



Title: Climate change: A review and analysis of globally adopted ESG reporting, and rating methods applied to New Zealand Organisations

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Climate change: A review and analysis of globally adopted ESG reporting, and rating methods applied to New Zealand Organisations

by

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Abstract

The increasing demand for information about businesses' environmental performance, especially with respect to climate change is reflected in the growth of investment in ethical/green funds. However, there are questions about the reliability of reporting and rating systems. Based on a review of three ESG reporting and six ESG rating systems, the report examines the capacity for divergence when applying different reporting/rating systems to the same organisation. The overall research design is a mixed method using both qualitative and quantitative data.

Two New Zealand companies were analysed using two ESG reporting methods: GRI and SciBeta's carbon footprinting methods. Six New Zealand companies were also analysed using two ESG rating methods: Thomson Reuters Asset and FTSE 4Good methods. As these rating systems do not disclose their methods in detail, a personal judgment scoring method evaluates the rating systems. The results indicated that the two reporting methods provided different assessments of the environmental performance of the same organisation. The two rating systems also provided almost a 70% divergence in their assessment of the same company. The results confirmed a low convergence in ESG data and the unreliability of ESG data as a measure of environmental performance. The study recommended that organisations consider a range of ESG reporting methods when reporting ESG data to ensure the information captured is representative of their contributions to climate change. Regulators need to standardise ESG reporting as well as the measurement techniques for GHG emissions to allow more reliance on ESG data. Rating agencies also need to develop comparable ratings that can be applied to the same organisations.

Dedication

This project is dedicated to my husband, Dr. Babajide Onademuren. Thank you for always believing in me and for being a dependable support system.

This project is dedicated to the organisations and agencies whose work and advocacy continue to reduce the negative impacts of climate change.

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List of Acronyms

CDP	Carbon Disclosure Project
CDSB	Climates Disclosure Standards Board
CF	Carbon Footprinting
CSR	Corporate Social Responsibility
DEFRA	Department for Environment, Food, and Rural Affairs
DJSI	Dow Jones Sustainability Indices
ESG	Environmental, Social and Governance
ETS	Emissions Trading System
EU	European Union
EnvProducts	Environmental Products
FTSE	Financial Times Stock Exchange
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GRI	Global Reporting Initiative
Gt	Giga tonnes
IPCC	Inter-governmental Panel on Climate Change
ISO	International Standards Organisation
Kt	Kilo tonnes
Ltd	Limited
m	Million
ML	Mega Litres
MSCI KLD	Morgan Stanley Capital International Kinder, Lydenberg, Domini and Co. Inc.
NA	Not Applicable
NGO	Non Governmental Organisation
NZ	New Zealand
PESTLE	Political, Economic, Social, Technological, Legal Environmental
PJ	Petajoule
SciBeta	Scientific Beta
SDP	Sustainability Disclosure Project

SRI	Socially Responsible Investment
TR	Thomson Reuters
UN	United Nations
UNCCD	United Nations Convention to combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNSDG	United Nations Sustainable Development Goals
USAID	United States Agency for International Development
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute
WWF	Worldwide Fund

Chapter 1. Introduction

1.1. Introduction

There is currently a big demand for information about business' environmental performance, especially with respect to climate change. This is reflected in the growth of investment in ethical/green funds (Sparkes, 2001) and the emergence of several environmental, social and governance (ESG) reporting and rating systems. There is however the problem of whether this information about business' performance is reliable. For instance, the Global Reporting Initiative (GRI) was founded in 1997 following public outcry over the environmental damage of the Exxon Valdez oil spill (GRI, n.d.). One of its main functions is to enable shareholders and other stakeholders to make well-informed decisions regarding investments and the purchases of goods and services from businesses (Marimon et al., 2012). While intended to raise the standard of environmental reporting, adherence to GRI guidelines remains rare with environmental reporting continuing to be used to promote positive images of corporate performance (Perry, 2015 p.62). The reliability and effectiveness of the GRI and other ESG reporting, and rating methods is the subject of ongoing debate (SciBeta Publication, 2019)

This study undertakes a review of some widely used environmental, social and governance (ESG) reporting methods particularly in terms of their coverage of their contributions to climate change. It also reviews some of the rating systems that rank organisations based on their contributions to climate change. The report examines how these systems have or have not lived up to their functions and the challenges that are often associated with the data that are available for investors and stakeholders to make investment decisions.

1.2. Statement of the problem

Due to the increased impacts of climate change (Houghton, 2005; Lineman et al., 2015) and an increased level of awareness by stakeholders, businesses have come under increased pressure to report their contribution to the rapidly changing climate in order to portray a good image and reputation to their stakeholders (Tarmuji et al., 2016). Several ESG

reporting and rating frameworks have been developed to achieve this, with several corporate bodies such as the Global Reporting Initiative (GRI, 2020), CDP (formerly Carbon Disclosure Project) (CDP, 2017), Scientific Beta (SciBeta) (SciBeta Publication, 2019) providing guidelines and requirements for businesses to report their climate change contributions. Rating agencies such as Thomson Reuters (www.thomsonreuters.com) and Financial Times Stock Exchange (FTSE Russell) (www.ftserussell.com) also provide ESG ratings for investment companies. These corporate bodies will be discussed in more details in Chapter 2. Despite the availability of several reporting and rating systems, existing literature shows that these are often not standardised and difficult to analyse, resulting in different rating systems providing starkly different assessments of the same business (Christofi et al., 2012). It is important to highlight what limitations exist within the reporting systems? What similarities or differences exist among these systems? How convergent or divergent are the rating systems in rating the same organisation?

Goal 13 of the United Nations' 17 Sustainable Development Goals (SDG) states that there is a need to “take urgent action to combat climate change and its impacts” (United Nations, n.d.). The SDG goals were set and adopted at the UN Sustainable Development Summit in New York in September 2015 (United Nations, 2015). There has not been much discussion on the deficiencies in the reporting and rating of ESG performance in New Zealand. It is important that good information exists about business ESG performance in New Zealand, for example to monitor the impact of climate change policies, and this study will contribute new evidence in assessing the reliability of reporting and rating systems among New Zealand entities. This study will highlight the need for organisations to provide a standard of reporting that allows them to achieve the United Nations Sustainable Development Goals (UNSDG). It will also highlight the need for reporting and rating agencies to develop standardised and comparable systems that are easy to analyse, and which allow investors to make informed decisions about an organisation. The study used a mixed methodology with data sourced from secondary data sources. Publicly available documents such as annual and sustainability reports were analysed for the six New Zealand companies selected for the study.

1.3. Significance of the study

Several studies have highlighted the limitations of ESG scores or data particularly ESG scores of individual organisations and identified issues such as reliability and environmental performance (Chatterji et al., 2016; Christiansen, & Ducoulombier, 2020; SciBeta Publication, 2019). For instance, Chatterji et al. (2016), assessed the level of agreement between six prominent ESG ratings (MSCI KLD and Innovest, Thomson Reuters Asset4, FTSE4Good, DJSI, and Calvert) and found low convergence in these raters' assessments of corporate social responsibility. The authors concluded that these metrics cannot guide issuers and that investment on the basis of these invalid metrics will fail to direct capital toward the most responsible firms. From the environmental dimension, Christiansen & Ducoulombier (2020), stated that ESG scores may be viewed as contributing to greenwashing. They further stated that averaging allows certain issuers to achieve strong scores despite association with material ESG concerns which leads to some questioning the very relevance of ESG scores.

This study will contribute to the body of knowledge on ESG reporting and rating by highlighting some of these limitations that exist in the current ESG reporting and rating systems and the similarities and differences that exist among these systems. This will help to further drive the conversation about developing a standardised reporting framework that is comparable and easy for stakeholders to analyse. This will also allow investors to consider how much they rely on these data for investment decisions.

This study fits into the field of Applied management as it relates to the role of ESG in investment management and how this directly impacts sustainability and shareholder value (Harvard Business School, 2016). By providing ESG reporting and ratings, stakeholders are informed about the contribution of organisations to climate change and can call for more ethical and green products that helps to achieve sustainability development goals which in turn drives shareholder value. This study will benefit organisations by further driving the conversation on the need for standardised reporting. It will highlight the need for organisations to make informed decisions when choosing reporting methods by making available limitations on some commonly used reporting systems. This will further foster

transparency and accountability on the part of the organisations. This study will also highlight the need for rating agencies to develop comparable ratings that can be applied to the same organisations to allow investors make better informed investment decisions.

1.4. Research question/aim and objectives

The aim of this study is to undertake a review of three ESG reporting and six ESG rating systems. Specifically, the study's objectives will be to:

1. Identify the challenges involved in reporting on and rating the ESG performance of business organisations.
2. Explain what differences and/or similarities exist among a sample of the most widely used ESG reporting systems.
3. Consider the implications of there being competing methods for the reporting of business ESG performance.
4. Apply different reporting systems to two New Zealand companies and different rating systems to six New Zealand companies with big environmental impacts to determine how consistent the reporting and rating systems are.

The rationale of this research is to determine the reliability of the information that stakeholders and investors often use in making investment and business decisions. The research strategy will be a documentary research and data will be sourced from secondary data sources such as published company financial and sustainability reports and existing literature on ESG reporting and rating methods available over the internet.

1.5. Structure of thesis

Chapter Two: Theory and Industry

This chapter provides an overview of the theories that drive organisational reporting and ratings. It also highlights the role of the different agencies in ESG reporting and rating as

well as how they work together to improve ESG data. An industry analysis of the evolution of the reporting and rating industry is also discussed to provide an historical perspective of the industry and the role it has played in climate change reporting. A brief overview of the reporting and rating agencies and the systems they used are also discussed. A PESTLE analysis is also carried out to highlight how businesses have come under increased pressure to report their contributions to climate change. The PESTLE analysis provides insights into the relevant agencies such as NGOs and international organisations that exert pressure on businesses to provide climate change disclosures. The purpose of this chapter is to provide a historical perspective of the reporting and ratings industry as well as the theories and agencies that drive the industry and helps to see how these agencies can continue to drive the need for improved reporting.

Chapter Three: Literature Review

This chapter reviews existing literature on why companies report, what they report and what rating agencies rate, the limitations of ESG data and the need for standardisation of ESG data. The purpose of this chapter is to highlight what is already established in literature about this study.

Chapter Four: Research Methodology

This chapter explains what research method is used in the study, the sources of data used and how these data were analysed. It also highlights some limitations to the study, bias and how these were mitigated. The purpose of this chapter is to explain the methodology used in the research, how data was sourced and analysed and how this has helped to achieve the overall objectives of the research.

Chapter Five: Findings and Analysis

This chapter explains the findings from the study and provides an analysis of these findings. The purpose of this chapter is to explain what the study has uncovered, and an analysis of the data sourced.

Chapter Six: Recommendations and Conclusions

This chapter provides broad statements that sum up the most important insights of this research. It also provides a summary of each chapter and attempts to draw conclusions based on the findings and analysis done in chapter five. It also discusses the limitations of the research and recommendations for future research.

Chapter 2. Theory and Industry Analysis

2.1. Introduction

In recent times, businesses have come under increased pressure from stakeholders' to report their contributions to reducing their carbon emissions and other environmental and social impacts. There has been an increase in the disclosure of sustainability-related information about the company's activities in the form of stand-alone sustainability and integrated reports which combine financial and environmental reports over the last several years in response to stakeholders' pressure (Hahn et al., 2015; Herold et. al, 2018; KPMG, 2011). Rating agencies have in turn used this publicly available information to rate organizational performance and/or collected information directly from organisations so as to rate their performance.

This chapter focuses on the theories that drive business disclosure, the evolution of the reporting and ratings industry, the role of reporting and rating agencies in standardising reporting. This is followed by a PESTLE analysis of the pressures on businesses to report their contribution to reducing climate change impacts. The PESTLE highlights how stakeholders exert pressure on businesses to report their contributions to climate change as part of wider reporting on their environmental, social and governance (ESG) performance.

2.2. Theoretical analysis

There are several theories in literature which discuss climate change disclosures such as socio-political theories: political economy theory, legitimacy theory and stakeholder theory which explain disclosure in terms of the extent to which organisations perceive a need to report. There are also economic based theories: voluntary disclosure theory and signaling theory which explain disclosure in terms of the calculation of cost and benefits. These theories are collectively called voluntary disclosure theories. This study will however focus on the legitimacy theory as it provides a more compelling narrative on why companies perceive the need to report.

2.2.1 Theories of voluntary disclosure

Socio-political (political economy theory, legitimacy theory and stakeholder theory) and economics-based theories (voluntary disclosure theory and signaling theory) provide useful insights into why organisations volunteer information. Economic theories explain disclosure in terms of the calculation of cost and benefits, whereas socio-political theories explain disclosure in terms of the extent to which organisations perceive a need to report. This study will however focus on the socio-political theories and in particular the legitimacy theory as it provides more compelling evidence for the study.

2.2.2. Socio-political theories

Cotter et al. (2011) discussed socio-political theories that have the potential to explain climate change disclosures. These theories include political economy theory, legitimacy theory and stakeholder theory.

- Political economy theory

The political economy theory's main idea is that political, social, and economic activities cannot occur in the absence of one of these elements. Several stakeholders exert pressure on firms. Therefore, financial, social, and environmental disclosures are used to provide information to different recipients to meet their interests (Deegan, 2009). This means that firms voluntarily provide information to either seek support from specific stakeholders (such as government, customers, or environmental organisations) or to mitigate pressure that is exerted on them from those stakeholders.

- Legitimacy theory

This theory works on the assumption that companies disclose more information about their performance to maintain their legitimacy within society (Deegan, 2002). The notion of legitimacy stems from the social contract concept (Cormier & Gordon, 2001), where an organisation derives its legitimacy from the contract between it and society. Social and environmental disclosure can be used by an organisation as a tool to deal with society's demands and needs (Freedman & Jaggi, 2005). Similar to the political economy theory, legitimacy theory suggests that this information would tend to be presented in a positive

light (voluntary disclosure theory) and may take the form of “soft” unverifiable disclosures or diversionary information rather than information which can be verified and leading to real action on climate change (Clarkson et al., 2008).

- Stakeholder Theory

According to stakeholder theory, an organisation is considered as a part of the social system. This system is comprised of several groups that are working together to achieve the system’s targets. The achievement of an organisation’s goals cannot be achieved without consideration for its stakeholders’ interests (Freeman, 2010). Freeman, (2001 p. 59) states “Corporations have stakeholders, that is, groups and individuals who benefit from or are harmed by, and whose rights are violated or respected by, corporate actions”. Stakeholder theory works with the assumption that firms take actions to meet the expectations of specific stakeholders who have the power to impact on their performance (Deegan, 2009). In relation to disclosure practices, firms have incentives to disclose relevant information to specific stakeholders to convince them that they are complying with their requirements (Cotter et al., 2011).

These theories provide a context in which a diversity of reporting systems have developed with no sign of coalescence on a single best practice mode of reporting. This theoretical diversity means companies can vary in the reason or the motivation for which they have to report, with resulting differences in what they report. As many of these disclosures are subsequently used by rating companies to rate businesses (DJSI, 2020), this could essentially lead to a flawed rating system upon which investment decisions are made. Depending on the motivation of the reporting entity, they have more or less concern to follow a rigorous reporting system which could subsequently lead to a flawed rating system.

2.3. Industry analysis

This section focuses on the evolution of the reporting and rating industries. It further discusses the agencies responsible for regulating these reports and rating organisations as well as the system they use to achieve this. It is important to note that most rating systems

use publicly available information or responses to questionnaires provided by businesses for their ratings (DJSI, 2020; Thomson Reuters, 2018), therefore an analysis of the reporting industry directly impacts on the ratings industry.

2.3.1. Evolution of the ESG Reporting and Rating Industry

Solomon & Maroun, (2012) reported that there has been a steady evolution in social, environmental and governance (ESG) reporting over the past four decades, with the development of sustainability reporting growing significantly in the last decade. Since the turn of the century there has been an increasing emphasis on transcending stand-alone social, environmental, social responsibility and sustainability reporting such that companies are expected to achieve integration of sustainability and governance information within the annual report. Such integration is deemed essential if businesses are to embed stakeholder accountability into the heart of their operations in a meaningful way (Solomon & Maroun, 2012). The beginning of modern voluntary ESG reporting may reasonably be traced to the Exxon Valdez oil spill and the subsequent call by a coalition of socially responsible investment (SRI) funds and environmental groups for greater disclosure of environmental risks by corporate actors (Rupley et al., 2017).

On the other hand, the global spread of the Socially Responsible Investment (SRI) movement over the past two decades, has led to a more pronounced reliance of investors on ESG rating agencies (Avetisyan & Hockerts, 2017). These investors who are interested in screening companies based on non-financial criteria increasingly rely on rating agencies to achieve this goal. This had led to a plethora of ESG rating agencies which have sprung up since the 1980s, developing new rating methodologies to meet the (new) needs of concerned investors and to help companies to improve their CSR performance (Avetisyan & Hockerts, 2017). ESG rating agencies provide investor-solicited and company-solicited rating services, corporate research, compliance and consulting services analogous to those provided by a credit rating agencies—but with a focus on ESG criteria (Avetisyan & Hockerts, 2017). The emergence and further evolution of these rating agencies as new institutions resulted from the convergence of interest of various stakeholders of the

Corporate Social Responsibility (CSR) field (Avetisyan and Ferrary, 2013) such as investors, companies and regulators.

2.3.2. ESG reporting and ratings agencies and systems

‘Environmental, social and governance’(ESG) reporting refers to the disclosure of data covering the company’s operations in three areas: environmental, social, and corporate governance (Sphera, 2021). ESG reporting helps investors avoid companies that might pose a greater financial risk due to their environmental performance or other social or governmental practices (Sphera, 2021). There are several reporting and rating agencies which provide reporting guidelines and ratings on companies’ ESG practices. These agencies have been set up as an attempt to create some form of standardization for reporting and rating of ESG data and to allow investors and stakeholders a range of information that are reliable to make informed investment decisions (Avetisyan, Emma; Hockerts, 2017; Sphera, 2021). The work of these agencies has allowed the continued build-up of pressure by stakeholders for more transparent disclosures when reporting. Such agencies and reporting systems include: the Global Reporting Initiative (GRI), the Carbon Disclosure Project (formerly CDP) and the Scientific Beta’s (SciBeta) Enhanced ESG Reporting systems. ESG rating agencies include the Dow Jones Sustainability Index (DJSI), Thomson Reuters (Asset4), and Financial Times Stock Exchange (FTSE4Good). Some of these agencies and their reporting and rating systems are reviewed in the next section.

2.3.3. ESG reporting agencies and systems

- **The Global Reporting Initiative (GRI) – GRI standards**

The GRI is an international, independent body that produces and makes available widely used standards for sustainability reporting (GRI, 2012). GRI standards claim to help businesses, governments and other entities understand, measure and communicate their significant impact on social, environmental and economic sustainability issues (GRI, 2020). Figure 2.1 provides an overview of the set of GRI standards and what each standard is used for.

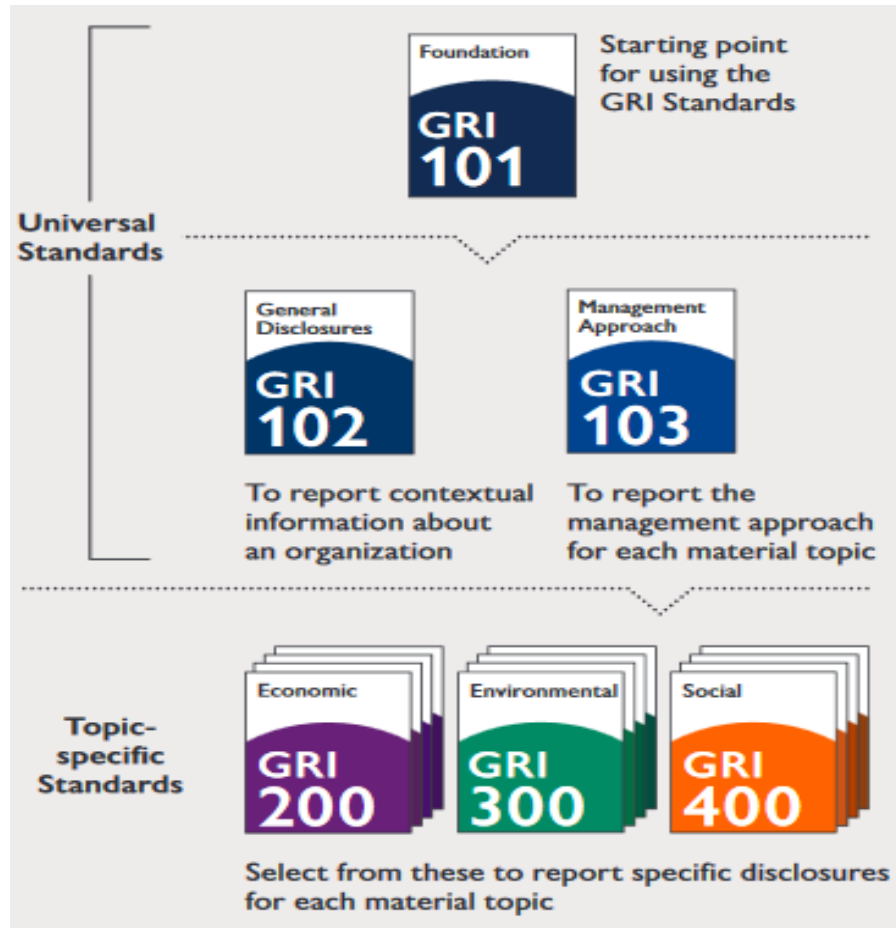


Figure 2.1 – Overview of the set of GRI standards (Ekberg, 2017)

The GRI Standards consists of universal and topic standards and create a common language for organisations to report on their sustainability impacts in a consistent and credible way. The standards are designed as an easy-to-use modular set. The GRI Standards start with the universal standards which cover the foundation, general and management approaches that includes governance. Topic standards are then selected, based on the organisation's material topics – economic, environmental, or social. This enhances global comparability and enables organisations to be transparent and accountable. The standards help organisations understand and disclose their impacts in a way that meets the needs of multiple stakeholders (GRI, 2020). By reporting publicly on sustainability, it informs decision makers, such as investors or governments and drives continuous improvement in processes and performance.

- **Carbon Disclosure Project (formerly CDP) – CDP disclosures**

The Carbon Disclosure Project (formerly CDP), is an international, not-for-profit organisation providing the system for companies, cities, states and regions to measure, disclose, manage and share vital information on their environmental performance (CDP, 2017). Some 5,800 companies, representing close to 60% global market capitalisation, disclosed environmental information through CDP in 2016 (CDP, 2017). Companies intending to use the CDP disclosure framework, complete CDP's questionnaires on climate change, forests, and water security. CDP then takes the information supplied to score companies and cities based on their journey through disclosure and towards environmental leadership. The CDP works with 827 institutional investors to motivate companies to disclose their impacts on the environment and natural resources and take action to reduce them (CDP, 2017). Through their independent scoring methodology, CDP measures corporate and city progress and incentivize action on climate change, forests, and water security (CDP, 2017).

- **Scientific Beta (SciBeta) – SciBeta's Enhanced ESG reporting**

Scientific Beta was set up by the EDHEC-Risk Institute in December 2012 while its Enhanced ESG Reporting was introduced in July 2019 to assist investors to incorporate ESG dimensions into their investment analysis and decision-making processes as well as their mandatory and voluntary disclosures (SciBeta Publication, 2019). The reporting supports investment initiatives such as the Principles for Responsible Investment. (SciBeta Publication, 2019). The carbon footprinting (CF) report is one of the seven climate change reports highlighted by SciBeta and discussed here based on its relevance and later use in the study for analysis.

Carbon Footprinting metrics represent the indirect responsibility of a portfolio's investor in respect of emissions. The three most common carbon footprinting metrics are: Total Emissions, Carbon Footprint and Carbon Intensity. Total Emissions represents the absolute footprint of the portfolio, whereas Carbon Footprint normalises Total Emissions by the current market value of the portfolio and Carbon Intensity by the revenues controlled by the portfolio (SciBeta Publication, 2019). These are explained in more details in Appendix F. As Carbon Footprinting measures, they can be used to report on a portfolio in a manner

consistent with the GHG Protocol Corporate Standard. Given two companies with the same emissions and revenues, the company that has a higher price-to-revenue ratio will have a lower Carbon Footprint. Likewise, the company that has a lower price-to revenue ratio will have a lower Carbon Intensity (SciBeta Publication, 2019).

2.3.4. ESG rating agencies and systems

ESG ratings provide an assessment and measurement which often form the basis of informal and shareholder proposal-related investor engagement with companies on ESG matters (Harvard Law School, 2017). Report and ratings methodology, scope and coverage, however, vary greatly among providers. Many providers encourage input and engagement with their subject companies to improve or sometimes correct data. There are currently numerous ESG data providers, a summary of each of which is beyond the scope of this study, but some well-known third party ESG report and ratings providers are discussed.

- **Thomson Reuters (TR) – Thomson Reuters Asset4 ESG ratings**

In 2009, Thomson Reuters acquired ASSET4 allowing users the possibility to combine and analyse ESG data using their applications for analysis (Thomson Reuters, 2018). Thomson Reuters Asset4 ESG Scores are designed to measure a company's relative ESG performance, commitment, and effectiveness across ten main themes based on company-reported data (Thomson Reuters, 2018). The model consists of 3 pillars and 10 themes using 178 of the most relevant data points. The TR methodology is then applied to obtain ESG scores and ratings (Thomson Reuters, 2018). The methodology is discussed in more detail in Chapter 4. The ten themes are discussed in more details below (Thomson Reuters, 2018):

- The emission reduction score measures a company's commitment and effectiveness towards reducing environmental emissions in its production and operational processes.
- The innovation score reflects a company's capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.

- The resource use score reflects a company's performance and capacity to reduce the use of materials, energy, or water, and to find more eco-efficient solutions by improving supply chain management.
- The workforce score measures a company's effectiveness in terms of providing job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities and development opportunities for its workforce.
- The human rights score measures a company's effectiveness in terms of respecting fundamental human rights conventions
- The community score measures the company's commitment to being a good citizen, protecting public health and respecting business
- The CSR strategy score reflects a company's practices to communicate that it integrates economic (financial), social and environmental dimensions into its day-to-day decision-making processes
- The product responsibility score reflects a company's capacity to produce quality goods and services, integrating the customer's health and safety, integrity, and data privacy.
- The management score measures a company's commitment and effectiveness towards following best practice corporate
- The shareholders score measures a company's effectiveness towards equal treatment of shareholders and the use of anti-takeover devices

- **FTSE Russell – FTSE4Good ESG ratings**

In May 2015, The Financial Times Stock Exchange (FTSE) Group combined with Russell to form the brand name, FTSE Russell (FTSE Russell, n.d.). The FTSE4Good Index Series is designed to measure the performance of companies demonstrating strong Environmental, Social and Governance (ESG) practices (FTSE Russell, n.d.). The model consists of 3 pillars and 14 themes using about 350 indicators to produce ESG Scores and Ratings (FTSE Publications, n.d.). The indicators are grouped into 14 themes e.g., Anti-Corruption, Climate Change, Health & Safety. The calculation of Pillar Scores and overall ESG Ratings are not a simple mean average of all the theme Scores, instead a weighted average is calculated whereby each theme is weighted by its exposure level; Low Exposure

has a weight of 1, Medium Exposure a weight of 2, High Exposure a Weight of 3 and for some themes, companies will not be assessed and hence categorised as “Not Applicable”.

2.4 PESTLE analysis of the pressure on businesses to report their contribution to reducing climate change impacts

Climate change is rapidly becoming a strategic priority for companies as environmental challenges are perceived as a substantial threat to existing business models and are under scrutiny from various stakeholders (Kolk et al., 2008). In response to these stakeholder’s pressure, the disclosure of sustainability-related information about the company’s activities in the form of sustainability reports have increased over the last several years (Hahn et al., 2015; KPMG, 2011). The PESTLE analysis provides an analysis of the political, economic, social, technological, legal, and environmental (PESTLE) pressure on businesses to report their contribution to reducing climate change impacts.

1. Political

Governments are legitimate and usually powerful stakeholders who can exert pressure through legislation, regulation, and policies (Sarkis et al., 2010). This pressure is often codified in laws and regulations (Summerhays & de Villiers, 2012). Therefore, companies are under pressure to demonstrate that their organisation is a ‘good citizen’ and use sustainability reports to promote themselves to government and the broader community (Lee et al., 2016; Schaltegger & Csutora, 2012). Businesses are also subject to regulatory risks arising from current and expected governmental policies related to climate change (such as energy efficiency standards and carbon trading schemes), and other climate-related risks (such as reputation, changing consumer behaviour, and increasing humanitarian demands) (Flammer et al., 2019). Governments can also use tax policies, fiscal policies, and trade tariffs as incentives to encourage businesses to disclose their contribution to reducing climate change impacts.

Several international initiatives have been launched by organisations such as the European Union (EU), the Global Environmental Facility (GEF) and the World Bank, as well as the United Nations Convention to Combat Desertification (UNCCD), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP),

United Nations Framework Convention on Climate Change (UNFCCC) and the United States Agency for International Development (USAID) to fund and combat climate change (McGuigan et al., 2002). In 2015, the Paris agreement was established to limit global warming (UNCC, 2015). The Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016 (UNFCCC, n.d.).

2. Economic

Businesses often imitate competitor's behaviour to obtain an economic advantage where such behaviour is viewed as having positive or successful economic growth patterns. For instance, if a business discloses data on its carbon emission and provides a pathway to reducing its carbon footprint, other competitors might be pressured into doing the same. This is especially true if this action allows the business to gain an economic advantage, such as a larger market share, over other competitors. The prospect of gaining a market or economic advantage where climate change reporting has resulted in success for a similar business, places the competition under immense pressure to do the same.

Addressing climate impacts also creates a business opportunity due to the increase in demand for green businesses and green products. This can be attributed to the increased awareness in sustainability and demand for green products which have been driving the development of green products (Salicath et al., 2020). In 2013, up to 31 countries provided tax incentives to promote renewable energy from wind, solar, biomass, geothermal and hydropower (KPMG, 2014). The economic and business opportunities that climate change policies create provide a motivation and exerts pressure on businesses to report in order to take advantage of these opportunities.

3. Social

Social institutions such as business associations, Non-Governments Organisations (NGOs) or media also exert pressure on businesses. The pressure arising from such social institutions are referred to as normative isomorphism (Cotter et al., 2011). International organisations or business associations such as SDP, CDSB, CDP and WRI, raise public awareness in many countries and industries worldwide (Anderies et al., 2013). The rising

popularity of green consumerism has been promoted as a pathway to a sustainable future and the preservation of future generations (Sachdeva et al., 2015). The authors further stated that green consumerism provides an accessible way to engage in pro-environmental, sustainable behaviour that are undertaken with the intention of promoting positive environmental effects. Figure 2.2 highlights the factors and behaviours that drive green consumerism from a psychological viewpoint. As these behaviours continue to become the norm in our society, it will drive more accountability from businesses who will want to take advantage of the “goodwill” it offers to create or maintain a positive image of their businesses in the larger society.

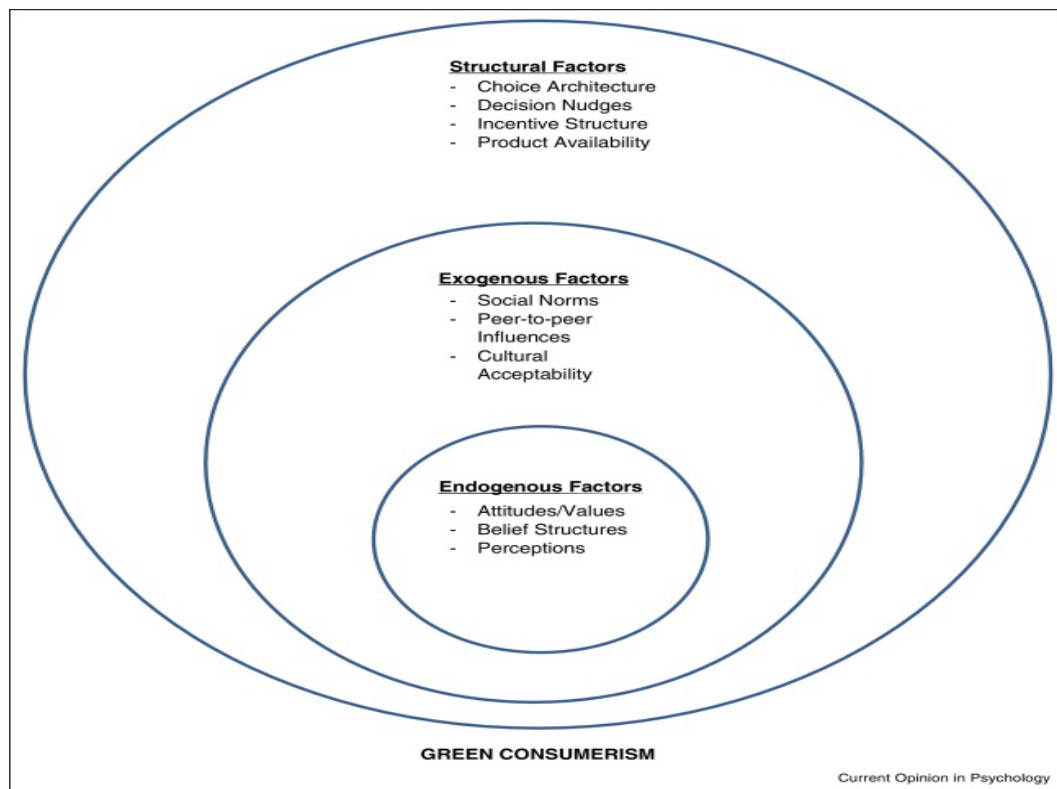


Figure 2.2. Multi-level factor model of green consumer behavior (Sachdeva et al., 2015)

4. Technological

Technological advancements such as automation, research and development, and an overall increase in technological awareness exert pressure on businesses to report their contribution to reducing climate change. With the advancement in technology, information is now readily available just by the click of a button. The increasing prevalence of social networks provides researchers greater opportunities to evaluate and assess changes in

public opinion and public sentiment towards issues of social consequence (Lineman et al., 2015). Businesses can no longer shy away from not reporting their contribution to climate change as stakeholders have become more knowledgeable due to the amount of information readily available on the internet.

The clean energy economy is an explosively growing economic sector over the last decade across the globe, as a response to global climate change, depleting traditional energy sources, and the need for industrial upgrade and structural transitions (Sachdeva et al., 2015). There is an increased demand for green technologies such as electric vehicles (Hidrué et al., 2011) and a shift to renewable energy sources. Many businesses are now moving away from plastic and traditional energy resources such as coal and fossil fuels as the population becomes more aware of the impact of climate change activities. Technological advancements have played a major role in making these possible and for organisations who have set their sights on the future, there is the need to ensure that their processes including reporting are aligned to take advantage of the future direction of the economy.

5. Legal

As an increasing number of countries, regions, cities and states implement emissions trading policies to limit CO₂ emission, many draw from the experience of the European Union's Emissions Trading Scheme, the largest greenhouse gas emissions trading system in operation (Laing et al., 2013). The EU Emissions Trading System (EU ETS) was established to enable the EU to meet its carbon mitigation objectives. Its environmental impact objectives are:

- i. To reduce GHG emissions efficiently, at a negotiated balance of cost and environmental gain.
- ii. To promote corporate investment in low carbon technologies (both energy efficiency and low carbon energy sources) (Laing et al., 2013). The emissions trading schemes and the requirement to measure carbon impacts has created an added pressure for business to report their climate change impacts.

6. Environmental

Increased awareness of the environmental impacts of climate change such as global warming and carbon emissions of green-house gases as a result of human activities has contributed to the pressure on businesses to report climate changes. Many of the likely characteristics of the resulting changes in climate (such as more frequent heat waves, increases in rainfall, increase in frequency and intensity of many extreme climate events) can be identified. Due to its negative impacts on human communities (including for instance substantial sea-level rise) and on ecosystems, global warming is the most important environmental problem the world faces (Houghton, 2005). As various stakeholders are aware of the environmental impacts of climate change, there is an increasing pressure on businesses to act which has resulted in more companies reporting on their carbon footprint. In 2019, almost 7,000 companies reported their emissions to the Carbon Disclosure Project (CDP, 2019), twice as many as in 2011 (Coppola et al., 2019)

2.4. Summary

This chapter reflects on socio-political theories that provide insights into why organisations volunteer information such as the political economy theory, legitimacy theory and stakeholder theory. Socio-political theories have the potential to explain climate change disclosures and are of the perspective that poor environmental performers have higher motivations to increase their level of disclosure than strong performers. These theories provide a context in which a diversity of reporting and rating systems have developed with no sign of coalescence on a single best practice mode of reporting and rating. Depending on the motivation of the reporting entity, they have more or less concern to follow a rigorous reporting system which subsequently dovetails into a similar rating system.

The reporting and rating industry has experienced a steady evolution in social, environmental and ethical reporting and rating. The beginning of modern voluntary ESG reporting may reasonably be traced to the Exxon Valdez oil spill. The global spread of the Socially Responsible Investment (SRI) movement has equally led to the evolution of rating agencies who have developed ESG ratings systems that allow investors to screen companies based on non-financial criteria. The PESTLE analysis provides useful insights into how businesses have come under pressure to report their contribution to reducing the

impacts of climate change provides a business analysis of the influence of political, economic, social, technological, legal, and environmental influences on climate change reporting. The analysis also provides insights into the relevant agencies such as NGOs and international organisations that exert pressure on businesses to provide climate change disclosures. The analysis shows that businesses are under increasing pressure from a wide range of sources to disclose their climate change impacts and report their carbon reduction initiatives.

Chapter 3. Literature Review

3.1. Introduction

Several stakeholders rely on one or more reports generated by businesses to make investment decisions. Such reports include annual, sustainability, environmental and ESG reports providing information on the financial, environmental, social and governance position of the business. This demand for more information, transparency and accountability has been largely driven by social institutions such as business associations, Non-Governmental Organisations (NGOs) and the media (Anderies et al., 2013). International organisations or business associations such as the Sustainability Disclosure Project (SDP), Climates Disclosure Standards Board (CDSB), Carbon Disclosure Project (CDP), World Resources Institute (WRI), also raise public awareness in many countries and industries worldwide (Anderies et al., 2013). However, a lack of standardized reporting remains a major limitation to the quality of data often available to investors.

Rating agencies that assess domains ranging from sustainability to corporate governance to best places to work play an important role in shaping perceptions of business performance (Chatterji et al., 2016). Managers, investors, and scholars increasingly rely on these ratings to make strategic decisions, invest trillions of dollars in capital and study corporate social responsibility (CSR), guided by the implicit assumption that the ratings are valid (Avetisyan, Emma; Hockerts, 2017). However, there is the question of how reliable these reports and ratings are in empowering investors to make financial as well as ethical decisions as a result of poor data quality, inconsistencies and environmental performance. This issue provides the focus for this literature review.

3.2 Why do companies report?

Pressures from stakeholders on environmental issues such as climate change, pollution and waste are growing significantly and are the fundamental drivers of companies moving to data stream based platforms (Tarmuji et al., 2016). Companies are aware that ESG disclosure is critical to portray their good reputation and image in meeting the challenge of

green issues to their stakeholders (Tarmuji et al., 2016). An increasing number of international firms have been voluntarily publishing standalone ESG reports detailing their compliance on environmental and social issues. The 2008 KPMG International Survey on Corporate Responsibility Reporting which surveyed the ESG reporting habits of the world's largest firms found "an important shift in direction with ESG reporting becoming the norm instead of the exception within the world's largest companies" (KPMG, 2008, p. 2). KPMG reported an increase in companies issuing stand-alone corporate social responsibility reports from 52% in 2005 to 79% in 2008 (KPMG, 2008, p. 14) but provided no definitive explanation as to why the increase occurred. This increase could be largely attributed to the increased pressure on organisations for environmental accountability and transparency. It is ultimately beneficial to highlight and compare the different reporting methods used by organisations in reporting their environmental impact in order to continue to suggest ways to improve, alter and build on these methods for a more accountable and transparent environmental impact.

3.3. What companies report and what rating agencies rate

Companies report based on their environmental, social and governance (ESG) contributions to the society, these reports are usually in the form of environmental, sustainability or ESG reports. A good ESG report should reflect the overall strategy and objectives of the company, address issues and topics that are relevant to the company and its stakeholders and provide information about its results, not omitting the uncomfortable topics (KPMG, 2008). A good rating system should also capture these as they are often done based on either publicly available information on ESG as reported by the businesses or based on questionnaires to organisations to provide the data on ESG to enable an analysis and rating (Avetisyan, Emma; Hockerts, 2017). Sphera, (2021) details what companies should report and ultimately what rating agencies rate:

- Environmental

The environmental criterion considers how companies use energy and manage their environmental impact as stewards of the planet. The "E" considers how a company uses resources across the board – scope 1-3. Scope 1 emissions are direct emissions from

sources owned or controlled by the company, Scope 2 emissions are indirect emissions from electricity, steam, heating/cooling purchased or consumed by the company, and Scope 3 emissions are other indirect emissions in the corporate value chain, or a combination of both Scope 1 and 2. Factors usually considered are energy efficiency, climate change, carbon emissions, biodiversity, air and water quality, deforestation, and waste management. Companies that do not consider these environmental risks may face unforeseen financial risks and investor scrutiny.

- Social

The social criterion examines how a company fosters its people and culture, and how that has ripple effects on the broader community. Factors considered are inclusivity, gender and diversity, employee engagement, customer satisfaction, data protection, privacy, community relations, human rights, labour standards.

- Governance

Governance considers a company's internal system of controls, practices, and procedures, how an organization stays ahead of violations. It ensures transparency and industry best practices and includes dialogue with regulators. Factors considered are the company's leadership, board composition, executive compensation, audit committee structure, internal controls, and shareholder rights, bribery, and corruption, lobbying, political contributions, and whistle-blower programs.

3.4. Limitations of ESG data and the need for standardised ESG data

In mid-2020, BlackRock surveyed their clients to better understand their drivers and challenges to sustainable investing, how the pandemic has affected their implementation, and how innovation can spur adoption. The company heard from 425 investors in 27 countries. 53% of global respondents cited the poor quality or availability of Environmental, Social, and Governance (ESG) data and analytics as the biggest barrier to deeper or broader implementation of sustainable investing, higher than any other barrier that was tested (BlackRock, 2020).

The absence of reliable environmental performance data is further endorsed by academic research. Chatterji et al., (2016), assessed the level of agreement between six prominent ESG rating systems (MSCI KLD and Innovest, Thomson Reuters Asset4, FTSE4Good, DJSI, and Calvert) and found low convergence between the six scores, meaning individual organisations could variously be judged good, poor or indifferent. The authors also concluded that the ESG scores metrics examined failed to distinguish responsible from irresponsible firms. They also observe that the lack of validity or the inconsistency of ESG scores should cast doubt on the validity of score-based academic research on the performance effects of ESG investment. This can equally be applied to ESG reporting systems where different reporting systems require different parameters for their reporting. For instance, GRI standards only require organisations to report carbon intensity figure for their (direct) Scope 3 emissions, whereas CDP requests intensity figures for Scope 1 and 2 emissions in addition to scope 3 emissions (CDP, 2017; GRI, 2020).

Christiansen & Ducoulombier (2020) argue that ESG scores contribute to greenwashing. Depending on how scores are calculated and presented, they identify how strong scores can be given to organisations whose actual ESG performance is poor. Similarly, the Worldwide Fund for Nature European Policy Office (WWF, 2019) noted in its feedback on the update of the EU Benchmark Regulation that ESG scores were poorly designed as evidenced by potentially giving high scores to businesses in inherently unsustainable sectors. EDHEC Business School (2021), have shown how reductions in carbon or temperature scores at the portfolio level can be inconsistent with scores for individual organisations in the portfolio. In its recent webinar titled “The climate deserves more than 12%”, the school emphasized that the study on greenwashing in portfolio construction shows that climate scores only correspond on average to 12% of the difference in the weights of stocks in the portfolio for all the strategies that can primarily impact companies’ climate performance (EDHEC Business School, 2021a, 2021b). This directly contradicts the claims from the financial sector of using its investment capabilities to engage companies on the necessary changes to products and production methods to limit greenhouse gas emissions.

It is important to note that these limitations are the direct result of poor data quality which has been identified as one of the biggest hurdles in the path of ESG investing (BlackRock, 2020). Poor data quality can also be the direct result of inconsistent measurement techniques for GHG emissions. For instance, there is the issue of how to measure greenhouse gas (GHG) or carbon emissions for ESG reporting. Matisoff et al. (2013) stated that inconsistent measurement techniques and standards, spotty verification practices, and a widely varying lexicon make the assessment of ESG reporting difficult. In a CDP survey from 2003 to 2010, the authors reported that responding firms used several greenhouse gas accounting methodologies such as WBCSD/WRI Greenhouse Gas Protocol, International Standards Organization (ISO) standards, Inter-governmental panel on climate change (IPCC), and Department for Environment, Food, and Rural Affairs (DEFRA) guidance in their responses (Matisoff et al., 2013). This resulted in varying results as there was no standardization across board. Some of these accounting methods also sets a minimum standard without detailing specific methods (Wintergreen & Delaney, 2007). Without a standardized measurement technique for GHG emissions reporting and ESG reporting as a whole, stakeholders will continue to be presented with data that are of poor quality, largely unreliable, inconsistent, and not a true reflection of the company's environmental performance. As these data are subsequently used to provide ESG ratings on organisations, this information also becomes unreliable and unable to be trusted by users in making investment decisions. It is therefore imperative to standardise ESG reporting due to these limitations to drive better outcomes for investors and the sector.

3.5. Summary

International organisations such as the CDSB, CDP and WRI continue to raise public awareness between countries and industries for more detailed and transparent reporting from business. However, a lack of standardized reporting remains a major limitation to the quality of data often available to investors. Companies report based on their environmental, social and governance (ESG) contributions to the society, these reports are usually in the form of environmental, sustainability or ESG reports. Rating agencies in turn use this information to rate companies or use questionnaires as a means of obtaining the required information for these ratings.

The limitations associated with using individual ESG scores have further highlighted the need to ensure a more standardised reporting framework. Reliability and environmental performance are two major limitations that have been identified with ESG data or scoring with BlackRock's 2020 survey citing the poor quality or availability of ESG data and analytics as the biggest barrier to deeper or broader implementation of sustainable investing, higher than any other barrier that was tested. Inconsistent measurement techniques for ESG emissions reporting also remains a major limitation and contributes to the poor data quality available to investors making financial and ethical investment decisions.

Chapter 4. Research Methodology

4.1. Introduction

This chapter will cover the research method used to conduct the study, the sources of data used and how these data were analysed. The purpose of this chapter is to explain the methodology used in the research, how data were sourced and analysed to achieve the research aim and objectives.

4.1.1. Overview of the research method

Before explaining the background to the research method, this section outlines the key steps in the research process.

1. Select two reporting systems to compare how the use of each reporting system can skew an organisation's true environmental performance.
2. Select two environmental performance ranking systems that can be applied to a sample of New Zealand organisations.
3. Identify components of each selected reporting system that can be applied to New Zealand organisations.
4. Identify components of each selected reporting system that can be applied to New Zealand organisations.
5. Identify six New Zealand organisations that publicly report aspects of their environmental performance matching the data needed to apply the reporting and ranking systems to the organisations.
6. Design a judgmental ranking scale to enable the application of ranking systems to the New Zealand organisations.

7. Apply the reporting and ranking systems to the New Zealand sample and identify and explain any discrepancies in the performance of organisations as judged by the reporting and/or ranking system.
8. Draw conclusions about how to improve environmental reporting and performance evaluation.

4.2. Research philosophy and design

This study is based on positivism research philosophy that entails working with an observable social reality to produce law-like generalisations (Saunders et al., 2016). This research philosophy fits a scientific empiricist method designed to yield pure data and facts uninfluenced by human interpretation or bias (Crotty, 1998). It aims to discover observable and measurable facts and regularities leading to the production of credible and meaningful data (Crotty 1998). This is further highlighted by the research problem which suggests the possibility of working with different types of knowledge and methods such as the use of quantitative and qualitative data to analyse findings.

The research approach is both evaluative and exploratory. The evaluative approach allowed the consideration of how well the current ESG reporting and rating systems work. A review of a sample of widely used reporting methods allowed to see how effective they have been in reporting ESG data and the shortfalls and limitations that their use have presented hence the need for a more standardized reporting system and subsequently a standardized rating system to address these gaps. The evaluative approach allowed the use of two reporting systems: GRI and SciBeta's carbon footprinting methods in obtaining quantitative and qualitative data and carrying out a qualitative and personal judgment review of two New Zealand companies: Z-Energy and Fonterra, which were the selected case studies for this study. The approach equally allowed the use of two rating systems: Thomson Reuters Asset 4 and FTSE4Good to evaluate the financial and sustainability reports of six New Zealand companies. The exploratory approach on the other hand allowed to gain insights into how the ESG reporting systems and ratings systems work by reviewing existing literature on these topics and applying these to the two companies.

The overall research design is a mixed method. While a mix of quantitative and qualitative data informed the study, in the final analysis, qualitative data were converted to numeric values.

4.2.1. Research method - Secondary Data Analysis

This study is based on secondary data analysis which is the analysis of data that was collected by someone else for another primary purpose. The use of this existing data provides a viable option for researchers who may have limited time and resources (Johnston, 2017). The data can also be evaluated for appropriateness and quality in advance of actual use as it already exist in some form (Stewart & Kamins, 1993). The analysis applies the same basic research principles as studies using primary data. The major advantages of secondary analysis are the cost effectiveness and convenience it provides (Johnston, 2017). Data was sourced from publicly available annual, sustainability and environmental reports of the six case studies used i.e., Z- Energy, Fonterra, Air New Zealand, Sanford Limited, Contact Energy Limited and Mercury New Zealand Limited which are all New Zealand companies.

For the ESG reporting, data used were extracted from annual, sustainability and environmental reports of two organisations: Z-Energy and Fonterra Cooperative Group Limited (Fonterra). The two companies were selected as case studies based on their high environmental impacts as large emitters of greenhouse gases. The use of a multiple case study approach is to allow replication and increase the likelihood to produce more evidence (Saunders et al., 2016). For the ESG rating, data used were extracted from annual and sustainability reports of six case studies: Z-Energy, Fonterra, Air New Zealand, Sanford, Contact Energy and Mercury New Zealand. The six companies were selected based on their high environmental impacts as large emitters of greenhouse gases. Using the case studies allowed to see how the reporting and rating systems can be applied to publicly available data of real companies to achieve a rating system or make a personal judgement on the performance of these organisations. This is important as it allows a real life application of the literature reviewed and allows to relate theory to practice.

For the evaluation of rating systems, data was sourced from publicly available annual; sustainability and environmental reports of the six companies. This approach and research design allows the exploration of a topic and the development of a theoretical explanation as the data are collected and analysed, the research project is thus data driven and adopts an inductive approach (Saunders et al., 2016). The use of secondary data sources also ensured that the role of the researcher is removed reducing the researcher bias that are often associated with data collection and interpretation. Table 4.1 provides a summary of the approach for this study.

Overall Approach	Design	Method(s)	Role of researcher	Kind of data collected	Analysis Approach
Evaluative Exploratory	Mixed methods Case study	Secondary data analysis	Removed	Qualitative and Quantitative	Inductive

Table 4.1: Study approach summary

4.3. Method: Secondary Data Analysis

4.3.1. Method 1 – ESG reporting systems

Two ESG reporting methods were used to analyse two New Zealand companies (Z- Energy and Fonterra) to determine the possibility of different reporting systems rating an organisation differently or similarly based on their reporting metrics. Z-Energy provided an integrated annual report which contained financial and non-financial information as its primary reporting framework but also used the GRI standard as a supporting reporting framework. This was used as a data source for information on the company. Fonterra on the other hand provided stand-alone sustainability report, annual report and environmental reports with its GHG emissions reported via the CDP disclosure framework. This was used as a data source for information on the company. There was sufficient literature information on data reporting components of the GRI and carbon footprinting of SciBeta reporting systems to extract data information on the indicators used and to make a subjective conclusion on how the rating systems might rate the organisation based on what reporting metrics were included as a result of the system used.

4.3.1.1. Procedure 1 – GRI reporting standard

GRI environmental topics: GRI 305: Emissions were used to extract scope 1, 2 and 3 emissions data and emissions intensity data of Z-Energy and Fonterra. These were then subsequently used to determine if GRI might rate the companies high or low based on these metrics. The GRI indicators used are listed in Appendix C.

4.3.1.2. Procedure 2 – SciBeta’s Carbon Footprinting (CF) method

SciBeta’s carbon footprinting metrics were used to extract scope 1, 2 and 3 data, carbon intensity, carbon footprint and total capitalisation data of Z-Energy and Fonterra. These were then subsequently used to determine if CF might rate the companies high or low based on these metrics. The CF indicators used, and their meanings are listed in Appendix F. The findings were then compared to see if the reporting methods rated a company similarly or differently based on what metrics were included in its reporting. The carbon footprint is especially important to consider as it measures the GHG emissions associated with a portfolio and is useful for comparison across portfolios or time (SciBeta Publication, 2019). According to capital.com, total or market capitalisation enables investors to work out the current market value of a company. Investors use market cap to assess a company’s potential for growth and the investment risk that goes with it (Capital.com, n.d.). It is therefore important to consider how these two parameters might provide a different assessment in comparison to the GRI standard.

4.3.2. Method 2 – ESG rating systems

Six rating systems were identified from which two rating systems were selected on the basis of the suitability of their indicators in analysing the selected organisations. Two ESG rating systems Thomson Reuters Asset4 (www.thomsonreuters.com) and Financial Times Stock Exchange (FTSE4Good) (www.ftserussell.com) were used to analyse six New Zealand companies Z- Energy, Fonterra, Air New Zealand, Sanford Limited, Contact Energy Limited and Mercury New Zealand Limited to determine if different rating systems will evaluate the same company differently or similarly. The measurement indices of the different rating systems allowed to compare and contrast the rating methods used, to

determine how similar or different these are and how this might impact on the ratings assigned by these systems.

There was sufficient publicly available information providing a step by step approach of how the Thomson Reuters Asset4 methodology can be applied to rate organisations. This made it possible to extract data from the sustainability, annual and environmental reports of Z-Energy and Fonterra using the indicators provided by the Thomson Reuters Asset4 ESG rating system. This data was then compared to the Thomson Reuters ESG rating scale to obtain a final ESG score and grade. The grades were then assigned a personal judgment rating ranging from poor to excellent as shown in table 4.3.

There was insufficient information to use the FTSE4Good methodology due to the proprietary nature of this reporting. A step by step approach comparable to the Thomson Reuters Asset4 methodology was not publicly available to achieve this. However, relevant FTSE4Good indicators were used to determine if the companies reported on this information. This was subsequently assigned a rating based on personal judgement using the number of indicators reported based on the relevant FTSE indicators as shown in table 4.5.

4.3.2.1. Procedure 1 (Thomson Reuter’s Asset 4 ESG rating Methodology)

Thomson Reuters Asset 4 ESG rating method was applied to Z- Energy, Fonterra, Air New Zealand, Sanford Limited, Contact Energy Limited and Mercury New Zealand Limited’s 2020 annual and sustainability reports to extract relevant information for ESG rating. The 10 themes recommended by the Thomson Reuters Asset4 ESG rating method were used. The TR indicators and data points used are listed in Appendix H while Appendix G provides the definitions for the categories used. 21 indicators were used based on their relevance to the organisations’ business activities. The 21 indicators were scored using Boolean values or quantitative values extracted from the annual report and sustainability reports of the six companies. The below details how the scoring was done (Thomson Reuters, 2018):

1. Qualitative Data (Boolean Data)

Qualitative metrics are Boolean questions, and the values are Yes, No or NA. If the company does not report on the metric, it was answered as No or NA depending on the default value of each measure. Each measure has a polarity indicating whether a higher value is positive or negative. For instance, having an emissions reduction policy is positive, but having environmental controversies is negative. All Boolean data were converted to numeric values for the percentile score calculation. Table 4.2 shows the conversion of Boolean values to numeric values:

Boolean value	Numeric value
Yes	1
No	0.5
NA	0

Table 4.2: Conversion of boolean values to numeric values.

2. Quantitative Data (Numeric Data)

Quantitative metrics were either assigned a numeric value or NA. If a measure has a value, then percentile rank formula was applied. Not available quantitative measures have no impact on the score as the percentile rank considers only companies with numeric values. Again, each measure has a polarity indicating whether the higher value is positive or negative. For instance, more water recycled is positive, but more emission is negative.

The values obtained were ranked from highest to lowest. For values with a negative polarity, these were ranked from lowest to highest. The percentile formula below was then applied to obtain percentile scores and average percentile scores calculated for each category.

$$\text{Score} = \frac{\text{n. of companies with a worst value} + \frac{\text{n. of companies with the same value included in the current one}}{2}}{\text{n. of companies with a value}}$$

Percentile Score Formula for calculation of individual category scores (Thomson Reuters, 2018)

To obtain the ESG score of each organisation, the average percentile scores were multiplied by the category weights and the values added to obtain an overall ESG score for the six companies. The overall ESG scores were then compared with the score range grading system in Table 4.3 to obtain a final grade for the companies across the 3 ESG pillars:

environmental, social and governance as well as an overall final grade for the respective companies. The grades were subsequently assigned a rating using personal judgement but based on the already established Thomson Reuters score range as shown in Table 4.3. The personal judgment rating was added to effectively compare the Thomson Reuters' Asset 4 ESG rating with the FTSE4Good ESG rating as no grade was available under the FTSE rating. Table 4.3 shows the Thomson Reuters score range and corresponding grades with added personal judgment rating.

Score Range	Grade	Personal Judgment Rating
$0.0 \leq \text{score} \leq 0.083333$	D -	Poor
$0.083333 < \text{score} \leq 0.166666$	D	
$0.166666 < \text{score} \leq 0.250000$	D +	
$0.250000 < \text{score} \leq 0.333333$	C -	Moderate
$0.333333 < \text{score} \leq 0.416666$	C	
$0.416666 < \text{score} \leq 0.500000$	C +	
$0.500000 < \text{score} \leq 0.583333$	B -	Good
$0.583333 < \text{score} \leq 0.666666$	B	
$0.666666 < \text{score} \leq 0.750000$	B +	
$0.750000 < \text{score} \leq 0.833333$	A -	Excellent
$0.833333 < \text{score} \leq 0.916666$	A	
$0.916666 < \text{score} \leq 1$	A +	

Table 4.3: Thomson Reuters Asset 4 ESG Score range grading scale (Thomson Reuters, 2018). A personal judgment score rating was added by the researcher for ease of comparison between the TR and FTSE ratings.

Table 4.4 provides an illustration of the application of the formular:

Parameter	Description	Z-Energy	Fonterra	Percentile Score Formula Applied (Z-Energy)	Percentile Score Formula Applied (Fonterra)
Total Emissions	No. of companies with worst value	1	0	$1 + (1/2)/6 = 0.25$	$0 + (1/2)/6 = 0.083$
	No. of companies with same value	1	1		
	No. of companies with value	6	6		

Table 4.4: Illustration of the percentile formula using Z-Energy and Fonterra total emission values

4.3.2.2. Procedure 2 – FTSE4Good ESG Rating Methodology

The FTSE methodology indicators were applied to measure how FTSE might rate the six organisations reviewed. A personal judgment scoring scale was then used to provide a final rating. This was based on personal judgment due to the proprietary nature of ESG rating methods such as the FTSE4Good rating method that offered limited information on scoring. There was not enough publicly available information to carry out a data scoring similar to the Thomson Reuters Asset4 method.

The 14 themes recommended by the FTSE4Good ESG rating method were used. The FTSE indicators and data points used are listed in Appendix P. 14 indicators were used based on their relevance to the organisations' business activities. The 14 indicators were applied to the annual, sustainability and environmental reports of Z- Energy, Fonterra, Air New Zealand, Sanford Limited, Contact Energy Limited and Mercury New Zealand Limited for 2020. The companies were rated based on the number of data points reported under each pillar (environmental, social and governance) using a personal judgment scoring scale. Ratings were assigned ranging from poor to excellent as shown in table 4.5 for ease of comparison with the Thomson Reuters Asset4 score ratings. To obtain the overall ESG scores, the total number of indicators were added for each pillar and averages obtained. This was then rounded to the nearest whole number. The overall ESG scores were then compared with the score scale in Table 4.5 to obtain a final grade for the companies across the 3 ESG pillars: environmental, social and governance as well as an overall final grade for the respective companies. Table 4.5 shows a personal judgment scoring scale and the parameters used for the rating

Personal Judgment Scoring scale	Personal Judgment Rating
Reported 1 or 2 out of 5 indicators	Poor
Reported 1 out of 4 indicators	
Reported 3 out of 5 indicators	Moderate
Reported 2 out of 4 indicators	
Reported 4 out of 5 indicators	Good
Reported 3 out of 4 indicators	
Reported 5 out of 5 indicators	Excellent
Reported 4 out of 4 indicators	

Table 4.5: Personal judgment scoring scale and rating

4.3.3. Data analysis

Data sourced were analysed using the GRI and SciBeta's carbon footprint methods and the Thompson Reuters Asset4 and FTSE4Good ESG ratings methods. An inductive approach was used to explore the topic and the subsequent theoretical explanation of analysed data (Saunders et al., 2016) using a qualitative review and personal judgment.

4.4. Limitations, reliability and bias

A major limitation to the study is the proprietary nature of ESG rating methods. Most rating agencies use computerised models or algorithms which are not publicly available to rate publicly available information about companies or information sourced from companies. This study applied the ESG ratings in a limited capacity by analysing indicators and potential themes from Thomson Reuters Asset4 and FTSE4Good ESG ratings methodology. While the Thomson Reuters methodology could be applied for analysis to a large extent, the FTSE method could not be applied in the same way as the methodology and specific dynamics used by the rating agency to do this was not publicly available. Other commonly used ESG rating methods such as MSCI KLD, Innovest, DJSI, and Calvert were also lacking in publicly available information on their methodologies and how these could be applied.

Delimitations to the study include the number of companies used for analysis, the number of reporting and rating methods used for analysis as well the objectives of the study. These were set to ensure the aim and objectives do not become impossibly large to complete within the timeframe for the study. The companies were selected based on their high environmental impacts as large emitters of greenhouse gases while the number of companies selected were based on the practicality of how many companies could be covered within the timeframe of the 17 weeks of the study. However, the results provided some insights into ESG reporting and ratings and helped to achieve the study's objectives of:

1. Identifying the challenges involved in reporting on and rating the ESG performance of business organisations.

2. Explaining what differences and/or similarities exist among a sample of the most widely used ESG reporting systems.
3. Considering the implications of there being competing methods for the reporting of business ESG performance.
4. Applying different reporting systems to two New Zealand companies and different rating systems to six New Zealand companies with big environmental impacts to determine how consistent the rating systems are.

A review of ESG reporting and rating methods allowed to highlight some limitations that exist within ESG data reporting and rating as well as explain the similarities and differences that exist among the ESG reporting and rating systems. A qualitative analysis and personal judgment of publicly available data of the sustainability and annual reports of the six companies also allowed the use of the Thomson Reuters Asset4 and FTSE4Good ESG ratings methodologies and indicators respectively, to determine how the two ESG rating systems will likely rate the six organisations similarly or in a divergent manner.

4.5. Ethical Considerations

As this research is based on secondary data analysis, it did not require ethical approval from the SIT Ethics Committee.

4.6. Summary

Overall, this study used both an evaluative and exploratory approach. The evaluative approach allowed to measure how the reporting systems might evaluate the two companies' data based on GRI and CF while the rating system allowed an evaluation of the six companies using the Thomson Reuters Asset4 and FTSE4Good ESG rating methods. Z-Energy, Fonterra, Air New Zealand, Sanford Limited, Contact Energy and Mercury NZ Limited, were used as case studies based on their high environmental impacts on GHG emissions in New Zealand. A multiple case study allowed more evidence and replication to be obtained with data sourced from annual, sustainability and environmental reports of

the six companies. Quantitative data were collected and where data collected was qualitative, this was converted to numeric data making the overall design a quantitative study using a multiple case study approach.

Data analysis employed both the use of a qualitative and personal judgment approaches as relevant to the reporting or rating method being used. The analysis approach was inductive which allowed the exploration of a topic and the development of a theoretical explanation as the data are collected and analysed. This method supported the realisation of the study's aim and objectives. The use of the application of the GRI and CF ESG reporting systems and the Thomson Reuters Asset4 and FTSE4Good ESG rating systems on the secondary data sourced allowed to determine how the two ESG reporting, and rating systems will rate either organisations similarly or in a divergent manner.

Chapter 5. Findings and Analysis

5.1. Introduction

This chapter provides the results of the application of the ESG reporting methods and ESG rating methods on the six New Zealand companies used: Z-Energy, Fonterra, Air New Zealand, Sanford Limited, Contact Energy and Mercury NZ Limited. Two ESG reporting systems discussed in chapter 2: GRI and CF were applied to two of the six New Zealand companies: Z-Energy and Fonterra and rated using applicable indicators, to consider how these systems would rate the companies similarly or differently. Two ESG rating systems also discussed in Chapter 2: Thomson Reuters Asset4 and FTSE4Good were applied to the six companies and rated using applicable indicators, to consider how these systems would rate the companies similarly or differently. Appendix B provides a brief overview of the six companies used in this study.

5.2. Results

The results presented here are:

1. The ESG reports of Z-Energy and Fonterra using the GRI and CF reporting method
2. The ESG ratings of Z-Energy, Fonterra, Air New Zealand, Sanford Limited, Contact Energy and Mercury NZ Limited.

5.2.1. GRI vs. Carbon Footprinting

The GRI standards discussed in Chapter 2 provides a standard that allows organisations to report against two sets of standards: Universal standards and topic specific standards. The universal standards cover general disclosures about the organisation and the management's approach for each material topic. The topic standards on the other hand covers economic, environmental, and social topics including governance. The carbon footprinting (CF) report is one of the seven climate change reports highlighted by SciBeta and discussed in Chapter 2. Carbon Footprinting metrics represent the indirect responsibility of a portfolio's investor in respect of emissions. The three most common carbon footprinting metrics are:

Total Emissions, Carbon Footprint and Carbon Intensity. These are discussed further in this chapter as well as in chapter 2.

Table 5.1 provides a comparison between Z-Energy and Fonterra in terms of what indicators they are expected to report upon by the GRI and CF. Personal judgment rating was based on the number of indicators reported using the personal scoring scale in Table 4.5. The personal judgment rating allows an ease of comparison of rating between the two organisations. The two methods were compared to determine how these methods might rate the same organisation similarly or differently based on their reporting metrics.

GRI and CF indicators applied to Fonterra and Z-Energy	GRI	CF
Total Emissions (scope 1, 2 and 3)	Yes	Yes
Emissions Intensity	Yes	Yes
Carbon Footprint	No	Yes
Total capitalisation	No	Yes
Personal Judgment Rating	Moderate	Excellent

Table 5.1: Comparison between Z-Energy & Fonterra using GRI & CF expectations. Refer to Appendices D and E for the numeric values of the GRI Emissions and CF data for Z-Energy and Fonterra.

According to GRI (2020), Scope 1 emissions are direct emissions from sources owned or controlled by the reporting company while scope 2 emissions are indirect emissions from electricity, steam, heating/cooling purchased or consumed by the company (GRI, 2020). Scope 3 emissions are other indirect emissions in the corporate value chain (i.e., multiple upstream and downstream sources not owned or controlled by the reporting company). An emission intensity or carbon intensity measures the emission rate of a given pollutant relative to the intensity of a specific activity, or an industrial production process (GRI, 2020). Total Emissions measures the absolute GHG emissions associated with a portfolio and allocated based on equity ownership (SciBeta Publication, 2019).

It is useful to report carbon footprint as it measures the GHG emissions associated with a portfolio and is useful for comparison across portfolios or time (SciBeta Publication, 2019). According to capital.com, total or market capitalisation in finance is the dollar value of a company's outstanding shares (Capital.com, n.d.) and enables investors to work out the current market value of a company. Investors use market cap to assess a company's potential for growth and the investment risk that goes with it (Capital.com, n.d.). In stock

markets, carbon emissions have influenced market capitalisation (Matsumo et. al. 2020). According to MSCI carbon emissions data by company, the top 30 corporations that slashed carbon emissions from 2014 to 2018 saw their market capitalisation increase by 15% as of September 2019 compared to December 2017 (Matsumo et. al. 2020). An increase in market capitalisation with corresponding reduction in carbon emission can be a positive indicator to investors. Appendices C and F explain the GRI and CF metrics in more detail.

Table 5.2 shows the results of applying GRI and CF reporting expectations to Z-Energy and Fonterra. A personal judgment rating was used to provide an overall rating using the personal scoring scale in Table 4.5.

Indicators	Z-Energy	Fonterra
GRI indicators		
GRI 305: Emissions (scope 1, 2 and 3)	Yes	Yes
Emissions Intensity	Yes	Yes
Personal judgment Rating	Excellent	Excellent
Carbon Footprinting indicators		
Emissions (scope 1, 2 and 3)	Yes	Yes
Emissions Intensity	Yes	Yes
Carbon Footprint	No	No
Total capitalisation	No	Yes
Personal judgment Rating	Moderate	Good

Table 5.2: Z-Energy and Fonterra GRI and CF ratings. Refer to Appendices C and F for detailed explanations of the GRI and CF metrics

5.2.2. Thomson Reuters Asset4 and FTSE4Good

Thomson Reuters Asset4 ESG scores are designed to measure a company's relative ESG performance, commitment, and effectiveness across ten main themes based on company-reported data (Thomson Reuters, 2018). The model consists of 3 pillars and 10 themes using 178 of the most relevant data points. The TR methodology is then applied to obtain ESG scores and ratings (Thomson Reuters, 2018). The FTSE4Good Index Series is designed to measure the performance of companies demonstrating strong Environmental, Social and Governance (ESG) practices (FTSE Russell, n.d.). The model consists of 3 pillars and 14 themes using about 350 indicators to produce ESG Scores and Ratings (FTSE

Publications, n.d.). The two methods were compared to determine how these methods might rate the same organisation similarly or differently based on their reporting metrics. Chapter 2 and Appendix G explains the Thomson Reuters categories and their definitions in more detail.

Table 5.3 shows the results of the Thomson Reuters and FTSE ESG ratings for the six companies across the 3 pillars: Environmental, Social and Governance and conversion to a personal judgment rating using the personal judgment scoring scale and rating in Table 4.5.

Environmental	Case studies	Personal judgment rating using Thomson Reuters grades	Personal judgment rating using FTSE indicators
	Z-Energy	Poor	Good
	Fonterra	Poor	Excellent
	Air New Zealand	Poor	Poor
	Sanford	Poor	Good
	Contact Energy	Poor	Good
	Mercury New Zealand	Poor	Moderate
Social	Z-Energy	Poor	Moderate
	Fonterra	Poor	Excellent
	Air New Zealand	Poor	Moderate
	Sanford	Poor	Poor
	Contact Energy	Poor	Moderate
	Mercury New Zealand	Poor	Good
Governance			
	Z-Energy	Poor	Good
	Fonterra	Poor	Good
	Air New Zealand	Poor	Good
	Sanford	Poor	Moderate
	Contact Energy	Poor	Excellent
	Mercury New Zealand	Poor	Poor

Table 5.3: Overall TR and FTSE ratings across ESG pillars for the six companies. Refer to Appendix O for the relevant grades and conversion to personal judgment ratings.

5.2.2.1. Thomson Reuters Asset4 (Based on TR methodology and personal judgment)

- **Environmental**

Upon analysis, Z-Energy, Fonterra, Sanford Limited, Contact Energy Limited showed D grades under the environmental pillar while Air New Zealand and Mercury New Zealand showed a D- and D+ rating respectively. Overall, the six companies showed a poor rating under the environmental pillar.

- **Social**

Upon analysis, Z-Energy, Fonterra, Air New Zealand, Sanford Limited and Mercury New Zealand showed D grades under the social pillar while Contact Energy Limited showed a D- grade. Overall, the six companies showed a poor rating under the social pillar.

- **Governance**

Upon analysis, Z-Energy, Fonterra and Mercury New Zealand showed D grades under the governance pillar while Air New Zealand, Sanford Limited and Contact Energy showed D- grades. Overall, the six companies showed a poor rating under the governance pillar.

5.2.2.2. FTSE4Good (Based on personal judgment)

- **Environmental**

Upon analysis, Z-Energy, Sanford Limited and Contact Energy Limited reported on 4 out of the 5 relevant indicators under the environmental pillar indicating a good rating. Fonterra reported on all 5 relevant indicators indicating an excellent rating. Air New Zealand and Mercury New Zealand reported on 2 and 3 out of the 5 relevant indicators, indicating poor and moderate ratings respectively.

- **Social**

Upon analysis, Z-Energy, Air New Zealand and Contact Energy Limited reported on 3 out of the 5 relevant indicators under the social pillar indicating moderate ratings. Fonterra reported on all 5 relevant indicators indicating an excellent rating. Sanford and Mercury New Zealand reported on 2 and 4 out of the 5 relevant indicators indicating poor and good ratings respectively.

- **Governance**

Upon analysis, Z-Energy, Fonterra and Air New Zealand reported on 3 out of the 4 relevant indicators under the governance pillar indicating good ratings. Contact Energy Limited reported on all 4 relevant indicators indicating an excellent rating. Sanford and Mercury New Zealand reported on 2 and 1 out of the 4 relevant indicators indicating moderate and poor ratings respectively.

Table 5.4 shows the results of the Thomson Reuters method applied to Z-Energy, Fonterra, Air New Zealand, Sanford Limited, Contact Energy and Mercury NZ Limited in 2020.

Case studies	ESG Score	Thomson Reuters Grade	Personal Judgement rating
Z-Energy	0.28818	C-	Moderate
Fonterra	0.40248	C	Moderate
Air New Zealand	0.24451	D+	Poor
Sanford	0.24556	D+	Poor
Contact Energy	0.2132	D+	Poor
Mercury New Zealand	0.40524	C	Moderate

Table 5.4: Thomson Reuters Asset 4 Data summary for the six companies. Refer to Appendix Refer to Chapter 2 and Appendix G for the Thomson Reuters categories and their definitions in more detail. Refer to Appendix H for the full list of parameters used for the data extraction and analysis using Thomson Reuters Asset4 Methodology.

Table 5.5 shows the results of the FTSE method applied to Z-Energy, Fonterra, Air New Zealand, Sanford Limited, Contact Energy and Mercury NZ Limited in 2020 showing an overall personal judgment rating using the personal judgment scoring scale and rating in Table 4.5.

Case studies	Average no. of relevant FTSE indicators reported	Overall personal judgment rating
Z-Energy	3/5	Moderate
Fonterra	4/5	Good
Air New Zealand	3/5	Moderate
Sanford	3/5	Moderate
Contact Energy	4/5	Good
Mercury New Zealand	3/5	Moderate

Table 5.5: FTSE4Good Data summary for the six companies. Refer to Appendix P for the parameters used for data extraction using the FTSE method. Refer to Appendix Q for the numeric values and conversion to a personal judgment rating.

Table 5.6 provides a summary of the rating for each company using the Thomson Reuters and FTSE methods.

Case studies	Thomson Reuters Overall Rating	FTSE Overall Rating
Z-Energy	Moderate	Moderate
Fonterra	Moderate	Good
Air New Zealand	Poor	Moderate
Sanford	Poor	Moderate
Contact Energy	Poor	Good
Mercury New Zealand	Moderate	Moderate

Table 5.6: Overall TR Asset4 and FTSE4Good ratings for the six companies. Refer to Appendices I-M for the ESG scores and grades for the six companies using the Thomson Reuters Asset4 ESG Rating Method.

5.3. Discussion

5.3.1. GRI and Carbon Footprinting

The GRI and carbon footprinting methods show similarities in the carbon emissions data for Z-Energy and Fonterra as these are specific values extracted from the company's sustainability reports. The two methods also cover reporting for scope 1, 2 and 3 emissions data. The two companies use GRI standards and CDP disclosures respectively which have been aligned in recent years (CDP, 2017). The carbon footprinting method and the GRI also cover carbon intensity in similar ways. However, a major difference is that the carbon footprinting method covers additional information that might be beneficial to investors in decision making such as total capitalisation and the companies actual carbon footprint. This indicates that stakeholders relying on the GRI, or CDP alone might not be accessing enough information on the risk factors involved in an investment in making an informed decision. Investors might be missing out on relevant information such as how well capitalised the business they are investing in is, and other risk factors such as the business' actual carbon footprint. The carbon footprint is especially important for stakeholders who might be particularly interested in the Greenhouse gas emissions associated with investment portfolios that they intend to invest in.

These results align with a similar study by Chatterji et al., (2016) where different ESG scores were compared and found low convergence in these raters' assessments of corporate social responsibility. An assessment of performance using GRI standards alone for

Fonterra and Z-Energy might show an excellent performance due to reporting on all required indicators by the standard however using SciBeta's CF report for Z-Energy and Fonterra shows a moderate and good performance respectively. This is due to no reporting on carbon footprint and total capitalisation by Z-Energy and no reporting on carbon footprint by Fonterra. These results also align with Christiansen & Ducoulombier's (2020) observations about ESG scores contributing to greenwashing and that the divergence of ESG Scores across providers questions their reliability. With GRI assessing Z-Energy and Fonterra as having performed excellently based on GRI standards without considering the company's carbon footprint, investors might be misled into believing that both organisations are environmentally friendly or sustainable to an excellent degree as compared to SciBeta's carbon footprinting assessment to a moderate and good degree respectively.

Thomson Reuters and FTSE

Z-Energy

Overall, Z-Energy had a moderate rating when the Thomson Reuters and FTSE ESG rating methods were applied to the company's integrated report.

Fonterra

Overall, Fonterra had a moderate rating when the Thomson Reuters method was applied to its sustainability and annual reports but had a good rating when the FTSE ESG rating methods were applied. This difference arises because of the differences in metrics covered by both methods as the FTSE rating was based on the number of indicators reported by the company.

Air New Zealand

Overall, Air New Zealand had a poor rating using the Thomson Reuters method but had a moderate rating using the FTSE ESG rating methods. This difference arises because of the differences in metrics covered by both methods as the FTSE rating was based on the number of indicators reported by the company.

Sanford

Overall, Sanford Limited had a poor rating using the Thomson Reuters method but had a moderate rating using the FTSE ESG rating methods. This difference arises because of the differences in metrics covered by both methods as the FTSE rating was based on the number of indicators reported by the company.

Contact Energy

Overall, Contact Energy had a poor rating using the Thomson Reuters method but had a good rating using the FTSE ESG rating methods. This difference arises because of the differences in metrics covered by both methods as the FTSE rating was based on the number of indicators reported by the company.

Mercury New Zealand

Overall, Mercury NZ Ltd. had a moderate rating when the Thomson Reuters and FTSE ESG rating methods were applied to the company's integrated report. This suggests that investors or stakeholders using either of these ratings in making an investment decision might make similar decisions based on the similar outcomes (ratings).

Out of the six case studies used, only two (Z-Energy and Mercury NZ Ltd) had similar ratings when both the Thomson Reuters and FTSE ESG ratings methods were applied to their integrated, annual and sustainability reports. The other four case studies show varied ratings between the two ESG rating methods with a widely varied rating such as a poor versus good rating observed in Contact Energy Limited for Thomson Reuters and FTSE methods respectively. Thus, for four out of six companies relying on one of the ratings only could lead to sub optimal decision making depending on which (if any) of the rankings is most accurate. These results further buttress the lack of consistency in environmental performance and unreliability of ESG data indicating competing methods for the reporting of business ESG performance. This is also highlighted by Christiansen & Ducoulombier (2020) who argued that environmental performance and unreliability were the limitations of individual ESG scores. The authors noted that for some of the scoring providers analysed they worryingly, found that good environmental scores positively correlated with high emissions. They also underlined that the scores "can be difficult to interpret due to the multitude of diverse metrics on environmental factors".

In this study, Fonterra with the highest total emission score of 0.023564 Gt had an excellent environmental rating (refer to table 5.2) using the FTSE method despite having the highest total emissions of the six companies analysed. Sanford Limited on the other hand with the least total emissions score of 0.00027636 Gt had a good environmental rating using the same method. The Thomson Reuters method however rated both companies as poor under the environmental pillar. The differences in metrics used also play a significant role in the low convergence of data and further highlights the challenges involved in reporting on and rating the ESG performance of business organisations. For instance, Air New Zealand did not consider scope 3 emissions in its reporting compared to the other five companies which covered scope 1, 2 and 3 emissions. BlackRock (2020) identified poor quality or availability of ESG data and analytics as the biggest barrier to deeper or broader implementation of sustainable investing, higher than any other barrier that was tested (BlackRock, 2020). There is therefore the imminent need for standardisation of these metrics as well as the reporting framework as a whole to improve data quality.

5.4. Summary

This chapter provides a summary of the results of the study by:

- i. Comparing the performance of Z-Energy and Fonterra using the GRI standards and SciBeta's carbon footprinting ESG reporting methods, as well as the similarities and differences between the GRI standards and SciBeta's carbon footprinting ESG reporting methods. This helps to achieve some of the study's objective of explaining what differences and/or similarities exist among a sample of the most widely used ESG reporting systems, considering the implications of there being competing methods for the reporting of business ESG performance and applying different reporting systems to two New Zealand companies to determine how consistent the reporting systems are. Using GRI standards only, Z-Energy and Fonterra are rated as excellent considering the number of indicators assessed while Z-Energy and Fonterra are rated moderate and good respectively using SciBeta's carbon footprinting method. The two methods also show similarities in reporting metrics such as total emissions and carbon intensity however the carbon footprinting method provides additional metrics such as carbon footprint and total

- capitalisation which can be considered relevant to investors in making financial decisions. Investors using the GRI standard might be making decisions without considering all risk factors involved in the business.
- ii. Highlighting the limitations and problems involved in reporting on and rating the ESG performance of business organisations which achieves the study's objective of identifying the challenges involved in reporting on and rating the ESG performance of business organisations. Limitations of ESG data such as environmental performance due to inconsistencies in or a lack of standardisation of environmental reporting metrics as well as the use of different methods in the measurement of GHG emissions are some of the challenges involved in reporting on and rating of ESG performance of business. There is also the challenge of the data being unreliable due to poor data quality and inconsistencies such as different ESG ratings providers providing different ratings to the same organisation as highlighted in this study.
 - iii. Highlighting how two ESG raters: Thomson Reuters and FTSE rated six New Zealand companies which achieves the study's objective of applying different rating systems to six New Zealand companies with big environmental impacts to determine how consistent the rating systems are. Out of the six case studies used, only two (Z-Energy and Mercury NZ Ltd) had similar ratings when both the Thomson Reuters and FTSE ESG ratings methods were applied to their integrated, annual and sustainability reports. The other four case studies show varied ratings between the two ESG rating methods with a widely varied rating such as a poor versus good rating observed in Contact Energy Limited for Thomson Reuters and FTSE methods respectively. These results further buttress the lack of consistency in environmental performance and unreliability of ESG data and indicates competing methods for the reporting of business ESG performance. There is therefore the imminent need for standardisation of these metrics as well as the reporting framework as a whole to improve data quality.

Chapter 6. Recommendations and Conclusion

This study highlighted the challenges that are often associated with ESG data or scoring and how this leads to unreliability of ESG data due to poor data quality and its assessment of environmental performance. Two ESG reporting methods: GRI standards and SciBeta's Carbon footprinting were used to analyse two New Zealand companies: Z-Energy and Fonterra. Two ESG rating systems: Thomson Reuters Asset4 and FTSE4Good were also used to analyse six New Zealand companies: Z-Energy, Fonterra, Air New Zealand, Sanford, Contact Energy and Mercury New Zealand. The six companies were selected based on their high environmental impacts as large emitters of greenhouse gases.

6.1. Purpose of the research

The aim of this study was to undertake a review of three ESG reporting and six ESG rating systems. Specifically, the study's objectives were to:

1. Identify the challenges involved in reporting on and rating the ESG performance of business organisations.
2. Explain what differences and/or similarities exist among a sample of the most widely used ESG reporting systems.
3. Consider the implications of there being competing methods for the reporting of business ESG performance.
4. Apply different reporting systems to two New Zealand companies and different rating systems to six New Zealand companies with big environmental impacts to determine how consistent the reporting and rating systems are.

Chapter 2 covered socio-political and economics-based theories of voluntary environmental reporting as well as insights into why organisations volunteer information. Chapter 2 highlighted the role of the different agencies in ESG reporting and rating as well as how they work together to improve ESG data. An industry analysis of the evolution of the reporting and rating industry was also discussed which provided a historical perspective

on the development and impact of the reporting and rating agencies. A PESTLE analysis highlighted how businesses have come under increased pressure to report their contributions to climate change with insights into the relevant agencies such as NGOs and international organisations that exert pressure on businesses to provide climate change disclosures.

Chapter 3 highlighted how pressures from stakeholders on environmental issues and the need for companies to portray their good reputation and image have largely driven why companies report (Tarmuji et al., 2016). The chapter also covered existing literature on what companies report using the environmental, social and governance criteria, what rating agencies rate using publicly available information or questionnaires to businesses to obtain the relevant information as well as the limitations of ESG data and the need for standardisation of ESG data.

The research methodology used was examined in Chapter 4 with the key aspects being:

- i. The GRI standards (GRI 305: Emissions) and Sci Beta's Carbon Footprinting (CF) ESG reporting methods to analyse two New Zealand companies: Z-Energy and Fonterra. This also allowed to compare the two reporting methods and highlight their differences and similarities.
- ii. The Thomson Reuters Asset4 and FTSE4Good ESG rating systems to analyse six New Zealand companies: Z-Energy, Fonterra, Air New Zealand, Sanford, Contact Energy and Mercury New Zealand. The six companies were selected based on their high environmental impacts as large emitters of greenhouse gases.

Chapter 5 provided the key results highlighting how different ESG reporting systems can indicate different performances for the same organisation based on the differences in metrics used and how this can impact on investor confidence due to the low convergence in the data. While three ESG reporting methods (GRI, CDP and CF) were discussed in the study, only two were compared due to the alignment in reporting GRI and CDP. Comparing the GRI standards and Carbon footprinting methods also show that both methods captured essentially similar information on carbon emissions and intensity however, the CF method

covered additional information such as total capitalisation and carbon footprint which the GRI standard does not cover. This might suggest that investors using the GRI standards alone might not be having all relevant information at their disposal in making an investment decision about any of the two companies. The performance of both companies using GRI standards alone might be considered as overstated compared to the CF reporting requirement. The results achieved the study's first three objectives earlier highlighted.

The results using the Thomson Reuters Asset4 ESG rating method on the six companies showed a range of ratings from poor to moderate while using the FTSE4Good method showed a range of ratings from moderate to good. While there were some similarities in the ratings such as the moderate ratings for Z-Energy and Mercury NZ Limited by both the Thomson Reuters Asset4 and FTSE4Good methods, four out the six companies showed a divergence in rating accounting for almost 70% of the data. This is considered mostly due to the differences in metrics or indicators used by the different ESG rating systems. Again, this highlighted how different ESG rating systems can indicate different ratings for the same organisation and how this can impact on investor confidence and their inability to rely on this data for investment decisions due to their low convergence.

Overall, the results showed the need to standardize ESG data to improve the reliance of stakeholders on these data. It can be concluded based on these results that organisations need to consider a range of ESG reporting methods when reporting ESG data to ensure the information captured is truly representative of their contributions to climate change. This is also important for transparency and accountability to stakeholders. Regulators also need to standardise ESG reporting as well as the measurement techniques for GHG emissions to allow more reliance on ESG data. Rating agencies also need to develop comparable ratings that can be applied to the same organisations to allow investors make better informed investment decisions.

6.2. Relationship to previous research

Several studies have highlighted the limitations of ESG scores or data particularly ESG scores of individual organisations and identified issues such as reliability and environmental performance (Chatterji et al., 2016; Christiansen, & Duoulombier, 2020;

SciBeta Publication, 2019). For instance, Chatterji et al. (2016), assessed the agreement of six prominent ESG ratings (MSCI KLD and Innovest, Thomson Reuters Asset4, FTSE4Good, DJSI, and Calvert) and found low convergence in these raters' assessments of corporate social responsibility. The authors concluded that these metrics cannot guide issuers and that investment on the basis of these invalid metrics will fail to direct capital toward the most responsible firms. From the environmental dimension, Christiansen & Ducoulombier (2020), stated that ESG scores may be viewed as contributing to greenwashing. They further stated that averaging allows certain issuers to achieve strong scores despite association with material ESG concerns which leads to some questioning the very relevance of ESG scores.

This study contributes to the body of knowledge on ESG reporting and rating by highlighting some of the limitations that exist in the current ESG reporting and rating systems and the similarities and differences that exist among these systems. This will help to further drive the conversation about developing a standardised reporting framework that is comparable and easy for stakeholders to analyse. This will also allow investors to consider how much they rely on these data for investment decisions. By providing ESG reporting and ratings, stakeholders are informed about the contribution of organisations to climate change and can call for more ethical and green products that helps to achieve sustainability development goals which in turn drives shareholder value. This study benefits organisations by further driving the conversation on the need for standardised reporting and highlights the need for organisations to make informed decisions when choosing reporting methods by making available limitations on some commonly used reporting systems. This will further foster transparency and accountability on the part of the organisations. This study also highlighted the need for rating agencies to develop comparable ratings that can be applied to the same organisations to allow investors make better informed investment decisions.

6.3. Limitations of the present study

A major limitation to the study is the proprietary nature of ESG rating methods. Most rating agencies use computerised models or algorithms which are not publicly available to rate

publicly available information about companies or information sourced from companies. This study applied the ESG ratings in a limited capacity by analysing indicators and potential themes from Thomson Reuters Asset4 and FTSE4Good ESG ratings methodology. While the Thomson Reuters methodology could be applied for analysis to a large extent, the FTSE method could not be applied in the same way as the methodology and specific dynamics used by the rating agency to do this was not publicly available. Other commonly used ESG rating methods such as MSCI KLD, Innovest, DJSI, and Calvert were also lacking in publicly available information on their methodologies and how these could be applied. This presents a limitation in replicating ESG rating methods for analysis.

Delimitations to the study include the number of companies used for analysis, the number of reporting and rating methods used for analysis as well the objectives of the study. These were set to ensure the aim and objectives do not become impossibly large to complete within the timeframe for the study. The companies were selected based on their high environmental impacts as large emitters of greenhouse gases (GHG) while the number of companies selected were based on the practicality of how many companies could be covered within the timeframe of the 17 weeks of the study.

6.4. Recommendations for future research and practice

It is recommended that businesses ensure that in choosing their ESG reporting methods, they consider the limitations and inadequacies of these methods and choose the method or combination of methods that allow them to provide more detailed information to stakeholders for increased transparency, reliability and accountability of reporting. Regulators also need to develop standardised ESG reporting and rating frameworks that are comparable and easy for stakeholders to analyse. ESG raters need to consider making their rating methodologies more publicly available including a step-by-step approach of how these methodologies are applied to analyse companies to allow contribution on how these methodologies can be further improved. These will further drive standardization of ESG data within the industry and greatly benefit the investment management industry. This will equally empower stakeholders to call for more ethical and green products to achieve the sustainability development goals and increase shareholder value.

It is also recommended that investors consider how much they rely on ESG data for investment decisions. Investors should consider how multiple rating agencies rate an organisation for comparison rather than relying on one ESG rating for investment decisions. Finally, it is recommended that future research consider analysing more companies (ten or more) within the same industry to determine whether this impacts on the performance and ratings of the companies.

6.5. Conclusion

The big demand for information about businesses' environmental performance, especially with respect to climate change is reflected in the growth of investment in ethical/green funds. Despite the evolution of the reporting and ratings industry which has resulted in the emergence of different reporting and rating methods, the lack of standardisation of ESG data makes this largely unreliable and of poor quality in its use as a determinant of environmental performance.

By analysing two New Zealand companies using two ESG reporting methods and six New Zealand companies using two ESG rating systems, this study highlighted the challenges of ESG data such as the low convergence among ESG rating methods. There is also the challenge of the proprietary nature of ESG rating methodologies which do not allow a replication of ESG rating methodologies for analysis. The results indicated that different reporting methods provide different assessments of the environmental performance of the same organisation. Different rating systems on the other hand, also provide almost a 70% divergence in their assessment of the same company. The study highlighted the differences and similarities in ESG reporting methods particularly as it relates to the indicators that are reported. It also highlighted the need for reporting and rating agencies to develop standardised and comparable systems that are easy to analyse, and which allow investors to make informed investment decisions about an organisation.

References

- Air New Zealand. (2020a). *2020 Greenhouse Gas Inventory Report*. <https://p-airnz.com/cms/assets/PDFs/air-nz-ghg-inventory-report-2020.pdf>
- Air New Zealand. (2020b). *Annual Financial Results*. <https://p-airnz.com/cms/assets/PDFs/air-nz-2020-financial-results.pdf>
- Air New Zealand. (2020c). *Sustainability report*. <https://p-airnz.com/cms/assets/PDFs/air-new-zealand-sustainability-report-2020.pdf>
- Anderies, J. M., Folke, C., Walker, B., & Ostrom, E. (2013). Aligning key concepts for global change policy: robustness, resilience, and sustainability. *Ecology and Society*, 18(2).
- Avetisyan, Emma; Hockerts, K. (2017). *The Consolidation of the ESG Rating Industry as an Enactment of Institutional Retrogression. Business Strategy and the Environment*, 26(13), 316-330. DOI: 10.1002/bse.1919. https://research-api.cbs.dk/ws/portalfiles/portal/57337075/kai_hockerts_et_al_the_consolidation_of_the_ESG_acceptedversion.pdf
- BlackRock. (2020). *2020 Global Sustainable Investing Survey*. <https://www.blackrock.com/corporate/about-us/blackrock-sustainability-survey>
- Capital.com. (n.d.). *What is capitalisation*. capital.com/capitalisation-definition
- Carbon Disclosure Project. (2017). *Linking GRI and CDP*. <https://www.globalreporting.org/media/zrtnajcx/gri-standards-and-cdp-2017-climate-change-linkage-document.pdf>
- Carbon Disclosure Project. (2019). *Group of 88 investors target over 700 companies for not reporting environmental information*. <https://www.cdp.net/en/articles/media/group-of-88-investors-target-over-700-companies-for-not-reporting-environmental-information>
- Chatterji, A. K., Durand, R., Levine, D. I., & Touboul, S. (2016). Do ratings of firms converge? Implications for managers, investors and strategy researchers. *Strategic*

Management Journal, 37(8), 1597–1614.

Christiansen, E. & Ducoulombier, F. (2020). *Scoring Against ESG? Avoiding the Pitfalls of ESG Scores in Portfolio Construction. A Scientific Beta Publication.*

https://newsletter.bvi.de/fileadmin/user_upload/letter/2021/01/scoring-against-esg-avoiding-pitfalls-esg-scores.pdf

Christofi, A., Christofi, P., & Sisaye, S. (2012). Corporate sustainability: historical development and reporting practices. *Management Research Review*.

Contact Energy Limited. (n.d.). *Contact Energy: About us*. <https://contact.co.nz/aboutus>

Contact Energy Limited. (2020). *Contact Integrated Report*.

[file:///C:/Users/User/Downloads/2020 Contact Integrated Report.pdf](file:///C:/Users/User/Downloads/2020%20Contact%20Integrated%20Report.pdf)

Coppola, M., Krick, T., & Blohmke, J. (2019). Feeling the heat. *Companies Are under Pressure to Act on Climate Change and Need to Do More. The Deloitte Sustainability Services*.

Crotty, M. (1998). *The Research Process: In The Foundations of Social Research*. London: Sage Publications.

Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures--a theoretical foundation. *Accounting, Auditing & Accountability Journal*.

Deegan, C. (2009). financial accounting theory McGraw Hill. *North Ryde, NSW, Australia*.

DJSI. (2020). *Maximising your performance in 2020*. <https://corporate-citizenship.com/wp-content/uploads/Corporate-Citizenship-DJSI-2020.pdf>

EDHEC Business School. (2021a). *EDHEC-SCIENTIFIC BETA RESEARCH CHAIR ON ADVANCED ESG AND CLIMATE INVESTING*. <https://www.edhec.edu/en/edhec-scientific-beta-research-chair-advanced-esg-and-climate-investing>

EDHEC Business School. (2021b). *Webinar: The Climate deserves better than 12%*. <https://on24static.akamaized.net/event/33/19/36/5/rt/1/documents/resourceList1631880071651/slidesedhecgreenwashingwebinar1632140566543.pdf>

- Ekberg, K. (2017). *Overview of the set of GRI Standards. Leadership and Sustainability*.
<https://www.leadership-sustainability.com/2017/11/01/time-set-up-sustainability-reporting/figure-1-overview-of-the-set-of-gri-standards/>
- ESG FTSE Publications. (n.d.). *Integrating ESG into investments and stewardship*.
<https://research.ftserussell.com/products/downloads/FTSE-ESG-Methodology-and-Usage-Summary-Full.pdf>
- Flammer, C., Toffel, M. W., & Viswanathan, K. (2019). Shareholder activism and firms' voluntary disclosure of climate change risks. *Strategic Management Journal*.
- Fonterra. (2020). *Sustainability Report 2020*.
<https://www.fonterra.com/content/dam/fonterra-public-website/fonterra-new-zealand/documents/pdf/sustainability/2020/fonterra-sustainability-report-2020.pdf>
- Fonterra Co-operative Group Limited. (2020). *Environmental Data Reporting Notes - Sustainability Report 2020*. <https://www.fonterra.com/content/dam/fonterra-public-website/fonterra-new-zealand/documents/pdf/sustainability/2020/2020-environmental-data-reporting-notes.pdf>
- Freeman, R. E. (2001). A stakeholder theory of the modern corporation. *Perspectives in Business Ethics* 3, 144.
- Freeman, R. E. (2010). *Strategic management: A stakeholder approach*. Cambridge university press.
- FTSE Russell. (n.d.). *ESG ratings*. <https://www.ftserussell.com/data/sustainability-and-esg-data/esg-ratings>
- Global Reporting Initiative. (n.d.). *Our why, how and what?*
<https://www.globalreporting.org/about-gri/mission-history/>
- Global Reporting Initiative. (2012). *Global reporting initiative*.
- Global Reporting Initiative. (2020). *The global standards for sustainability reporting*.
<https://www.globalreporting.org/standards/>
- Hahn, R., Reimsbach, D., & Schiemann, F. (2015). Organizations, climate change, and transparency: Reviewing the literature on carbon disclosure. *Organization* \&

Environment, 28(1), 80–102.

Harvard Business School. (2016). *Sustainability and Shareholder Value*.

<https://static1.squarespace.com/static/5143211de4b038607dd318cb/t/57d2b9f38419c276f91c6c19/1473427957635/JACF-ESG-Integration-Myths-and-Realities.pdf>

Harvard Law School Forum on Corporate Governance. (2017). *ESG reports and ratings: What they are, why they matter*. <https://corpgov.law.harvard.edu/2017/07/27/esg-reports-and-ratings-what-they-are-why-they-matter/>

Herold, D. M., & others. (2018). Demystifying the link between institutional theory and stakeholder theory in sustainability reporting. *Economics, Management and Sustainability*, 3(2), 6–19.

Hidru, M. K., Parsons, G. R., Kempton, W., & Gardner, M. P. (2011). Willingness to pay for electric vehicles and their attributes. *Resource and Energy Economics*, 33(3), 686–705.

Houghton, J. (2005). Global warming. *Reports on Progress in Physics*, 68(6), 1343.

IBISWorld. (2019). *Sanford Limited Premium Company Reports Australia*.

<https://www.ibisworld.com/au/company/sanford-limited/10201/#:~:text=Sanford Limited is a fishing,China and the Pacific Islands>.

IIRC. (2021). *INTERNATIONAL <IR> FRAMEWORK*.

<https://integratedreporting.org/wp-content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf>

Johnston, M. P. (2017). Secondary data analysis: A method of which the time has come. *Qualitative and Quantitative Methods in Libraries*, 3(3), 619–626.

KPMG. (2008). KPMG International survey of corporate responsibility reporting 2008. *Amsterdam, The Netherlands: KPMG*.

KPMG. (2011). *Corporate Sustainability a Progress Report*.

https://www.sustainabilityexchange.ac.uk/kpmg_corporate_sustainability_a_progress_report

KPMG International. (2014). *Taxes and incentives for renewable energy*.

<https://assets.kpmg/content/dam/kpmg/pdf/2014/09/taxes-incentives-renewable-energy-v1.pdf>

- Laing, T., Sato, M., Grubb, M., Comberti, C., & others. (2013). *Assessing the effectiveness of the EU Emissions Trading System* (Vol. 126). Grantham Research Institute on Climate Change and the Environment London, UK.
- Lee, K.-H., Herold, D. M., & Yu, A.-L. (2016). Small and medium enterprises and corporate social responsibility practice: A Swedish perspective. *Corporate Social Responsibility and Environmental Management*, 23(2), 88–99.
- Lineman, M., Do, Y., Kim, J. Y., & Joo, G.-J. (2015). Talking about climate change and global warming. *PloS One*, 10(9), e0138996.
- Marimon, F., del Mar Alonso-Almeida, M., del Pilar Rodr  guez, M., & Alejandro, K. A. C. (2012). The worldwide diffusion of the global reporting initiative: what is the point? *Journal of Cleaner Production*, 33, 132–144.
[http://repositori.uic.es/bitstream/handle/20.500.12328/1144/Marimon Viadiu%2C Frederic et al._The worldwide diffusion_2012.pdf?sequence=1&isAllowed=y](http://repositori.uic.es/bitstream/handle/20.500.12328/1144/Marimon_Viadiu%2C_Frederic_et_al._The_worldwide_diffusion_2012.pdf?sequence=1&isAllowed=y)
- Matisoff, D. C., Noonan, D. S., & O'Brien, J. J. (2013). Convergence in environmental reporting: assessing the Carbon Disclosure Project. *Business Strategy and the Environment*, 22(5), 285–305.
- Matsumo, H., Manabe, K., & Morikuni, T. (2020). *Companies slashing carbon emissions see 15% rise in market cap*.
<https://asia.nikkei.com/Spotlight/Datawatch/Companies-slashing-carbon-emissions-see-15-rise-in-market-cap>
- McGuigan, C., Reynolds, R., & Wiedmer, D. (2002). Poverty and climate change: Assessing impacts in developing countries and the initiatives of the international community. *London School of Economics Consultancy Project for the Overseas Development Institute*, 1–40.
- Mercury NZ Limited. (2020). *Annual Report*.
https://www.mercury.co.nz/documents/j001075_mercury_ar2020_digital_pp8_v3_download.aspx

- Owler. (2020). *Air New Zealand*. <https://www.owler.com/company/airnewzealand>
- Perry, M. (2015). *Environmental Policy for Business: A Manager's Guide to Smart Regulation*. Business Expert Press.
- Rupley, K. H., Brown, D., & Marshall, S. (2017). Evolution of corporate reporting: From stand-alone corporate social responsibility reporting to integrated reporting. *Research in Accounting Regulation*, 29(2), 172–176.
- Sachdeva, S., Jordan, J., & Mazar, N. (2015). Green consumerism: moral motivations to a sustainable future. *Current Opinion in Psychology*, 6, 60–65.
- Salicath Aasen, J., Eichhardt, E., & Steen, O. (2020). *A study on dynamics of green financing: A qualitative analysis of supply and demand on green products and future opportunities*.
- Sanford Limited. (2020). *Integrated Report*. file:///C:/Users/User/Downloads/SAN111-AR2020-final-for-web.pdf
- Sarkis, J., Gonzalez-Torre, P., & Adenso-Diaz, B. (2010). Stakeholder pressure and the adoption of environmental practices: The mediating effect of training. *Journal of Operations Management*, 28(2), 163–176.
- Saunders, M., Lewis, P., & Thornhill, A. (2016). Research methods for business students (no. Book, Whole). Harlow: Pearson Education.
- Schaltegger, S., & Csutora, M. (2012). Carbon accounting for sustainability and management. Status quo and challenges. *Journal of Cleaner Production*, 36, 1–16.
- Scientific Beta. (n.d.). *ESG/Climate Indices*. <https://www.scientificbeta.com/#/>
- Scientific Beta Publication. (2019). *Scientific Beta Enhanced ESG Reporting – Supporting Incorporation of ESG Norms and Climate Change Issues in Investment Management*. https://www.esginvesting.co.uk/wp-content/uploads/2019/07/Scientific_Beta_Publication_Scientific_Beta_Enhanced_ESG_Reporting.pdf
- Solomon, J., & Maroun, W. (2012). *Integrated reporting: the influence of King III on social, ethical and environmental reporting*.

- Sparkes, R. (2001). Ethical investment: whose ethics, which investment? *Business Ethics: A European Review*, 10(3), 194–205.
- Sphera. (2021). *What Is ESG Reporting, and Why Is It Important?*
<https://sphera.com/glossary/what-is-esg-reporting-and-why-is-it-important/>
- Stewart, D. W., & Kamins, M. A. (1993). *Secondary research: Information sources and methods* (Vol. 4). Sage.
- Summerhays, K., & de Villiers, C. (2012). Oil company annual report disclosure responses to the 2010 Gulf of Mexico oil spill. *Journal of the Asia-Pacific Centre for Environmental Accountability*, 18(2), 103–130.
- Tarmuji, I., Maelah, R., & Tarmuji, N. H. (2016). The impact of environmental, social and governance practices (ESG) on economic performance: Evidence from ESG score. *International Journal of Trade, Economics and Finance*, 7(3), 67.
- Thomson Reuters. (2018). *Thomson Reuters ESG scores*.
<http://zeeroverly.nl/blogfiles/esg-scores-methodology.pdf>
- UNC. (2015). *The paris agreement*.
- UNFCCC. (n.d.). *The Paris Agreement*. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
- United Nations. (n.d.). *Sustainable Development Goals*. <https://sdgs.un.org/goals/goal13>
- United Nations. (2015). *United Nations Sustainable Development Summit 2015*.
<https://sustainabledevelopment.un.org/post2015/summit>
- Value Reporting Foundation. (2021). *International <IR> Framework*.
<https://integratedreporting.org/resource/international-ir-framework/>
- Wintergreen, J., & Delaney, T. (2007). ISO 14064, international standard for GHG emissions inventories and verification. *16th Annual International Emissions Inventory Conference, Raleigh, NC*.
- World Wide Fund for Nature. (2019). *Response to the Call for Feedback on the TEG interim report on EU Climate Benchmarks and benchmarks' ESG disclosures, July, available at: https://ec.europa.eu/eusurvey/publication/teg%02report-climate-*

benchmarks-and-disclosures

Z-Energy. (2020a). *ESG (Environment, Social and Governance)*.

<https://investors.z.co.nz/corporate/esg-environment-social-and-governance>

Z-Energy. (2020b). *What matters most. Annual Report*. <https://investors.z.co.nz/static-files/d736a457-bb7e-4575-aefd-4327116e527f/#page=15>

Appendix A: Brief overview of the six New Zealand companies

Case studies	Overview
Z-Energy	<p>Z-Energy describes itself as New Zealand's largest integrated transport fuel supplier, providing just under half of all New Zealand's fuels from jet fuel to marine fuel oil, to petrol and diesel, to bitumen for the roading industry (Z-Energy, 2020b). Their operations span crude oil and refined fuel procurement from international markets, contracted domestic refining, national distribution via pipeline, ship and truck, and commercial and retail marketing (Z-Energy, 2020a).</p> <p>Z-Energy has been reporting against the integrated reporting (IR) framework since 2017 (Z-Energy, 2020b). The company uses IR as their primary reporting framework while using the GRI Standards and the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) as supporting frameworks (Z-Energy, 2020b). Integrated reporting is a process founded on integrated thinking that results in a periodic integrated report by an organisation about value creation, preservation or erosion over time and related communications regarding aspects of value creation, preservation or erosion (IIRC, 2021). An integrated report provides concise communication about how an organisation's strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value in the short, medium and long term (Value Reporting Foundation, 2021).</p>
Fonterra	<p>Fonterra is a dairy company, which was formed in October 2001, and since then it has excelled and enlarged its milk processing and is at present the fourth largest dairy company in the world. (Fonterra Annual Report, 2010). Fonterra directly manages a small number of farms around the world: 29 in New Zealand to help the manufacturing sites manage excess nutrients, seven in China producing fresh milk, one training farm in Chile and one in Sri Lanka (Fonterra, 2020).</p> <p>Fonterra produces stand-alone sustainability reports since 2017 (FGCL, 2020). The company's GHG emissions reporting applies the principles of the Greenhouse Gas (GHG) Protocol and also reports its GHG emissions via the Carbon Disclosure Project (CDP), with its first submission completed in 2015 (FCGL, 2020). Fonterra's</p>

	greenhouse gas emissions (GHG) reporting focused on Scope 1, 2 where they have operational control and also main Scope 3 emissions.
Air New Zealand	Prior to the 2020 Covid-19 pandemic, Air New Zealand operated a global network, with a Pacific Rim focus, connecting passengers and providing cargo services to, from, and within New Zealand (Air New Zealand, 2020c). While the company reported passenger numbers to have dropped significantly since March 2020 due to Covid-19, it operated five repatriation flights to get returning Kiwis home to New Zealand's shores as well as 26 repatriation charter flights for stranded visitors in New Zealand. This included flying to ports they had never flown to before. They also reported carrying more than 35,000 tonnes of New Zealand exports in 2019, transporting high value products to international markets and supporting New Zealand businesses as well as facilitating urgent movements of medical and infrastructure supplies. Air New Zealand produced stand-alone sustainability report in addition to its financial report and GHG reports in 2020 (Air New Zealand, 2020b, 2020a).
Sanford Limited	Sanford Limited is a fishing company that harvests, farms, processes, and markets seafood products with operations in New Zealand and Australia (IBISWorld, 2019). The company exports seafood to Europe, North America, China, and the Pacific Islands. Sanford is NZ's second largest quota holder with 19.7% Quota ownership in 2020 based on New Zealand Annual Catch Entitlement (ACE) equivalent (Sanford Limited, 2020). Sanford reported 6 processing sites including joint operations in 2020 and 15 Deepwater & inshore vessels in the same year. The company also reported 444 independent sharefishers and 22 aquaculture vessels in the same year. Sanford Limited produced an integrated report for its 2020 reporting.
Contact Energy Limited	Contact Energy was created in 1996 and prides itself as one of New Zealand's largest listed companies with over 550,000 customers across electricity, natural gas, and LPG products (Contact Energy Limited, n.d.). Contact Energy offers electricity, natural gas and bottled LPG generated through their 11 hydro, geothermal and gas-fired power stations. The company produced its first integrated report in 2020 (Contact Energy Limited, 2020).
Mercury New Zealand Limited	Mercury NZ Limited describes itself as primarily a generator and retailer of electricity, focused on meeting the energy needs of New Zealanders (Mercury NZ Limited, 2020). Their retail operations serve residential, commercial (small and medium sized businesses), industrial and spot market customers. Sub-brands include GLOBUG, their

	pre-pay electricity product. Mercury produced an integrated report for its 2020 reporting.
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Appendix B: Parameters used for data extraction - GRI 305: Emissions Method (GRI, 2020)

GRI 305: Emissions Indicators	What they measure/cover
305-1	Disclosure 305-1 Direct (Scope 1) GHG emissions This disclosure covers all GHG emissions under scope 1. Scope 1 emissions are direct emissions from sources owned or controlled by the company (i.e., reporting company)
305-2	Disclosure 305-2 Energy indirect (Scope 2) GHG emissions This disclosure covers all GHG emissions under scope 2. Scope 2 emissions are indirect emissions from electricity, steam, heating/cooling purchased or consumed by the company.
305-3	Disclosure 305-3 Other indirect (Scope 3) GHG emissions This disclosure covers all GHG emissions under scope 3. Scope 3 emissions are other indirect emissions in the corporate value chain (i.e., multiple upstream and downstream sources not owned or controlled by the reporting company)
305-4	Disclosure 305-4 GHG emissions intensity An emission intensity or carbon intensity measures the emission rate of a given pollutant relative to the intensity of a specific activity, or an industrial production process.
305-5	Disclosure 305-5 Reduction of GHG emissions This disclosure covers GHG emissions reduced as a direct result of reduction initiatives, in metric tons of CO2 equivalent.

Appendix C: Greenhouse Gas (GHG) Emissions data for Z-Energy and Fonterra - GRI 305

GRI 305: Emissions indicators	Z-Energy (tCO ₂ -e/t)	Fonterra (tCO ₂ -e/t)
	2020	2020
305-1	4,127	1,696,000
305-2	3,371	628,000
305-3	12,117,090	21,240,000
305-4	2,474	Emissions intensity by revenue (Scope 1+2+3) (tCO₂/NZ\$)
		1,123,000,000
		Emissions intensity by finished goods (Scope 1+2+3) (tCO₂-e/t)
		6.0
305-4	1,734	Emissions intensity by revenue (Scope 1+2) (tCO₂/NZ\$)
		111,000,000
		Emissions intensity by finished goods (Scope 1+2) (tCO₂-e/t)
305-5	1,148,384	0.59

Data was retrieved from the 2020 integrated report for Z-Energy (Z-Energy, 2020b) and the 2020 sustainability report (environmental data) for Fonterra Co-operative Group Limited (FCGL, 2020).

Appendix D: Carbon Footprinting Report for Z-Energy and Fonterra

CF Indicators	Z-Energy (tCO ₂ -e/t)	Fonterra (tCO ₂ -e/t)
	2020	2020
Total Emissions (S1+2, Kt)	8,498	2,323,000
Total Emissions (S1+2+3, Kt)	12,125	23,564,000
Current Total Capitalisation (FF, M NZ\$)	-	6,158
*Carbon Footprint (S1+2, kt/M NZ\$)	-	-
Carbon Footprint (S1+2+3, kt/M NZ\$)	-	-
Carbon Intensity (S1+2, kt/M NZ\$)	1,734	111
Carbon Intensity (S1+2+3, t/M NZ\$)	2,474	1,123

Data was retrieved from the 2020 integrated report for Z-Energy (Z-Energy, 2020b) and 2020 sustainability report (environmental data) for Fonterra Co-operative Group Limited (FCGL, 2020)

*Z-Energy reported a carbon footprint of 12.1 million tonnes in its integrated report. However, this refers to the total emissions figure and not the carbon footprint using the CF formular in Appendix F.

Appendix E: Common carbon footprinting metrics and their relevance

<p><u>Total (Carbon) Emissions (TCE)</u></p> <p>Absolute greenhouse gas emissions associated with a portfolio, as allocated based on equity ownership, expressed in tons of CO₂e.</p>	<p>Useful to report absolute Carbon Footprint of portfolio. Does not control for portfolio size, making comparisons across time or portfolios difficult. TCE is mathematically expressed as:</p> $\sum_i^n \frac{\text{current market value of investment}_i}{\text{current market capitalisation}_i} \times \text{emissions}_i$
<p><u>Carbon Footprint (CF)</u></p> <p>Greenhouse gas emissions associated with a portfolio, as allocated based on equity ownership and normalised by the market value of the portfolio, expressed in tons of CO₂e per (USD) billion (or million) invested.</p>	<p>Useful for comparisons across portfolios or time. Affected by changes in market value of portfolio, e.g., changes in capitalisation of revenues. CF is mathematically expressed as:</p> $\frac{\sum_i^n \frac{\text{current market value of investment}_i}{\text{current market capitalisation}_i} \times \text{emissions}_i}{\text{current value of portfolio}}$
<p><u>Carbon Intensity (CI)</u> (also known as financed emissions/financed revenue)</p> <p>Greenhouse gas emissions associated with a portfolio, as allocated based on equity ownership and normalised by the revenues associated with the portfolio, expressed in tons of CO₂e per (USD) million of revenues.</p>	<p>Useful for comparisons across portfolios or time. Informs on carbon efficiency at the portfolio level. Affected by changes in revenues. CI is mathematically expressed as:</p> $\frac{\sum_i^n \frac{\text{current market value of investment}_i}{\text{current market capitalisation}_i} \times \text{emissions}_i}{\sum_i^n \frac{\text{current market value of investment}_i}{\text{current market capitalisation}_i} \times \text{revenues}_i}$

Appendix F: Relevance of the carbon footprinting metrics retrieved from SciBeta Publication (2019)

Appendix F: Thomson Reuters Asset4 categories and their definitions

Score	Definitions
TR ESG emissions reduction score	The emission reduction score measures a company's commitment and effectiveness towards reducing environmental emissions in its production and operational processes.
TR ESG innovation score	The innovation score reflects a company's capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.
TR ESG resource use score	The resource use score reflects a company's performance and capacity to reduce the use of materials, energy, or water, and to find more eco-efficient solutions by improving supply chain management.
TR ESG workforce score	The workforce score measures a company's effectiveness in terms of providing job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities and development opportunities for its workforce.
TR ESG human rights score	The human rights score measures a company's effectiveness in terms of respecting fundamental human rights conventions.
TR ESG community score	The community score measures the company's commitment to being a good citizen, protecting public health and respecting business ethics.
TR ESG product responsibility score	The product responsibility score reflects a company's capacity to produce quality goods and services, integrating the customer's health and safety, integrity, and data privacy.
TR ESG CSR strategy score	The CSR strategy score reflects a company's practices to communicate that it integrates economic (financial), social and environmental dimensions into its day-to-day decision-making processes
TR ESG management score	The management score measures a company's commitment and effectiveness towards following best practice corporate governance principles

TR ESG shareholders score	The shareholders score measures a company's effectiveness towards equal treatment of shareholders and the use of anti-takeover devices
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Thomson Reuters Categories and definition (Thomson Reuters, 2018)

Appendix G: Parameters used for Thomson Reuters data extraction and analysis

Pillar	Categories	Relevant Themes	Data Points//Indicators used for data extraction	Value type	Polarity based on data point selected
Environmental	Emission	Total Emission	Total Emissions	Numeric	Negative
		Waste	Total Waste	Numeric	Negative
	Innovation	Product Innovation	EnvProducts	Boolean	Positive
		Green Revenue/R&D/Capex	Capex	Numeric	Negative
	Resource Use	Water	Water Use	Numeric	Negative
		Energy	Energy Use	Numeric	Negative
Social	Workforce	Diversity & Inclusion	Women Employees	Numeric	Negative
		Career Development and Training	Average Training Hours	Boolean	Positive
		Working conditions	Trade Union Rep	Numeric	Positive
		Health and Safety	Lost Days	Boolean	Negative
	Human Rights	Human Rights	Policy Human Rights	Boolean	Positive
	Community	Community	Community	Boolean	Positive
	Product Responsibility	Responsible marketing	Policy Responsible	Boolean	Positive
		Product Quality	Product Quality Monitoring	Boolean	Positive
		Data Privacy	Policy Data Privacy	Boolean	Positive
Governance	CSR Strategy	CSR Strategy	CSR Strategy	Boolean	Positive
		ESG reporting and transparency	ESG reporting and	Boolean	Positive
	Management	Structure (Independence, diversity, committees)	Structure (Independence,	Boolean	Positive
		Compensation	Compensation	Boolean	Positive
	Shareholders	Shareholder rights	Shareholder rights	Boolean	Positive
		Takeover defences	Takeover defences	Boolean	Positive

Summary of the parameters used for the data extraction and analysis (Thomson Reuters, 2018)

Appendix H: Themes, score and grade for Z-Energy using the Thomson Reuters Method (Thomson Reuters, 2018)

Pillar	Categories	Category weights	Indicators	Actual/Boolean values Z-Energy (2020)	Percentile scores	Average Percentile scores	Overall ESG Score calculation
Environmental	Emission	0.10	Total Emissions	0.01212459 Gt	0.25	0.375	0.0375
			Total Waste	0.00000483 Gt	0.5		
	Innovation	0.10	EnvProducts	1	0.417	0.459	0.0459
			Capex	NZ\$102m	0.5		
	Resource Use	0.10	Water Use	0	-	-	-
			Energy Use	0	-		
							0.0834
Social	Workforce	0.19	Women Employees	191	0.1	0.2	0.038
			Average Training Hours	1	0.417		
			Trade Union Rep	0	-		
			Lost Days	1	0.083		
	Human Rights	0.05	Policy Human Rights	1	0.417	0.417	0.02085
	Community	0.05	Community	0.5	0.083	0.083	0.00415
	Product Responsibility	0.14	Policy Responsible Marketing	0.5	0.083	0.417	0.05838
			Product Quality Monitoring	1	0.75		
			Policy Data Privacy	1	0.417		
							0.12138
Governance	CSR Strategy	0.10	CSR Strategy	1	0.417	0.334	0.0334
			ESG reporting and transparency	1	0.25		
	Management	0.10	Structure (Independence, diversity, committees)	1	0.083	0.083	0.0083
			Compensation	1	0.083		
	Shareholders	0.10	Shareholder rights	1	0.417	0.417	0.0417
			Takeover defences	1	0.417		

							0.0834
						Total	0.28818
						Grade	C-

Data was retrieved from the 2020 integrated report for Z-Energy (Z-Energy, 2020b)

Appendix I: Themes, score and grade for Fonterra using Thomson Reuters Method (Thomson Reuters, 2018)

Pillar	Categories	Category weights	Indicators	Actual/Boolean values Fonterra (2020)	Percentile scores	Average Percentile scores	Overall ESG Score Calculation
Environmental	Emission	0.10	Total Emissions	0.023564 Gt	0.083	0.083	0.0083
			Total Waste	0	-		
	Innovation	0.10	EnvProducts	1	0.417	0.259	0.0259
			Capex	NZ\$419m	0.1		
	Resource Use	0.10	Water Use	0	-	0.5	0.05
			Energy Use	28.5PJ	0.5		
							0.0842
Social	Workforce	0.19	Women Employees	0	-	0.417	0.07923
			Average Training Hours	1	0.417		
			Trade Union Rep	12,572	0.75		
			Lost Days	1	0.083		
	Human Rights	0.05	Policy Human Rights	1	0.417	0.417	0.02085
	Community	0.05	Community	1	0.75	0.75	0.0375
	Product Responsibility	0.14	Policy Responsible Marketing	1	0.917	0.695	0.0973
			Product Quality Monitoring	1	0.75		
			Policy Data Privacy	1	0.417		
							0.15565
Governance	CSR Strategy	0.10	CSR Strategy	1	0.417	0.334	0.0334
			ESG reporting and transparency	1	0.25		
	Management	0.10	Structure (Independence, diversity, committees)	1	0.083	0.083	0.0083
			Compensation	1	0.083		
	Shareholders	0.10	Shareholder rights	1	0.417	0.417	0.0417
			Takeover defences	1	0.417		
							0.0834

						Total	0.40248
						Grade	C

Data was retrieved from the 2020 sustainability report (environmental data) for Fonterra Co-operative Group Limited (FCGL, 2020)

Appendix J: Themes, score and grade for Air NZ using Thomson Reuters Method (Thomson Reuters, 2018)

Pillar	Categories	Category weights	Indicators	Actual/Boolean values Air NZ (2020)	Percentile scores	Average Percentile scores	Overall ESG Score Calculation
Environmental	Emission	0.10	Total Emissions	0.00317947Gt	0.583	0.583	0.0583
			Total Waste	0	-		
	Innovation	0.10	EnvProducts	0.5	0.083	0.083	0.0083
			Capex	0	-		
	Resource Use	0.10	Water Use	0	-		-
			Energy Use	0	-		
							0.0666
Social	Workforce	0.19	Women Employees	2,497	0.9	0.355	0.06745
			Average Training Hours	0.5	0.083		
			Trade Union Rep	0	-		
			Lost Days	1	0.083		
	Human Rights	0.05	Policy Human Rights	1	0.417	0.417	0.02085
	Community	0.05	Community	0.5	0.083	0.083	0.00415
	Product Responsibility	0.14	Policy Responsible Marketing	0.5	0.083	0.194	0.02716
			Product Quality Monitoring	0.5	0.083		
			Policy Data Privacy	1	0.417		
							0.11961
Governance	CSR Strategy	0.10	CSR Strategy	0.5	0.083	0.083	0.0083
			ESG reporting and transparency	0.5	0.083		
	Management	0.10	Structure (Independence, diversity, committees)	1	0.083	0.083	0.0083
			Compensation	1	0.083		
	Shareholders	0.10	Shareholder rights	1	0.417	0.417	0.0417
			Takeover defences	1	0.417		
							0.0583

						Total	0.24451
						Grade	D+

Data was retrieved from 2020 Air New Zealand financial (Air New Zealand, 2020b), sustainability (Air New Zealand, 2020c) and GHG emissions reports (Air New Zealand, 2020a) and Owler, (2020)

Appendix K: Themes, score and grade for Sanford using Thomson Reuters Method (Thomson Reuters, 2018)

Pillar	Categories	Category weights	Indicators	Actual/Boolean values Sanford (2020)	Percentile scores	Average Percentile scores	Overall ESG Score Calculation
Environmental	Emission	0.10	Total Emissions	0.00027636 Gt	0.25	0.25	0.025
			Total Waste	0	-		
	Innovation	0.10	EnvProducts	1	0.417	0.659	0.0659
			Capex	NZ\$45m	0.9		
	Resource Use	0.10	Water Use	0	-	-	-
			Energy Use	0	-		
							0.0909
Social	Workforce	0.19	Women Employees	458	0.7	0.446	0.08474
			Average Training Hours	1	0.417		
			Trade Union Rep	277	0.25		
			Lost Days	1	0.417		
	Human Rights	0.05	Policy Human Rights	0.5	0.083	0.083	0.00415
	Community	0.05	Community	0.5	0.083	0.083	0.00415
	Product Responsibility	0.14	Policy Responsible Marketing	0.5	0.083	0.083	0.01162
			Product Quality Monitoring	0.5	0.083		
			Policy Data Privacy	0.5	0.083		
							0.10466
Governance	CSR Strategy	0.10	CSR Strategy	1	0.417	0.334	0.0334
			ESG reporting and transparency	1	0.25		
	Management	0.10	Structure (Independence, diversity, committees)	1	0.083	0.083	0.0083
			Compensation	1	0.083		
	Shareholders	0.10	Shareholder rights	0.5	0.083	0.083	0.0083
			Takeover defences	0.5	0.083		

							0.05
						Total	0.24556
						Grade	D+

Data was retrieved from 2020 Sanford Limited's Integrated report (Sanford Limited, 2020).

Appendix L: Themes, score and grade for Contact Energy using Thomson Reuters Method (Thomson Reuters, 2018)

Pillar	Categories	Category weights	Indicators	Actual/Boolean values Contact Energy (2020)	Percentile scores	Average Percentile scores	Overall ESG Score Calculation
Environmental	Emission	0.10	Total Emissions	0.00123932 Gt	0.417	0.417	0.0417
			Total Waste	0	-		
	Innovation	0.10	EnvProducts	0.5	0.083	0.344	0.0344
			Capex	NZ\$51m	0.7		
	Resource Use	0.10	Water Use	132,134ML	0.25	0.25	0.025
			Energy Use	0	-		
							0.1011
Social	Workforce	0.19	Women Employees	439	0.5	0.222	0.04218
			Average Training Hours	0.5	0.083		
			Trade Union Rep	0	-		
			Lost Days	1	0.083		
	Human Rights	0.05	Policy Human Rights	1	0.417	0.417	0.02085
	Community	0.05	Community	0.5	0.083	0.083	0.00415
	Product Responsibility	0.14	Policy Responsible Marketing	0.5	0.083	0.083	0.01162
			Product Quality Monitoring	0.5	0.083		
			Policy Data Privacy	0.5	0.083		
							0.0788
Governance	CSR Strategy	0.10	CSR Strategy	0.5	0.083	0.167	0.0167
			ESG reporting and transparency	1	0.25		
	Management	0.10	Structure (Independence, diversity, committees)	1	0.083	0.083	0.0083
			Compensation	1	0.083		
	Shareholders	0.10	Shareholder rights	0.5	0.083	0.083	0.0083
			Takeover defences	0.5	0.083		

							0.0333
						Total	0.2132
						Grade	D+

Data was retrieved from 2020 Contact Energy Limited's Integrated report (Contact Energy Limited, 2020)

Appendix M: Themes, score and grade for Mercury Limited using Thomson Reuters Method (Thomson Reuters, 2018)

Pillar	Categories	Category weights	Indicators	Actual/Boolean values Mercury NZ Ltd. (2020)	Percentile scores	Average Percentile scores	Overall ESG Score Calculation
Environmental	Emission	0.10	Total Emissions	0.00031Gt	0.917	0.917	0.0914
			Total Waste	0	-		
	Innovation	0.10	EnvProducts	1	0.417	0.359	0.0359
			Capex	NZ\$279m	0.3		
	Resource Use	0.10	Water Use	0.043426ML	0.75	0.75	0.075
			Energy Use	0	-		
							0.2023
Social	Workforce	0.19	Women Employees	309	0.3	0.267	0.05073
			Average Training Hours	1	0.417		
			Trade Union Rep	0	-		
			Lost Days	1	0.083		
	Human Rights	0.05	Policy Human Rights	0.5	0.083	0.083	0.00415
	Community	0.05	Community	1	0.75	0.75	0.0375
	Product Responsibility	0.14	Policy Responsible Marketing	0.5	0.083	0.194	0.02716
			Product Quality Monitoring	0.5	0.083		
			Policy Data Privacy	1	0.417		
							0.11954
Governance	CSR Strategy	0.10	CSR Strategy	1	0.417	0.334	0.0334
			ESG reporting and transparency	1	0.25		
	Management	0.10	Structure (Independence, diversity, committees)	1	0.083	0.083	0.0083
			Compensation	1	0.083		
	Shareholders	0.10	Shareholder rights	1	0.417	0.417	0.0417
			Takeover defences	1	0.417		

							0.0834
						Total	0.40524
						Grade	C

Data was retrieved from 2020 Annual Report Mercury NZ Limited (Mercury NZ Limited, 2020)

Appendix N: Thomson Reuters ESG scores and grade ratings across the three pillars

Pillars	Case studies	ESG Score	Grade	Personal judgment rating
Environmental	Z-Energy	0.0834	D	Poor
	Fonterra	0.0842	D	Poor
	Air New Zealand	0.0666	D-	Poor
	Sanford	0.0909	D	Poor
	Contact Energy	0.1011	D	Poor
	Mercury New Zealand	0.2023	D+	Poor
Social	Z-Energy	0.12138	D	Poor
	Fonterra	0.15565	D	Poor
	Air New Zealand	0.11961	D	Poor
	Sanford	0.10466	D	Poor
	Contact Energy	0.0788	D-	Poor
	Mercury New Zealand	0.11954	D	Poor
Governance	Z-Energy	0.0834	D	Poor
	Fonterra	0.0834	D	Poor
	Air New Zealand	0.0583	D-	Poor
	Sanford	0.05	D-	Poor
	Contact Energy	0.0333	D-	Poor
	Mercury New Zealand	0.0834	D	Poor

Appendix O: Parameters used for FTSE4Good data extraction and analysis

Pillar	Themes	Relevant indicators
Environmental	Climate Change	GHG emissions and energy reduction
	Water use	Total water usage
	Biodiversity	Policy commitment on biodiversity
	Pollutions & Resources	Recycled and non-recycled waste
	Environmental supply chain	Encourage suppliers to reduce and report
Social	Health & safety	Policy addresses health & safety and contractors
	Labour Standards	Policy addresses non-discrimination
	Human Rights & Community Indicators	Policy addresses data privacy
	Customer Responsibility	Responsible advertising and marketing
	Social Supply Chain	Capacity building in suppliers
Governance	Anti-Corruption	Policy addressing anti-corruption
	Tax Transparency	Policy commitment to tax transparency
	Risk Management	Whistle-blowing mechanism in place
	Corporate Governance	Percentage of women on the Board

Appendix P: FTSE4Good personal judgment ratings across the three pillars

Case studies	Pillars	Personal Judgment Rating	No. of relevant FTSE indicators reported	Overall Personal Judgment rating
Z-Energy	Environmental	Good	4/5	Moderate
	Social	Moderate	3/5	
	Governance	Good	3/4	
Average			3.33/4.67	
Adjusted av.			3/5	
Fonterra	Environmental	Excellent	5/5	Good
	Social	Excellent	5/5	
	Governance	Good	3/4	
Average			4.33/4.67	
Adjusted av.			4/5	
Air New Zealand	Environmental	Poor	2/5	Moderate
	Social	Moderate	3/5	
	Governance	Good	3/4	
Average			2.67/4.67	
Adjusted av.			3/5	
Sanford	Environmental	Good	4/5	Moderate
	Social	Poor	2/5	
	Governance	Moderate	2/4	
Average			2.67/4.67	
Adjusted av.			3/5	
Contact Energy	Environmental	Good	4/5	Good
	Social	Moderate	3/5	
	Governance	Excellent	4/4	
Average			3.67/4.67	
Adjusted av.			4/5	
Mercury New Zealand	Environmental	Moderate	3/5	Moderate
	Social	Good	4/5	

	Governance	Poor	1/4	
Average			2.67/4.67	
Adjusted av.			3/5	