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Master in Business Administration

Graduate Dissertation

“ESG criteria of sustainable development and their importance for
energy companies in Greece”

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Patras, Greece, May 2024

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energy companies in Greece”

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Devoted to my little son

Abstract

This thesis aims to analyze the criteria that have a direct relationship with both social and environmental performance of energy companies in Greece, but at the same time with the performance they achieve in terms of their corporate governance. These criteria have a high level of importance for a number of factors such as credit institutions and/or investors, who plan to invest in these companies according to the criteria of sustainable development. Through the study of ESG criteria and indicators, a «deeper» understanding will be achieved regarding the risks but also the opportunities that the energy companies in Greece are required to manage and face, in the context of promoting the energy transition towards a low-polluting economy.

The importance of the thesis is the new role that companies take on, through a new concept that applies, with their administrations, to carry out measurements, to publicize information and also in the effort to manage all the risks as well as the opportunities presented, and which are directly intertwined with sustainable development. Also, another very important section that concerns are the one that refers to whether investors take them into account, before making any investment move. With this knowledge, investors can form an opinion regarding the readiness and resilience of a company, so that it can successfully manage any changes that occur without causing problems to its operation or sustainability.

The thesis in question consists of five chapters in total, the first, its introduction, presents both the purpose and the objectives to be satisfied as well as the importance of the topic under consideration. At the same time, the chapter analyzes the proposed methodology to be adopted. In the second chapter the theoretical framework of operation and application of ESG criteria is analyzed, initially presenting the definition but also its historical path up to today. Also, the most important reasons cited for the necessity of applying the ESG criteria are presented, while a detailed discussion is made on the dimensions that make up the ESG criteria. The chapter concludes with the issue concerning the modern theories of ESG criteria

The energy sector in Greece is one of the two issues analyzed in this thesis. To this extend the third chapter discusses the most important elements concerning the professional sector in question, where initially the existing situation in Greece is captured and described. Also, an analysis is made in terms of the development of the specific branch of activity in Greece, while the most important companies active in the country today are presented based on

market shares. Special mention is made of the contribution of the energy sector to the economy of Greece in general, as well as to the sectors of public health and the environment. This third chapter concludes with the presentation and analysis of the most important challenges that the energy sector in Greece will have to face in the future, as well as the priorities that should be set at the policy level.

The second important part of the thesis under consideration refers to the adoption and application of ESG criteria by energy companies in Greece. This is the fourth chapter of the thesis where the importance of the specific criteria for the energy sector is analyzed, as well as the effects, positive and negative, that they bring. At the same time, the way in which the ESG criteria are adopted by the energy companies in the country is analyzed, while the most basic elements of the strategy that the energy companies should plan and implement, in the context of securing financing, according to the criteria in mind. The thesis concludes with the fifth chapter, where the main conclusions drawn from the previous analysis are presented, while at the same time the case of the most important company in the energy sector in Greece today, DEI SA, is studied and analyzed, regarding the adoption of a sustainable strategy and mainly regarding the delimitation to achieve a series of goals that focus on ESG criteria.

Keywords

ESG

Sustainability

Energy

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1. Introduction

1.1 Purpose of Thesis

The 2008 year is a landmark year for global entrepreneurship, since the financial crisis that broke out led to a significant change in both the way companies operate and how decisions are made (Boffo R., Patalano R., 2020). In addition, the new treaty that was formed brought to the fore the need for a new strategy that will focus on sustainability and the implementation of "green" investments, aiming to preserve and protect the environment. Within this context, the factors through which the real "value" of companies is formed were also institutionalized (Kiehne D., 2019). These factors are divided into three main categories related to the environment, society, and corporate governance. This triptych of factors is more widely known as ESG, with these acronyms referring to the words Environmental, Social and Governance.

Today, the number of companies that give priority to sustainable development is increasing, which, after all, as an issue mobilizes governments and societies in general, towards the adoption of new actions and practices (Pollman E., 2022). The role of companies is described through a new concept that applies, with their administrations, to carry out measurements, to publish data but also to try to manage all the risks as well as the opportunities presented, and which are directly intertwined with sustainable development. At the same time, another very important section that concerns ESG factors is the one that refers to whether investors take them into account, before making any investment move (Boffo R., Patalano R., 2020). Through this knowledge, investors are able to form an opinion regarding the readiness and resilience of a company, so that it can manage any changes that occur successfully and without causing problems to its operation or sustainability (Kiehne D., 2019).

The main purpose of this thesis is to study all the factors that shape the framework of ESG criteria in general at a theoretical level, while also analyzing their application to energy companies and their sector. This thesis will be carried out within the borders of Greece, through a critical overview of the importance of ESG criteria, focusing on the sustainability and development of companies in the energy sector and how through the adoption of these criteria, they can adopt a new and different operating culture.

1.2 Goals of Thesis

With reference to the objectives set to be achieved through the implementation of this thesis, these are formed based on the restructuring of the financing strategies as well as the operational approaches that the companies of all sectors and of course also the companies of the energy sector do, in the context of alignment with global sustainable development goals (Zhang C., Jin S., 2022). The companies in the energy sector offer integrated solutions of renewable forms of energy and support their transition towards a low – pollution economy, through the fulfillment of three main trends, which are also the goals sought to be achieved, through this thesis. These objectives are as follows (Kuzmina J., Atstaja D., Purvins M., Baakashvili G., Chkareuli V., 2023):

- Net – Zero Goal

The commitment to zero emissions represents a major shift in the models of major companies, with around a fifth of the 2,000 largest listed companies committing to Net – Zero targets.

- Divestment from fossil fuels and the rise of renewable energy sources

Approximately 50% of investment funds, including large investment funds, are divesting from fossil fuel investments, signaling a global shift towards renewable energy alternatives.

- Integrating carbon reduction targets into supply chains

The new European legislation is in place, highlighting the urgent need to integrate carbon reduction strategies into supply chain practices, affecting companies of all sizes, including hundreds of small and medium companies in Greece as well, outside of energy companies.

1.3 Importance of Thesis

This thesis what aims to analyze the criteria that have a direct relationship with both social and environmental performance of energy companies in Greece, but at the same time with the performance they achieve in terms of their corporate governance. These data have a high level of importance for several factors such as credit institutions or investors, who aim to place their capital in these companies according to the criteria of sustainable development. Through the study of ESG criteria and indicators, a «deeper» understanding will be achieved regarding the risks but also the opportunities that the energy companies in Greece are

required to manage and face, in the context of promoting the energy transition towards a low – polluting economy.

The importance of the thesis is the new role that companies take on, through a new concept that applies, with their administrations, to carry out measurements, to publicize information and also in the effort to manage all the risks as well as the opportunities presented, and which are directly intertwined with sustainable development. Also, another very important section that concerns ESG factors is the one that refers to whether investors take them into account, before making any investment move. With this knowledge, investors can form an opinion regarding the readiness and resilience of a company, so that it can successfully manage any changes that occur without causing problems to its operation or sustainability.

1.4 Methodology of Thesis

Regarding the methodology that will be adopted for the implementation of this thesis, it will be based on two main pillars: the first concerns the realization of a broad bibliographic review using a number of valid sources both on the internet and in studies or research that have been published by official international organizations for the most part. The second pillar concerns the realization of a research at a secondary level, where practically data will be collected from other corresponding studies and research that have been conducted and refer to the significance of ESG criteria for the companies of energy sector in Greece.

The reason for not undertaking primary research is because it is a set of criteria but also a strategic choice that does not show a significant past and consequently their application, especially in the case of the companies of energy sector in Greece is extremely short – term. What is sought through the implementation of the thesis is to collect as much data as possible from other primary research, so that there is a comparison and also a correlation of the conclusions obtained and then a critical analysis and overview is carried out, with the aim of presentation of the future main situation, as it can be shaped in Greece.

At the same time, another remark that should be made regarding the absence of a primary research is the one that refers to the impossibility of collecting primary data through conducting interviews (qualitative analysis) with market executives. Both the difficulty in approaching them, as well as the corresponding difficulty in finding available time on their part and collecting appropriate data, makes it impossible to implement such an action.

2. Theoretical Framework of Operation and Application of ESG Criteria

2.1 Definition of ESG Criteria

With reference to the concept and content of ESG, these focus on three main variables used, which are related to Environmental, Social, and Corporate, Governance (Eccles R., Elling Lee L., Stroehle J., 2019). Through the specific variables, the collective conscientiousness of an organization is evaluated, using factors with social and environmental content. ESG is a set of standards, related to the activities of an organization, and which in many cases are used by investors with the aim of the possibility of placing funds in it. With reference to the environmental criteria, through them is examined the way in which an organization can function against nature (Boffo R., Patalano R., 2020). On the other hand, regarding the social criteria, these examine the way in which an organization can manage the relationships it has both with its customers and suppliers, as well as with its employees, or even with the community within which it operates and is active (Eccles R., Elling Lee L., Stroehle J., 2019). Finally, regarding the corporate criteria, these refer to the examination of the leadership of an organization, to the amount of remuneration that its executives receive, but also to the internal audits that are carried out, through which its most efficient operation is sought.

However, as a concept, ESG is not stable, except for the three main variables that refer to Environmental, Social and Corporate Governance (Boffo R., Patalano R., 2020). As far as the interpretation of ESG is concerned, there is a discrepancy, as a result of which there is actually no common and clear definition. Therefore, without this common definition each professional in the field has developed their own methodology for measuring ESG and their own set of indicators (Kiehne D., 2019). Depending on the measurements and methodologies used, results may differ. They are a complex ecosystem of ESG metrics, data sources and scores that need timing to interpret, develop appropriate methodology and successfully use in analysis and investment decisions.

2.2 History of ESG Criteria

The first time that the concept of ESG appears is in 2004, in a UN Report which refers to the development of a joint initiative at the financial level (Kell G., 2018). This initiative had as its central content «the development of a series of guidelines and recommendations for the better integration of environmental, social and corporate governance issues in asset management, securities brokerage services and related functions (Pollman E., 2022)». Following the final endorsement of this effort through the Report, a study was published the following year (2005) that focused on whether ESG issues are relevant to ESG information in making investment decisions. In this Report for the first time the question of the use of ESG information is raised not only for use in the financial sector, but also for wider use.

In the years that followed, many important changes took place in the international business environment, which focused not only on the sustainability of companies, but also on the sustainability of the planet itself (Henisz W., Koller T., Nuttall R., 2019). Rising temperatures, the greenhouse effect, the risk of flooding and sea level rise, privacy and data security, demographic changes and regulatory pressures, etc., introduce new risk factors for investors that may had not been observed in the past and had not acquired such a significant importance (Lee M., Suh I., 2022).

As companies face increasing complexity on a global scale and greater control is required to properly manage modern risks, investors are re-evaluating traditional investment approaches (Saetra S., 2021). In previous years, socially responsible investing had a reputation for requiring compromise on the part of the investor due to limiting the range of companies eligible for investment, limiting the investor's potential profit (Kell G., 2018). «Bad» companies have sometimes performed very well, at least in terms of their share price. However, in recent years, on an almost daily basis, modern news headlines include data breaches, oil spills, rescues, product recalls, foodborne illnesses, and emissions scandals (Lee M., Suh I., 2022). These events reduce corporate profits, increase the cost of capital, and almost overnight, destroy a corporate reputation that took years to build.

2.3 Reasons of Applying ESG Criteria

Regarding the reasons that dictate the application of ESG factors, these are formed through the existence of a multitude of incentives that entrepreneurs consider in order to proceed with any of their investment moves and also in the implementation of their strategic

decisions (Friede G., Busch T., Bassen A., 2015). However, it is not always clear and unambiguous in all cases that ESG factors are those that are directly related to the achievement of a specific company performance and, by extension, to securing the relevant benefits (Halbritter G., Dorfleitner G., 2015). Therefore, the number of factors that drive business interest in the implementation of ESG investments is quite significant and varied. In summary, it could be stated that the most important factors that motivate an ESG investment strategy are as follows:

- first factor is the one related to the fact that investors wish to implement investments that are distinguished by their long – term duration, since those investments that have a short – term horizon in many cases entail the existence of a greater level of risk (Saetra S., 2021). Also, another element of long - term decisions is that they can be made more easily, compared to the corresponding short – term ones, because, in the first case, investors have more information about a company at their disposal and, consequently, the factors ESG may constitute a more important part of this information
- second factor is the one related to the existence of sufficient knowledge regarding the intangible assets of a company, with this knowledge being able to work in favor of undertaking an investment that will focus on the various ESG criteria (Boffo R., Patalano R., 2020). Regarding the evaluation of the expected return that an investment can have for a company, this may simply exceed the evaluation performed on its financial assets. However, investors who are interested in investing their capital should have an overall picture of the company's valuation, in order to then determine its market value as accurately as possible (Halbritter G., Dorfleitner G., 2015). Also, in the context of this investment decision made, the fact that companies make many and important efforts to invest in their human resources, through the training of their employees but also through the observance of a set of safety standards and regulations, with the goal of building a proper reputation.
- third factor is also the one that refers to the fact that in the context of making ESG investments, helpers are both the entrepreneurs themselves, the media and the governments of the countries (Friede G., Busch T., Bassen A., 2015). Through this support, all those involved contribute to fueling the rapid development of ESG investments, which is also a central goal of the strategy of various companies, in the

context of increasing their responsibility (Halbritter G., Dorfleitner G., 2015). Especially with regard to this specific dimension, what is mentioned is that in recent years there has been a significant demand for a series of environmental issues, while companies are now turning towards the satisfaction of those customers who are more socially conscious. For this reason, after all, companies have as their main goal to become more responsible regarding the effects of their activities both on the environment and on society in general, while they are also interested in the adoption of appropriate work practices. Therefore, today companies are putting more emphasis on ESG indicators and factors, while also improving the level of transparency in their transactions, as well as the way they operate, seeking to be as competitive as possible.

2.4 ESG Criteria Dimensions

2.4.1 Environmental Governance

In recent years, there have been an increasing number of opinions regarding the fact that extreme temperatures and water scarcity, as well as the climate crisis in general, threaten the economic development of the various regions of the world. Indicatively, it is mentioned in a study by the McKinsey Global Institute in 2020 that, in 2003, from the heat that broke out at the level of the European Union, more than 15 billion dollars were lost in the effort of countries to deal with the adverse effects (McKinsey Global Institute, 2020). More generally, this condition in which countries try to deal with adverse effects at the environmental level, constitutes the «E – Environmental» factor of Environmental Governance. More generally, through this specific factor, it is studied at the ESG level to what extent companies can perform, as managers of the natural environment.

Regarding the criteria that examine this specific factor, these may include (Boffo R., Patalano R., 2020):

- The individual waste management program
- The ways in which a company can handle and deal with the various problems related to the pollution of either water or air and which are created by its operation
- How supply chains are organized and operate in the context of the least possible burden on the environment from transportation

In addition to the above, there are also a few other criteria such as the conservation of natural resources, the possible deforestation, but also in general, biodiversity conservation practices in terms of the land and areas that a company can dispose of (Saetra S., 2021). There are five ways in which the value of a company can be linked to the Environment and these ways are as follows (Henisz W., Koller T., Nuttall R., 2019):

1. Cost reduction
2. Top growth
3. Employee productivity level
4. Level of regulatory interventions
5. Optimizing the company's investments and assets

To understand the above, an example can be used that concerns product distribution companies, which in recent years have made efforts to convert their fleet of vehicles from conventional to hybrid or even electric (Capelle – Blancard G., Monjon S., 2012). This act of theirs can ensure for the environment its least impact by at least fifty million gallons of oil on an annual basis, an extremely large amount considering the number of vehicles in circulation (Henisz W., Koller T., Nuttall R., 2019). Also, another parameter is the one related to the strategy of projecting and promoting for companies an environmental profile that attracts employees to work in it, knowing and understanding the importance of environmental protection. Through this strategic move the company can employ better workers with higher productivity and of course with better results for its shareholders.

2.4.2 Social Governance

Regarding the social factors that influence the various aspects of ESG, these refer to a multitude of issues, but mainly focus on the social relationships that develop in the world of companies (Amel - Zadeh A., Serafeim G., 2018). One of the most basic relationships are the one that a company has with its employees and which relationship is formed through a series of factors, such as:

- Providing workers with an «appropriate» remuneration for the services they provide, which should be governed by fairness but in some cases should also be generous about the comparison that may exist between different jobs (Capelle – Blancard G., Monjon S., 2012)

- It is also the provision of pension plans to the employees, with the company itself contributing from its side to the reinforcement of the specific amount of the plan
- The provision of additional benefits to employees that ensures them additional motivation for increased productivity (Amel - Zadeh A., Serafeim G., 2018)
- The creation and implementation of appropriate educational training and skills acquisition programs, which give employees the opportunity to have better knowledge of their work and in general to acquire more skills to support their future professional development.
- Operating in an environment of commitment between the two sides, which increases the employee's feeling of trust towards the company where he is employed (Lee M., Suh I., 2022)
- Observance of working hours, which largely ensures employees the possibility of maintaining a balance between their professional and personal lives (Amel - Zadeh A., Serafeim G., 2018)
- The complete protection of all those rights related to the diversity of employees or even the prevention of events linked to the occurrence of incidents of sexual harassment (Capelle – Blancard G., Monjon S., 2012)

In addition to the above, regarding the Social (S) factors of ESG, issues related to both the company's mission and its goals are also studied, in terms of investigating whether these two promote and benefit the social equality (Lee M., Suh I., 2022). The examination of the specific factors is done in the light of the extent to which companies return to the economies and societies a part of their profits or even to what extent they encourage their employees to take part in various voluntary activities (Amel - Zadeh A., Serafeim G., 2018). Also, another factor that is being studied is the one that refers to the effectiveness presented by the customer management department, in terms of forming and maintaining relationships with their customers, but also with how the human resources management department proceeds to take actions related to the proper management of relations between employees, as well as the protection of these relations between them.

2.4.3 Corporate Governance

Corporate Governance, as it is formed in the context of ESG, its content refers to and is related to companies' ethics. Practically, it concerns the way in which a company is managed by its senior executives, as well as the care that exists on the part of the Board of

Directors as well as the executive management, in relation to the protection of the interests of the parties involved, as it is for example employees, suppliers, customers and of course shareholders (Auer B., Schuhmacher B., 2016). In this context, the transparency of the company is studied at the accounting and financial level, as well as the provision of complete and objective financial information. Also, another very important element is that which refers to the way of action of the members of the Board of Directors of the company, which should be governed by the existence of a relationship with a high degree of trust with its shareholders, to avoid either conflicts or the conflicts between them and of course that there are no conflicting interests (Buallay A., 2019).

In addition to the above, another very important parameter that is studied in the context of ESG factors is the one that refers to the issue of the compensation of company executives (Auer B., Schuhmacher B., 2016). In particular, future or existing investors in a company take very seriously and evaluate appropriately the receipt by the executives of very high bonuses for productivity or achievement of goals, with the existence of such a condition not being evaluated positively, in fact, at the moment when possibly in case of this company that the rest of the employees who are lower in the hierarchy do not receive any increase in their salaries at all (Buallay A., 2019).

2.5 Modern Theories of ESG Criteria

As a concept and content, the theory of ESG factors first appeared in 2004, in a UN Report, which referred to the undertaking of a series of joint initiatives by financial institutions, with a focus on the development of those guidelines, through which it would be possible to better integrate those issues that touch both the environmental and the social as well as the corporate governance, for a series of banking functions, such as asset management, but also securities services (Buallay A., 2019). However, to reach the year 2004 and the identification of the ESG factors, the formulation of certain theories has proceeded, on which the formation of the final content was based. These modern theories that have acted as a precursor to ESG are:

- Theory of Shares or Shareholder Value Maximization
- Stakeholder Theory
- Theory of Sustainable Development

According to the theory of Shares or the Maximization of Shareholder Value, this refers to company's ethics, as formulated by the economist Friedman M., in 1970, in the context of the view that the shareholders of a company are also the ones who have the sole responsibility for it (Friedman H., Heinle M., Luneva I., 2021). The shareholders of a company are the economic driving force of the company and at the same time they are the only practical partner to whom the company is shown to be socially responsible. Consequently, the main objective that a company aims to satisfy is also the one that refers to the maximization of its performance, in the context of the satisfaction of its shareholders (Schanzenbach M., Sitkoff R., 2020). Then, it is the shareholders who make the decision about the social initiatives they can and should undertake and participate in, without leaving the responsibility for this decision to those executives who work for the company, without owing it.

Also, according to this theory, the main purpose of the company is to ensure as many sales and profits as possible, but through the observance of the basic and elementary social rules, which either concern the current legislation or concern ethics (Friedman H., Heinle M., Luneva I., 2021). The specific reasoning has as its focus both the achievement of company's profits, but mainly the satisfaction of the specific purpose, in the context of its integration into the ethics of the social whole. In conclusion, this is a theory that had many applications in corporate strategies, but at the same time, it was also criticized, mainly due to the design of a strategic plan from the side of businesses, which focuses on the achievement of profit.

According to the Stakeholder theory, it over – themes the interconnected relationships that exist between companies, their investors, their customers, their suppliers, their employees and in general, the wider community that seek to ensure a benefit within the companies. Based on the specific theory, what is supported is that a company is called upon to create value for all its stakeholders, as described above, and not exclusively for its shareholders (Schanzenbach M., Sitkoff R., 2020). At the same time, the specific theory is applied in the context of the exercise of management and the existence of a business ethics, which can deal with the values and morals of a company, at the management level. This theory is the focus of the study of companies' ethics, serving as a platform focused on the adoption and practice of a modern management style (Zhang C., Jin S., 2022). From the beginning of the 1980s onwards, the acceptance and application of theory at the company level has been important, while at the same time all the researchers and scholars openly referred to the fact

that the viability of a company cannot be positively influenced by the ensuring as an exclusive objective the profitability of its shareholders (Schanzenbach M., Sitkoff R., 2020).

Finally, the theory of Sustainable Development is the one that focuses on ensuring a development through which the needs of current people and generations will be satisfied, without at the same time putting in doubt the development of the corresponding future ones (Zhang C., Jin S., 2022). Sustainable development according to this theory is based on four different dimensions, which concern society, the environment, culture and the economy, with each of these dimensions showing a connection with the others, without operating independently. The specific theory sought to have an approach that would have a multilateral character, in terms of ensuring a sustainable development, mostly raising environmental issues, with the aim of protecting the environment and parallel development at all levels. The main goals to be achieved through this specific theory are mentioned (Buallay A., 2019):

- in reviewing a series of critical issues concerning both the environment and development, while also formulating solutions aimed at taking actions that are both innovative and realistic
- in the strengthening of cooperation between states, with a focus on development and environmental protection, in order for this cooperation to be exploited and at the same time an evaluation is made regarding the adoption of new standards that will positively influence those policies that lead to the adoption of the appropriate changes
- to increase the level of commitment as well as action, not only of companies but also of individuals, governments and agencies participating in a social, political and economic system.

3. Energy Sector in Greece

3.1 Current Situation of Energy Sector in Greece

3.1.1 Main Sources of Energy in Greece

The main source of energy in Greece is lignite, which accounts for up to 30 percent of the country's primary energy consumption. This is a domestic fuel and 97 percent is mined by the Public Electricity Company (Kyriakopoulos L., 2018). The two main sources of energy used by Greek households are oil products and electricity. The share of electricity in household energy consumption has increased over the years, from 1965 to 2001. In addition, agricultural and livestock waste can be a significant energy source in Greece, with a theoretical estimated energy of up to 77 TWh (Lavidas G., 2019). However, renewable energy sources such as wind and solar have a very small share of the energy mix. Residential buildings in Greece consume about a quarter of the total final energy consumption, and space heating and domestic hot water are the main final energy uses in these buildings. Therefore, lignite is the main source of energy in Greece, followed by agricultural and livestock waste.

The energy sector in Greece is highly dependent on imports and has a long history of foreign energy dependencies (Loizou F., 2015). Although there are policies for sustainable development the industry has an environmental impact, with the electricity sector contributing around 40% of the country's total greenhouse gas emissions. Greece has prospects for renewable energy sources and the introduction of natural gas has offered to the country a new opportunity to become a hub in wider international system transportation (Karagianni S., 2021). To reduce greenhouse gas emissions, Greece needs to implement CCS technology, to increase electricity production and to diversify its energy mix. The integration of wave energy can also contribute to energy independence and job creation and the right one inverter choice can lead to significant energy benefits.

The Greek region is often overlooked because of its lower resources, but the milder resources offer opportunities to reduce costs in devices and energy (Kyriakopoulos L., 2018). The energy sector in Greece focuses on domestic, industrial, commercial and agricultural interests and the regional units can be classified into two typologies based on their energy characteristics (Loizou F., 2015). Developments in the prices of imported

energy are critical for examining the prospects of the lignite industry in Greece. Thus, Greece faces many challenges in its energy sector and the future energy policy will be based on planning decisions to achieve the goal of getting rid of carbon emissions (Lavidas G., 2019). New methodologies are being developed to comply with the European energy strategy for 2050 and the aim is to achieve significant de - carbonization of the energy system by 2050, while maximizing the penetration of renewable in electricity. The transport sector must also be intensively electrified, while the electrical interconnection of unconnected islands is also a focus.

3.1.2 Development of Energy Sector in Greece

Energy poverty is a problem in Greece and has increased during the economic crisis. In 2004, 11.3% of households spent more than 10% of their income in heating and electricity. Research activity on energy poverty in Greece is limited. Reducing energy consumption was due to the decrease in income and the increase in oil prices, resulting in a decrease of about 15% in the winter of 2011 – 2012 (International Energy Regency, 2017). This reduction in energy consumption has had a negative impact on people's quality of life. Before 2010, the Greek state was inactive in establishing laws for the thermal protection of buildings. However, in 2010, Greece introduced the «KENAK» regulation, which was the basic regulation for the thermal protection of buildings. This lack of thermal laws protection of buildings was the reason why Greece had the highest energy consumption in Europe in the period 2011 – 2012 (Hellenic Association for Energy Economics, 2023). Since then, Greece has gone through important institutional changes in the energy sector, such as changes in the energy mix, penetration of renewable energy sources and attraction of foreign investment. Greece has valuable and exploitable potential in several Renewable Energy Sources and the production of electricity from these sources can significantly contribute to the energy security of the states and to the protection of the environment.

The economic crisis significantly affected the energy sector in Greece. During this period, however, the changes that took place in the sector of energy, because of the country's institutional obligations for harmonization with European standards, were many. These changes substantially changed several of the structural characteristics of the energy sector and now facilitate its adaptation to the challenges it has to face in the future (International Energy Regency, 2017). The electricity sector in Greece is characterized by milder

compared to the past structural imbalances and high concentration, especially in the electricity supply sector, high dependence until recently on fossil fuels, relatively high electricity costs in the wholesale market and weak connectivity with the retail market, partly due to the significant percentage of regulated charges and taxes in electricity tariffs (Hellenic Association for Energy Economics, 2023).

For several years, the limited competition in the electricity market was mainly due to the lack of access of new entrants to lower cost primary energy sources (lignite and hydroelectric power generation) (International Energy Regency, 2023). This was sought to be corrected with various regulatory instruments to increase competition, such as the obligation to reduce the share of the dominant company (DEI S.A.) in the retail market, with a simultaneous auction of part of its lignite production (NOME auctions). These arrangements, although they activated competitive forces in the retail market, limiting the share of DEI SA and caused significant losses to the company (Hellenic Association for Energy Economics, 2023). The NOME auctions were abolished in the autumn of 2019, following unsuccessful attempts to sell part of the lignite portfolio of the mines, due to the significant changes in the economic data of lignite power generation, which led, together with the environmental arm, to the decision of the government for complete decommissioning of lignite power generation units by 2028.

The electricity market, in important aspects, is also affected by the huge amount of arrears in electricity tariffs (about 2.7 billion Euros at the end of 2022), also a result of the financial crisis of the previous years (International Energy Regency, 2023). The collection rate of overdue accounts, despite showing some signs of improvement, remains low and needs strengthening, especially in view of the deepening recession of the economy, by the end of this year (Hellenic Association for Energy Economics, 2023). On the other hand, the existence of unpaid bills prevents the further development of competition in the retail market, which, combined with the changes in the wholesale market organization model, will lead to drastic changes in the operation of the electricity market in the country. The energy infrastructures in several cases do not meet the requirements that will ensure the path of transition towards an energy system with low greenhouse gas emissions.

Electricity transmission and distribution networks to deal with saturation issues which will become more acute as the penetration of renewable energy sources further increases

(Hellenic Association for Energy Economics, 2023). The interconnections of the autonomous island systems with the continental electricity system are not complete, while the electricity losses in the networks are significant, but are decreasing with the development of decentralized generation. The better use of renewable energy sources and the cessation of electricity production from polluting plants on the islands depend on the completion of these investments (International Energy Regency, 2023). There has been a relative lag in the development of «smart» electricity distribution networks and the installation of «smart» meters, which will enable consumers to benefit from improved energy efficiency and demand response mechanisms, while providing flexibility to the electricity system.

Finally, regional integration of the domestic electricity market with wholesale markets in neighboring electricity systems is underway (Hellenic Association for Energy Economics, 2023). Steps have been taken to implement the rules of the internal electricity market, which will allow connection to the wholesale markets of Italy and Bulgaria and, in the future, to neighboring Energy Community systems. The Hellenic Energy Exchange, established in 2018, is speeding up this process, along with other bodies such as the Thessaloniki – based Regional Electricity Control Center for Southeast Europe, which has recently been established to ensure the coordination of the country's electricity markets of Greece, Bulgaria, Romania and Italy (International Energy Regency, 2023). Despite the weaknesses and related delays, significant changes were carried out in the previous years, aimed at adapting the domestic energy sector to new conditions, strengthening competition and attracting investment.

3.2 Energy Sector and Market Shares in Greece

Energy in Greece is mostly provided by the Public Electricity Company S.A. (DEI S.A.). In January 2023 D.E.I. SA. held the 64,50% market share of energy demand in Greece. Electricity production in Greece comes mostly from natural gas (42% i.e. 1.998 MW), followed by Renewable Energy Sources with 741 MW (16%) of electricity production, lignite 4% with 190 MW and hydroelectric plants with 167 MW (3%) (Regulatory Authority for Energy, 2023). The remaining 35% of the total demand of 4.850 MW comes from the interconnection balance (479 MW from Italy, 103 MW from Albania, 280 MW from North Macedonia, 339 MW from Bulgaria and 471 MW from Turkey). In 2008 renewable energy sources accounted for 8% of the country's total energy consumption, a slight increase from

the 7.2% estimated in 2006, but still below the European Union average of 10% for 2008. The 10% of the country's renewable energy comes from solar energy, while most energy comes from biomass and waste recycling. In 2013, according to the Independent Electricity Transmission Operator in Greece (ADMIE), more than 20% of electricity in Greece has been produced by renewable energy sources and hydroelectric power systems. This percentage, in April 2023, rose to 42% (Regulatory Authority for Energy, 2023).

Next, a series of statistics are presented regarding the energy sector in Greece, the market shares of the companies operating in the country and energy production in general.

Company	2015	2016	2017	2018	2019	2020	2021	2022	2023
DEI S.A.	97,40%	96,60%	94,30%	89,50%	84,90%	79,40%	71,40%	67,10%	64,50%
Protergia	0,01%	0,03%	1,07%	2,44%	3,39%	4,17%	5,61%	7,66%	6,97%
Elpedison	0,84%	1,09%	1,63%	2,49%	3,47%	3,39%	5,18%	4,64%	5,90%
HERON	0,87%	1,09%	1,63%	2,49%	3,19%	4,09%	5,18%	6,03%	6,48%
Watt & Wolt	0,17%	0,20%	0,29%	0,76%	1,33%	1,91%	2,63%	2,81%	2,33%
NRG	-	0,09%	0,37%	0,70%	0,89%	1,36%	2,26%	3,46%	4,36%
Volton	-	-	-	-	0,13%	0,43%	1,03%	1,39%	1,47%
KEN	-	-	-	-	0,30%	0,90%	0,83%	0,59%	0,72%

Table 1: Market Share of Energy Companies in Greece (2015-2023)

(Regulatory Authority for Energy, 2023)

2014	2015	2016	2017	2018	2019	2020	2021	2022
64,369	53,368	43,468	57,003	61,712	64,369	46,503	119,934	242,688

Table 2: Average Energy Value

(Regulatory Authority for Energy, 2023)

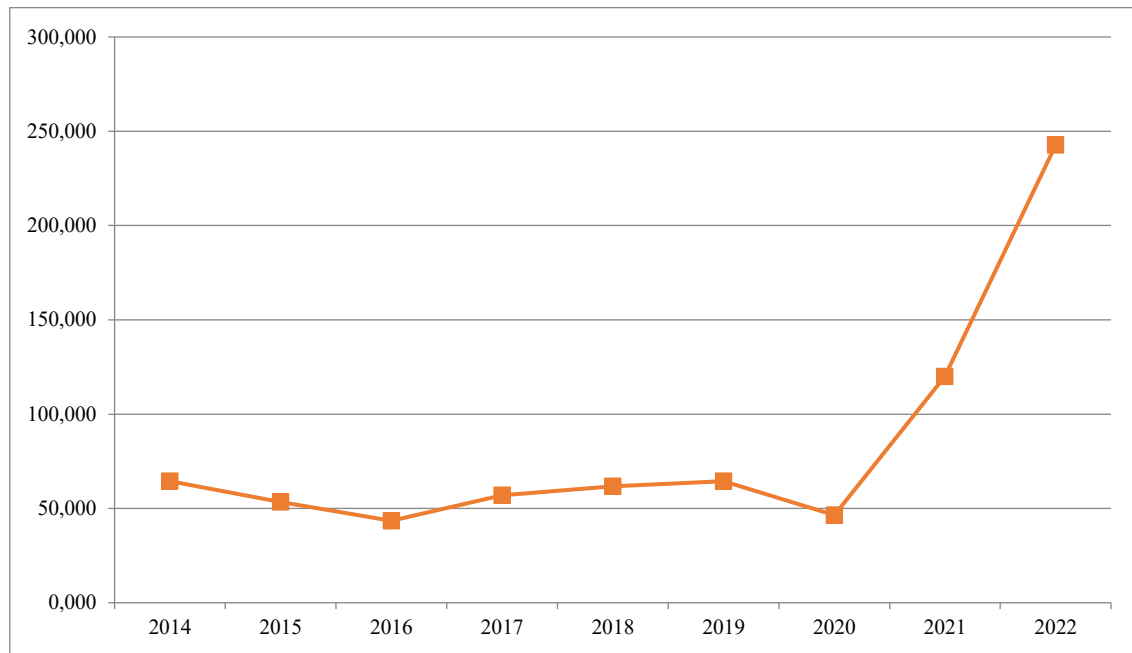


Figure 1: Average Energy Value

(Regulatory Authority for Energy, 2023)

	2022	2021	2020	2019	2018	2017	2016	2015
European Union	192.231	178.826	168.729	153.730	141.726	129.060	117.383	105.696
Greece	3.576	2.844	2.651	2.374	2.135	1.980	1.865	1.749

Table 3: Wind Energy – Average in European Union and Greece (2015 – 2022)

(Regulatory Authority for Energy, 2023)

3.3 Contribution of Energy Sector to the Economy of Greece

The energy sector can be a key factor in stimulating growth and creating employment in Greece. According to studies, green investments in energy efficiency and renewable energy technologies can create up to 108,000 jobs in Greece. This can be achieved through investments of 47.9 billion Euros over the period 2020 – 2030 (Lavidas G., 2019). Energy efficiency investments are more labor intensive than renewable energy projects, leading to more job creation. In addition, the implementation of energy saving measures and renewable energy technologies would have macroeconomic effects on production and employment in the Greek economy, with an average annual increase of the national product of 9.4 billion

Euros (Markaki M., 2023). The energy sector can also drive economic activity through exports and cross-sector linkages, as well as commitments and measures to limiting CO₂ emissions towards the Kyoto targets. However, it is important to note that the introduction of the necessary equipment can reduce the effects of production and employment, so the benefits of the energy sector must be carefully evaluated (Karagianni S., 2021).

The energy sector in Greece has a significant impact on employment. The primary sources of energy production in Greece are lignite and natural gas power plants (Tsakiris T., 2021). The employment intensity of lignite power plants is much higher compared to natural gas power plants due to the labor-intensive mining and transportation of lignite. The employment intensity of natural gas power plants is lower because of the lower labor requirement for fuel transportation (Markaki M., 2023). The closure of lignite plants power generation is likely to have a significant negative impact on employment in Greece, as employment generated by the energy sector is mainly concentrated in areas where the lignite plants are located. The underemployment rate and the population at risk of poverty in the energy producing region are also high (Karagianni S., 2021).

On the other hand, the Public Electricity Company S.A. (DEI S.A.) contributes to the creation of almost 50% of jobs in the secondary sector in the region of Western Macedonia (Tsakiris T., 2021). Each of the 5,000 jobs at DEI S.A. maintains 3.5 – 4 indirect jobs in the local labor market. The energy sector showed an increase in employment as well and during the financial crisis, offsetting losses and creating a comparative advantage for the region (Lavidas G., 2019). The energy sector provides employment opportunities both locally and nationally in Greece and energy investments in the power generation sector create significant employment opportunities in Greece (Markaki M., 2023). The stages of the fuel cycle include power plant construction, fuel extraction, plant operation and waste management, and the energy sector provides employment opportunities at all stages of the respective fuel cycles in Greece.

Job creation remains significant even with limited installed capacity compared to other European markets, and most of employment in the energy sector in Greece is concentrated in temporary and industrial activities (Karagianni S., 2021). Stable long – term policies are needed to strengthen the sectoral value chain and the energy sector has created a significant number of jobs in Greece. However, Greece's energy producing region has the highest

unemployment rate in the country and the energy sector does not appear to have a positive impact on employment in Greece. Moreover, an accelerated energy transition is likely to destroy jobs in the energy producing regions of Greece, as the negative socio – economic externalities of the energy transition will be amplified without strong economic support measures. Therefore, the impact of the energy sector on employment in Greece is closely linked to the impact of de-lignification on income distribution (Lavidas G., 2019).

3.4 Contribution of Energy Sector to the Environment and Public Health of Greece

The Greek electricity sector has a direct impact on the environment, with 91% of total CO₂ emissions attributable to the energy sector (Georgakellos A., 2010). The overall increase in CO₂ emissions since 1990 has been 18%, with a high annual growth rate since 1996 due to the electricity generation and transport sectors. CO₂ is the main contributor to greenhouse gas (GHG) emissions in Greece, representing 81% of the total. To reduce these emissions and reduce environmental impacts, the internalization of environmental externalities could influence energy prices in Greece (Markaki M., 2023). The external cost of greenhouse gases produced during the production of electricity in thermal power plants in Greece is particularly high, especially in lignite plants. Internalizing these external costs would result in an average increase of 52% in generation costs, which in turn would affect electricity prices. However, there are limitations to this methodology, such as data limitations and cost-related assumptions and exclusions or omissions of cost elements (Vlassopoulos C., 2020). The investments required for the implementation of energy saving measures and the promotion of renewable energy technologies have been estimated at 47.9 billion Euros in the period 2020 - 2030, which is expected to lead to an average annual increase in the national product of 9.4 billion Euros and create 108,000 full-time equivalent jobs.

The decision to phase out lignite by 2028 will have a huge impact on public health in Greece. Lignite has been used as a source of electricity in Greece for centuries, but its use has become an environmental and health problem (Markaki M., 2023). Combustion of lignite releases several pollutants into the atmosphere, which can have negative effects on public health. In addition, the use of lignite has become detrimental to the national economy. The high cost of producing lignite and the cost of cleaning up the environment have both been found to be detrimental to the economy. In addition, resistance to change in the energy sector

has led to a major crisis (Vlassopoulos C., 2020). Greece was forced to look for alternatives to lignite, such as solar, wind and biomass energy. The introduction of these renewable energy sources will be beneficial for the environment, economy and public health. The transition to renewable energy sources will also help reduce energy dependency, making Greece more energy efficient. In addition, this transition is expected to increase employment opportunities and reduce air pollution. This, in turn, will lead to improved public health, increased economic growth and improved energy security.

3.5 Main Challenges and Policy Priorities in Energy Sector

The war in Ukraine had a significant impact on the Greek energy sector. This has been seen in the form of oil and gas blockades, which were used during the oil crisis of the 1970s and are now used as a form of political leverage. The Greek NECP and Climate Law, which were expected to enter into force by 2030, have been affected by the energy dynamics of natural gas prices (Tsakiris T., 2021). The conflict also led to the reconstruction of energy infrastructure in Serbia after the war in Ukraine, which had a significant impact on Greek energy demand. In addition, Greece's ecological system has been significantly affected due to the war in Ukraine, and the country had to strategically develop its energy production. This led to increased cooperation between Ukraine and the Hellenic Republic and Greece's performance improved on the business impact of energy sector rules and regulations.

More generally, the electricity sector in Greece is characterized from milder compared to the past, structural imbalances and high concentration, especially in the electricity supply sector, high dependence until recently on fossil fuels, relatively high costs of electricity in the wholesale market and its weak connection to the retail market, in partly due to the significant percentage of regulated charges and taxes in electricity tariffs (Vlassopoulos C., 2020). For several years, the limited competition in the electricity market was mainly due to the lack of access of new entrants to lower cost primary energy sources (lignite and hydroelectric power generation) (Tsakiris T., 2021). This was sought to be corrected with various regulatory instruments to increase competition, such as the obligation to reduce the share of the dominant company (DEI S.A.) in the retail market, with a simultaneous auction of part of its lignite production. These arrangements, although they activated competitive forces in the retail market, limiting the share of DEI S.A. caused significant losses to the company.

The radical transformation of the energy sector in Greece, in the context of the European Union's strategy to achieve the long-term goal of climate neutrality by 2050, will require significant investments in the next few years, among others, for (Vettas N., Danchev S., Maniatis G., Paratsiokas N., Balaskas K., 2022):

- Improving energy efficiency
- Further development of energy production using technologies utilization of renewable energy sources
- Critical energy grid infrastructure to facilitate the development of renewable energy sources and the coupling of end-use sectors energy
- Just transition of areas dependent on lignite

Investments in the energy sector, which will be financed by public and private resources, will stimulate the growth dynamics of the Greek economy, improve energy productivity, facilitate the development of innovative activities, drastically reduce the environmental footprint of the energy system and enrich the choices of energy consumers (International Energy Regency, 2023). The energy sector in Greece is called upon to face the significant challenges associated with the process of liberalization and integration of the energy market and the strategic choice of the European Union for sustainable development, which ultimately determine its contribution to the development of the Greek economy in the coming years (Vlassopoulos C., 2020). However, to realize these goals, a systematic effort, consistent planning, securing of resources, organizational skills and monitoring of progress within a framework (organizational, regulatory, investment) that will provide the necessary incentives and effectively utilize the available resources are required. Some indicative priorities and actions are as follows (Vettas N., Danchev S., Maniatis G., Paratsiokas N., Balaskas K., 2022):

- ***Energy saving***

Energy conservation is one of the key pillars that will support the transition towards climate neutrality, but at the same time the required drastic improvement of energy productivity through the implementation of measure spolicy, is characterized by uncertainties. It is necessary to define and systematically monitor a national strategy for upgrading buildings

and improving energy efficiency in the residential building sector and in buildings for professional use (International Energy Regency, 2023)

- ***Electricity market***

Ensuring a competitive electricity market with sufficient liquidity, effective supervision and financial integrity and reliability, which will contribute to the reduction of electricity costs (Vlassopoulos C., 2020). Maintenance of existing and implementation of new measures to reduce the energy costs of industrial enterprises (compensation of indirect costs of electricity emissions, review of network charges, etc).

- ***Electricity distribution network***

Digitization and upgrading, which will contribute to the creation of highly flexible conditions for the operation of the energy system (International Energy Regency, 2023). Finalization of a model for making an investment in «smart» meters and «intelligent» electricity distribution networks and sources of financing. Introduction of financial incentive mechanisms in the regulated charges of the networks. The electricity distribution network is a critical infrastructure for the transformation of the energy system and the realization of its de - carbonisation vision (Vettas N., Danchev S., Maniatis G., Paratsiokas N., Balaskas K., 2022). The technological upgrade and transition of the distribution network to the digital age is a basic condition both for the improvement of its operational parameters and reliability, as well as for the further development of the domestic energy markets. It will also significantly facilitate the achievement of energy planning objectives, which envisage an ever-increasing role for renewable energy sources and decentralized generation and improving energy efficiency at all levels (Vlassopoulos C., 2020)

- ***Energy Infrastructures***

Promotion and implementation of transmission, distribution and storage projects in the electricity and natural gas transmission, distribution and storage networks. Strengthening electricity and natural gas network interconnections with neighboring countries. Development of electric car recharging network. Support of renewable energy sources that related to new technologies (e.g. hydrogen, bioeconomy, etc.) and «green» transport (Vettas N., Danchev S., Maniatis G., Paratsiokas N., Balaskas K., 2022). Electricity storage technologies are expected to develop in the coming years and have an important role in

optimizing the performance of the distribution network, integrating unregulated electricity generation from renewable energy sources and balancing the grid load. The storage of electricity will concern both consumers and managers of distribution and transmission networks (International Energy Regency, 2023).

- ***Innovation, research and development***

Shaping a strategic long - term framework for research and development in the energy sector with a focus on (Vlassopoulos C., 2020):

1. in the business and development potential of research in the energy sector
2. in collaborations between universities, companies and the state in the field of innovation.

- ***Ensuring acceptance of investments by local communities***

Active involvement of the country's central and local authorities (e.g. by understanding the source of reactions to each project through informal or formal consultation, by participating in conciliation and compromise processes, by expediting judicial decisions, with the support of local communities with compensatory measures) to facilitate planned or ongoing projects (interconnection of islands, strengthening of the electricity transmission system, investments in renewable energy sources, etc.) (Vettas N., Danchev S., Maniatis G., Paratsiokas N., Balaskas K., 2022). Energy communities can facilitate the participation of local communities in the development of renewable energy investments and strengthen their social acceptance, but the existence of a control and prevention mechanism is required.

4. Energy Sector in Greece and ESG Criteria

4.1 Importance of ESG Criteria for Energy Sector

Environmental, social and governance policies should be adopted by every industrial firm since doing so would result in various benefits. These policies should be implemented because of the multiple advantages that would arise from doing so. To begin, one of the most major difficulties that the energy industry needs to face is that of emission management. This is a task that must be met (Thewissen J., Ayaydin O, Westerman W., Dorsman A., 2024). If fossil fuels continue to be utilised for a substantial portion of the process of producing electricity, there will always be a chance of damaging CO₂ emissions being released into the atmosphere (Palacios L., 2021). This risk will remain as long as fossil fuels continue to be employed. Either by utilizing sources of renewable energy or by collecting and storing the emissions from sources of fossil fuels, energy companies can effectively cut their emission levels by implementing ESG strategies. This can be done either by employing renewable energy or by collecting and storing the emissions (Norton Rose Fulbright, 2023).

The energy industry can pursue one of these two paths. In addition, the development of renewable energy sources leads to the generation of new employment possibilities in addition to the expansion of the energy industry. So, from a sociopolitical point of view, investments in the generation of energy with low levels of carbon emissions are quite acceptable (Kain T., 2023). Thirdly, the use of ESG principles will make it feasible for participants in the energy sector to fulfil their commitments to reduce their carbon emissions. This is significant because firms that deal in power are being pressured to comply with stricter regulations on fossil fuels (Palacios L., 2021).

In the energy sector, the challenges that must be faced according to ESG factors are the following:

- *Environmental Challenges*

Examples of problems with the environment that need to be handled include emissions of greenhouse gases as well as pollution. Because a substantial section of the industry continues to rely on methods of generation that produce a high amount of carbon dioxide

emissions, the generation of energy is one of the primary contributors to climate change (Thewissen J., Ayaydin O, Westerman W., Dorsman A., 2024). The burning of fossil fuels to generate electricity is another significant contribution to environmental degradation, notably in terms of the emissions of air pollutants produced by coal - fired power plants (Palacios L., 2021). The increased concentration of greenhouse gases in the atmosphere, such as carbon dioxide (CO₂), works as a blanket that traps heat from the sun, which in turn drives up average temperatures all around the world. This phenomenon is known as "greenhouse effect." From the beginning of the industrial revolution, the average world temperature has grown by approximately one degree Celsius, as determined by the conclusions of the Intergovernmental Panel on Climate Change (Kain T., 2023).

Whenever fossil fuels are burned, there is a subsequent release of pollutants into the surrounding environment (Norton Rose Fulbright, 2023). When coal is burned, a significant number of pollutants, including as sulphur dioxide (SO₂) and nitrogen oxides (NO_x), are released into the atmosphere. These pollutants, together with oxygen and water vapour in the atmosphere, can contribute to the development of acid rain (Kain T., 2023). Both SO₂ and NO_x have been implicated in a wide range of detrimental effects on human health, some of which include but are not limited to respiratory problems, asthma in children, and cardiovascular ailments (Thewissen J., Ayaydin O, Westerman W., Dorsman A., 2024). It has been estimated by the World Health Organization (WHO) that air pollution is to blame for 4.3 million deaths throughout the world every single year. Conditions such as lung cancer, heart disease, stroke, and chronic respiratory diseases are the root causes of many fatalities

- ***Social Challenges***

Instability in employment and the subsequent impact on communities are two instances of social challenges. More than 40 million people are directly employed by the industries of oil and gas extraction, coal mining, renewable energy, bioenergy production, and energy networks across the world. According to projections made by the International Energy Agency (IEA), the number of people engaged in the supply of oil, gas, and coal fuel will drop by 5 million by the year 2030, while the number of people employed in the provision of clean energy would have climbed by 14 million (Norton Rose Fulbright, 2023). The objective of the International Energy Agency (IEA) is to achieve carbon neutrality by the

year 2050. Many communities are dependent on the jobs that are related with fossil fuels; this is the case even though this indicates a net growth of 9 million employment opportunities inside the energy market (Kain T., 2023).

There is a large body of information that points to a high degree of political and societal acceptability of new renewable projects all around the world. These projects include ones that use renewable sources of energy. People are aware of the benefits of energy sources with low carbon emissions, and they have voiced a wish to have their nation's energy mix result in a smaller total carbon footprint (Thewissen J., Ayaydin O, Westerman W., Dorsman A., 2024). It is almost probable that legislators will support initiatives to promote low-carbon energy due to the widespread usage of this type of energy. It is vital to build effective frameworks that incorporate not just the relevant markets and politicians, but also the local community for such initiatives to be effectively executed. This is a prerequisite for achieving success (Kain T., 2023).

- ***Governance Challenges***

In the year 2022, there is a significant focus on the regulation of energy production and distribution companies. Stakeholders and members of the public are asking, maybe more so than they ever have in the past, that power businesses assume responsibility for the damage they cause to the environment (Norton Rose Fulbright, 2023). Companies that do not make active efforts to improve their environmental credentials are being shunned by investors, and social organisations centred on climate change are educating communities about the negative repercussions of ever-increasing carbon emissions. Investors are shunning companies that do not make active efforts to improve their environmental credentials (Thewissen J., Ayaydin O, Westerman W., Dorsman A., 2024). Because of the ongoing growth in the amount of cyberattacks, electricity companies have also become the focus of these kinds of attacks. The executives who are employed in the power industry ought to make the mitigation of these dangers one of their highest priorities in order to protect their company.

4.2 Effects of ESG Criteria for Energy Sector

Since the beginning of the 2010s, a number of literature studies and researches have been carried out, in the context of examining the effects that ESG factors bring to the performance

of energy companies (Palacios L., 2021). Most of these studies find the positive effect that ESG factors have on returns, while other research that has been conducted focuses on the positive effects that these factors bring, at an operational level. Most of these studies have shown several positive effects on businesses, such as the reduction of the financing costs of an existing business, which also implies a reduction in the behavior that develops at the level of business risk taking (S&P Global Ratings, 2019). This in turn leads to energy companies taking on a number of good ESG commitments, which ensure the necessary flexibility but also stability, in terms of their financing and operation.

A very important positive effect that exists on the returns achieved by energy companies is that those buyers who have a higher involvement in ESG, then they also have a better efficiency in the mergers they carry out (Thewissen J., Ayaydin O, Westerman W., Dorsman A., 2024). Also, another positive impact is the one that refers to the competition that is developing in the energy sector, with the performance of those companies that base their operation on ESG factors showing lower volatility and especially being able to manage risks in a better way (Vettas N., Danchev S., Maniatis G., Paratsiokas N., Balaskas K., 2022). The reason for the formulation of these positive effects is that, through the integration of ESG factors, a better level of management quality can be ensured as well as mitigation of any corporate risks.

In continuation of the above, through ESG factors, it has been established over time that energy companies are provided with the possibility and above all the flexibility in terms of managing to respond to those phases of the economy that have recessionary characteristics, thus limiting their any systemic risks (Palacios L., 2021). If a company, in terms of its ranking regarding ESG factors, shows a low score, this implies that it is more sensitive to the occurrence of adverse effects in terms of the overall risk it will be called upon to face (Stjepcevic J., Siksnylyte I., 2017). Another finding of ESG factors for their positive effect is the one that refers to the fact that external interest groups, such as investors and customers, take very seriously ESG factors as a necessary condition for achieving long-term development, which also entails the creation of a much better image in the economy and in society in general.

In addition to the above positive effects that ESG factors bring to business returns, there is also a key issue that has been thoroughly studied by a number of studies and researches and

concerns whether the choices of energy company management, in relation to corporate responsibility, increase or decrease corporate performance and corporate value, or whether firms with higher performance and value have a greater ability to make better ESG choices (S&P Global Ratings, 2019). Some of the ESG factors, as found by the studies carried out, have the potential to lead to an increase in the value of a company in the specific sector, for the reason that its customers seek to purchase its products or services, as a consequence of the very good reputation it maintains in the market. At the same time, in these cases, even the employees in the companies are shown to be more productive and efficient (Nitlarp T., Kiattisin S., 2022).

Finally, a very important issue that is examined is the one that concerns to what extent, the ESG factors and their effectiveness, can be related to the size of a company in the energy sector, which is smaller or larger in size (Vettas N., Danchev S., Maniatis G., Paratsiokas N., Balaskas K., 2022). What is established by international studies and research is that, the bigger a company is, the more available resources it has and, consequently, the stronger ESG profile it can form (Palacios L., 2021). Also, another relationship that is formed is that between the size of the company and the pressures it receives, both internally and much more in its external environment. Therefore, the size of companies positively affects their performance, since through ESG factors they can face the pressures exerted on them and at the same time contributes to the improvement of society through the adoption of an appropriate strategy.

As can be seen from the above, the adoption of ESG factors by energy companies can bring about a series of positive effects at the level of performance but mainly at the level of creating an appropriate corporate profile in the context of ensuring their sustainability and development (Stjepcevic J., Siksnyte I., 2017). However, apart from these positive effects on performance, there are also some cases where the adoption of ESG factors can also cause problems in returns (S&P Global Ratings, 2019). These conditions are formed when companies seek to adopt practices to ensure the protection of the environment and the promotion of their corporate responsibility, with methods and ways that are not legal. It is practically about the development of sustainable development tools and methods, which in theory respect the ESG criteria, but in practice attempt to shape a condition that is not the real one (Thewissen J., Ayaydin O, Westerman W., Dorsman A., 2024).

With investors and more generally interested parties looking for more and more "green" investments, it is clear that a combination of deficit standards and an increased investment demand, will lead to the adoption of a more "opportunistic" profile of companies oriented to ESG criteria (Palacios L., 2021). This strategy is mainly aimed at attracting capital, but there is no real commitment on the part of the companies' managements to actions aimed at sustainable development. On a practical level, this is the appearance of the phenomenon of "greenwashing", which refers to the existence of a process through which false and misleading information is transmitted to interested parties, regarding how the products or services produced and offered by a business, they can be environmentally friendly (Nitlarp T., Kiattisin S., 2022).

It is a strategic move, which aims to create false beliefs and impressions from the interested parties about a company, that the actions and actions it implements are much more and important, in relation to the observance of sustainability standards (Stjepcevic J., Siksnylyte I., 2017). But in reality, this company only undertakes initiatives that are more symbolic in nature and mainly aimed at satisfying a strategy oriented towards the satisfaction of public relations actions (S&P Global Ratings, 2019). Indicative are the examples that concern companies that declare that they are taking actions to reduce their carbon footprint in the environment, through the installation of mechanisms and sensors that contribute to energy savings, but without at the same time presenting the real picture of the overall production the process which is characterized by the very high number of pollutants they cause (Nitlarp T., Kiattisin S., 2022).

Of course, the above concern of "greenwashing" is also put to investigation by prospective investors, who, in the context of ensuring the placement of their capital in an investment, study thoroughly and with specific tools whether a company belongs to the category of "greenwashers" or not (Thewissen J., Ayaydin O, Westerman W., Dorsman A., 2024). There are certainly those cases of smaller investors who may present a difficulty in terms of whether it is possible to distinguish the companies - "greenwashers" from those that do not belong to this category, but the majority of investors have the possibility, mainly through conducting audits, to ensure the reliability of their prospective investments (Nitlarp T., Kiattisin S., 2022).

Such a collateral policy is satisfied both by the presence and control of lawyers on the part of the investors, and by securing the ESG mark. At the same time, various environmental organizations, consumers and the various regulatory authorities can carry out checks regarding compliance with the standards (Palacios L., 2021). This control can be done according to a company's declaration to fulfill the ESG criteria, according to the advertisements that the company makes and more generally, according to the policy it applies at the level of production, distribution and sale of its products or services (S&P Global Ratings, 2019).

4.3 Adoption of ESG Criteria in Energy Sector

It would be expected that ESG criteria are the most decisive in the role of energy industry' in the transition to a global zero - carbon economy (CFA Institute, 2022). And this is because the ESG criteria are linked on multiple levels to the energy transition required at the international and national level to effectively deal with the climate crisis. These criteria include, among others:

1. corporate climate policies
2. the carbon footprint of companies' operations
3. the utilization of renewable energy sources
4. actions to save energy
5. raw materials

These indicators are inextricably linked to the decoupling of economic development from environmental pressures (OECD, 2022b). In practice, however, this is not so emphatically the case. In other words, even though it has the fastest institutional and technological developments in a green direction, the energy sector comes second to last among all sectors of the economy, just after telecommunications, in ESG evaluations. The evaluation in the environmental dimension "E", which is one of the three inseparable ESG dimensions, is often confused with the evaluation of companies in terms of their ability to generate economic value in the future. Thus, if a company maintains a high carbon footprint, but this is not judged to threaten its future economic value, it may still enjoy a high ESG rating from various rating agencies. In other words, ESG investment sustainability does not exclude

practices that are inconsistent with, or diametrically opposed to, environmental sustainability and climate priorities (OECD, 2022a). In part, this also explains some additional oddities observed in the energy sector regarding ESG performance. For example, while the main effort in energy is to divest from fossil fuels, oil companies are reported to receive more favorable ESG ratings compared to companies operating purely in Renewable Energy Sources, based on some evaluation methodologies. Such practices increase the risk of "greenwashing".

Moreover, the environmental dimension wrongly overshadows the other two dimensions, as far as is concerned the energy transition. Failed management of the social impacts (the "S" dimension) of the green transition will not only lead to stranded assets and infrastructure, but also to significant social inequalities, with communities and people becoming "inert" (CFA Institute, 2022). Such a risk still exists today with the increase in energy costs which exacerbates the problem of energy poverty for a large portion of citizens. At this point, the dimension "G" (Governance) is added to the equation. ESG criteria must have an identity for the company and be an integral element of transparent corporate governance, and not just another marketing tool. For this to happen, open systems and governance tools are needed which will engage management and mobilize the entire organization to promoting sustainable practices (OECD, 2022b).

It is worth noting that there is also the prospect of connecting ESG with the National Energy and Climate Plan, which includes the implementation of actions worth more than 40 billion Euros until 2030 (YPEN, 2024). With the process of updating to be already underway, the ambition of the Plan is expected to be significantly strengthened, bringing expansion and final cost of actions upwards. Based on studies, for Greece, if this taken into account investments with a total value approaching 300 billion Euros are going to be needed to achieve a climate neutral economy until 2050. With the financial sector being a necessary pillar for the smooth implementation of the National Plan and the achievement of the more specific objectives specified, it becomes clear that the companies that are a key pillar of support for the financial sector and their compliance with the ESG assessment framework will contribute to "unlocking" additional funds and channeling them in a transparent, environmentally and socially friendly manner in this direction (OECD, 2022b). ESG criteria can lead to open systems and governance tools to promote a just and green transition. If ESG criteria do not work in this direction, supported by open scientific methodologies that

"certify" the ESG "claims" of companies or fund managers, then they will not promote sustainable practices but risk leading to "greenwashing".

4.4 Energy Sector and Funds: ESG Strategies

According to the international standards that are already applied at the international level, energy companies and not only, starting from the largest and ending with the smallest, will be required every year, in addition to their financial statements, to publish a series of financial data (Liu G., Hamori S.,2020). This is the beginning of a new reality, which will now be evaluated according to the performance they present and which will be measurable, on an annual basis. These performances will be received, studied and then evaluated by investors, of all categories and especially credit institutions, in order to then issue a positive or negative opinion on receiving funding from a business (Naeem N., Cankaya S., 2022). Of course, outside of credit institutions, these performances will be evaluated by other interested parties, such as suppliers and customers, as well as the employees themselves.

As for those energy companies that have a positive evaluation based on their ESG criteria, they have been assured a very significant competitive advantage, in relation to other companies of the same size or operating in the same industry, in terms of attracting foreign investors but also credit institutions (Loftsgarden C., 2020). The reason is because they can in a much easier way create added value both in the products and services they produce and offer and, in this way, receive, especially from the credit institutions, more and better financing. In practice, these businesses show a higher degree of viability, an extremely important element for a lender (see credit institution), not only in terms of the investment being financed, but also in terms of the business receiving the loan itself (Polzin F., Sanders M., Serebriakova A., 2021). Also, these businesses will have the ability to secure better usage results, compared to other businesses. The more a business in the sector manages to adopt and implement ESG criteria, the greater the willingness of credit institutions to finance it.

As the economy and business environment is shaping up today, the central finding is the extent to which businesses, regardless of size, will have access to efficient, flexible and cheap financing. However, the degree of access will vary depending on whether they make use of the ESG criteria (Liu G., Hamori S.,2020). The finding is that in a few years and possibly until 2029, no company in all sectors of the economy, and of course also in the

energy sector, will be able to receive financing from a credit institution, in the event that it does not meet the ESG criteria (Egli F., Polzin F., Sanders M., Schmidt T., Serebriakova A., Steffen B.,2022). This is certainly a development which is expected to create new data in general in the economy in the sense that energy companies are the driving force and a very important size of the global economy, while at the same time, the way in which the financing will be done it will be based on a series of criteria, not purely economic or financial but also on criteria referring to the promotion of actions focused on the environment, society and corporate governance (Loftsgarden C., 2020). What is now needed from business administrations is to invest in their development and evolution, through the specific criteria, which will be an active part of their culture and their wider structure.

In the event that these companies do not take the necessary actions and actions, then it is clear that they will not be eligible clients of the financial institutions, while they will not be attractive in terms of attracting other investors (Naeem N., Cankaya S., 2022). With energy companies today being the core of the global economy, it is clear that their further empowerment contributes not only to their own development but also to the wider economic development. Through the strengthening of these businesses, what is achieved is the increase of jobs and subsequently the improvement of the quality of the level of welfare of the citizens (Polzin F., Sanders M., Serebriakova A., 2021). To the above should also be added the fact that through ESG criteria, a significant reduction in their operating costs is achieved, which ensures increased competitiveness in terms of selling prices of products and services.

The main objective, as mentioned, that is now set is that of ensuring the correct use of financial resources on the part of the energy companies as a whole (Loftsgarden C., 2020). This goal focuses on the exercise of control at the level of the environment as well as of people, and for this reason there is now the mandatory submission from 2024 of a series of official data regarding their environmental footprint, but also regarding the way human resources are managed their potential, as well as with the functioning of their government (Liu G., Hamori S.,2020). Therefore, within the specific frameworks, financial institutions adopt a series of procedures and prerequisites, which aim to ensure that the funds placed by energy companies will not simply aim to implement a series of investments in infrastructure or other fixed assets, but will aim in strengthening the transition in general towards a "green" economy, where less resources will be used, adopting circular economy practices and

renewable energies will be used (Naeem N., Cankaya S., 2022). More generally, what is now being attempted through the financing of energy companies is to bring about an overall "transition" of the economy and its mode of operation, centered on the human being.

The challenges that energy companies will have to face in the coming years concern both the achievement of greater competitiveness and the adoption of a legislative obligation, in the context of the application of ESG criteria (Polzin F., Sanders M., Serebriakova A., 2021). Their administrations should include more actions related to the design and implementation of a regulatory compliance, which will be related to the way they operate (Egli F., Polzin F., Sanders M., Schmidt T., Serebriakova A., Steffen B., 2022). In order for the energy companies to be able to adequately respond to these data created in the market, they will have to carry out a readjustment of their business model, through which they will include, in addition to actions aimed at profitability, actions related to social and environmental action (Liu G., Hamori S., 2020). More generally, the steps that an energy company should now implement, according to ESG criteria, in order to be compatible with the funding frameworks and regulations that financial institutions will set, are as follows:

- identification of interested parties, or alternatively identification of those common points, which can affect and be affected by the operation of an energy company
- identification of the most important issues that either burden the operation of a company, or are burdened by it (Naeem N., Cankaya S., 2022)
- finally, determination of those goals and the actions that will be adopted in the context of their achievement, in order to effectively deal with any possible adverse effects, while at the same time, the ways in which it will be possible to improving the performance of a business, while offering more benefits to both the environment and society as a whole (Loftsgarden C., 2020).

5. Conclusion and Critical Review

5.1 Conclusion

As ESG public policy has come into focus in recent years and innovative environmentally friendly technologies have become available, adopting ESG criteria is a high priority for most energy companies (Kuzmina J., Atstaja D., Purvins M., Baakashvili G., Chkareuli V., 2023). It could be argued that these companies would be the last to be able to deal with environmental, social and governance issues due to ethical norms but also due to their very nature (Naeem N., Cankaya S., 2022). However, as public policy on ESG factors has come into focus in recent years and innovative environmentally friendly technologies have become available, the implementation of these factors has become a high priority for most energy companies.

The majority of the energy companies have significantly reduced their emissions footprint, some investing in renewable and alternative energy sources and others pursuing carbon sequestration technologies and natural carbon sink (Liu G., Hamori S., 2020). This trend is likely to continue as the energy industry develops and matures, and it is understood that companies that do not adopt an ESG strategy will find themselves at a competitive disadvantage by being subject to regulatory penalties, and their access to public and private capital with disastrous consequences for their liquidity and sustainability (Nitlarp T., Kiattisin S., 2022). Therefore, energy companies that invest seriously in ESG strategies, utility tactics, and greener technologies that are more environmentally friendly will be the ones to have a say in the energy transition of the future.

Alongside the above, investors who are recognized as "socially conscious" are increasingly investing in energy companies that have made ESG criteria a high priority within their business (Kuzmina J., Atstaja D., Purvins M., Baakashvili G., Chkareuli V., 2023). There is also a significant increase in requests from investors and customers for environmental impact reports on company activities. In addition to the immediate economic costs and benefits for companies undertaking ESG initiatives, there is increasing regulatory pressure on companies to address environmental issues arising from governments' efforts to respond to global climate and other environmental imperatives (Stjepcevic J., Siksnyte I., 2017). Combating climate change is at the heart of the political goals of almost all the world's

governments. Most countries follow the Paris Agreement on climate change and have set high targets for 2030 to reduce greenhouse gas (GHG) emissions. To achieve this, governments have required enhanced regulation and enforcement of environmental protection across a wide range of industries.

Then, with regard to the main ones and proposals affecting climate change, ESG criteria and the oil and gas industry, these include (Naeem N., Cankaya S., 2022):

- reduction in methane emissions from abandoned oil and gas wells
- reduction in emissions from existing oil and gas extraction.
- compliance monitoring program for new and existing drilling sites and compression stations
- recommended performance standards for storage tanks, pumps and compressors.

Managements of energy companies seem to have understood the importance of ESG factors, given that one – third of greenhouse gas warming is due to anthropogenic emissions of "methane" a powerful greenhouse gas that is 30 times more potent than carbon dioxide (CO₂) and which traps heat in the atmosphere for 100 years (Nitlarp T., Kiattisin S., 2022). Methane is also the main component of natural gas, and the oil and gas industry is the largest industrial source of methane emissions. The increased emissions of methane and carbon associated with the production of fossil fuels (oil and natural gas) has prompted investors, consumers and producers to look for new and innovative ways to reduce the carbon footprint and the intensity of methane in the atmosphere (Liu G., Hamori S., 2020).

Therefore, due to the fact that there is significant pressure both from public opinion and from governments and environmental organizations, the most important oil and gas companies such as Exxon Mobil, Total and Shell proactively support efforts for fight climate change (Stjepcevic J., Siksnyte I., 2017). These efforts include reducing carbon and methane emissions in their own operations, as well as promoting renewable energy research. This has prompted many other smaller oil and gas producers to also develop short- and long-term goals around ESG.

In conclusion, what should be argued is that energy companies:

- have realized the importance of ESG criteria and the benefits deriving from their implementation and for this reason they maintain high ethical standards due to the nature of their business (Naeem N., Cankaya S., 2022)
- public has increased awareness of ESG issues, so these companies must take steps to ensure they are not involved in any negative commentary on the company's reputation
- energy companies will have the opportunity to demonstrate leadership in investing in new technologies that can reduce environmental impact or improve efficiency for the public good
- energy companies can support through investments an ESG strategy are more likely to attract public and private capital from investors interested in environmental and social responsibility (Liu G., Hamori S.,2020)
- through the adoption of an ESG strategy energy companies have the potential to become more sustainable and efficient in the long term and will become an increasingly important factor to consider when choosing investments and partners in the energy industry (Nitlarp T., Kiattisin S., 2022)
- through the adoption of ESG technologies energy companies can generate immediate economic returns and cost savings, i.e. reducing natural gas leakage into the atmosphere can lead to increased natural gas sales, along with the potential for monetization and value of methane mitigation results (Stjepcevic J., Siksnyte I., 2017)
- finally, ESG strategies can help investors avoid companies that may have greater financial risk due to their poor environmental or other practices.

5.2 Critical Review

There has been a lot of discussion lately by companies, institutional organizations, investors and other stakeholders about the importance of ESG criteria in the energy sector internationally and in Greece as well (EnExGroup, 2022). As far as Greece is concerned, the sector has entered a period of tectonic changes and transformation. The main drivers of change are:

- the implementation of the Green Deal – through the accelerated rate of de – lignifications, the development of renewable energy sources, electrification, etc.
- deregulation and increased competition in the energy trading market – with the concomitant change in consumer demands from trading companies
- the increasing complexity of the energy market and the products and services offered – both for companies and private consumers
- investments in transmission and distribution network infrastructure – as well as alternative fuel infrastructure
- the pressure to increase efficiency and digital transformation of infrastructure / network operators.

Through the adoption of ESG criteria, energy companies ensure greater transparency and become more "attractive" to investors and receive financing from banks more easily, as they prove their sustainability in this way. Indicatively, it could be mentioned that sustainable investments in the first half of 2020 amounted to 20.9 billion dollars in the USA, compared to 21.4 billion dollars in all of 2019 (EnExGroup, 2022). Accordingly, the recent research of the Center for Sustainability (CSE) in the USA and in Canada, it showed that four out of five of the leading energy companies achieved better financial results according to ESG criteria than the rest of the companies such as in terms of annual revenue.

In Greece, a corresponding survey carried out on ESG criteria by the Center for Sustainability (CSE) in 2020 investigated the use of international criteria and focused on the analysis of listed companies with a presence in international ESG Ratings, which in total employ more than 140 thousand employees. The research showed that although the vast majority of listed companies in Greece issue Corporate Responsibility and Sustainable Development Reports, they do not use global and reliable assessment standards, such as TCFD and SASB, and do not participate in important ESG Ratings (EnExGroup, 2022). In particular, the energy sector with the exception of the large leading organizations in the sector that perform relatively well in this sector and have ratings in reliable organizations such as Sustainalytics, MSCI and CDP, the rest of the companies are not at the same level in ESG criteria while it does not seem to understand their meaning.

For this reason, the use of ESG criteria will allow the development of a deeper understanding of the opportunities and risks facing the Greek energy markets and promoting their energy transition towards a low-emission economy, which is one of the main objectives of the Hellenic Stock Exchange Energy (EnExGroup, 2022). At the same time, ESG criteria can contribute positively to issues of contribution to society as well as to corporate governance, which is one of the biggest challenges for companies. Energy companies can therefore benefit significantly from the application of ESG criteria, not only vis – à – vis investors and banks but also in relation to the rise in demand for low- or zero-emission energy, in the context of the country's transition to a low – emission economy.

On the positive side of the debate that is taking place regarding the adoption and application of ESG criteria in Greece is that the environmental and social parameters as well as the governance parameters are being integrated at a faster rate into the institutional framework of the capital markets, while the framework for the disclosure of non – financial information from listed companies (EnExGroup, 2022). However, significant efforts are still required in the context of the integration of ESG criteria and a great deal of maturity and readiness is required from companies for radical policy and process changes across their entire scope. There are also a number of factors that help in a successful application of ESG criteria and which include, in addition to a holistic strategy and publication of an independent ESG report, the setting of ambitious goals, the use of reliable standards such as GRI, SASB, TCFD & CDP, as well as the frequent materiality assessment through the participation of key stakeholders. In summary, the path towards the adoption of an ESG strategy seems to be the path that will ensure the sustainability and efficiency of energy companies, and it is certainly worth it for companies to direct their efforts in this direction, not only to achieve a better evaluation and potentially facilitate their financing, but also because the integration of ESG criteria seems to positively affect their overall financial results.

5.3 Case Study of Energy Company

Studying the case of a Greek energy company, DEI SA is chosen, which is currently the largest company in size in the specific sector, both in terms of market and in terms of its importance. In recent years, the company's Management has been adopting a sustainable development strategy, which is completely in line with its business model and its transformation needs, creating a transformation "road map" in a "Creating Shared Value"

(CSV) model (DEI SA, 2021). Through this specific model, the company places at the center of its efforts, the recognition of the needs of its stakeholders, and of society at large, creating shared value between the company, society and the environment. This sustainable development strategy that DEI SA adopts is governed by the philosophy of creating shared value (Creating Shared Value) and among other things aims at the following:

1. to integrate the United Nations Sustainable Development Goals (SDGs) into its business plan and operating model to enhance the achievement of these goals (DEI SA, 2022)
2. to support the company's course in reducing emissions in accordance with intermediate goals and with the final goal of net zero emissions by 2040
3. to aim to reduce the negative impact resulting from the company's activities on nature and biodiversity (Nature positive)
4. to push for the transformation of the production chain and procurement process based on ESG criteria (DEI SA, 2021)
5. to set goals, taking into account ESG criteria
6. to form a new corporate culture where it will be integrated into the entire operation of the company
7. to reach out to customers and society at large (DEI SA, 2022)
8. to support employees and partners
9. to increase the company's access to green capital for sustainable development
10. to take into account the requirements of the European Taxonomy Regulation (EU Taxonomy)

Even at the level of communication strategy of DEI SA, its content is directly related to the wider ESG strategy (DEI SA, 2021). Key components of DEI SA's communication strategy is the promotion of its new identity, informing the public about new products and services, strengthening friendly attitudes and lifestyles towards the environment, improving its reputation, and its connection with the future, respecting its history. This is achieved by

highlighting its vanguard through a series of actions that have an impact on the Environment and Society. The following table presents the ESG goals that the Management of DEI SA sets, in the context of achieving a sustainable development, having as a basic tool the use of ESG criteria, and the measurement of the effectiveness and efficiency of achieving the specific goals, according to these standards (DEI SA, 2021), (DEI SA, 2022).

<i>Strategic Pillar</i>	<i>Sustainability Theme</i>	<i>Goals</i>	<i>Time</i>	<i>Performance</i>
<i>Decarbonization: Switch to low coal economy by developing the renewable energy sources</i>	Decarbonization and Coping of Climate Change	57% reduction of its direct gas emissions greenhouse in 2024 compared to the base year 2019)	Short Term	<ul style="list-style-type: none"> • Reduction of its direct gas emissions greenhouse by 36% compared to fiscal year 2019 • Commitment to the international initiative "Science Based Targets initiative" (SBTi) • Join CDP's global initiative for climate change (CDP Climate Change)
		Gradual withdrawal of existing lignite units	Medium Term	<ul style="list-style-type: none"> • Decommissioning of lignite facilities with a net capacity of 1.35GW representing 40% of lignite assets to be decommissioned • Join the We Mean Business initiative, a

				<p>global initiative to take action on climate change</p> <ul style="list-style-type: none"> • Participation in the Race to Zero initiative supported by the UN
<p><i>Functions with a positive sign for nature / Reducing resource use, waste management, conservation of natural systems</i></p>	<p>Biodiversity and Ecosystem</p>	<p>Steady pursuit of operating new facilities with zero net loss of biodiversity</p>	<p>Long Term</p>	<p>Participation in the LIFE17 program NAT/GR/000514 – LIFE Bonelli east Med, for the conservation and management of the Spitzeagle population in Eastern Mediterranean, which provides for the installation of special insulating covers in selected locations medium voltage (MV) overhead network</p>
	<p>Waste Management and Circular Economy</p>	<p>Seeking to reduce non-hazardous waste (excluding ash) leading</p>	<p>Long Term</p>	<p>59% reduction of non-hazardous waste deposition in and on land in 2024 compared to 2021</p>

		to final disposal		
		Rational management of hazardous waste	Medium Term	77.5% recovery rate on total quantities of hazardous waste, removed from the facilities in 2024
		Seeking to increase revenue from its recognition value of waste	Long Term	Diversification in Waste-to-Energy Utilization as part of the "Green Deal" in production
<i>Creating socio-economic shared value - Strengthening the economy, people and social collective action</i>	Customer Relations and Satisfaction	Renovate 70% of customer service stores and incorporate the necessary specifications for easy access and service for the disabled by 2025	Medium Term	Renovation in the stores in the year 2024
	Energy for all	Recognition of DEI SA as the leading provider of	Medium Term	<ul style="list-style-type: none"> • Doubling of public electric vehicle chargers in

		charging stations and services for electric vehicles in Greece, reaching 10,000 charging points nationwide in 2027		2024 compared to 2021 <ul style="list-style-type: none"> • More than 1,500 publicly accessible chargers in 49 Prefectures More than 80 fast charging points with power up to 300 kW HPDC
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5.4 Proposals

Regarding the proposals that could be formulated, after studying and analyzing both the application and the importance of ESG criteria for energy companies, the interest is focused on one key element: ESG criteria should have a character "identity" for each company and to be an integral element of transparent corporate governance, and not just another marketing tool. Essentially, this is a proposal - exhortation, in the context of the understanding that companies should operate through open systems but also appropriate governance tools that will bind their administrations and mobilize the entire organization in the context of promoting sustainable development and much more the observance and application of ESG criteria. By definition, ESG criteria can and should play a decisive role in the transition of energy companies to a new strategy and a new environment, provided the transparency of the scientific authenticity and reliability of the methodologies and assessment systems it uses. If the ESG criteria are not based on open systems and governance tools, which will be supported by open scientific methodologies, that "certify" the ESG "claims" of the companies' managements, then they will not promote sustainable practices but lead to green fraud (green washing).

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