

The Impact of Disclosing Scope 3 Greenhouse Gas Emissions on the Enterprise Value

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Abstract

This study looks at how telling people about Scope 3 greenhouse gas emissions affects the value of a company. It is getting harder to report on sustainability in the supply chain. The study used statements and sustainability reports from Karsan Economic Entity in Turkey over twelve years from 2013 to 2024. It compared the company before. After it started reporting on sustainability. The results show that the value of the company went up after it started doing things in a sustainable way. Scope 3 emissions were responsible for forty one point seven percent of this increase. However just telling people about Scope 3 emissions did not directly affect the value of the company. Other things like changes in the way the company operates and things happening in the economy also played a role. The study found that it is not about telling people about sustainability but actually doing things in a more sustainable way that really increases the value of a company. The study says that company leaders and people who make policies should make sure to include Scope 3 emissions in their reports so they can help reduce the effects of climate change and make their companies stronger, in the run.

Keywords: *Sustainability; Greenhouse Gas Scope 3; Enterprise Value.*

1. Introduction

Greenhouse gases are things in the air that trap heat and make the earth get really hot. This is called the greenhouse effect. It is connected to global warming. When we have greenhouse gases like carbon dioxide and methane in the air the earth gets hotter and the weather gets weird. This means we have droughts, storms and floods which is really bad for the earth and for people.

For companies this can be a problem because they have to spend more money to get the things they need and they have to worry about their buildings and equipment getting damaged. So it is very important that we reduce the amount of greenhouse gases we put in the air to stop the earth from getting too hot. One way to do this is to use energy from water, wind and sun of energy from coal and oil.

If companies use these energy sources, they can save money on energy and be more competitive. If we all switch to these new energy sources we can reduce the amount of carbon dioxide in the air. There are meetings where countries agree to reduce the amount of greenhouse gases they put in the air like the Paris Agreement.

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The government makes rules to help the earth and companies can help by using energy. We can all help by being careful with energy and doing things that're good for the earth. We need to work to make sure the earth is okay, for our kids and grandkids. Greenhouse gases are a problem and we need to do something about them. We need to reduce greenhouse gases to stop warming.

2. Conceptual Framework

2.1 Accounting for greenhouse gases and their regulatory limits

Scope 3 greenhouse gas emissions frequently make up the biggest chunk of an organization's total emissions 75% or more, depending on the sector. These are indirect emissions that occur in a firm's value chain (both upstream and downstream), from sources that are not owned or controlled by the reporting company. They include emissions from suppliers, product use, waste disposal and other activities related to the production or use of items and services purchased or sold by a company. Scope 3 emissions is a major factor to consider to fully comprehend the environmental impact of a company's activities (Majamäki, 2022; 34).

So principles for accounting of greenhouse gases are really important. We need them to measure and report the emissions correctly. These principles give companies a way to track the amount of carbon they produce and see how it affects the environment. This is about the carbon footprint of companies and how it affects the earth. Accounting principles, for greenhouse gases help us understand this better. These principles help organizations understand their emissions, set targets, and make informed decisions to fight climate change. They include (WBCSD, 2005; 22):

- i. **Relevance:** The measurement and disclosure of GHG reductions must include just the information required by users, both internal and external to the GHG project, for their decision-making processes. This information should thus align with the objectives of the GHG project and fulfill the expectations or criteria of its consumers. Data, methodologies, criteria, and assumptions that are deceptive or do not adhere to Project Protocol standards are irrelevant and should be excluded.
- ii. **Completeness:** All relevant information must be included in the quantification of greenhouse gas (GHG) reductions. This means all GHG impacts of a GHG project must be evaluated; all pertinent technologies or practices should be regarded as baseline options; and all relevant baseline options must be taken into account when calculating baseline emissions. The monitoring strategy for the GHG project must specify the methods for collecting all data required to measure GHG reductions. Ultimately, despite some sections allowing flexibility and discretion, all requirements within the relevant chapters must be fulfilled to measure and report GHG reductions.
- iii. **Consistency:** The reliable measurement of GHG reductions necessitates the consistent application of methods and procedures to a GHG project and its components, the uniform use of criteria and assumptions for assessing significance and relevance, and the collection and reporting of data that is sufficiently compatible to enable meaningful temporal comparisons.
- iv. **Transparency:** Due to the flexibility and policy importance of many GHG accounting choices, transparency is essential for measuring and reporting GHG reductions. A clear, logical compilation, analysis, and documentation of GHG project information helps evaluators assess its legitimacy. Identify exclusions and inclusions, clarify assumptions, and offer data and assumption references. The GHG assessment boundary, baseline candidate, and baseline emission information should be sufficient for reviewers to understand all findings. A transparent report will explain all GHG reduction accounting and quantification estimates. All supporting evidence should be documented to corroborate and verify the data, methodology, criteria, and assumptions.

- v. Accuracy: Uncertainties regarding GHG measurements, estimates, or computations should be minimized to the greatest extent feasible, and measurement and estimation methodologies should be devoid of bias. The permissible degrees of uncertainty will depend on the goals of executing a GHG project and the intended application of quantifiable GHG reductions. Enhanced precision will often bolster the credibility of any greenhouse gas reduction claim. When accuracy is compromised, the data and estimates used to assess GHG reductions should be used with caution.
- vi. Conservativeness: Greenhouse gas reductions should not be exaggerated. In situations where facts and assumptions are ambiguous, and the cost of mitigating uncertainty does not justify the increase in precision, conservative values and assumptions should be used. Conservative values and assumptions tend to underestimate rather than overstate greenhouse gas reductions.

Establishing organizational boundaries is crucial in corporate greenhouse gas accounting. This stage identifies the activities included and defines how the reporting entity consolidates emissions from each activity. The GHG Protocol Corporate Standard presents three ways to delineate organizational boundaries, as shown in Table 1. Organizations must use a consistent consolidation approach across Scope 1, Scope 2, and Scope 3 inventories. The chosen consolidation technique influences whether value chain processes are classified as direct (Scope 1) or indirect (Scopes 2 and 3) emissions (WBCSD, 2011, 28-29).

Table 1 Organizational boundaries

Equity share	A company's greenhouse gas emissions from operations are accounted for in accordance with its ownership percentage in the business under the equity share technique. The equity share is a representation of economic interest, indicating the extent of a company's rights to the risks and benefits associated with an activity.
Financial control	A firm is accountable for 100 percent of the greenhouse gas emissions over which it has financial control, as per the financial control methodology. It omits GHG emissions from firms in which it has an interest but lacks financial control.
Operational control	The operational control method stipulates that a corporation must reveal all greenhouse gas emissions for which it is responsible. It excludes GHG emissions from enterprises in which it has an ownership but lacks operational management.

2.2 The difficulty of capturing indirect emissions from value chain activities and the lack of methods to measure them

Several factors complicate the assessment of enterprises' overall carbon footprints. These emissions are a problem for companies because they do not have all the information they need. Companies may not really understand how their actions affect the environment. They may also miss some chances to make things better.

Some studies have found that companies can make mistakes of up to 20% when they try to figure out their Scope 3 emissions. This is because they do not have all the data they need. In fact many companies are missing up to 30% of the data they need to get it right.

To deal with these issues companies should work with their suppliers to get the information they need about emissions that're not directly their fault. They should also come up with plans to reduce the carbon footprint of their business from start, to finish and make Scope 3 emissions a priority. This will help companies understand their impact and make a positive change. Proactive quantification and mitigation can demonstrate a company's commitment to sustainability and yield reductions in environmental impacts. The GHG Protocol specifies that emission data for the first two phases must include scopes 1 and 2 for all relevant activities in the value chain during those phases. Scope 3

emissions correspond to the Scope 1 or 2 emissions of another entity within the same supply chain. If all companies accurately calculate these emissions, Scope 3 emissions for a given product should be consistent across the supply chain, effectively balancing each other out. Consequently, the sum of Scope 1 and 2 emissions for each company should be equal to the aggregated Scope 3 emissions across all entities in the value chain (Strömberg, 2024, 30). Significant challenges remain for the industry in making emission levels as transparent as pricing information for consumers. People who work together in the value chain need to collaborate with each other to measure Scope 3 emissions. Now there is no system in place that helps organisations share secret information with each other. The problem of greenhouse gas data that organisations have access, to is still a big issue. Organisations need to work on the integrity of their greenhouse gas data to get a measurement of Scope 3 emissions (Gutwald et al., 2024; 9).

Li et al. highlight the shortcomings of the current GHG Protocol Corporate Value Chain (Scope 3) and argue that "organizations have long sought science-based metrics to quantify, scale, and benchmark environmental outcomes, including greenhouse gas emissions." Li et al. assert in their research that their "absolute targets offer increased certainty regarding environmental outcomes by delineating future permissible levels of indirect emissions, thereby enhancing the existing GHG Protocol Corporate Value Chain (Scope 3)." (Li et al., 2020, 408). Klaaßen and Stoll's study indicated that only around one-third of suppliers report their scope 3 emissions. As a result, most companies cannot quantify their scope 3 emissions across their supply chains with primary data. This leads to incomplete emission reporting if the deficiencies are not addressed with supplementary data (Klaaßen et al., 2021; 4).

To mitigate the generalizability issues caused by the emission factors, the amount of primary data and the calculations based on it should be increased. For their operations, companies often have access to valid primary data; however, this is not the case for upstream scope 3 emissions. Thus, there is a need for a centralized approach to first collect companies' externally audited emission calculations and then distribute the results to the relevant entities.

All upstream and downstream processes that the firm does not control but that would not occur if the company did not undertake certain activities are included in the scope 3 greenhouse gas emissions (Radonjic & Tompa, 2018, 356-366). A company's carbon footprint is largely defined by its Scope 3 emissions. Nonetheless, these contaminants are also those over which the company has the least control. Consequently, quantifying and identifying scope 3 emissions pose the greatest challenge. The company's indirect emissions originate from factors beyond its direct control, including outsourced transportation, business travel, and waste disposal (WBCSD;2011,5), That which encompasses The three emissions that provide the most issues among the scopes because to their extensive and complex nature (Seixas et al., 2021; 23) The upstream supply chains, marked by their intricate and wide networks, are mostly responsible for the majority of greenhouse gas emissions across the whole value chain (Eggert et al., 2021; 1). Scope 3 includes all greenhouse gas emissions not directly controlled by the reporting company. Other firms provide the upstream operations (Pattara et al., 2012, 1250). Consequently, it is warranted to analyze upstream activities and the emissions associated with them within a sustainable supply chain management paradigm.

2.3 Enterprise Value and Measurement Methods

2.3.1 Concept of Enterprise Value

Economic entities strive, through their operational practices, to achieve a set of objectives, including attaining an acceptable and satisfactory level of sales and operational performance to maximize profits and ensure the continuity of their operations. However, this is considered a current objective as it pertains only to the current activity. It is essential to note that there are other objectives related to the continuous activity of the economic entity spanning more than one financial period, including maximizing the entity's value. Hence, it is essential to define the concept of value to clarify how to maximize it (Khaleel & Alshaheen, 2022:116). The value of an economic entity can often guide investor decisions, particularly in critical moments such as pricing an initial public offering (IPO).

The economic entity, which is represented by the selling entity, has defined value as the sum that investors pay for a commodity (Hostynski, 2006:320). This concept is essential in mergers and acquisitions, as it assists in the formulation of strategic decisions through precise valuation.

Na and Qian said in 2017 that the value of the entity is basically a tool that helps the company keep doing what it does over a long time. The company uses this tool to make decisions about investing, buying companies and managing credit. The goal is to avoid risks and make the company run smoothly. This is really important when companies are thinking about what they want to do in the term. The economic entity is what helps the company make decisions about long term investments. The economic entity is key, to making sure the company is managed well (Na & Qian, 2017:185).

It consists of a collection of activities for creating value for the economic entity. It starts with identifying important stakeholders and understanding their expectations, with strong and continuous interactions with them. For Karsan this means interacting with different stakeholder groups including suppliers, consumers, workers and shareholders. Suppliers have responsibility for providing good quality supplies in a timely manner, which is critical to keeping production schedules and product quality on track. Customers, on the other hand, want creative and dependable goods that meet contemporary environmental requirements. The company's dedication to sustainability motivates employees and encourages them to contribute to its objectives. Shareholders want to see strategic actions that improve both financial return and long-term value of the firm. By understanding and integrating these expectations, Karsan can reinforce its competitive advantage and enable continuous improvement in business performance. The sustainability and development of the economic entity fundamentally rely on the endurance of these relationships, which, in turn, serve as a primary source of competitive advantage, thereby allowing for continuous improvement in business performance (Harrison & Wicks, 2013:102).

2.3.2 The Essential Aspects of Creating Enterprise Value

For an economic entity to create value that enables its sustainability and continuity of activity, it is essential to analyze the fundamentals of value itself. Therefore, it is necessary to clarify these aspects to achieve the appropriate value for it, which are (Dyduch,2022:291):

- i. Formulating an innovative approach that prioritizes value enhancement.
- ii. Concentrating on strategic leadership.
- iii. Communicating about the challenging and complex strategic aspects across all departments of the economic entity.
- iv. Forming teams with diverse specializations.
- v. The potential for implementing methods and approaches by creative experts and competencies among investors in the economic entity.
- vi. Designing systems that execute operations to maximize value.
- vii. Investing secondary ideas into additional strategic plans to maximize value.

2.3.3 Curricula for Analyzing the Enterprise Value

There are four approaches through which the economic entity value can be analyzed from an accounting perspective (Zieniuk, 2018:200): -

- i. Book value.
- ii. Replacement value.
- iii. Liquidation value.
- iv. Multi-derivative value.

2.3.4 Enterprise Value Objectives

When the economic entity enjoys a satisfactory long-term value, it can make better strategic and operational decisions, thereby maximizing this value and increasing its profits, revenues, and wealth over the long term. Therefore, maximizing value can achieve a set of objectives, which are represented as follows (Mackowiak & Emeriing,2023:248-285):

- i. Achieving the project's primary objective, which is to maximize its long-term value and increase the wealth of shareholders and owners.
- ii. Evaluating capital expenditures using the weighted average cost of capital and the expected rate of return. Value is created when the rate of return on invested capital exceeds the weighted-average cost of capital.
- iii. Comprehending the significance and sensitivity of fluctuations in a variety of value determinants, such as the weighted average cost of capital, investment in long-term assets and working capital, cash tax rate, and sales growth rate.
- iv. Motivating managers to improve the performance of the economic entity by implementing measures to maximize shareholder value.

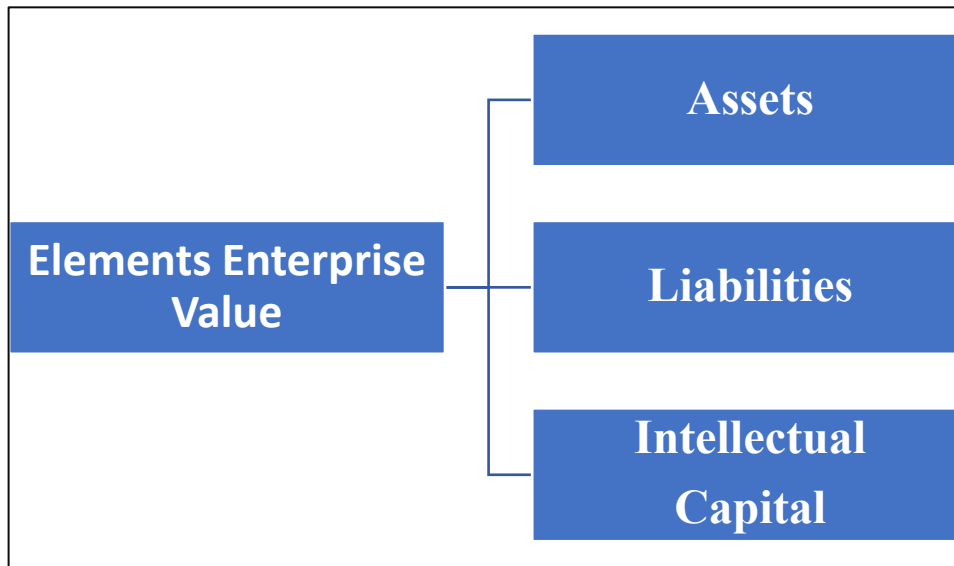
Others have added:

- i. Enhancing the scientific knowledge base by providing a common language between operational processes and information technology to measure the returns and costs of evaluations aimed at maximizing the value of the economic entity Plessius et al., 2018:2).
- ii. Contributing to the increase in capital value by providing managers with planning, control, and management tools for the activities of the economic entity (Shtefan et al.,2023:120-121).
- iii. Maximizing value leads to the realization of green and sustainable management by providing activities that serve the community and the environment, thereby generating an increasing interconnection between sustainable development, social responsibility, corporate governance, and both financial and non-financial performance of the economic entity, which in turn leads to enhanced energy efficiency and a transition from reliance on primitive sources to renewable energy sources that increase the future revenues of the economic entity, ultimately transforming to maximize its value (Lorenc & Kustra,2021:4-5).

2.3.5 Valuable Elements of the Enterprise Value

In order for the measurement and control of the value of the economic entity to take place, certain elements must be present that constitute it for the measurement process, whether financial or non-financial, to occur. These elements can be clarified in Figure 1:

Figure 1 Elements Enterprise Value



(Kutsyk & elat.,2019:626)

It can be computed according to the following equation:

Enterprise value = market value of shares + total debts - cash and cash equivalents.

2.3.6 Factors Influencing the Value of the Enterprise

Several factors may determine the value of the economic entity, which can positively or negatively affect it (Murati et al.,2022:135-138) (Trabulsi & Salem1,2025:15) (Olwan,2025:25):

Firstly, internal factors: these are the factors that affect the value of the economic entity and are related to its internal elements, and are established from:

- i. The extent of depreciation and amortization of the unit's assets, both tangible and intangible.
- ii. The unit's financial capabilities stem from its strategic plans.
- iii. The unit's image and intellectual potential depend on the qualifications and training of its staff.
- iv. The expertise and experience of the unit's personnel and management.
- v. The quality control system and the unit's economic performance system.

Secondly, external factors: these are the factors related to the external conditions of the economic entity and include:

- i. Economic factors.
- ii. Political factors.
- iii. Legal factors.
- iv. International factors.
- v. Social and cultural factors.

3. Methodology

3.1 Problems

Many economic entities face challenges in measuring and managing greenhouse gas emissions within Scope 3, due to the complexities of supply chains and the multitude of indirect sources. These issues get in the way of sustainability efforts. Make it hard to reach our climate and regulatory goals. The main challenge of this study is to help us achieve our global objectives for reducing climate change make sure companies are honest, about their Scope 3 greenhouse gas emissions, and assist businesses in understanding and managing these emissions including where they come from and also Scope 3 emissions.

3.2 Objectives and Importance

Scope 3 greenhouse gas emissions are really important when we look at the carbon footprint of organizations and institutions. Scope 3 includes emissions that are not directly controlled by the company like the ones from supply chain activities and third-party operations. This also includes things like supply chain how people use the products, solid waste and business travel. The research, on Scope 3 greenhouse gas emissions is very important because it helps with global goals to stop climate change and to tell people about greenhouse gas emissions. It also helps the company understand and manage Scope 3 emissions and find out where they are coming from.. The objectives are further emphasized by improving sustainability across operations, supply chains, and supplier and customer relationships, as well as by empowering economic entities to make strategic decisions that positively influence greenhouse gas emissions and enhance enterprise value, ultimately leading to increased corporate value and environmental efficiency.

3.3 Hypothesis

This study's hypothesis centers on the correlation between an economic entity's management of its Scope 3 emissions and its effect on enterprise value. As shown below, a statistically significant difference in the organization's value is observed after sustainability implementation, whereas no statistically significant association is observed between Scope 3 emissions and the organization's value.

3.4 Sample

The 269 Turkish entrepreneurs created Karsan Economic Entity in 1966. OEM components were provided for 15 years. Peugeot began building the J9 minibus in 1981. Peugeot Economic Entity helped them build their first small, closed-box truck. From 1998, the Kiraça Group controlled Karsan Economic Unit, Turkey's leading commercial vehicle exporter. An independent J9 Premier minibus was manufactured by Karsan Economic Entity in 2006. It forged strategic ties with Hyundai, Renault, and Citroën the next year. Karsan Economic Entity developed the V1 concept for the New York Taxi of Tomorrow competition, drawing on its 2009 vision of "Borderless Mobility Solutions." Karsan began producing its first large buses in Rome in 2011. The 2013 variety was revamped with the private-label brands Jest, Atak, and Star. Hyundai, Industry Italiana Autobus, and Bozankaya formed new collaborations. After being upgraded to match customer expectations and relaunched as Jest+ with a new appearance in 2017, the Economic Entity changed. To safeguard the environment and future generations, keep up with dynamic historical cities, and ease life, the economic entity, Jest Electric, was founded that same year. Between 2018 and 2021, Karsan's economic entity introduced e-JEST and e-ATAK in 2019. Karsan's economic entity introduced the single e-ATAK and 10m, 12m, and 18m e-ATA family models in 2021. Thus, Karsan's economic entity sold Europe's first fully electrified 6–18-meter products. Menarinibus operates Karsan's 10-, 12-, and 18-meter buses. Karsan starts manufacturing Renault Megane cars in 2022. Since 2020, the business unit has concentrated on EVs. The business unit began writing and submitting GRI-compliant sustainability reports the same year. A factory is operated by the economic entity in Hasanağa, Bursa Province, Turkey. The factory has 203,000 and 99,000 square meters inside. It produces 65,000 automobiles annually. It builds cars, trucks, minibuses, and large buses. The Karsan economic entity has produced for global brands and its own brand in modern facilities for nearly 50 years. Karsan

sells its products in over 15 European nations, including Germany, Italy, Austria, and France, as well as in Eurasian countries, the Dominican Republic, and Asian and Middle Eastern countries, including the UAE, Bahrain, and Vietnam. Karsan Economic Entity seeks innovation and sustainability. It adds cutting-edge electric vehicle technology and continues to grow. Consumer and community satisfaction inspired Karsan Economic Unit's 100% electric bus designs.

4. Analysis and Results

4.1 Greenhouse gas emissions (Scope 3)

Greenhouse gas emissions pose a significant global environmental issue, exacerbating global warming and climate change. In this context, after reviewing the economic unit's sustainability reports, we will clarify and analyze Scope 3 emissions data.

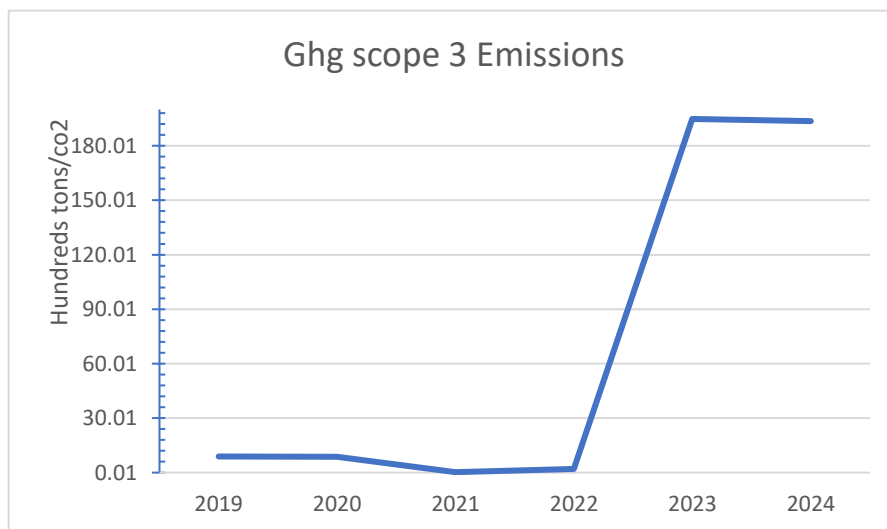
Table 2 Greenhouse gas emissions for production

Details	2019	2020	2021	2022	2023	2024
Greenhouse gas emissions for production (Scope 3) (tons of CO2e)	890	880	25.13	210.62	19479	19366.15

Source: Prepared by the researcher

Table 2 shows us that Scope 3 emissions, which are measured in tonnes of carbon dioxide went up a lot from 2019. This was the year the company first talked about emissions from gases, in their sustainability reports. These emissions have kept going up until 2024. If we look at Chart 1 we can see that the company has been getting bigger and doing things over time. The reason emissions went up at first was because the company came out with products in 2019. This was part of their plan to innovate. The year the company made some strategic partnerships to make more things, which made emissions go up even more. In 2021 the company started making electric models, which meant they were doing more work. This made emissions go up again. Then in 2022 the company made some improvements to their infrastructure and Scope 3 emissions went up some more. Recently, in 2023 and 2024, international market expansions and increased production volumes contributed to the peak in emissions observed in the firm's latest data.

Chart 1 Ghg scope 3 emissions



Source: Prepared by the researcher

4.2 Enterprise Value

Several elements contribute to strategic decision-making, including growth and investment, and enterprise value is among the most significant factors that affect its market position. Before revealing emissions in the Economic Unit's sustainability reports, the emphasis will be on presenting and assessing the Economic Entity's financial position. This will be done before applying sustainability standards and commencing disclosure of these emissions.

Table 3 Enterprise Value

Before		After	
Years	Enterprise Value	Years	Enterprise Value
2013	1,098,192,348	2019	2,515,854,208
2014	1,343,521,178	2020	4,582,434,996
2015	1,735,193,158	2021	4,667,190,996
2016	1,777,995,590	2022	13,897,950,987
2017	2,131,085,698	2023	10,937,164,991
2018	2,501,092,618	2024	16,642,113,987

Source: Prepared by the researcher

The commencement of the official adoption of sustainability and the publication of sustainability reports are indicated as occurring in 2019, as shown in Table 3, which illustrates the enterprise value based on the firm's information over 12 years, from 2013 to 2024. Because of this, the enterprise value is calculated for the years preceding the reporting of emissions (2013-2018) and for those after (2019-2024).

By examining the descriptive measures of the quantities, we have arrived at the findings shown in Table 4.

Table 4 Descriptive Measures

Descriptive measures	before	after
Mean	1764513431	8873785027
Std. Deviation	509741863	5768554724
Variance	25984	33276

Source: Prepared by the researcher

A comparison of the key statistical values for the variables, both before and after the adoption of greenhouse gas reporting (Scope 3), is presented in Table 4, available here. Before we started using greenhouse gas reporting the average was 1,764,513,431. After we started using greenhouse gas reporting it went up to 8,873,785,027. This is an increase. In cases using greenhouse gas reporting has led to better results than we thought it would. This big difference in averages shows us what is happening. We have to think about other things that might have caused this increase. Things like changes in what people want to buy new rules or big changes in the economy might have also affected the

numbers after 2019. If we think about these things we can understand what is happening with the organizations value better.

The standard deviation was 509,741,863 before we started using greenhouse gas reporting. After we started using it the standard deviation went up to 5,768,554,724. This means that the numbers are more spread out after we started using greenhouse gas reporting. This shows that the results are different in situations after we started using greenhouse gas reporting. The numbers are more spread out because some people or companies might have been helped more or less by using greenhouse gas reporting.

The variance was 25,984 before we started using greenhouse gas reporting. After we started using it the variance went up to 33,276. This is like what the standard deviation told us: the results are more different after we started using greenhouse gas reporting.

This change means that the average after we started using greenhouse gas reporting is much higher than the average before we started. The standard deviation and variance also show that the numbers are more spread out after we started using greenhouse gas reporting. This means that using greenhouse gas reporting usually leads to results but the results can be very different, in different cases.

4.3 Statistics Analysis

4.3.1 Paired Samples t-test

The study found that the average values before we implemented the method were actually lower.. After we implemented it the average values went up. This shows that the method worked and improved the indicator we were studying.

The average values before implementation were lower than those after implementation. This means the methods execution led to an improvement, in the indicator.

We looked at how much of a difference this new thing made. To do that we did a kind of test called a paired samples t-test. This test helped us compare the information we had before we started using it. The information we had after it was up and running. If you look at Table 5

Table 5 Paired samples t-test

Paired Differences		t	df	Sig.
95% Confidence Interval of the Difference				
Lower	Upper			
1511630289.097	12706912902.569	3.265	5	0.022

Source: Prepared by the researcher

Table 5 displays the results of the Paired Samples Test, indicating a calculated t value of 3.265 with 5 degrees of freedom, compared to the standard t value of 2.776. The statistical significance level (Sig) is 0.022, which is below the established significance criterion ($\alpha = 0.05$). Consequently, the null hypothesis may be rejected and the alternative hypothesis accepted, signifying a statistically significant change in the institution's worth after the adoption of sustainability. The t-test indicates a roughly 25% enhancement in shareholder value subsequent to the implementation of sustainable practices. This insight makes the data relevant for executives, highlighting the substantial correlation between sustainability practices and shareholder value, so informing boardroom choices on future sustainability projects.

4.3.2 Regression Analysis

To assess the degree of influence between the two variables, regression analysis was employed, as shown in Table 6-7.

Table 6 Model Summary

R	R Square	Adjusted Square	R	Std. Error of the Estimate
.646 ^a	0.417	0.272		4923453936.288

Source: Prepared by the researcher

Table 7 Regression Analysis

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	6279030296.552	2528053856.371		2.484	0.068
Ghg scope 3	381106.130	225203.429	0.646	1.692	0.166

Source: Prepared by the researcher

The analysis of the data in Table 6-7 indicates that the regression coefficient for greenhouse gases (Scope 3) has attained a value of 381106.130. This suggests that a one-unit increase in the percentage is expected to result in a corresponding increase in the company's value by 381106.130. The observed level of statistical significance (Sig = 0.166) exceeds the conventional threshold of 0.05. This finding suggests that the effect observed within this sample does not reach statistical significance and, consequently, cannot be extrapolated to the broader statistical population. Furthermore, a positive correlation was found between greenhouse gas emissions (Scope 3) and the company's valuation. However, the R² value of 0.417 indicates that approximately 41.7% of the variability in the measured quantities is accounted for by Scope 3 emissions. The residual 58.3% of the variance arises from factors not included in our model. Think that things like what's happening outside in the market and how new ideas are developed will be important. These things will be looked at in detail later on. We are going to keep doing research. We will get more information about these things so we can really understand them and be open, about what we find..

5. Conclusion

The economy is. This is affecting how we think about money and business. We use accounting and finance to see how well companies are doing and to help them do better. One important idea is about how valuable a company's what it can do to grow. A company can do this by getting involved in the market and making more money, which helps the company be stronger and more responsible to people. This is what companies need to do to stay and be good, to the people they affect. The economy and accounting and finance are all. Help us understand how companies are doing and how they can improve. One such tool is the focus on environmental sustainability through various aspects, the most important of which is the disclosure of greenhouse gas emissions.

The research focused on the requirements for disclosing Scope 3 greenhouse gas emissions and their impact on the enterprise value. To test the research hypotheses, the study relied on Karsan's financial statements and sustainability reports for a 12-year period from 2013 to 2024. The research concluded with several key findings, including that attention to enterprise value is a fundamental tool for achieving development and competitiveness. This is achieved

by identifying the main stakeholders of the economic entity and culminating in the entity's operations becoming sustainable, along with the continuous improvement of work processes. This aligns with the requirements of sustainability standards that focus on creating a clean environment by recycling waste into environmentally friendly materials, including those that mitigate greenhouse gas emissions. A clear difference in institutional value was found before and after the adoption and reporting of sustainability applications. This difference is not about Scope 3 greenhouse gas disclosures. It is about the changes that happen when a company stops doing things and starts doing things that are good for the environment and have other positive effects. The biggest change in how valuable a company's comes from making sustainability a priority. This is because the effect of Scope 3 greenhouse gases was really big at 41.7%. Sustainability implementation has an impact on the value of a company like this. Scope 3 greenhouse gas disclosures are important. The change, in the company's activities is what really matters.

To make these findings really useful I think CEOs should start working on adding sustainability information to the reports they do every quarter. They should make sure to show the Scope 3 emissions and do it in a way that follows the rules set by the country and the world. If companies do this they will not be better than others and increase their value but they will also show that they really care about the environment and want to do what is right. CEOs should focus on sustainability metrics in their reports and remember that sustainability metrics are very important, for companies. CEOs should use sustainability metrics to help their companies. This strategic shift in reporting and operations will ensure long-term sustainable development and potentially unlock new economic opportunities.

Furthermore, when attention is given to the enterprise value of the economic entity, it leads to environmental sustainability. This can be attributed to the focus on meeting market requirements and investment needs, as well as on fulfilling user desires regarding financial statements and sustainability reports, and on addressing their needs. Finally, the implementation of the requirements for reporting greenhouse gas emissions Scope 3 has a slight impact on the enterprise value due to its exposure to various factors that may have a positive or negative effect depending on the economic situation of the entity and the surrounding international and social factors, as well as the mechanism or manner in which the measurement, development, and subsequent disclosure processes are conducted in accordance with the presentation and disclosure requirements mentioned in the relevant accounting standards.

References

- Dyduch, W. (2022). Strategic processes and mechanisms of value creation and value capture: Some insights from business organisations in Poland. In *Effective implementation of transformation strategies* (pp. 289–316). Springer. https://doi.org/10.1007/978-981-19-2336-4_12
- Edenhofer, O., Pichs-Madruga, R., Sokona, Y., Seyboth, K., Kadner, S., Zwickel, T., ... Matschoss, P. (Eds.). (2011). *Renewable energy sources and climate change mitigation: Special report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.
- Eggert, J., & Hartmann, J. (2021). Purchasing's contribution to supply chain emission reduction. *Journal of Purchasing & Supply Management*, 27, 100685. <https://doi.org/10.1016/j.pursup.2021.100685>
- Gutwald, B., Baumann, N., Funk, F., Reichenstein, T., Albayrak, B., & Franke, J. (2024). Sustainable manufacturing practices: A systematic analysis and guideline for assessing the industrial product carbon footprint. In *2024 1st International Conference on Production Technologies and Systems for E-Mobility (EPTS)* (pp. 1–11).
- Harrison, J. S., & Wicks, A. C. (2013). Stakeholder theory, value, and firm performance. *Business Ethics Quarterly*, 23(1), 97–124. <https://doi.org/10.5840/beq20132314>
- Hostyński, L. (2006). *Wartości w świecie konsumpcji*. Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej.

Khaleel, M. S., & Alshaheen, N. S. (2022). Evaluation of value flow management according to the requirements of the specification (ISO 22468:2020): At the General Company for Electrical and Electronic Industries/Al-Wzeerai. *Journal of Techniques*, 4(3), 115–125. <https://doi.org/10.51173/jt.v4i3.526>

Klaaßen, L., & Stoll, C. (2021). Harmonizing corporate carbon footprints. *Nature Communications*, 12, 6149. <https://doi.org/10.1038/s41467-021-26349-x>

Kutsyk, P., Koryagin, M., Chik, M., & Kuskova, S. (2019). Development of evaluation of the market value of the enterprise in the system of accounting and analytical support. *Independent Journal of Management & Production*, 10(7).

Li, M., Wiedmann, T., & Hadjikakou, M. (2020). Enabling full supply chain corporate responsibility: Scope 3 emissions targets for ambitious climate change mitigation. *Environmental Science & Technology*, 54(1), 400–411. <https://doi.org/10.1021/acs.est.9b05245>

Lorenc, S., & Kustra, A. (2021). Distributing enterprise value to stakeholders in the range of sustainable development on the basis of the energy industry in Poland. *Sustainability*, 1–18.

Mačkowiak, E., & Emerling, I. (2023). Theoretical foundations of enterprise value management. *Scientific Papers of Silesian University of Technology: Organization and Management Series*, 179. <https://doi.org/10.29119/1641-3466-2023.179.14>

Maia, L., Moura, I., & Moura, J. J. G. (2021). *Enzymes for solving humankind's problems: Natural and artificial systems in health, agriculture, environment and energy*. Springer International Publishing. <https://doi.org/10.1007/978-3-030-58315-6>

Majamäki, T. (2022). *Understanding the importance of Scope 3 upstream emissions in the textile industry value chain: A case study of a Finnish textile company*.

Melo, V. (2018). *Collaborative efforts for sustainable development: Surveying the literature on multi-stakeholder initiatives to realize the Sustainable Development Goals*. <https://doi.org/10.13140/RG.2.2.19706.75209>

Murati, S., Alili, A., & Ismaili, L. (2022). Business enterprises and organizations as a business entity in the global market. *International Scientific Journal in Economics, Finance, Business, Marketing, Management and Tourism*, 9(17–18), 136–143.

Na, W., & Rao, Q. (2017). Enterprise value evaluation: Application and improvement based on cash flow model and economic value-added model. *Advances in Social Science, Education and Humanities Research*, 96, 185–190. <https://doi.org/10.2991/hsmet-17.2017.38>

Olwan, M. M. (2025). The impact of liquidity ratios on market value and market value added: A case study of the Bank of Palestine (2017–2023). *Technical Journal of Management Sciences*, 2(1), 21–29. <https://doi.org/10.51173/tjms.v2i1.14>

Organisation for Economic Co-operation and Development. (2019). *Reforming public procurement: Progress in implementing the 2015 OECD recommendation*. OECD Publishing.

Pattara, C., Raggi, A., & Cichelli, A. (2012). Life cycle assessment and carbon footprint in the wine supply-chain. *Environmental Management*, 49(6), 1247–1258. <https://doi.org/10.1007/s00267-012-9844-3>

Plessius, H., Steenbergen, M., Slot, R., & Versendaal, J. (2018). The enterprise architecture value framework. In *Proceedings of the Twenty Sixth European Conference on Information Systems (ECIS 2018)* (pp. 1–10).

Radonjič, G., & Tompa, S. (2018). Carbon footprint calculation in telecommunications companies – The importance and relevance of scope 3 greenhouse gases emissions. *Renewable and Sustainable Energy Reviews*, 98, 361–375. <https://doi.org/10.1016/j.rser.2018.09.018>

Seixas, J., & Ferreira, F. M. F. C. (2021). Carbon economy and carbon footprint. In J. J. G. Moura, I. Moura, & L. B. Maia (Eds.), *Enzymes for solving humankind's problems: Natural and artificial systems in health, agriculture, environment and energy* (pp. 3–28). Springer International Publishing. https://doi.org/10.1007/978-3-030-58315-6_1

Shtefan, N. M., Tsurkan, I. M., & Banshchikova, A. Q. (2023). Enterprise value management: Directions, key factors and growth tools. *Economics Bulletin*, 3, 120–130. <https://doi.org/10.33271/ebdut/83.120>

Strömberg, T. (2024). *Emissions accounting in cradle-to-gate scope in a case company: Challenges and solutions*.

The Royal Society. (2014). *Climate change: Evidence and causes*. National Academies Press.

Trabulsi, H., & Salem, M. I. (2025). The role of electronic governance in enhancing entrepreneurial performance. *Technical Journal of Management Sciences*, 2(1), 13–20. <https://doi.org/10.51173/tjms.v2i1.23>

World Business Council for Sustainable Development, & World Resources Institute. (2005). *The greenhouse gas protocol: The GHG protocol for project accounting*. World Business Council for Sustainable Development & World Resources Institute.

World Resources Institute, & World Business Council for Sustainable Development. (2011a). *Corporate value chain (Scope 3) accounting and reporting standard*.

World Resources Institute, & World Business Council for Sustainable Development. (2011b). *Corporate value chain (Scope 3) accounting and reporting standard – Greenhouse Gas Protocol*. <https://ghgprotocol.org/standards/scope-3-standard>

Zieniuk, P. (2018). Estimated value in accounting theory and practice of listed companies. In *Monograph co-financed by the University of Economics in Krakow* (Vol. 212, Issue 1, pp. 196–209). Difin.