Investigating the relationship between corporate environmental responsibility and environmental & financial performance in the oil & gas sector: with communication transparency and quality acting as moderators

Naut Jacobs

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University of Tilburg - TiSEM

Supervisor: dr. Maria Roszkowska-Menkes

Second Reader: dr. Marcus Schutz

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Abstract

This study examines the complex relationship between Corporate Environmental Responsibility (CER) initiatives and the outcomes of environmental and financial performance within firms in the oil and gas sector. As the world increasingly prioritizes sustainability, understanding the impact of CER initiatives becomes essential for both policymakers and industry stakeholders. The research explores how CER initiatives affect environmental and financial performance. It also critically examines the impact of communication transparency and quality as a moderating factor in this relationship. Additionally, this study hypothesized that environmental and financial performance have a positive direct relationship with CER initiatives. Prior literature has theorized that CER initiatives do have a positive impact on the environmental and financial performance, but prior literature is lacking research on the moderating role of communication transparency and quality on this relationship. This study examines the moderating effect of the communication transparency and quality with the use of a panel data regression analysis. The panel data consists of data gathered from the last 10 fiscal years and Breusch & Pagan tests in combination with Hausman tests, if necessary, have been done to consider if the different models with panel data had a fixed, random, or pooled effect. The findings of this study were mainly significant for the dependent variable environmental outcomes, meaning that a significant positive relationship have been found between CER initiatives and environmental performance. On the contrary, insignificant results have been found for the dependent variable financial outcomes, making it difficult to make statements about the relationship between CER initiatives and financial performance. Eventually, a conclusion could be made that more research on the topic is mandatory in the future for more accurate findings on the stated relationship and moderating effects. These conclusions are discussed, and limitations and recommendations have been mentioned in the last section of this study.

Keywords: Corporate environmental responsibility, Environmental performance, Financial performance, Communication, Transparency, Quality, Oil & Gas sector.

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1. Introduction

Environmental sustainability is increasingly supporting economic development and corporate environmental responsibility (CER) has become more popular within the business world combined with two goals: environmental sustainability, and economic growth. CER initiatives refer to certain actions and programs which firms voluntarily implement to show they considerate environmental commitment during their business operations as well as their interactions with stakeholders (Carroll & Brown, 2018). All in line with the sustainable development principles, firms agree that it is possible for environmental preservation and profitability to appear together, being more than only the sole objective of profit maximization for a firm. Eventually, this results in CER becoming a more important factor for a firm's competitive advantage (Lloret, 2016). More studies are being done about this subject and specifically on the possible impact of CER on environmental, and economic outcomes (Ioannou & Serafeim, 2012).

Environmental results of CER encompass the measurable and qualitative improvements a company achieves in areas such as ecological sustainability, resource conservation, pollution reduction, and overall environmental stewardship. These outcomes reflect a commitment to minimizing the environmental footprint of business activities and contributing to broader environmental goals (Elkington, 1998).

When considering the financial results of a firm in the context of CER, in this study it involves assessing traditional financial performance like market capitalization, return on assets, and return on equity. The financial results of CER initiatives have become more important, especially for stakeholders, like managers and investors, in order to make the decision if the implementation of CER initiatives is worth the investment (Giannarakis et al., 2016).

The oil & gas industry is one of the most important sectors of the whole energy industry, while being ranked eighth as one of the largest industries worldwide, the industry has a lot of influence over environmental sustainability, geopolitical dynamics, and economic development. This industry plays a crucial role in influencing the course of global energy markets, since it is a primary source of energy for households, logistics, and industries around the world. It is estimated that its market size will develop from USD 4.6 trillion in 2020 to USD 7.4 trillion in 2025. Being the backbone of today's economy, it is hard to believe the industry will lose its influence on the global economy (Philip et al., 2021).

The interest in understanding the relationship between CER initiatives, environmental outcomes, and financial performance in this industry is growing, this nexus can be explained by a couple of impactful factors, based of prior research and industry trends.

Firstly, the awareness of environmental issues is growing, e.g., pollution and climate change. This resulted in stakeholders prioritizing sustainability in a firm. This trend is underscored by former research, indicating that companies with strong environmental outcomes score better financially than companies with weaker environmental outcomes (Clarkson et al., 2008).

Secondly, globally stricter environmental laws demand companies to make expenditures based on CER initiatives, hence compliance. Understanding the financial implications coming out of these CER initiatives is crucial for ensuring regulatory compliance and effective risk management (Sohn et al., 2020).

Thirdly, while investors make investment decisions, they more and more take a look at Environmental, Social, and Governance (ESG) factors. Companies which show a strong environmental performance are looked at positively by investors. These investors acknowledge the long-term value creation potential of these companies (Eccles et al., 2014).

Fourthly, If companies invest in CER initiatives, they differentiate from their competitors. These sustainable initiatives strengthen brand reputation and are attractive for environmentally aware consumers resulting in competitive advantage (Li et al., 2019). Lastly, environmental risks present significant financial challenges to companies. That is why it is crucial to understand the relationship between CER initiatives and financial outcomes, to have an efficient risk management and the cultivation of resilience (Lee & Faff, 2009).

In conclusion, the increasing focus in understanding the relationship between CER initiatives, environmental outcomes, and financial performance mirrors broader shifts in the direction of sustainability and the acknowledgement of environmental stewardship as the essence of corporate success.

This study has a contribution to the current literature by laying the focus on the moderating effect of the transparency and quality of a firm's communication regarding the relationship between CER initiatives and environmental, and financial results. Communication transparency of a firm regarding CER refers to the extent to which the company openly and honestly communicates information about its environmental practices. A transparent approach involves providing stakeholders with clear, accurate, and comprehensive details about the company's CER initiatives, performance, and impact (Liu et al., 2023). According to Motu'apuaka et al. (2015), engaging stakeholders into the review process is seen as a crucial aspect of guaranteeing transparency and accountability, particularly in circumstances where systematic reviews have a direct impact on policy decisions. Key informants from the program/policy and stakeholder perspective indicated that engaging a wider community into this decision process is a moral imperative or a democratic entitlement. Both program officials and systematic reviewers underscored that mandates to involve stakeholders are essential aspects of demonstrating ongoing support for systematic reviews, transparency, and accountability.

The communication quality is about the way a firm communicates with its stakeholders. This study uses the Global Reporting Initiative (GRI) as an indicator for communication quality. The GRI, an independent international organization, maintains and develops sustainability reporting standards. Since 1997, GRI promotes sustainability by offering a framework for firms so they can report their economic, environmental, social, and governance (ESG) results. GRI stimulates organizations to involve with their stakeholders during the reporting process to make sure that all the reported information is credible, useful, and relevant (*GRI - Mission & History*, z.d.). According to Lock & Schulz-Knappe, effective communication of corporate social activities is considered as essential for achieving favourable outcomes for an organization and a key factor in enhancing corporate legitimacy and success. The expectation is that these favourable outcomes also show up regarding CER initiatives with communication as its moderator.

The main objective of this study is to assess the impact of CER initiatives on environmental performance indicators within the oil & gas industry at first and following up the influence of CER initiatives on the financial performance metrics will be examined. Eventually the moderating effect of communication transparency and communication quality on the relationship between CER initiatives and environmental/financial outcomes will be investigated.

As described as above, this leads to the following research question: *"What is the relationship between CER initiatives and environmental, and financial results of firms in the oil & gas sector, and how does the communication transparency/quality moderate this relationship?"*

Below, this research question is visually portrayed in a conceptual model for a better understanding about what this study is about.

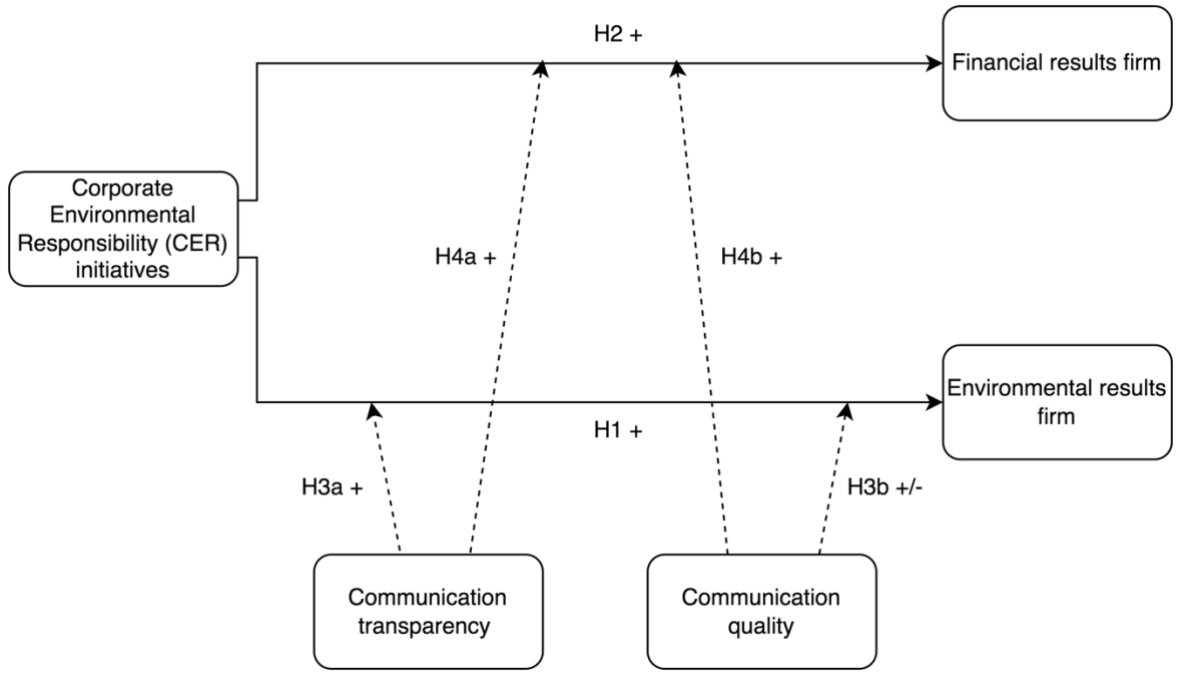

Figure 1. Conceptual model

RQ1: What is the impact of CER practices on environmental outcomes?

RQ2: What is the impact of CER practices on financial outcomes?

RQ3: What is the influence of communication transparency within a firm on the relationship between CER practices and environmental outcomes?

RQ4: What is the influence of communication transparency within a firm on the relationship between CER practices and financial outcomes?

RQ5: What is the influence of communication quality within a firm on the relationship between CER practices and environmental outcomes?

RQ6: What is the influence of communication quality within a firm on the relationship between CER practices and financial outcomes?

Investigating the impact of CER initiatives within the oil & gas sector is meaningful for multiple reasons, regarding its consequences for sustainability, stakeholder management, and corporate governance.

The oil & gas sector plays a major part in the degradation of the environment due to its water usage, remarkable carbon emissions, and habitat disruption. Comprehending the CER initiatives' impact in this sector is essential for promoting environmental sustainability. With executing CER initiatives, it will be possible for oil & gas companies to reduce their environmental footprint, mitigate pollution, retain natural resources, and support the change towards a more sustainable future for the energy industry (Darnall et al., 2008).

Oil & gas companies have to deal with complicated stakeholder ecosystems including regulators, investors, local communities, customers, environmental organisations, and employees. Investigating CER initiatives' impact supports companies to effectively interact with stakeholders and attend their concerns regarding environmental risks and social effects connected to oil & gas activities. Being transparent in the communication concerning CER initiatives can strengthen credibility, cooperation, and trust of stakeholders, resulting in better stakeholder relations and future corporate success (Lozano, 2013).

CER initiatives play an essential role with respect to corporate governance by encouraging ethical conduct, accountability, and transparency within oil & gas companies. By implementing environmental elements into their policies, decision-making processes, and governance structures, companies can uphold their license to operate, enhance their management of environmental risk, and comply with regulations. Advanced corporate

governance structures which prioritize CER initiatives can lessen risks, generate long-term value for shareholders, and improve the company's reputation (Emeka-Okoli et al., 2024). In summary, investigating the effect of CER initiatives within the oil & gas sector is crucial for encouraging the environmental sustainability, improving stakeholder management, and strengthening corporate governance. By prioritizing CER initiatives, oil & gas companies can showcase their dedication to accountable business practices, minimize environmental and social risks, and play a part in the change towards a more sustainable and comprehensive energy industry.

This study could advance research on the influence of communication transparency and communication quality in moderating the relationship between CER initiatives and outcomes, illuminating the essence of transparent communication for attaining sustainability performance. Besides, this study could contribute to prior literature by offering empirical evidence on the relationship between CER initiatives, financial results, and environmental results in the oil & gas sector, which could enhance current theoretical frameworks and models. Besides, results from this study could advice corporate decision-making within oil & gas firms by emphasizing the rationale for investing in CER initiatives. This could result into the adoption of more environment friendly practices and strategies to improve the environmental performance aside of enhancing financial performance. Eventually, this research could assist companies with comprehending the essence of transparent, and clear, communication in effectively conveying their sustainability efforts to stakeholders. This could result in enhancements in communication practices and strategies.

This study will, firstly, look at prior relevant literature on corporate environmental responsibility, CER initiatives in the oil & gas sector, environmental performance measurement, financial implications of sustainability initiatives, and the role of communication transparency/quality in shaping stakeholder perceptions. From this literature review it will be possible to develop multiple hypotheses on which further empirical research will be done. The empirical research has a conceptual framework consisting of different concepts which will be measured in the following way.

Firstly, the independent variable, CER initiatives of a firm, is retrieved from Refinitiv database and summarizes all the data points reported representing environmental initiatives. The dependent variables of this study are the different dimensions of CER outcomes (environmental and economic). These variables are determined by specific, measurable, and quantitative indicators related to CER goals. As such they are retrieved from the Refinitiv

database. Besides, we take a look at the moderating variables, communication transparency and communication quality within a firm. These variables are also sourced from the Refinitiv database. While the former is proxied with data on stakeholder engagement and environmental expenditures investments, the latter is measured with GRI reporting guidelines. The hypotheses were tested on a sample of 349 North American oil & gas companies in the period 2014 – 2023. Following, the results section will give an overview of all the regressions and correlation matrices that has been simulated. Finally, in the conclusions & recommendations part of the study the results will be discussed, and eventual limitations of the study are also brought to the light.

2. Literature review

This chapter will serve as an overview of the literature about the relationship between corporate environmental responsibility initiatives, environmental outcomes, and financial outcomes within the oil & gas industry. Besides, the communication transparency and communication quality are also being discussed and what effects these concepts have on the stakeholders' perception with the support of prior literature. Next to this the used hypotheses will be presented on which empirical research will be done during this study.

2.1 Corporate environmental responsibility

Corporate Responsibility (CR) is a well-recognized concept in international management literature containing an environmental (CER) and social (CSR) aspect (Lo et al., 2008). Matten and Moon (2008) describe CR as the transparent practices and policies of companies that showcase their dedication to broader ecological and societal well-being.

Ever since the industrial era, sustainability concerns have been increasingly highlighted, with problems like climate change, trade disputes, resource conflicts, energy crises gaining attention, and ecological degradation. Statistics show worrying levels of pollution in soil irrigation and industrial water globally, an amount of 157 types of pollution waste are recognized in industrial waste (Wang, 2009). These global environmental challenges result in a heightened public awareness of the essence of CR, especially with regard to Corporate Environmental Responsibility (CER). CER became a crucial topic for both the academic literature and business community due to these environmental challenges.

As such, comprehending and dealing with CER has become crucial for companies looking to manage the difficult relationship between environmental sustainability and economic activities (Starik and Rands, 1995).

CER refers to a company's interaction with the environment. It encompasses the obligations of decision-makers to undertake accountable actions which aim to safeguard and improve the environment as a whole, while also being aligned with their own interests (Huckle, 1995). The definition of CER following Gunningham's (2009) perspective is "practices that benefit the environment (or mitigate the adverse impact of business on the environment) that go beyond those that companies are legally obliged to carry out." This perspective conforms with the perspective of the World Business Council for Sustainable Development, which characterizes CER as follows, "environmentally friendly actions not required by law, also referred to as going beyond compliance, the private provision of public goods, or voluntarily internalizing externalities" (World Business Council for Sustainable Development, 2000).

CER has evolved as a distinct dimension of CSR. As a result, CER is now being recognized as a crucial part of CSR (Jo et al., 2014). Following Kitzmueller and Shimshack (2012), CER does represent the resulting dimension of CSR, addressing that CER is more specific than CSR and less abstract than CSR. Because CER is more specific than CSR, academics argue that CER can be measured more accurately than CSR. Besides, the findings also suggest that the environmental preferences of stakeholders cause CER to be of importance as part of a corporate's strategy with CER investments being markedly associated with sustainability and also company profits. Following Schmidheiny and Timberlake (1992), enterprises could make use of the development opportunities provided by the CER initiatives. Hence, enterprises take a crucial part in protecting the environment as the primary force of social development and industrial progress (Dimitropoulos & Koronios, 2021).

2.2 CER initiatives in the oil & gas sector

According to Zohuri (2023), the oil & gas industry is seen as a crucial pillar for providing energy globally, supplying essential resources to power economies and communities around the world. However, despite its undisputed importance, multiple environmental and social dilemmas developed from the activities within this industry. Think of habitat disturbance, greenhouse gas emissions, and community relocation. As a result of

growing concerns about societal and sustainability changes, CSR and environmental stewardship within this industry have gained increasing attention (ElAlfy et al., 2020).

Within the oil & gas industry there is a wide range of operations, e.g., the extraction, distribution, exploration, and refining of fossil fuels according to Craig & Quagliaroli (2020). This industry is active in different geographical regions, like onshore refineries and offshore drilling platforms, but these areas are often environmentally sensitive. The operations in this industry are crucial for meeting the energy needs worldwide, yet they often intervene with communities, indigenous territories, and ecological habitats, resulting in complex ethical, environmental, and social dilemmas. With growing issues over pollution, and climate change, environmental stewardship and CSR have become an unmissable necessity withing the oil & gas sector (Afolarin, 2022). These principles showcase the importance of this industry to take responsibility to decrease its environmental impact, have a positive impact on the communities it interacts with, and maintain ethical business practices. The implementation of environmental stewardship and CSR, or a form of CSR (like CER), in a corporate's strategies and operations within the oil & gas industry, can reduce negative impacts, improve brand reputation, and promote future sustainability (Agudelo et al., 2020).

According to Okeke (2021) it has become increasingly crucial to implement environmental stewardship for recognizing the ecological footprint within the oil & gas sector and decreasing its impact on the environment. That's why the next section will delve some examples of environmental stewardship within the oil & gas industry and the outcomes of these initiatives with regard to the environment.

The first example of environmental stewardship would be ecosystem restoration initiatives by oil & gas companies. Within the oil & gas sector, the production processes often result to biodiversity loss, deforestation, and the destruction of habitats, in specific in regions like coastal regions, forests, and wetlands which are very sensitive for these type of processes (Chomphosy et al., 2021). For challenging these problems, multiple firms started with operating in different initiatives to heal and restore damaged ecosystems. E.g., is the region around the Niger Delta in Nigeria, this area has experienced some heavy degradation of the environment because of years of oil production and exploration. In reaction to this environmental degradation, Chevron and Shell started ecosystem restoration initiatives on a wide scale with the idea of aiding local communities, restoring polluted waterways, and revitalizing mangrove forests. In the oil sands region in Canada, companies have done the

same kind of initiatives as done in Nigeria. Reclamation initiatives have been launched by the Canadian companies with the cause of rehabilitating land which has been disrupted by mining operations. In specific, these initiatives include the remediation of wildlife, soil restoration, and reforestation to eventually help the land to return to its original state. Following Sakai et al. (2022), environmental initiatives based on ecosystem restoration are not only helping to decrease the environmental effects of oil & gas activities, but they also play an essential part with the well-being of communities, ecosystem services, and the conservation of biodiversity.

Environmental stewardship can also lead to investments in renewable energy initiatives within the oil & gas sector (Hartmann et al., 2020). Cherepovitsyn and Rutenko (2022) recognize that oil and gas companies have started to enlarge their portfolios with implementing renewable energy resources like hydroelectric power, wind, and solar. This portfolio enlargement of companies is due to the necessity of changing to cleaner energy sources. One of the examples within the oil & gas sector is BP, which has been investing in such renewable energy resources to realize its strategy in aiming for a long-term lower-carbon output. Investments in wind and solar energy projects has been done globally by BP, included in these investments was the acquisition of Lightsource Renewable Energy, a big solar developer, and developing offshore wind farms located in Europe and the US (Oshilalu, 2021). Just like BP, TotalEnergies also enlarged its renewable energy portfolio with the help of investments in biomass, wind, and solar initiatives. TotalEnergies is a multinational from France within the oil & gas sector and according to Mailhol (2022), TotalEnergies is trying to claim the position as leading player, with regard to renewable energy, by already setting aspirational goals to improve the capacity for renewable energy in upcoming years. If a company engages in these type of initiatives, they'll not only help with the reduction of carbon emissions, but they'll also establish the company for long-term sustainability and create different sources of revenue within a developing energy-based playfield.

The third example of these environmental initiatives in the oil & gas industry is the adoption of advanced technologies to decrease emissions. This industry is notorious for its role in the contribution to greenhouse gas emissions, mainly because of the transportation, methane leaks while extracting, and the combustion of fossil fuel (Lee et al., 2022). To fight this problem, companies within the industry have been looking for innovative technologies to invest in with regard to decreasing the emissions across all stages of the production process.

For example, one of the biggest oil companies in the world, Shell, has stated that they want to reduce its carbon footprint by implementing multiple technologies which reduce their emission. An example of one of the technologies is the carbon capture and storage (CCS), a technology which captures carbon dioxide emissions deriving from industrial operations and eventually storing these emissions underground. Investments in these CCS technologies has Shell been doing multiple times worldwide, one of these investments includes the Quest project in Canada, during this project Co2 emissions, deriving from a tar sands facility, were captured and kept underground (Martin-Roberts et al., 2021). Furthermore, other companies within the industry like ExxonMobil have done investments in the detection of methane and alleviation technologies to decrease methane emissions, known for having a potent greenhouse effect with a more intense impact on global warming compared to Co2. The inclusion of satellite imaging, drones, and sensors enable these technologies to detect and rectify methane leaks within the oil & gas infrastructure. The implementation of these technologies shows the dedication of the oil & gas industry to environmental stewardship and its readiness to make investments for solutions to address climate change and minimize its impact on the environment (Cheng et al., 2023).

These above-mentioned case studies showcase the dedication of the oil & gas industry to implement initiatives based on environmental stewardship and the reduction of its ecological footprint with the use of ecosystem restoration, investment in renewable energy resources, and making use of advanced technologies. The implementation of these successful environmental initiatives underscore that the industry knows its responsibility to challenge the environmental issues like protecting the biodiversity, fostering sustainable development, and climate change (Fei et al., 2021). Besides, another underlying thought of these initiatives is the potential of the industry to work with the civilisation, and the government to reach collective environmental targets and promote positive transition to a more sustainable future. However, even though these initiatives exist, challenges persist. Challenges like the need for enhanced transparency, more robust regulatory frameworks, and never-ending innovation to speed up the transformation towards a long-term sustainable energy world (Emeka-Okoli et al., 2024).

2.3 Environmental initiatives and environmental performance

Proactive environmental management which prioritizes CER initiatives can lessen risks, generate long-term value for shareholders, offer operational and competitive advantages, and improves the company's reputation (Sharma and Vredenburg, 1998; Emeka-Okoli et al., 2024). However, in the available literature about environmental management, in specific Wisner et al. 2009, environmental proactivity is still a somewhat abstract concept. According to Li et al. (2020) "Environmentally proactive firms" refers to businesses that take proactive measures to minimize their environmental impact, going beyond mere compliance with regulations and actively seeking to adopt environmentally sustainable practices throughout their operations, products, and services. Hunt and Auster (1990) describe environmentally proactive firms as firms which, at the highest management levels, prioritize environmental management. Judge and Douglas (1998) define this as a firm which allocates its significant resources towards environment management practices and includes this in strategic planning. Aragòn-Correa and Sharma (2003) speak of constantly managing processes to reduce the negative impact on the environment aside from regulatory standards. As a result, there is still no acknowledgement about which management processes specifically cause a firms' environmental initiatives to result in enhanced environmental performance (Wisner et al., 2006).

To know more about this concept, some further investigation into environmental performance measurement systems need to be done. According to Bonacchi and Rinaldi (2007), these systems have raised the attention of companies, in recent years, which use these systems as tools for deciding if environmental concerns should be integrated into the business processes of the company. Systems regarding environmental performance measurement form essential elements within environmental management control systems and a specific utilization of performance measurement systems (Henri and Journeault, 2010). The environmental performance measurement provides information which is crucial for decision-making processes and aiding in obtaining environmental goals through evaluating performance and providing incentives (Burritt and Schaltegger, 2010; Perego & Hartmann, 2009). When aligning companies' goals and fundamental value drivers with the processes done by management, systems for measuring environmental performance can support companies in realising their environmental incentives into enhanced performance (Ittner, 2003; Lisi, 2015).

An environmental performance measurement which is recently used very frequently, would be the ESG's environmental pillar. The environmental pillar measures the impact of a company based on living and non-living natural systems and this includes land and water, the complete ecosystem, and the air. The measurement showcases if a company makes efficient use of the best management strategies for preventing environmental risks and leverage environmental opportunities in order to enhance long-term shareholder value. In this measurement areas are taken into account like emission, environmental innovation, and the use of natural resources as shown in the figure below (Refinitiv, 2024).

Pillars	Catagories	Themes
Environmental	Emmission	Emissions
		Waste
		Biodiversity*
		Environmental management systems*
	Innovation	Product innovation
		Green revenues, research and development (R&D) and capital expenditures (CapEx)
	Resource use	Water
		Energy
		Sustainable packaging*
		Environmental supply chain*

Figure 2. Components of the ESG's Environmental pillar

Eventually, the environmental score (E-score) portrays the weighted average of all the ESG key issues, shown above, that resemble the environmental pillar. For this study two themes from the environmental pillar are taken into account, emissions and biodiversity.

Little research has been done on the actual impact of CER initiatives on environmental performance. Annandale et al. (2004) have done research on the impact of voluntary environmental instruments on the actual environmental performance of companies and concluded that CER does have a significant impact on environmental performance. This finding concludes that CER initiatives have an overwhelmingly positive impact on outcomes like environmental performance, this is acknowledged by senior managers. These initiatives do have a direct positive impact on better management of spills, energy efficiency, recycling programmes, and the development of environmentally friendly processes and products.

The main theory of these studies suggests that CER initiatives have a positive impact on the environmental performance of firms. Therefore, this study will investigate the following hypothesis.

H1: CER initiatives are positively associated with environmental outcomes.

2.4 Environmental initiatives and financial performance

Multiple researchers have investigated the influence of CER initiatives on the financial performance of companies, utilizing different theoretical perspectives. For instance, a theory which has been employed frequently is the Resource-Based View, concluding a positively correlating relationship between Corporate Financial Performance and CER initiatives. Enhancement of competitive advantage by harnessing both internal and external resources is being discussed by this theory, with the generation of such resources and offering risk management capabilities in times of adversity due to CER initiatives (Russo & Fouts, 1997).

Instead, according to Wei et al. (2017), the Signalling Theory proposes that CER initiatives and related information are being communicated towards the market with the thought of increasing the stakeholders' awareness, resulting in the legitimacy of a company being improved regarding their operations. Farooq et al. (2017), noticed the Social Identity Theory highlighting the essence of CER initiatives in nurturing the identification of employees within companies, having influence on the CER activities and the strategic decision-making of firms.

Furthermore, a contemporary framework, called the Neo-Institutional Theory, clarifies the nature and workings of institutions. According to this theory, CER is seen as a validity mechanism which enables companies to broaden stakeholder approval, enhance financial performance, and access financial markets (Jiang et al., 2018).

Together, all the above theories indicate a positive correlation between CER initiatives and the corporate financial performance.

Academic research has found that the existing pressure from stakeholders on companies cause corporate strategies to change with regard to corporate relationships (Sarkar, 2007), and Wahba (2007) also indicates that environmental responsibility has a positive influence on institutional investors. According to Lyon and Maxwell (2008), a multitude of factors prompt companies to adopt CER initiatives, such as the pressure arriving from non-governmental organizations and environmentally conscious customers. Additionally, corporate environmental initiatives underscore the significant impact of market forces in strengthening CER (Suto and Takehara, 2018). Furthermore, the importance of managerial practices and dedication in implementing environmental initiatives have been highlighted by other researches (Kassinis & Panayiotou, 2006; Lee & Ball, 2003).

Lately, CER has been transitioning from only being perceived as a charitable effort towards also being viewed as a strategic imperative. CER, beside its social impact, creates opportunities for companies to mitigate its negative characteristics while gaining positive recognition on the social and strategic aspect (Porter and Kramer, 2006). According to Montiel (2008), multiple factors have influence on companies with regard to adopting environmental initiatives, this includes the reduction of financial and administrative risks, profit augmentation, customer confidence, cost reduction, increasing sales, operational efficiency improvement, and reputation enhancement.

CER ought to be perceived as a strategic investment, with CER efforts being broadened for strategic benefits to be achieved. Efforts towards environmental conservation have demonstrated to positively affect corporate value (Wahba, 2007). International stakeholders demand an expanded accountability framework within traditional accounting methods, aiming to offer more precise and reliable information regarding the company's financial situation. According to Waddock (2003), this extended framework is founded on the notion that corporate responsibility goes beyond profit maximization. Berthelot et al. (2003) states that voluntary revelations of data regarding the environment may not have an accurate reflection of corporate environmental performance and may lack credibility. Former research showcases that companies might avoid sharing environmental information unless compelled by strategic considerations. Specifically, companies facing notable environmental challenges might hesitate to disclose such details due to the fact that the high expenses of production could surpass potential gains of diminishing investor uncertainty (Li et al., 1997).

Moreover, Darrell and Schwartz (1997) found evidence that voluntary environmental disclosures have impact on investors' views of a firm's future cashflow and earnings. For example, a low number of investments in CER initiatives may signify an inadequate administrative and governance framework within the company, indicating a lack of accountability and progressiveness towards stakeholders of the company (Orlitzsky and Benjamin, 2001). This corresponds, according to Klassen and McLaughlin (1996), with the Management Quality Theory, which suggests that significant CER initiatives may indicate strong management practices and enhanced corporate financial performance.

Empirical results regarding the direct relationship between CER initiatives and Corporate Financial Performance (CFP) have been contentious, with most findings implying a positive effect of CER initiatives on CFP. Yet, one body of evidence indicates that the implementation of CER initiatives asks for valuable financial resources, this may outweigh the benefits of CER initiatives, and this could result in a negative effect on CFP. Former research has shown a negative influence of CER on CFP, arguing that the substantial investments needed for CER initiatives do not generate positive returns, thus negatively affecting CFP (Jia et al., 2019; Suto & Takehara, 2018; Testa & D'Amato, 2017).

On the flipside, a considerable amount of research indicates the opposite correlation. Within the Chinese business world, Jiang et al. (2018) suggests a positive impact of CER initiatives on CFP, claiming that CER fosters competitive resources, either external as internal, resulting in competitive advantages and improved financial performance, while doing either market-based or accounting measurements. Further support has been presented by Fiandrino et al. (2019), who examined a substantial European sample and Chen et al. (2018), utilizing a worldwide sample of companies. Both researches conclude that CER initiatives and its performance have a positive influence on financial performance.

Additionally, several meta-analytical studies have corroborated the earlier arguments regarding the positive influence of CER initiatives on CFP. Friede et al. (2015) and Revelli & Viviani (2014), imply that environmental and social investments yield enhanced financial returns, resulting in improved future prospects and profitability. In conclusion, based on the discussed issues mentioned above and the compelling evidence on the positive impact of CER initiatives on the relationship with CFP, the following hypothesis states:

H2: A companies' CER initiatives are positively associated with its financial outcomes.

2.5 The role of communication transparency/quality in shaping stakeholder perceptions and consumer behaviour

Communication is essential for delivering the value of CER initiatives to the target audience. According to Golob et al. (2013) and Yang & Ji (2019), strategic communication illustrates companies' deliberative efforts to convey their CER commitments to the target audience, foster organizational legitimacy, and satisfy public anticipations. Recent research on CSR communication has pinpointed effective communication tactics that help organizations in meeting stakeholders' expectations, have a positively societal impact, and achieve organizational goals (Kim, 2017). Importantly, effective CSR communication strategies should be adapted to tailor to a society's particular business and social environment and public requirements (Kim & Ji, 2017). In light of increasing scepticism among consumers and changing consumer expectations regarding CSR, organizations must explore ethical and strategic approaches to communicate CSR news to a bigger audience (Kim & Rim, 2016, 2019; Ham & Kim, 2020).

The study of Rim et al. (2024) focuses on transparency as an essential strategy of CSR communication. According to Dong and Ji (2018), in public relations, transparency is a vital component in fostering trust in the relationship between organizations and its stakeholders. It serves as an indicator of an organization's sincerity to its stakeholders, honesty, and openness, it is also broadly identified as a professional ethical standard (Stanić, 2019; Wehmeier & Raaz, 2012). Within CSR, transparency represents the quality of CSR communication, reflecting an organizations' authenticity and commitment to CSR initiatives (Rim et al., 2019). It can also effectively generate trust in CSR initiatives (Kim, 2017). According to Rawlins (2008), transparency is defined as organization's' deliberate efforts to reveal information that strengthens stakeholders to assess it and hold companies accountable. Transparency in communication should have three characteristics which the public could see: accountability, information substantiality, and stakeholder involvement (Rawlins, 2008). Accountability refers to supplying objective accounts on organizations' policies, actions, and missions. It emphasizes unbiased revelation of organizational performance, including both

shortcomings and strengths, to enable stakeholders to make informed assessments of the organizations' dedication and accountability. Information substantiality requires that information sharing be relevant, lucid, complete, precise, dependable, and confirmable. Stakeholder involvement underscores the importance of engaging stakeholders' interactions and inputs in the communication process, and ensuring they understand the information to make informed choices. Transparency is usually regarded as a communication strategy for CSR communication within organizations from a managerial and instrumental perspective (Kim, 2017). However, recent research has begun to place CSR transparency in a wider societal context to investigate its connection with institutional growth (Carroll & Einwiller, 2014). As a pioneer study, Rim et al. (2019) analysed CSR reports of large corporations from three countries, China, South Korea, and the United States. They concluded that transparency varied significantly reflecting the distinct stages of each country's institutional growth. Ju et al. (2021) examined transparency in the Canadian cannabis industry and its CSR communication on social media, revealing the varying and potentially concerning usage of transparency strategies within a debated business environment. These studies provide a distinct point of view on CSR disclosure as more than mere reporting, but it underscores its ethical attributes and high quality. Nonetheless, they are primarily descriptive. Analytical research on the relationship between stakeholder reactions to CSR and organizations with influence of CSR transparency still remains scarce (Kim et al., 2020).

Not much research has been done on the relationship between communication transparency of a firm and the relationship with environmental outcomes. Research rather have been done on the relationship between communication transparency and the financial outcomes. Some studies have been done about sustainable behaviour, this may lead to better environmental outcomes. According to Foscht et al. (2018), better transparency may motivate customers to act with more sustainable behaviour leading to more sustainable and responsible consumption. This enhanced sustainable and responsible consumption may eventually result in a better environmental outcome. Research about communication quality and the relationship with environmental outcomes was not available so with this in mind the study proposes that communication quality does not have any influence on the environmental outcomes. This research eventually results in the following hypotheses.

H3a: Communication transparency positively moderates the relationship between CER initiatives and environmental outcomes.

H3b: A companies' communication quality doesn't have such an influence on its environmental outcomes.
H4a: A companies' communication transparency positively moderates the relationship between CER initiatives and financial outcomes.
H4b: A companies' communication quality positively moderates the relationship between CER initiatives and financial outcomes.

3. Research Methodology

This chapter explains the research methodology. The initial section introduces the method for collecting data and the sample. Subsequent sections explain the dependent variables, independent variables, moderating variables, and the control variables. Finally, in the last section the methods for analyzing data to empirically test the hypotheses will be discussed.

3.1 Data collection and sample

The dataset chosen for this study has a period of 10 years, ranging from 2014 to 2023. This period was selected because it is possible to see the value changes over the last 10 years. Besides, the data that is being used is very recent. All the data being used for the independent, dependent, moderating, and control variables is sourced from Refinitiv Eikon using the screener function. All data necessary for each variable is obtainable from Refinitiv Eikon and the screener function has a tool which makes it possible to look at data of the last 10 fiscal years. In Refinitiv Eikon it is possible to use CER databases on companies' historical CER practices and outcomes. Eikon and DataStream are owned by Refinitiv and are major financial databases when it comes to extracting Environmental, Social, and Governance (ESG) data across 76 countries while covering over 88% of the global market cap, in our study we will only focus on the environmental part of the ESG data within the North American oil & gas industry.

The sample being used for this research consists of North American oil & gas firms based in Canada and/or the United States. The number of companies within this industry, and

within North America, known to Refinitiv Eikon is 629 companies. Out of these 629 companies Refinitiv Eikon owns a complete dataset of at least 192 companies for the last 10 fiscal years. This data set is a mix of large multinationals and smaller regional firms which ensures a representative sample group for the CER practices being done in the oil and gas sector. All the collected data has been analyzed using statistical methods like correlations, descriptive analytics, and multiple panel data regressions such as fixed effects models, random effects models, and pooled effects models. This, because of the longitudinal data set of 10 fiscal years.

3.2 Dependent variables

The dependent variables used for this study are environmental results and financial results of a firm. Environmental results of a firm can be measured by multiple environmental indicators. Indicators like pollutant emissions, resource efficiency, biodiversity and land use, waste management, water usage, and greenhouse gas (GHG) emissions. For this study the indicators *emission score and biodiversity impact reduction score* will be combined to measure the environmental outcomes of CER initiatives. Emission score measures a company's effectiveness and commitment towards diminishing environmental emissions during the production and operational activities. This metric is essential in the oil and gas sector, where carbon emissions pose a significant environmental problem (*IEA – International Energy Agency*, 2024). Biodiversity impact reduction score tells if a company does report on its impact on biodiversity or on its activities to diminish its impact on the regional ecosystems and species. The operations of the oil and gas industry, such as extraction and drilling, frequently disrupt ecosystems and wildlife in the nearby region, making biodiversity preservation a vital aspect of environmental responsibility (World Wide Fund for Nature, 2024). Integrating these two metrics provides a holistic view of the environmental performance of a firm. Emission scores focus on the atmospheric impact on the environment, while biodiversity impact reduction scores focus on the aquatic and terrestrial components. This combined approach ensures a more comprehensive and nuanced evaluation of CER initiatives' effectiveness, improving our understanding of how these efforts result in tangible environmental benefits (GRI, 2024).

The emission score is measured with numerical data existing in the form of a scale from 0 to 100, whereas biodiversity is also measured on a scale from 0 to 100. A higher score on both scales defines a more positive combined impact on the environment.
The financial results of a firm can be measured by using multiple financial indicators like market capitalization, return on equity, and return on assets. These indicators will be used in this study to measure the financial outcomes of CER initiatives by a firm.

3.3 Independent variable

The independent variable used for this study is CER initiatives of a firm. This variable will be measured using data on indicators environmental investments on initiatives, environmental partnerships, environmental restoration initiatives, and environmental products. Each indicator has to do with initiatives to preserve the environment, environmental investments on initiatives explains if a company does investments on initiatives or not, environmental partnerships means if a company does (or does not) partner up with other companies or stakeholders to promote or implement environmentally friendly practices, environmental restoration initiatives highlight if companies assist the recovery or conserve the ecosystems that have been destroyed, degraded, or are still intact, and lastly environmental products tell more about the products of a company and if these products cause minimal environmental degradation (Cooper-Ordoñez et al., 2018). These indicators combined make the CER initiatives variable and they ought to have an influence on the dependent variables since they affect both the environmental and the financial outcomes of a firm.
Each variable used to construct the independent variable has the form of a dummy variable with ‘FALSE’ or ‘TRUE’ being transformed into numerical data respectively presented as ‘1’ and ‘2’.

3.4 Moderating variables

The moderating variables used for this study are ‘communication transparency’ and ‘communication quality’. Communication transparency consists of the indicators stakeholder engagement score and environmental expenditures investments combined. Stakeholder engagement score explains what the rate of involvement is of stakeholders with the active

projects of a firm. A high rate suggests an active engagement of the stakeholders within the firm and this may lead to more alignment, better feedback, and a higher chance of overall success of a companies' project (Project Management KPI Examples, z.d.). The measurement of this score is on a scale of 0 to 100. Environmental expenditures investments explain if the company mentioned its environmental expenditures or proactive environmental investments, for reducing the risks in the future or increasing the opportunities in the future, in its reports (Refinitiv, 2024). These indicators combined form a measure for communication transparency in this study.

Communication quality consists of the indicator GRI Report Guidelines. This indicator tells if a company does its reporting following the GRI guidelines. The GRI report guidelines are an indicator for companies to determine if they follow the correct sustainability reporting and if their communication is of high quality or not (GRI, 2024). In the analysis this variable is measured in the form of a dummy variable with 'FALSE' or 'TRUE' being transformed into numerical data respectively presented as '1' and '2'.

3.5 Control variables

Control variables are added to ensure the internal validity of this study. The control variables showcase an influence on both the independent and the dependent variables and are thus referred to as confounding variables.

Firm size (total assets)

An important control variable used in this research is Firm size, which can have an impact on both financial and environmental outcomes. This variable will be controlled with the use of the logarithm of the total assets from all firms in the database, referring to as log (Total Assets). The influence of firm size on financial and environmental outcomes is due to larger firms investing in CER initiatives with more resources and having different risk profiles and financial structures compared to smaller firms.

Corporate Governance board committee

By making corporate governance board committees a control variable, researchers will be able to isolate the influence of CER initiatives and communication transparency on financial and environmental outcomes. This method guarantees that the perceived

connections are not confounded by the different governance practices between companies which provides a better comprehension of the real effects of CER initiatives. This way the analysis is more precise by considering the variations in oversight and strategic direction offered by various governance structures (K. D. Chen & Wu, 2015).

Environmental innovation score

With the use of the environmental innovation score as a control variable during the analysis within this research, the study ensures that the relationship between CER initiatives and environmental and financial outcomes is identified in an accurate way. It serves for accounting other environmental efforts by companies, minimizes the potential for omitted variable bias, and it provides a clearer comprehension of the moderating effects of communication transparency and quality on the relationship between CER initiatives and environmental and financial outcomes.

R&D

The implementation of R&D as a control variable in this study's analysis, will capture the effects of CER initiatives on environmental and financial outcomes more accurately because controlling for R&D isolates the particular effects of the CER initiatives on the financial outcomes caused by innovation (Griliches, 1998). Controlling for R&D will also isolate the specific impact CER initiatives have on environmental outcomes since R&D can also result in cleaner technologies and sustainable products (Porter & Van Der Linde, 1995).

4. Results and discussion

The chapter with the results showcases and explains the outcomes of the empirical analysis that was conducted to investigate the relationship of CER initiatives on environmental outcomes and financial outcomes, moderated by communication transparency and communication quality. This section serves as an interpretation and comprehensive summary of the analysis done on the assembled data in this study.

4.1 Descriptive statistics and correlation

This thesis' dataset has longitudinal data, that is why a panel regression has been chosen to run the data in this analysis. Firstly, this dataset has been set to 'xtset' to make the dataset structure ready for analysis with panel regression. After making the dataset ready for regression, first a Breusch Pagan test is needed to determine, for each indicator of the dependent variables, if the panel data regression is random/fixed or pooled. If the test leads to the use of a random or fixed effect, then a Hausman test needs to be run to determine if the panel regression has a random or fixed effect.

H0: Fixed/random effects model is preferred	
Chi (1)	77.75
Prob>Chi2	0.000

Table 1: Breusch Pagan test outcomes for emission score

H0: Fixed/random effects model is preferred	
Chi (1)	36.92
Prob>Chi2	0.0120

Table 2: Hausman test outcomes for emission score

The results of the Breusch and Pagan test, presented in table 1, show that a pooled effect model is dismissed, since $p < 0.05$ (Prob > chibar2 = 0.000). If $p < 0.05$, then a Hausman test would be necessary to test if a random or fixed effect is needed for the panel data regression but, in this scenario, it is needed for the emission score model. The results of the Hausman test in table 2 show that a fixed effects model is more suitable to use for the emission score model, since $p < 0.05$. This model is referred to as model 1.

H0: Fixed/random effects model is preferred	
Chi (1)	69.94
Prob>Chi2	0.000

Table 3: Breusch Pagan test outcomes for biodiversity impact reduction score

H0: Fixed/random effects model is preferred	
Chi (1)	22.88
Prob>Chi2	0.2945

Table 4: Hausman test outcomes for biodiversity impact reduction score

The results of the Breusch and Pagan test, presented in table 3, show that a pooled effect model is dismissed, since $p < 0.05$ (Prob > chibar2 = 0.000). If $p < 0.05$, then a Hausman test would be necessary to test if a random or fixed effect is needed for the panel data regression and, in this scenario, it is needed for the biodiversity impact reduction score model. The results of the Hausman test in table 4 show that a random effects model is more suitable to use for the biodiversity impact reduction score model, since $p > 0.05$. This model is referred to as model 2b.

H0: Fixed/random effects model is preferred	
Chi (1)	3.34
Prob>Chi2	0.0339

Table 5: Breusch Pagan test outcomes for market capitalization

H0: Fixed/random effects model is preferred	
Chi (1)	26.54
Prob>Chi2	0.2291

Table 6: Hausman test outcomes for market capitalization

The results of the Breusch and Pagan test, presented in table 5, show that a pooled effect model is dismissed, since $p < 0.05$ (Prob > chibar2 = 0.0339). If $p < 0.05$, then a Hausman test would be necessary to test if a random or fixed effect is needed for the panel data regression and, in this scenario, it is needed for the market capitalization model. The results of the Hausman test in table 6 show that a random effects model is more suitable to use for the market capitalization model, since $p > 0.05$. This model is referred to as model 3.

H0: Fixed/random effects model is preferred	
Chi (1)	0.00
Prob>Chi2	1.00

Table 7: Breusch Pagan test outcomes for return on assets

The results of the Breusch and Pagan test, presented in table 7, show that a pooled effect model is advised, since $p > 0.05$ (Prob > chibar2 = 1.00). If $p < 0.05$, then a Hausman test would be necessary to test if a random or fixed effect is needed for the panel data

regression and, in this scenario, it is not needed for the return on assets model. This model is referred to as model 4.

H0: Fixed/random effects model is preferred	
Chi (1)	0.00
Prob>Chi2	1.00

Table 8: Breusch Pagan test outcomes for return on equity

The results of the Breusch and Pagan test, presented in table 8, show that a pooled effect model is advised, since $p > 0.05$ (Prob > chibar2 = 1.00). If $p < 0.05$, then a Hausman test would be necessary to test if a random or fixed effect is needed for the panel data regression and, in this scenario, it is not needed for the return on equity. This model is referred to as model 5.

Next a descriptive table is presented with the mean, standard deviation, and minimum or maximum value of each variable. Besides, a table with Pearson correlation computations is constructed between the different variables. To evaluate the strength of the relationship between the correlations of the variables, Akoglu's (2018) study is used which can be seen in table 2 below.

Table 9: Correlation coefficient table (Akoglu, 2018)

Correlation coefficient (range)	Strength
1 or -1	Perfect correlation
+/- 0.7 to +/- 0.9	Strong correlation
+/- 0.4 to +/- 0.6	Moderate correlation
+/- 0.1 to +/- 0.3	Weak correlation
0	No correlation

Table 10: Table of Descriptive model

	Mean	S.D	Min	Max
Environmental investments on initiatives	1.248	0.432	1	2
Environmental partnerships	1.455	0.498	1	2
Environmental restoration initiatives	1.277	0.448	1	2
Environmental products	1.132	0.339	1	2
Emission score	164.62	211.841	1	657
Biodiversity impact reduction score	2.236	2.691	1	12
Market Capitalization	1818.665	1210.755	1	3941
Return on Assets	138.498	58.277	1	297
Return on Equity	211.189	97.871	1	484
Stakeholder Engagement Score	4.807	7.534	1	28
Environmental expenditures investments	1.342	0.475	1	2
GRI Report Guidelines	1.992	0.091	1	2
Total Assets	1893.602	1455.074	1	4521
Corporate Governance board committee	1.910	0.286	1	2
Environmental innovation score	4.704	9.423	1	44
R&D	477.312	326.980	1	1058

Table 11: Table of Pearson's correlation computations

	1	2	3	4	5	6	7	8	9	10
1. Env. Invest. on Initiatives	-									
2. Env. Partnerships	*.0875****	-								
3. Env. Restor. Initiatives	*.0606****	*.4014****	-							
4. Env. Products	*.3831****	*.1701****	*.3108****	-						
5. Emission score	*.4400****	*.5128****	*.4884****	*.3957****	-					
6. Biodiv. Impact reduct. score	*.0550****	*.0929****	*.1418****	*.1003****	*.3119****	-				
7. Market Capitalization	*.0337*	*-.0007*	*-.0262*	*.1323*	*.1465*	*.0662*	-			
8. ROA	*.1209**	*.0747***	*.1844****	*.1284****	*.1299****	*-.1149***	*.1596*	-		
9. ROE	*-.0031*	*.0934****	*.2134****	*.0626****	*.1597****	*-.0475****	*.1020*	*.6964****	-	
10. Stakeholder Engage. score	*-.1366****	*.3437****	*.1068****	*.1404****	*.2390****	*.3916****	*.0950*	*.0284****	*.0378****	-

11. Env. Expen. Invest.	*.7889****	*.0197****	*.1259****	*.3658****	*.4427****	*.1418****	*.0346*	*.1118**	*.0197*	*-.0741****
12. GRI Report Guidelines	*-.1028*	*-.0377*	*-.0811*	*-.2217**	*-.0363*	*.0858*	*-.0272*	*-.0830*	*-.0340*	*.0944*
13. Total Assets	*.1685**	*.0235*	*.1088**	*.3357****	*.1694**	*.0766*	*.1594****	*.0808*	*.0538*	*-.0221*
14. Corp. Govern. Board committee	*-.1988*	*.0158*	*-.0528*	*-.3072*	*-.1997*	*-.1799*	*-.1069*	*-.0343*	*-.0512*	*-.2828*
15. Env. Innovation score	*.4282****	*.1686****	*.3421****	*.8453****	*.4194****	*.2354****	*.1423*	*.1557****	*.0682***	*.1848****
16. R&D	*.0219*	*.1044**	*-.0769*	*-.0126*	*.0789*	*.0035*	*.0393*	*-.0758*	*-.0206*	*-.0597*

**** p<0.001, ** p<0.01, * p<0.05*

	11	*12*	*13*	*14*	*15*	*16*
11. Env. Expen. Invest.	*-*					
12. GRI Report Guidelines	*-.0811*	*-*				
13. Total Assets	*.1717*	*-.0489*	*-*			
14. Corp. Govern. Board committee	*-.1189*	*-.0359*	*-.2533***	*-*		
15. Env. Innovation score	*.3625****	*-.0204*	*.2781****	*-.2748*	*-*	
16. R&D	*-.0537*	*-.0792*	*.0006*	*.0603*	*-.0970*	*-*

**** p<0.001, ** p<0.01, * p<0.05*

Looking at the correlation table shown above, all indicators for independent variable CER initiatives have a significant positive correlation on the indicators for dependent variable environmental outcomes (emission score (0.4400, 0.5128, 0.4884, 0.3957) and biodiversity impact reduction score (0.0550, 0.0929, 0.1418, 0.1003)) and these findings support the literature review and hypothesis 1 about the positive relationship between CER initiatives and environmental outcomes, especially the moderate correlation of indicator emission score. The indicators for independent variable CER initiatives all have significant positive correlations on the indicator ROA (0.1209, 0.0747, 0.1844, 0.1284) and all indicators, except for environmental investments on initiatives, have a significant positive correlation on the indicator ROE (0.0934, 0.2134, 0.0626) for dependent variable financial outcomes. The indicator market capitalization has no significant correlation when it comes to the relationship between CER initiatives and the financial outcomes. The correlation results of indicators ROA and ROE do align with the literature and hypothesis 2 suggesting a positive effect of CER initiatives on financial outcomes.

Furthermore, looking at the correlations of the moderating variables communication transparency and communication quality, a significant positive influence of communication transparency indicators stakeholder engagement (0.2390, 0.3916) and environmental expenditures on investments (0.4427, 0.1418) can be found on the environmental outcomes. These findings align with the composed hypothesis 3a which states that communication transparency positively moderates the relationship between CER initiatives and environmental outcomes. The correlation between communication quality indicator GRI report guidelines and the indicators for environmental outcomes are insignificant (-0.0363, 0.0858), also supporting hypothesis 3b which states that a companies' communication quality doesn't have such an influence on its environmental outcomes.

Next, a significant positive correlation of communication transparency indicators stakeholder engagement (0.0284, 0.0378) and environmental expenditures on investments (0.1118) can be found on the financial outcome indicators ROA and ROE. These findings align with the composed hypothesis 4a which states that communication transparency positively moderates the relationship between CER initiatives and financial outcomes. Lastly, the correlation between communication quality indicator GRI report guidelines and the indicators for financial outcomes are insignificant negatively correlated (-0.0272, -0.0830, -0.0340). These findings do not align with hypothesis 4b which states that communication quality positively moderates the relationship between CER initiatives and financial outcomes.

Finally, before the models are ready for regression, the Variance Inflation Factor (VIF) will be utilized to make sure there is no multicollinearity present in this study. According to Daoud (2017), a resulting VIF of 1 indicates the absence of multicollinearity, a VIF of 1-5 means an acceptable multicollinearity, and a VIF of 5 or higher means that too much multicollinearity is present in the data set. Table 12 highlights the mean VIF results for each indicator of the dependent variables.

Table 12: VIF outcomes for every indicator of the dependent variables

Indicators DV	**Mean VIF**
Emission score	2.34
Biodiversity impact	2.19

Market Cap.	2.46
ROA	2.33
ROE	2.38

As table 12 shows, the VIF outcomes are VIF<5, which means that there is no significant multicollinearity present for the indicators of the dependent variables. Concluding, all models used for the analysis are ready for regression

4.2 Regression analysis

For the regression analysis five distinct models are going to be evaluated. The choice of these models is derived from the different indicators of the dependent variables this study uses to explain the financial and environment outcomes. Consequently, different analysis methods need to be applied since the regression models are tested each with a different dependent variable. All five models will be processed individually and judged as such so that each outcome reflects its effect on the independent variable.

The different analysis methods which are used for the different regression models are the pooled effects model, the Random effects model and the fixed effects model which are shown below in figures 3 and 4.

$$y_{it} = \beta_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + \ldots + \beta_k x_{kit} + \epsilon_{it}$$

Figure 3. Pooled OLS regression model equation (Date, 2024)

Pooled OLS regression is an analysis technique which combines data from multiple cross-sectional units while treating it as a single data set and is being used in panel data analysis. This method ignores the panel structure of the data, treating all observations as independent and uniformly distributed.

$$y_{it} = \boldsymbol{x}_{it}\boldsymbol{\beta}_i + \alpha + (\mu_i + \epsilon_{it})$$

Figure 4. The Random Effects regression model for unit i with time period t (Date, 2024)

The random effects regression model is used to address the individual specific effects assumed to be randomly allocated over entities and not correlating with the predicting variables in a panel data analysis. This model comes in handy when making use of panel data where the unobserved heterogeneity, differences of entities, is regarded as independent and random of the predicting variables.

$$y_{it} = \boldsymbol{x}_{it}\boldsymbol{\beta}_i + c_i + \epsilon_{it}$$

Figure 5. The Fixed Effects regression model for unit i with time period t (Date, 2024)

The fixed effect regression model is tailored to analyze panel data by addressing unobserved heterogeneity which is constant over time and correlating with the independent variables. This model is able to estimate the influence of time-varying predictor variables while controlling for time-invariant attributes of the entities.

Table 12 highlights the fixed effects regression results for model 1a and model 2a, since the Hausman tests for these models without moderators result in $p < 0.05$. Model 1a shows the effect of CER initiatives on emission score, without a moderation effect by communication transparency and communication quality. Model 2a shows the effect of CER initiatives on biodiversity impact reduction score, without a moderation effect by communication transparency and communication quality.

Table 12. Regression results of models 1a and 2a

Variables	Model 1a	Model 2a
Independent variable		
Environmental investments on initiatives	59.432*	-0.306
	(15.631)	(0.579)
Environmental partnerships	65.626**	1.118*
	(17.960)	(0.466)
Environmental restoration initiatives	114.722***	-0.564
	(22.931)	(0.484)
Environmental products	-69.938	-3.789***
	(43.870)	(0.864)
Control variables		
Total assets	0.007	0.000
	(0.007)	(0.0001)
Corporate Governance board committee	-27.090	-0.475
	(35.944)	(0.729)
Environmental innovation score	0.660	0.147***
	(1.883)	(0.037)
R&D	-0.002	-0.0001
	(0.021)	(0.0004)
Constant	124.088	5.732*
	(119.626)	(2.405)
Number of observations	349	349
Overall R^2	0.5787	0.3870

** p<0.05, ** p<0.01, *** p<0.001*

For regression results to be ought significant, the level of significance should be at least ($p < 0.05$). Looking at models 1a and 2a, some significant results can be seen looking at all the independent variables, environmental investments on initiatives, environmental partnership, environmental restoration initiatives, and environmental products. Also, in model

2a a significant positive result can be found for control variable environmental innovation score (β = 0.147, p = 0.000 in model 2a), suggesting that firms with more environmental innovation have less emission outputs. Regarding these results, a positive relationship can be found between CER initiatives and environmental outcomes since 4 out of the 5 significant independent variables in both model 1a and 2a combined show a positive effect on environmental outcomes emission score and biodiversity impact reduction score. These findings are aligned with the literature in this study, as it is expected that a firms' CER initiatives cause more positive environmental outcomes. Further, independent variable indicator environmental products is the only variable with a significant negative effect on environmental outcomes in model 2a (β = -3.789, p = 0.000). Additionally, the R-squared of model 1a and 2a show that in model 1a roughly 57.87% and in model 2a roughly 38.70% of the variation in the dependent variable could be explained by the independent variables shown in the regression model.

Hypothesis 1 states that CER initiatives have a positive effect on environmental outcomes. Aligned to the literature in this study a significant positive effect is found of CER initiatives on environmental outcomes in model 1a and partially in model 2a, Environmental investments on initiatives (β = 59.432, p = 0.037 in model 1a), Environmental partnerships (β = 65.626, p = 0.004 in model 1a & β = 1.118, p = 0.017 in model 2a), and Environmental restoration initiatives (β = 114.722, p = 0.000 in model 1a). Hence hypothesis 1 is accepted.

Table 13 highlights the pooled and random effects regression results for model 3a, 4a, and 5a. Model 3a is a random effects regression and models 4a, and 5a are pooled effects regressions. Model 3a shows the effect of CER initiatives on Market capitalization, without a moderation effect by communication transparency and communication quality. Model 4a shows the effect of CER initiatives on Return of Assets, without a moderation effect by communication transparency and communication quality. Lastly, model 5a shows the effect of CER initiatives on Return of Equity, without a moderation effect by communication transparency and communication quality.

Table 13. Regression results of models 3a, 4a, and 5a

Variables	Model 3a	Model 4a	Model 5a
Independent variable			
Environmental investments	-41.767	7.103	-26.437*
on initiatives	(185.561)	(7.406)	(12.853)

Environmental partnerships	-115.404 (194.705)	-1.044 (8.574)	17.081 (14.924)
Environmental restoration initiatives	24.788 (189.306)	3.067 (7.872)	15.764 (13.705)
Environmental products	-28.197 (389.172)	-1.277 (17.242)	-5.187 (30.071)
Control variables			
Total assets	-0.003 (0.057)	-0.002 (0.002)	0.0003 (0.004)
Corporate Governance board committee	-192.393 (244.626)	3.637 (9.794)	-12.514 (17.071)
Environmental innovation score	7.815 (15.226)	0.822 (0.638)	-0.182 (1.116)
R&D	0.189 (0.207)	-0.014 (0.010)	0.011 (0.017)
Constant	2490.598** (819.391)	72.085* (34.528)	53.658 (60.548)
Number of observations	349	349	349
Overall R^2	0.0503	0.5995	0.5449

** p<0.05, ** p<0.01, *** p<0.001*

Looking at models 3a, 4a, and 5a, one significant negative effect can be seen looking at the independent variable environmental investments on initiatives in model 5a (β = -26.437, p = 0.04). Regarding this significant negative effect, a negative relationship can be found between environmental investments on initiatives and financial outcomes since the independent variable in model 5a shows a negative effect on the financial outcome Return on Equity. Further, Environmental partnerships (β = -115.404, p = 0.553 in model 3a & β = -

1.044, p = 0.903 in model 4a), Environmental products (β = -28.197, p = 0.942 in model 3a & β = -1.277, p = 0.941 in model 4a & β = -5.187, p = 0.863 in model 5a), and control variables total assets (β = -0.003, p = 0.961 in model 3a & β = -0.002, p = 0.484 in model 4a), and Corporate Governance board committee (β = -192.393, p = 0.432 in model 3a & β = -12.514, p = 0.464 in model 5a) all show an insignificant negative effect on financial outcomes. Additionally, the R-squared of model 3a, 4a, and 5a show that in model 3a roughly 5.03%, in model 4a roughly 59.95%, and in model 5a roughly 54.49% of the variation in the dependent variable could be explained by the independent variables shown in the regression model. Although the coefficient values indicate a negative relationship between the variables and the variable financial outcome, the variables are considered insignificant which means it cannot be determined if these relationships are statistically meaningful or if they happen by chance. These findings contradict the literature in this study, as insignificant negative effects are found of the independent variables on financial outcomes.

Hypothesis 2 states that CER initiatives have a positive effect on financial outcomes. Findings contradict the literature in this study, as insignificant negative effects are found of the independent variables on financial outcomes, as mentioned above. Hence hypothesis 2 needs to be rejected.

Table 14 highlights the fixed effects regression results for model 1b and the random effects regression results for model 2b. Model 1b shows the effect of CER initiatives on emission score, with a moderation effect by communication transparency and communication quality. Model 2b shows the effect of CER initiatives on biodiversity impact reduction score, with a moderation effect by communication transparency and communication quality.

Table 14. Regression results of models 1b and 2b

Variables	Model 1b	Model 2b
Independent variable		
Environmental investments on initiatives	-37.552	-0.524
	(29.067)	(0.639)
Environmental partnerships	122.628***	-2.013**
	(31.600)	(0.649)
	66.792***	-0.037

Environmental restoration initiatives	(18.283)	(0.440)
	-30.143	-1.405
Environmental products	(28.586)	(0.774)
Moderating variable		
Stakeholder Engagement score	0.725	0.064**
	(1.117)	(0.025)
Environmental expenditures investments	51.350 (28.586)	0.326 (0.620)
GRI Report Guidelines	58.976 (47.769)	-0.291 (1.346)
Control variables		
Total assets	0.001	0.0002
	(0.007)	(0.0002)
Corporate Governance board committee	-49.906*	0.922
	(22.045)	(0.578)
Environmental innovation score	-0.184	0.059
	(1.255)	(0.032)
R&D	-0.003	0.0003
	(0.017)	(0.0005)
Constant	49.137	0.619
	(152.802)	(3.735)
Number of observations	197	197
Overall R^2	0.4520	0.6802

** p<0.05, ** p<0.01, *** p<0.001*

Looking at models 1b and 2b, some significant results can be seen looking at the independent variables environmental partnership (β = 122.628, p = 0.000 in model 1b & β = -2.013, p = 0.002 in model 2b) and environmental restoration initiatives (β = 66.793, p = 0.000 in model 1b), the moderating variable stakeholder engagement score (β = 0.064, p = 0.010 in model 2b), and the control variable corporate governance board committee (β = -49.906, p =

0.025 in model 1b). These significant findings suggest that there is a positive relationship between independent variables environmental partnerships & environmental restoration initiatives and environmental outcomes. Besides, there is also a positive influence of moderating variable stakeholder engagement score on the relationship between CER initiatives and environmental outcomes. Further, moderating variables stakeholder engagement score ($\beta = 0.725$, $p = 0.517$ in model 1b), Environmental expenditures investments ($\beta = 51.350$, $p = 0.075$ in model 1b & $\beta = 0.326$, $p = 0.599$ in model 2b) and GRI Report Guidelines ($\beta = 58.976$, $p = 0.219$ in model 1b) all show an insignificant positive effect on environmental outcomes. Additionally, the R-squared of model 1b and 2b show that in model 1b roughly 45.20% and in model 2a roughly 68.02% of the variation in the dependent variable could be explained by the independent variables shown in the regression model.

Hypothesis 3a states that communication transparency positively moderates the relationship between CER initiatives and environmental outcomes. Aligned to the literature in this study a significant positive effect is found of stakeholder engagement score ($\beta = 0.064$, $p = 0.010$ in model 2b), as a part of communication transparency, on the relationship between CER initiatives and environmental outcomes in model 2b. Hence hypothesis 3a is partially accepted.

Hypothesis 3b states that a companies' communication quality doesn't have such an influence on its environmental outcomes. The variable GRI Report Guidelines represents a companies' communication quality and the results of the regression show an insignificant positive effect of GRI Report Guidelines on environmental outcomes in model 1b ($\beta = 58.976$, $p = 0.219$) and an insignificant negative effect of GRI Report Guidelines on environmental outcomes in model 2b ($\beta = -0.291$, $p = 0.829$), thus hypothesis 3b needs to be accepted.

Table 15 highlights the pooled and random effects regression results for model 3b, 4b, and 5b. Model 3b is a random effects regression and models 4b, and 5b are pooled effects regressions. Model 3b shows the effect of CER initiatives on Market capitalization, with a moderation effect by communication transparency and communication quality. Model 4b shows the effect of CER initiatives on Return of Assets, with a moderation effect by communication transparency and communication quality. Lastly, model 5b shows the effect of CER initiatives on Return of Equity, with a moderation effect by communication transparency and communication quality

Table 15. Regression results of models 3b, 4b, and 5b

Variables	Model 3b	Model 4b	Model 5b
Independent variable			
Environmental investments on initiatives	-149.414 (355.353)	18.091 (14.441)	-29.735 (26.538)
Environmental partnerships	-446.139 (369.221)	-1.638 (14.163)	-16.176 (28.803)
Environmental restoration initiatives	-319.496 (249.595)	11.435 (10.042)	20.102 (18.632)
Environmental products	-212.405 (485.522)	-29.280 (24.088)	19.381 (41.515)
Moderating variable			
Stakeholder Engagement score	16.701 (13.989)	0.408 (0.534)	-0.366 (1.033)
Environmental expenditures investments	-267.137 (341.448)	1.623 (13.945)	-4.138 (25.325)
GRI Report Guidelines	-798.363 (858.193)	-47.596 (51.885)	52.973 (77.492)
Control variables			
Total assets	0.125 (0.088)	0.002 (0.004)	-0.001 (0.007)
Corporate Governance board committee	244.893 (343.856)	-5.374 (13.308)	-17.050 (26.263)
Environmental innovation score	11.187 (19.339)	1.379 (0.859)	-1.436 (1.494)
R&D	0.026 (0.288)	-0.012 (0.015)	0.003 (0.026)

Constant	3335.579	192.910	-21.739
	(2278.578)	(124.309)	(200.295)
Number of observations	197	197	197
Overall R^2	0.1013	0.6344	0.5426

** p<0.05, ** p<0.01, *** p<0.001*

Looking at models 3b, 4b, and 5b, no significant results can be seen. In model 3 b these insignificant findings suggest that there is a negative relationship between the independent variable CER initiatives and Market capitalization since all independent variables in the table are of a negative coefficient. Besides, there is also a negative influence of moderating variables environmental expenditures investments and GRI Report Guidelines in model 3b on the relationship between CER initiatives and financial outcomes. Further, moderating variable stakeholder engagement score (β = 16.701, p = 0.233 in model 3b), and all the control variables are the only insignificant positive effects in model 3b. Model 3b suggests that there is an insignificant negative relationship between CER initiatives and financial outcomes moderated by communication transparency and communication quality. In model 4b independent variables environmental investments on initiatives (β = 18.091, p = 0.212) and environmental restoration initiatives (β = 11.435, p = 0.256) show an insignificant positive relationship with dependent variable return of assets and in model 5b independent variables environmental products (β = 19.381, p = 0.641) and environmental restoration initiatives (β = 20.102, p = 0.282) show an insignificant positive relationship with dependent variable return of assets. In model 4b the moderating variable GRI Report Guidelines (β = -47.596, p = 0.360) has the only negative insignificant effect on the relationship between CER initiatives and return of assets. GRI report guidelines represent communication quality, so this finding suggests that communication quality has an insignificant negative influence on the above-mentioned relationship. In model 5b the moderating variables Stakeholder Engagement score (β = -0.366, p = 0.723) and Environmental expenditures investments (β = -4.138, p = 0.870), representing communication transparency, show an insignificant negative influence on the relationship between CER initiatives and return of equity. These findings suggest an insignificant negative influence of moderating variable communication transparency on the relationship between CER initiatives and financial outcomes. Additionally, the R-squared of model 3b, 4b and 5b show that in model 3b roughly 10.13%,

in model 4b roughly 63.44% and in model 5b roughly 54.26% of the variation in the dependent variable could be explained by the independent variables shown in the regression model. Although the coefficient values indicate a negative relationship between the independent and moderating variables and the variable financial outcome, the variables are considered insignificant which means it cannot be determined if these relationships are statistically meaningful or if they happen by chance. These findings contradict the literature in this study, as insignificant negative influences are found of the moderating variables on the relationship between CER initiatives and financial outcomes.

Hypothesis 4a states that a companies' communication transparency positively moderates the relationship between CER initiatives and financial outcomes. Contradicting the literature in this study, an insignificant negative effect is found of stakeholder engagement score (β = -0.366, p = 0.723 in model 5b) and Environmental expenditures investments (β = -267.137, p = 0.434 in model 3b & β = -4.138, p = 0.870 in model 5b), as a part of communication transparency, on the relationship between CER initiatives and financial outcomes. Hence hypothesis 4a needs to be rejected.

Hypothesis 4b states that a companies' communication quality positively moderates the relationship between CER initiatives and financial outcomes. Contradicting the literature in this study, an insignificant negative effect is found of GRI report guidelines (β = -798.363, p = 0.352 in model 3b & β = -47.596, p = 0.360 in model 4b), as a representation of communication quality, on the relationship between CER initiatives and financial outcomes. Hence hypothesis 4b needs to be rejected.

5. Conclusion and Discussion

The last section of this study is the conclusion and discussion chapter. This chapter highlights the interpretation of the analysis results and delivers an overview on the contributions and limitations this study supplements.

5.1 Contributions and practical implications

Research conducted on the effect of CER initiatives on environmental and financial outcomes is broadly available. The main findings in those studies are that the implementation of CER initiatives have a positive effect on environmental outcomes and financial outcomes.

Yet, following Wisner et al. (2006) it is still not acknowledged which management processes specifically cause a firms' environmental initiatives to result in enhanced environmental performance and according to Jia et al. (2019) and Testa & D'Amato (2017), research has shown a negative influence of CER on CFP, arguing that the substantial investments needed for CER initiatives do not generate positive returns, thus negatively affecting CFP. Especially in the oil & gas sector the implementation of environmental initiatives has become increasingly crucial for recognizing the ecological footprint of companies within this sector and decreasing its impact on the environment (Okeke, 2021). That is why in this study research has been done on the effect of communication and to be specific, communication transparency and quality. These factors could be the moderating explanation for a better performance of the environment and financial results by a firm. Literature about communication suggests that in public relations, transparency is a vital component in fostering trust in the relationship between organizations and its stakeholders (Dong and Ji, 2018), enhancing a companies' market value. But research on the influence of communication transparency and quality on environmental outcomes remains scarce. Hence, are why this study makes contributions to the literature on CER and the impact it has on the environmental and financial results within the oil and gas sector, especially looking at the influence communication transparency and quality has on this relationship. This leads to the following research question: *"What is the relationship between CER initiatives and environmental, and financial results of firms in the oil & gas sector, and how does the communication transparency/quality moderate this relationship?"*.

At first, the sample data existed out of oil & gas companies from the United States, but this sample was not big enough due to missing datapoints in the majority of the American companies making it difficult for results to be credible, that is why the Canadian oil & gas companies have been added to the sample making the sample data more complete, credible, and significant for regression.

The results regarding the formulated positive effect CER initiatives should have on environmental outcomes suggested by hypothesis 1 were significant enough. Thus, this statistically shows a positive relationship between CER initiatives and environmental outcomes within the oil & gas sector, just like prior literature suggests.

Furthermore, the results regarding the formulated positive effect CER initiatives should have on financial outcomes suggested by hypothesis 2 were not significant enough. On the contrary, findings contradict the literature, as insignificant negative effects are found

of the independent variables on financial outcomes. A possible explanation for this finding, is that the financial data variables which were used do not accurately measure the financial outcomes on the long-term but only highlight short-term financial challenges which negatively impacts a firm's financial results. Other explanations could be the operational disruptions these initiatives cause leading to temporary declines in productivity and efficiency, companies which invest heavily in CER initiatives may end up at a competitive disadvantage if other companies do not engage in these CER initiatives and offer lower prices for their products, and there may be uncertainty about the return on investment for these initiatives on the long-term leading to not seeing immediate financial gains making it challenging for companies to justify investments in the initiatives towards their stakeholders prioritizing short-term performance.

The results regarding the formulated positive impact of communication transparency on the relationship between CER initiatives and environmental outcomes suggested by hypothesis 3a were partially significant. Thus, this statistically shows a partially positive impact of communication transparency on relationship between CER initiatives and environmental outcomes within the oil & gas sector, just like prior literature suggests. The part which is significantly positive of the communication transparency is the stakeholder engagement score which can be explained by the fact that the engagement of stakeholder builds trust, ensures the accountability, and fosters the internal engagement (Hahn & Kühnen, 2013). The reason for the result being partially significant could be due to a selective disclosure of information by a company or the complexity of communicating environmental issues in an effective manner.

The results regarding the formulated influence a companies' communication quality doesn't have on its environmental outcomes suggested by hypothesis 3b is justified since the communication quality of a company had an insignificant effect on the environmental outcomes, just like prior literature suggests.

The results regarding the formulated positive impact of communication transparency on the relationship between CER initiatives and financial outcomes suggested by hypothesis 4a were insignificant. Contradicting the literature in this study, an insignificant negative effect is found of stakeholder engagement score and Environmental expenditures investments, as a part of communication transparency, on the relationship between CER initiatives and financial outcomes. An explanation according to Clarkson et al. (2008) for this insignificant negative effect could be the higher costs of maintaining a high level of transparency eventually reducing the financial performance of CER initiatives. According to

Cormier and Magnan (2003), detailed transparency of a companies' CER initiatives could reveal important information which competitors may make use of leading to a competitive disadvantage affecting their financial outcomes and their position in the market.

Lastly, the results regarding the formulated positive impact of communication quality on the relationship between CER initiatives and financial outcomes suggested by hypothesis 4b were insignificant. Contradicting the literature in this study, an insignificant negative effect is found of GRI report guidelines, as a representation of communication quality, on the relationship between CER initiatives and financial outcomes. An explanation for this finding would be that the implementation of GRI reporting guidelines could result in higher implementation costs than their benefits. Besides, meeting the reporting standards of the GRI reporting guidelines could be time and resource consuming meaning that time and resources would be taken away from core business activities which may lead to a reducing financial performance (Clarkson et al., 2008). Another explanation could be that investors do not always equally value detailed sustainability reports, especially if investors are mainly concerned about traditional financial metrics and overlook the information originated from GRI reports. This could lead to the perception of GRI reporting quality benefits not being translated into enhanced financial performance.

5.2 Limitations and Recommendations

This study was done with the intention to investigate the relationship between CER initiatives and environmental and financial outcomes. While the research made multiple important aspects clearer, it is crucial to underscore the limitations concerning this research. The first limitation is the origin of the sample population. The sample of this research consisted only of North American based oil and gas companies. As a result, these findings may not be representable for other companies in other continents where they may have different stakeholder expectations, market conditions, or regulatory environments (Ghemawat, 2001). Besides, there may be a limitation on the availability and quality of the data being used on CER initiatives and the resulting effects. Incomplete data has an influence on the accuracy of the research and could affect the generalizability of the findings (Lobdell et al., 2011). Furthermore, within the time period of the data there could have been multiple changes which could influence the observed relationships. Changes like technological innovations, market conditions, and even regulatory policies could have an influence and even lead to a reducing relevance of this research in future events (Freij, 2021). Lastly, there

may be other variables excluded from the research which may have an influence on CER initiatives, financial outcomes, and communication quality or transparency. Multiple control variables like external economic conditions, management quality, and corporate culture could have an influence on the outcomes (Antonakis et al., 2010).

To conclude, the recommendations section meant for firms that plan on investing in CER initiatives. Starting with the engagement of stakeholders, this aspect is very important for firms to adopt since in this study the stakeholder engagement score and the environmental partnership both indicate the engagement with stakeholders, and both have significant positive effects on environmental outcomes. Actively engaging with stakeholders does not only affect environmental outcomes but also may provide valuable feedback and an enhanced quality of sustainability reporting. Besides, the engagement with stakeholders supports the alignment of stakeholder expectations with CER initiatives which generates a higher perceived value of these investments (Greenwood, 2007).

Next, investments in sustainable R&D projects by firms can enhance CER initiatives. Investments of R&D aimed at the development of sustainable practices and technologies could diminish the environmental impacts, shown in the statistical analysis of this study, and support innovation (Porter & van der Linde, 1995).

Furthermore, firms should implement strong evaluation and monitoring technologies to be able to constantly assess the effectiveness and impacts of the implemented CER initiatives of a certain firm. This will support the ability to identify parts of the CER initiatives that need an upgrade to foster the positive contributions towards the financial and environmental outcomes (Epstein et al., 2017).

Finally, Collaboration between active firms within the industry should be promoted. This may lead to improved addressing of shared environmental challenges due to joint efforts and the exchange of best practices. If the CER initiatives are shared industry-wide, these initiatives may have a stronger cumulative impact and could lead to an overall improvement within the sector concerning sustainability performance (Elkington, 1998).

For further research it is advised to be aware of these limitations and recommendations, so the next study has more accurate findings on the relationship between CER initiatives and environmental and financial outcomes.

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Appendices

Appendix A: Disclosure of AI Tools

Name of the tool	**Date of access**	**Prompt**
ChatGPT	During the entire process	Used as a reference for a logical chronical order of each chapter. https://chatgpt.com/
ChatGPT	During the entire process	Used to comprehend difficult parts of particular study's https://chatgpt.com/
Scribbr	13-06-2024	Used for checking spelling, grammar, plagiarism check https://www.scribbr.nl/