MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
STATE HIGHER EDUCATIONAL INSTITUTION "KYIV NATIONAL ECONOMIC UNIVERSITY NAMED AFTER VADYM HETMAN"

Faculty of International Economics and Management

Department of International Economics

EDUCATIONAL-PROFESSIONAL PROGRAM	**"INTERNATIONAL ECONOMICS"**
FIELD OF KNOWLEDGE	**05 Social and Behavioral Sciences**
SPECIALTY	**051 "Economics"**

Form of study: full-time

QUALIFYING BACHELORS THESIS

on the topic "The European model of sustainable development: experience for Ukraine"

Applicant Kubrakova Anastasiia
Scientific adviser: Doctor of Economics, prof. Galenko O. M.

(signature)

The thesis is admitted to defense before the examination commission for the certification of higher education applicants

Head of the Department: Doctor of Economics, Professor Stoliarchuk Y.M.

(signature)

Kyiv 2024

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BACHELOR DEGREE PROGRAM	**«INTERNATIONAL ECONOMICS»**
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AGREED

Head of the project group (guarantor) of the educational-professional program

_____

_____ 2023

APPROVED

Head of the Department

_____Y. Stoliarchuk

_____ 2023

INDIVIDUAL TASK
higher education applicant: Kubrakova Anastasiia

full-time forms of education

Bachelor Thesis
Title: "European Models of Sustainable Development: Experience for Ukraine»

The title of the Bachelor's thesis has been approved by the Rector's Order «07» 12. 2023 №535

Bachelor Thesis is based on materials from international organizations (IMF, WTO, OECD, Eurostat, UNCTAD), data from rating agencies and research institutes and funds (WEF, Bloomberg Agency, Bertelsmann Foundation), scientific works of leading domestic and foreign scientists, official websites -pages of global multinational corporations..

Deadline for submitting the final version of Bachelor's Thesis to the Academic Supervisor (*Deadline -*

Plan of Bachelor Thesis and the terms of it submission to the Academic Supervisor

Chapter 1 CHAPTER 1. THEORETICAL AND METHODOLOGICAL FOUNDATIONS OF SUSTAINABLE DEVELOPMENT OF THE WORLD ECONOMY

Chapter 2 ANALYSIS OF THE IMPLEMENTATION OF EUROPEAN SUSTAINABLE DEVELOPMENT MODELS AT THE MICRO AND MACRO LEVELS

Object of research:	The object of the Bachelor thesis are processes of sustainable development of the world economy.
Subject of research:	The subject of the Bachelor thesis are conditions, factors and mechanisms of functioning of the European model.
The purpose of the Thesis:	The purpose of the study is to substantiate the paradigm of sustainable development through its economic, social, and environmental components in the context of European integration shifts. By analyzing these various European models of sustainable development, I aim to provide valuable insights and recommendations for Ukrainian enterprises and policymakers.

Specific tasks applicant has to accomplish to meet the objective:

In Chapter 1:

• Define the concepts of "sustainable development" and "model of sustainable development."

• Review the experience of European Union countries in implementing sustainable development and identify key features and principles of each model.

• To review various methodologies used to evaluate the success of sustainable development initiatives in the EU.

In Chapter 2:

• Evaluate the positive and negative impact of the application of European sustainability models on economic and social development.

• Analyze OMV projects and initiatives in the field of sustainable development and provide recommendations for Ukrainian enterprises based on this experience.

• To explore the potential for Ukrainian enterprises to adopt and benefit from European sustainable development practices.

• To propose strategic initiatives for promoting sustainable economic development in Ukraine.

The task has been set

by the Academic Supervisor _____ _____

"___" 01. 2023

The task has been given to

Applicant _____ _____ "___" 01. 20

ABSTRACT

Bachelor`s Thesis for a bachelor`s degree on contains 58 pages. The thesis includes 8 tables, 13 figures, and 3 annexes. The list of used sources contains 45 entries on 7 pages.

"European Models of Sustainable Development: Experience for Ukraine"

The object of the Bachelor thesis are processes of sustainable development of the world economy.

The subject of the Bachelor thesis are conditions, factors and mechanisms of functioning of the European model.

The purpose of the study is to substantiate the paradigm of sustainable development through its economic, social, and environmental components in the context of European integration shifts. By analyzing these various European models of sustainable development, I aim to provide valuable insights and recommendations for Ukrainian enterprises and policymakers.

In accordance with the set goal, the following tasks were defined:

- Define the concepts of "sustainable development" and "model of sustainable development.»
- Review the experience of European Union countries in implementing sustainable development and identify key features and principles of each model.
- To review various methodologies used to evaluate the success of sustainable development initiatives in the EU.
- Evaluate the positive and negative impact of the application of European sustainability models on economic and social development.

• Analyze OMV projects and initiatives in the field of sustainable development and provide recommendations for Ukrainian enterprises based on this experience.

• To explore the potential for Ukrainian enterprises to adopt and benefit from European sustainable development practices.

• To propose strategic initiatives for promoting sustainable economic development in Ukraine.

Practical significance of the obtained results.

The year of completion of the qualifying bachelor thesis is 2024.

The year of job protection is 2024.

Keywords: Model of Sustainable Development, European Union, Sustainability, Economic Development, European Integration, Corporate Sustainability.

REVIEW

of the qualification Bachelor's thesis

of the student of the Faculty of International Economics and Management educational program "International economics"

Kubrakova Anastasiia

Title **"European models of sustainable development: experience for Ukraine"**

1. Relevance of the topic: In today's world, where the global market environment is constantly changing, enterprises have to constantly adapt to new economic, political, legal and social conditions, as well as to rapid scientific and technological progress. This requires improvement of all aspects of their activity. Sustainable development is becoming a decisive factor that gives enterprises a competitive advantage in the long term in the context of European integration, so this research is relevant.

2. Positive features of the qualifying bachelor's thesis: Comprehensive analysis based on scientific sources and factual material of the scale of European models of sustainable development in the context of European integration.

3. The presence of independent developments of the author: The study describes the factors contributing to the efficiency of the sustainable development of enterprises. The priority areas are also substantiated, and recommendations are offered for improving the sustainable development process of the energy sector of Ukraine in the context of European integration.

4. The value of theoretical conclusions and practical recommendations: The theoretical conclusions and recommendations contained in the bachelor's thesis can be valuable for domestic corporations in the practical sphere of their activities aimed at improving their own sustainable development strategies.

5. The presence of shortcomings: There are flaws in the stylistic presentation of this thesis. It would be desirable if the author paid more attention to the study of the features of sustainable development models of European countries in the context of European integration.

6. General assessment of the bachelor's thesis and its admission to the defence examination board: In general, the qualifying Bachelor's thesis meets all the requirements, is performed at a high theoretical level, is complete and independent, and testifies to the author's ability to research complex scientific issues. The work is recommended for defence before the Attestation Examination Commission with a score of 48 points.

Academic Supervisor: Doctor of Economics, Professor of the Department of International Economics ___ Galenko O.M

_____

"_____"_____ 2024

CONTENT

INTRODUCTION

Relevance of the topic The Russia's full-scale invasion have significantly impacted the Ukrainian business landscape, presenting serious operational challenges. Despite these hurdles, Ukrainian businesses have shown resilience by maintaining their commitment to sustainable development. However, the ongoing conflict poses a threat to Ukraine's potential for autonomous economic growth. The national debt is rising sharply, and critical infrastructure, including production facilities and the energy sector, are being devastated. This crisis highlights the urgent need for Ukraine to adopt and adapt effective sustainable development models, particularly from European experiences, to rebuild and enhance its economic sectors. Focusing on sustainable development in the energy sector, for instance, could help mitigate some of the current vulnerabilities and contribute to long-term economic stability, social welfare, and environmental protection. This research should aim to provide a strategic framework that integrates comprehensive sustainable development approaches to stabilize and grow Ukraine's economy while ensuring the preservation of its natural environment.

Analysis of the recent publications the analysis of existing scientific publications, both domestic and foreign, reveals widespread research on achieving sustainable development goals at global, national, and individual company levels, the latter being economic entities that directly contribute to these goals. Discussions on defining the essence of sustainable development and the factors determining the effectiveness of its achievement have been conducted by several foreign researchers, such as H. Daly [5], G. H. Brundtland [11], as well as Ukrainian scholars actively investigating the sustainable development of enterprises, both as a whole and in its individual components, including V. Komandrovska[14], M. Kowalska [2], P. Kubinski [3]

Purpose and objectives of the study. The purpose of the study is to substantiate the paradigm of sustainable development through its economic, social, and environmental components in the context of European integration shifts. By analyzing these various European models of sustainable development, I aim to provide valuable insights and recommendations for Ukrainian enterprises and policymakers. The study seeks to

contribute to Ukraine's sustainable development efforts by leveraging the experiences and best practices from European countries.

In accordance with the set goal, the following tasks were defined:

• Define the concepts of "sustainable development" and "model of sustainable development.»

• Review the experience of European Union countries in implementing sustainable development and identify key features and principles of each model.

• To review various methodologies used to evaluate the success of sustainable development initiatives in the EU.

• Evaluate the positive and negative impact of the application of European sustainability models on economic and social development.

• Analyze OMV projects and initiatives in the field of sustainable development and provide recommendations for Ukrainian enterprises based on this experience.

• To explore the potential for Ukrainian enterprises to adopt and benefit from European sustainable development practices.

• To propose strategic initiatives for promoting sustainable economic development in Ukraine.

Object of study.

The object of the Bachelor thesis are processes of sustainable development of the world economy.

The subject of the study.

The subject of the Bachelor thesis are conditions, factors and mechanisms of functioning of the European model of sustainable development.

Research Methods. The methodological foundation of the study is a systemic and comprehensive approach to elucidating the concept of sustainable development. The methods employed in this work include synthesis, analysis, generalization, comparison, historical, and monographic methods.

Theoretical and practical significance of the results obtained.

The theoretical significance lies in the in-depth analysis of scientific and practical tasks related to the chosen topic, and the systematization of theoretical approaches to the

essence of sustainable development. The practical significance of the research lies in identifying the prospects and mechanisms of sustainable development by taking into account an experience from EU countries development in Ukraine. The research findings were presented at the student scientific and practical online conference.

Information base.

consists of Ukrainian and foreign studies devoted to issues of sustainable development and European models of sustainable development, international resolutions, reports, regulations, laws of Ukraine, normative acts regarding the achievement of the SDGs, implementation of the principles of green and circular economy.

Structure of the work.

The defined objectives and tasks of the research determined the structure of the thesis, which consists of an introduction, two chapters, conclusions, a list of used sources, and appendices. The main content of the thesis is presented on 52 pages. The thesis includes 9 tables, 13 figures, and 3 annexes. The list of used sources contains 45 entries on 7 pages.

CHAPTER 1. THEORETICAL AND METHODOLOGICAL FOUNDATIONS OF SUSTAINABLE DEVELOPMENT OF THE WORLD ECONOMY

1. Theoretical concepts of the modern model of sustainable development of the world society.

The origins of sustainable development can be traced back to the early environmental movements of the 19th and 20th centuries. During this time, concerns about the negative impacts of industrialization and urbanization on the environment began to emerge. American environmentalists such as John Muir and Rachel Carson played a pivotal role in raising awareness about the need to protect natural resources and preserve biodiversity. Their work highlighted the interconnectedness between human activities and the environment, laying the foundation for the concept of sustainable development. These early environmental movements emphasized the importance of balancing economic development with environmental conservation, setting the stage for future discussions on sustainability [15, p. 8]

Since the 1980s the concept of sustainable development has been a pivotal topic of discussion, emphasizing the necessity for societal progress in a manner that equitably addresses present and future human needs without depleting the resources future generations depend on. First broadly popularized in the Brundtland Report "Our Common Future", sustainable development has since become a central theme in policy making, academic research, and practical implementation in diverse sectors including business. This concept was first published by the United Nations in 1987 [7].

WCED's report "Our common future" formulated a definition of sustainable development, which states that: «Sustainable development is framed around the principle of meeting the needs of the present without compromising the ability of future generations to meet their own needs.» [10, p. 553] This principle has evolved to influence not only environmental policies but also the operational strategies of businesses worldwide.

The official definition of the term "sustainable development" was received in 1992 after the conference in Rio de Janeiro during the adoption of the "Agenda for the 21st century" and was interpreted as "development that meets the needs of the present generation without jeopardizing the ability of future generations to satisfy their own needs" [6]. It is the basis of the following interpretations of this definition.

There are also many alternative definitions of sustainable development. (Table 1.1)

Table 1.1 – Interpretation of the category "sustainable development" in the scientific community

The authors	**Interpretation of "sustainable development"**
G. Daly	Sustainable development is harmonious, conflict-free, balanced progress of the entire civilization, groups of countries (regions, subregions), as well as of individual states of the planet according to a scientifically based plan, according to which in the course of unceasing innovation and investment economic development of states, at the same time, issues are resolved positively and comprehensively preservation of the environment, elimination of poverty, exploitation and discrimination as an individual person, as well as whole peoples or population groups (for example, for sexual, ethnic or racial characteristics).
B. G. Danylyshyn, L. B. Shostak	Sustainable development is a system of social production that succeeds to achieve an optimal relationship between economic development, normalization of the qualitative state of the natural environment, growth material and spiritual needs of society.

Z. V. Gerasimchuk	Sustainable development is a process of ensuring functioning territorial system with defined parameters under certain conditions over the required period of time, leading to harmonization factors of production and improvement of the quality of life of the present and future one's generations under the condition of preservation and gradual restoration of integrity environment.
Slovnyk Makmillana	Sustainable development is the development of a country or region in which society consumes no more natural resources than those that can be regenerated, and that itself does not harm the environment
S. M. Sudomyr	Sustainable development provides modern material and spiritual needs and creates conditions for sustainable economic development in the future, considering future value benchmarks thanks to harmonization mechanisms of man with nature and society.
E. M. Borshchuk	Sustainable development is bio harmonious or sustainable development of society, which is acceptable for preserving the ecological niche of man.

Source: systematized by the author based on [28; 29, 30,31,32]

Polish professor Rosiek Janusz in his article claims that all definitions of sustainable development emphasize economic aspects and intergenerational equity, ensuring that current resource usage does not compromise the ability of future generations to meet their needs. While some definitions also highlight the importance of social welfare, economic stability, and citizens' quality of life, not all incorporate ecological and social dimensions. [10, p.553]

Sustainable development is often described using a three-pillar model: economic, social, and environmental. These interconnected pillars create a comprehensive structure to address the complex issues and possibilities associated with sustainability. (Fig.1.1).

Focusing on the economic dimension, sustainable development aims to foster economic expansion and prosperity while promoting efficient and fair resource use. This aspect highlights the creation of jobs, generation of income, and improvement of living standards, particularly for underprivileged and vulnerable populations. Simultaneously, it emphasizes the critical need to decouple economic growth from environmental harm and the overuse of natural resources.

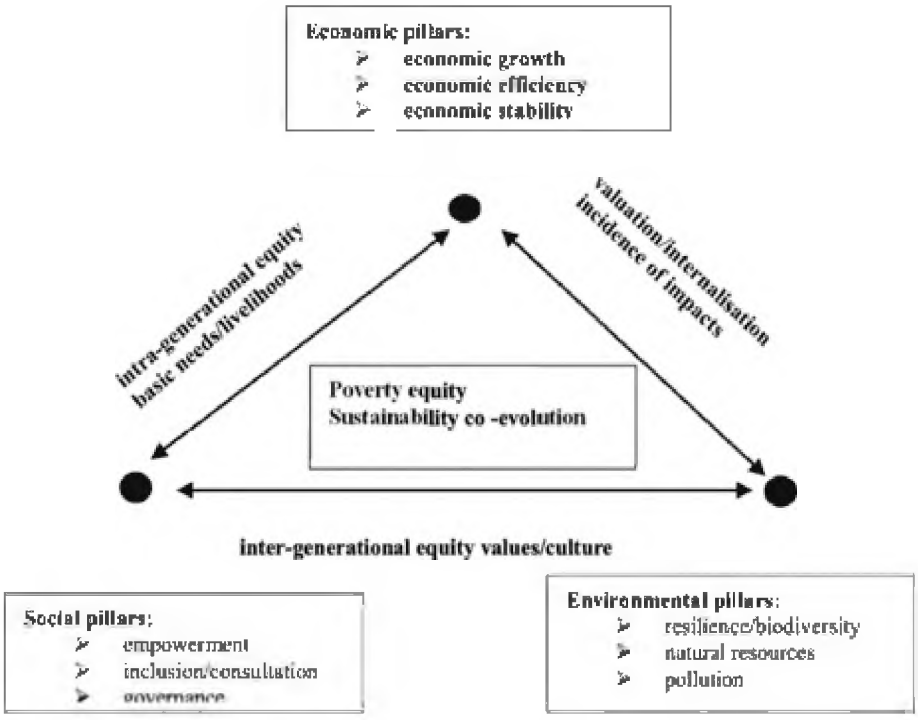


Figure 1.1- The "Sustainomics" Triangle.

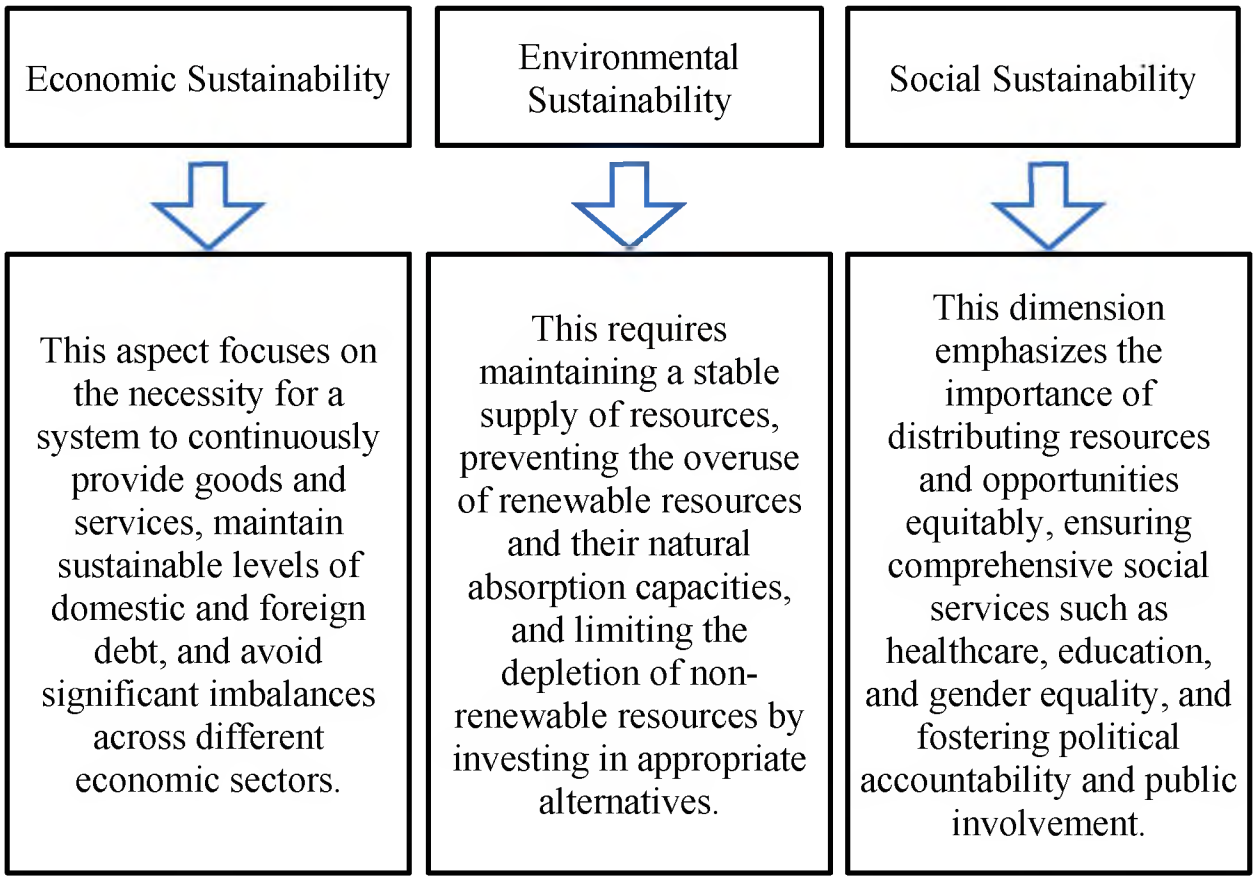
Source: *systematized by the author based on* [10, p. 555]

Irish scientist Kevin Murphy notes while the concept of sustainable development generally refers to the achieving a balance among the environmental, economic, and social pillars of sustainable development, the meaning of the social pillar remain vague. [16]

There is an increasing awareness of three key elements integral to the concept of sustainable development. (Table 1.2)

The concept of sustainability is increasingly gaining traction in the business community. Companies recognize that long-term success requires more than just economic efficiency.

Table 1.2 – Key elements of sustainable development.



Source: *systematized by the author based on* [35, p. 1]

There are various interpretations of "sustainable enterprise development." (Fig 1.2) However, several key aspects can be highlighted. First, it involves aligning and balancing economic, social, and environmental goals and outcomes. Second, it prioritizes long-term over short-term interests, with decisions made considering their impact on future generations. Third, it encompasses a continuous process of improvement, seeking opportunities for enhancing sustainability through innovation, better management practices, and building partnerships with stakeholders.

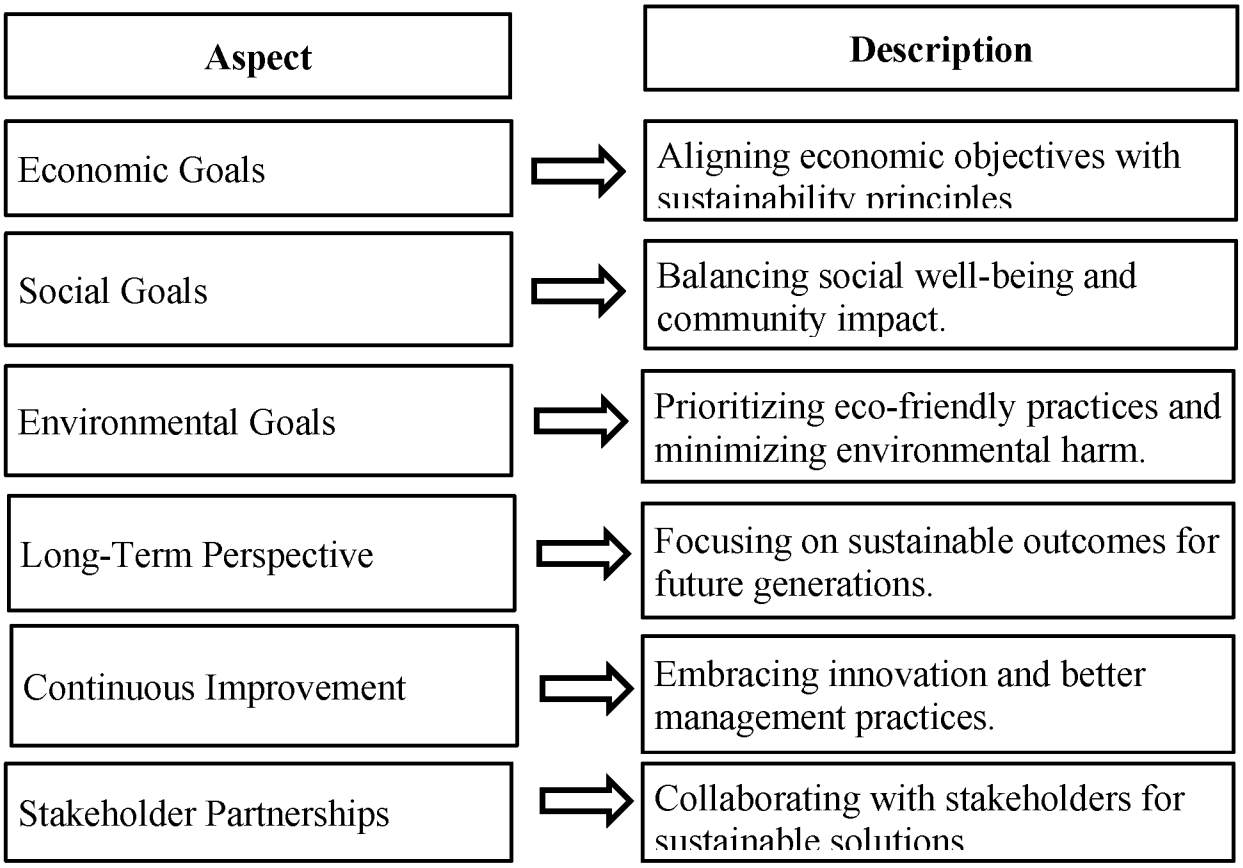


Figure 1.2- Key Aspects of Sustainable Enterprise Development.

Source: *systematized by the author based on* [14, p. 2]

Therefore, Ukrainian aassociate professor Komandrovska Veronika argues that the sustainable development of the enterprise covers all aspects of its activity and is oriented towards the long-term prosperity of business in harmony with public interests and the environment. [14]

In the business context, sustainable development takes on a specific angle, commonly referred to as sustainability in business. This approach necessitates that businesses operate in a manner that reduces negative environmental impacts. However, it's not solely about environmental considerations but also involves social and governance aspects, collectively evaluated under Environmental, Social, and Governance (ESG) metrics. This approach ensures that the business operations are sustainable not just in

terms of resource use but also in creating equitable opportunities and maintaining transparent, ethical governance practices. (Figure 1.3)

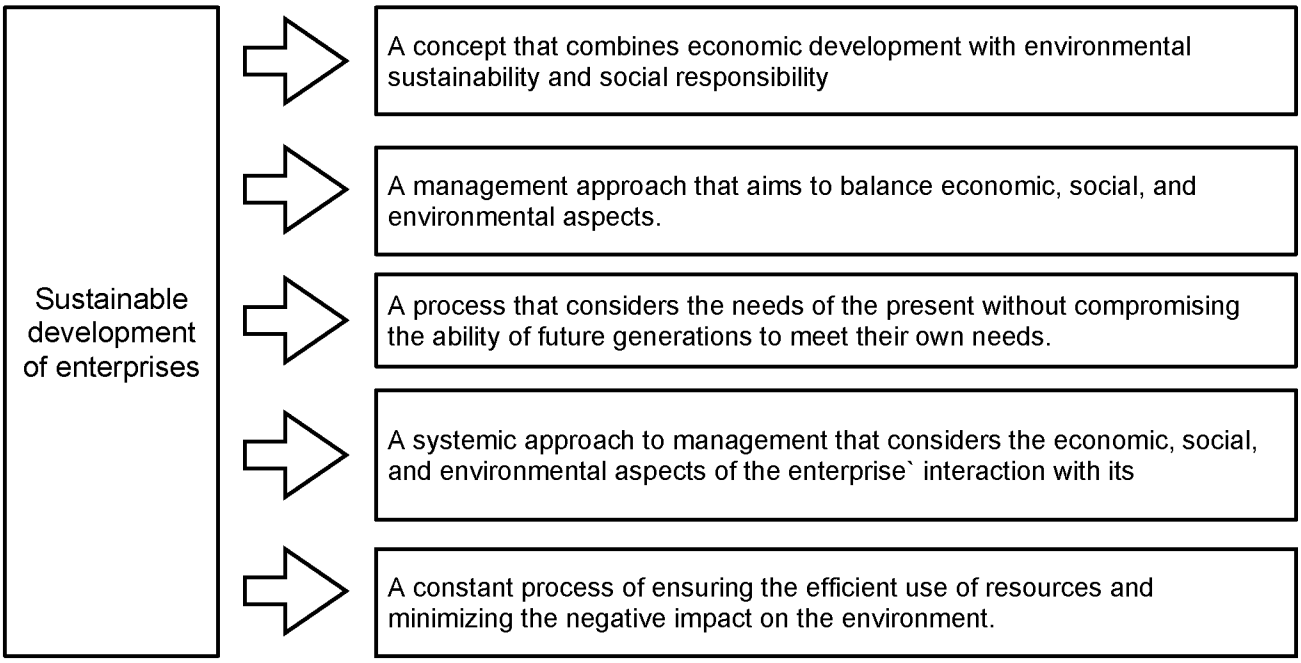


Figure 1.3 - Sustainable development of enterprises.

Source: illustrated by the author

Here (Table 1.3) are key aspects and practices associated with the sustainable development of enterprises.

Business sustainability is a complex, multifaceted phenomenon, integrating several often contradictory and conflicting aspects. There are different approaches to business sustainability in the literature and management practice. For example, Norwegian professor Øyvind Ihlen recognizes the creation of long-term shareholder value as the essence of Business sustainability, where social and environmental concerns are important in the context of the opportunities and risks, benefits and costs, that are crucial for building this value. Business sustainability refers here to the survival and development of the organization as a system. [3, p. 3]

The concept of sustainable development has gained widespread acceptance and is often discussed by scholars, multinational companies, advocacy groups, government entities, and international organizations. In September 2015, the United Nations' 2030 Agenda for Sustainable Development was adopted, marking a significant milestone. This agenda introduced 17 Sustainable Development Goals (SDGs) that highlight

sustainability as a comprehensive framework influencing a variety of initiatives worldwide, including economic, social, environmental, and governance dimensions.

Table 1.3 - Key aspects of sustainable development of enterprises.

Transparency and Accountability	Offer transparent and comprehensive reporting on environmental, social, and governance (ESG) performance, and establish systems to ensure accountability for sustainable practices and continual enhancement.
Social Responsibility	Guaranteeing fair wages, safe working conditions, and respect for workers' rights; encouraging workforce diversity and nurturing an inclusive workplace culture; engaging with local communities to understand their needs and contribute positively to their development; and upholding human rights principles throughout the supply chain.
Environmental sustainability	Promoting efficient resource use, waste reduction, and sustainable material sourcing; implementing energy-saving practices and adopting renewable energy sources; developing strategies to minimize greenhouse gas emissions and support climate change mitigation; and embracing circular economy principles, including recycling, reuse, and reduction.
Economic viability	Adopting a forward-looking perspective in business decisions rather than solely prioritizing short-term profits; embracing innovation to enhance efficiency, develop new products, and adjust to evolving market dynamics; adhering to robust financial practices to bolster the company's resilience against economic uncertainties.

Regulatory Compliance and Standards	Ensuring adherence to environmental and social regulations across all operational domains; Upholding and, when feasible, shaping industry standards that advance sustainability principles.
Stakeholder Engagement	Engaging in collaborative efforts with diverse stakeholders, such as customers, suppliers, investors, and local communities; Actively soliciting and incorporating stakeholder input into decision-making processes.
Green Innovation and Technology	Developing and advocating for eco-friendly products and services; Integrating technologies that support sustainability objectives.

Source: systematized by the author based on [37, p. 275]

The Sustainable Development Goals (SDGs) are a set of 17 interconnected global objectives aimed at creating a better and more sustainable future for everyone. Established by the United Nations General Assembly in 2015, these goals are to be accomplished by 2030 as part of the 2030 Agenda for Sustainable Development. The SDGs address a wide range of issues across social, economic, and environmental dimensions, including poverty, inequality, climate change, environmental degradation, and the promotion of peace and justice.

The term "model of sustainable development" refers to a framework or approach that seeks to balance environmental, social, and economic considerations in order to meet the needs of the present without compromising the ability of future generations to meet their own needs. This concept is central to addressing ongoing global challenges such as climate change, resource depletion, and social inequality.

Models of sustainable development can vary widely in their specific applications and priorities, depending on local contexts, resources, and goals. Examples include sustainable urban planning, green energy initiatives, sustainable agriculture, and corporate sustainability practices. These models are often integrated into governmental

policies, corporate strategies, and community planning to ensure long-term sustainability and quality of life.

2. Determinants of the formation of European models of sustainable development.

The formation of European models of sustainable development is influenced by a diverse range of factors. The expansion of industrial production and economic activities leads to increased consumption of natural resources, placing significant anthropogenic pressure on the environment and disturbing the natural equilibrium. This, in turn, exacerbates socioeconomic issues. As non-renewable resource stocks are depleted, environmental pollution intensifies, particularly affecting water resources and atmospheric air. Additionally, there is a decrease in forest areas and arable lands, and some plant and animal species are becoming extinct. These factors ultimately undermine the natural resource potential crucial for societal production and have a detrimental impact on human health.

As a result, Earth overshoot day - which marks the day that humanity's demand for ecological resources exceeds the resources Earth can regenerate within that year - is arriving earlier each decade. [17]

The determinants of sustainable development in Europe are influenced by both internal factors specific to the region and external global trends. The primary aim of sustainable development in Europe is to achieve a balance between environmental protection, economic growth, and social equity, in alignment with the United Nations Sustainable Development Goals (SDGs).

Socioeconomic development should adhere to principles that acknowledge and respect the limits of natural systems to handle human-induced stresses. This respect is essential to preserve the normal functions of the biosphere and local ecosystems, which is crucial for sustaining their productivity, enhancing living conditions, and supporting both the ecological and economic health of communities in any region.

The degradation and depletion of environmental resources primarily result from ecologically unsustainable practices in resource utilization, a lack of holistic approaches in economic activities, and poor management and exploitation of land and mineral resources. Economic activities often compromise the genetic integrity of landscapes. Such disturbances include an ecological imbalance caused by improper structuring of agricultural lands, ignoring the ecological capacity and erosion resistance during land use, excessive plowing, and irrational forest management practices that overlook the forests' ecological roles.

Consumer demand for sustainable products has increased, pushing companies towards greener solutions. Over the past five years, there has been a 71% rise in online searches for sustainable goods globally, according to The Economist Intelligence Unit.[34] Increasingly, European businesses adopt sustainability as a core part of their strategy, not only to comply with regulations but also to enhance competitiveness.

Public awareness and activism concerning environmental issues play a crucial role in shaping sustainable development across Europe. This heightened consciousness among European citizens not only influences personal behaviors and consumer choices but also exerts significant pressure on policymakers and businesses to prioritize and implement sustainable practices. Researchers have noted that grassroots movements and public campaigns often precede major policy shifts, suggesting a strong link between public advocacy and governmental action on environmental issues.

For instance, widespread public protests and advocacy have been pivotal in driving the adoption of more stringent regulations on plastic use and emissions standards across various European countries. Similarly, consumer demand for sustainable products has led companies to adopt greener supply chains and reduce their carbon footprints, a trend that is increasingly observed across sectors from manufacturing to retail. One of the sectors of the economy that has the greatest impact

on environmental pollution is the energy industry. Therefore, this work will discuss the development of sustainable concepts with an emphasis on the energy industry. (Fig 1.4)

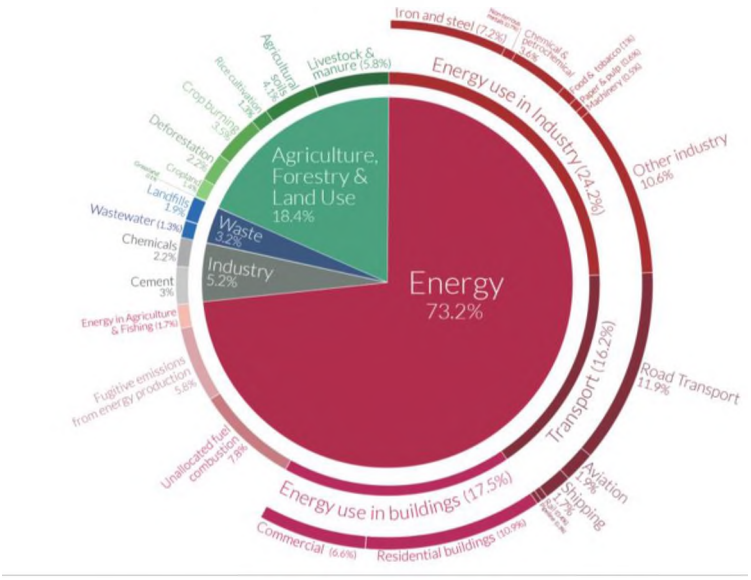


Fig 1.4 - Global Greenhouse emissions by sector of the economy [18]

The energy sector faces a significant and distinctive challenge outlined in the 2030 Sustainable Development Agenda: how to enhance access to clean energy to drive sustainable economic growth for a burgeoning population, while simultaneously reducing emissions from global energy sources. Broadening access to clean energy will be pivotal in advancing nearly all Sustainable Development Goals, encompassing aspects such as agricultural productivity, healthcare outcomes, educational attainment, water management, infrastructure accessibility, and inequality reduction. Nonetheless, certain practices within the energy sector, coupled with persistent dependence on fossil fuels with high greenhouse gas emissions, hinder global endeavors to combat climate change, uphold robust ecosystems and populations, and can escalate global conflicts and disparities. [33, p. 3]

Numerous economic analyses have focused on sustainable development, yet there has been no endeavor to pinpoint the primary mechanism of interdependence between sustainable energy development and sustainable economic growth in the second decade of the 21st century. The role of energy in achieving the Sustainable Development Goals is due to the fact that the production, supply and use of energy underpin economic growth. [36, p.1]

Europe's advancement in sustainable development is heavily shaped by strong policy frameworks across various levels of governance. The European Council's adoption of the first EU Sustainable Development Strategy (SDS) in Göteborg in 2001 marked a significant milestone. This strategy was further enhanced in 2002 by the European Council in Barcelona, incorporating an external dimension in preparation for the World Summit on Sustainable Development held in Johannesburg that same year. [10, p. 562]

Considering the review of the EU Sustainable Development Strategy initiated by the European Commission in 2004 and drawing upon the insights from the Commission Communication titled "On the review of the Sustainable Development Strategy – A platform for action", the European Council has adopted a revised and detailed SDS for the EU, building on the framework set in 2001.

The primary goal of this updated EU SDS is to pinpoint and foster activities that will allow the EU to continually enhance the quality of life for both present and future generations. This is envisioned through the establishment of sustainable communities capable of using resources effectively and harnessing the ecological and social innovation capabilities of the economy. This approach aims to ensure sustained prosperity, environmental preservation, and social cohesion.

In its pursuit to refine the sustainable development agenda, the European Commission sought to extract key principles aligned with the Brundtland definition of sustainable development, around which broad agreement could be secured. These principles, as outlined in the Commission Communication of 2005, form the basis for a practical strategy that emphasizes:

- Enhancing the quality of life,
- Adopting a responsible approach to resource management,
- Ensuring coherence in policy formulation,
- Additionally, the strategy pinpointed specific priority areas needing urgent action, which include two socially critical issues (ageing and poverty eradication) and four environmental concerns (climate change, environment and health, transport and land use, and nature and biodiversity).

Following on from this, the Seventh European Environment Action Programme, detailed by the EC in 2012 for the period 2014-2020, articulates environmental targets and delineates necessary actions to achieve these (EU, 2013). This Programme stresses several key objectives:

(a) Protecting, conserving, and enhancing the EU's natural capital,

(b) Transitioning the EU towards a resource-efficient, competitive green, and low-carbon economy,

(c) Shielding citizens from environmental pressures and health risks,

(d) Maximizing the benefits from EU environment legislation through better implementation,

(e) Strengthening the knowledge base for EU environmental policy,

(f) Securing funding for environmental and climate initiatives and addressing environmental externalities,

(g) Enhancing policy integration and coherence in environmental matters,

(h) Promoting sustainable urban development,

(i) Boosting the EU's global role in addressing environmental and climate challenges. [10, p. 563]

The parallel Programme for the Environment and Climate Action covering the period from 1 January 2014 to 31 December 2020 (the "LIFE Programme") has the following general objectives (Fig. 1.5)

All these strategic documents and programs detail foundational principles and governance challenges necessary to advance sustainable development strategies effectively.

Restoring ecosystem resilience and enhancing human well-being typically demand much more time than the achievements seen in reducing environmental pressures or improving resource efficiency. While the latter can often be realized within a span of two decades or less, the former generally requires several decades of consistent effort. These varying time scales present a significant challenge for policymakers.

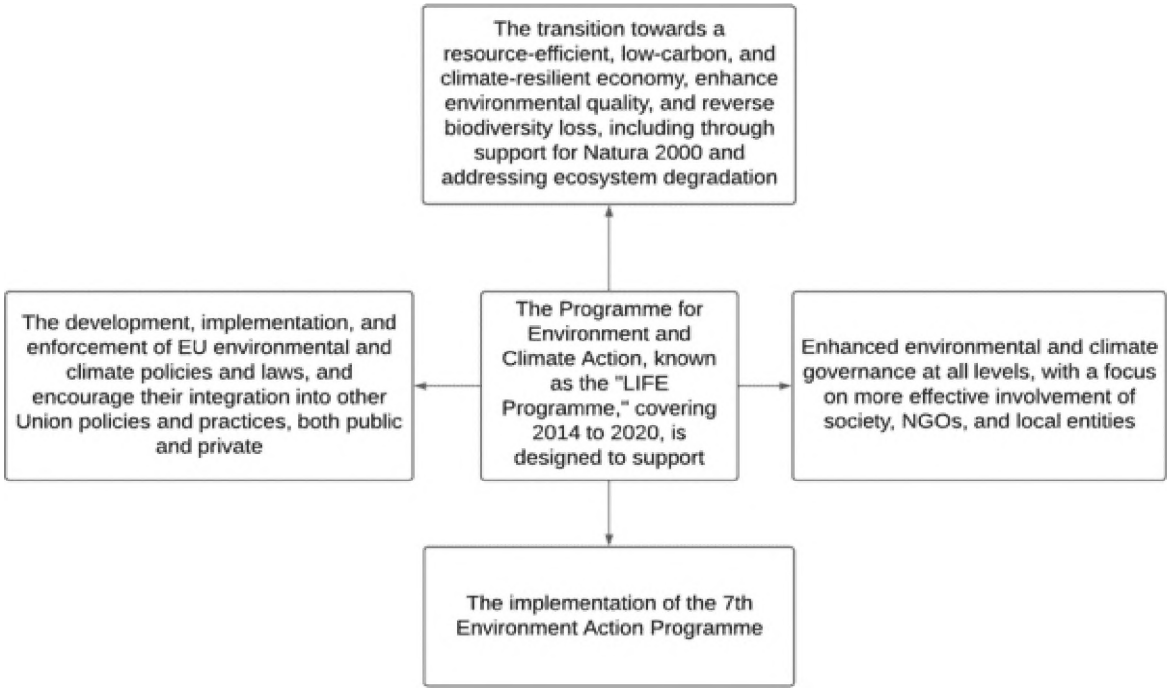


Fig 1.5 - LIFE Programme` aims.

Source: systematized by the author based on [10, p.563]

Despite these challenges, integrating different time scales into a unified, comprehensive strategy is feasible and necessary, as the success of long-term goals is dependent on the achievement of short-term objectives. In response, the European Union and many European countries are increasingly developing environmental and climate policies that cater to these varied time scales (Figure 1.6).

While numerous global leaders emphasize the significance of sustainable policies, the world's most advanced nations continue to exploit and accumulate stocks of traditional energy resources for future use. Ukrainian scientists argue that there is still a widespread reluctance to decrease or eliminate the use of non-renewable energy sources. Moreover, Indian professor R. Jenkin Suji's claims that for highly developed economies, sustainable development strategies have proven to be lucrative as they enable these nations to reap benefits from the economies of less developed countries. A further aspect of these policies is the emphasis on adopting new technologies created in highly

industrialized countries. For a nation to be considered part of the "civilized" world, it must buy and deploy these technologies within its own borders [5]

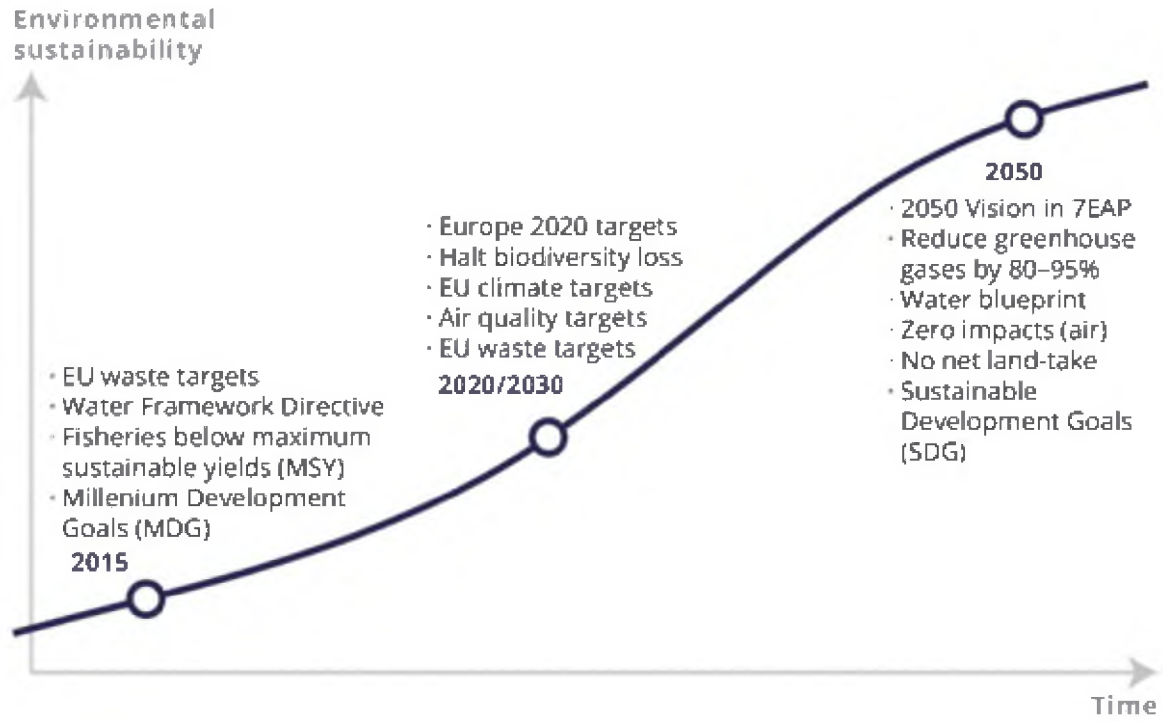


Fig 1.6 - Long-term transition/intermediate targets of EU models related to environmental policy from 2015 until 2050 [19]

The Paris Climate Agreement (PCA) stands as the inaugural globally binding accord aimed at averting potentially disastrous consequences of climate change. It charges its signatories with the task of restraining the rise in the global average temperature to levels "well below 2°C above pre-industrial levels" and striving for efforts to cap the increase at 1.5°C above pre-industrial levels. As per the Intergovernmental Panel on Climate Change (IPCC), achieving a 66% probability of limiting global warming to 1.5°C above pre-industrial levels necessitates the global economy achieving net-zero carbon emissions by 2050, followed by subsequent negative emissions. Realizing this objective demands fundamental, profound, and swift transformations across all facets of energy, transportation, agriculture, and industry. These agreements signify a turning point in international politics, business practices, and civil society involvement concerning sustainable development.

At the heart of the global energy system, the electric utility sector assumes a pivotal role in driving the decarbonization of the world economy and, consequently, advancing sustainable development objectives. This sector holds central importance in global decarbonization initiatives, with electricity and heat generation accounting for 41 percent of global emissions in 2017. Furthermore, a significant surge in electricity demand is anticipated, propelled by population and economic expansion, alongside endeavors for widespread electrification to curtail emissions from the industrial and transportation sectors. The choices made by the electric utility sector, via its involvement in power generation and distribution, will be decisive in determining whether the decarbonization of the energy system progresses at the necessary pace to avert catastrophic impacts of climate change.[13, p.3]

3. Methodological approaches to assessing the effectiveness of the implementation of sustainable development models in the EU countries.

Governments worldwide are increasingly committed to implementing integrated policies and actions that address sustainable development and climate change objectives simultaneously. Consequently, there is a growing need to evaluate and communicate the multifaceted impacts of these policies to ensure their effectiveness in delivering diverse sustainable development and climate change benefits. Policy assessment is crucial in helping countries meet the goals of both the Paris Agreement and the 2030 Agenda for Sustainable Development, which includes the Sustainable Development Goals. The urgency of transitioning towards sustainable development and achieving net zero global greenhouse gas (GHG) emissions is emphasized in the Intergovernmental Panel on Climate Change (IPCC) special report, "Global Warming of 1.5°C.»

Swedish lecturer Samuel Petros Sebhatu claims the end of 20th century observed unprecedented prominent changes in corporate strategy and management towards sustainable thinking - the emergence of sustainability as corporate strategy and

making sustainability an integral part of a company's business strategy to obtain the bottom-line benefits [20, p. 1]

The development of sustainability as a strategic corporate focus emphasizes the need for organizations to go beyond mere compliance and reporting. Instead, it's crucial for companies to enhance their sustainability performance by identifying and managing the drivers of sustainability, and by developing effective systems and structures for performance measurement.

Sustainability Performance Measurement must encompass a variety of factors that consider economic, ecological, and social dimensions. [20, p.1] Some researchers suggest that while many view sustainability primarily as environmental friendliness, it extends beyond simple measures like energy reduction and recycling. It includes broader considerations such as overall ecological protection and social impacts. As a result, a holistic approach to measuring sustainability requires a distinct methodology compared to other business performance metrics.

Various organizations, nations, and sectors employ different frameworks for sustainable development, which complicates the comparison and benchmarking of advancements. Sustainable development is multifaceted, involving economic, social, and environmental aspects. It is challenging to measure progress within these areas and to identify indicators that effectively reflect their interplay. The process of balancing and assigning importance to these dimensions often involves subjective judgment. Moreover, the positive or negative outcomes of sustainable practices might not be immediately visible. Particularly in environmental sustainability, long-term impacts may take considerable time, often years or even decades, to become apparent, thereby complicating the evaluation of immediate results from sustainability efforts. [21, p. 276]

In recent years, there has been a proliferation of frameworks and standards aimed at assessing energy companies' adherence to the Sustainable Development Goals (SDGs) and aiding in enhancing their performance and decision-making processes. While these endeavors mark a positive step forward, many existing tools fall short of providing a comprehensive assessment of how the conduct of energy sector entities could impact sustainable development across all 17 SDGs. This deficiency has enabled

companies to selectively choose reporting criteria that align with their interests while disregarding SDGs that pose challenges. Additionally, the absence of consensus on standards and evaluation metrics for SDG-aligned practices has resulted in divergent evaluations of the same companies, undermining confidence in the effectiveness of evaluation frameworks as a whole.

Greenhouse Gas (GHG) Protocol is the gold standard framework for emissions tracking, and a foundational framework for modern carbon accounting. Most organizations measuring their emissions in metric tons of carbon equivalents (tCO_2e) will use Greenhouse Gas Protocol's frameworks, and our own sustainability reporting software at Brightest is based on GHG Protocol's methodology. Its categorization into Scope 1, 2, and 3 (Fig 1.7) emissions allows companies to measure their direct and indirect impacts comprehensively. [22]

Scope 1 and 2 emissions are easier for companies to measure. Measuring Scope 3 emissions can be incredibly complex, difficult, and data intensive.

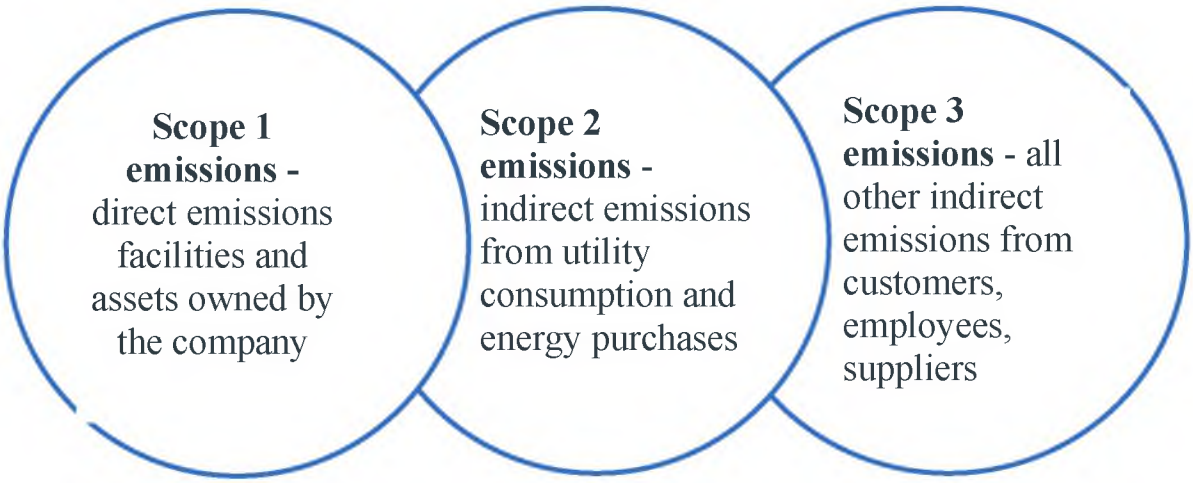


Fig 1.7 – Definition of Scope 1, 2, 3 according to GHG Protocol.

Source: created by author based on [22]

This detailed breakdown helps organizations, regardless of their size or industry, to pinpoint hotspots of emissions and prioritize areas for improvement.

The structured approach of the GHG Protocol also simplifies complex sustainability assessments by providing clear definitions and boundaries. (Fig 1.8) This is particularly beneficial in a region like the EU, where companies may face varying

national regulations and market conditions but need to adhere to overarching sustainability goals.

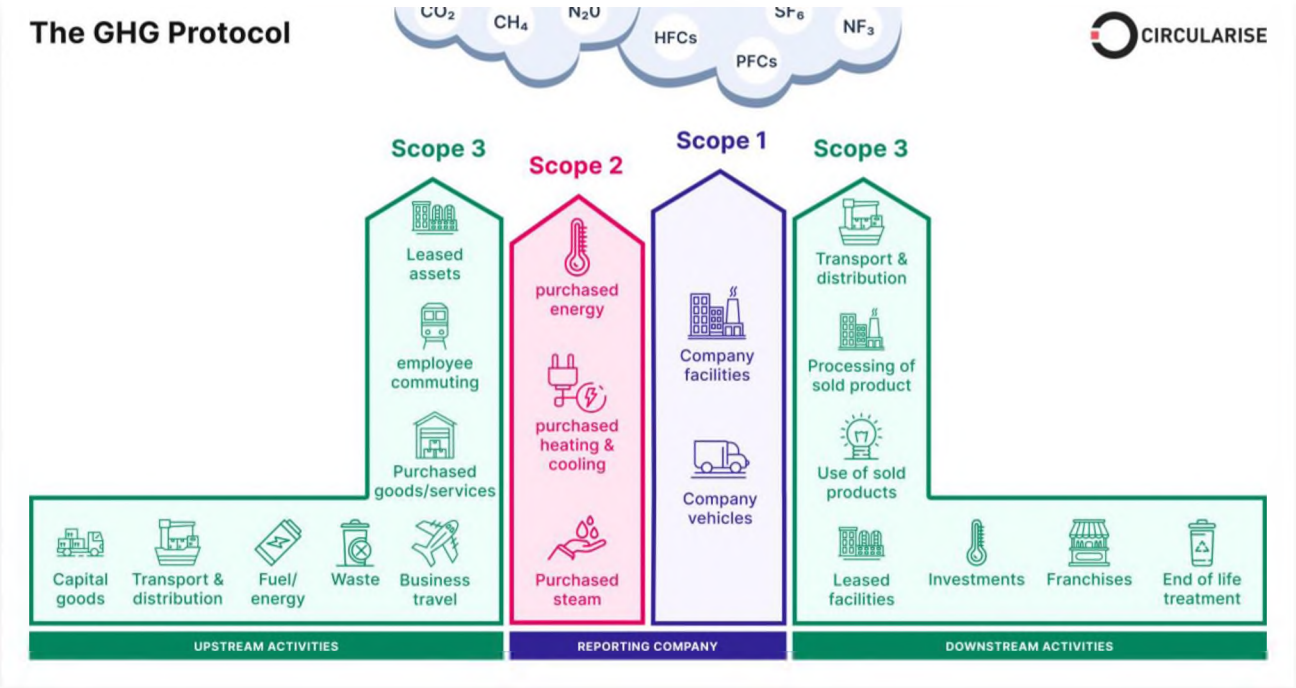


Figure 1.8: A Visual representation of an organization´s GHG emissions broken out into Scope 1, 2, 3 emissions. (45, p.6)

One primary approach is the use of indicators and indexes. The EU has developed a set of indicators specific to its context, aligning them with both the SDGs and its own policy framework. These indicators are vital tools for measuring progress, allowing for comparisons across time and between countries. For instance, the EU SDG Indicator Set, adapted from the global indicator framework, enables the monitoring of each goal through statistical data. Such data are typically collected by Eurostat and encompass a wide range of areas including socio-economic growth, environmental sustainability, and governance.

Another significant methodological approach involves integrated assessments, which consider the interconnections between different SDGs. Recognizing that actions taken to advance one goal may affect others positively or negatively, integrated assessments help in understanding these synergies and trade-offs. Tools like systems analysis and modeling have been particularly useful in these assessments, providing a holistic view of how various policy interventions may play out across the SDG spectrum.

The achievement of Sustainable Development Goal 7 (SDG7), which focuses on ensuring access to affordable, reliable, sustainable, and modern energy for all, is closely intertwined with the success of the energy sector. The Energy Trilemma Index (ETI), utilized by the World Energy Council (WEC), offers a comprehensive evaluation of a country's energy policy. This index assesses a country's energy policies based on 31 indicators categorized by relevance. Each country's ETI value is determined as a weighted average across these parameters, with the highest possible score being 100. The ETI ranking ranges from the highest balance grade of AAAa to the lowest grade of DDDd. The first letter denotes energy security, the second represents energy equity, the third signifies environmental sustainability, and the fourth reflects the country's specific context.[24]

Furthermore, the use of qualitative research, including case studies, helps illustrate how specific policies and practices are being implemented at national or regional levels. These qualitative analyses provide deeper insights into the practical challenges and successes in implementing the SDGs, offering a granular view that complements the broader statistical models.

Benchmarking and peer reviews are also employed to gauge the relative performance of countries. By comparing progress among EU member states, these practices encourage a form of 'positive competition' and sharing of best practices. Peer reviews foster a cooperative environment where countries can learn from each other's experiences, adapt successful strategies, and collectively advance towards the SDGs.

Understanding and assessing the effectiveness of European sustainable development models necessitates a nuanced approach that focuses specifically on the methods used to evaluate and measure the progress of the Sustainable Development Goals (SDGs) within the context of European models.

Dr. Suzanne Brugman, a Dutch Doctor of Psychology, asserts that measuring sustainable development poses numerous challenges owing to its intricate and multifaceted nature. The absence of a universally acknowledged definition or standardized set of indicators for sustainable development compounds these difficulties. Variations in frameworks used by different organizations, countries, and industries further

complicate efforts to compare and evaluate progress. Sustainable development encompasses economic, social, and environmental dimensions, each requiring nuanced measurement methods to adequately capture their interactions. Subjectivity arises when balancing and assigning weights to these dimensions.

Professors Miola and Hickel from Spain suggest that discerning the immediate benefits or negative impacts of sustainable practices can be elusive. Long-term effects, particularly in environmental sustainability, may not materialize for years or even decades, rendering the immediate success of sustainability initiatives challenging to assess.

Looking ahead, there are several critical areas for enhancing methodological approaches to evaluate the effectiveness of sustainable development models within the EU. These include refining data granularity to encompass local and regional diversities more comprehensively, enhancing data availability and quality on emerging issues, and bolstering the integration of forecasting and predictive analytics to anticipate future trends and their implications for achieving Sustainable Development Goals (SDGs).

CHAPTER 2. ANALYSIS OF THE IMPLEMENTATION OF EUROPEAN SUSTAINABLE DEVELOPMENT MODELS AT THE MICRO AND MACRO LEVELS

2.1 Characterization of the effectiveness of implementation of sustainable development models in the EU countries.

The effectiveness of sustainable development models' implementation in EU countries was characterized through an in-depth examination of the governance structures on the national level regarding the adoption of SDGs. This segment of the research aimed to provide a comprehensive overview of how the EU and its Member States in particular (Finland, Austria, France, Slovakia, and Poland) have incorporated the 2030 Agenda into their policies and institutional frameworks, including the role of national parliaments. Additionally, it sought to identify opportunities for better integration of SDGs into EU policies and suggest potential actions for the European Parliament to enhance the implementation of SDGs across the EU and its Member States. This involved the creation of a distinct analytical framework, gathering data from diverse sources, and conducting assessments of each Member State, as elaborated in this chapter.

At the national scale, an examination encompassing all 28 member countries of the EU was conducted to assess the governance structures established, focusing on both institutional and procedural aspects. This assessment drew primarily from three major sources, encompassing surveys and reports from nearly the entire EU 28. To analyze this data, a distinctive analytical framework was crafted, which amalgamates various viewpoints on governance aimed at sustainable development. This framework incorporates five fundamental governance components and principles aligned with sustainable development, which are in sync with the principles of Agenda 2030 and

mirror the OECD's foundational elements for policy coherence. This offers a holistic perspective on the governance mechanisms promoting sustainable development.

The analytical framework uses the four key governance principles of horizontal and vertical coordination, participation, knowledge, and monitoring.

Through desktop research, I focused on three primary data sources renowned for their extensive coverage across multiple or all Member States. These sources shed light on the governance and execution of Sustainable Development Goals (SDGs) at the national level, complemented by additional secondary data. The key sources include the Voluntary National Reviews (VNR) of EU Member States, the European Sustainable Development Network (ESDN) Country Profiles and associated reports, and the OECD Country Profiles for Policy Coherence for Sustainable Development (PCSD).

It's widely acknowledged that implementing the SDGs at both national and subnational levels doesn't adhere to a one-size-fits-all approach. Nonetheless, there exists a wealth of lessons to be gleaned from the experiences of various countries, facilitating cross-border knowledge exchange and fostering more effective SDG implementation strategies. Following data collection at the country level, findings from country fiches were synthesized thematically and across all countries, particularly focusing on the seven governance elements for sustainable development that underpin this study. The assessment framework operates under the assumption that a higher degree of institutionalization is conducive to SDG implementation.

Monitoring

It stands as a pivotal element for an efficient and operative strategy. Numerous nations had pre-existing systems for regular progress tracking, either continuing or revitalizing them for the SDG implementation. Several countries, such as Denmark, have acknowledged the role of parliaments in monitoring and review, exemplified by the launch of an annual SDG progress report to parliament in 2018. Similarly, Spain and the Netherlands have devised plans for comprehensive annual reports. Despite the prevalence of progress reports, their frequency varies across countries. It is advisable to establish a periodic reporting rhythm, ideally annually or biennially. The significance attributed by the 2030 Agenda and SDGs to data and indicators is evidenced by the

efforts of many countries, with around 23 of them revising or updating their indicators to align with the SDGs.

Countries have different starting points. (Table 2.1) While some countries boast a rich history of sustainable development strategies dating back decades, others have only recently embarked on this journey. Interestingly, the initial commitment to sustainable development does not always align with the current operational status of SDG strategies or plans within countries. Although sustainable development strategies serve as valuable tools for establishing long-term overarching frameworks, their direct influence on day-to-day policy decisions tends to be somewhat constrained.

Table 2.1.- Monitoring of sustainable development on the governmental level in Austria, France, Slovakia, Poland, Finland

	Indicators (pre-SDGs)	**Progress reports (pre-SDGs)**	**External review (pre-SDGs)**	**Progress reporting since SDGs?**	**Indicators updated since SDGs?**
Austria	Yes	Biannual	External review and audit	Planned	
France	Yes (beyond GPD and NSDS indicators)	Annual report on beyond GDP indicators, NSDS reports in 2006, 2013, and to parliament in 2016	Peer review report on SD plans 2005	Planned: SDG reporting, continued: annual report on beyond GDP indicators - potentially converging	List of around 100 indicators to follow up SDGs nationally, including Beyond GDP indicators
Slovakia		Annual		Planned: biannual reporting and evaluation scheme, first mid-2020	Work in progress
Poland				Planned	Yes
Finland	Yes	Reports from every ministry	Independent review every 4 years	Independent review every 4 years continued	New indicators added, participative approach

Source: created by author based on [43]

Finland stands as a notable example of effective sustainable development implementation. With a highly advanced strategy and a robust monitoring framework in place, Finland has demonstrated proactive commitment to aligning its efforts with the Sustainable Development Goals (SDGs). The country's national sustainable development strategy, outlining a vision for 2050, underscores its dedication to fostering prosperity while shouldering global responsibility for sustainability and nature's carrying capacity.

Furthermore, Finland's government has taken concrete steps by adopting an implementation plan for the 2030 Agenda, grounded in the overarching themes of achieving carbon neutrality and resource efficiency, alongside promoting non-discriminatory, equitable, and competent practices. This comprehensive approach ensures integration across all SDGs.

Notably, Finland has integrated its sustainable development strategy into the national budget, with clear measures and direct links established since 2019. The Ministry of Finance has played a pivotal role in embedding SDGs into budget justifications, elucidating connections between expenditures and sustainable development goals. Additionally, the budget proposal highlights priority areas, particularly emphasizing the pursuit of a carbon-neutral and resource-wise Finland.

Moreover, Finland's monitoring framework incorporates a participatory approach, encompassing a new set of SDG-aligned indicators selected through consultation. Regular progress reports from every ministry and independent reviews every four years ensure accountability and transparency.

Finland's commitment to sustainable development is further evidenced by its initiation of a revision process for the strategy, commencing with an independent gap analysis. These comprehensive efforts underscore Finland's exemplary leadership in advancing sustainable development goals at the national level.

Leadership and Horizontal Coordination

The governance and implementation of the SDGs are founded on the principle that sustainable development is integral and indivisible across all aspects of society,

surpassing the traditional 'triple-P' model. Achieving truly integrated and indivisible sustainable development necessitates policy coherence as a cornerstone of governance. While central leadership signifies the political prioritization of the SDGs, effective coordination mechanisms at the working level in ministries are imperative to support this leadership. In cases where there is central leadership, such coordination mechanisms exist, signifying significant strides towards policy coherence and integration in achieving the SDGs across more than half of EU Member States. In states lacking central leadership on the SDGs, horizontal coordination mechanisms linking ministries across government are crucial for policy coherence at the political level.

Table 2.2 - Leadership and Horizontal Coordination of sustainable development on the governmental level in Austria, France, Slovakia, Poland, Finland

	HoS level	**Domestic (or if not unspecified) Lead**	**External Lead**	**Other Involved**	**Coordinating mechanism**
Austria	Federal Chancellery	Min Sustainability tourism	MFA	SD focal points in each Min	*SD* Steering group *IM WG*
France		Interministerial Delegate under Prime Minister and Ministry of Environment	MFA	All responsible, focal point	Inter-minist. Delegate for *SD* & High Commissioner General for *SD*
Slovakia	Deputy *PMO*	Deputy PMO	*MFA & EU*	All min in Gov't Council	Government Council WG for A2030
Poland		Min Entrepreneur-ship & Techn.	*MFA*		Team of 5 Min. for VNR & beyond
Finland	*PMO*	FNCSD, Chair by PM	*MFA*	all 11 Min in Inter-min Network Secretariat (in Coordination)	2030 Agenda Coordination Secretariat (PMO) & FNCSD

Source: created by author based on [43]

Not all Member States have centralized leadership, and for some, leadership and ownership of the SDGs remain divided between environmental and development aspects across corresponding ministries. (Table 2.2) Even with clear coordination mechanisms in place, this division persists, often between environmental ministries dealing with internal aspects and ministries of foreign affairs handling external and international aspects.

Spain's aspirations and plans are noteworthy. The country is undergoing a significant transformation in its approach to sustainable development, propelled by a central role for the SDGs. Key features of their planned new system include a High Commissioner for the 2030 Agenda and a High-Level Group for coordination, considering both internal and external dimensions in proposed mechanisms. The High Commissioner, established in 2018, oversees the coordination of actions for 2030 Agenda implementation, supported by an office in the Prime Minister's office and led by the Prime Minister. A High-Level Group, chaired by the Minister of the Presidency, with vice-chairpersons including ministers from various key sectors, underscores clear horizontal coordination of the agenda.

Stakeholder Participation

Nearly all Member States employ participation or coordination mechanisms to involve key stakeholders in SDG governance and implementation. (Table 2.3) I've identified four main types of participation mechanisms: 1) one-off consultations, 2) enhanced participation processes such as forums, 3) dedicated bodies like independent sustainable development councils or government councils integrating stakeholders, and 4) additional participation elements tied to specific events or policy areas. The distinction between independent councils and integrated bodies doesn't always imply greater institutionalization, as contextual factors often shape their designs. The following sections will detail these mechanisms based on their level of assessment in the scheme.

Stakeholder involvement in sustainable development governance and decision-making is increasingly common among Member States, though not universal. While many states engage stakeholders in developing sustainable development strategies,

consultation on SDG-related governance or strategies may lag. Some states plan future involvement, while others lack it entirely. This gap underscores the need for improvement. Additionally, bottom-up initiatives by societal actors contribute to governance, but existing institutional mechanisms may not fully capture this input. Coordination between stakeholder participation and sub-national governments varies, often conflated despite distinct roles. Advanced participation entails diverse consultation mechanisms, attention to inclusivity, and coherence between governance levels, all aimed at SDG implementation rather than mere participation.

Table 2.3 - Stakeholder participation in developing SDG governance in Austria, France, Slovakia, Poland, Finland

	Sub-national coordination or participation mechanism	**Is the SDS done in consultation ?**	**Independent SD Council, Forum, Platform(or other institutionalized participation mechanism)**	**Integrated/mixed in Gov't SD Council (or other institutionalized particip mechanism)**	**Other stakeholder participation mechanism**
Austria	Expert conf. of Nat. & Reg. SD coordinators	2017		Committee for a Sustainable Austria	Actor Network for Sustainable Austria (SDG Watch Austria)
France	National Council for Sust. Dev't	multiple occasi- ons, including current SDG road- map & 2015 SDS	National Council for Sust. Dev't	National Council for Ecological Transition	Nat. Council for Dev't and Internat. Solidarity, Nat. Env. Roundtable; participation in 2016
Slovakia	Government Council for the 2030 Agenda for SD	2018		Government Council for the 2030 Agenda for SD	Slovak Non-Governmental Organisations Platform
Poland	Joint Government and Territorial Self-Government Committee		2030 Agenda National Stakeholders Forum		Partnership for implementation of SDGs (business init.); participation in 201

Finland	Finnish National Commission on Sust. Dev't (FNCSD)	through FNCSD	Society`s Commitment to Sust. Dev't	Finnish National Commission on Sust. Dev't (FNCSD)	Dev't Policy Committee, Youth Agenda 2030, Expert Panel; online VNR par

Source: created by author based on [43]

The science-policy interface is gaining recognition for its role in informing sustainable development policies. Nine countries already include representatives from science and academia in their sustainable development councils or commissions, with two more planning to do so. These bodies provide strategic advice and policy recommendations, often involving multiple stakeholders, including academia. Some countries, like Italy and Slovakia, have given academia a specific role in conducting context analysis or impact assessments for SDG implementation. Denmark integrates SDGs into legislative assessments, while countries like Germany, Greece, and Latvia have developed or plan to develop tools and guidelines to incorporate SDGs into impact assessments for policy coherence and evidence-based decision-making.

The integration of SDGs into budgetary processes is gaining traction among Member States. Ten countries, including Croatia, Denmark, Finland, and Spain, either directly or indirectly link the SDGs to their budgetary processes. Methods vary, with some countries including qualitative or quantitative SDG elements in budget documents, while others use performance indicators aligned with SDGs. Some countries tag budget appropriations to specific SDGs or targets. Notably, Finland demonstrates strong accountability by actively involving civil society in linking SDGs to the national budget through multi-stakeholder workshops organized by the Ministry of Finance. This approach results in advanced integration, with SDGs influencing budget justifications, strategy, and resource allocation, particularly focusing on carbon neutrality and sustainable development.

2.2 Analysis of the implementation of OMV's initiatives in the field of sustainable development.

OMV, an international integrated oil and gas company based in Austria, has been actively involved in sustainable development, reflecting an industry-wide shift towards more environmentally conscious operations. The implementation of these initiatives can be analyzed based on several core areas: reduction of carbon emissions, investment in renewable energy, and community and environmental stewardship.

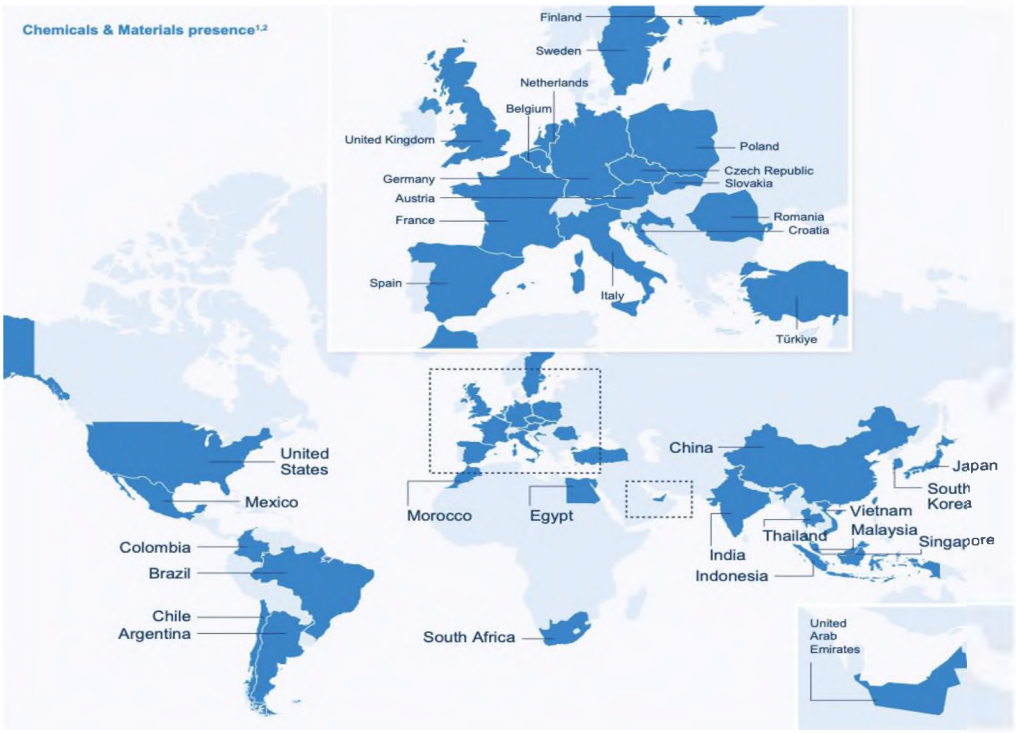


Figure 2.1 – The map of the countries where OMV operates [38, p.3]

The company's annual Sustainability Report offers transparency, providing a comprehensive overview of its efforts and progress. This public disclosure allows stakeholders to track OMV's advancements towards its sustainability goals and offers a benchmark for accountability. Therefore, further analysis will be based on data from Sustainable Report 2023 and Annual report 2024.

OMV is actively transforming from an integrated oil, gas, and chemicals company (Fig. 2.1) into a leader in sustainable fuels, chemicals, and materials. [Annex C] Nevertheless, the process of restructuring the company for sustainable development

is a lengthy one, during which both positive and negative changes can be seen over the course of a year. (Table 2.5) This shift aligns with the global push towards a circular economy and aims at achieving net-zero emissions across Scope 1, 2, and 3 by 2050. To facilitate this ambitious transformation, OMV has committed to investing over EUR 13 billion by 2030 to reduce its carbon footprint significantly.

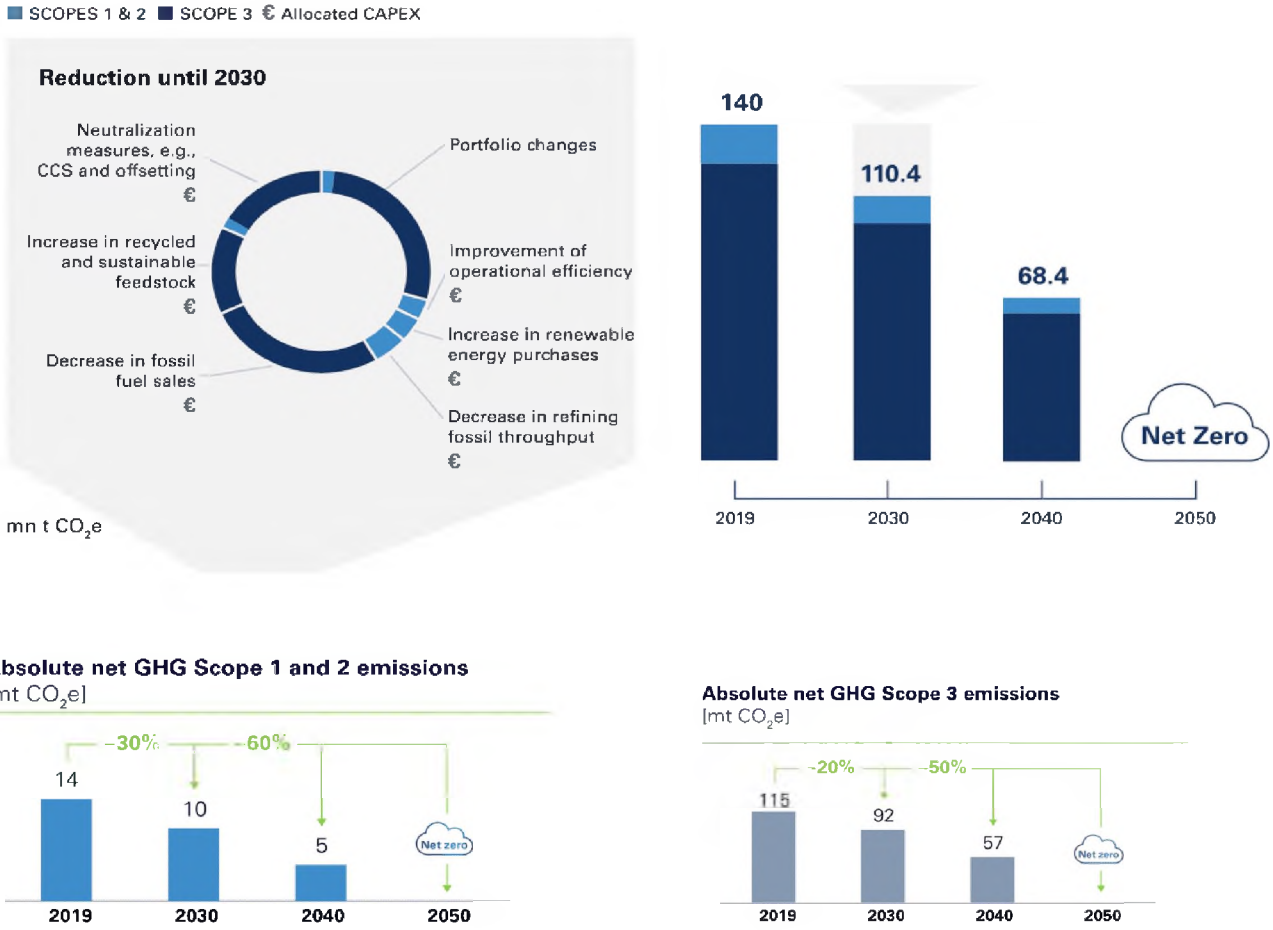
Table 2.5 - Absolute GHG emission at OMV for the period from 2019 to 2023 [23. p.174]

	Unit	2023	2022	2021	2020	2019
Total GHG direct, Scope 1	Mn t CO2 equivalent	10	11,7	13,5	10,9	10,8
Total GHG indirect, Scope 2	Mn t CO2 equivalent	1,1	0,9	1,1	0,3	0,4
Total GHG indirect, Scope 3	Mn t CO2 equivalent	124	133,6	156,4	117,7	126,1

OMV recognizes the critical global issue of climate change and is committed to the objectives of the Paris Agreement. By 2050, OMV intends to become a net zero enterprise. (Fig. 2.2) In 2022, OMV developed its first comprehensive roadmap detailing short-term, medium-term, and long-term targets. These targets include both absolute and intensity measures, aiming for net zero greenhouse gas (GHG) emissions across Scopes 1, 2, and 3 by 2050. Specifically, OMV plans to reduce its absolute emissions by 30% by 2030 and 60% by 2040 for Scopes 1 and 2. In terms of Scope 3, which includes emissions from OMV's product portfolio and other significant Scope 3 sources, the goal is to cut emissions by at least 20% by 2030 and 50% by 2040. Additionally, increasing sales of zero-carbon energy products and reducing the carbon intensity of OMV's energy supply by 20% by 2030 and 50% by 2040 are pivotal strategies. These objectives are in line with the International Energy Agency's

Sustainable Development Scenario (SDS), with a broader goal to meet the IEA's Net Zero Emissions by 2050 Scenario ahead of schedule, by 2050. [23]

OMV is committed to meeting its climate goals through a range of strategic



initiatives, including enhancements in operational practices, the development of its product and service offerings, involvement in circular economy projects, as well as through innovations and research & development efforts. The company also focuses on improving its work environment and expanding its social investment projects. Addressing climate change effectively requires more than just a simple solution. To achieve ambitious objectives for 2030 and the years that follow, substantial efforts from all business sectors will be essential. This will be achieved by leveraging the existing capabilities and expertise.

Figure 2.2 - Capex allocated for Decarbonization Measure to meet OMV`s 2030 Climate Targets [38, p. 45]

Sustainability Framework of the company is built around the three pillars Environmental, Social, and Governance (ESG). OMV has made the following commitments, which lie at the heart of the Sustainability Framework, to propel ESG journey. [23, p.23]

Within its Sustainability Framework, OMV has identified five key strategic areas: Climate Change, Management of Natural Resources, Health, Safety, and Security, People, and Ethical Business Practices. For each area, the company has set specific objectives and actions to be realized by 2030, aligning with the UN's 2030 Agenda for Sustainable Development. [23, p.19]

OMV has committed to the United Nations Global Compact, emphasizing that a principled approach to business is the foundation of sustainability. The company expects its business partners to uphold similar values of ethical conduct. The focus on Ethical Business Practices consolidates efforts and initiatives aimed at maintaining high standards of integrity among employees and partners. This culture of integrity sets the stage for further embracing the UN's Sustainable Development Goals. This includes actions such as fostering local economies through procurement practices and aligning lobbying efforts and supplier interactions with OMV's commitments to climate change mitigation.

In 2022, OMV revamped its approach to capital allocation and introduced a strategic scoring system for evaluating investment decisions. This system categorizes projects according to four main criteria. (Fig 2.3) Currently in its pilot stage, this scoring framework enables OMV to objectively assess and prioritize its vital strategic initiatives. This aids in enhancing facility-wide improvements within OMV and streamlining the implementation processes, including efforts to minimize greenhouse gas emissions over

the long term. Climate-related scores play a crucial role within this framework, assessing how investments influence climate change initiatives.

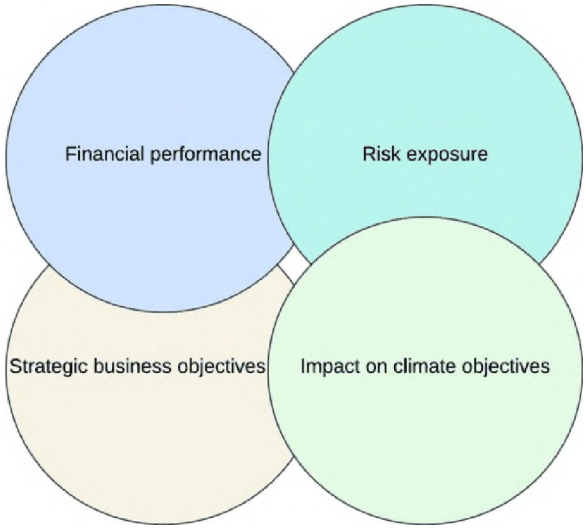


Figure 2.3 - Four main criteria of projects that aim to capital allocation and introduced a strategic scoring system.

Source: systematized by the author based on [38, p.563]

Additionally, OMV has aligned its 2030 climate objectives for Scope 1, 2, and 3 emissions with the European Union's climate targets, ensuring a comprehensive and strategic approach to meeting these ambitious environmental goals.

Implementing these initiatives is not without challenges, including technological limitations, financial costs, regulatory hurdles, and market conditions. However, these efforts also present opportunities such as operational cost reductions, enhanced corporate reputation, and potential for innovation and new business areas.

OMV's implementation of sustainable development initiatives represents a significant shift towards more responsible energy production. [Annex 1] The success of these initiatives depends on continuous commitment, adaptation to emerging technologies, and robust stakeholder engagement. As the energy industry continues to evolve, OMV's strategies and their implementation will likely need to be dynamic, adapting to new challenges and opportunities in the global push for sustainability.

2.3 Prospects for implementation of the European experience of sustainable development for Ukrainian enterprises.

Ukraine faces significant environmental challenges, making it one of the most polluted and environmentally problematic countries in Eastern Europe. Environmental pollution levels in Ukraine surpass those of other Eastern European nations by several multiples. The carbon intensity of Ukraine's Gross Domestic Product (GDP) remains significantly higher than the global average, standing at 4.5 times higher, and more than 8 times higher than the average in OECD Europe. [25] The energy intensity of the Despite per capita emissions aligning with the global average, Ukraine's energy intensity, reflecting the amount of energy consumed per unit of GDP, is three to four times higher than the European Union average. (Figure 2.4) Furthermore, data reveals that Ukraine and many Eastern Partnership countries exhibit lower values on the Energy Trilemma Index compared to economically advanced nations. This indicates challenges in achieving a balanced approach to energy security, environmental sustainability, and energy affordability. (Annex B)

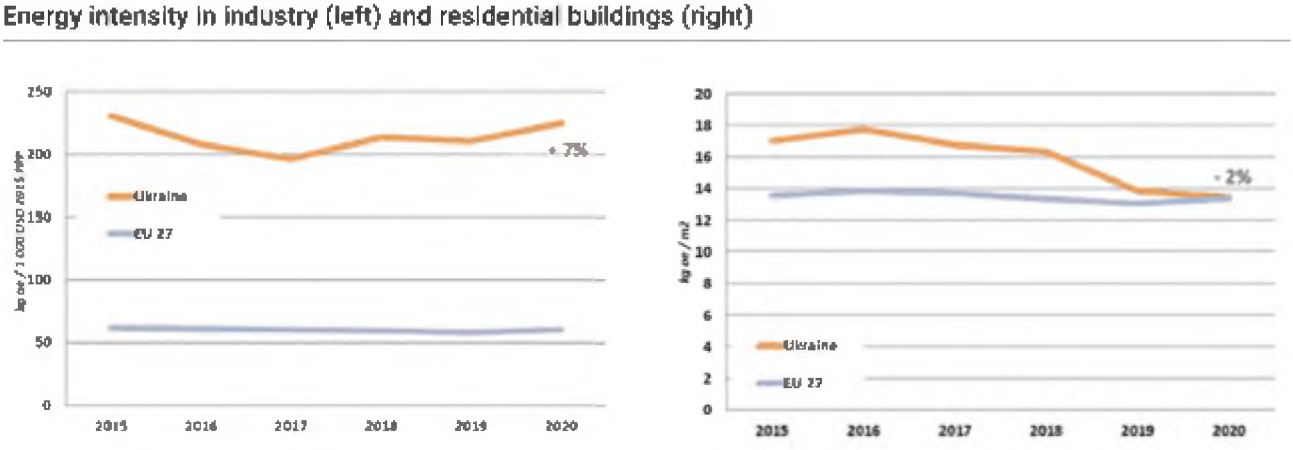


Figure 2.4 - Energy intensity in Ukraine and EU countries in industry and residential buildings for the period from 2015-2020 [25]

Therefore, Ukraine ranks among the poorest performers in environmental management among the former Soviet states. Nonetheless, the Ukrainian authorities are committed to enhancing the living standards of its population by actively working

towards a more climate-resilient economy, in line with their obligations under the Paris Agreement. It is important to note the significant role that the country's most environmentally detrimental economic sectors play in its overall greenhouse gas emissions.

A significant portion of Ukraine's industrial structure is dominated by heavy industry, particularly in sectors such as mechanical engineering, energy production, and coal mining. Heavy industry alone contributes to over 80% of the total value of industrial goods sold within the country. Over the years, the electricity and heating sector have emerged as primary contributors to harmful gas emissions, accounting for approximately 20% of these emissions. Following closely behind is the metal-extracting and transformation sector, further exacerbating environmental concerns related to pollution and emissions in Ukraine. [25]

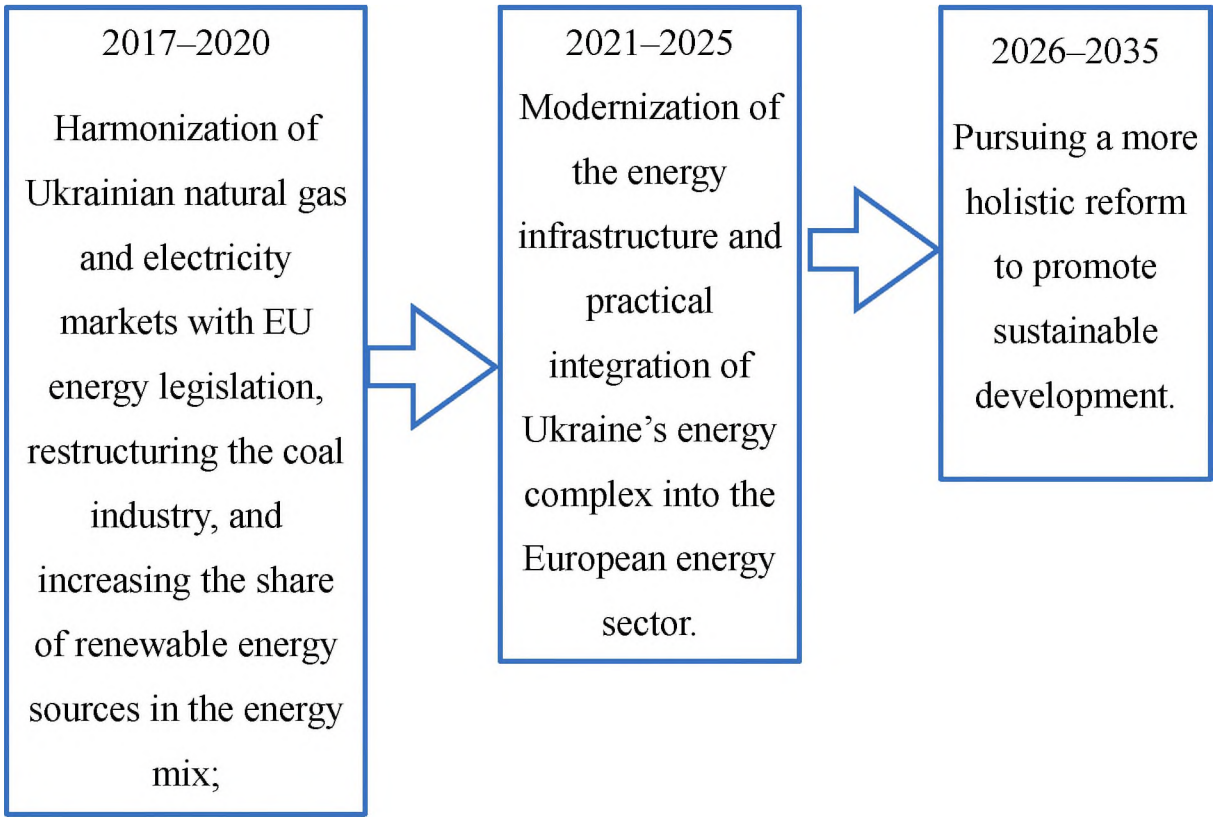
In March 2014, Ukraine signed an association agreement with the European Union, opening the door for Ukraine to integrate environmentally friendly market incentives and policy recommendations into its strategic economic planning. This agreement facilitated the adoption of EU standards across crucial sectors of Ukraine's economy.

The primary objective of the agreement was to bolster major reforms aimed at revitalizing and growing the Ukrainian economy. It also aimed to enhance sectoral collaboration with the EU in areas such as industry, energy, climate action, social development, and consumer protection. The ongoing conflict with the Russian Federation poses a substantial threat to the Ukrainian economy, which has been under strain since 2014.

Ukraine's orientation towards achieving SDG7 is in the attention of the authorities and the Government of Ukraine, which is reflected in relevant documents (Cabinet of Ministers of Ukraine, 2017; OECD, 2020; UNICEF, 2020). In 2015, the Law of Ukraine on the Natural Gas Market was adopted by Verkhovna Rada of Ukraine to increase competition and diversify energy supplies. Furthermore, on April 22, 2016, Ukraine signed the Paris Agreement. The updated nationally determined contribution to

the Paris Agreement set the goal of reducing greenhouse gas emissions by 2030 to 35% compared to 1990 and achieving carbon neutrality by 2060 at the latest. [24, p.381]

When these challenges are addressed, Ukraine will have the opportunity to rehabilitate its industrial plants and infrastructure networks. As a result, many of its heavy industries are likely to continue producing significant amounts of carbon dioxide. Therefore, Ukraine will need to secure both local climate financing and substantial international investments to meet its commitments under global climate accords. Consequently, while Ukraine has set targets for cutting harmful emissions, these targets



do not necessarily translate into specific commitments to actual emission reductions.

Since 2016, Ukraine has undertaken the implementation of the EU-funded energy program known as EU4Energy. This initiative is geared towards aiding Eastern Partnership countries in their endeavors to establish sustainable energy policies and enhance the regional energy sector. [26] The overarching goals of the program include mitigating the adverse environmental effects of energy production, fostering greater liberalization of energy markets within the region, bolstering energy security, and

ensuring that citizens across these nations have access to consistent and dependable energy sources.

Figure 2.5 – Stages of Energy Strategy implementation in Ukraine.

Source: systematized by the author based on [24, p.381]

In 2017, the Energy Strategy of Ukraine was approved by Cabinet of Ministers of Ukraine, focused on achieving SDG7, and containing three main stages. [24, p. 380] (Fig. 2.5)

Of relevance are the issues of financing the energy transition. First, it should be noted that global investment in renewable energy and energy efficiency is set to triple by 2030. Therefore, gaining access to adequate and predictable finance is of particular importance in developing and implementing a sustainable energy policy, and access to finance and the provision of technology transfer are given priority. However, Polzin and Sanders identify a qualitative mismatch between available sources and required investments for the European energy transition.

Ukraine lacks funds to develop the energy sector and accelerate the achievement of SDG7. It should be noted that the projected amount of funding for state support for energy efficiency for the next 5 years in various sectors of the economy is set at about USD 335 million, which is not enough to overcome these problems. The establishment of the Decarbonization Fund is also envisaged, which should be an additional source of annual funding for energy efficiency measures of more than USD 35 million. It is planned to replenish this fund by attracting contributions from the payment of the CO2 emission tax. Given the limited financial capacity, it is becoming increasingly essential to activate the MTM credit channel to involve banks and other financial institutions more actively to financing energy projects and developing climate finance markets. [24, p. 381]

Despite existing challenges, the Ukrainian government remains steadfast in its commitment to transitioning towards a low-carbon and resilient economy in the near future. This dedication stems from Ukraine's position as one of the most energy-intensive economies globally, coupled with significant potential for energy conservation and emission reduction.

In line with this commitment, Ukraine has taken concrete steps to establish and implement domestic legislation related to green finance, particularly in the realm of green bonds issuance within capital markets. Notably, in June 2021, the Ukrainian government enacted the law on "Capital Markets and Organized Commodity Markets," which officially recognized Ukrainian green bonds as a distinct financial instrument. Under this legislation, green bonds are defined as a specific type of financial instrument, categorized based on the intended use of borrowed funds. Green bonds are earmarked for financing environmental projects or specific sustainable activities, as stipulated in their prospectus, thus facilitating investments in green initiatives to support Ukraine's transition towards a more sustainable future. [27, p.90]

However, the actions taken by the Ukrainian government and local bodies thus far are insufficient to drive the shift towards a climate-resilient economy. Additional green financial mechanisms, such as green credits and green stock indices, are integral to the broader green finance framework and must be considered. Moreover, various other strategies, incentives, and initiatives have facilitated the effective deployment of this green financial system. This system helps to divert investments away from environmentally harmful industries and supports the funding of eco-friendly sectors. Adopting this approach not only benefits Ukraine's national economy but also promotes the development of innovative energy technologies, new sources of energy, and environmentally friendly industrial equipment within the country.

2.4 Strategic directions of development of the "sustainable economy" in Ukraine in the context of European integration

Ukrainian authorities should look to the European Union's approach as a model for developing a clear and consistent framework to transition from an industrial and fossil fuel-based economy to a more sustainable and greener one. By implementing a set of principles that incentivize both public and private sectors to invest in green activities, Ukraine can foster a future green economy.

One key area where Ukraine can focus its efforts is in providing financial incentives for investments in environmental goods and services, such as climate change mitigation and adaptation, as well as pollution prevention and minimization. By directing funds towards these areas, Ukraine can address pressing environmental challenges while stimulating economic growth.

Additionally, improving the financial system and creating new financial instruments are essential for driving green finance initiatives forward. Establishing a standardized green classification system will help identify activities that contribute to the green economy, providing clarity and transparency to investors. By following the example set by companies like OMV in Austria, which developed a roadmap for climate-related practices, Ukraine can streamline information dissemination to investors, ensuring better transparency and security in green investments.

Furthermore, aligning green finance principles with United Nations Sustainable Development Goals (SDGs), such as ensuring access to sustainable energy (SDG 7), promoting resilient infrastructure (SDG 9), and combating climate change (SDG 13), can provide a solid foundation for Ukraine's green finance regulatory framework.

Ukraine can also encourage the implementation of environmental projects, such as feed-in tariffs for renewable energies, to further drive sustainable development and reduce pollution. Prioritizing innovation is crucial in addressing Ukraine's pollution challenges and improving air quality. By investing in research and development, Ukraine can enhance its innovation capabilities and promote sustainable economic development.

Given Ukraine's current conflict with Russia and its reliance on coal as an alternative to gas imports, the country faces significant challenges in meeting its Paris Agreement commitments and transitioning to a climate-resilient economy. However, by investing in renewable energy systems and reducing dependency on fossil fuels, Ukraine can mitigate its carbon emissions and move towards a more sustainable future.

To bolster the implementation of green investments, Ukrainian authorities can establish a regulatory framework tailored to components of the financial system dedicated to sustainability, such as the green climate fund and financial instruments like

green bonds and structured green funds. This framework would encompass legal, economic, and institutional conditions specific to renewable energy development, fostering an environment conducive to green investment.

Furthermore, active engagement of civil society, businesses, and other stakeholders is crucial for creating a robust framework for sustainable development in Ukraine. Drawing inspiration from Finland's exemplary approach to stakeholder participation in Sustainable Development Goals (SDGs) governance, Ukraine could establish similar mechanisms. For instance, establishing a multi-stakeholder platform where various sectors commit to operational goals aligned with green economy principles could drive progress. This could include initiatives such as sustainable public procurement, low-carbon development, and resource-efficient production.

Moreover, organizing multi-stakeholder workshops, akin to those conducted by Finland's Ministry of Finance, would be beneficial. These workshops would link SDGs with national budgeting processes, ensuring that financial strategies and resource allocations prioritize sustainability objectives, particularly those focusing on carbon neutrality and inclusive infrastructure development.

In addition to legislative and technological changes, it's imperative to revise methods for assessing the progress of sustainable development implementation. The evaluation of Sustainable Development Goal 7 in Ukraine has been limited, focusing on a narrow set of goals and only seven indicators. This approach fails to capture the comprehensive economic, social, and environmental impacts of energy policy implementation. Therefore, there's a pressing need to re-prioritize objectives and significantly expand the number of indicators used to monitor SDG7, facilitating a more holistic approach to sustainable development assessment. Moreover, it is essential to introduce measures that track access to consistent and reliable energy sources for both private citizens and businesses. It would also be beneficial to establish minimum standards for these energy access metrics to safeguard the most economically disadvantaged communities.

Foe effective measuring of performance it is essential to establish good monitoring system. To enhance monitoring, there must be coordinated efforts in

developing metadata, assigning responsibilities for indicator calculations, and setting timelines for data delivery to the State Statistics Service of Ukraine.

Drawing from Spain's experience in sustainable development, Ukraine could benefit significantly in its energy sector. Spain has demonstrated a strong commitment to the Sustainable Development Goals (SDGs) by establishing a centralized leadership structure. This includes the appointment of a High Commissioner for the 2030 Agenda, who is responsible for overseeing the implementation of the SDGs and is supported by an office within the Prime Minister's office. The High Commissioner's role is to ensure that all actions across various sectors are aligned with the 2030 Agenda.

Furthermore, Spain has created a High-Level Group for coordination, which is chaired by the Minister of the Presidency and includes vice-chairpersons from key sectors. This group exemplifies the importance of horizontal coordination across different ministries, ensuring that both internal and external dimensions of sustainable development are addressed.

Ukraine could emulate Spain's approach by establishing a similar centralized leadership position, such as a Commissioner for Sustainable Development, who would work closely with the Prime Minister's office. Additionally, forming a coordinating body with representatives from relevant ministries could help Ukraine achieve a more integrated and effective implementation of the SDGs. This could be particularly impactful in the energy sector, where a unified strategy is essential for transitioning to sustainable energy sources and practices. By adopting Spain's model of governance, Ukraine could enhance its sustainable development efforts and move towards a more resilient and sustainable energy future.

Additionally, this study recommends employing new metrics to measure improvements in energy efficiency. These should include indicators of energy consumption relative to economic output across different sectors of the Ukrainian economy. Another critical metric, CO2/TES (CO2 intensity of the energy mix), should be adopted for more precise monitoring of decarbonization efforts, particularly suitable

for nations with vulnerable economies since it focuses purely on environmental impacts without being skewed by economic factors.

Drawing inspiration from OMV's approach to sustainable development in the energy sector, Ukraine could benefit from a similar strategy. Prioritizing strategic investments in renewable energy and low-carbon technologies would be a key step, much like OMV's commitment to decarbonization measures. Establishing a robust framework for sustainability reporting can enhance transparency and accountability, allowing stakeholders to track progress and maintain a benchmark for accountability. Embracing the principles of a circular economy can aid Ukraine in transitioning to more sustainable energy production methods, promoting recycling, waste reduction, and efficient resource use.

Investing in research and development is crucial for fostering innovation in sustainable fuels, chemicals, and materials. Ukraine should support R&D initiatives that aim to reduce the environmental impact of energy production. Building a sustainability framework around Environmental, Social, and Governance (ESG) pillars can guide the energy sector, with specific objectives and actions for climate change, resource management, health, safety, security, and ethical business practices aligning with global sustainability standards.

Engaging stakeholders, including local communities, employees, and business partners, is essential for ensuring that sustainability efforts are inclusive and reflect the interests of all parties involved. Aligning national climate objectives with international agreements, such as the Paris Agreement, can position Ukraine as a committed player in global sustainability efforts. The energy sector must remain adaptable to emerging technologies and market conditions, prepared to adjust strategies in response to new challenges and opportunities.

Upholding high standards of integrity and ethical conduct is vital. Ukraine's energy sector should foster a culture of integrity and expect business partners to adhere to similar ethical values. Implementing a strategic scoring system for evaluating investment decisions can help Ukraine objectively assess and prioritize initiatives that contribute to sustainability goals. By following these steps, Ukraine can make

significant strides in achieving its sustainable development goals in the energy sector, ensuring a more responsible and environmentally conscious approach to energy production.

CONCLUSION

In conclusion, this thesis has underscored the critical importance of sustainable development for Ukraine amidst the challenges posed by Russia's full-scale invasion. The resilience of Ukrainian businesses, despite the adversities, reflects a strong commitment to sustainable growth and the potential for recovery through the adoption of European sustainable development models. The comparative analysis of European strategies and the adaptation of their best practices offer a strategic pathway for Ukraine to fortify its economy, enhance social welfare, and protect the environment.

Sustainable development is framed around the principle of meeting the needs of the present without compromising the ability of future generations to meet their own needs. Focusing on the economic dimension, sustainable development aims to foster economic expansion and prosperity while promoting efficient and fair resource use. This aspect highlights the creation of jobs, generation of income, and improvement of living standards, particularly for underprivileged and vulnerable populations. There are various interpretations of "sustainable enterprise development." However, several key aspects can be highlighted. First, it involves aligning and balancing economic, social, and environmental goals and outcomes. Second, it prioritizes long-term over short-term interests, with decisions made considering their impact on future generations. Third, it

encompasses a continuous process of improvement, seeking opportunities for enhancing sustainability through innovation, better management practices, and building partnerships with stakeholders. Business sustainability is a complex, multifaceted phenomenon, integrating several often contradictory and conflicting aspects.

The determinants of sustainable development in Europe are influenced by both internal factors specific to the region and external global trends. The primary aim of sustainable development in Europe is to achieve a balance between environmental protection, economic growth, and social equity, in alignment with the United Nations Sustainable Development Goals (SDGs). Europe's advancement in sustainable development is heavily shaped by strong policy frameworks across various levels of governance.

Governments worldwide are increasingly committed to implementing integrated policies and actions that address sustainable development and climate change objectives simultaneously. Consequently, there is a growing need to evaluate and communicate the multifaceted impacts of these policies to ensure their effectiveness in delivering diverse sustainable development and climate change benefits.

Greenhouse Gas (GHG) Protocol is the gold standard framework for emissions tracking, and a foundational framework for modern carbon accounting. Most organizations measuring their emissions in metric tons of carbon equivalents (tCO_2e) will use Greenhouse Gas Protocol's frameworks, and our own sustainability reporting software at Brightest is based on GHG Protocol's methodology.

Understanding and assessing the effectiveness of European sustainable development models necessitates a nuanced approach that focuses specifically on the methods used to evaluate and measure the progress of the Sustainable Development Goals (SDGs) within the context of European models. Dutch Doctor of Psychology Suzanne Brugman claims that measurement of sustainable development poses several challenges due to the complex and multidimensional nature of the concept. There is no universally accepted definition or set of indicators for sustainable development.

It is generally understood that there is no one-size fits all approach to implement the SDGs at national and subnational level, but there are lessons to be learnt between

countries. Following data collection at the country level, findings from country fiches were synthesized thematically and across all countries, particularly focusing on the seven governance elements for sustainable development that underpin this study. The assessment framework operates under the assumption that a higher degree of institutionalization is conducive to SDG implementation.

OMV, an international integrated oil and gas company based in Austria, has been actively involved in sustainable development, reflecting an industry-wide shift towards more environmentally conscious operations. It is actively transforming from an integrated oil, gas, and chemicals company into a leader in sustainable fuels, chemicals, and materials. Nevertheless, the process of restructuring the company for sustainable development is a lengthy one, during which both positive and negative changes can be seen over the course of a year.OMV's implementation of sustainable development An experience of this company can be used for Ukraine.

Ukraine grapples with severe environmental challenges, ranking among the most polluted and environmentally problematic countries in Eastern Europe. Environmental pollution levels in Ukraine far exceed those of other Eastern European nations by several multiples. The carbon intensity of GDP in Ukraine remains alarmingly high, standing at 4.5 times the global average and over 8 times higher than the OECD Europe average, while per capita emissions align with the global average.

Despite these challenges, Ukraine has taken steps to address environmental issues through domestic legislation, particularly in the realm of green finance. The implementation of the Ukrainian law on "Capital Markets and Organized Commodity Markets" in June 2021 introduced green bonds as a new financial instrument. These bonds, categorized based on the purpose of borrowed funds, signify a significant milestone in Ukraine's efforts to promote sustainable finance.

To further advance towards a sustainable and green economy, Ukrainian authorities could emulate the EU approach, establishing a clear and consistent framework to guide both public and private sectors. Enhancing financial institutions and markets, as well as developing new financial instruments, are essential components in this endeavor. Moreover, encouraging the implementation of environmental projects,

such as feed-in tariffs for renewable energies, can accelerate progress towards environmental sustainability.

Innovation also plays a pivotal role in addressing Ukraine's pollution challenges and improving air quality. By focusing on innovative solutions, Ukrainian authorities can effectively combat pollution and enhance environmental conservation efforts.

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Annex A

Climate change

Intensity Targets

Carbon intensity of operations

–20%	≥30%
Status 2023	**Target 2025**
Reduced carbon intensity of operations (Scope 1) vs. 2010	Reduce carbon intensity of operations (Scope 1) by ≥30% vs. 2010

Carbon intensity of energy supply

–1%	≥20%	≥50%
Status 2023	**Target 2030**	**Target 2040**
Reduced carbon intensity of energy supply vs. 2019	Reduce carbon intensity of energy supply by ≥20% vs. 2019	Reduce carbon intensity of energy supply by ≥50% vs. 2019

Carbon intensity of the product portfolio

–1%	>6%
Status 2023	**Target 2025**
Reduced carbon intensity of product portfolio (Scope 3) vs. 2010	Reduce carbon intensity of product portfolio (Scope 3) by >6% vs. 2010

Methane intensity

0.3%	≤0.2%	≤0.1%
Status 2023	**Target 2025**	**Target 2030**
E&P methane intensity	Achieve an E&P methane intensity of ≤0.2%	Achieve an E&P methane intensity of ≤0.1%

Absolute Targets

Scope 1

0.7 mn t	1 mn t
Status 2023	**Target 2025**
Reduced through concrete emissions reduction initiatives and divestments since 2020	Achieve at least 1 mn t of CO_2 reductions in 2020–2025 from operated assets

Scopes 1 and 2

–25%	≥30%	≥60%
Status 2023	**Target 2030**	**Target 2040**
Reduced Scope 1 and 2 emissions vs. 2019	Reduce Scope 1 and 2 emissions by ≥30% vs. 2019	Reduce Scope 1 and 2 emissions by ≥60% vs. 2019

Scope 3

–10%	≥20%	≥50%
Status 2023	**Target 2030**	**Target 2040**
Reduced Scope 3 emissions vs. 2019	Reduce Scope 3 emissions by ≥20% vs. 2019	Reduce Scope 3 emissions by ≥50% vs. 2019

Flaring and venting

53 mn m^3	0
Status 2023	**Target 2030**
Volume of gas routinely flared and vented in 2023 vs. 240 mn m^3 in 2022	Zero routine flaring and venting of associated gas as soon as possible, but no later than 2030

Annex B

Five-year summary

		2023	2022	2021	2020	2019
Sales revenues	in EUR mn	39,463	62,298	35,555	16,550	23,461
Operating Result	in EUR mn	5,226	12,246	5,065	1,050	3,582
Profit before tax	in EUR mn	4,604	10,765	4,870	875	3,453
Taxes on income	in EUR mn	–2,687	–5,590	–2,066	603	–1,306
Net income	in EUR mn	1,917	5,175	2,804	1,478	2,147
Net income attributable to stockholders of the parent	in EUR mn	1,480	3,634	2,093	1,258	1,678
Clean CCS Operating Result[1]	in EUR mn	6,024	11,175	5,961	1,686	3,536
Clean CCS net income[1]	in EUR mn	3,421	5,807	3,710	1,026	2,121
Clean CCS net income attributable to stockholders of the parent[1]	in EUR mn	2,593	4,394	2,866	679	1,624
Balance sheet total	in EUR mn	50,663	56,863	53,798	49,271	40,375
Equity	in EUR mn	25,369	26,628	21,996	19,899	16,863
Net debt	in EUR mn	2,120	2,207	5,962	9,347	4,686
Average capital employed	in EUR mn	27,720	29,431	29,366	21,555	19,923
Cash flow from operating activities excl. net working capital effects	in EUR mn	4,638	9,843	8,897	2,786	4,264
Cash flow from operating activities	in EUR mn	5,709	7,758	7,017	3,137	4,056
Capital expenditure	in EUR mn	3,965	4,201	2,691	6,048	4,916
Organic capital expenditure[2]	in EUR mn	3,748	3,711	2,650	1,884	2,251
Free cash flow	in EUR mn	2,682	5,792	5,196	–2,811	–583
Organic free cash flow[3]	in EUR mn	2,272	4,891	4,536	1,273	2,119
Return On Average Capital Employed (ROACE)	in %	7	17	10	8	11
Clean CCS ROACE[1]	in %	12	19	13	5	11
Return On Equity (ROE)	in %	7	20	13	9	13
Equity ratio	in %	50	47	41	40	42
Leverage ratio	in %	8	8	21	32	22
Earnings Per Share (EPS)	in EUR	4.53	11.12	6.40	3.85	5.14
Clean CCS EPS[1]	in EUR	7.93	13.44	8.77	2.08	4.97
Cash flow per share[4]	in EUR	17.46	23.73	21.47	9.60	12.42
Dividend Per Share (DPS)[5]	in EUR	5.05	5.05	2.30	1.85	1.75
Payout ratio[5]	in %	112	45	36	48	34
Employees as of December 31		20,592	22,308	22,434	25,291	19,845
Polyolefin sales volumes[6]	in mn t	5.69	5.66	5.93	5.95	5.59
Utilization rate steam crackers Europe[6]	in %	80	74	90	73	93
Fuels and other sales volumes Europe	in mn t	16.3	15.5	16.3	15.5	18.6
Utilization rate refineries Europe	in %	85	73	88	86	97
Production cost	in USD/boe	9.67	8.20	6.67	6.58	6.61
Total hydrocarbon production	in kboe/d	364	392	486	463	487
Total Recordable Injury Rate (TRIR)	in mn hours worked	1.37	1.23	0.96	0.60	0.95

[1] Adjusted for special items and CCS effects; further information can be found in Note 5 – Segment Reporting – of the Consolidated Financial Statements

[2] Organic capital expenditure is defined as capital expenditure including capitalized exploration and appraisal expenditure excluding acquisitions and contingent considerations.

[3] Organic free cash flow is cash flow from operating activities less cash flow from investing activities excluding disposals and material inorganic cash flow components (e.g., acquisitions)

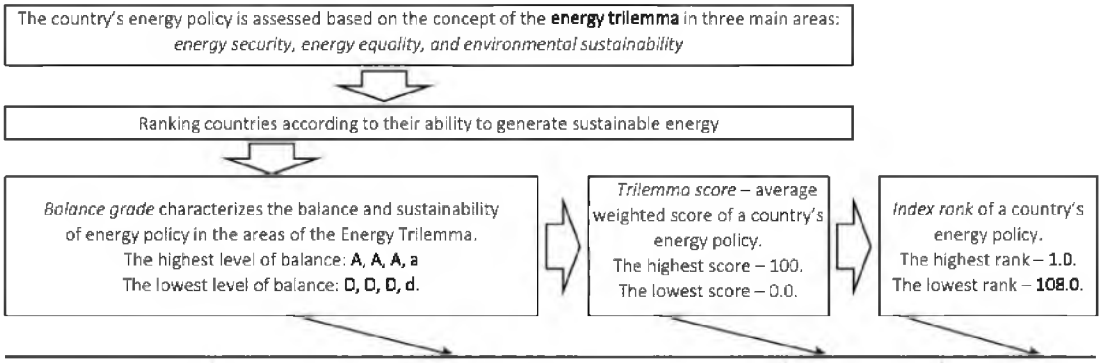
[4] Cash flow from operating activities, based on total weighted average outstanding shares

[5] 2023: as proposed by the Executive Board and the Supervisory Board, subject to adoption by the Annual General Meeting 2024. Includes regular and special dividend.

[6] As of 2021, the Downstream segment was split, and the Chemicals & Materials segment is reported separately. For comparison only, figures for the previous years are shown in the new structure.

Annex C

Source: Elaborated by the authors based on WEC (2021).



Country	Balance grade				Trilemma score	Index rank
	Energy security	Energy equity	Environmental sustainability	Context country		
EU countries with the highest level of energy policy balance: AAAa						
Sweden	A	A	A	a	84.2	1
Denmark	A	A	A	a	83.0	3
Finland	A	A	A	a	81.7	4
Austria	A	A	A	a	81.0	5
France	A	A	A	a	81.1	5
Germany	A	A	A	a	80.4	7
Other EU countries						
Luxembourg	C	A	A	a	76.9	10
Spain	A	B	A	a	76.9	10
Ireland	C	A	A	a	76.8	11
Belgium	B	A	A	a	76.3	12
Hungary	A	B	B	b	76.2	12
Lithuania	B	B	A	a	75.7	14
Portugal	B	B	A	a	75.6	14
Italy	A	B	A	b	75.4	15
Netherlands	B	A	B	a	75.3	16
Slovenia	A	B	A	a	74.9	17
Czech Republic	A	B	B	a	74.4	19
Estonia	A	B	B	a	73.9	20
Latvia	A	B	B	a	73.9	20
Malta	D	A	A	a	73.8	21
Romania	A	B	A	b	73.7	21
Slovakia	A	B	A	b	73.6	22
Croatia	A	B	A	b	73.4	23
Bulgaria	A	B	B	b	73,0	24
Poland	B	B	C	b	70.4	30
Greece	C	B	A	c	68.1	39
Cyprus	D	A	B	a	66.7	42
Eastern Partnership countries						
Azerbaijan	A	B	C	c	68.2	39
Ukraine	**A**	**C**	**B**	**d**	**66.5**	**43**
Georgia	C	C	B	b	66.2	44
Armenia	C	C	B	c	62.7	53
Moldova	D	C	D	c	56.5	68

Figure 1. Energy Trilemma Index of the EU and Eastern Partnership countries

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