ten years. This attitudinal study reveals that over two-thirds of consumers in Europe expect digital devices to last significantly longer than the general mandatory warranty period of two years. Therefore, when choosing durable goods, they are aware that the warranty period covers a shorter part of the expected lifetime, which prompts them to contract an extended warranty, mostly for a fee. If a mandatory warranty period is extended (e.g. to three or four years) retailers will face the situation of their extended warranty marketing strategy having less market attractiveness.

Consumers with weaker financial power are likely to use durable products for longer and seek ways to extend their functional lifetime before replacement. The opinion poll also reveals consumer behaviour. Most of them, 38 percent, broke the device due to improper handling, and even 30 percent replaced the device with a new one because they believe that the features of the “old” one are significantly outdated. Although many retailers offer insurance and technical protection (e.g. phone screen protective glass), careless handling is still the most common reason for discarding durable products. The sustainable warranty should cover the upgrade of critical features (e.g. expanding data storage, more advanced software, faster charger) to avoid reasons for premature replacement, and to extend the life of these devices owned by every European household.

Labelling the product with a durability symbol would inform the consumer when making a purchase decision. This would be a legal act of expanding consumer rights as manufacturers would have to

disclose insights about the product's fate that they have not been willing to reveal. Consumers can more easily decide whether they want a more durable product (e.g. 5 or 7 years). A shorter service life corresponds to a more favourable price and implies planning for a replacement sooner. In this way, consumers can reduce their risk of investing in a durable product because they become more familiar with durability. Products with shorter duration strain the circular economy more, so this marketing strategy should be recognized and distinguished by regulators from those that promote longer lifetimes (Umweltbundesamt, 2016).

As can be concluded from the results of the public opinion survey on device failure reports conducted by IFC (2017), a longer mandatory warranty period would not represent an additional technical or financial burden for manufacturers and traders due to the very low proportion of consumers' claims after two years. The results of Flash Eurobarometer 367 (European Commission, 2015) show that 66 per cent of consumers are willing to pay more for a product if its warranty period is extended to five years.

The consumer's perception of a longer basic warranty creates the impression of quality and reliability, which is important for planning the length of the investment in durable goods. However, this is not enough to meet the requirements of sustainable consumption. According to the results of the study (European Commission, 2020a), after the expiration of the warranty period, only a third of Europeans decided to repair the product instead of replacing it. Sweden is where the most consumers practice repair (52 per cent), whereas the lowest numbers are in Portugal (18 per cent) and Poland (20 per cent). Increasing the proportion of repair-oriented consumers would require the introduction of additional features such as a performance-based warranty.

Dai et al., (2023) argue that a performance-based warranty not only covers repair caused by non-conformity or failure but also ensures minimum performance during the warranty period as was expected at the time of purchase. By introducing this type of soft warranty in addition to the mandatory hard warranty, the manufacturer may also be obliged to provide, for example, an additional warranty on some sensitive parts such as the battery capacity or low gas pressure in the air conditioner. Consumers of durable devices are often irritated by a drop in the performance (i.e. duration) of the battery, which can

be a reason to replace a fully functional device. Consumers can also be encouraged by better warranty coverage to buy 2-in-1 durables (e.g. Combo Washer Dryer, Microwave Oven & Grill). With almost the same amount of production resources, consumers can meet multiple household functions.

Table 1. Options for warranty regulation on stimulating sustainable consumption.

Extend product functional lifetime	Longer mandatory warranty period	Minimum product lifetime	Durability symbol	Performance-based warranty
<ul style="list-style-type: none">• Producers should organize the availability of service centres, and spare parts for a longer time• Upgrade of critical product features• Circulation of spare parts extracted from used devices	<ul style="list-style-type: none">• No additional burden for traders• Affects consumer perception of longer durability• Decreasing the risk and cost of failure or defect	<ul style="list-style-type: none">• An opportunity for the traders to increase the retail price• Facilitates product valuation while making a purchase decision	<ul style="list-style-type: none">• Disclosing information to the consumer about the duration• Decreases the risk of investment• New opportunities for planning product replacement	<ul style="list-style-type: none">• Preventing drop in product performance during the lifetime• Additional warranty on sensitive parts

Source: the author.

A summary of the five elaborated guidelines that are expected to be regulated is presented in Table 1. The effective implementation of those five measures would stimulate the longer use of durable goods and thus have a positive impact on the implementation of sustainable consumption in the field of consumer durable goods.

2.3. Conclusion

The consumer warranty is both a favourable marketing strategy among traders and a beneficial regulation instrument. Consumers consider it as an investment that decreases the risk of product use. The political and social aim is to keep white, brown, and grey durables longer in-home use to avoid premature replacement and sustain valuable

production resources. To create an impression among customers that the product is more durable, it is important to inform them about the predicted minimum lifetime of the product. Likewise, their perception of durability would be positively affected by a longer warranty period, as they can plan their investment more easily. If the predicted lifetime of the refrigerator is declared to be eight years, consumers will probably get it with the plan that it will last at least that long. At the same time, manufacturers will also take the initiative to ensure that the built-in materials and technology ensure the functionality and attractiveness of the product for at least that long. The chapter also foresees other regulatory options that would influence consumer perception to reduce the need for replacement and encourage repair. Longer product life-cycles depend on how consumers treat their durables and their planned behaviour (e.g. When do I plan to buy a new model?) greatly supports the achievement of sustainable consumption policy goals.

3. Discussion questions and tasks for students

Discussion question 1. Why is it important for the internal market to have a mandatory warranty on durables? Describe your good or bad experience with a retailer based on a warranty claim.

Discussion question 2. Explain the European warranty policy on consumer durables.

Discussion question 3. In your opinion which among the five presented strategies is the most difficult to implement in the market?

Discussion question 4. How can warranty policy boost sustainable consumption?

Task. Check the implementation of basic (legal) and commercial warranties in each country at <https://europa.eu> website. Compare two warranty features (e.g. duration period, redress claim) among three selected countries.

4. Further reading

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SUSTAINABLE CONSUMER BEHAVIOUR

SUSTAINABLE CONSUMPTION PATTERNS

Barbara Borusiak

■ Annotation

As sustainable consumption patterns are the subject of this subchapter, it contains an explanation of the essence of sustainable consumption and a presentation of chosen theories widely used to examine the determinants of sustainable consumption, like the Theory of Planned Behaviour, the Norm Activation Model and the Values-Beliefs-Norms concept. The second part of the subchapter is devoted to the characteristics of selected sustainable consumption patterns: sustainable diets, the consumption of Fairtrade products, and sharing goods (collaborative consumption).

Key words: sustainable consumption, sustainable diets, organic products, ecolabels, Fairtrade products, collaborative consumption

1. Introduction

The consumption of goods and services (measured at the aggregated level) has been contributing to severe environmental problems. In general, about 70–80% of environmental issues result from the consumption of various products such as food and drinks, construction and maintenance, domestic energy use, transportation, water and electronic products. Overconsumption and consumerism are identified as the main causes of environmental problems (Anuar et al. 2018). Along with fast growing climate changes and other phenomena dangerous for human beings (like deforestation, air and water pollution, mass extinction), which are commonly recognized as an anthropogenic, the need to change previous consumption models increases. In the

case of individuals, many behavioural trends can be observed which are leading to lower negative impact of consumption. The objective of this chapter is to define sustainable consumption and other related terms, as well as to present emerging sustainable consumption patterns in order to highlight their diversity.

2. Background

2.1. The definition and determinants of sustainable consumption behaviour

Sustainable consumption is defined in many different ways, as the concept of socially responsible consumption has evolved over a period of 40 years. At the beginning, it was mainly associated with environmental issues, and it was defined as consumption that entails a reduction of the adverse impact on the environment (Paavola, 2001). Later it expanded, and so now includes a much wider range of categories (Prendergast, Tsang, 2019). Sustainable consumption can be regarded as a decision-making process, taking the consumers' social and environmental responsibility into consideration in addition to individual preferences concerning a product's attributes (Vermeir, Verbeke, 2008). According to Webb, Mohr and Harris (2008), a socially responsible consumer is an individual who bases their purchase, usage and disposition of products on the desire to minimise or eliminate any harmful effects and maximise the long-term beneficial impact on society and the environment. Sustainable consumption behaviour refers to the patterns of consumption reducing natural resources usage but also respecting human rights, that is, taking other people in consideration when making a choice. So sustainable consumption behaviour is more than buying environmentally-friendly products – it is behaviour based on a holistic approach to minimizing the negative environmental impacts of consumption while promoting quality of life for all. It covers a wide range of aspects, including: environmental – such as enhancing resource efficiency, using renewable sources and minimizing waste; social – such as meeting consumer needs sustainably, lowering injustice; and economic – which entails promoting the economic well-being of society (Rizkalla, 2018).

There are numerous determinants of sustainable consumption behaviour. The most important intrinsic ones are presented in widely used theories. One of the most popular theoretical concepts, originating in the field of social psychology and explaining consumer behaviour connected with choice – the Theory of Planned Behaviour (TPB), is also applied in this case. According to TPB, volitional behaviour is determined by a personal intention to perform a specific behaviour. It is assumed to aggregate all motivational factors influencing a form of behaviour, which are: the attitude towards the behaviour, subjective norm, and perceived behavioural control over a given behaviour (Ajzen, 1991). The attitude is defined as a positive or negative evaluation of one's performance of the behaviour in question, the more positive the attitude, the more likely it is that an individual will intend to perform a given behaviour. The subjective norm is the individual's perception of what others think of a specific behaviour – do they regard it as desirable or not? Finally, perceived behavioural control shows people's perception of their abilities to perform a particular behaviour. TPB is not the only concept to explain individuals motivation to act in a sustainable way. As was mentioned before, sustainable consumption may be regarded as a pro-social behaviour – in some cases it requires more effort and/or money from a consumer – so the determinants of such behaviour are delivered by theories applied specifically in altruistic behaviour explanations, such as the Norm Activation Model and the Values-Beliefs-Norms theory.

The Norm Activation Model (NAM) formulated by Schwartz (1977) has been widely used to predict people's altruistic and pro-social behaviours. Such behaviours refer to a person's action that is intended to help other people and consists of a broad range of activities, like helping, sharing, and cooperating behaviours (De Groot and Steg, 2009), which meet sustainable consumption criteria. These activities are closely related to a person's morality, expressed by a personal norm, which is regarded as internalized behavioural standards not driven by perceived external social pressure, but by self-expectations toward a certain behaviour. Initially, the NAM was applied mainly to explain various types of pro-social intentions and behaviours, later, the NAM was adopted to study pro-environmental behaviours and their motives (Sia, Jose, 2019, Borusiak et al., 2020).

The Values-Beliefs-Norms (VBN) theory of environmentalism postulates that values (especially altruistic values) influence

pro-environmental behaviour via pro-environmental beliefs (such as about the biosphere and the effects of human action on, it as well those regarding awareness of consequences and the ascription of responsibility), and personal norms in four areas: environmental activism, environmental citizenship, policy support, private-sphere behaviours (Stern et al. 1999). This means the very important determinants of sustainable consumption are: personal knowledge concerning the impact of products (including services) on both the natural and social environment, as well as self-efficacy, understood as confidence in the ability to exert control over one’s own motivation and behaviour.

Sustainable consumption is also determined by extrinsic factors. One of the most important is an economic factor connected with products’ affordability. This is driven by people’s income on the one hand and the level of prices on the other. In general, it was proved that a country’s wealth is positively related to sustainable consumption behaviour (Dunković et al., 2023). As sustainable products are, for many reasons, more expensive (compare Table 1), so the willingness to purchase them is generally lower in less wealthy countries. What is more, less developed countries may consider the introduction of sustainable consumption practices as a threat to their development, which is mainly related to consumption limitation.

Table 1. Comparison of conventional and eco fashion products prices – example of Australia (prices expressed in AUD).

Fashion item	Conventional	Eco
Sneakers	120.00	120.00
T-shirt	2.00	31.90
Hoodie	16.00	90.00
Socks	1.00	9.95

Source: Ofei, 2022.

Wealthy countries’ societies, with higher levels of consumption, have more to reduce but at the same time everybody may be eager to choose patterns of consumption that reflect the feeling of responsibility for others.

2.2. Chosen patterns of sustainable consumption

There is such a huge variety of sustainable consumption patterns that they are practically uncountable. Feeling responsibility for other people and orientation to the good of others are the main common denominators. However, it does not mean automatically that this motivation is the main one in the case of every single consumer. All sustainable consumption patterns are based on some limitations in product choice. People may consume less because they may want to lose weight or save some money. In some cases, limitations concern other product attributes, such as the amount of product used (this will be presented in the next section). It should be highlighted that consumers may apply several patterns at the same time and they cannot be regarded as separate.

Sustainable diets

People's diets are what keep them alive, however at the same time they often result in diseases like diabetes, heart disease, some cancers, and obesity, which are the leading risk factor for mortality globally. On the other hand, over 800 million individuals remain undernourished and about 2 billion suffer from micronutrient deficiencies. (FAO, IFAD, UNICEF, WFP, WHO, 2019). At the same time, global food systems emit 20–35 percent of global greenhouse gas (GHG) emissions, occupy ~40 percent of the Earth's ice-free land area, causes terrestrial and aquatic nutrient pollution from excess fertilizer usage, and is the largest driver of biodiversity loss (Foley, 2011). Facing these facts we must admit that changing people's diet is a necessity.

Sustainable Healthy Diets are dietary patterns that promote all the dimensions of individuals' health and well-being; have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable. The aims of Sustainable Healthy Diets are to achieve optimal growth and development of all individuals; to support functioning and physical, mental, and social well-being at all life stages for present and future generations; to contribute to preventing all forms of malnutrition (i.e. undernutrition, micronutrient deficiency, overweight and obesity); reduce the risk of diet-related diseases; and support the preservation of biodiversity and planetary health. Sustainable healthy diets must combine all the dimensions of sustainability to avoid unintended consequences (FAO, WHO, 2019).

This means that sustainable diets should be designed along the following guidelines, in three main aspects:

- health aspects – diets should be based on a great variety of unprocessed or minimally processed foods, balanced across food groups; including wholegrains, legumes, nuts and a variety of fruits and vegetables, and possibly moderate amounts of eggs, dairy, poultry and fish; and small amounts of red meat,
- environmental impact – diets should help maintain greenhouse gas emissions, water and land use, nitrogen and phosphorus application, and chemical pollution, within set targets; should preserve biodiversity, including that of crops, livestock, forest-derived foods and aquatic genetic resources, and avoid overfishing and overhunting; should minimize the use of antibiotics and hormones in food production, minimize the use of plastics and derivatives in food packaging; and should reduce food loss and waste,
- sociocultural aspects – diets should be built on and respect local culture, culinary practices, knowledge and consumption patterns, and the values involved in the way food is sourced, produced and consumed; should help to avoid adverse gender-related impacts, especially with regard to time allocation; and should be accessible and desirable.

Many different diets may support the above guidelines, and it is mainly the individual's responsibility to design their diet in order to achieve the desirable effects. In order to help consumers in product choice, goods which are healthy for users and friendly to the environment are marked with labels. The organic logo can only be used on products that have been certified as organic by an authorised control agency or body. This means that they have fulfilled strict conditions on how they must be produced, processed, transported and stored. The European Union organic logo (Figure 1) can only be used on products when they contain at least 95% organic ingredients (certified to have grown on soil that had no prohibited substances applied for three years prior to harvest, without the use of synthetic herbicides, pesticides, and fertilizers, or bioengineered genes) and additionally, respect further strict conditions for the remaining 5% (European Commission, 2023).



Figure 1. EU organic logo.

Source: https://agriculture.ec.europa.eu/farming/organic-farming/organic-logo_en.

Ecolabels are a form of sustainability measurement directed at consumers, intended to make it easy to take environmental concerns into account when shopping. Some labels quantify pollution or energy consumption by way of index scores or units of measurement, while others claim compliance with a set of practices or minimum requirements for sustainability or reduction of harm to the environment. The International Organization for Standardization has developed ISO 14020 and ISO 14024 to establish principles and procedures for environmental labels and declarations that certifiers and eco-labellers should follow. In particular, these standards relate to the avoidance of financial conflicts of interest, the use of sound scientific methods and accepted test procedures, and openness and transparency in the setting of standards.

Fairtrade products consumption

For the last thirty years the power of international producers and retailers has been growing significantly. This process particularly influenced the level of purchase prices of agricultural products, especially in African, Asian, and South American countries. The very low prices of products like coffee, cocoa beans, fruits, flowers, and so on, meant that farmers were only able to achieve the minimal profitability. The Fairtrade movement aims at promoting societal well-being by establishing prices for products that allow for living wages for workers and farmers (Fairtrade Foundation, 2021). The main assumptions of the Fairtrade movement are as follows:

- prices aim to cover the average costs of producing their crop sustainably – a vital safety net when market prices drop,

- the Fairtrade premium – an extra sum of money paid on top of the selling price to invest in business or community projects of their choice,
- decent working conditions and a ban on discrimination, forced labour and child labour,
- access to advance credit ahead of harvest time,
- being able to plan more for the future with more security and stronger relationships with buyers.

Consumers have been showing growing interest in purchasing Fairtrade products. It is visible in many countries, for example also in Poland. Table 2 presents data concerning the wholesale revenue for these products generated in Poland between 2015 and 2021.

Table 2. Wholesale revenue from Fairtrade products in Poland.

Year	Revenue (in mln PLN)
2015	27
2016	37
2017	61
2018	95
2019	293
2020	559
2021	834

Source: Raport Fairtrade Polska 2021

Although there is a wide variety of Fairtrade products – certificates may be found on: bananas and other fruits, cocoa, coffee, cotton, flowers, fruit juices, herbs and spices, honey, nuts and oils, quinoa, rice, sugar, tea, textiles, vegetables, wine, and even on gold and precious metals, this huge growth in the sale of Fairtrade products in Poland mainly concerns cocoa. Figure 2 presents data on the sale structure of Fairtrade products in Poland in 2021.

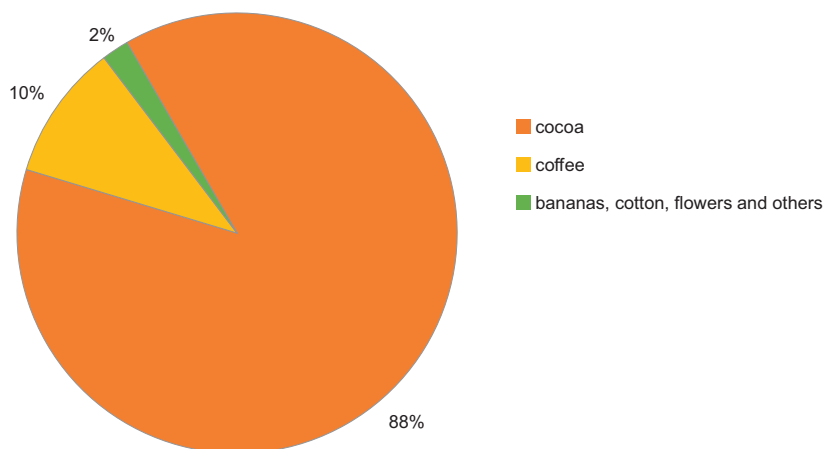


Figure 2. The sale of Fairtrade products in Poland in 2021 by categories.
Source: Raport Fairtrade Polska 2021.

Sharing goods (collaborative consumption)

Collaborative consumption differs from standard consumption in that the cost of purchasing the good or service is not borne by one person, but instead is divided across a larger group as the purchase price is recouped through renting or exchanging. Collaborative consumption lets consumers gain access to goods and services by paying for the experience of temporarily accessing them, whereas no ownership is transferred in these transactions. Examples of access models vary from car- or bike-sharing programs to online borrowing programs for movies, fashion, furniture, toys, jewellery, or animals. While public access to goods, such as borrowing books from public libraries or use of public transportation, has been and continues to be the norm in some cultures and social contexts, models of access mediated by the marketplace are gaining popularity, fuelled by the Internet (Bardhi, Eckhardt, 2012). On the one hand, the sharing economy is an appealing alternative for consumers due to its economic benefits, but on the other, consumers are increasingly aware of the pressure that (over)consumption can pose to the environment. The idea of sharing in order to reduce the overall level of production can be an important pro-environmental motivation for collaborative consumption (Tussyadiah, 2015). The sharing economy has positive environmental impacts, not only

through reducing the total resources required but it helps reduce pollutants, emissions and carbon footprints. In the transportation sector, vehicle sharing behaviour can have a positive environmental impact by decreasing the number of kilometres travelled. Such sharing activities can also stimulate long-term changes in consumer behaviour by shifting personal transportation choices from ownership to demand-fulfilment. Similarly, bicycle sharing schemes can reduce the use of motorised vehicles that usually consume petroleum products and generate emissions. For example in Shanghai, bicycle sharing reduced carbon dioxide (CO₂) and nitrogen oxide (NO_x) emissions by 25,000 tonnes and 64 tonnes in 2016, respectively (Mi, Coffman, 2019).

There are several challenges associated with the collaborative consumption concept understood as presented above: lack of trust between peer-to-peer users, lack of reputation and standards, opposition from existing businesses, uncertainty over the longevity of the business models, and the perceived disruption of existing regulation (Owyang, 2013).

Digital platforms enable the creation of markets thanks to which collaborative consumption may happen on a big scale. Two main categories of models have emerged: the “sharing for money” model, which is primarily a B2C for-profit model popular in the case of means of transport (cars, bikes, scooters) but may also work in the case of food for example – restaurants sell left over food in order to reduce waste and loss. The other one – the “sharing for the community” model is a C2C model where goods (like fashion, food, children’s items, accommodation) are shared amongst consumers.

According to Statista data, the value of the sharing economy worldwide in 2021 reached 113 billion USD and is predicted to reach 600 billion USD in 2027 (Statista, 2023).

3. Discussion questions and tasks for students

1. Referring to the determinants of sustainable consumption behaviour, indicate methods for encouraging people to consume in a more sustainable way.
2. Discuss to what extent sustainable consumption behaviour may be regarded as egoistic behaviour, and to what extent as pro-social, altruistic behaviour.

3. What are the advantages and disadvantages of sustainable consumption? Consider various stakeholders perspectives.
4. Working in groups, list your favourite meals. Discuss their health, environmental and sociocultural impact.
5. Look here: <https://youmatter.world/en/10-worst-popular-foods/> and discuss the problem of food products' harmfulness.
6. Is the consumption of local products sustainable? Organize a debate based on the following research paper: <https://link.springer.com/article/10.1007/s41130-021-00148-w>.
7. Discuss the main obstacles to applying sustainable consumption patterns, referring to Fairtrade products.
8. Design a Fairtrade food products market communication campaign. What product attributes would you focus on? Who could be a target group? What communication channels can be used?
9. Present the economic and social consequences of shared use of means of transport.

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CONSUMPTION REDUCTION BEHAVIOUR

Barbara Borusiak

■ Annotation

The consumer behaviour of reducing consumption is the subject of the following subchapter. The origin of the consumption reduction idea is rooted mainly in the concept of post-growth – which is presented in this subchapter, as well as some manifestations of consumption reduction involving chosen products and services like meat, water, air travel, and food waste.

Key words: the concept of post-growth, consumption reduction, meat consumption reduction, water consumption reduction, food waste reduction, air travel reduction, flight shame

1. Introduction

One of the most urgent problems of the contemporary global economy is constantly growing natural resources usage, leading to their depletion, which is regarded as predatory usage. The International Resource Panel found that the global average of material demand per capita grew from 7.4 tonnes in 1970 to 12.2 tonnes in 2017. What is more, in 2020 only 8.6% of the global economy was circular, whereas in 2018 this share amounted 9.1%. This has significant adverse impacts on the environment, notably increased greenhouse gas emissions (Bansard and Schröder, 2021). This process is driven by consumption, which in wealthy countries achieved enormously high levels. The per capita material footprint in high-income countries is thirteen times higher than in low-income countries: 27 tonnes and 2 tonnes per

capita, respectively. When faced with these facts, it should be said that it is not enough to make consumption sustainable simply by choosing more eco-friendly products. It is necessary to reduce consumption.

2. Background

2.1. The concept of post-growth and its consequences for consumer behaviour

According to Jason Hickel (2020), the essence of post-growth is the planned reduction of excessive consumption of energy and natural resources, thanks to which the economy will be able to return to a balance with the living world, and this will happen in a safe and socially just way. Serge Latouche, one of the greatest advocates and promoters of the idea of post-growth, states that the functioning of a society based on the idea of economic growth destroys the natural environment and generates social inequalities. It also states that the goal of development is a society that lives better by working and consuming less (Latouche, 2003, cited in: Pogonowska, 2018). Post-growth does not necessarily require a decline in GDP, although it cannot be ruled out that this will occur. However, if this happens, it will not be a sign of recession, i.e. a dangerous and chaotic process. It is about a completely new order of things, a system in which growth will not be indispensable, although it is not excluded. It is not necessary because, as shown by the results of numerous studies (Jackson, 2019), an increase in GDP does not clearly mean an increase in the quality of life. In particular, it does not translate into greater emotional comfort for people, which explains the so-called Easterlin's paradox (Easterlin, 1995; Kahneman and Deaton, 2010). However, there are no ready-made comprehensive solutions yet, there is only a set of proposed actions, or rather postulates (Hickel, 2020):

- reduce the consumption of materials and energy, and in particular reduce the scale of waste,
- end built-in obsolescence of devices and equipment (which manufacturers do frequently, wanting to increase profits and turnover),
- extend the useful life of goods by giving them a second life and extending the warranty period for manufactured goods,

- introduce the principle of shared use (e.g. bicycles, cars – which we have already partially seen),
- expand the scale of access to public goods, from collective transport to reducing the amount of work and thus travel to work,
- limit the activities of environmentally harmful industries, from the production of plastic, through the industrial production of beef, to the production of disposable items,
- shorten supply chains, and thus the path from the producer to the consumer,
- reduce income disparities, especially between the management layer and the ordinary worker.

2.2. Examples of consumption reduction behaviour

Meat consumption reduction

Total global meat production and consumption has been growing for the last 60 years, and has almost doubled within this time (Sans and Combris, 2015). Meat is a special type of food, it has gained special status in the diets of numerous societies as it is associated with wealth, power, hospitality, and masculinity (De Backer et al., 2020). Nevertheless, the high level of animal-based protein intake has numerous negative consequences for the environment, human health, and for animals' life conditions and well-being (Godfray et al., 2018). Meat (especially beef) production is harmful to the environment. Livestock production utilizes approximately one-third of the global land area and generates 14% of all human-caused greenhouse gas emissions. Meat production also requires a lot of water; the water footprint of any animal product is larger than that of crop products with an equivalent nutritional value (Mekonnen & Hoekstra, 2012). Meat is the food product with the greatest negative environmental impact due to the low efficiency of animals in converting feed to meat (Djekic, 2015). The relative share of animal products in the future global diet will be a key determinant of environmental outcomes, as it significantly influences greenhouse gas emissions, water usage, and land occupation (Swain, Blomqvist, McNamara, & Ripple, 2017). It was proven that reducing meat consumption will help prevent global average surface temperatures from rising by more than 2°C above preindustrial levels (Hedenus, Wirsenius, & Johansson, 2014), while the food-related water

footprint of a consumer in an industrialized country may be reduced by 36% by shifting from an average meat-based diet to a vegetarian diet (Gerbens-Leenes, Mekonnen, & Hoekstra, 2013). These findings highlight the need to change the dietary habits of societies that consume large amounts of meat.

The motivations for not consuming meat also cover other aspects. From an ethical perspective, animals are considered to be creatures capable of experiencing pain and suffering, that have the right to physical integrity and a life under species-appropriate conditions which are not met in the mass meat production process. Various empirical studies have also proved that increased consumption of meat, and in particular red and processed meats, is associated with negative health impacts. This includes an increased risk of developing coronary heart disease, type 2 diabetes, and various types of cancer. So even if meat is generally regarded as a nutritionally valuable food due to its protein, vitamins, and microelements, like iron, zinc and selenium content, limited consumption of meat and processed meat products is highly recommended (Spiller and Nitzko, 2015).

Water usage reduction

Fresh water is the most vital resource; people can't live without it. At the same time it is a finite resource and there are no substitutes for it. Meanwhile there is growing proof that human activities (production and consumption) are contributing to the increase of water scarcity in many parts of the world (Fielding et al., 2012). Water scarcity impacts people's quality of life, food security, destruction of eco-systems, extinction of species and social stress (Addo, Thoms and Parsons, 2019). Table 1 contains data on the percentage of people in chosen countries using drinking water from an improved source that is accessible on premises, available when needed and free from faecal and priority chemical contamination (improved water sources include piped water, boreholes or tubewells, protected dug wells, protected springs, and packaged or delivered water).

Table 1. Percentage of people using drinking water from an improved source in chosen countries.

Country	2020	2016
Malta	100.00	100.00
Greece	100.00	99.94
Iceland	100.00	100.00
Kuwait	100.00	100.00
Germany	99.99	99.97
Netherland	99.97	99.98
Belgium	99.91	99.77
Sweden	99.75	99.74
Spain	99.59	99.58
France	99.25	98.89
Slovakia	99.24	99.03
Poland	98.33	96.56
Czech Republic	97.88	97.88
Denmark	96.73	96.74
Hungary	92.59	92.50
Romania	81.99	81.91
Albania	70.67	70.62
Peru	51.26	50.17
Nigeria	21.67	20.23
Ethiopia	12.58	10.45
Chad	5.59	5.57

Source: Clean Water Access by Country, Macrotrends.

Saving water is a necessity, both in business premises and in the households. There are several behaviours recommended to individuals in this regard:

- take shorter showers,
- install water-saving shower heads or flow restrictors,
- eliminate pipe and toilet leaks,
- use an automatic dishwasher and washing machine for full loads only,
- don't leave the water running when you brush your teeth, shave, etc.
- plant drought-resistant trees and plants,

As it was proven that knowledge of personal water usage makes people more willing to save water (Madias, Borusiak, Szymkowiak, 2022), it is important to build people's awareness of the quantity of

water they use. This knowledge can be delivered with the help of smart water meters – devices based on internet of things technology, which deliver very precise data on water usage.

Food waste reduction

The increasing volume and value of food waste is a huge threat to achieving sustainable development, food market stability, human population growth, and people's well-being. Food waste is defined as any food disposed from the food supply chain, which includes food production, distribution, and consumption. In highly developed countries consumers generally cause about 40%–50% of global food waste (Aschemann-Witzel, Giménez, Ares, 2018). It is a huge paradox that on the one hand an enormous amount of resources is used to produce food, and on the other so much food is wasted, whereas millions of people are still starving. Consumer decisions about wasting food are determined by two sets of factors. The first is related to product attributes, mainly food category – fresh food is wasted to a greater extent than long-life products (Figure 1).

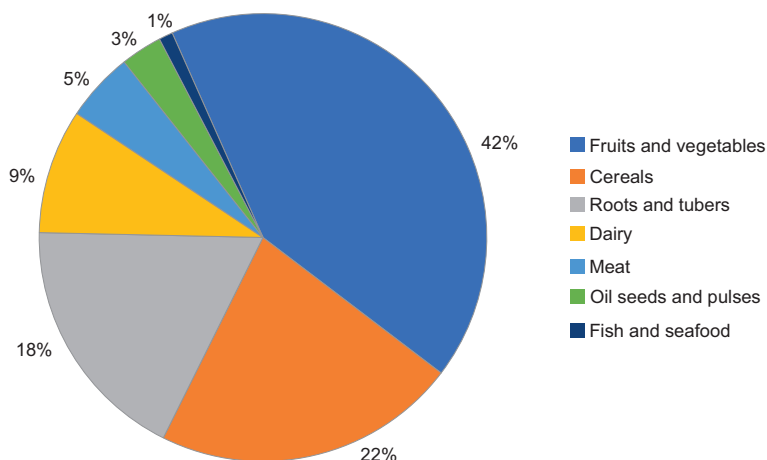


Figure 1. Structure of wasted food by product categories.

Source: What food is wasted? <https://toogoodtogo.com/en-us/movement/knowledge/what-food-is-wasted>.

The second set is connected with customer characteristics (social, like household type, family stage, and related lifestyles; and individual)

as well as individuals' "resources" in terms of time for food-related activities, cooking skills, and knowledge and awareness in this regard.

It should also be highlighted that food waste reduction doesn't mean food consumption reduction but it requires some effort to:

- plan meals,
- store products properly,
- control food stock,
- use leftovers,
- buy suboptimal food (which is not perfect in terms of visual aspects but without any detriment to nutritional values),
- share food if one has more than one needs (using special platforms, for example).

Air travel reduction

Around 2.4% of global CO₂ emissions come from aviation. Counted together with other gases and the water vapour trails produced by aircraft, the industry is responsible for about 5% of global warming. A return flight from London to San Francisco emits around 5.5 tonnes of CO₂ equivalent per person – more than twice the emissions produced by a family car in a year, and about half of the average carbon footprint of someone living in Britain (Timperley, 2020). Aviation is increasingly in conflict with societal goals to limit climate change and challenges related to air pollution, noise, and infrastructure expansion. People travel for a wide range of reasons, such as business, to visit friends and family, to relax or escape, to experience novelty, or self-develop, however there is a growing question concerning the extent to which flying is necessary and can be reduced (Gössling et al., 2019). The International Air Transport Association (IATA) confirmed that so-called flight shaming, ('flygskam' in Swedish), could bring about a decline in air travel growth in the future. Flight shaming has emerged as a trend towards making air travel socially unacceptable, owing to its high carbon footprint thanks to the efforts of the Swedish climate change activist – Greta Thunberg (Flaherty, Holmes, 2020).

3. Discussion questions and tasks for students

1. Referring to the assumptions of the post-growth economy concept, indicate the obstacles for its implementation.

2. Discuss both the advantages and disadvantages of consumption reduction. Apply both micro and macro-perspectives, and different share-holders perspectives.
3. Investigate the level of meat consumption in your country, in all EU countries, in the United States, in Japan, and in India. Try to find the sources of differences using as many factors as possible.
4. Examine your household energy and water usage. How could you limit it?
5. Examine your University activities that encourage limiting the consumption of single-use bottled water.
6. Conduct a simple survey on the willingness to install smart water/energy meters in a household. What conclusions can be made from this survey?
7. For what purposes is potable water used in your household? Could you replace it with grey water for some purposes?
8. Discuss the ways to reduce consumption presented here: <https://www.atidymind.co.uk/easy-ways-to-simplify-your-life-and-reduce-consumption/>
9. Examine food waste sources in your household. What kind of food is wasted the most? Why? What can be done to eliminate/lower it?
10. What food sharing apps do you know? What is your experience with using them?
11. Investigate the carbon footprint of a trip from Vienna to Madrid. Assume that 4 people are travelling either by car or by plane. You may use a calculator: <https://sustainabletravel.org/our-work/carbon-offsets/calculate-footprint/>

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MINIMALISM AND SUSTAINABLE LIVING

Konstantinos Madias

■ Annotation

Excessive consumption and mass production are two of the main reasons for the negative environmental impact on our planet. Consumerism is constantly growing, as individuals do not want to miss buying the latest trends and also as they have correlated consumption with happiness. Mass consumption and mass production are responsible for greenhouse gas emissions, air pollution, natural resources exploitations, and water pollution. However, consumers seem to react to these behavioural patterns and adopt new ones, such as minimalism. Minimalism is defined as a “voluntary action of reducing consumption and limiting the number of possessions that one owns”. Architects and artists first introduced minimalism as an art movement, however nowadays it is also considered to be a consumption lifestyle. This lifestyle is perceived as a solution to mass consumption and production, as the idea behind it is “less is more”. Minimalists go against mass consumption and focus on limiting their possessions, purchasing only needed products and better-quality products that could last for a long time. Thus, minimalism may have been introduced as an art movement, but nowadays, it is considered a sustainable consumption lifestyle.

Key words: minimalism, consumption, economy, sustainability, sustainable consumption, anti-consumption

1. Background

Over the past decades, consumerism has grown due to the constant increase in standards of living, internalization, and short-term trends from different cultures resulting in a more experience-driven economy (Pine & Gilmore, 2013). Advertising and marketing have also encouraged consumers to discard products after only using them once and to purchase new ones as they are more “trendy.” Due to this experience economy, a social movement or a lifestyle known as minimalism has emerged (Pangarkar et al., 2021).

Minimalism is an increasingly popular lifestyle. According to previous research, minimalism is the voluntary action of reducing consumption and limiting the amount of possessions that one owns to a bare minimum (Martin-Woodhead, 2022). Minimalism can be characterized as an anti-consumption behaviour focused on other aspects of life than consumerist attitudes. The main idea behind minimalism is “less is more.”

The etymologies of the word minimalism stem from the mid-century art and architecture movement, which focused on functionalism and efficiency (Martin-Woodhead, 2022). The architect Ludwig Mies van der Rohe (1886–1969) was the one who gave publicity to the saying “less is more”, as he was using it to describe his work. Additionally, in the mid 1960s, minimalism gained more popularity as a movement in the visual arts in the USA, which was presented as a reaction against the excessive nature of abstract expressionism (Wilson & Bellezza, 2022). Over the years, minimalism expanded from an art movement representing simplicity to a lifestyle or consumer culture through advertising, design, and fashion (McCracken, 1986). It is assumed that the minimalist lifestyle started in the USA in the 1970s and has been presented as a lifestyle where people resist excessive consumption and seek a higher quality of life (Alexander & Ussher, 2012). Minimalism has also been conceptualized as a second wave of voluntary simplicity, which came as a reaction to the global financial crash in 2008 and the rise of excessive western consumption (Martin-Woodhead, 2022).

This lifestyle re-gained popularity in the western economy during the last decade due to the emergence of minimalists and their actions to promote minimalism through TedTalks, YouTube, podcasts, and

books. These minimalists include: Joshua Becker, the creator of '[becomingminimalist.com](https://www.becomingminimalist.com)' and author of 'The More of Less'; Leo Babauta, who is the author of 'The Simple Guide to a Minimalist Life'; Joshua Fields Millburn and Ryan Nicodemus, authors of 'Minimalism: Live a Meaningful Life'; and Millburn and Nicodemus who have released two documentary films on Netflix – in 2016 and 2021. According to the minimalists above, one following a minimalist lifestyle should start by realizing what is needed in life, and then limiting, reducing, or getting rid of what is unnecessary.

Minimalism is strongly related to consumption in terms of quantity and quality. In terms of amount, minimalism refers to removing excess things and keeping only the practical things or limiting consumption. From the quality perspective, minimalists consume more durable items with longer life-cycles and limit their consumption when it comes to single-use products. Thus, this lifestyle is very connected with anti-consumption and criticizes over-consumption and its effect on the economy.

2. Over-consumption

As mentioned before, minimalism also emerged as a reaction to excessive materialism and mass consumerism which has been proven to affect the environment in many ways (Bradshaw, 2019). The mass consumerism movement boomed during the industrial revolution due to the abundance of resources and technological advancements; however, historically, consumerism has been associated with the spread of capitalism (Ali & Wisnieski, 2010). Apart from the industrial revolution, mass consumption has increased due to the rise of the population and urbanization in many areas. Larger populations require more food, water and energy, to the extent that in many cases this exceeds nature's ability to provide these resources in these amounts of people. However, consumerism is also perceived as a lifestyle that incorporates the idea that to be happy and prosperous, people should purchase more and better products and services. Increased consumption requires mass production to fulfil the consumption demand, which is responsible for greenhouse gas emissions, air pollution, exploitation of resources, water pollution, and waste increase. Mass consumption and, therefore, mass production require high energy and material

consumption levels, generate large quantities of waste, and exploit many natural resources. Mass consumption leads to overconsumption, which is when an ecosystem can no longer sustain the use of its resources as they are used faster than they can be produced in nature. The United States is an example of overconsumption, as this country uses over 1 trillion disposable items related to food each year, it is estimated that the United States generates about 287 pounds of plastic per year, which ends in landfills and pollutes the environment. China, Middle Eastern nations, and Europe also have high carbon emissions associated with overconsumption.

Overproduction is the production of products and services that exceed the actual needs of the consumers. Modern production methods – based on mass production, Just-in-Time philosophies, and short product life cycles – have shifted consumers' appetite to excessively consume products and services which end up in landfills as solid unrecycled waste (Panizzut et al., 2021). Such behaviours are not only impacting the available natural resources for future generations but are also impacting our current resources (Donmez-Turan & Kiliclar, 2021).

However, today's consumer seems to be more aware of the consequence of mass consumption on the environment. Consequently, it is noted that some consumers avoid buying products that harm the environment and have started to consume more sustainably (Funk et al., 2021). Additionally, due to increased ethical thinking, businesses focus more on sustainable production (Rafi-ul-Shan et al., 2018). Minimalism is regarded as a method of sustainable consumption and sustainable production.

3. Eco-minimalisms

Minimalists vary greatly in terms of their motives and values. Some of them choose this lifestyle as they want to distance themselves from the excessive consumption of our decade, others for environmental reasons, some want to expand their consciousness, while others choose this lifestyle for spiritual reasons. However, all of them are limiting their consumption and their possessions, therefore minimalism goes hand-in-hand with sustainable and conscious consumption.

The minimalist lifestyle can be seen as a solution to mass consumption and mass production, as it suggests that individuals should focus on reducing their consumption and behave more sustainably. To be more precise, minimalism can include being more engaged in eco-cautious sustainable decisions, such as buying ethical products with less environmental impact or high-quality products that can last longer, purchasing second-hand, buying local products, and sharing possessions (Kang et al., 2021). Other minimalistic behaviours that reflect sustainable living are focusing on saving energy by installing energy-efficient home appliances or reducing the size of one's home. Reducing the house size means reducing the amount of energy, gas and water needed to run a house. Additionally, many minimalists often practice "zero waste," which refers to reducing one's waste as much as possible, which means either limiting the consumption or consuming products that will be used long-term or will be recycled in order not to end up in a landfill. Thus, these minimalistic practices are seen as a solution to many crucial environmental issues that we face globally.

Minimalists are often considered to vote with their money to boycott or support certain products or services. Such consumption behaviours can play an essential role in protecting and maintaining natural resources (Hüttel et al., 2020), reducing the amount of non-recyclable waste, reducing the carbon emission caused by the mass production of goods, and minimizing the negative environmental impact.

Some of the main benefits of minimalism to the environment are that, by buying less, there is less need for products and services to be created, which means that fewer resources are needed, less fossil fuels are burned, and so there is less pollution of the environment. When following a minimalistic lifestyle, consumers tend to buy fewer products, but of better quality. Better quality products last longer, so the consumer does not have to purchase new products often. Additionally, minimalists have a low carbon footprint, as they don't consume unnecessary products, have a lower amount of waste, make more conscious decisions, and promote a circular economy.

However, such a swift change of lifestyles (from accumulating to minimalism) would require a de-growth of our current system. This transition would require new policies for the basic income, reduction of working hours, and environmental and consumption taxes (Kallis, 2011). To implement such change, policies should change, and people's perception of well-being would need to transform to avoid the

idea that living standards are connected with their social progress and well-being. (Meissner, 2019).

4. Criticism of minimalism

Minimalism, like all consumer lifestyles, has some potential disadvantages. For instance, the starting point of the minimalistic lifestyle could be perceived as expensive if, for example, an individual wants to change their home into an energy-saving space by purchasing new appliances. However, in the long-term, these changes will be beneficial both for the finances of the consumers and also for the environment due to the energy they will manage to save. Others criticize minimalism by claiming it is another form of consumption as it encourages consumers to purchase new products and services to save energy (sustainability reasons) or aesthetics. On the other hand, many minimalists do not care about aesthetics but rather about purchasing products needed for this lifestyle and repurposing or recycling their already purchased belongings. One of the last criticisms of minimalism is that consumers who follow this lifestyle tend to declutter a lot, so many products end up in landfills. However, based on the principles of minimalism, consumers declutter things that are not functioning anymore and cannot be repurposed; minimalists do not throw away useful or needed products.

5. Discussion questions and tasks for students

As mentioned above, minimalism is a lifestyle that can be seen as a reaction to excessive consumerism. Minimalism focuses on reducing/eliminating consumption, consuming sustainably, getting rid of non-essential products, reducing natural resources consumption, and repurposing or recycling products that are no longer functional. By following these practices, fewer natural resources are used and less waste ends up in landfills. Minimalism is connected with sustainable living, as minimalists consciously consume products and services that harm the planet the least. However, many will argue that minimalism is another form of elitist consumption, as shifting to this lifestyle may

require investing a certain amount of money in replacing the already purchased products and services with minimalistic products.

As a minimalistic lifestyle may be seen as a solution to many global environmental issues, the question is why we can't regulate some of these practices. To be more precise, regulating the amount of waste and consumption per household based on pragmatic needs would be a way to reduce the carbon footprint that is emitted from excessive production and would also reduce the amount of waste that is generated per household. If a home produces more waste than the regulations, or emits more carbon emissions, it will be fined. That way, more families would follow a minimalistic lifestyle and reduce their waste and carbon emissions, which would lead to protecting the environment. However, that would mean monitoring individuals' waste volume and consumption pace, which may cause different societal problems. Enforcing regulations on individuals' households, in terms of how they consume, may infringe people's liberties, as the house is an individual's private space. Thus, another way should be found to promote a minimalistic lifestyle to individuals. For instance, educating younger generations about how their consumption habits may harm the planet could raise awareness of the issues caused by overconsumption and over-production. More solutions on how to overcome these issues may be introduced.

After reading the above, answer the following questions:

1. How do you think minimalism and sustainability are connected?
2. Do you think minimalism can be seen as a solution to overconsumption and overproduction?
3. Refer to some solutions that a minimalistic lifestyle could offer to over consumption.
4. What is the main criticism of minimalistic behaviour? How would you answer this criticism?
5. Discuss how we can regulate minimalistic lifestyle in an ethical way without overstepping on the privacy of the consumers.
6. Refer to other consumption lifestyles that are connected with sustainable living and how we can regulate them.

6. Further reading

- The Life-Changing Magic of Tidying Up: The Japanese Art of Decluttering and Organizing – by Marie Kondō, 2011.
- The More of Less: Finding the Life You Want Under Everything You Own by Joshua Becker, 2016.
- Movie: Minimalism: A Documentary About the Important Things by Joshua Fields Millburn, Ryan Nicodemus, 2016.

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GREEN CONSUMPTION AND SLOW MOVEMENT

Sándor Nagy, József Gál, Krisztián Kis

■ Annotation

The aim of this subchapter is to provide an insight into the theoretical and practical aspects of green consumption, sustainable consumption and the Slow Movement concept. At first glance, consumption and sustainability are an oxymoron, i.e. contradictory phenomena. While consumption means the use of resources, sustainability implies their conservation. The resolution of this contradiction is perhaps one of the most important challenges of humanity. Although there are no specific, straightforward solutions offered here, hopefully we can read some interesting concepts and ideas. We will discuss the benefits of slowing down and the characteristics of people-oriented economics in the second section, as well as how these attributes might be used in practice in order to move towards sustainability. Finally, the Cittaslow movement will be presented as a concrete example of these phenomena.

Key words: green consumption, sustainable consumption, slow movement, slow living, Cittaslow

1. Introduction

It is increasingly obvious that humanity's global consumption and the production that serves it are unsustainable. Year after year, we exploit the Earth's renewable and non-renewable resources, and we intervene in the processes that serve the regeneration of the Earth's biosphere.

The rapid expansion in world population, accompanied by materialistic lifestyles, is boosting the global demand for goods and services

and leading humanity to never ending over-consumption. To meet such a huge, ever-increasing demand, the companies develop such goods and services which can be mass produced at very low cost but unfortunately these are generating ecological deficit (Pan, 2019; Tripathi and Singh, 2016). We should also mention here that sustainability is a concept that is difficult to grasp; it is almost impossible to define precisely, so it is a so-called fuzzy concept. There are countless approaches to the description, interpretation and applicability of sustainability, depending on the context in which it is placed.

July 28 2022 was the date when humanity's demand for ecological resources and services in a given year exceeded what Earth can regenerate in that year. We call this the Earth Overshoot Day (Global Footprint Network, 2022). This chapter specifically focuses on the relationship between (over)consumption and sustainability, and aims to illustrate this connection from a theoretical and practical perspective. Overconsumption is a serious problem both globally and at country or community level as well, which threatens the opportunities and well-being of future generations, not to mention other negative externalities associated with consumption (e.g. health effects, waste management issues, social and cultural consequences, etc.).

In comparison to their population size, some countries have a disproportionately significant impact on the planet. The next figure (Figure 1.) depicts the excessive resource usage in each of these countries to highlight their responsibility towards the global picture. These nations all consume resources at an unsustainable rate. We would require 3.3 globes to sustain the lifestyles of everyone on the planet if they all lived like the average person in these countries.

The situation has only worsened in recent decades. While in 1971 Earth Overshoot Day was on December 25, in 1980 the date fell on November 8. In 2010 it changed to August 8, while in 2020 it moved to August 22 (Global Footprint Network, 2022).

In this approach, a country's overconsumption equals the ratio of a country's Ecological Footprint of Consumption (EF_c) to its biocapacity in global hectares per person. For a better understanding, let's examine the methodological background of the Global Footprint Network. For more details, you can click on the following link:

<https://www.footprintnetwork.org/resources/data/>

The Ecological Footprint of Consumption (EF_c) indicates the consumption of biocapacity by a country's total population. In order to

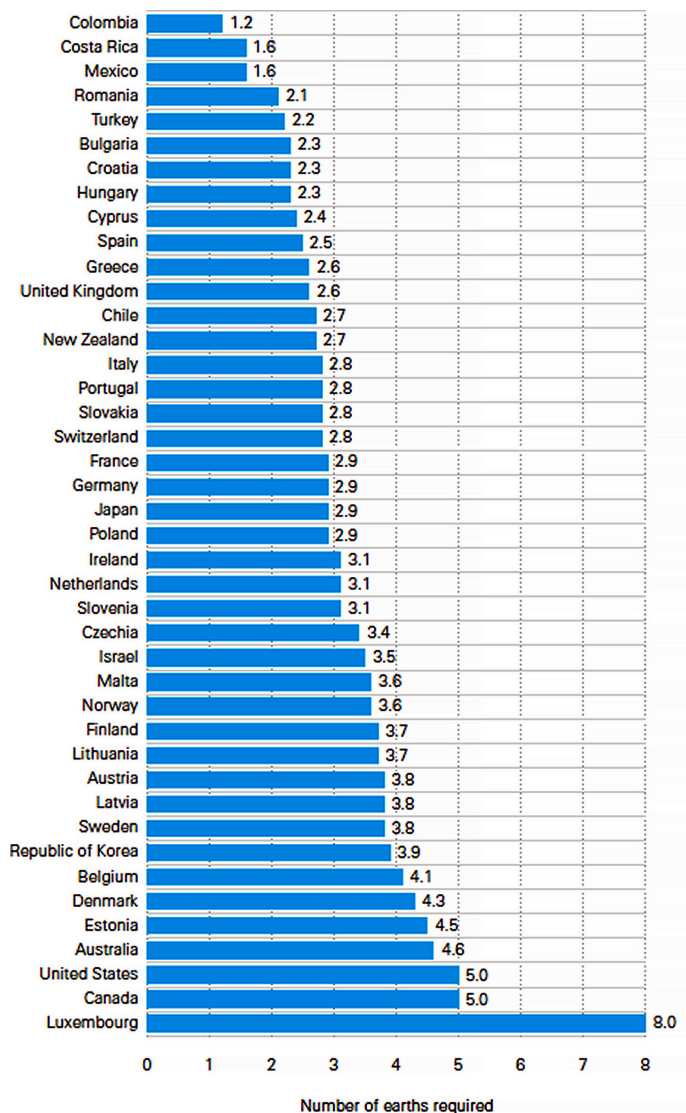


Figure 1. If everybody in the world consumed resources at the same rate people do in the given country, we would require the equivalent of the indicated number of Earths to satisfy their needs (2018).

Source: UNICEF (2022) and Global Footprint Network (2022).

assess the whole domestic demand for resources and ecological services of a population, they formed this indicator. (EF_c) refers to both the export of national resources and ecological services for use in other countries, and the import of resources and ecological services for domestic consumption. The reduction of the EF_c value can be achieved mainly by reducing consumption.

$$EF_c = EF_p + (EF_{IMP} - EF_{EXP})$$

The Ecological Footprint of Production (EF_p) reflects the consumption of biocapacity generated by production processes within a given geographic area. It is the sum of all the bioproductive areas within a country necessary for supporting the actual harvest of primary products (e.g. cropland, forestland, lakes/rivers etc.), the country's built-up area (roads, factories, cities), and the area needed to absorb all fossil fuel carbon emissions generated within the country. This measure mirrors the gross domestic product (GDP), which represents the sum of the values of all goods and services produced within a country's borders.

Net Ecological Footprint of Trade ($EF_{IMP} - EF_{EXP}$)

The utilisation of biocapacity in global trade is shown by the Ecological Footprint of Imports and Exports. The usage of biocapacity and the net ecological footprint of trade are both factors in international trade between nations (the Ecological Footprint of Imports – the Ecological Footprint of Exports). A country is considered to be a net exporter of renewable resources and ecological services if its Ecological Footprint as measured by exports exceeds its Ecological Footprint as measured by imports. In contrast, a nation that imports more than it exports is dependent on the renewable resources and ecological services provided by ecological assets outside of its national borders (Global Footprint Network, 2022).

Overconsumption and unsustainable lifestyles require responses and solutions. Sustainable consumption and green consumption are approaches whose understanding, investigation and promotion can start us on a sustainable path. The next subsection deals with these concepts.

2. The theoretical background of green consumption

As I mentioned before, sustainability is a fuzzy concept. The same is true for green and sustainable consumption. This can already be seen from the fact that the two concepts are often used synonymously in the literature, even though they are different. It will therefore be worthwhile to specify their meanings, at least to draw attention to the most important differences in their content. It can also be noticed that different authors emphasise different aspects and characteristics of the concepts. Below, we present the relevant interpretations of the terms, the pattern of their appearance in the literature and the most important differences.

2.1. Green consumption

In line with the above thoughts, we can agree with Peattie's approach (2010). According to him, the idea of "green consumerism" is really problematic, because as a concept, green consumption is also under attack. It is a set of practices that are highly context-dependent, complicated and multifaceted in both theory and practice. Since it overlaps with other ideas like ethical, sustainable, or responsible consumption, the definitions of green consumption in the literature are neither clear nor consistent. "Green" might be primarily assumed to relate only to environmental/ecological issues, but the definitions are subtly intertwined with the social and economic pillars of sustainable development as well (Peattie, 2010).

With this observation in mind, let's review some concepts:

- Yue et al. (2020) argue that green/sustainable consumption is an environmentally responsible behaviour characterised by advocating on behalf of nature and protecting ecology.
- Green consumption is the regular practice of exclusively using environmentally friendly products that do not harm human health and do not jeopardise the health or ability of any biological ecosystem to function. Studies suggest that it is the most cost-effective approach for implementing cleaner production efforts (Patil, 2013).
- Li (2020) claims that green consumption considers the environmental impact, resource efficiency and consumer rights

mode of consumption. Green consumption is based on consumer health protection and resource conservation and conforms to people's health and environmental protection; its core is sustainable consumption.

- Li (2020) also points out that with regard to green consumption the China Consumers' Association distinguishes three different meanings: (1) it encourages consumers to consume green products, (2) it pays attention to the disposal of garbage in the consumption process to avoid environmental pollution, and (3) it guides consumers to change their consumption attitudes, advocate on behalf of nature and pursue health.
- Focusing on psychological aspects, green consumption behaviour is the behaviour of an individual who considers environmental or social issues while making purchasing or non-purchasing decisions (Gilg et al., 2005; Peattie, 2010).
- According to Yue et al. (2020), green consumption behaviour refers to a kind of consumption style which shrinks the negative impact of consumption on the environment during the whole process of purchase, use and disposal, especially by choosing eco-friendly products.

2.2. Sustainable consumption

Since Agenda 21 identified unsustainable production and consumption as the primary cause of the continuous deterioration of the global environment, sustainable consumption (SC) (as a behavioural pattern, phenomena, or concept) is at the forefront of scientists' interest.

The definitions describing sustainable consumption are mainly focused on the allocation of opportunities between generations.

- Sustainable consumption refers to a level and pattern of consumption which meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Commission, 1987).
- Use of products and services that meet basic needs and improve quality of life while minimising the use of natural resources, harmful materials and emissions of trash and pollutants over the course of the product's life cycle is known

- as sustainable consumption (Oslo Ministerial Roundtable, 1994).
- Sustainable consumption calls for customers to take responsibility for society and the environment while living in peace with nature. According to Steg and Vlek (2009), sustainable consumption activities cover all consumer behaviours that have the potential to reshape the structure and dynamics of an ecosystem or biosphere due to changes in the availability of resources. Examples of these behaviours include the use of organic products, the purchase and use of energy-efficient devices, the insulation of homes, the use of smart grids, the reduction of plastic usage, the use of public transportation, reduction of fossil fuel usage, reuse of items, repairing of appliances, and the reduction of wastage and recycling (Park and Ha, 2014). The review of past studies shows that sustainable, green, pro-environmental, ecological and other similar terms have been used interchangeably (Tripathi and Singh, 2016).
 - Jackson (2005), Sheth et al. (2011), Welsh and Kühling (2009) think differently, their opinion differs from the consumption reduction dogma. According to them, sustainable consumption does not necessarily equate to consuming less, but rather to consuming differently.
 - Robins and Roberts (2006) already include the role of time and money in their own definition: sustainable consumption means consumption that balances time and monetary expenditure, while satisfying the basic needs of life and the future needs of generations.
 - Regarding the psychological dimension, there is a relatively strong consensus in the description of sustainable consumption behaviour: such behavioural actions and patterns which improve social and environmental performance and also meet consumer needs (Tripathi and Singh, 2016 quote: Belz and Peattie, 2009; Jackson, 2005; Jain and Kaur, 2006; Luchs and Mooradian, 2012; Sharp and Wells, 2013; Shrum et al., 1995; Wang et al., 2014; Zhao et al., 2014).
 - Nekmahmud et al. (2022) point out additional, long term effects: sustainable consumption behaviour (locating, purchasing, and consuming products in an environmentally

friendly manner) is an indispensable requirement for promoting sustainable development.

- In light of the above-mentioned conceptual components, the differences can be summarised as follows: the concept of sustainable consumption is much broader than green consumption. Sustainable consumption concentrates on a longer time period and takes into account the interests of different generations. It is necessary to place the concept of sustainable consumption in a broader and multidimensional context: a more accurate understanding requires a holistic approach, which also promotes consumer awareness. Conceptual boundaries are often blurred in the literature, which will not be confusing if we keep in mind the indicated differences.

2.3. The patterns of sustainable consumption in the literature

It can also be useful and interesting to examine the penetration of sustainable consumption related topics in the field of scientific publications. The work of Hasbullah et al. (2021) will help us trace the literary development of the concept. This systematic and extensive analysis covers a period of 45 years, which also included the oldest accessible paper in the Scopus database published in 1997.

In the 1980s and 1990s, discussions of sustainability were frequently combined with CSR activities of companies. However, since the late 1990s, a significant shift has been noted in who is responsible for advancing sustainable corporate practices. In the middle of the 1990s, many consumers had begun to believe that it is their responsibility to buy and consume in a way in which the society and the environment can be preserved (Roberts, 1995).

As a result of growing pollution and ecological devastation at the turn of the millennium, awareness of sustainability further encouraged the publication of this field of study (Joshi and Rahman, 2015; Sun and Ko, 2016). From 2016 to 2019, research on sustainable consumption significantly increased. Customers and scientists have focused on the need for durable, sustainable and innovative products in recent years (McMeekin and Rothman, 2012; Kumar, 2018). The following figure (Figure 2.) shows the exponential growth in the number of scientific articles related to sustainable consumption.

Bibliometric methods are gaining more and more popularity. In relation to green consumption, a similar, very comprehensive analysis was conducted by Yao et al. (2022). A total of 2194 papers were collected which were published from the beginning of 2016 to February 2022. Principal Component Analysis and Multidimensional Scaling were used in their research, and in order to perform a collaborative network analysis among authors, institutions and countries, they used the Citespace software which is a knowledge mapping tool. Even the last cited article draws attention to the factors and their relevance which have a significant impact on eco-conscious consumption. These will be discussed in the next subsection.

2.4. Influencing factors of sustainable consumption behaviour

The fuzzy nature of green- and sustainable consumption behaviour is also reflected by the fact that in many cases the factors (predictors) affecting them cannot be clearly defined or exactly delimited, and in different contexts their effects appear with different strengths, or their explanatory power cannot be demonstrated significantly. The situation is further complicated by the fact that researchers often examine these factors together and try to map the causal relationships between them. Structural equation modelling (SEM) analysis is most often used for this purpose. SEM is a set of statistical techniques used to measure and analyse the relationships of observed and latent variables.

As we discussed earlier in connection with literature penetration, the authors examined a number of factors that influence or can influence sustainable consumption, as well as the behaviour that leads to a purchase decision. Some of these are listed below, especially for demographic factors. The list below is based on a very comprehensive review article (Tripathi and Singh, 2016).

2.4.1 Demographic factors

Gender

Females generally show greater concern for the environment and engage in more green activities, even if the impact of gender has been observed to be uneven. When it comes to purchasing decisions, women are more likely to consider social and environmental issues. Olli

et al. (2001) noted that women have been found to care more about social and environmental concerns during purchases.

Income

While several studies (Zimmer et al., 1994; Tilikidou, 2007) have revealed a significant relation between income and environmental attitudes and behaviours, Tilikidou's 2013 study showed no evidence of a relationship between any green behaviour and income. In a similar vein, Park and Ha (2014) discovered no differences in green product purchases across different household income levels. In addition, numerous studies have found insignificant or negative connections between income and all aspects of green consumption (Akehurst et al., 2012; Olli et al., 2001).

Age

High age was consistently linked to green behaviour, according to a number of studies (Sandahl and Robertson, 1989; Olli et al., 2001; Wang et al., 2014; Zhao et al., 2014); nevertheless, some studies did not detect a connection (Bhuiyan et al., 2014; Khare, 2014). Age could be a significant factor when analysing sustainable consumption, since as individuals get older, they become more aware of their health and the choices they make. However, because of discrepancies in the previous studies, further research is required.

Education

Education and pro-environmental behaviour have been demonstrated to be positively correlated. Numerous earlier studies found a positive relation between education and the green consumer's behaviours (Arbuthnot, 1977; Schwartz and Miller, 1991; Tilikidou, 2007; Zhao et al., 2014; Wang et al., 2014). Higher education levels were associated with more knowledge, favourable attitudes, higher perceived consumer effectiveness (PCE), and higher intentions to buy environmentally friendly goods (Diamantopoulos et al., 2003; Sandahl and Robertson, 1989; Zimmer et al., 1994).

Lifestyles

An ascetic or voluntary simplicity lifestyle, which is characterised by both restraints in acquiring possessions and ingenuity in using goods and services, has been reported as positively impacting sustainable

actions (Lastovicka et al., 1999), however, very limited studies have examined the relationship of frugal lifestyle with green behaviour.

2.4.2 Socio-psychological factors

There are 28 socio-psychological factors listed in the cited article. Among these, the more well-known and more frequently investigated include the following: attitudes, predicting power of attitudes, intentions, norms (personal and social norms), values, environmental concern and knowledge, perceived consumer effectiveness/self-efficacy/locus of control, identity, mindfulness, perceived consumer effectiveness, cultural orientation, and promotion of government and enterprise.

The following examples are less common, but quite specific: perceived marketplace influence, perceptions of product effectiveness, willingness to sacrifice, consumer's faith in science and technology, perceived product necessity, global cultural identity, and past behaviour (Tripathi and Singh, 2016).

3. The theoretical background of "slow down"

Fast life is an obvious consequence of global capitalism: wasting time is a cost burden to economies and capitalists who are pursuing the principle of the *return on capital*, so speeding up processes, and making society move faster, serve the quickest and least risky return. Due to the realisation, imposition and enforcement of profit-oriented value creation processes we can witness the following phenomena: faster traffic, faster flow of information, faster food, faster cities and faster lifestyle (Knox, 2005). Increasing globalisation also amplifies the differences between the "fast world" and "slow world", where the former boosts mass production and particularly (over)consumption of goods and services, or in other words "material culture", including a wide range of strongly related aspects – sociology, psychology, ecology or politics, which has been the case since 1970s (Kaplan et al., 2010).

If we want to characterise the current global business environment, we must consider the following special attributes:

- rapidly changing deterministic environment (VUCA or non-linearity),
- universal, global culture,

- profit-oriented innovation, disruptive technologies, digital transformation,
- time is a scarce resource, short-term thinking and tunnel vision.

Complementing the last item in the list, according to Jessop (2003) globalisation is not only a spatial or scalar phenomenon – it is also a temporal one. However, many of the research topics analysed in line with sustainable consumption are only indirectly concerned with the time factor.

Jalas (2006) argues that in general, people use their time as well as their money and other available resources while engaged in consuming activities. He also claims that individuals consume not only to satisfy their needs but also for other reasons, which cannot simply be categorised as unnecessary needs.

In modern, materialistic societies the need to fill time is also a reason for consumption. So people usually fill their free time through consumption, by doing so they can avoid experiencing empty time.

When we talk about the relation between time and wealth, we should mention the famous report, titled *The Limits to Growth*, written by Meadows et al. (1972) and the explanation of Reisch (2001). According to these sources, “wealth in time”, in addition to the concept of “wealth in goods”, can be an effective parameter in sustainable consumption. More time will not directly generate a more sustainable lifestyle unless it is used wisely. People do not want “more free time” but “enough time for meaningful things”. In this case we can talk about the intrinsic value of time (Jouzi et al., 2021, Reisch, 2001).

If we extend the human-centred and sustainability focused approach to the whole of economics, we arrive at Schumacher’s perspective. The foundations of *human-oriented economics* were elaborated by E. F. Schumacher (1973). These theoretical contributions had also been integrated into the new, “slow-down” paradigm. The following table (see Table 1.) contains a comparison of human-oriented and modern, profit-oriented economics.

Table 1. Comparison of human-oriented and modern, profit-oriented economics.

	Human-oriented Economics	Modern, mainstream economics
lifestyle	human-oriented	materialist
relationship to work	creating value, cooperation, building capacities and capabilities	work is a necessary evil, it is an opportunity to earn money
governing principles	simplicity, non-violence	continuous growth
cornerstones of the standard of living	happiness, minimisation of the ecological footprint	amount of consumption, maximisation of owned goods
ultimate goal	satisfying human needs (demands) with the least consumption	striving to maximise consumption; land, labour and capital are only tools
relationship with nature	respect; the human being is part of nature; use of local resources; self-sufficiency; taking care of non-renewable resources and minimising their use	dependence on distant assets/resources; the natural factor is only a tool to increase consumption; wasteful activities
education	holistic	specific
dimension	human scale, transparent	the bigger, the better

Source: Schumacher (1973), buddhista-kozgazdasagtan.hu (2008).

Considering the thoughts so far, we can state that reappraisal of *time* as a resource and the findings of human-oriented economics can generate intelligent responses to the challenges of globalism and unsustainable consumer patterns. It should be noted that these are exactly the most important pillars of the new cultural paradigm that we call the Slow Movement.

4. Slow Movement

As more and more people became open to environmental issues, in parallel they started to question the relation between increased consumption and well-being. In this context, new ideologies began to emerge that advocated diminishing overconsumption and finding solutions toward a more sustainable lifestyle, such as “simple living” (or voluntary simplicity), “eco-consciousness” or the “Slow Movement”.

The Slow Movement is basically a movement in opposition to global capitalism and the inherent consumerist culture, and – at the same time – could facilitate a slow down of the pace of life.

The historical roots of the movement can be found in the Hindu, Buddhist and Christian religions, offering a simple life and time for regular reflective, meditative practices. Today, the most relevant attributes of the movement are as follows:

- the Slow Movement aims to address the issue of “time poverty” through making connections and building networks,
- respect for nature and local values,
- human-oriented, focus on families and healthy life,
- sustainability and slow living.

The beginning of the movement dates back to 1986, when a global fast food restaurant chain opened a new branch near the Spanish Steps, one of the most important symbols of Italian culture, in Rome, Italy. This event initiated a large protest, which later sparked the formalisation of the Slow Food Organization led by Carlo Petrini, an Italian food and wine journalist. At that time, only food was focused on, which is reflected in the name: a movement against fast food. In 1989, in Paris, the basic manifesto of the organisation was published, which advocated going to local markets, enjoying the preparation and the taste of food, as opposed to fast and standardised food. The slow food movement was launched by activists around the world, and accordingly, this method also conveys a critical viewpoint. The activists, led by Petrini, formulate basic principles, organise themselves into communities, organise events, and to this day start dialogue with key organisations (slowbudapest.com).

The Slow Movement, as an ideological and cultural melting pot, and the Slow Food Organization triggered different, related initiatives: Slow Living, Slow Food, Slow City, Slow Art, Slow Tourism, Slow Parenting etc. Furthermore, in 1999 Geir Berthelsen founded The World Institute of Slowness with a vision of a “Slow Planet”. The substantial and fast expansion of the Slow Movement may reflect a deep-rooted desire in societies and communities to become greener and for places to become more liveable (Botta, 2016).

In the next subsection we can gain a brief insight into the Slow Living and the Slow City concepts.

4.1. Slow Living

The *Slow Living* concept aims to improve the quality of life of individuals, communities and the environment. Slow living is a response to a high-tech, quick-paced environment, as well as a way to reconnect with local traditions in an era of global culture. In recent years for example, the handicraft activities and small self-organising groups (e.g. different initiatives of the sharing economy, urban gardening, self-learning groups, etc.) gained increasing popularity on the local level (Botta, 2016).

Slow living offers four guiding principles as a solution to the aforementioned challenges: (1) slower temporalities and (2) localities, as well as (3) social and (4) ecological principles. Carl Honoré (2004) formed the ideas and emphasised the use of slowness in daily routine (1). It's not the same as being lazy or delaying doing something. This principle seeks to balance the flow of time during our life. Honore explained this as follows "The Slow philosophy is not about doing everything at a snail's pace. It's about seeking to do everything at the right speed" (Honoré, 2004).

(2) Another principle is locality. It is all about harnessing the local potential, the social capital and the affordability of activities. It can contribute to the sustainability of society's identity (culture) by maintaining heterogeneity, a distinctive character that manifests in physical and spatial components. (3) The third principle is social activity oriented behaviour. This principle emphasises the importance of social interactions. It involves raising the level of happiness in society and enhancing the quality of life of communities. Here, self-interest turns into collectivism. (4) The fourth principle is ecology. Its objectives are to stop environmental degradation and raise environmental quality. In order to reach this goal, it also pays attention to harmonising people and their materialistic lifestyle (Sari and Lukito, 2017).

Sustainable communities (including smaller groups or even towns) based on slow living concepts may offer a viable alternative and the quality of life. Concepts of slow living used in these communities are reemerging in the shape of new eco-villages and eco-cities being built all over the world, or in slow cities where a substantial transformation can be detected, which helps in making the lifestyle of the citizens more liveable (Botta, 2016).

4.2. Slow City/Cittaslow

Cittaslow's primary objective was – and remains to this day – to expand the Slow Food philosophy to local communities and towns by implementing the principles of ecogastronomy and slow living in daily life. The great initiative of Paolo Saturnini, a former mayor of the small Tuscan town of Greve in Chianti, gave birth to the Movement of Cittaslow in 1999.

The mayors of Greve in Chianti, Bra, Orvieto and Positano in Italy decided to join Saturnini's initial suggestion to transform theoretical principles into practical successes, emphasising the advantages of slowness, sustainability and social fairness.

Since that time, Cittaslow has grown and now counts 287 member towns in 33 different countries that actively preserve the sustainable processes of our Planet.

Cittaslow cannot exist without the lively and precious contribution of different local entities, such as traders, craftsmen, farmers, schools, voluntary associations, etc. The diversity and the vibrant cooperation of local actors is the starting point for new ideas and innovative solutions.

The main goal is to preserve the identity of the community and at the same time share knowledge with the new generations to make them aware of their cultural heritage. As they say: "There's no Smart without Slow" ([Cittaslow.org](https://cittaslow.org), 2019).

We can identify 5 different pillars on which the concept rests ([Cittaslow.org](https://cittaslow.org), 2019; Özmen, 2018):

(1) The positive side of slowness

As everyone is now aware, slowness is essential to a "good life". Of course we should change our habits and lifestyle, and we should also reconsider our relation with production and consumption. Let's take back the time as a resource to grow, socialise, appreciate culture, nature and healthy local food, keeping in mind that every living entity has the right to follow their own natural rhythms.

(2) Circular economy

Consuming less, recycling, and reusing are no longer options; they are essential duties that we all must perform. With the help of active

citizens and other actors involved in the slow movement, Cittaslow develops new ideas for circular economies.

(3) Resilience

One of Cittaslow's tenets is "Enhancing what we are and what we have, without hurting ourselves." It is both a message and a plan for the present and the future.

(4) Social justice

Cittaslow channels the energies of local communities toward common aims in order to handle division and dissolve prejudices. However, prosperity cannot exist if it is not shared by all people, without exception.

(5) Sustainability and culture

We must do more than only protect the natural environment in order to curb climate change and manage other sustainability challenges; we also need to promote local culture and heritage. Cittaslow – as a cluster of resilient micro-economies – extends the commitment to sustainability to social resources through actions of inclusion and shared responsibility within its network.

The commitment to these principles and their implementation are embodied in the admission and membership criteria. A town must go through a specific certification process in order to become a Cittaslow town. To achieve the "Slow City" membership, a city must agree to accept the guidelines of Slow Food, work to improve liveability, and save the local environment and its resources.

The certification of towns specifies 72 requirements for quality, subdivided into 7 macro areas (Özmen, 2018):

(1) Energy and environmental policies

Some fields of requirements are as follows: air- and water quality conservation, parks and green areas, renewable energy, energy saving in buildings and public systems, reduction of public light pollution, conservation of biodiversity etc.

(2) Infrastructure policies

Such as alternative mobility, cycle paths, street furniture, removal of architectural barriers, "sustainable" distribution of merchandise in urban centres, initiatives for family life and pregnant women, etc.

(3) Quality of urban life policies

Some requirements are as follows: planning for urban resilience, urban liveableness, use of ICT in the development of interactive services for citizens and tourists, service desk for sustainable architecture, promotion of private sustainable urban planning and social infrastructure, creation of spaces for the commercialisation of local products.

(4) Agricultural, touristic and artisan policies

We can list here e.g. development of agro-ecology, prohibiting the use of GMO in agriculture, increasing the value of rural areas, protection of handmade and labelled artisan production, etc.

(5) Policies for hospitality, awareness and training

We can mention here: offering a good welcome, increasing awareness of operators and traders (transparency of offers and practised prices, clear visibility of tariffs), availability of "slow" itineraries, permanent training of trainers and/or administrators and employees on Cittaslow slow themes, support for Cittaslow campaigns, etc.

(6) Social cohesion

The most important requirements here: child care, integration of disabled people, community association, multicultural integration, public housing, youth activity areas.

(7) Partnerships

Support for Cittaslow campaigns and activities, collaboration with other organisations promoting natural and traditional food, support for twinning projects and cooperation for the development of developing countries covering also the spread of Cittaslow's philosophy.

5. Discussion questions and tasks for students

Based on the learning material, make suggestions or any additional comments in relation to the case studies. Present your answers and remarks in a slide show. Write your arguments in to express your ideas. A minimum of 12 slides is required. If necessary, you can use the Internet to conduct additional research based on the guidelines of the textbook.

1st Case Study

In a Cittaslow member town, the local government wants to install a smart infrastructure system based on digital technology. In other words, the town intends to become a smart settlement in parallel with the slow movement efforts.

- What is your opinion, are these two commitments compatible with each other?
- What areas would you prioritise during the development (tourism, education, public transport, recreation, resource management or any other topics)?

2nd Case Study

There is a medium-sized university that would like to implement some of the characteristics of the slow movement into reality.

- In which areas of education do you think this could be most easily achieved?
- What should be changed in the infrastructure of the university?
- In your opinion, is the slow-down of a university and its fundamental role in creating knowledge in modern, digital societies at all compatible?

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DISCLOSURES IN SUSTAINABLE BUSINESS PRACTICES

THE REGULATORY FRAMEWORK OF NON-FINANCIAL REPORTING

Nikolina Dečman

■ Annotation

Non-financial reporting is not a new concept in the field of company reporting, but for many years it was a more or less non-binding way of informing interested users about a company's environmental, social, and governance (ESG) practices, so-called non-financial performance. Today, the situation has changed significantly. Namely, back in 2014, the Non-Financial Reporting Directive (NFRD) was passed, which obliged certain categories of companies to report on information necessary for understanding the development, business results and position of the entrepreneur, as well as the effect of his activities, which relate at least to environmental, social and employee issues, respect for human rights, anti-corruption and bribery issues. Furthermore, at the end of 2022, the new Corporate Sustainability Reporting Directive (CSRD) significantly expands the range of users obliged to apply sustainability reporting, which now includes a larger number of large companies as well as listed small and medium-sized companies. This subchapter primarily defines non-financial reporting and analyses its development throughout history in the context of regulatory frameworks that define the content and scope of disclosures about non-financial information. It discusses which currently existing regulatory guidelines and frameworks for non-financial reporting are applicable at the international level. In addition, this subchapter describes all the novelties related to reporting regulations at the level of the European Union and provides an analysis of the shift from non-financial to sustainability reporting.

Key words: non-financial reporting (NFR), environmental, social, and governance reporting (ESGR), corporate sustainability reporting (CSR), regulatory frameworks, EU directives, guidelines.

1. Introduction

Knowledge of relevant financial and non-financial information is a prerequisite for a quality information base where the accounting profession, in cooperation with company management, can make a significant contribution to business decision-making. The rules for compiling and presenting financial statements are given in the normative framework, i.e. in the form of accounting principles, accounting standards and legal regulations. Accounting principles can be described as basic rules used when compiling and presenting financial statements, and they are regularly applied in the accounting of all companies regardless of their legal status or their size. In order to make accounting principles easier to apply, they are elaborated in more detail through accounting standards and legal regulations. Accounting standards represent a more detailed elaboration of individual accounting principles. Therefore, the principles actually form the foundation for establishing reporting standards that are further developed in detail by professional associations since they were developed by the accounting profession, i.e. accounting experts. On the other hand, various legal regulations are passed by regulatory bodies, and certainly at the level of the European Union, that place belongs to the European Commission. In other words, national legislation is significantly affected by the regulations, directives and guidelines enacted by EU legislation. Regulations adopted at the EU level are binding for all full-fledged Member States, as well as other countries that are applying for EU membership. The directive is a legislative act that contains the guidelines that all EU countries must achieve, but each country individually decides through its own laws how to achieve these goals. There is another form of regulation that is binding, but only for those to whom it applies (an EU country or an individual company), these are the so-called "decisions". EU legislation can also make various statements and opinions that are not binding, but reflect the official positions of the EU bodies (for more information see European Union, n.d. b).

Companies communicate with their stakeholders by reporting on the financial position and business performance in a financial and non-financial sense. Related to the above, two types of reporting can be distinguished, namely financial and non-financial reporting. For the purposes of financial and non-financial reporting, Directive 2013/34/EU, Directive 2014/95/EU and the latest Directive (EU) 2022/2464 are especially important as a turning point that brings numerous innovations into the field of sustainability reporting and marks it as mandatory for a wide range of users.

This subchapter is divided into three main parts. After the introduction, it provides insight into the conceptual definition of non-financial reporting and provides an overview of its development throughout history. The subchapter identifies three major accelerations, i.e. waves within which the conceptual framework of non-financial reporting changed and developed, and which have had a significant impact on the current regulatory environment. Furthermore, the chapter presents some of the most widely used standards and legal frameworks for corporate sustainability reporting, and puts emphasis on importance and value of non-financial reporting for all users involved in the reporting process. Finally, this subchapter covers the key novelties related to new EU reporting regulations and highlights the implications, key challenges and tasks that companies will soon encounter and need to implement.

2. Background

2.1. Defining Non-Financial Reporting and exploring its historical development

There is no single universally accepted definition of the non-financial reporting (Baumüller, Sopp, 2022; Ortiz-Martinez et al. 2022; Carungo et al., 2021; Remlein, 2021; Tarquinio, Posadas, 2020; Heller et al., 2017). It often includes several terms that essentially denote the same or similar meaning. For example, for the concept of reporting on social and environmental issues in the literature, we can find about 10 terms used to explain the same or similar meaning, such as “social reporting, environmental reporting, social and environmental reporting, CSR reporting, social responsibility reporting, non-financial reporting,

integrated reporting, corporate sustainability reporting, triple bottom line reporting or environmental social and governance reporting" (Zyznarska-Dworczak, 2019 cited by Remlein, 2021, p. 127). Carungo, Di Pietra, Molinari (2021) find that many authors of academic articles avoid defining non-financial reporting, but instead refer to fundamental concepts in research such as social, environmental and governance reporting, human capital reporting, or corporate sustainability reporting.

Below are some of the recognized definitions or concepts of non-financial reporting. The most well-known definition of non-financial reporting can be read from the non-financial directive from 2014, where it is defined what is meant by non-financial information. In accordance with the Directive, non-financial reporting implies the publication of all relevant information relating to "at least environmental matters, social and employee-related matters, respect for human rights, anti-corruption and bribery matters" (Directive 2014/95/EU). Some authors present a much broader definition and say that it is "reporting on any matters relating to activities of a business that are beyond the financial transactions and financial standing of the business" (Department for Business, Energy and Industrial Strategy, 2021, p. 23). They additionally reason that the meaning of that definition will change depending on the stakeholder's perspective, since its meaning depends on the context (for more information see Department for Business, Energy and Industrial Strategy, 2021).

Thus, it can be confirmed that there are numerous synonyms that can be used in the context of non-financial reporting. For the purposes of this subchapter, non-financial reporting means informing and reporting to all stakeholders and the public on environmental, social and employee matters, respect for human rights, anticorruption and bribery matters, as well as any form of governance, corporate sustainability and/or climate related disclosures.

Monciardini, Mähönen & Tsagas (2020) recognize the importance and value of non-financial reporting for all users involved in the reporting process: reporting companies, all users of non-financial disclosure, and society and the environment as a whole. Specifically, non-financial reporting "creates greater value for the reporting companies; better information for all the users of non-financial disclosure such as investors, civil society and other stakeholders; and positive implications for society and the natural environment at large" (Monciardini,

Mähönen & Tsagas, 2020, p. 21). "Non-financial reporting is becoming a relevant type of disclosure in the corporate environment, causing growth in the amount and extent of non-financial reporting by companies that deal with different requests for information from several stakeholders" (Carungu, Di Pietra, Molinari, 2021, p. 450).

It is known that there are currently many different international frameworks for the disclosure of non-financial information, and one of the reasons is that until recently, social and environmental reporting was in the domain of primarily voluntary reporting and companies had the opportunity to apply the reporting framework that they themselves considered most appropriate for the industry or activity they are engaged in and the country in which they operate, i.e. whether they operate primarily on the domestic or international markets. In order to position and understand the current situation regarding non-financial reporting, it is important to see how its conceptual framework has developed throughout history. According to the literature, it is possible to identify "three major accelerations over the decades through which the current regulatory landscape has emerged" (Monciardini et al. 2020, p. 8.). Figure 1 systematizes the main characteristics of those three layers of non-financial reporting frameworks.

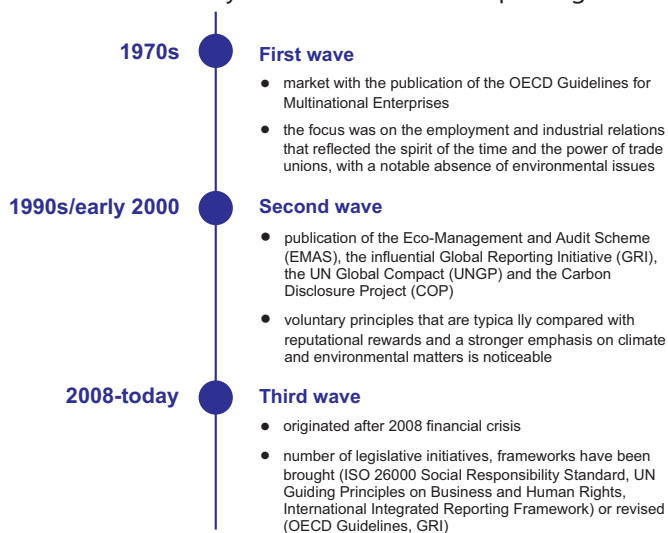


Figure 1. Three waves of non-financial reporting frameworks. Source: according to Monciardini, Mähönen & Tsagas, 2020, p. 8–17.

It is interesting to note how the problem of non-financial reporting has intensified almost every 20 years or so, as evidenced by the three periods of significant development of non-financial regulatory frameworks mentioned above. The first indications of the importance of reporting on employee matters and industrial relations can be found in the 1970s, in the OECD's Guidelines for Multinational Enterprises. In the second wave, numerous frameworks were published, the application of which was mostly voluntary, and more and more attention was being paid to environmental and climate issues. The third wave was marked by the new financial crisis in 2008, which demanded that the issues of non-financial information be legislated and that certain groups of companies be required to publish such information, either as part of the management report or as part of a separate sustainability report (for more information see Monciardini, Mähönen & Tsagas, 2020). Since there are currently numerous standards and regulatory frameworks for non-financial reporting, below the existing regulatory initiatives and frameworks for non-financial reporting that are currently in use will be compared in more detail.

2.2. Regulatory initiatives and non-financial reporting frameworks

Many authors have already confirmed the importance of non-financial reporting and its influence on business sustainability and on gaining the greater trust of investors, creditors, financiers, business partners, and the state, and therefore on improving the business performance of companies (Burhan & Rahmanti, 2012; Carunga et al., 2021; Ortiz-Martinez et al., 2022; Reddy & Gordon, 2010). Its international significance and importance is also evidenced by the large number of stakeholders, mainly different international non-governmental and/or non-profit organizations, who participated and contributed in the creation of standards, regulatory frameworks and guidelines that define key settings, tools and techniques for evaluating non-financial information such as: Global Sustainability Standards Board (GSSB), International Sustainability Standards Board (ISSB), Climate Disclosure Standards Board (CDSB), United Nations (UN) Global Compact, Financial Stability Board – Task force on Climate-related Financial Disclosure, Value Reporting Foundation (VRF), International Integrated Reporting Council (IIRC), Sustainability Accounting Standards Board (SASB),

European Commission (EC), European Financial Reporting Advisory Group (EFRAG) Sustainability Reporting Board, and many more (for more information see Department for Business, Energy & Industrial Strategy, 2020). A more detailed comparison of selected non-financial reporting frameworks can be seen in Table 1.

Such a large number of different organizations that offer some of their narrowly specific guidelines creates confusion in the application, therefore an internationally acceptable solution is expected to be sought that would reconcile certain differences that can be found when reporting with different reporting frameworks. The above would be necessary for the sake of transparency and international comparability. Let us recall that financial reporting at the international level has already been standardized for many years, where the International Financial Reporting Standards are generally accepted standards for reporting on the financial position and financial performance of all large and listed companies at the EU level. On the other hand, according to Tsagas & Villiers (2020, p. 15) “the non-financial reporting landscape is less consistent and much softer in its approach, leaving considerable freedom for companies to decide for themselves which initiative they will follow and what information they will present and to whom”. Therefore, it is logical that today international efforts are aimed at harmonizing non-financial reporting, i.e. reporting on sustainability. Since the European Commission is “the executive branch of the European Union and it has the right of initiative to propose laws in a wide range of policy areas” (European Union, n.d. a), its interest and involvement in regulating such an important topic for a large number of companies operating in the EU is logical. In Table 2 there is an overview of the previous and existing regulatory initiatives of the European Commission.

The first mention of non-financial information and non-financial reporting in EU regulatory frameworks dates back to 2013, when the European Commission, by Directive 2013/34/EU, provided that companies should, if appropriate, include in the management report certain non-financial key performance indicators that could be relevant for the individual company. However, there were no more detailed instructions on which guidelines or frameworks for non-financial reporting companies should apply.

Table 1. Comparison of selected non-financial reporting frameworks

Name of the standard / framework/ guidance	Abbreviation	Publisher	Main purpose	To whom do they report?	Mandatory/ voluntary use
Task Force on Climate related Disclosures	TCFD	Financial Stability Board	improve and increase reporting of climate-related financial information	investors, lenders, and insurance underwriters	voluntary
Climate Disclosure Standards Board Framework	CDSB	Climate Disclosure Standards Board	a framework for reporting environment and social information in the main-stream corporate reports	investors	voluntary
Global Reporting Initiative	GRI	Global Sustainability Standards Board	enable organizations to understand and report on their impacts on the economy, environment and people in a comparable and credible way	investors, policymakers, capital markets, and civil society	voluntary
Sustainability Accounting Standard Board standards	SASB	Sustainability Accounting Standard Board	help companies disclose financially-material sustainability information	investors	voluntary
UN Guiding Principles Reporting Framework	UN GPRF	United Nations	enables investors to review companies' understanding and management of human rights risks	investors, government, civil society, business	voluntary

Name of the standard / framework/ guidance	Abbreviation	Publisher	Main purpose	To whom do they report?	Mandatory/ voluntary use
ISO 26000 Social responsibility	ISO 26000	International Organization for Standardization	helps clarify what social responsibility is, helps businesses and organizations translate principles into effective actions and shares best practices relating to social responsibility, globally	wider stakeholders	voluntary
International Integrated Reporting Framework	International <IR> Framework	International Integrated Reporting Council (IIRC) – from 2022 under IFRS Foundation	promote a more cohesive and efficient approach to corporate reporting that results in efficient and productive capital allocation, acting as a force for financial stability and sustainable development	providers of financial capital, investors and other wider stakeholders	voluntary

Source: adjusted according to: Department for Business, Energy and Industrial Strategy, 2020, p. 36–37; <https://www.fsb-tcfd.org/>;
<https://www.cdskb.net/what-we-do/reporting-frameworks/environmental-information-natural-capital>;
<https://www.globalreporting.org/standards/>;
<https://www.sasb.org/standards/download/>;
<https://www.ungpreparing.org/>;
<https://www.iso.org/iso-26000-social-responsibility.html>;
<https://www.integratedreporting.org/the-iirc-2/>.

Table 2. Overview of the regulatory initiatives of the European Commission

Name	Year	Publisher	Main purpose
Directive 2013/34/EU	2013	European Parliament and Council	Regulatory framework for annual financial statements, consolidated financial statements and related reports of certain types of undertakings that need to be transposed into national legislation
Directive 2014/95/EU	2014	European Parliament and Council	Regulatory framework for disclosing non-financial and diversity information by certain large undertakings and groups that needs to be transposed into national legislation
Guidelines on non-financial reporting (methodology for reporting non-financial information)	2017	European Commission	Guidelines that help companies disclose high quality, relevant, useful, consistent and more comparable non-financial (environmental, social and governance-related) information
Directive 2022/2464/EU	2022	European Parliament and Council	Regulatory framework for corporate sustainability reporting that needs to be transposed into national legislation
Draft European Sustainability Reporting Standards (ESRS)	2022	EFRAG	Sustainability reporting standards that need to ensure the quality of reported information regarding environment, social and governance matters, which are divided into 2 cross-cutting standards and 10 topical standards

Source: according to Directive 2013/34/EU, Directive 2014/95/EU, Directive .2022/2464/EU, EFRAG (n.d.), European Commission (2017).

Due to a certain need for clarification, a new Directive 2014/95/EU was issued in 2014 that clarified in more detail what is meant by non-financial information. Within this directive, the goal was to provide the information necessary to understand the impact of the undertaking on its development, performance and position, covering 5 sustainability areas (environmental, social and employee matters, respect for human rights, anticorruption and bribery matters). Although it was now clearer what issues should be reported, as well as when and by whom, there was still a lack of guides, guidelines and concrete methodology that would help in the preparation of a wide spectrum of non-financial information.

Precisely for these reasons, in 2017 the European Commission issued Guidelines for Non-financial reporting. In their preparation, the

Commission reviewed over 20 national, EU-based and international frameworks (European Commission, 2017).

In the last 5 years, significant changes have taken place in the field of non-financial reporting. Recognizing the criticism of different users, shortcomings in practical application as well as new market requirements for reporting on business sustainability, the European Commission, through a series of public consultations, approached new changes and proposed the publication of a new Corporate Sustainability Reporting Directive (CSRD), which will significantly affect the future landscape of sustainability reporting (Deloitte, 2022a). More about the news, new requirements and expectations for a large number of EU companies, as well as tips and tricks on how they can prepare for their application, will be presented below.

2.3. Novelties in the field of regulation of non-financial reporting in the European Union

The aim of this subchapter is to present novelties in the field of EU regulation and analyze the transition from non-financial to sustainability reporting. In accordance with the existing legal regulations of the European Union, certain large companies are obliged to disclose information about the way they operate and manage social and environmental challenges with the aim of assessing non-financial performance by different users (primarily investors and other interested stakeholders), and in this way they are encouraged to engage in socially responsible business. The benefits of reporting on sustainability have been recognized and largely depend on the priorities and specific requirements of their users (Deloitte, 2022b):

(a) the investor wants insight into hidden material risks and corporate governance; (b) consumers, employees, non-governmental organizations and other stakeholders seek greater transparency to improve ethical, social and environmental performance.

In order to meet the information requirements and expectations of various users, the European Commission issued a proposal for a new non-financial directive (Corporate Sustainability Reporting Directive) as part of the European Green Deal, i.e. a much broader Sustainable Finance package (EY, 2021), in April 2021. In December 2022, the European Parliament and Council accepted the final version of the directive on corporate sustainability, where, in addition to other news,

it decided to changing the name of the directive itself. As already mentioned, there was controversy in the business community as to whether the term “non-financial” is the most appropriate because it implies that this information has no financial importance. Since this is not the fact, and the term “sustainability” is increasingly used in this context, the European Commission decided to change the name and replace the existing “non-financial information” with “sustainability information” (Directive 2022/2464/EU).

With the adoption of the new Directive, the range of users and obligees of non-financial reporting in the EU has significantly expanded. While in the Directive on non-financial reporting from 2014, the main target group of users were mainly creditors, this new Directive covers a much wider spectrum of potential stakeholders (Baumüller & Sopp, 2022, p. 21). The number of companies that will be covered by this directive increased from “11,700 to approximately 49,000 covering 75 % of revenue of all reporting companies” (Deloitte, 2022a). What the new Directive brings is systematized in Table 3.

Table 3. Features analysis of the new Corporate Sustainability Reporting Directive (CSRD).

Feature	Explanation
Application obligors	All large companies that meet 2 of the following 3 conditions: <ul style="list-style-type: none">• more than 250 employees• more than EUR 40 million net turnover• more than EUR 20 million total assets
Date of first application	<ul style="list-style-type: none">• January 1 2024 for reporting in 2025 for all companies already subject to old directive from 2014• January 1 2025 for reporting in 2026 for all large companies according to scope of a new Directive• January 1 2026 for reporting in 2027 for all listed SMEs (except micro undertakings), small and non-complex credit institutions and captive insurance undertakings• January 1 2028 for reporting in 2029 for all third-country undertakings with net turnover above EUR 150 million in the EU if they have at least one subsidiary or branch in the EU exceeding certain thresholds
Objective	The objective is to ensure the double materiality perspective; undertakings to report both on the impacts of the activities of the undertaking on people and the environment, and on how sustainability matters affect the undertaking
Minimum reporting content	3 sustainability matters (environmental, social and governance)

Feature	Explanation
Reporting framework	European Sustainability Reporting Standards (ESRS)
Reporting format	Digital xHTML format
Assurance requirement	Yes, mandatory external assurance

Source: according to: Baumüller & Sopp (2022); Council of the EU (2022); Deloitte (2022a); Directive 2022/2464/EU.

The application will go through 4 stages, depending on the type of company that needs to report on sustainability. The first application begins already for the reporting year of 2024, where publicly accountable entities (PAEs) are obliged to compile a sustainability report included in the management report in accordance with the new rules. Certainly the biggest change will be visible in the sector of listed small and medium-sized enterprises, where sustainability reporting becomes mandatory for them for the first time (more information here: Council of the EU, 2022). Furthermore, the Directive stipulates that all new sustainability reports will need to be prepared in accordance with a unique set of standards developed by EFRAG, called European Sustainability Reporting Standards (ESRSs). They are not yet fully completed, and currently the drafts of 2 cross-cutting standards (ESRS E1 – General requirements & ESRS E2 – General disclosures) and the drafts of 10 topical standards divided into 3 categories (environment, social and governance) are available to the public. The sector standards are expected to be published soon. Also, the trend of continued digitization in the field of non-financial reporting is also visible, since the publication of the report is required to be made publicly available and in digital xHTML format. More and more attention is being paid to the importance of control and assurance that the reports are prepared in accordance with the rules and standards, which will require strong support from the auditors in their implementation. More about this topic can be found in subchapter 5.4.

To conclude, overall sustainability reporting is still an ongoing process and will continue to evolve, expand and further elaborate the relevance and value of communicating the very important non-financial information about business sustainability.

3. Discussion questions and tasks for students

1. What is meant by the term non-financial reporting and is there a unified definition of non-financial reporting?
2. What are the differences between financial and non-financial reporting in the context of regulation and harmonization of regulations at the EU level?
3. Discuss the basic features of the best-known international regulatory frameworks for non-financial reporting.
4. Take a critical look at the fundamental criticisms regarding the preparation of a non-financial report. Do you advocate the extensiveness of the report or do you feel that “less is more” in the context of the materiality principle?
5. Analyze the new EU Corporate Sustainability Reporting Directive (available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022L2464&qid=1672985132850>). What changes have been made in relation to the Non-Financial Reporting Directive from 2014?
6. Comment on who, in your opinion, should be in charge of creating non-financial reporting standards at the level of the European Union? Why was this role entrusted to EFRAG? Do you think this was a good decision?
7. Will the normative obligation to compile non-financial reporting cause a significant increase in the quality of published non-financial reports?
8. Does the size of the company affect the quality of non-financial statements? Do you think that small and medium-sized enterprises should have remained exempt from the obligation to report non-financial information?

4. Further reading

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ANALYSIS OF SOCIAL RESPONSIBILITY REPORTING STANDARDS AND FRAMEWORKS

Ana Rep

■ Annotation

Social responsibility reporting is a crucial aspect of corporate transparency and accountability. It allows companies to communicate their efforts to address social and environmental issues to stakeholders, including customers, investors, employees, and others. Analyzing social responsibility reporting standards and frameworks helps us understand the various approaches organizations use to report on their social and environmental performance. In this subchapter, we will review the different social responsibility reporting standards and frameworks that exist, including the United Nations Global Compact (UN Global Compact), Global Reporting Initiative (GRI), Guiding Principles on Business and Human Rights: Implementing the United Nations “Protect, Respect and Remedy” Framework, the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises, ISO 26000 – Guidance on social responsibility, and the International Labour Organisation’s Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy. We will examine the content of each approach and consider how they can effectively communicate an organization’s social and environmental performance. Additionally, we will discuss the challenges and opportunities associated with implementing and reporting on social responsibility initiatives.

Key words: CSR reporting standards and frameworks, UN Global Compact, Global Reporting Initiative (GRI), Guiding Principles on Business

and Human Rights, Guidelines for Multinational Enterprises, ISO 26000
– Guidance on social responsibility, Tripartite Declaration of Principles.

1. Introduction

Social responsibility reporting standards and frameworks cover a broad spectrum of structured-in-detail standards, frameworks and initiatives intended to be used on a voluntary or mandatory basis by all types of companies worldwide. The common characteristic of all existing social responsibility reporting frameworks is that they navigate or show the ways a company could follow while reporting on social responsibility. In other words, they all strive to facilitate the preparation of social responsibility reports by companies, by proposing paths for collecting the data, then grouping, analyzing and presenting them to their stakeholders. Generally, standards and frameworks are interrelated in terms of their explanations, but they differ in their fundamentals. Standards, in their comprehensive definition, “provide specific, detailed, and replicable requirements for what should be reported for each topic, including metrics” (IFRS Foundation, n.d.).

On the other hand, “frameworks provide principles-based guidance on how information is structured, how it is prepared, and what broad topics are covered” (IFRS Foundation, n.d.). Regardless of social responsibility, these standards and frameworks refer to environmental, governmental, economic, ethical, and human rights, as well as labour, anti-corruption and similar issues. The different terms used for them, as covered in the previous subchapter, arise from this wide range of subjects to which they refer. The most comprehensive term for all these subjects could be non-financial standards and frameworks. Observed in this way, they can be compared with financial standards. Unlike non-financial standards, financial standards are mandatory for all companies, and the set of standards depends primarily on the company’s size and is prescribed by each country. The world’s most widespread financial or accounting standards are the International Financial Reporting Standards issued by the International Accounting Standards Board.

On the other hand, standards or – more correctly – frameworks for social responsibility or non-financial reporting, when it comes to the practices in the European Union, are not prescribed. This means

that companies can choose from the existing ones they evaluate as most suitable for them. Directive 2014/95/EU (the so-called non-financial reporting directive or corporate sustainability reporting directive) states that “undertakings which are subject to this Directive may rely on national frameworks, Union-based frameworks such as the Eco-Management and Audit Scheme (EMAS), or international frameworks such as the United Nations (UN) Global Compact, the Guiding Principles on Business and Human Rights implementing the UN ‘Protect, Respect and Remedy’ Framework, the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises, the International Organisation for Standardisation’s ISO 26000, the International Labour Organisation’s Tripartite Declaration of principles concerning multinational enterprises and social policy, the Global Reporting Initiative, or other recognized international frameworks” (par. 9, p. 2). In this subchapter, each of these Directive’s proposals will be analyzed in detail.

2. Background

2.1. Analysis of the United Nations Global Compact

The United Nations Global Compact (henceforth: UN Global Compact), supported by the Foundation for the Global Compact and launched in 2000, is a voluntary initiative whose primary goal is to promote corporate sustainability and gather companies that strive to implement the UN Global Compact principles in their business strategies and support and promote positive changes regarding sustainability. The UN Global Compact provides a principle-based framework combined with best practices that are directions companies should follow to achieve their best potential, but reasonably and responsibly for the mutual benefit of society and businesses. The Ten Principles of the UN Global Compact (henceforth: the Ten UN GC Principles) represent the primary tool of the UN Global Compact initiative. The UN GC Principles are derived from the Universal Declaration of Human Rights, the International Labour Organization’s Declaration on Fundamental Principles and Rights at Work, the Rio Declaration on Environment and Development, and the United Nations Convention Against Corruption (United Nations Global Compact, n.d.b). The Ten UN GC Principles are distributed into

four groups regarding human rights, labour, environment, and anti-corruption. Companies involved in the UN Global Compact initiative must prepare and publish a Communication on Progress (COP) annually so that stakeholders can follow their progress regarding the implementation of the Ten UN GC Principles. To ease that process, the UN Global Compact issued a guide to help participating companies navigate their reporting (UN Global Compact, 2009). In addition to the Ten UN GC Principles, companies committed to their integration also have to incorporate strategic actions into their strategies that will positively impact broader societal goals. In that context, the Sustainable Development Goals (from now on: SDGs), the Ten UN GC Principles and the UN Global Compact guidelines and recommendations (structured in the form of reports) shape a complete set of sustainability standards and frameworks for all companies worldwide. The connection and intertwining of the SDGs and Ten UN GC Principles are presented in Figure 1.

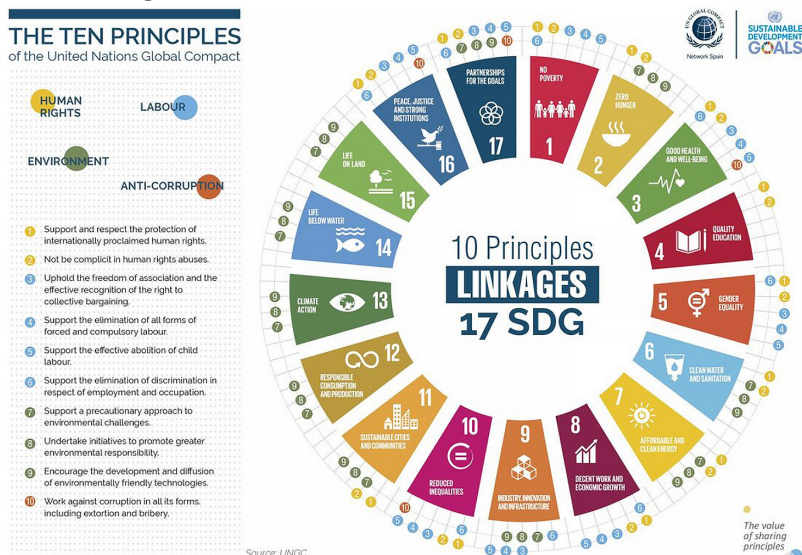


Figure 1. Intertwining of The Principles of the United Nations Global Compact and the Sustainable Development Goals.

Source: United Nations Global Compact, n.d.b; SDG Services, n.d.

"In September 2015, all 193 Member States of the United Nations adopted a plan for achieving a better future for all – laying out a path

over the next 15 years to end extreme poverty, fight inequality and injustice, and protect our planet” (United Nations Global Compact, n.d.a). That plan is incorporated into the Agenda 2030, whose primary focus is the 17 SDGs. When it comes to reporting on corporate sustainability by applying the UN Global Compact standards and frameworks, the focus is on mapping the 17 SDGs, 169 targets incorporated in the SDGs, and 232 indicators arising from the targets. The Global Reporting Initiative and its great relevance to corporate sustainability reporting is going to be presented in detail in the following subchapter. Going back to the SDGs, targets and indicators, companies joining the UN Global Compact initiative have to understand, recognize, choose, measure, follow, and report on the targets selected as relevant for their business. Furthermore, it means a company will not select all the SDGs and targets as appropriate for its business. Each company will choose its relevant goals and targets and monitor, measure, and report on the selected ones. To present one of the SDGs, its targets and indicators, we will analyze Goal 12 – *Responsible consumption and production (Ensure sustainable consumption and production patterns)* (Figure 2).

SDG 12 consists of 11 targets (Figure 2) and 13 indicators (targets 12.2 and 12.4 have two indicators each). The targets cover measures of sustainable production and consumption patterns (12.1, 12.2) as well as many measures of waste reduction (12.3, 12.4, 12.5). They also promote the availability of relevant sustainability information at the company level (12.6, 12.7) and people’s level (12.8). The means of implementation indicators involve promoting and monitoring sustainable patterns (12.a, 12.b) and reducing market distortions to combat wasteful consumption (12.c). To provide a deeper insight, for example, target 12.5 – *Substantially reduce waste generation* says: “By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse” (European Commission, n.d.). The indicator for that target is reflected in the national recycling rate, which is measured by tons of material recycled. SDG 12 is also directly connected with sustainability reporting since its target 12.6 – *Encourage companies to adopt sustainable practices and sustainability reporting*, which says: “Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle” (European Commission, n.d.), is measured by the number of companies publishing sustainability reports (this being its indicator).

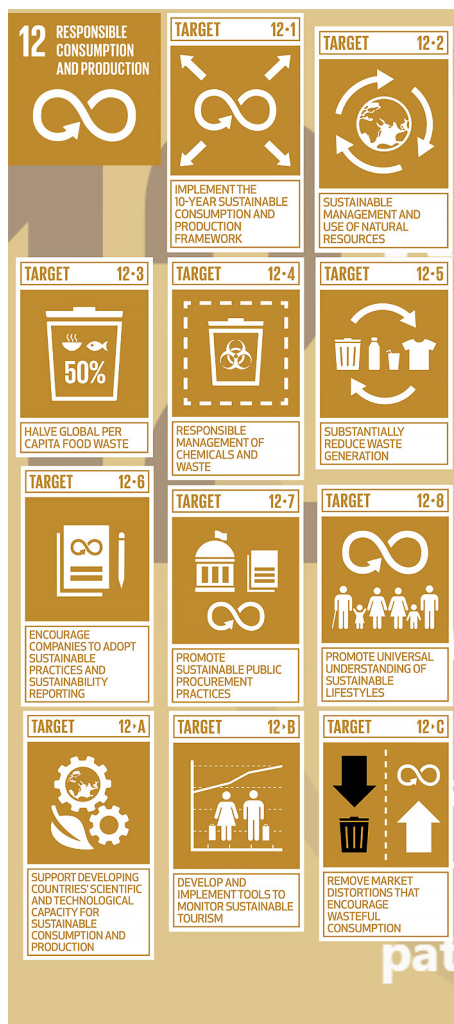


Figure 2. SDG 12 – Targets.

Source: the author's work based on The Global Goals, n.d.

The European Commission collects and publishes the “EU indicators” based on the targets and indicators associated with the SDGs. Those indicators require monitoring the progress towards the SDGs on the EU level. Most of them refer to one specific SDG, while others

refer to several SDGs (multi-purpose indicators). Data are collected for each goal and are publicly available free of charge through the European Commission data browser – Eurostat. They can be downloaded in several formats so we can make desired presentations of the EU-level data. Figure 3 shows the EU indicators for SDG 12, while Figure 4 presents specific results for the EU indicator 12_41 Circular material use rate.








EU INDICATORS FOR GOAL 12	
	12_10 Consumption of chemicals by hazardiousness - EU aggregate.
	12_20 Resource productivity and domestic material consumption (DMC).
	12_30 Average CO2 emissions per km from new passenger cars.
	12_41 Circular material use rate.
	12_50 Generation of waste excluding major mineral wastes by hazardiousness.
	12_61 Gross value added in environmental goods and services sector.
MULTI-PURPOSE INDICATORS	
	07_30 Energy productivity.

Figure 3. EU indicators for SDG 12.
Source: European Commission, n.d.

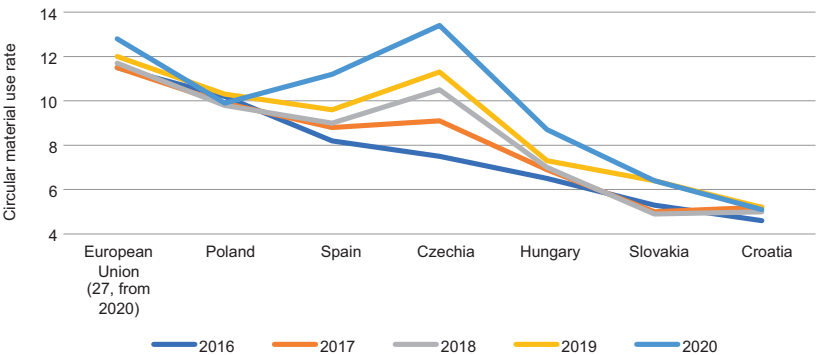


Figure 4. Circular material use rate – selected EU member states.
Source: the author’s work based on Eurostat, 2021.

“The circular material use rate (CMR) measures the share of material recovered and fed back into the economy in overall material use. The CMR is defined as the ratio of the circular use of material

to the overall material use" (Eurostat, 2021). From Figure 4, it is evident that Czechia has a constant and the highest overall increase in the CMR. Their CMR increased by 78.67% in 2020 compared to 2016. Spain and Hungary also show promising results (increases of more than 30% in the same period). Slovakia had a turning point in 2019, while Poland and Croatia had small-scale fluctuations but with one big difference: Poland has a CMR of around 10%, while Croatia has the lowest one among observed countries, which is approximately 5%. Czechia is the only country from the observed sample that exceeded the EU average, and it was in 2020.

Although these results are presented on the EU level, companies which select that target applicable to their business can also do similar presentations and disclosures based on their results. Using the policy documents and reports available via the UN Global Compact online Library, companies relying on the UN Global Compact initiative have many inputs on preparing high-level sustainability reports. In addition, the UN Global Compact launched the Chief Financial Officers' Coalition for the SDGs (henceforth: CFO Coalition). "The Coalition was convened as a platform for CFOs to interact with their peers, investors, financial institutions, and the United Nations to share ideas, develop new concepts and frameworks, and provide recommendations to unlock private capital and create a market for mainstream SDG investments" (CFO Coalition for the SDGs, n.d.). As a supplement to the UN Global Compact's Ten Principles, the CFO Taskforce designed the CFO Principles on Integrated SDG Investments and Finance, consisting of 4 principles (UN Global Compact, 2020):

1. SDG impact thesis and measurement,
2. Integrated SDG strategy and investments,
3. Integrated corporate SDG finance,
4. Integrated SDG communications and reporting.

The importance of reporting is highlighted among the CFO Principles since the fourth principle refers to disclosures related to SDG impact¹.

¹ For more detailed information, see the UN Global Compact, 2020.

2.2. Analysis of the Global Reporting Initiative

The Global Reporting Initiative (henceforth: GRI), founded in 1997, is “the independent, international organization that helps businesses and other organizations take responsibility for their impacts, by providing them with the global common language to communicate those impacts” (GRI, n.d.b). This organization stands behind the sustainability reporting standards, the GRI Standards, which are the most widely used sustainability reporting standards globally. The GRI Standards are intended for all types of companies regardless of their size, although primarily the large ones use them. The standards comprise the world’s best practices regarding reporting on economic, environmental and social impacts, regardless of whether that effect is positive or negative. It should be emphasized that companies should disclose information transparently and not use sustainability reports for marketing purposes only. The GRI Standards are of great importance not only for companies reporting on sustainability but for all their stakeholders, who should be familiar with them to be able to judge the relevance of disclosures.

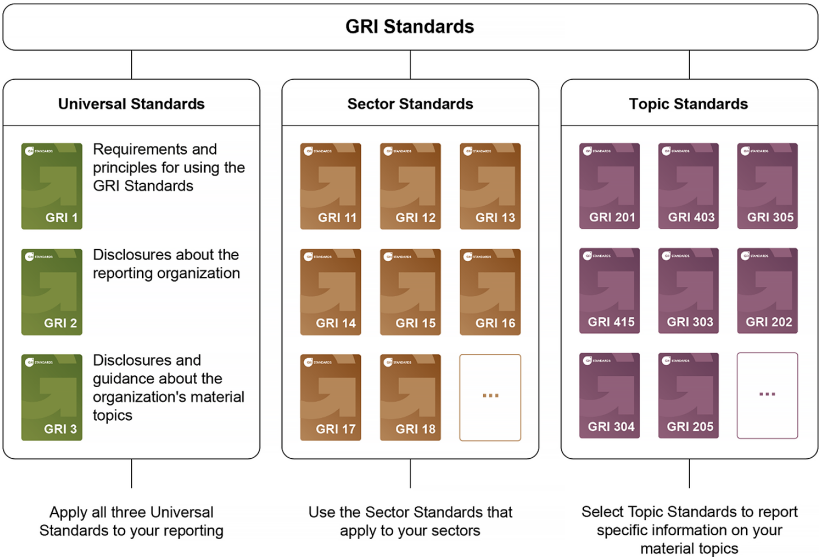


Figure 5. GRI Standards – an overall overview.
Source: GRI, n.d.c.

The GRI Standards are designed as interconnected standards grouped into a modular system of three series of Standards (Figure 5). Currently, there are 38 modules/standards in total, and the glossary stands separately. Stand-alone standards vary in length, starting from less than ten pages, but as a whole, they make a substantial document of more than 850 pages.

To ease the reporting process for companies applying the GRI Standards, the GRI issued a simple guide for reporting using the GRI Standards – *A Short Introduction to the GRI Standards*. First, a reporting company must understand the system and key elements of the GRI Standards and apply reporting principles throughout the reporting process. After that, the company has to identify and assess impacts and determine material topics for its business to present a comprehensive picture of its most significant impacts on the economy, environment, and people. This process consists of four steps. The reporting company has to (1) understand the organization's context, (2) identify actual and potential impacts, (3) assess the significance of the impacts, and (4) prioritize the most significant impacts for reporting. After these four steps, it is ready to determine material topics. Regarding the reporting itself, stakeholders value only relevant disclosures. To achieve that, each report must contain a GRI content index, which "makes reported information traceable and increases the report's credibility and transparency. The content index provides an overview of the organization's reported information and helps stakeholders navigate the report at a glance" (GRI, n.d.a). Finally, the report must contain a statement of use, and the reporting company has to notify GRI about using the GRI Standards for sustainability reporting (all based on the GRI, n.d.a).

A reporting company can choose to use the whole set of GRI Standards or can select only those standards relevant to its business. It also can use just a part of selected standards, all based on its needs and business operations or, more precisely, on its material topics and goals. However, each reporting company has to start with the GRI 1: Foundation 2021, which stands for a revised version of the GRI 101: Foundation. This standard particularly leads companies through the reporting process and guides them using the GRI Standards. The content of GRI 1 consists of an explanation of the purpose and system of GRI Standards, key concepts, reporting in accordance with the GRI Standards, reporting principles, and additional recommendations for

reporting (GRI, 2022). At the standard’s end, two appendices refer to the GRI content index and provide detailed guidance on approaching its filling with an example that reporting companies can use. To illustrate the structure of the GRI Standards, one standard, namely GRI 306: Waste 2020, is used to present it. The standard was published in May 2020 and is effective as of January 2022, partly replacing the previous GRI 306: Effluents and Waste 2016. It is 30 pages long, and its content and structure are presented in Figure 6.

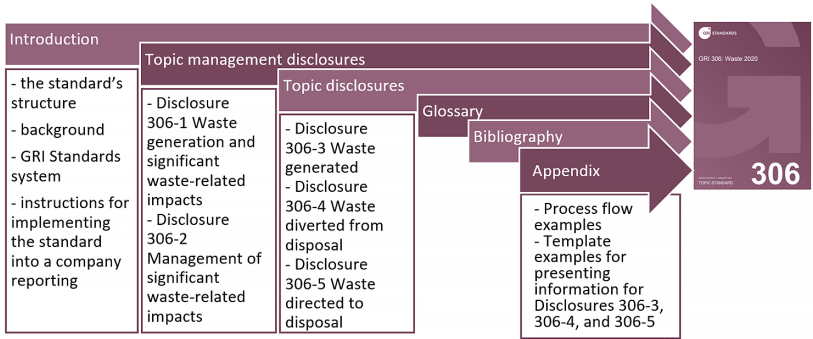


Figure 6. GRI 306 – overview of the content.
Source: the author’s work based on GRI, 2022.

Each GRI standard has the same general content as GRI 306, and only a few do not contain a bibliography or appendix. Still, all the standards give a detailed overview of each specific disclosure and guide a reporting company in reporting on material topics relevant to the company. Determining material topics is of great importance for relevant reporting. Guidance to determine material topics is an integral part of GRI 3: Material topics 2021. This process is divided into four steps, which are split into two phases: (1) ongoing identification and assessment of impacts, and (2) determining material topics for reporting.

Once set, material topics are not defined for an unidentified period. Still, they should be revised at least once in each reporting period, although the recommendation is to assess them regularly. Like all the other processes and policies, the process of determining material topics should be adequately documented.

To conclude, the overall sustainability reporting process does not happen once but is rather an ongoing process during the whole

and each reporting period, which is clearly described under the GRI standards.

2.3. Analysis of other non-financial reporting guidelines

In addition to the globally known initiatives regarding social responsibility reporting, i.e. the UN Global Compact and the GRI, there are other valuable guidelines for this kind of reporting. The Office of the High Commissioner for Human Rights (or more specifically, the Special Representative of the Secretary-General), which is the leading United Nations entity in the field of human rights, developed the *Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework* (henceforth: Guiding Principles). This publication is a valuable contribution to the field of respect for human rights, primarily from a business and state perspective. The Guiding Principles "reflect and build on the three-pillar structure of the 'Protect, Respect and Remedy' framework, comprising of 31 principles, each followed by a brief commentary. Together, the Guiding Principles outline steps for States to ensure and foster business respect for human rights; provide a blueprint for companies to respect human rights; and offer a set of benchmarks for stakeholders to assess business respect for human rights" (OHCHR, 2012). To simplify, each of the three pillars stands for a chapter under the Guiding Principles and consists of two sets of principles: foundational and operational. After a description of each principle follows a relevant commentary, which explains the principle in more detail.

Another valuable resource for social responsibility reporting is the *Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises* (henceforth: OECD Guidelines). The OECD Guidelines do not provide binding principles and standards. They provide recommendations regarding responsible business conduct and are intended for multinational enterprises that should use them together with a chosen set of standards for non-financial reporting, as well as in line with all positive regulations. "The Guidelines are the only multilaterally agreed and comprehensive code of responsible business conduct that governments have committed to promoting" (OECD, 2011, p. 3). The OECD Guidelines are structured in two chapters. The first chapter, which is about the recommendations for responsible business conduct in a global context, consists of

the preface and 11 subchapters that refer to Concepts and Principles, General Policies, Disclosure, Human Rights, Employment and Industrial Relations, Environment, Combating Bribery, Bribe Solicitation and Extortion, Customer Interests, Science and Technology, Competition, and Taxation. The second chapter, which is about the implementation Procedures of the OECD Guidelines for Multinational Enterprises, consists of three subchapters that refer to the Amendment of the Decision of the Council on the OECD Guidelines for Multinational Enterprises, Procedural Guidance, and Commentary on the Implementation Procedures. "The common aim of the governments adhering to the Guidelines is to encourage the positive contributions that multinational enterprises can make to economic, environmental and social progress and to minimize the difficulties to which their various operations may give rise" (OECD, 2011, p. 15).

A standard that should not be overlooked when it comes to social responsibility is *ISO 26000 – Guidance on social responsibility*. Unlike other ISO standards, this standard provides guidelines to businesses and organizations, not requirements. It helps them clarify what social responsibility is and how to translate principles into practical actions, and it shares best practices related to social responsibility (ISO, n.d.). ISO 26000 covers seven core social responsibility subjects and intends to band together the UN SDGs with the implementation of the core subjects. For a better understanding of the standard, its interconnectivity with other initiatives (standards and guidelines), and its application, several publications available for stakeholders encourage and simplify the translation of the guidelines into actions but also ease the reporting process on social responsibility. One of these is *Social responsibility – Discovering ISO 26000*, a brochure of the ISO 26000 content resume. It explains the objective of social responsibility, the benefits that can be achieved by implementing ISO 26000, who can benefit, and how. It also briefly describes the core subject contents and sets all 37 social responsibility issues covered by the core subjects. Another valuable publication is *ISO 26000 and OECD Guidelines – Practical overview of the linkages*. This document explains key similarities and differences between ISO 26000 and the above-mentioned OECD Guidelines. It contains comparison tables (in the form of Annexes) on the principles for social responsibility, responsibility issues, and practices and policies. The fourth annexe is a schematic overview of ISO 26000 with a brief explanation. Finally, ISO 26000 supports the UN

2030 Agenda, particularly through the SDGs. A publication that briefly summarizes ISO 26000 contribution to the SDGs is entitled *ISO 26000 and the SDGs*. Mainly through illustrations, it links ISO 26000 with the SDGs and gives tips to get started with ISO 26000.

The last framework to be presented and analyzed is the *International Labour Organisation's Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy*. After the scope and aim, which is "to encourage the positive contribution which multinational enterprises can make to economic and social progress and the realization of decent work for all; and to minimize and resolve the difficulties to which their various operations may give rise" (ILO, 2017), there come general policies. After that, the Declaration focuses on policies regarding employment, training, conditions of work and life, and industrial relations. In the end, there are two annexes. The first one summarizes the most important regulation acts, and the other reflects operational tools.

Besides the frameworks referred to in Directive 2014/95/EU, there are other important organizations in the field of non-financial reporting and their valuable contributions. These include the International Integrated Reporting Council (IIRC) and the Sustainability Accounting Standards Board (SASB), which merged in 2021 into the Value Reporting Foundation (VRF) that is in 2022 consolidated with the IFRS Foundation (Deloitte, 2022).

After analyzing the contents of the most widely used standards and frameworks for social sustainability reporting, it can be concluded that businesses and all other organizations, either willing or obliged to prepare such reports, have plenty of sources for proper reporting. All these standards and frameworks resulting from the outstanding contributions of experts from different fields, often used together, give a solid ground for preparing objective and non-biased non-financial reports. Finally, by having relevant sustainability reports that come from a clearly defined and standardized but still open system, all stakeholders could benefit and, based on the improvements of actions undertaken by businesses, states and society as a whole, relevant information could lead us to a prospective future. All that is possible only if we have accurate and relevant information and strive to make a positive difference.

3. Discussion questions and tasks for students

1. Analyze the United Nations Global Compact. How does that framework differ from other non-financial reporting standards and frameworks? Explain its correlation with the SDGs.
2. How does the Global Reporting Initiative's framework for sustainability reporting encourage companies to be transparent and accountable in their social and environmental practices?
3. What are the key components of the Guiding Principles on Business and Human Rights reporting guidelines, and how do they promote responsible business practices in relation to human rights?
4. What are the reporting requirements for companies following the OECD Guidelines for Multinational Enterprises, and how do these guidelines promote transparency and accountability in areas such as labour, environment, and anti-corruption?
5. How does ISO 26000 provide guidance on reporting on social responsibility in areas such as corporate governance, human rights, labour practices, and the environment?
6. What are the reporting requirements outlined in the International Labour Organisation's Tripartite Declaration of Principles?
7. How can companies use these non-financial reporting guidelines to improve the transparency and accountability of their social and environmental practices?
8. What challenges do companies face in implementing and reporting on these guidelines, and how can they overcome these challenges?
9. How can stakeholders (e.g. investors, consumers, employees, NGOs) use the information provided in these reports to hold companies accountable for their social and environmental impacts?
10. How can we compare and evaluate the effectiveness of different non-financial reporting guidelines in promoting responsible business practices and transparency?

4. Further reading

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TRANSPARENT NON-FINANCIAL REPORTING WITH A FOCUS ON THE PRINCIPLE OF MATERIALITY

Ana Rep

■ Annotation

Transparent non-financial reporting provides clear and accurate information about a company's non-financial performance, including its environmental, social, and governance (ESG) practices. This type of reporting is becoming increasingly crucial as stakeholders, including investors, customers, employees, standard setters, media, and the general public, are increasingly interested in understanding the broader impact of a company's operations on society and the environment. Although the principle of materiality is a concept used in accounting and financial reporting, it is also relevant for non-financial reporting. It is based on the idea that only information that is significant enough to influence the decisions of users of the reports should be included in those reports, regardless of whether they present financial or non-financial information. This subchapter examines the importance of providing information about a company's social and environmental impacts and its governance practices. It discusses the concept of transparent non-financial reporting and the role of the principle of materiality in ensuring that companies report on the most critical and relevant information. In addition, the subchapter highlights the importance of transparent non-financial reporting in helping companies communicate the impacts of their operations to stakeholders and in enabling stakeholders to make informed decisions about the company.

Key words: Corporate transparency, Non-financial reporting, Materiality principle, Corporate social responsibility, Sustainability, Environmental, social, and governance (ESG) reporting, Disclosure, Accountability.

1. Introduction

Transparent non-financial reporting is a crucial aspect of corporate social responsibility and sustainability. It allows companies to present information about their environmental, social, and governance (ESG) performance to stakeholders. This type of reporting helps build trust and accountability and can also identify and address potential risks and opportunities.

The materiality principle is central to non-financial reporting, as it determines which information is important enough to be disclosed. This principle is based on the idea that specific issues or impacts may be more relevant to a company's operations and decision-making than others. For example, the impact of a company's supply chain on local communities or the environment may be considered more material than its willingness to end poverty. Companies are expected to exercise judgement in determining what is material and should be disclosed in their non-financial reports.

Neither non-financial reporting nor materiality principle are new terms. Non-financial reporting has a long history. Gokten et al. (2020) introduced a periodic approach to the development history of sustainability reporting. They divided it into three main periods: the pre-standardization period (1962–1998), the standardization (institutionalization) period (1999–2016), and the post-standardization period (beginning in 2017). According to Brockett and Rezaee (2012), the origins of sustainability reporting can be traced back to the 1960s and 1970s in Europe and the United States (slightly later), when organizations began to recognize their broader social responsibilities beyond profit maximization. However, it was not until the 1990s and early 2000s that non-financial reporting began to gain widespread recognition and adoption. Sustainability reporting has evolved from its initial focus on environmental issues to include corporate social activities and the disclosure of information on economic, governance, social, ethical, and environmental (EGSEE) performance, focusing on multiple bottom-line dimensions of sustainability performance (Brockett and Rezaee, 2012). In recent years, the importance of non-financial reporting has only continued to grow as stakeholders, including investors, consumers, regulators, and broader society, have placed increasing pressure on companies to be transparent about

their ESG performance. Today, many companies are using non-financial reporting to demonstrate their commitment to sustainability and responsible business practices, but it also has a marketing purpose for some of them.

Sustainability reports and financial reports contain a large amount of information, which can make it difficult for stakeholders to find the specific information that is relevant to them. Sustainability reports, in particular, often cover a wide range of topics, including economic, governance, social, ethical, and environmental (EGSEE) performance, making it challenging for stakeholders to identify the essential information. As a result, it is vital for organizations to clearly and concisely present the most relevant information in their sustainability and financial reports so that stakeholders can easily find and understand the information they need. This is where the concept of materiality becomes essential. Materiality refers to the idea that certain information is more important or relevant to stakeholders than other information. In the context of sustainability reporting, materiality refers to the importance of an issue or aspect of a company's operations to its stakeholders.

The materiality principle determines which issues or aspects of a company's operations should be disclosed in sustainability reports. It helps to ensure that the reports provide stakeholders with the most important and relevant information rather than overwhelming them with a large amount of less important information. By applying the principle of materiality, companies can help ensure that their sustainability reports are more useful and relevant to stakeholders and provide a clear and accurate picture of the company's operations and performance. For example, suppose a company has a significant impact on the environment due to its operations. In that case, this may be considered a material issue that should be disclosed in the company's non-financial report. On the other hand, if a company's impact on the environment is minimal, this may not be considered a material issue and may not need to be disclosed.

This subchapter, in its three main topics, provides an overview of the concept of materiality, including its definition and how it is applied in the context of non-financial reporting. It also explores the importance of materiality in ensuring that non-financial reports provide relevant and helpful information to stakeholders. In addition, it dives into the process of identifying material issues for non-financial reporting.

It covers topics such as assessing the importance of different issues to stakeholders, prioritizing them, and determining which issues should be included in non-financial reports. Finally, this subchapter discusses the practical considerations involved in implementing the principle of materiality in non-financial reporting. It covers topics such as gathering and reporting on material information, presenting information clearly and meaningfully, and ensuring that non-financial reports are transparent and accurate.

2. Background

2.1. Defining Materiality in Non-Financial Reporting

The materiality principle is a fundamental concept in both financial and non-financial reporting, as it determines what information should be included in such reports. Simply put, materiality refers to the relevance and significance of certain information to the stakeholders of an organization. In financial reporting, materiality is typically determined based on the size of the company and the nature of its business. For example, a small company with a simple business model may not need to report on as many details as a larger, more complex company. Financial information is generally considered material if its inclusion or exclusion in the financial statements would change the overall understanding of the company's financial position or performance. In non-financial reporting, the materiality principle is applied similarly. Non-financial information, such as information about a company's environmental impact or social responsibility, should be included in a report if it is significant enough to affect the understanding or decisions of the report's users. For example, a company may choose to report on its circular material use rate or average CO₂ emissions per km from new passenger cars if it believes that this information is vital to its stakeholders.

There are numerous definitions of materiality and material information. The concept of materiality has evolved, with various explanations in frameworks developed by different organizations and regulatory bodies. However, the general idea is that material information is that which could potentially influence the stakeholders' decision-making process and understanding of business operations. First, definitions

primarily related to financial reporting will be analyzed since they are longer in use.

According to the Financial Accounting Standards Board's (FASB, 1980) *Statement of Financial Accounting Concepts No. 2*, materiality is based on the size and nature of the organization and the expectations of the financial statement users. Materiality is a relative concept, meaning that what may be considered material for one organization may not be material for another. The FASB's statement also notes that materiality depends on the context in which the information is presented and the nature of the item or event being disclosed. Materiality should be considered both quantitatively and qualitatively when determining whether an item or event is material. In general, an item or event is considered material if its inclusion or exclusion in the financial statements would likely influence the decisions of users of the financial statements (FASB, 1980).

The above-interpreted definition is the ground of the definition of materiality presented in the *SEC Staff Accounting Bulletin No. 99 – Materiality (SAB 99)*. According to *SAB 99* (SEC, 1999), materiality is the threshold at which the inclusion or exclusion of certain information in a company's financial statements could potentially affect a reasonable investor's decision. In other words, material information is that which could reasonably be expected to influence an investor's decision to buy, sell, or hold a company's securities. *SAB 99* also states that materiality is a relative concept that depends on the circumstances of each case. In determining materiality, companies should consider both the quantitative and qualitative aspects of the information and the context in which it is presented. Finally, *SAB 99* emphasizes the importance of applying a consistent approach to materiality in financial reporting, as it helps to ensure the reliability and comparability of financial statements over time (SEC, 1999). Although *SAB 99* refers primarily to financial reporting, their interpretations can also be observed from the aspect of non-financial reporting.

Moving from the United States to Europe, the core concept of materiality does not change. What slightly changes is the approach to the definition. The importance of materiality as a concept that must be understood and applied in reports is quite evident from the International Accounting Standards Board's (IASB) activities and projects, primarily the Disclosure initiative. Users of International Financial Reporting Standards (IFRS) can become familiar with the concept or

principle of materiality through several sources. As an accompanying guideline to the IFRSs, the *Conceptual Framework for Financial Reporting* (IFRS Foundation, 2018) defines material information as that which if omitted, misstated or obscured could, in the light of the surrounding circumstances, reasonably be expected to influence the decisions of the primary users of general purpose financial reports. Materiality is determined based on the size and nature of the entity, as well as the environment in which it operates and the users' needs. Materiality is not a fixed numerical threshold, but a concept determined on a case-by-case basis. With regard to making materiality judgments, the *Conceptual Framework for Financial Reporting* states that they should be based on quantitative and qualitative factors, including the costs of providing the information and the potential impact of the information on users' decisions (IFRS Foundation, 2018).

It should be pointed out that all the disclosed information should also be relevant. The *Conceptual Framework for Financial Reporting* emphasizes the importance of relevance in financial reporting, as it is one of the critical characteristics of useful financial information. According to the *Conceptual Framework for Financial Reporting* (IFRS Foundation, 2018), relevance refers to the ability of financial information to make a difference in the decisions of users of financial statements. Relevant information can affect the decisions of those who use it, whether by confirming or correcting their previous expectations or providing new information that affects their choices.

From all the above-described definitions of materiality, it can be concluded that materiality refers to the relevance and significance of a piece of information in corporate reporting. Ensuring that financial statements contain relevant information is essential for providing users with the information they need to make informed decisions about an entity's financial health and prospects. In non-financial reporting, which refers to the disclosure of information about a company's environmental, social, and governance (ESG) performance, materiality also refers to the importance of information to stakeholders, such as investors, creditors, employees, customers, standard setters, media, and the general public. However, it does not refer to financial values. This type of material and thus relevant non-financial information is becoming increasingly important to stakeholders, as it provides a more comprehensive view of an organization's impact on society and the environment, and helps ensure that companies provide relevant and

meaningful information to stakeholders. By disclosing material information, companies can help stakeholders make informed decisions about their investments, business relationships, cooperations, and other interactions with the company. Materiality also allows companies to be transparent and accountable to stakeholders, enhancing trust and confidence in the company.

The concept of materiality in non-financial reporting is often guided by international standards and frameworks provided by the Global Reporting Initiative (GRI), UN Global Compact, World Business Council for Sustainable Development (WBCSD), International Sustainability Standards Board (ISSB) and other relevant organizations. These frameworks provide guidance on how to determine which non-financial information is material and should be disclosed in a company's reporting.

In the context of the *GRI Standards* (GRI, 2022), materiality refers to the significance of an issue or topic to an organization's stakeholders. In other words, materiality refers to the extent to which an issue or topic is necessary or relevant to an organization's stakeholders, including its investors, employees, customers, suppliers, and the communities in which it operates. It is also emphasized that when identifying the organization's material issues or topics, priority should be given to those with the most significant impact, which should be reported accordingly. Conversely, issues or topics with less significant impacts should not be considered material and should not be reported.

A *Practical guide* developed by the GRI and UN Global Compact (2018) defines materiality as an important concept in corporate reporting because it helps organizations identify and report on the most important topics relevant to their business and stakeholders, which ensures that the information in the report is reliable and useful for stakeholders. Since materiality is a concept that is subject to change over time, the *Guide* emphasizes that organizations should review and reassess what they consider to be material regularly to ensure that their reporting is up-to-date and relevant.

According to the *SDG Compass – The guide for business action on the SDGs* (GRI, UN Global Compact and WBCSD, 2015), materiality is one of the ten principles for sustainability reporting. The *SDG Compass* states that material issues in sustainability reporting are those that significantly impact a company's economic, environmental, and social performance, as well as those that significantly influence stakeholders. Companies should report on both positive and negative

aspects of their performance on these issues, including how they meet their responsibilities related to the SDGs, address any negative impacts on the SDGs, and use their resources to further contribute to the achievement of the SDGs. In addition, companies should consider issues of high significance to stakeholders, even if they have not been identified as priorities by the company. In addition, the SDG Compass suggests using a matrix to visualize the materiality assessment in a report, showing the priority areas concerning the significance of the company's impacts and the influence on stakeholders (GRI, UN Global Compact and WBCSD, 2015).

Instead of preparing and publishing two (or more) separate reports, companies can choose to merge financial and non-financial disclosures into an integrated report (IR). From that perspective, the IFRS Foundation explains materiality in the new *International <IR> Framework* (IFRS Foundation, 2021) as those "matters that substantively affect the organization's ability to create value over the short, medium and long term". In addition, matters affecting the organization's ability to create value are relevant matters, and both positive and negative matters assessed as material should be presented in an integrated report (IFRS Foundation, 2021).

The last definition to be emphasized, and the one that is mandatory to align with in the European Union Member States, comes from *Directive 2013/34/EU* (known as the Accounting Directive). Article 2(16) of the *Directive* states that "'material' means the status of information where its omission or misstatement could reasonably be expected to influence decisions that users make on the basis of the financial statements of the undertaking. The materiality of individual items shall be assessed in the context of other similar items". The Non-financial Reporting Directive (*Directive 2014/95/EU*), which amends the Accounting Directive, states that "undertakings which are subject to this Directive should provide adequate information in relation to matters that stand out as being most likely to bring about the materialization of principal risks of severe impacts, along with those that have already materialized. The severity of such impacts should be judged by their scale and gravity" (Recital 8). According to the Non-financial Reporting Directive, "the Commission shall prepare non-binding guidelines on methodology for reporting non-financial information, including non-financial key performance indicators, general and sectoral, with a view to facilitating relevant, useful and comparable disclosure of non-financial

information by undertakings" (Article 2). By taking into account existing best practices, international developments and the results of related Union initiatives, the efforts have resulted in the *Guidelines on non-financial reporting (methodology for reporting non-financial information)* (European Commission, 2017). They stand for a systematic and straightforward guide for companies reporting on non-financial information. The *Guidelines* deal with key principles, materiality, a fair, concise, and consistent presentation, and orientation to stakeholders, but also with the content of non-financial reports.

To summarize, materiality is a fundamental concept in both financial and non-financial reporting, as it determines the characteristics of information that should be included in reports. It refers to the relevance and significance of certain information to an organization's stakeholders. Material information is that which could potentially influence stakeholders' decision-making processes. Since materiality is a relative concept, it should be considered both quantitatively and qualitatively when determining its relevance. It is crucial to apply a consistent approach to determining materiality to ensure the reliability and comparability of financial and non-financial reports over time. On the other hand, material topics and issues should be reassessed regularly to ensure the relevance of the presented information.

2.2. Identifying Material Issues for Non-Financial Reporting

Identifying material issues for non-financial reporting is very important because it helps organizations communicate their impact to a wide range of stakeholders in a transparent and accountable manner. By identifying and disclosing material issues that are most important to stakeholders, organizations can demonstrate their commitment to sustainability and social responsibility and provide valuable information to stakeholders that can help them make informed decisions. On the other hand, other than just identifying material issues, it is more important to do business sustainably. Identifying material issues for non-financial reporting can help organizations to prioritize their sustainability efforts and to communicate their progress and impact to stakeholders. By disclosing material issues that are most important to stakeholders, organizations can demonstrate their commitment to sustainability and social responsibility, and provide valuable information to stakeholders about their efforts in this area.

The process of identifying material issues for non-financial reporting is an integral part of doing business sustainably and of good corporate governance. It helps organizations to build trust and credibility with stakeholders while contributing to the long-term viability of the organization. There are several steps that organizations can take to identify material issues that are most important to stakeholders and should be included in non-financial reports. They can include, but are not limited to: consultations with stakeholders to get input from their perspective; reviewing existing data that the organization already collects; conducting a materiality assessment; setting reporting boundaries; and reviewing and updating material issues regularly to ensure that the report reflects the most current and relevant information.

Several relevant international organizations have contributed to the development of guidelines for identifying material issues for non-financial reporting. Some of the key organizations in this area include, but are not limited to:

- Global Reporting Initiative (GRI): The GRI has developed the *GRI Standards*, which provide guidelines for organizations on how to identify and report on material issues related to economic, environmental, and social performance;
- United Nations Global Compact (UNGC): The UNGC, together with the GRI and WBCSD, has developed the *SDG Compass – The guide for business action on the SDGs*, which guides companies in alignment, measurement and contribution to the SDGs;
- International Integrated Reporting Council (IIRC): The IIRC has developed the *International <IR> Framework*, which guides how to identify and report on material issues for integrated reporting;
- Sustainability Accounting Standards Board (SASB): The SASB has developed the *SASB Standards*, sector-specific standards for sustainability reporting, including guidelines on identifying and reporting material issues;
- IFRS Foundation: “As of August 2022, the IFRS Foundation assumed responsibility for the Integrated Reporting Framework. The IFRS Foundation’s International Accounting Standards Board (IASB) and the International Sustainability Standards Board (ISSB) will work together to agree on how to build on and integrate the Integrated Reporting

Framework into their standard-setting projects and requirements” (IFRS Foundation, 2021);

- International Organization for Standardization (ISO): The ISO has developed the *ISO 26000 standard*, which provides social responsibility guidance, including identifying and reporting material issues.

These organizations and their guidelines can provide helpful guidance for organizations looking to identify material issues for non-financial reporting. In this subchapter, we will analyze only a few approaches in the context of identifying material issues for non-financial reporting.

According to the *GRI Standards* (GRI, 2022), the materiality determination process should involve stakeholder engagement and take into account the specific context in which the organization operates. The goal of the materiality determination process is to identify the most significant sustainability issues the organization should report on to provide a complete and accurate picture of its sustainability performance. *GRI 3: Material Topics 2021* (GRI, 2022), effective as of 1 January 2023, offers step-by-step guidance to organizations on how to identify and prioritize material topics for non-financial reporting. While determining its material topics, the organization reporting following the GRI Standards should follow the four steps illustrated in Figure 1.

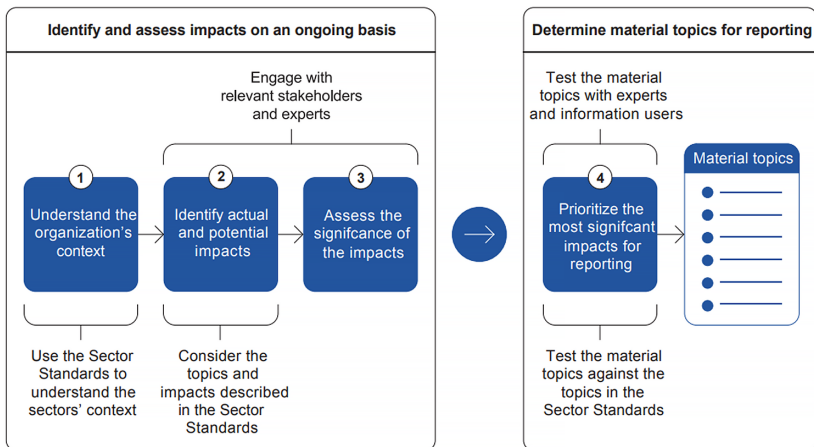


Figure 1. Materiality determination process according to the GRI Standards
Source: GRI, 2022, p. 103.

The first step in identifying material issues for non-financial reporting is understanding the organization's context. This includes creating an initial overview of the organization's activities, business relationships, stakeholders, and sustainability context. The organization should consider all the entities it controls or has an interest in, such as subsidiaries, joint ventures, and affiliates. Relevant departments and functions within the organization, such as communications, human resources, and legal and compliance, can assist in this step. The organization should also consider the sectors in which it is active and the characteristics of these sectors, as well as the number and demographic characteristics of its employees and workers who are not employees. In addition, the organization should consider its business relationships, including those with business partners, entities in its value chain, and any other entities directly linked to its operations, products, or services. To understand the sustainability context of its activities and business relationships, the organization should consider economic, environmental, human rights, and other societal challenges at local, regional and global levels related to its sectors and the geographic location of its activities and business relationships. The organization should also consider its responsibility regarding authoritative intergovernmental instruments, laws and regulations. To identify its stakeholders, the organization should draw a complete list of individuals and groups whose interests are affected by its activities, products or services, and engage with them to identify its impacts. Stakeholders may include customers, employees, shareholders, communities, and others (according to the GRI, 2022: 104–105).

The second step is to identify the actual and potential impacts of an organization's activities on the economy, environment and people, including effects on their human rights. These impacts can include both positive and negative consequences, short-term and long-term effects, intended and unintended results, and reversible and irreversible impacts. The organization can gather information from various sources, including its own or third-party assessments, legal reviews, financial audits, occupational health and safety inspections, shareholder filings, and many others. It can also seek input from stakeholders and consult with internal and external experts. The organization should prioritize identifying its negative impacts. It should carry out an initial assessment or scoping exercise to identify areas where negative and significant impacts are most likely to be present. If adverse

effects are identified, the organization should consider how to prevent or mitigate them. Afterwards, it should focus on positive ones. The organization should also consider the impacts described in the *GRI Sector Standards* and determine if they apply to them. It is essential to continually assess and identify impacts and business relationships as the organization's activities change over time (according to the GRI, 2022: 105–108).

The final step in identifying and assessing impacts on an ongoing basis is to evaluate the significance of the impacts. This assessment should involve both quantitative and qualitative analysis and consider the organization's sectors of operation and business relationships. The organization should consult with relevant stakeholders and experts, and prioritize negative impacts by assessing their severity and likelihood. The severity of an impact is determined by its scale, scope, and irremediable character, and the likelihood of an impact is the chance of it occurring. The organization should assess the significance of the implications in relation to each other rather than global impacts. The organization should also consider the proximity of the impact, as impacts that affect stakeholders directly or indirectly, or that have more closer proximity to the organization's operations, may be considered more significant. Finally, it should consider the temporal dimension of the impact, as impacts that are expected to occur in the short or long term may be considered more significant (according to the GRI, 2022: 108–109).

After passing the first three steps, the organization begins to determine material topics for reporting, and here it should prioritize the most significant impacts for presentation. To assess its material matters for reporting, an organization should prioritize its impacts based on their significance. The organization should group its impacts into topics, rank them from most to least significant, and set a threshold to determine which topics to focus on. The organization should then test its selection of material topics against the applicable GRI Sector Standards and consult with potential information users and experts. The organization's highest governance body should review and approve the list of material topics. Once the material topics have been determined, the organization should decide what to report for each one. If the organization does not manage a material topic, it should

give reasons for not doing so, or outline any plans to manage it (according to the GRI, 2022: 109–111).¹

Another valuable guideline for identifying material issues for non-financial reporting is the *SDG Compass guide*, a tool for companies to align their strategies and operations with the SDGs. It is organized into five steps. The second step, entitled *Defining priorities*, helps the company to determine material issues by providing a structured and comprehensive approach to identifying and prioritizing the material issues specific to the reporting company. To identify the most important business opportunities presented by the SDGs and minimize risks, companies are encouraged to define their priorities based on an assessment of their current and potential positive and negative impacts on the SDGs across their value chains (GRI, UN Global Compact and WBCSD, 2015). While defining priorities, the company should focus on the following actions (according to GRI, UN Global Compact and WBCSD, 2015):

1. Mapping the value chain to identify impact areas: this can help a company identify areas in its operations with the most significant impact on the SDGs. This includes both negative and positive effects and current and potential future impacts. The value chain assessment should consider the entire process, from the supply base and inbound logistics, through production and operations, to product distribution, use, and end-of-life. A high-level mapping of the value chain can help the company identify areas with a high likelihood of either negative or positive impacts on the issues that the SDGs represent. The mapping process includes engaging with external stakeholders to identify views and concerns, and to make an internal assessment of linkages between the company's activities and the themes covered by the SDGs. Various tools and methodologies can assist companies in identifying areas of high impact in their value chain and help them to understand the environmental and social

¹ For more details and examples, see GRI, 2021, pp. 103–111. The GRI Standards provide guidance on how to determine materiality, including the use of a materiality matrix or other tools.

implications of their products and operations throughout their entire life cycle and supply chain.²

2. Selecting indicators and collecting data: it is suggested that indicators should be selected for each identified area of potentially high impact to track the company's performance and effects on sustainable development over time. The *SDG Compass* website contains an inventory of business indicators³ that can be used to track the company's impact on sustainable development and select relevant indicators for potentially high-impact areas. Afterwards, data is collected using existing systems and by field visits, questionnaires, focus groups, interviews and similar methods if existing systems cannot generate all the required data. It is vital to ensure the accuracy and integrity of the collected data by identifying the risks of misreporting and implementing controls, as well as internal and external verification.
3. Defining priorities: to define priorities related to sustainable development, the company should consider the magnitude, severity and likelihood of its current and potential adverse impacts, as well as the importance of these impacts to stakeholders. The company should also assess the opportunity for growth or advantage from its current or potential positive results. Assessing impacts and determining priorities is subjective, so transparent documentation is recommended. It is suggested that this process be repeated periodically to keep track of how impacts and priorities change over time. The priorities identified in this step should be on top of the priorities defined by the company's baseline responsibilities.⁴

The GRI and UN Global Compact have developed another valuable guideline to ease the reporting process on sustainability issues: *Integrating the SDGs into Corporate Reporting: A Practical Guide*. This *Guide*, as well as *An Analysis of the Goals and Targets* (GRI and UN Global Compact, 2022), is connected with the *SDG's Compass* steps

² For more details about the tools against the SDGs, see GRI, UN Global Compact and WBCSD, n.d.b

³ See more in SDGs, see GRI, UN Global Compact and WBCSD, n.d.a

⁴ For additional examples, see SDGs, see GRI, UN Global Compact and WBCSD, 2015, pp. 11–15.

and is also structured as a step-by-step guide. It consists of three main steps, each of which has three sub-steps. The first step helps companies to define priority SDG targets. According to the first step, a company should pass the following three steps (according to GRI and UN Global Compact, 2018):

1. Understand the SDGs and their targets: to prioritize SDGs targets, a company should first review all of the SDGs and their targets. The company should consider how these issues relate to its business, including risks to people and the environment and opportunities for beneficial products, services, and investments. It is crucial to consider both the company's operations and its value chain. The company should also consider the interconnected nature of the SDGs and their targets, as its actions may contribute to multiple targets or SDGs. The company can then identify priority SDG targets based on risks to people and the environment and opportunities for beneficial products, services, or investments.
2. Conduct principled prioritization of SDG targets: there are two ways the company can identify priority SDG targets based on the impacts of its operations and value chain. The first is assessing the significant risks to people and the environment related to these impacts and the corresponding SDG targets. The goal is to identify opportunities to address these risks in a way that maximizes positive outcomes for people, the environment, and the SDGs. The second way is identifying SDG targets that the company can best contribute to through beneficial products, services, or investments. The company should use its skills and capabilities to develop products, services, or investments that contribute to achieving the SDGs. The goal is to ensure that these beneficial products, services, or investments are also developed and delivered to minimize negative impacts and reinforce the company's long-term viability.⁵
3. Define your SDG-related report content: the company should consult with stakeholders to determine any additional SDG-related topics that may influence their decisions

⁵ For more detailed explanations and examples, see GRI and UN Global Compact, 2018, pp. 11–16.

and assessments and adjust the priority targets as needed. The final set of priority SDG targets should be included in the report, taking into account materiality and the company's responsibility to respect human rights and adhere to other relevant principles and standards for responsible business conduct.

To conclude, determining materiality in non-financial reporting can be challenging, as it requires a subjective judgment about what information is important to stakeholders. To ensure that non-financial reports provide relevant and valuable information, organizations should consult with stakeholders to understand their priorities and concerns. Once set, material topics are not defined for an unidentified period. Still, they should be revised regularly. Like all the other processes and policies, determining material topics should be adequately documented.

2.3. Implementing Materiality in Non-Financial Reporting

After identifying material issues that should be reported, companies have to define key performance indicators to measure their impacts, collect the data, analyze it and report on it. As mentioned in the previous section, many indicators and tools are available to ease this process. On the other hand, companies must pay attention not to disclose information that is not material and therefore relevant for disclosure since that results in information overload and, thus, non-transparent reporting.

In today's world of easily accessible information, there are several reasons why transparent non-financial reporting is essential. Transparent non-financial reporting is a meaningful way for companies to demonstrate their commitment to responsible business practices and contribute to the sustainable development of society and the environment. It can enhance their reputation and build trust with stakeholders. In that sense, it can also provide valuable information to investors and other stakeholders, who may use it to make informed decisions about their investments or whether to do business with a particular company. Furthermore, it can help companies identify and address potential risks and opportunities associated with their operations, improving their long-term sustainability. Finally, it allows companies to meet regulatory requirements for non-financial reporting.

The materiality principle is relevant to transparent non-financial reporting because it determines which ESG issues are significant enough to be included in the company's report. For example, suppose a company significantly impacts the environment due to its operations. This may be considered a material issue that should be disclosed in the company's non-financial report. On the other hand, if a company's impact on the environment is minimal, this may not be considered a material issue and may not need to be disclosed.

While disclosing non-financial information, reporting entities commonly reveal a lot of information, making non-financial reports quite long. The number of pages of various kinds of reports significantly increased between 2006 and 2011 (from a mean of 178.7 to 297.3 pages) and continued to rise until 2016 (to a mean of 305.8 pages) (Stolowy and Paugam, 2018). There are several reasons why companies may disclose too much information in non-financial reporting, which can also be related to the reasons for financial information overload:

- Lack of time and uninformed staff: due to increased disclosure requirements and fast business operation changes, some companies may struggle with time to follow all the steps they should follow. The result is that the materiality assessment is not conducted properly, or there is a failure to conduct it, and thus the disclosure of all gathered information. In addition, uninformed staff exacerbate the issue.
- Complex reporting requirements and development of new reporting frameworks: companies may struggle to navigate complex reporting requirements and may include more information than necessary to ensure compliance. Although most reporting frameworks are voluntary, some companies combine them and add additional disclosures over time to present their commitment.
- Stakeholder demand: companies may feel pressure from stakeholders, such as investors, customers, NGOs, government, media, or the general public, to disclose more information than is strictly material to demonstrate transparency and good governance.
- Complex organizational structure and business operations: companies with a complex organizational structure, such as those with multiple international subsidiaries, business units, or different business operations, may find it challenging

to determine what information is material to stakeholders. As a result, they may include more information than is necessary.

- Fear of liability: some companies may disclose more information than is necessary to mitigate the risk of legal liability or reputational damage.
- Concealment of unpublished mandatory data: some companies disclose more information on certain topics to cover the ones they do not want to reveal for whatever reason. By only disclosing certain information, companies may be able to avoid revealing information that could be damaging or embarrassing for their reputation. This approach can be very harmful to the company in the long run.
- Misconceptions about materiality: companies may misunderstand the concept of materiality and believe that all information is equally important to stakeholders, leading to the inclusion of irrelevant or immaterial information in non-financial reports.
- Subjective judgments: subjective judgments refer to personal opinions, feelings, and beliefs that can influence the process of determining material information. That can include what an individual considers to be material information, how they analyze and interpret it, and how they present and communicate it to others.
- Insufficient resources: companies with limited resources may struggle to effectively prioritize and filter the information that is included in non-financial reports. As a result, they may end up disclosing more information than is necessary.
- Marketing or PR: some companies may use non-financial reports as a marketing or PR tool to promote a positive image and attract customers or investors. As a result, they may include more information than is strictly necessary to showcase their achievements and accomplishments.
- Development of reporting systems: accelerating improvements in technology development ease all kinds of administrative processes, including non-financial reporting. Suppose the reporting parameters do not allow setting some constraints or cannot assess materiality. In that case, such created reports may consist of information that is not

material to shareholders as it is too analytical, redundant or just side information.

The above reasons for disclosing too much information in non-financial reports, making it difficult to read them and find specific data, can be separated or grouped together in various forms that lead to an overload of non-financial reporting. Those companies that feel that they might identify with these issues should pay extra attention and focus on proper materiality assessment. When reporting on sustainability issues, a company should choose one framework if the use of a specific one is not prescribed and follow its recommendations regarding, among other fields, the reporting process. The guides for non-financial reporting stated in the previous section also contain some reporting guidelines. For instance, the final step in the SDG Compass is focused on *Reporting and communicating*; in Integrating the SDGs into Corporate Reporting: A Practical Guide it is *Report, integrate and implement change*; International <IR> Framework ends with the *General reporting guidance*; GRI 2: General Disclosures 2021 sets requirements for disclosures alongside the guidance for reporting on them. Although all these guidelines are written in simple language, when combined with all the requirements for disclosures, which often come from different stakeholders, this can make it difficult for reporting companies to prepare a concise report. The same problem occurred in financial reporting, and we are still searching for the right solution to overcome it. Unfortunately, one of the positive impacts of reducing disclosure overload in financial statements corresponds to an increase of disclosures in non-financial reporting (Stolowy and Paugam, 2018). However, implementing the concept of materiality should be imperative to reduce irrelevant and immaterial disclosures, either financial or non-financial ones. Thus, ultimately we will achieve transparent reporting.

In summary, disclosing too much information in non-financial reporting can create confusion and make it difficult for stakeholders to understand the organization's most critical issues. However, it is generally better for companies to be transparent and disclose all material information, even potentially harmful, to build trust and credibility with stakeholders. That is clearly recommended in all the analyzed standards, frameworks and guides. Furthermore, implementing the materiality principle helps ensure that transparent non-financial reporting focuses on the most crucial sustainability issues and provides

valuable information to stakeholders. It is an ongoing process, meaning that conclusions of materiality assessment can differ for reporting periods, although companies must bear in mind the comparability of the reports. Overall, it can be concluded that the non-financial reporting cycle starts even before the report for the last period is announced, or, in other words, it never ends.

3. Discussion questions and tasks for students

1. Research the concept of materiality in non-financial reporting. Compare the definitions of materiality as outlined in various guidelines. Write a summary of the multiple definitions of materiality and how they differ.
2. Research the process of identifying material issues for non-financial reporting and the importance of doing so for organizations.
3. Research the role of stakeholder consultation in the process of identifying material issues for non-financial reporting.
4. Choose one organization and analyze its non-financial report to determine how it identifies and communicates material issues to stakeholders. Write a report summarizing your findings and recommendations.
5. Research the process of implementing materiality in non-financial reporting, including the steps involved in defining key performance indicators, collecting and analyzing data, and reporting on material issues.
6. Explain the importance of transparent non-financial reporting and the role of materiality in ensuring that only relevant and significant information is disclosed.

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AUDIT OF NON-FINANCIAL REPORTS

Mateja Brozović

■ Annotation

Internal and external audit are essential mechanisms for ensuring the credibility and reliability of financial statements prepared by companies. Due to an increased demand for non-financial information¹, the questions are: what is the current situation with regard to involving both types of auditing in the preparation and presentation of non-financial reports, and what are the future prospects? This subchapter provides a short introduction to the main characteristics of internal and external audit. After listing several benefits of providing assurance on non-financial reports, it is first explained how an internal audit can contribute to non-financial reporting. The rest of the chapter is related to external audits, in terms of the current involvement of external auditors in providing assurance on non-financial information, as well as the proposed regulatory changes in the future.

A key finding is that providing the assurance on non-financial information would benefit numerous stakeholders, but it is not as nearly developed as is the case with financial information. Although research results suggest that the processes related to preparing non-financial information are usually not adequately included in the plans of an internal audit, the internal auditors should play an important role in providing both assurance and consulting activities. Assurance activities can include reviewing the relevance, accuracy, timeliness, and consistency of the published data, while the advisory activities can contribute to creating a control environment

¹ Non-financial information, sustainability information and ESG (environmental, social and governance) information are terms that are used as synonyms in this chapter since different sources use different terms.

for sustainability activities or recommending reporting indicators. When it comes to the involvement of external auditors, companies hire audit firms for external assurance of non-financial reports usually on a voluntary basis. The current situation across different jurisdictions varies a lot, since the assurance providers (audit firms and other service providers) rely on different standards and provide different types of assurance. This is why regulators started working on changing the regulatory requirements and making the market more uniform. For example, the European Commission proposed a new Directive which would make a limited assurance on non-financial reports mandatory. Such developments will certainly bring non-financial reporting closer to financial reporting.

Key words: internal audit, external audit, assurance on non-financial reports, independence, assurance providers, European Union.

1. Introduction

Auditing can be described as a process of obtaining evidence by means of which the actual situation is compared with defined criteria (the desired or necessary situation) and information about the level of compliance (of the actual situation with reference to the criteria) is provided to interested users (Brozović, Mamić Sačer, Pavić, Sever Mališ, Tušek & Žager, 2020, p. 57). Therefore, the key words used to describe the essence of auditing are: evidence, criteria, compliance, users. The scope of auditing can be limited to certain aspects of the entity's operations, or it can encompass the entity as a whole. This is why different types of auditing can be distinguished. External auditing is usually limited to financial statements, while internal auditing is oriented to all functions within the entity (Table 1).

Table 1. Comparing the characteristics of internal and external audits.

Type of audit	Who?	What (scope)?	How (criteria and procedures)?	Why (result)?
Internal audit	employees of the organization	all functions within an organization	<i>Criteria:</i> goals of the organization, policies, regulations <i>Evaluation procedure:</i> internal audit standards, code of ethics for internal auditors	internal auditor's report (not available publicly, more extensive, contains recommendations) + monitoring the execution of recommendations
External audit	external certified experts	financial statements (+ other engagements if agreed)	<i>Criteria:</i> accounting principles, accounting standards and policies, regulations <i>Evaluation procedure:</i> auditing standards, code of professional ethics, regulations	independent auditor's report (publicly available, standardized)

Source: the author's synthesis.

"Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations" (Institute of Internal Auditors [IIA], n.d.). The main characteristics of internal audit are: 1) it is carried out by persons employed in the entity whose operations are being evaluated, 2) it is an independent examination, judgement and evaluation function, without any limitations or restrictions on the judgement of internal auditors, 3) all activities of the entity fall within the scope of internal audit, and 4) internal audit provides both assurance and advisory activities, which is why it should be classed as an advisory and not a line function of the entity (Tušek & Sever, 2007, p. 278). The assurance services of the internal audit are directed towards the management and the audit committee, focusing on evaluating the effectiveness of the corporate governance, risk management, and control processes established by the management. On the other hand, advisory services include consulting or advising management on risk management and the internal control system (Tušek & Pokrovac, 2009, p. 52). For this reason, it is often pointed out that internal audit represents an important factor without which good management of a company cannot be imagined,

and in this context internal audit is considered an “extended arm of management”. In contrast to external audit, the origin and development of which is often initiated by the environment, sometimes by legal regulations, internal audit arises solely from a business entity’s needs, regardless of the fact that its implementation is often not prescribed by law (Brozović et al., 2020, p. 58).

On the other hand, external auditing is carried out by expert, independent external auditors that are certified to perform this task. When conducting an external audit, it is crucial that the auditors cannot be employed in the company that is the subject of the audit or in any connection with that company, as this would violate the principle of independence. External auditors primarily examine the true and fair view of principle financial statements, although they can also engage in a number of other activities. The criteria for evaluating the reality and objectivity of financial statements are usually legal regulations, accounting principles and accounting standards (financial reporting standards), and the evaluation procedure itself is carried out in accordance with auditing standards.

The services that are usually provided by external auditors are presented in Figure 1. The audit of financial statements is an audit engagement which results with a reasonable assurance that the financial statements do not contain material misstatements. Reasonable assurance is a lower level of assurance than absolute assurance, since it is not a guarantee. However, the audit procedures performed are sufficient to enable the auditor to express a conclusion in a positive form, i.e. to conclude that the financial statements are or are not in accordance with the criteria. A lower level of assurance is provided by limited assurance, where the audit risk is greater than with the reasonable assurance. The performed audit procedures are sufficient for the audit to reach a negative conclusion. An example of an engagement that results in limited assurance is a financial statement review. In the case of a review, the auditor, based on the performed audit procedures (e.g. inquiries to management or analytical procedures), which are not as extensive as in an audit of financial statements, draws a conclusion as to whether he or she came across evidence that would indicate to him or her that the financial statements were compiled in accordance with the applicable financial reporting framework in all significant aspects. Audit engagements without expressing assurance also generally result in the preparation of a report, but the difference

is that the auditor does not express any form of assurance. In other words, the auditor will present the results of his or her work, but will not form a conclusion about the truthfulness and fair presentation of the information that he or she examined. In addition to audit services, there is a wide range of non-audit services external auditors are able to provide. These services include: finance, accounting, tax and other business consulting, appraisals and court expertise, education, development and improvement of the accounting information system, consulting during business combinations, etc. Since providing non-audit services might threaten the independence of auditors who at the same time conduct statutory audit of financial statements, there is a list of prohibited non-audit services when it comes to auditees who are public interest entities.

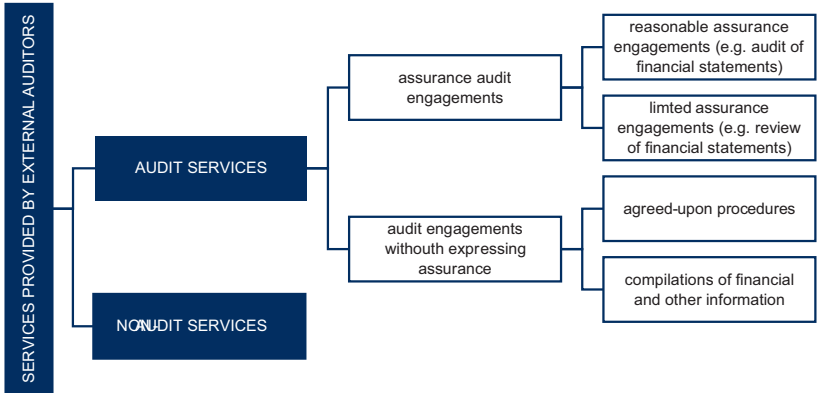


Figure 1. Audit and non-audit services provided by external auditors.
Source: Brozović et al., 2020, p. 87.

All of the above suggests that auditing, especially external, is primarily oriented towards ensuring truthfulness and fair presentation of financial information, while non-financial information is still severely underrated. However, stakeholders increasingly rely on non-financial information, which implies that they will also seek some form of assurance that the disclosed non-financial information is accurate and reliable.

2. Background

2.1. The importance of providing assurance on non-financial information

The process of providing assurance can be described as asking an expert to give an independent opinion on the subject for a fee (World Business Council for Sustainable Development [WBCSD] & Institute of Chartered Accountants in England and Wales [ICAEW], 2019, p. 10). It is not a form of insurance, since the expert is not offering a guarantee regarding the information that has been assured. The reasons for seeking assurance might include: 1) a legal requirement (e.g. under an EU Directive), 2) a regulatory requirement (e.g. required by regulators of financial services), 3) the need for management decision-making and compensation (i.e. for internal purposes of the organization), or 4) investor and stakeholder demand (to reduce information asymmetry) (WBCSD & ICAEW, 2019, p. 11).

Since the disclosed non-financial (or environmental, social and governance – ESG) information is generally not controlled to the same extent as financial information, the risk of material misstatement is high and can influence decision-making (World Business Council for Sustainable Development [WBCSD] & FSR – Danish Auditors, 2019, p. 5). That is why it is understandable that 97% of investors in a survey conducted by McKinsey stated that sustainability reports should be subject to some form of audit, in the sense that they need assurance that the published data is reliable and credible (ESG Lynk, n.d., p. 1). According to the research conducted by Del Giudice and Rigamonti (2020, p. 1) in Italy, the reliability of ESG scores can benefit from providing assurance on sustainability reports, signalling the quality of the company's sustainability information.

2.2. The contribution of internal audit to non-financial reporting

Many organizations have incorporated sustainability-related topics and goals in their strategic plan and mission, encouraged by the increased interest from numerous stakeholders such as investors, employees, customers, and regulators, who expect to be informed about

more than just financial results. Therefore, sustainability should be on everyone's agenda, including every internal auditor (Brozović, 2021). However, identifying the risks associated with ESG factors is still problematic, since a 2020 Institute of Internal Auditors (IIA) survey found that boards and internal auditors rated sustainability as the least important risk among 11 offered risks included in the research (Institute of Internal Auditors [IIA], 2021, p. 10). Similar results were found in a 2021 survey of internal auditors in Canada, where 65% of internal auditors revealed that their organization did not include sustainability-related issues in their three-year internal audit plan (Olson, 2021, p. 4). On the other hand, it is too often the case that companies publish non-financial information that is not fully supported by relevant data, or cannot confirm with certainty that the data does not contain significant errors (Moats, 2021, p. 1). Also, non-financial data is generally collected and processed separately from financial data, without appropriate internal controls and supervision over reporting process, which causes inconsistency between different departments, business units and branches (Association of International Certified Professional Accountants [AICPA], Chartered Institute of Management Accountants [CIMA] & Center for Audit Quality [CAQ], 2021, p. 1).

Risks that emerge when it comes to ESG issues include a reliance on data collected by third parties, potential reputational damage resulting from misreporting, and the very real possibility that a company may be obligated to meet certain sustainability targets that it cannot meet (IIA, 2021, p. 2). Internal auditing in this context can increase security and trust in processes and data related to sustainability (KPMG, 2021, p. 2), not only for external users, but also for management and other internal users who, based on the collected information, make decisions about further business. Although investors increasingly rely on corporate sustainability disclosures, they are mostly dissatisfied with the level of disclosure of adequate quantitative information related to ESG factors, their comparability from period to period, and questionable quality (Vodovoz, Robinson & Sullivan, 2020, p. 1). Internal auditors can assist management in answering important questions such as:

1. Who are the relevant stakeholders of the company and which ESG factors are they interested in?
2. Does a company have a clear view of the risks related to ESG factors, are those risks regularly reassessed, and does

- a company comply with existing and upcoming local and international legislation related to sustainability reporting?
3. Does a company have an appropriate ESG culture that is in line with their ESG initiatives?
 4. Does a company have key performance indicators (KPIs) to measure its ESG activities and are those related to ESG strategy? (KPMG, 2021, p. 3).

The degree of involvement of internal audit in processes and reporting on sustainability depends on the degree of integration of the ESG model in business (Figure2), i.e. the maturity of the company in thinking about ESG factors. At the most advanced level, it is an integrated model, where ESG risks are included into the company's risk management and the internal audit plan in a way that is comparable to other business risks.



Figure 2. ESG integration maturity model and the level of internal audit involvement.

Source: based on Vodovoz, Robinson, Sullivan, 2020, p. 5.

Due to the growing importance of ESG reporting, the Institute of Internal Auditors (IIA) published a white paper in 2021 on the role of internal audit in ESG reporting, emphasizing that independent assurance is necessary for effective reporting on sustainability. "What is clear is that strong governance over ESG – as with effective governance

overall – requires alignment among the principal players as outlined in The IIA Three Lines Model. As with any risk area, internal audit should be well-positioned to support the governing body and management with objective assurance, insights, and advice on ESG matters” (IIA, 2021, p. 1) (Figure 3). The governing body, i.e. supervisory board, has the role of monitoring sustainability or delegating this responsibility to a specific sub-committee, such as the audit committee, which has the most experience in supervising external reporting process and knows the importance of internal controls, policies, and procedures. Management is in charge of planning and executing strategy related to ESG factors, identifying relevant indicators used for sustainability reporting, creating related procedures, policies, and internal controls, and overseeing the compilation of such reports. Internal audit should provide objective and independent assurance on the effectiveness of sustainability risk management, as well as reporting and compliance with relevant regulatory requirements (IIA, 2021, p. 4). Internal auditors can also review the disclosure procedures and ensure that the data collection systems are organized and robust (Luxembourg Stock Exchange [LuxSE], 2021, p. 27).

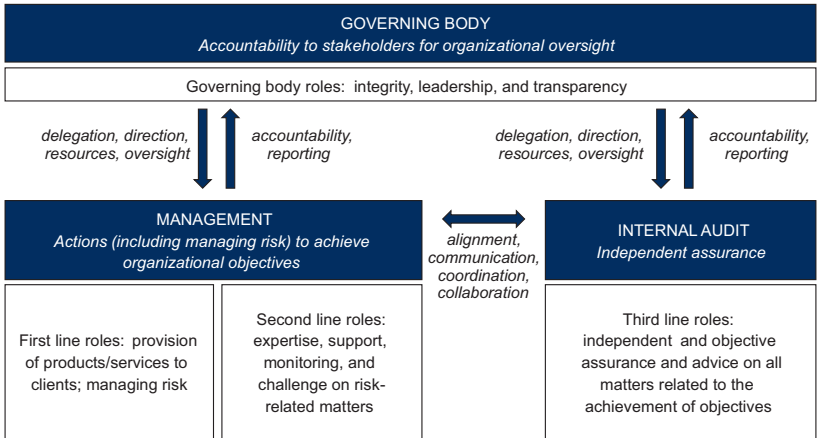


Figure 3. The Institute of Internal Auditors’ Three Lines Model
 Source: Institute of Internal Auditors [IIA], 2020, p. 4.

The role of internal audit in non-financial or sustainability reporting is twofold, consisting of providing assurance and advisory. Assurance should at least consist of the following activities:

1. reviewing the relevance, accuracy, timeliness, and consistency of the published data, which becomes especially important in conditions where regulatory supervision over non-financial reporting increases,
2. examining the compliance of published data with formal financial disclosures, so that contradictory data does not appear that would cause concern to regulators and investors,
3. carrying out an assessment of the materiality or risk of ESG reporting, since stakeholders are looking for information that is materially significant,
4. integration of ESG factors into internal audit plans (IIA, 2021, p. 5–6).

On the other hand, advisory activities of internal audit in the field of ESG may include:

1. creation of a control environment for ESG activities – internal auditors can recommend suitable internal control system frameworks to effectively manage risks, and can also provide advice on specific internal controls in the field of ESG reporting,
2. recommending reporting indicators on sustainability – internal auditors can suggest what type of data should be published in order to faithfully reflect the efforts undertaken by the company in the matter of sustainability,
3. sustainability management consulting – due to their unique perspective and understanding of enterprise-wide risks, internal auditors can identify roles and responsibilities in ESG-related processes and provide training on internal controls (IIA, 2021, p. 6).

Internal audit has an important role in all elements of the company's internal control system, which, to the same extent as it is the case with financial reporting, should also be directed towards non-financial reporting. According to the COSO framework (Figure 4), it can add value by serving as an advisor and helping to establish a functional control environment related to ESG factors. It can also offer assurance support by providing an objective and independent review of the ESG risk assessments and controls. Internal auditors that operate in accordance with internationally recognized internal audit standards and guidelines are well trained and positioned to assist their companies in establishing and implementing reliable internal controls related to

sustainability (IIA, 2021, p. 2). While the organization and implementation of internal controls is the responsibility of the management, the internal auditors are responsible for providing independent assurance regarding the design and effectiveness of the control activities (IIA, 2021, p. 3). In line with all that has been stated, the COSO framework suggests that the objectives of non-financial reporting can and should be integrated into the company's existing system of internal controls (Herz, Monterio & Thomson, 2017, p. 18).



Figure 4. Components of the COSO framework

Source: Committee of Sponsoring Organizations of the Treadway Commission [COSO], 2013, p. 6.

2.3. The current role of external auditors regarding non-financial information

In addition to the important contribution of internal auditors to the reliability and accuracy of non-financial information, stakeholders also often seek a third-party assurance, which might include external auditors or other assurance providers. Since this information is publicly disclosed, the board of directors wants to assess its quality level. Investors use the non-financial information to manage their investments, while management may benefit from obtaining another perspective on the processes related to ESG reporting. In addition to benefits for other stakeholders in the form of customers, suppliers and future employees, third-party assurance might impact the company's sustainability indexes (Center for Audit Quality [CAQ], 2021, p. 2). This is confirmed by the research results, since it was found out that having non-financial information assured increases the likelihood of the company's inclusion in the Dow Jones Sustainability Index (Clarkson, Li, Richardson & Tsang, 2015, p. 1). In addition, external assurance can have a significant positive effect on a company's value (Harymawan, Nasih, Salsabilla & Putra, 2020, p. 1500), through enhanced brand reputation, lower cost of capital, improved risk management, improved ability to attract and retain employees, etc. (Association of International Certified Professional Accountants [AICPA], 2018, p. 6).

Despite numerous potential benefits of third-party assurance, the current practices around the world show that it is not mandatory. In other words, companies might seek the assurance on a voluntary basis. According to the extensive analysis of 656 companies in 19 European countries over a period from 2009 to 2014, companies that are better performing in terms of sustainability are more likely to have their non-financial reports assured voluntarily. The same applies for companies in countries with weaker legal systems, as well as countries that are stakeholder oriented (Visscher, 2016, p. 1). The issues regarding voluntary external assurance on non-financial information include: 1) there is a range of different assurance providers, since the market is unregulated, 2) there is a range of different guidelines on sustainability reporting and assurance, and 3) there is no benchmark for assurers, due to the voluntary aspect of non-financial reporting and assurance (Visscher, 2016, p. 8). The analysis conducted by Ling Li Sonnerfeldt and Aggesteam Pontoppidan (2020, p. 1) confirms that the sustainability assurance still faces persistent challenges, including immaturity of reporting standards, lack of shareholder engagement, favouritism of particular stakeholder groups. In addition, the non-financial information can be incomplete or unreliable, which limits the possibilities of the assurance engagement. If and when the disclosed information meets the characteristics necessary for the assurance engagement, the auditors will be suitable for providing external assurance (Accountancy Europe, 2017, p. 2).

The voluntary notion of external assurance on non-financial information in the European Union is mentioned in an EU Directive that is relevant for companies disclosing non-financial information (Directive 2014/95/EU). According to the Directive, "statutory auditors and audit firms should only check that the non-financial statement or the separate report has been provided. In addition, it should be possible for Member States to require that the information included in the non-financial statement or in the separate report be verified by an independent assurance service provider". Therefore, external assurance is generally not mandatory. As for the responsibilities of auditors that are engaged in conducting audits of financial statements, auditors in the European Union act in accordance with Directive 2006/46/EC and the International Standard on Auditing (ISA) 720 (Revised). It is strictly emphasized that the auditor's opinion does not cover other financial or non-financial information, published outside of the audited

financial statements. The auditor is only required to read and consider other information (e.g. contained in the annual report), and to check if there are any material inconsistencies with the financial statements that might undermine the credibility of the financial statements (ISA 720, p. 6). This means that, if the other information is related to the CO2 emissions of the company, the auditor is not required to gather evidence and investigate the truthfulness of this information. On the other hand, if the annual report contains information about the annual revenue growth rate that is incorrect, i.e. different from what can be calculated from the audited financial statement, then the auditor will react. The same applies for auditing US public companies, whose audits of financial statements are conducted in accordance with the auditing standards issued by the Public Company Accounting Oversight Board (PCAOB). Additionally, when the non-financial or sustainability reports are published separately or within reports that do not contain the audited financial statements, the auditor is not required to pay attention to this information (there not even an obligation to read and consider it) (CAQ, 2021, p. 2).

Even though assurance engagements on non-financial reports are usually voluntary, assurance providers have to act in accordance with relevant standards in order to ensure consistency and high-quality. Citing such a standard in the assurance report related to non-financial information also contributes to the stakeholders' confidence in that report. Assurance standards that are often used are: ISAE 3000, ISAE 3410, national versions of ISAE 3000, AA 1000AS, ISO 14064-3, etc. The International Standard on Assurance Engagements (ISAE) 3000 (Revised) is a generic standard intended for any assurance engagement that is not an audit or review of financial statements, developed by the Auditing and Assurance Standards Board (IAASB) (Global Reporting Initiative [GRI], 2014, p. 34). It emphasizes comprehensive procedures for evidence gathering process, that include: 1) defining the scope of the engagement, 2) assessing the subject matter, 3) assessing the reporting criteria, 4) assessing materiality, 5) considering the maturity of the company's reporting processes, and 6) forming an assurance report (Accountancy Europe, 2017, p. 4–7). All reports that are prepared in accordance with ISAE 3000 must contain a statement declaring this (International Federation of Accountants [IFAC], 2021). The construction of ISAE 3000 allows the national professional associations and the assurance practitioners to determine the details

of the engagements (Ling Li Sonnerfeldt & Aggesteam Pontoppidan, 2020, p. 15). Together with ISAE 3000, assurance providers often use a subject-matter specific standard such as ISAE 3410 *Assurance Engagements on Greenhouse Gas Statement* (Seidenstein, 2021). The AccountAbility AA1000 Assurance Standard (AA 1000AS) was developed by AccountAbility, a think-tank and advisory services firm. It “offers principles-based guidance rooted in the AA1000 Accountability Principles” (AccountAbility, n.d.). ISO 14060 is a set of standards that provides consistency for monitoring and reporting greenhouse gas emissions to support sustainable development. In other words, ISO 14064-3 provides a framework for evaluating greenhouse gas related statements (International Organization for Standardization [ISO], 2019). It is evident that the situation with the assurance standards used for providing assurance on non-financial information is the same as the situation with the guidelines for preparing non-financial reports: there is a variety of standards with different requirements, which in the end may be confusing for stakeholders that are interested in the assurance reports.

Although providing external or third-party assurance on non-financial information is not mandatory in most countries, the market has been growing. For example, 67% of the top 250 global companies that disclose sustainability reports invest in external assurance, which is a significant increase from 29% in 2002 (AICPA, 2018, p. 4). In addition, the Dow Jones Sustainability Index awards additional points for companies that submit assured sustainability reports (AICPA, 2018, p. 4), which provides encouragement for companies to hire an assurance provider. In order to investigate the current state of non-financial reporting and assurance, several global organizations (International Federation of Accountants [IFAC], American Institute of Certified Public Accountants & Chartered Institute of Management Accountants [AICPA & CIMA] & Audit Analytics) have conducted extensive research that included 1400 companies across 22 countries. The criterium for selecting companies was the largest market capitalization. The research results showed that 91% of analyzed companies disclose some level of sustainability information, while 51% of those companies provide some level of assurance on it (44% excluding EU). Industry analysis showed that industries with the highest percentage of non-financial assurance are: basic materials, telecommunications, financial and energy. The analysis across countries is presented in Figure 5. Among

the 22 countries included in the research, the leaders according to the rate of ESG assurance are: France (96%), South Korea (93%) and Spain (79%). Saudi Arabia, Indonesia and Singapore are at the end of the list (IFAC, AICPA, CIMA & Audit Analytics, 2021, pp. 24–45). According to the national research conducted in Croatia in 2019 and 2020, only 14% of companies that published non-financial report had some form of external assurance, mostly in the form of limited assurance – 9% (Ravlić Ivanović, Žepić, Cigula, Marszałek, Kartelo, Labaš, Omazić, Jaklin, & Markota Vukić, 2022, p. 40).

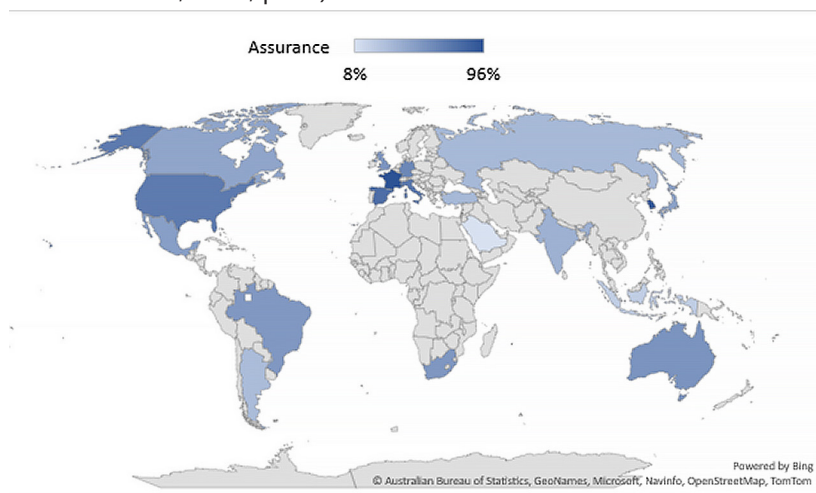


Figure 5. Percentage of companies that received assurance on their ESG disclosures – comparison across countries

Source: IFAC, AICPA, CIMA & Audit Analytics, 2021, pp. 24–45.

The type of the external assurance that prevails in the analyzed 22 countries is limited assurance, which is expressed in 83% of the engagements. As previously explained, this is a lower level of assurance when compared with the reasonable assurance that is used for audits of financial statements. Out of 22 countries included in the analysis, 6 countries are uniform in their practices (Argentina, Australia, Italy, Russia, Saudi Arabia, and Spain), since all the companies have the same type of assurance (limited). However, there are significant differences across jurisdictions. For example, Hong Kong is the only jurisdiction where the reasonable assurance prevails over limited assurance (46% vs. 38%). In addition, there are 2 countries where the dominant type

of assurance is moderate assurance (South Korea with 58% and Indonesia with 44%), which is an even lower level of assurance than limited assurance. Distribution across countries is presented in Figure 6.

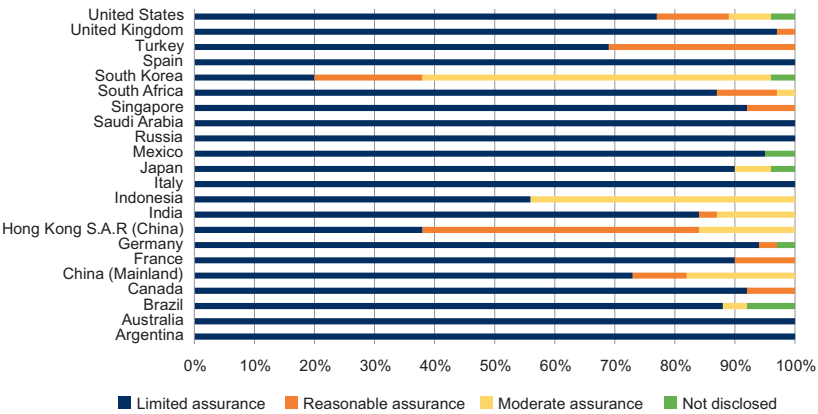


Figure 6. Types of assurance received on ESG disclosures – comparison across countries.

Source: IFAC, AICPA, CIMA & Audit Analytics, 2021, pp. 24–45.

Audit firms are not the only entities providing external assurance on non-financial information. The research in 22 countries has shown that 63% of the assurance engagements were conducted by audit or audit-affiliated firms, while the remaining 37% was conducted by other service providers. As may be seen from Figure 7, audit firms strongly dominate in the EU market (France – 98%, Germany – 94%, Italy – 97%, Spain 93%) (IFAC, AICPA, CIMA & Audit Analytics, 2021, p. 15). This is expected, since the auditors or professional accountants are well-prepared to provide assurance on non-financial information, as they can employ wide experience gained from auditing financial statements, they have knowledge about assurance techniques and process, and are acting in accordance with the professional standards, as well as codes of ethics. In addition, they are experts in evaluating internal controls and processes for collecting, analyzing, and reporting information, they have analytical skills and understand why certain sustainability factors are important from a risk and financial perspective (AICPA, 2018, p. 7). However, it can be expected that smaller audit firms are less prepared for offering additional services, such as non-financial assurance, which is why this growing market is probably highly

concentrated and dominated by big audit firms, primarily the Big 4. In addition, non-financial reports are usually prepared by large companies that are already audited by big audit firms, so it is expected that they will also hire big audit firms for non-financial assurance. According to the KPMG UK statement from 2021, they have a dedicated ESG Assurance team, which provides assurance on different sustainability reporting frameworks, such as the Global Reporting Initiative (GRI), or specific data metrics assurance (KPMG, 2021, p. 2). On the other hand, research conducted in Poland in 2020 showed that only 2.3% of audit firms offer auditing services related to non-financial reports (Bartoszewicz & Rutkowska-Ziarko, 2021, p. 1). The countries with the lowest involvement of audit firms in providing assurance on non-financial information are South Korea (5%), Japan (10%) and USA (11%) (IFAC, AICPA, CIMA & Audit Analytics, 2021, pp. 24–45).

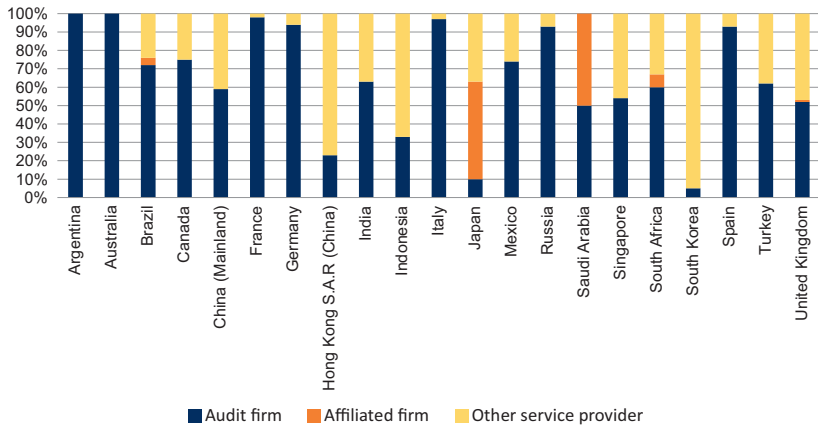


Figure 7. Types of firms providing assurance on ESG disclosures – comparison across countries.

Source: IFAC, AICPA, CIMA & Audit Analytics, 2021, pp. 24–45.

In order to ensure a constant level of quality and make the assurance process more credible, assurance providers are conducting their engagements in accordance with one or more assurance standards. Out of the total number of conducted engagements by audit firms in the analyzed 22 countries, 88% of them cited the International Standard on Assurance Engagements (ISAE) 3000 (Revised), while other service providers often use alternative assurance standards (Figure 8). EU countries are again pretty uniform, while on the other hand some

countries (e.g. Australia, Brazil and Saudi Arabia) use national alternatives to ISAE 3000. Countries such as Indonesia and South Korea use AA 1000AS (IFAC, AICPA, CIMA & Audit Analytics, 2021, pp. 24–45).

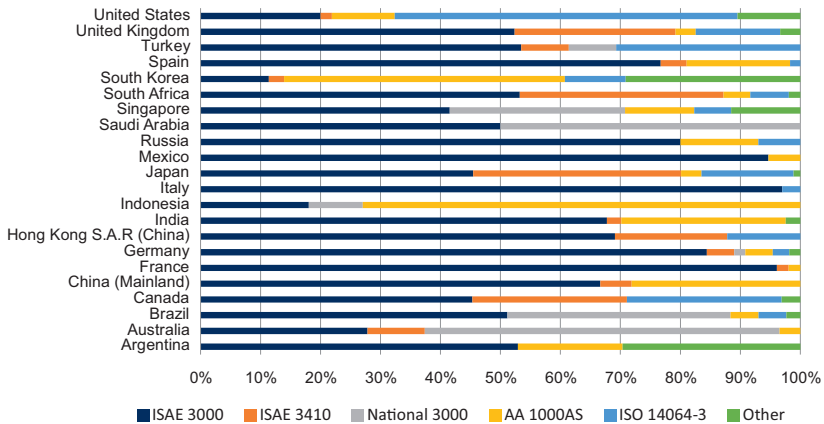


Figure 8. Assurance standards used when providing assurance on ESG disclosures – comparison across countries.

Source: IFAC, AICPA, CIMA & Audit Analytics, 2021, pp. 24–45.

This extensive research across 22 countries confirmed the main conclusions regarding the current state in non-financial assurance: 1) external assurance on non-financial information is gaining in popularity, 2) there are large differences across different jurisdictions, but certain regions (such as EU) are pretty uniform, and 3) the market for external assurance for non-financial reports is insufficiently regulated, since the service is provided by different practitioners that apply different assurance standards and provide different types of assurance.

2.4. Future expectations from external auditors as assurance providers

In order to ensure a high-quality level external assurance in the EU, several conditions have to be fulfilled in the future:

1. EU regulatory framework mandating assurance
 - mandatory independent external assurance – assurance at the EU level should be mandatory according to the EU regulatory framework,

- a clear level of assurance – non-financial information should be covered by the same type of assurance (reasonable) that is required for financial information, due to its importance to investors and connectivity to financial information,
 - the precise subject matter of an assurance engagement – the intended users of non-financial reporting should be clearly defined, as well as their needs, in order to adjust the assurance service accordingly,
2. professional standards applicable to all assurance service providers – regardless of the type of subject providing assurance (audit firm or other provider), they all need to act in accordance with the same set of subject-matter specific standards that need to be developed, and should cover:
 - competence – assurance providers must be sufficiently familiar with a wide range of matters, to be able to assess the entity as a whole,
 - quality management – assurance providers must have a quality management system in place to ensure the high quality of the engagement,
 - ethical requirements, primarily independence – all assurance providers must act in line with all the ethical requirements that are mandatory for statutory auditors,
 3. public oversight of assurance providers – in order to ensure that all the necessary requirements are fulfilled and to add credibility to the assurance process, public oversight is a necessity; since there are already bodies which conduct oversight of the audit profession in relation to the audit of financial statements, the same bodies would probably be the best for both tasks (Accountancy Europe, 2020, pp. 1–5).

The European Commission has recognized that “there is a widening gap between the sustainability information companies report and the needs of the intended users of that information” (European Commission, 2021, p. 3), stating that the reported information is often neither sufficiently comparable across companies, nor sufficiently reliable (European Commission, 2021, p. 2). This type of thinking resulted in the proposal for a new Directive that would significantly amend the current non-financial reporting Directive 2014/95/EU. The main requirements of the proposed new Directive regarding external

assurance on non-financial reports are presented in Table 2. The principal novelty is a requirement of a company to hire a “statutory auditor to perform a limited assurance engagement on a company’s sustainability reporting...” (European Commission, 2021, p. 15). Member States may allow other assurance practitioners to conduct this task. The Commission also states that the final goal is to have the same type of assurance on financial statements and non-financial reports, but in their opinion the non-financial reporting is not mature enough. This is primarily due to the absence of a commonly agreed standard for non-financial assurance engagements, which creates the risk of different understanding and expectations from the engagement. The Commission, therefore, plans a progressive approach, by raising the level of assurance to a reasonable assurance in the future (European Commission, 2021, p. 37). The reason for allowing Member States to assign other assurance practitioners (i.e. other than statutory auditors) to perform assurance engagements related to non-financial reports, is the risk of further concentration of the audit market, which could result in increased audit fees and potentially jeopardized auditor’s independence. Moreover, the requirements imposed on auditors conducting assurance engagement on sustainability reporting should be consistent with the requirements regarding their work on the statutory audit of financial statements (European Commission, 2021, p. 39–40). This means that they should comply with the same principles, present the findings in the same audit report, extend the scope of their internal quality assurance reviews, be subjected to external oversight, etc.

Table 2. The main requirements of the new proposed EU Directive.

Assurance requirement	Assurance providers	Expertise required	Framework
<ul style="list-style-type: none"> companies that have to present non-financial reports must also seek external limited assurance for reported sustainability information there is an option to move towards reasonable assurance at a later stage 	<ul style="list-style-type: none"> assurance providers are auditors Member States might have the option to choose other independent external assurance service providers that are accredited 	<ul style="list-style-type: none"> auditors (as well as other assurance service providers if allowed) must have relevant skills and knowledge for this type of assurance engagement 	<ul style="list-style-type: none"> the same framework as for the audits of financial statements includes EU Auditing Directive (2006/43/EC) and Regulations

Source: according to Akelis, 2021, p. 13.

In addition, the International Auditing and Assurance Standards Board (IAASB) recognized the need to provide better guidance for assurance practitioners when it comes to assuring non-financial reports. They state that their consultations might result in: 1) developing new subject-matter specific standards that supplement ISAE 3000 (Revised), 2) introducing enhancements to ISAE 3000 (Revised), and/or 3) revising existing or developing new guidance (Seidenstein, 2021).

It is clear that the intention of regulators in the future is to bring non-financial reporting to the level of financial reporting, which also includes the external assurance provided by competent and independent auditors. It is a process that takes time and will start with creating preconditions in the form of legal framework that will clearly define the rules of the game for both companies that publish non-financial reports and auditors. However, all stakeholders will certainly benefit from a clearly defined and standardized system.

3. Discussion questions and tasks for students

1. Describe the advantages and disadvantages of internal audit and external audit in providing assurance on non-financial information. In your opinion, which type of audit is able

- to contribute more to the reliability and truthfulness of the disclosed information?
2. Do you think that internal auditors are independent enough to provide credible assurance on non-financial reports?
 3. In your opinion, can the auditing process used for financial statements be applied in the same way when providing assurance on non-financial reports? Are there any adjustments that had to be implemented?
 4. Find examples of external assurance reports that are published together with non-financial reports.
 5. Analyze the *Independent assurance statement* that is part of the *McKinsey 2021 ESG Report* (available at: https://www.mckinsey.com/spContent/ bespoke/esg-pdf/pdfs/in/McKinsey_2021_ESG_Report_VF.pdf, p. 82). Compare the McKinsey statement with the independent assurance reports prepared for Nestle (available at: <https://www.nestle.com/sustainability/performance-reporting/independent-assurance>) and BP (available at: <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/sustainability/group-reports/bp-sustainability-report-2021.pdf>, p. 57). Identify similarities and differences in the reports' elements, volume, used criteria, assurance provider, etc.
 6. Compare the analyzed assurance reports over non-financial information (from question 5) with the structure and elements of the independent auditor's report.
 7. In your opinion, should external auditors be required to provide reasonable assurance on non-financial reports in the same manner as with the financial statements?
 8. Analyze the proposal for a new EU Directive that would make external assurance on non-financial reports mandatory (available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0189>). Find the explanation as to why the European Commission decided to introduce regulatory changes. Are there future plans for additional changes presented in the proposal?

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GREEN BONDS AND GREEN LOANS IN SUPPORTING SUSTAINABILITY PROJECTS

Nika Šimurina

■ Annotation

Green bonds and green loans are financing tools used for mitigating climate change by increasing the level of financial flows from public, private and non-profit sectors for investment in sustainable development goals. The green bond market has developed rapidly on the global level since 2007, when the first green bond was issued by the European Investment Bank (EIB). The most popular green lending instruments are green bonds, but green loans and sustainability-linked loans have gained in popularity and recognition. According to the Green Bond Principles (GBP), a green bond is any type of bond where the proceeds are exclusively applied to finance or refinance new or existing eligible green projects. Green loans are very similar to green bonds because they are project-based debt instruments and they should be used only and entirely for green financing. Green financing therefore could be a very useful tool in supporting sustainability projects and could be promoted in the EU through regulatory frameworks and the harmonization of public financial incentives, but also through increases in green financing from the private sector.

Key words: sustainable finance, ESG, green finance, green bonds, green loans, Green Bond Principles, Green Loan Principles.

1. Introduction

Sustainable financing is a new growing trend at the global level, which encompasses any form of financial service that incorporates positive environmental, social and governance factors into business considerations in general, and financing decisions in particular. In recent years, investor interest in sustainable investment products has grown exponentially, not only with regard to the green bond market. The rising interest in socially responsible investment (SRI) is reflected in the increasing number of products offered to investors and the increasing level of assets under management.

SRI is usually of a long-term nature, and the provision of adequate capital is essential. One of the financial instruments capable of meeting expectations are green bonds. According to the GBP, a green bond is any type of bond where the proceeds go to finance or refinance new or existing eligible green projects. For a bond to be considered green, the issuer must, among other criteria, certify that its proceeds will be used to finance eligible green projects. Another important fact about green bonds is that they are also a debt instrument that public or private entities can issue. The EIB issued the first green bonds in the year 2007, but according to Ehlers and Packer (2017) compared to the conventional bond market, the market for this type of bond is still relatively small. Since 2013, green bond issuance has been growing rapidly on a global basis due to an increase in private sector issuers. An interesting fact is also that the first sovereign green bonds were issued in late 2016 by Poland.

According to data provided by the UniCredit Research, the green bonds market grew from USD 11 billion in 2013 to USD 250 billion in 2019. From 2020, due to the COVID-19 crisis, we have seen a shift from green to social bonds. The definition of social bonds is also very narrow because, usually, they are defined as use-of-proceeds bonds that raise funds for projects with positive social aims in the areas of affordable basic infrastructure, access to essential services, affordable housing, employment generation, food security, and socioeconomic advancement and empowerment. Combined global issuance of green, social, sustainability and sustainability-linked bonds amounted to USD 904bn in 2021, exceeding the total global environmental, social and governance (ESG) bond supply in 2020 of USD 529bn by 71%.

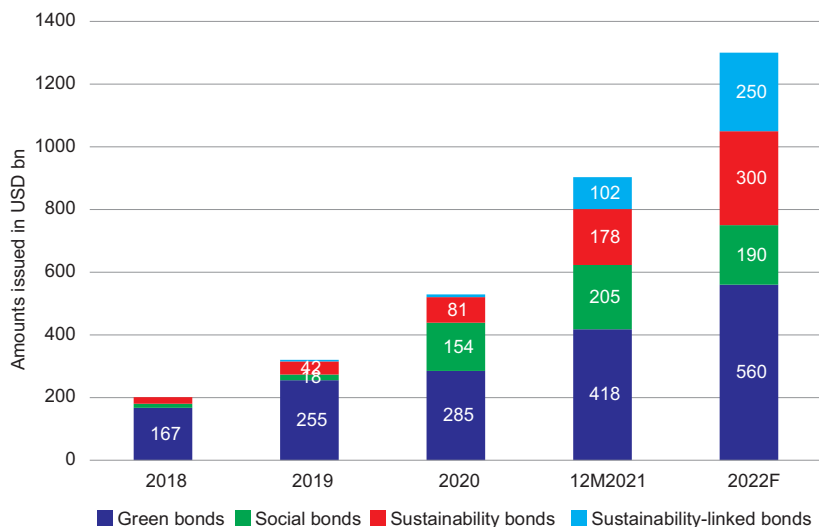


Figure 1. Green, social, sustainability and sustainability-linked bonds (Forecast 2022).

Source: UniCredit Research, The Green Bond and ESG Chartbook, 2022.

Another form of sustainable financing is a green loan which is very similar to the green bond in a sense that it raises capital for green projects, but the green loan is usually smaller than a bond and done in a private operation. A green bond typically has a higher volume and transaction costs, and can be either listed on an exchange or placed privately. For both forms different principles exist: for green bonds the Green Bond Principles (GBP), and for green loans the Green Loan Principles (GLP). Green loans are important because they help borrowers to demonstrate the greening of their operations and, considering all the above-mentioned characteristics of green bonds, issuers in emerging markets with a small green portfolio would rather receive a green loan than issue a green bond.

Besides green loans, sustainable loans also exist, which do not have any limitations regarding use of proceeds. In practice, this means that the terms of a loan are determined by the borrower's performance connected with predefined ESG criteria. So, if the borrowers improve their ESG performance, they are granted a pricing reduction, or if they are not able to improve their ESG performance – e.g. achieving predefined corporate social responsibility targets, increasing the

proportion of women in management positions, or reducing the incident and sick rates at the workplace – they would be punished with a pricing increase. Sustainable loans are also accessible to a broader scope of companies that are devoted to incorporating sustainable targets into their financial decisions.

This subchapter, in its three main topics, provides an overview of the concept of sustainable finance and green finance, including their definition and practical application. It also explores the importance of green bonds and green loans as instruments to support the green transition. Finally, this subchapter provides some successful implementation examples and data on the utilization of green financing.

2. Background

Although sustainable finance seems to be a new concept, it has been in use for more than two decades and is attracting considerable interest today because it upholds all of society's important values. Sustainable finance is a broader term than green finance, because it covers all financing activities that contribute to sustainable development. From an ethical point of view, the importance of sustainable finance is about taking social and environmental factors into account when investing. For that reason, banks have created ESG products to meet the needs of those who want to invest more sustainably. Green finance includes climate finance but excludes social and economic aspects, and climate finance is just a subset of green finance.

In the literature, green finance is often called environmental finance and we can find different, but also very similar, definitions of this phenomenon. According to Huang *et.al.* (2019), green finance is a recent innovation that offers an alternative financing pathway to individuals, corporations and governments willing to fund and invest in green activities or low carbon activities. Ozili (2021) for instance defines green finance as the financing of projects that yield economic benefits while promoting a sustainable environment. It is also important to mention that green finance is connected to public policies with an eco-friendly element and that the benefits of this kind of financing have multiple effects.

The green finance terminology may vary among different countries and regions due to the fact that policy makers and practitioners

can define green finance in a national context or in a broader global context.

In the EU there are still very few scientific studies or papers connected to the development of green finance, but we can find many policy reports on the EU level or from national authorities. A report from the European commission (EC) from 2017 shows that the common green financing strategies adopted in Europe are green bonds, green lending, and green equity investment.

Recent findings from Umar *et.al.* (2021) have proven that green financing lowers credit risk due to the fact that sustainable business models have less volatility in earnings, which means borrowers have less credit risk and lenders can benefit from lower loan loss provisions and capital requirements. Green finance has other important benefits, such as the promotion of inclusive economic growth, reducing the funding of fossil fuel activities, and lowering short- and long-term carbon emission levels.

Strategies for increasing green financing and investments are connected to the presence of an efficient legal framework for green bond operations and good collaboration between government and the private sector. In this context, the EU is developing its own Sustainable Finance Strategy. For that purpose, the EC has established the High Level Expert Group on Sustainable Finance (HLEG) and the Technical Expert Group (TEG), and their recommendations were the basis of the European Action Plan on Sustainable Finance (European Commission 2018), which has been refined through the Renewed Sustainable Finance Strategy (European Commission 2021a) and the "April package" version was also presented in 2021 (European Commission 2021b). The most important areas that the sustainable finance strategy should cover in the EU, according to the document, are taxonomy regulation, disclosure regulation, green bond standard, low carbon benchmark and FinMarket regulation. On 6 July 2021, the EC published the Strategy for financing the transition to a sustainable economy (European Commission 2021c). It represents a comprehensive package of measures designed to improve the flow of money for financing the transition to a sustainable economy. The aim of this document is to support financing of the transition to a sustainable economy by proposing action in four areas: transition finance, inclusiveness, resilience and contribution of the financial system, and global ambition.

In order to avoid greenwashing, support the investors, and help to channel capital flows to sustainable investments, the EU is establishing the EU taxonomy (classification system) for sustainable activities. Therefore, Regulation (EU) 2020/852, "Taxonomy Regulation" came into force on 12 July 2020 and details were established through Delegated Acts. The Taxonomy Regulation distinguishes six environmental objectives by which economic activities can be classified as sustainable. The first objective is connected with climate change mitigation and covers activities that contribute to a reduction of greenhouse gas emissions in line with the goals of the Paris Agreement. The second objective is connected to climate change adaptation and refers to activities that substantially reduce the adverse impacts of current and expected future climate change on people or nature. The other environmental objectives are connected to the sustainable use and protection of water and marine resources, the transition to a circular economy, the prevention of pollution, and the protection of biodiversity and ecosystems.

According to the taxonomy, regulation only specifies the types of economic activity to be classified as sustainable, such as activities that directly contribute to the defined sustainability goals, so-called "enabling activities", and "transitional activities" that support the transition to a CO₂-neutral economy, as long as "enabling" (technological) alternatives are not available. The Taxonomy Regulation has applied from 1 January 2022 for climate change mitigation and climate change adaptation, and for the other environmental objectives from 1 January 2023 onwards.

Promoters of the growth and development of green finance are banks, institutional investors, public agencies, central banks, financial regulators, international financial institutions and others, such as research institutes or universities. On the EU level, the EIB plays a very important role in financing renewable energy projects and government agencies of the EU Member States are also trying to find policy solutions to enable green projects.

The development of standards for green financial products will support further development of the ESG-oriented financial market segments. One of the examples created to help investors identify products that comply with low-carbon criteria is the European Green Bond Standard (EUGBS). The EUGBS will create a voluntary European high-quality standard available to private and sovereign issuers within

or outside the EU to finance sustainable investments. According to these, standard bonds qualified as “green” have to fulfil the following criteria: the funds raised by the bond have to be fully allocated to sustainable economic activities described by the Taxonomy Regulation. Also, the use of the funds has to be reported annually by the issuer in a European Green Bond Allocation Report. Compliance with the standards has to be monitored by external reviewers that are registered and supervised by the European Securities and Markets Authority (ESMA). Furthermore, a European Green Bond Impact Report on the positive and potentially negative environmental effects of the activities has to be prepared at least once during the maturity of the bond. We can conclude that EUGBS is a first step toward a broader spectrum of green financial products (European Commission 2021d). There are also other incentives for the new green standards and financial products, such as the project to create an EU Ecolabel for Retail Financial Products.

It is important to mention that there are some microeconomic challenges for the further development of green finance, such as the well-known problem of the internalization of environmental externalities and the problem of information asymmetry, but also some specific challenges, such as maturity mismatch between short-term and long-term green investment, or lack of effective coordination between financial and environmental policies connected with the uncertainty about government policies for the transition to a green economy.

3. Green bonds and green loans as instruments to support green transition

To find an appropriate definition to cover all aspects of green bonds is not an easy task. As previously mentioned, green bonds are usually defined according to the GBP, but there is still a dilemma regarding the structure and the reasons for the issue of this type of bond and about green bond pricing factors.

Firstly, we have to make a distinction between environmental bonds, climate bonds and green bonds. Climate bonds and environmental bonds are bonds with an ecological aspect, but climate bonds are used for financing investments related to adapting an economy to climate change, and green bonds and environmental bonds finance

projects aimed at environmental protection in the broadest sense. Therefore, green bonds can be understood more broadly than climate bonds, but sometimes we can find in the literature that they are treated as synonymous. The World Bank (WB), which is one of the main issuers of these bonds, and the Climate Bonds Initiative (CBI), an institution that recommends issuance standards and promotes the development of the green bond market, treat green bonds and climate bonds in a similar way.

Secondly, we have to understand if there is a systematic price difference between conventional bonds and similar green bonds, like for instance the green bond premium. Kapraun et al. (2021) shows that the existence and importance of the green premium varies considerably across currencies and issuer types. According to Antoniuk and Leirvik (2021) the existence and significance of the green premium depends on unexpected political events related to climate change.

The most popular and well-known standard for issuing green bonds is the GBP, voluntary process guidelines, developed by the International Capital Market Association (ICMA). The GBP are constructed to provide transparent green credentials, and also a good investment opportunity. These principles recommend a clear process and disclosure for issuers, which investors, banks and others may use to understand the characteristics of any green bond. The GBP emphasise the required transparency, accuracy and integrity of the information that will be disclosed and reported by issuers to stakeholders through core components and key recommendations. The GBP were updated in June 2021 and then again in June 2022 (Appendix 1).

If we summarize GBP, the four most important components are:

- **Use of proceeds:** GBP are used for green projects. Legal documents for green bonds must state clear environmental objectives, including climate change mitigation, biodiversity conservation and pollution prevention and control. They must also specify if funds will be used for financing or re-financing.
- **Process for project evaluation and selection:** issuers should convey other evaluation criteria they consider when deciding whether to accept proposals, and in the EU all documents should be reviewed by a certified external provider.
- **Management of proceeds:** the issuer must credit and track the proceeds to ensure their correct use. The GBP state that

“the issuer should make known to investors the intended types of temporary placement for the balance of unallocated net proceeds”.

- **Reporting:** the issuer should post regular, up-to-date information about the use of the proceeds and the expected environmental impact of projects.

Besides GBP, there is another group of guidelines developed by the Climate Bond Initiative (CBI, 2022). According to this Initiative, there are detailed conditions for classifying projects as green or climate by sector. In order for an investment project to qualify for green bond financing, it must specifically relate to investments that identify assets and projects needed to ensure low carbon emissions in the areas of:

- Renewable energy (solar, wind, geothermal, hydro, bioenergy);
- Low-carbon buildings (new residential and commercial buildings and building refurbishment);
- Transport (low-carbon transport, public transport, rail transport, alternative fuels);
- Waste and pollution (recycling, closed-loop economy, energy waste, landfills);
- Industry (cement, steel, glass, chemical, fuel production);
- Agriculture, forestry, fisheries;
- Water (collection, monitoring, treatment, distribution, and flood protection).

The CBI has also developed its own climate bond standards along with the system of certification. Following a rigorous scientific criteria certification system ensures that bonds and loans with certification, are consistent with the 2 degrees Celsius warming limit of the Paris Agreement. The scheme is used globally by bond issuers, governments, investors and the financial markets to prioritise investments which genuinely contribute to addressing climate change. With the Climate Bond Standard, bonds can be certified before they are issued, which means that the Climate Bond Certificate label can also be used in marketing activities. Once the bonds have been issued and funds allocated, the certificate must be confirmed through a post-issue report containing an independent assessment of post-issue compliance and submitted to the Climate Bonds Standard Board for approval.

The CBI has also built a Climate Bonds Taxonomy guide to climate aligned assets and projects, which is a tool for issuers, investors,

governments and municipalities to help them understand what the key investments will deliver to a low carbon economy. The Taxonomy from CBI aims to provide common green definitions that can be used across global markets and has been very useful for the development of the EU Taxonomy.

The European Commission, has also, as already mentioned, introduced a uniform green bond standard and the main goal of the regulation created for the EU GBS is to create a standard of high-quality green bonds. The EU GBS is connected with its voluntary application and use for financing projects inside or outside the EU. It is also connected with its application to listed and unlisted instruments by private and public sector issuers. The EU GBS can be issued by governments, local authorities, companies, and financial institutions. In the future, the list of types of green bonds will grow longer. However, it has to be pointed out that besides the mentioned regulations and standards, many jurisdictions have developed their own national taxonomies of what constitutes eligibility as a green bond. Table 1 shows the types and described features of green bonds.

Table 1. Types of Green Bonds.

Types of Green Bonds	Features
Use of Proceeds from Revenue Bonds or ABS	The debt is secured by revenues from single or multiple investment projects financed by a given debt issue.
Project Bond	The bond is secured by one or more projects for which the investor has direct exposure to project risk, with or without recourse to the bond issuer.
Asset-Backed Security ABS	The bond is secured by one or more specific projects, typically providing recourse to the property backing the bond.
Municipal Bond	The bond is issued by a municipality, government, region, or city.
Supranational, sub-sovereign, and agency (SSA) Bond	The bond is issued by the World Bank or European Investment Bank. The bonds have characteristics similar to corporate bonds with recourse to the issuer.
Financial Sector Bond	A type of corporate bond issued by a financial institution to specifically raise capital for finance loans for environmental activities.
Covered Bond	The collateral is used as recourse for the issuer, and if the issuer is unable to repay the debt, the security of the bond is encumbered.

Source: Hada’s-Dyduch et al, 2022, p. 5.

Green bond indices identify specific bonds as green through a stated methodology. They are different from conventional market indices and can provide information to investors about the firm's sustainability performance, they are new and constantly developing stock market indices. The green bond index providers also effectively act as institutions of certification. According to Inderst et al (2012), providers are relatively transparent about the methodologies used to identify green companies for use in their indices.

It has to be pointed out that global green bond indices are compiled by Bank of America Merrill Lynch, Barclays MSCI, Standard & Poor's and Solactive. Each of these institutions has its own methodology for choosing the components of the index, but they are all aligned with the GBP. Also, each index specifies additional factors such as size and liquidity, as well as the specific industry sectors for which the proceeds are used. However, many inclusion criteria for green bond indices are much less concrete than those for conventional bonds and it remains to be seen whether the index providers can monitor such environmental criteria on a continuous basis.

For the green bond market to channel a significant amount of funds into environmentally friendly projects, green bonds should also fulfil the needs of both issuers and investors. According to Bundesbank (2021), green bonds have a volume of EUR 225 million and conventional bonds have an average issuance volume of EUR 300 million. As previously mentioned green bonds have on average longer maturity, with an issuance weighted average of 12 years compared to a conventional bond's average maturity of 10 years.

Looking at the same issuer, the risk characteristics of a green bond are essentially identical to those of a conventional bond, but they are serviced from the cash flows of the entire operations of the issuer and not just the green project. These characteristics have implications for the pricing of green bonds and their attractiveness for investors. Another consideration is the exposure to credit risks related to environmental change. The fact that green bonds support environmentally beneficial projects does not necessarily imply lower exposure to such risks.

One of the hot topics in the loan markets are green and sustainability linked loans, which are a relatively recent innovation, but can be a signal of a fundamental shift in the global economy. At first, there were no recognised market standards to help determine what qualifies as a green or sustainability linked loan, and sometimes risked

loans were presented as green or sustainable. Such operations were described as green washing, and to help prevent them, market standards for green loans were published by recognised industry associations in March 2018, and were followed in March 2019 by sustainability linked loan standards.

The GLP are similar to the GBP in scope and providing a minimum standard for the loan markets. They were developed by the Loan Market Association (LMA), Asia Pacific Loan Market Association (APLMA) and the Loan Syndications and Trading Association (LSTA) with the support of the International Capital Market Association (ICMA) in March 2018. The Sustainable Linked Loan Principles (SLLP) were published a year later in March 2019 by the same institutions (LMA, APLMA, LSTA). It has to be pointed out that both GLP and SLLP are voluntary frameworks, and that they will hopefully mitigate the risks of green washing in the loan markets.

We can conclude that a loan can be called a green loan if it is structured in alignment with the GLP, based on the following four core components:

1. **Use of Proceeds:** Designated Green Projects should provide clear environmental benefits, which will be assessed, measured, and reported by the borrower.
2. **Process for Project Evaluation and Selection:** the borrower of a green loan should clearly communicate how it is organized to assess and select projects that will receive loan proceeds. In addition, the borrower explains how it will manage the environmental and social risk of eligible projects.
3. **Management of Proceeds:** the proceeds of a green loan should be credited to a dedicated account or tracked by the borrower to maintain transparency and promote the integrity of the product.
4. **Reporting:** the principles recommend the use of qualitative performance indicators and, where feasible, quantitative performance measures (for example, energy capacity, electricity generation, greenhouse gas emissions reduced/avoided, etc.)

The GLP provide list of green projects towards which the proceeds of the loan can be applied and additionally require proof that the green project provides clear environmental benefits. It is expected that green borrowers will communicate information to their lenders

regarding details of their wider environmental sustainability objectives and also to provide details of any wider green standards to which they seek to conform.

The GLP also require that the proceeds of a green loan should be credited to a dedicated account, which will ensure transparent use of proceeds for eligible green purposes in order to promote the credibility of green loans. This also reduces the risk that proceeds are applied for other purposes and are not available to fund the relevant green project.

It is required that the borrower of a green loan record the green projects towards which proceeds are applied, together with a description of the project, the amount allocated and the expected impact of the project. Borrowers should renew that information annually and report it to their lenders. Also, the GLP have a recommendation regarding third-party oversight, and acknowledge that borrowers can seek guidance and input on their green loan processes in a variety of ways, like for instance taking advice from external environmental consultants on their activities and arranging certification against external green assessment standards.

Table 2. The Key features of the GLP.

Green loans	
Aim	To facilitate and support environmentally sustainable economic activity.
Definition	Loan instruments made available exclusively to finance or refinance new or existing "green projects".
Restrictions on purpose	The fundamental feature is the utilisation of the loan for "green projects". The GLP set out a non-exhaustive list of 10 categories of green projects, including renewable energy, energy efficiency and pollution prevention and control. Loan proceeds should be credited to a dedicated account or otherwise tracked.
Impact of pricing of borrower performance	No pricing impact is contemplated in the GLP. There are facilities which have been split into tranches for green purposes and for other purposes where the green tranche attracts lower pricing.
Review	Borrowers should maintain records of the use of green loan proceeds, including a list of the green projects to which the proceeds have been allocated together with a description of the project, amount allocated and the expected impact. External review is recommended but not required.

Source: The Green Loan Principles, 2019.

4. Green bonds and green loans in supporting sustainability projects

Green bonds are a key tool for governments to raise capital to implement infrastructure plans in line with national climate targets and the Paris Climate Agreement. A sovereign green bond issuance helps bring down the cost of capital for green projects by attracting new investors and mobilising private capital towards sustainable development.

The Polish government amended the Polish Public Finance Act on 27 August 2009 to support its Green Bond Framework by including the transparency and traceability of proceeds. The first sovereign green bond in the Americas was issued by Chile in 2019 and was of the value of USD1.42bn. France is the largest sovereign issuer to date, which is tied with France's ambitious climate goals. Fiji was the first emerging market issuer, which was linked to its hosting the UN Climate Summit in 2017. Ireland was the country with the third largest single sovereign bond issuance in the year 2018. In 2018 Seychelles issued the world's first blue sovereign bond and the proceeds are expected to support eligible activities related to sustainable fisheries and marine projects. In 2020 Luxembourg issued its debut sovereign bond, which was the first government Sustainability Bond.

Sub-sovereign entities at the state and city level have also issued green bonds. Some states, like for instance California, have gone as far as developing green bond strategies, while others have raised awareness by issuing green bonds to raise funds for local green infrastructure. Sub-sovereigns in Australia, Canada and the US have issued green bonds financing renewable energy, energy efficiency, low-carbon public transport, and sustainable land use.

Besides corporates, supranational organizations, municipalities and national governments, financial institutions can also be issuers of green bonds. Commercial banks, investment banks, and development banks can all issue green bonds to diversify their offering and signal their commitment to sustainable development.

Commercial banks were the most active of all financial institutions in terms of green bond issuance. Property banks and real estate investment trusts (REITs) were also very much involved. According to the CBI ASEAN Green Finance State of the Market 2019 Report, 118

financial corporates became the largest issuer type in 2018 in the ASEAN region.

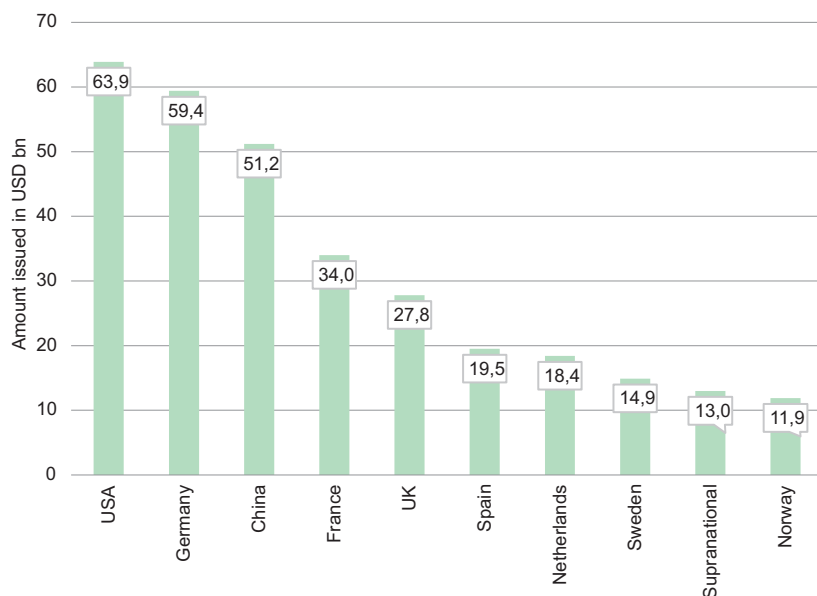


Figure 2. Green Bond supply – Geographic overview.

Source: UniCredit Research, The Green Bond and ESG Chartbook, 2022.

According to the Figure 2, Germany, the US and China are the most important players regarding the green bond supply.

A lot of multilateral banks, but also national development banks, as well as green investment banks and general commercial banks, provide green loans or credit lines for clients. Eligibility for green loans is usually tied to the compliance with technical eligibility criteria. Such eligibility criteria can be accompanied by taxonomies listing technologies or products that can be considered as green without further in-depth assessment.

Examples of using green loans in supporting sustainability projects are numerous, but the most important ones are:

- Agence Française de Développement's provision of green financing programmes in various countries. Green credit lines under the label named "SUNREF" are aimed at local banks, which lend the money to eligible companies and projects.

Eligible activities are related to energy management and environmental performance, recycling and sanitation for local authorities, high environmental quality housing, conversion to sustainable/organic farming; sustainable forestry exploitation. These activities can be conducted in areas of industry, services, individuals and professionals, agriculture and can be further refined together with local partner banks according to their expertise and portfolios.

- The UK Green Investment Bank, which is a part of the Green Investment Group, has focused on offshore wind, energy solutions, waste and bioenergy and onshore renewables in the UK. The definition of a project eligible for financing is that it must “make a positive contribution to a recognised green purpose”. Therefore, projects eligible for financing involve the reduction of greenhouse gas emissions, the advancement of efficiency in the use of natural resources, the protection or enhancement of the natural environment, the protection or enhancement of biodiversity, and the promotion of environmental sustainability.
- The Inter-American Development Bank (IDB) provides loans and guarantees, called Green Lines. These loans are used to support Financial Intermediaries to promote environmental initiatives connected to renewable energy or energy efficiency, cleaner production, sustainable buildings, sustainable transport, sustainable agriculture, sustainable tourism, sustainable forestry industry, and biomass.
- In the ASEAN market, green loans are also an important source for supporting sustainable projects. One of the examples is the loan which in January 2020 VP Bank of Vietnam received from the International Finance Corporation (IFC). The proceeds will be used for the energy and building sectors. This loan will help to expand the bank’s lending to small and medium enterprises (SMEs) and represents a great example of how to channel institutional investment into emerging markets.

Due to the fact that climate change risks are recognized and better understood, investors’ demand for green bonds has increased. Therefore, green financing will surely be very important source of financing in the future.

5. Discussion questions and tasks for students

1. Investigate the GBP and compare it to the GLP.
2. Write a summary of multiple definitions of GB and GL.
3. Explain the types of green bonds and describe their features.
4. Investigate the impact of borrower performance pricing regarding GL.
5. Investigate the role of corporates, supranational organizations, municipalities and national governments, and financial institutions, as issuers of green bonds.
7. Find examples of green loan usage in financing sustainable projects in practice.

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