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EFFECTIVENESS EVALUATION OF THE AOTEAROA NEW ZEALAND CLIMATE-RELATED DISCLOSURE FRAMEWORK

INTERIM REPORT – EVALUATION METHODOLOGY DESIGN & BASELINE ASSESSMENT

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As part of the research programme "the effectiveness evaluation of the Aotearoa New Zealand Climate-Related Disclosure Framework", this research brief report outlines the progress and findings of stages 1-3 as at December 2023. First the brief provides a literature review, which supports the theory of change. This is followed by the methodology development to date and a range of initial results and insights. Specifically, this report outlines the results from the interviews, initial results from the survey and some preliminary statistics on voluntary climate-related reporting in New Zealand to date.

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1. EXECUTIVE SUMMARY

This research project aims to assess the effectiveness of the Aotearoa New Zealand Climate-related Disclosure Framework (**the Disclosure Framework**) in meeting its purposes, which are:

a) to encourage entities to routinely consider the short, medium and long-term risks and opportunities that climate change presents for the activities of the entity or the entity's group

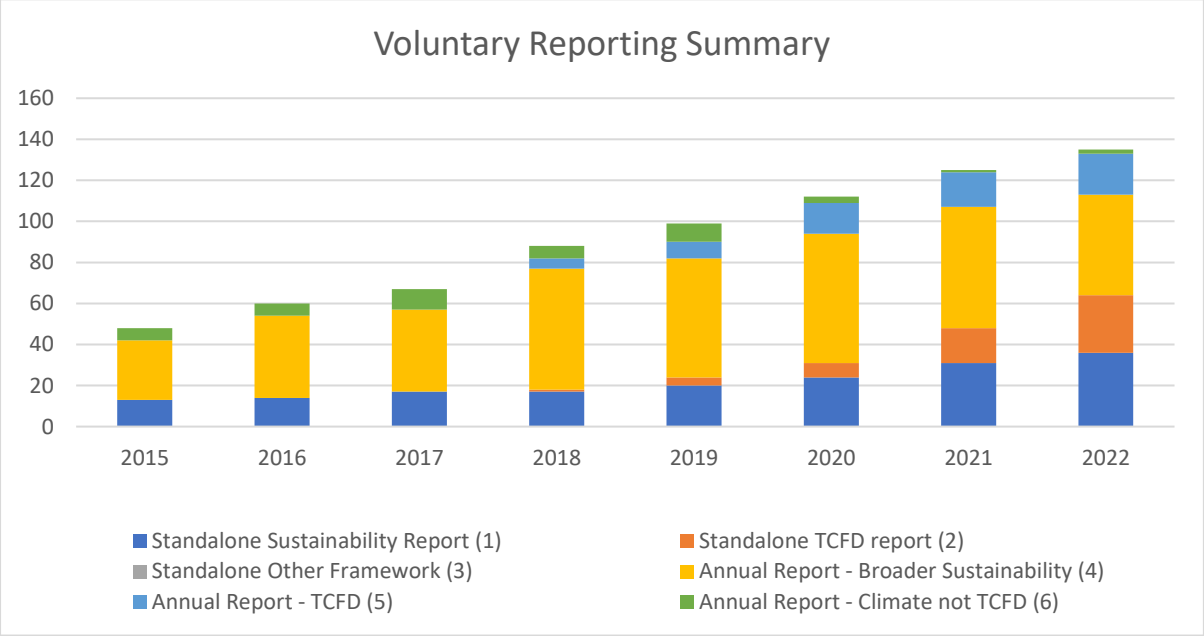
b) to enable entities to show how they are considering those risks and opportunities

c) to enable investors and other stakeholders to assess the merits of how entities are considering those risks and opportunities.

In this report we provide background information on global climate and broader sustainability-related reporting frameworks and standards and review the relevant literature to form a theory of change for the Disclosure Framework. We then describe our three primary data collection methodologies, namely interviews, surveys and disclosure analysis, as well as how these and secondary datasets will be combined for this evaluation.

Figure 1. Voluntary Climate Sustainability Reporting in New Zealand

Figure 1 presents the number of CREs that engage in different voluntary non-financial disclosures. The coding (numbers) of this reporting is defined in Appendix 3.



The primary data collection approaches for the baseline assessment are at varying stages of completion. The first round of interviews is complete, while the surveys for the baseline assessment are still open, with a closing date of 31 January 2024. For the textual analysis, we downloaded all voluntary climate, and broader sustainability, related reporting in standalone documents or within annual reports from 2015-2022 financial years.

In this summary we provide some initial insights from the literature and each of the primary data collection methods.

Insights from the Literature

- Several findings in the literature support the need for mandatory climate-related reporting standards.
    - Studies show the lack of quality, comparability and consistency in voluntary climate-related reporting.
    - There is strong evidence of 'cheap talk' and 'cherry picking' in voluntary climate-related disclosures and some evidence of greenwashing.
    - Many studies evidence how investment funds may be overstating their portfolios' climate, and broader sustainability-related performance.
- Currently climate-related data and information required for the required capital reallocation is scarce and unreliable.
- To avoid boilerplate disclosures, principles-based climate-related disclosure standards, such as the Aotearoa New Zealand Climate Disclosure Standards (**NZ CS**) may be preferred.
- For climate-related disclosures standards to be effective, strong assurance and enforcement is essential.
- Several factors drive entities' decisions to voluntarily disclose on climate or sustainability risks, opportunities and impacts, which can be summarised as:
    - Investor and stakeholder pressure
    - Regulation (realised or expected) and litigation risk
    - Company characteristics, such as size, climate performance and climate-risk exposure
    - Manager characteristics, such as capability, experience with sustainability reporting and education
    - Disclosure costs.
- The literature shows that climate-related risks are being priced in financial markets (stocks, bonds and derivatives) and affecting access to and cost of capital, although these risks are likely still mispriced, due to the lack of reliable information.
- It has been shown that mandatory climate-related disclosure rules can decrease subsequent firm carbon emissions and increase sustainability-related activities. Further, such regulations can improve the quality and comparability of disclosures.

Interviews of Climate Reporting Entities

- Participants were well-versed in climate risk disclosures, starting with ESG and TCFD frameworks and progressing to NZ CS. They expressed a view of little discrepancy between these frameworks, especially TCFD and the NZ CS.
- The standard of reporting is often related to the type of organisation reporting. In some cases, it was described as a learning and humbling experience. For others it was the opportunity to be the best and show leadership. Then for others it was about being cautious and only doing the minimum expected until being able to see benchmarking occurring across their industry, nationally and globally.
- The key drivers for voluntary climate-related reporting before the mandatory regime are:
    - International peer disclosure
    - Wider commitment to sustainability as a strategic priority and/or part of the business model
    - Aligning to associations such as the Climate Leaders Coalition
    - Already experiencing climate change impacts to business processes
    - Compliance
    - First mover advantage.
- The greatest challenge to companies with the climate-risk disclosure process was when it came to translating certain risk factors and opportunities into the specific company context,

specifically aligning risks with the strategic direction and operational processes. Interviewees also discussed a challenge in the development and translation of scenarios to the company context.

- At this early stage of climate-risk disclosure reporting, participants were unsure of any known impact on decision-making or capital allocation.

Interim Results Survey of Climate Reporting Entities and Primary Users

- Of the 45 survey respondents (as of 10 January 2024), 23 had completed voluntary climate-related disclosures and most of them started in the last two years.
- Responses by voluntary reporters support the theory of change that disclosures can improve business decision making and capital allocation.
    - The most common reasons for voluntary disclosures were improving their strategy and risk management as well as reputational benefits. Attracting capital, primary user pressure, industry peer pressure and legal action were much less prevalent reasons.
    - Further, these respondents are engaging in various activities to improve the quality and reliability of the disclosures, including collaboration and seeking assurance.
    - Corporate reporters were improving their capabilities by hiring climate-related disclosure expertise, while non-corporates added to their data and information audit processes instead.
    - Interestingly, very few have had feedback from standard setters or primary users.
- Survey respondents see climate-related risks as highly important, almost on par with other financial risks. These risks are seen as becoming more important in the next one to five years.
- The respondents also currently see many challenges with climate related information in terms of reliability, quality and usefulness and believe the Disclosure Framework will improve reliability while providing material information. The challenges are more prevalent for those entities that had not voluntarily reported ahead of the Disclosure Framework.
- The most common challenges with climate-related disclosures currently are lack of reliable data and cost of producing such disclosures. Revealing commercially sensitive information and lack of board or stakeholder demand are less common issues.
- All the sections of the NZ CS are seen as important to decision making of responding entities.
- Most of the responding investors incorporate consider climate change across all their investments. The most important motivations for this are stakeholder demand, materiality to financial performance, ethical responsibility and improving investee climate actions. Investors mostly use negative screens and fundamental analysis to integrate climate risks into their investment approaches.

Voluntary Reporting

- Voluntary climate, and broader sustainability, related disclosures by CREs has increased from 2015 to 2022.
- The voluntary reporting by CREs seems to have some shifting from sustainability related reporting to climate related reporting, likely in anticipation of and preparation for mandatory reporting in accordance with NZ CS.

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3. INTRODUCTION

As of early 2024, the impact of climate change is evident through critical statistics. Global surface temperature has risen by approximately 1.1^{O}C since the late 19th century due to increased carbon dioxide emissions. Atmospheric carbon dioxide levels have surged to over 412 parts per million, the highest in 800,000 years and global sea levels have risen by about 10 centimetres since 1993[1]. Newman & Noy (2023) find that USD 143 billion per year of the costs of extreme events is attributable to climatic change over the last 20 years. The risks of climate change will be experienced diversely, but all jurisdictions, states and organisations will face physical and transition risks.

On the back of the Paris Agreement, the development of the sustainable development and other economic and social factors, Socially Responsible Investing (**SRI**) and other similar approaches[2] is becoming an accepted approach for many asset managers, who are motivated predominantly by the demand of their clients and the material risks and opportunities of ESG issues (Revelli, 2017; Amel-Zadeh & Serafeim, 2018; Kim and Yoon, 2021; Diaz-Rainey et al., 2023). Global assets under management (**AUM**) claiming to integrate ESG considerations in their investment strategy made up more than US$35 trillion in 2020 (GSIA, 2021) and are expected to surpass US$50 trillion by 2025 (Bloomberg Intelligence, 2022). As investors are trying to integrate these broader risks and considerations global institutional investors now value and demand climate risk disclosures (Sautner et al, 2023b).

Mitigating the worst outcomes of climate change by transitioning globally to a net-zero economy requires vast sums of investment. The two most popular global policy levers to incentivise the reallocation of capital are the direct pricing of emissions (and other externalities) and climate-related disclosure standards and rules. The price on emissions creates a direct incentive for emitters to transition or reduce their activities, while climate-related disclosure rules allow investors and creditors to incorporate climate risks when allocating capital. New Zealand launched one of the first national emission trading schemes in 2008, which now puts a price on almost half of the country's emissions and has continuously been evolved to provide a more effective market.

Currently, information on entities' climate risks and opportunities in the New Zealand capital market is sparse, although some entities have been voluntarily reporting on climate-related risks and opportunities (see Figure 1). Globally climate-related, and further non-financial, disclosure standards are being developed on a voluntary basis, but New Zealand is the first country to implement a standards-based mandatory climate related reporting. Under this Disclosure Framework approximately 170 of New Zealand's largest financial and corporate entities (i.e. Climate Reporting Entities (**CREs**)) are being required to make disclosures from the 2023 financial year. In the development of NZ CS, the External Reporting Board (**XRB**) incorporated insights from the international voluntary disclosure frameworks, such as recommendations of the Task Force on Climate-Related Financial Disclosures (**TCFD**).

This research project's objective is to design a multi-year evaluation programme to evaluate the impacts of climate reporting, establish a baseline for carrying out the evaluation (2023) and implement the first cycle of the evaluation (2025). The primary purpose is to evaluate the effectiveness of the Disclosure Framework in achieving the purposes of the Disclosure Framework which are:

- to encourage entities to routinely consider the short, medium and long-term risks and opportunities that climate change presents for the activities of the entity or the entity's group

[1] For a summary of the state of climate change visit the NASA website: https://climate.nasa.gov/.
[2] See Appendix 1 for examples different definitions related to sustainable or responsible investing.

- to enable entities to show how they are considering those risks and opportunities
- to enable investors and other stakeholders to assess the merits of how entities are considering those risks and opportunities.

The first step in this research programme was to review the relevant academic literature and develop a theory of change for the effects of the Disclosure Framework – see section 5. To evaluate the effectiveness, we have designed a methodology consisting of primary data collection, and interviews and surveys with CREs and Primary Users. We further expand our primary dataset by collecting all voluntary climate and sustainability related disclosures of CREs from 2015 onward. This methodology is further described in section 5 and some initial results of the baseline assessment are provided in section 6.

4. GLOBAL CLIMATE-RELATED REPORTING FRAMEWORKS

Over the last three decades, since the formation of the United Nations Framework Convention on Climate Change (UNFCCC) and the accompanying Conference of the Parties (COP), regulations to mitigate and adapt to climate change have grown substantially. The annual COPs have heralded many significant international agreements such as Kyoto Protocol (COP 3, 1997), which has now been replaced by the Paris Agreement (COP 21, 2015), where 196 parties agreed to limit global warming to 2^{O}C above pre-industrial levels.

One of the key developments in recent years is voluntary and mandatory climate and broader sustainability and non-financial reporting frameworks. These developments reflect a growing global trend towards integrating climate-related risks and opportunities into reporting, driven by an increasing recognition of the financial materiality of climate change.

Figure 1 provides a timeline summarising the developments of mandatory (orange) and voluntary (green) climate-related and broader sustainability and non-financial disclosure frameworks and standards globally. As can be observed, there has been an amalgamation of voluntary disclosures leading to two major frameworks:

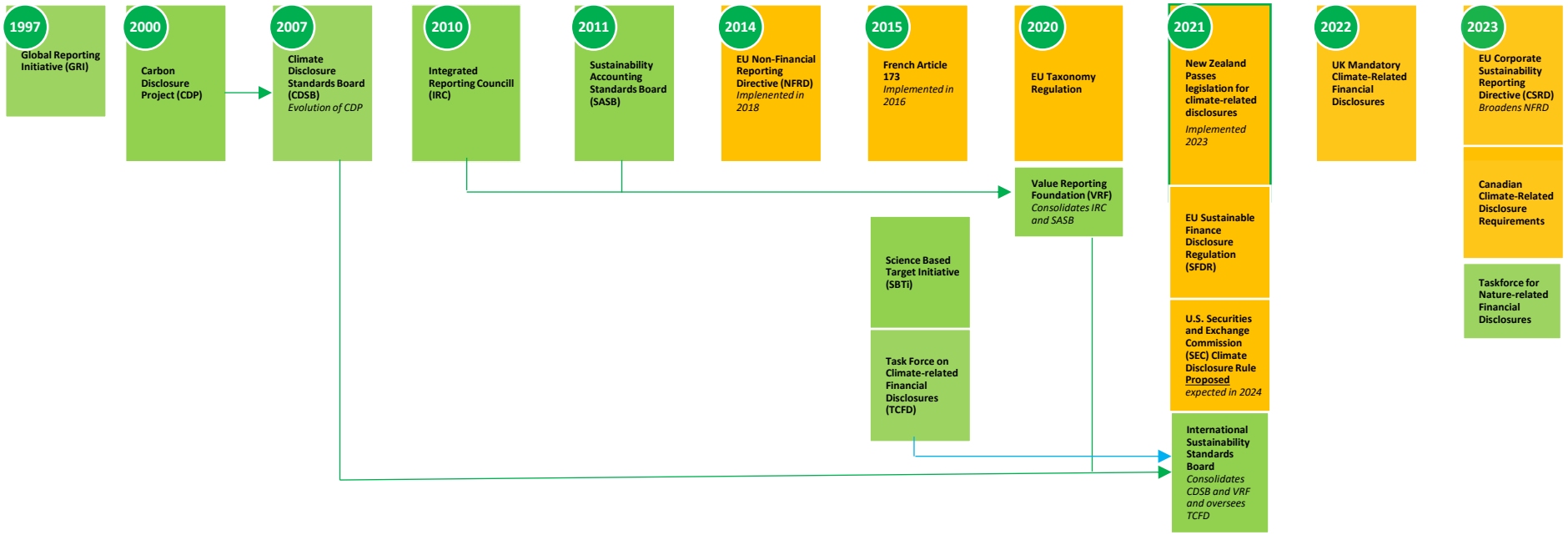
- The International Sustainability Standards Board (**ISSB**) standards focus on sustainability and climate-related risks and opportunities from an investor perspective.
- The Global Reporting Initiative (**GRI**) standards also require reporting of the impact on the environment and society.

NZ CS are predominantly financial risk and opportunity focussed, with the intention of serving the information needs of Primary Users as defined in NZ CS (i.e. existing and potential investors, lenders and other creditors). They follow the same structure as the TCFD framework and the standards subsequently issued by the ISSB, with a less prescriptive and more principles-based approach. The XRB has published a comparison of NZ CS to the ISSB standards.[3]

[3] The comparison to the IFRS standards, as of December 2022, is available here: https://www.xrb.govt.nz/dmsdocument/5006

Figure 2. Non-financial reporting frameworks and regulations

This figure presents a timeline of the major global voluntary and mandatory non-financial reporting standards and frameworks. Green boxes indicate voluntary standards or frameworks, while the orange boxes indicate mandatory standards. The arrows indicate when a standard/framework has been merged or subsumed.



5. LITERATURE REVIEW AND THEORY OF CHANGE

In this section we review the relevant international literature on climate-related and other non-financial reporting globally to gain insights on the motivation for mandatory climate-related reporting, drivers of entity's voluntary reporting and the effects of climate, and broader sustainability related reporting. This review allows us to build the initial theory of change, presented in Figure 3, and provides some initial insights into the research questions of this effectiveness evaluation.

5.1. NEED FOR MANDATORY REPORTING STANDARDS

Carbon pricing policies to date have been implemented by some countries, including New Zealand, but often with a price far below the social cost of carbon (Klenert et al., 2018)[4]. The next best approach for encouraging a transition is through bottom-up engagement and capital reallocation by firms and capital providers. However, to engage with firms or reallocate capital, primary users (investors and creditors) need to be able to price climate-related risks and opportunities, which requires information that is not currently readily available. This lack of information transparency is one of the motivators for mandated climate related disclosures.

Although climate-related risks are now well accepted, they are novel relative to usual risk considerations, which adds complexity to mitigating and disclosing relevant information on these risks. Climate-related risks have much longer time horizons (Carney, 2015; Fiedler et al., 2021) and are more difficult and complex to predict. Therefore, requiring mandatory disclosures with set standards and sufficient guidance is likely to improve the efficiency of capital markets in addressing these risks.

Disclosure Quality and Greenwashing

Some researchers have raised concerns regarding the diverse approaches in climate-related disclosures regarding quality, credibility and comparability (Sullivan & Gouldson, 2009; Tauringana & Chithambo, 2015; Depoers et al., 2016; among others).

Most current disclosure policies do not require much needed climate-related information and the voluntary frameworks such as the TCFD are not sufficient to drive capital reallocation toward a net-zero emission economy (Armour et al., 2021). One issue with voluntary disclosure frameworks, such as the TCFD, is that they allow companies to pick and choose, therefore leading to incomparability of the information. The 2023 TCFD status report[5] shows that although overall disclosure is increasing, companies voluntarily reporting on climate-related risks are selective in which parts of the recommendations they disclose on. For example, in 2022 only 11% of the examined companies reported on their resilience to climate scenarios. Bingler et al. (2022a) use a sophisticated AI model (more on this in section 6.3) to analyse the disclosures of firms which are in support of the TCFD and find that TCFD support is mostly cheap talk and that these firms are predominantly cherry picking to report non-material climate risk information. Further, they show that much of the information disclosed after the TCFD was released may not be new, but just structured in a new way.

Elliott & Löfgren (2022) show that although banks that finance fossil fuel companies are disclosing more actions on climate change there are very few clear commitments in relation to financing fossil fuels.

[4] The World Bank provides an interactive dashboard with an overview of global carbon prices and emission coverage: https://carbonpricingdashboard.worldbank.org/

[5] TCFD 2023 status report: https://www.fsb.org/wp-content/uploads/P121023-2.pdf

Further there is some evidence on the lack of quality or even greenwashing in corporate voluntary climate-related reporting. Pitrakkos & Maroun (2020) show low-quality carbon reporting by listed firms on the Johannesburg Stock Exchange, arguing that firms only report to mitigate stakeholder pressure. Wedari et al. (2021), provide some initial evidence pointing to greenwashing by high emitting companies in Australia.

An emerging stream of literature has investigated asset manager 'greenwashing', where institutions overstate their commitment to responsible investing (Liang et al., 2020; Kim & Yoon, 2023; Brandon et al., 2022). By appearing more responsible than they truly are, greenwashing enables funds to profit from the increased demand for ESG investing (Brandon et al., 2022). Several studies have shown that investor public commitments, such as signing up to the United Nations Principles for Responsible Investing do not mean much in actual sustainability performance (Liang et al, 2020; Kim and Yoon, 2020; Brandon et al, 2022). Further, the labelling of funds to indicate they are a responsible or sustainable option does not mean much in term of their portfolio sustainability performance (Raghunandan & Rajgopal, 2021). Diaz-Rainey et al (2023) find similar initial evidence of greenwashing for retail investment funds in New Zealand.

Climate and Sustainability Data Issues

Some of the information required to determine the climate-related risks and opportunities of companies is available through media, scientific analyses and new methodologies incorporating earth observation through satellites and artificial intelligence (Burke et al., 2021)[6]. However, most of the information required to analyse a company's climate-related risks and opportunities can only be made available by the company itself. Further, even these new and sophisticated methods which implement earth observation are limited by the asset ownership data, to tie physical risks and emission estimates to a particular company.

Currently many investors, creditors and other stakeholders must rely on estimated emissions, let alone other climate relevant information, in their analysis of companies. However, estimated emissions of non-disclosing firms are inaccurate (Nguyen et al., 2021; Nguyen et al., 2022). Degryse et al. (2023) show that lack of information is currently an important barrier for sustainable investors.

Issues of unreliable data are even more prevalent when investors and lenders want to incorporate broader environmental and social concern, which is often done using ESG scores, ranks and ratings. A majority (56%) of asset managers surveyed by Eccles et al. (2017) identified a lack of standards as a barrier to ESG integration. Major data providers include Refinitiv, Bloomberg, Sustainalytics, MSCI, which supply ESG data using different methodologies, measurement techniques, categories and scoring methods. These differences compromise their comparability and consistency (Chatterji et al., 2016; Berg et al., 2022). Additionally, there is some evidence of historical ESG scores by some providers changing without any announcement in methodology change, compromising their use in back-testing or evaluating current sustainability performance (Berg et al., 2020).

Requirements for Effective Disclosure Regime

Mandatory disclosures will not eliminate the potential for greenwashing as firms may respond with boilerplate reporting (Dyer et al. 2017). This creates a strong argument for less specific disclosure standards, as is the approach in New Zealand.[7]

Another important aspect of an effective climate-related disclosure regime is the need for effective enforcement and assurance. Enforcement is not only important to the effectiveness of climate-

[6] For a summary of the earth observation (satellite imagery) for climate change industry please visit: https://newsletter.terrawatchspace.com/p/earth-observation-for-climate

[7] for a discussion supporting the idea of less specific sustainability related disclosures, see Christensen et al. (2021, section 6.3)

related disclosures, but disclosure rules in general (Bhattacharya & Daouk, 2002; Byard et al., 2011; Landsman et al., 2012; Christensen et al., 2013; Christensen et al. 2016). Peters & Romi (2013) show that the compliance with SEC disclosure rules for environmental sanctions is low, despite the use of bright-line materiality thresholds. Climate disclosure enforcement is even more challenging in financial disclosures because the reported information is more difficult to verify, with many different measurement systems (O'Dwyer 2011) and use of external information. With the introduction of a mandatory regime, regardless of assurance requirement mandates, demand for third-party assurance is likely to go up as it did in China, Denmark, Malaysia and South Africa (Ioannou & Serafeim, 2017).

Overall, the literature supports the need for mandated climate-related disclosure and the insufficiency of voluntary reporting, to support the enormous reallocation of capital required to mitigate and adapt to climate change, to avoid mispricing of risks, and to address greenwashing. Not only can mandatory climate-related reporting improve information flows for investors, creditors and other stakeholders and therefore support the capital reallocation and investor engagement process, but it can also accelerate transitions of companies as it incentivises an internal learning process (Armour et al., 2021).

5.2. DETERMINANTS OF VOLUNTARY CLIMATE-RELATED REPORTING

Although voluntary disclosure of climate related risks is increasing globally[7] and in New Zealand (see section 7.4), these disclosures have many issues and are not yet sufficient, as outlined above, evidencing the need for mandatory disclosure requirements. However, we now explore the evidence on what factors can drive voluntary climate-related reporting as voluntary disclosure was the baseline in New Zealand until 2023. These determinants of climate-related reporting can be categorised as investor and stakeholder pressure, regulation and litigation, and entity-specific factors.

Investor and Stakeholder Pressure

There is a growing literature exploring the demand for climate and broader sustainability-related disclosures. Institutional investors globally value and are demanding climate risk disclosures (Borghei, 2021; Demers et al, 2021; Ilhan et al., 2023; Cohen et al., 2023) as they see these risks as important and already beginning to materialise, especially transition risks (Revelli, 2017; Amel-Zadeh & Serafeim, 2018; Krueger et al., 2020; Kim and Yoon, 2023). This also holds for New Zealand retail fund managers who mostly believe ESG risks are or soon will be financially material and that climate change is the most important of these risks (Diaz-Rainey et al., 2023). Gillan et al. (2021) reviews the literature and show that institutional investor ownership is often related to ESG performance of companies, further making the point that institutional investors are using this information in their capital allocation decision making and engagement decisions and activites. Botsari & Lang (2020) show that even venture capital and angel investors have a preference for socially responsible investments.

Further, these asset managers are also observing the exceptional growth in demand for sustainable investment products and opportunities from large asset owners and retail investors. Many studies show that retail investors are demanding such investments (Hartzmark & Sussman, 2019; Bauer, Ruof and Smeets, 2021; Ceccarelli, Ramelli and Wagner, 2023). Some studies show that investors would be willing to forego some financial return to achieve positive environmental and social impacts (Barber et al., 2021; Brodback et al., 2021). In a study of Dutch households, Degryse et al. (2023) find two types of sustainable investors, those that invest in sustainable funds for financial return and those that do so due to social preferences.

Investors, especially institutional investors, engaging with companies on climate-risk disclosure have been successful in attaining increased disclosures (Flammer et al., 2021). Dimson et al. (2015) show that successful engagements by investors on sustainability issues leads to improved financial

performance. Dimson et al., (2021) found that the chances of success in coordinated engagements relating to environmental and social issues are improved if there is a lead investor from the same country as the target firm. Barko et al., (2017) and Dyck et al., (2019) measure successful engagement through an increase in the firms' ESG rating following engagement requests and reduced financing costs following successful engagement (Hoepner et al., 2016).

Regulation and Litigation

Another channel of external pressure for climate-related disclosure is significant pressure from other stakeholders, especially government regulators. Chithambo et al. (2021) show that company's emissions disclosure is most affected by capital providers, then government regulators, then internal stakeholders and lastly by broader stakeholders such as NGOs, media and competitors.

Internationally, governments are forming agreement and alignment on the need for climate-related disclosure mandates. For example, in 2021 the G7 countries' Ministers of Finance backed mandatory rules in line with the TCFD framework[8] and in 2023 the ISSB, a G20 backed body, approved the first global baseline rules for climate-related disclosures[9]. Some jurisdictions, such as New Zealand, the European Union and the United Kingdom have already mandated climate-related reporting and many others have announced plans to do so. Beyond governments and regulators, 72 stock exchanges across the globe are already providing guidance on sustainability related disclosures,[10] some of which require mandatory reporting.

Another important factor that can affect the decision to voluntarily disclose climate related information may be the increase in climate litigation in recent years (Setzer and Byrnes, 2022), with some litigation focusing specifically on the lack of disclosure (Wasim, 2019). However, Robinson et al. (2023) suggest that firms respond to peers' lawsuits by providing less verifiable, and forward looking, disclosures to minimize the risk of being sued.

Company Features

Beyond the external determinants of voluntary climate-related and broader sustainability disclosure there is a growing literature on the company features and internal drivers of such disclosures.

Disclosure theory (Core, 2001; Hart & Zingales, 2017) suggests that outperforming firms would report on this outperformance, while socio-political theories (Reid & Toffel, 2009; Liesen et al., 2015; Choi & Luo, 2021) suggest that poor CSR provide positive disclosures to deceive users of their poor performance, i.e. greenwashing.

Companies which have higher exposure to climate-related risks, often measured by emissions, tend to disclose more (Sullivan, 2009; Dawkins & Fraas, 2011; Hassan & Romilly, 2018; Siddique et al. 2021). Christensen et al. (2021) reviews the literature and shows that company sustainability performance is also related to voluntary disclosure, although the findings are mixed. Similarly, there seems to be more disclosure after significant environmental or social events, such as oil spills or nuclear disasters (Patten, 1992; Heflin & Wallace, 2017; Bonetti et al., 2018; Christensen et al., 2021).

One of the most common features that drives the quantity or quality of voluntary sustainability disclosures is the firm size (Hahn & Kühnen, 2013; Lietal. 2021). This has been attributed to the level

[8] https://www.reuters.com/business/environment/g7-backs-making-climate-risk-disclosure-mandatory-2021-06-05/
[9] https://www.reuters.com/business/sustainable-business/g20-backed-standards-body-approves-first-global-company-sustainability-rules-2023-02-16/
[10] For an up to date list and breakdown of these guidance documents please see this Sustainable Stock Exchanges Initiative (SSE) website: https://sseinitiative.org/esg-guidance-database/

of attention of larger firms (Cormier & Magnan 2003; Thorne et al. 2014) or that the relative cost of reporting on sustainability issues may be lower (Wickert et al. 2016).

Another stream of literature reports positive associations of voluntary reporting with manager characteristics, such as education, personal views, ethnicity, whether the CEO has a daughter, confidence, prior expertise with CSR issues and manager capabilities (Haniffa & Cooke 2005, Adams & McNicholas, 2007; Parker, 2014; Lewis et al., 2014; Peters & Romi, 2015; Cronqvist & Yu, 2017; McCarthy et al., 2017; Davidson et al., 2018; Daradkeh et al., 2023).

Beyond this, the industry in which the firm operates in also matters, as research has shown that firms in more polluting, controversial or 'sin' industries tend to disclose more on sustainability issues to shape public opinion (Gamerschlag et al., 2011; Byrd et al., 2016; Grougiou et al., 2016).

Voluntary climate, or broader sustainability, related disclosures are also costly, not just in resources but they could also reveal proprietary information (Breuer et al. 2020).

Overall, the external and internal factors outlined above seem to drive voluntary climate-related disclosure, but the argument for mandatory disclosure, as implemented in New Zealand, remains strong for useful disclosures by companies which are consistent, comparable and verifiable.

5.3. EFFECTS OF CLIMATE-RELATED REPORTING

In the vast accounting literature, it has been shown that disclosures can affect firms' investment behaviour and other business decisions (Leuz & Wysocki 2016; Roychowdhury et al. 2019).

Climate Risk and Performance

Some authors state that the lack of disclosure has resulted in mispricing of climate related risks (Sautner et al., 2023b; Ilhan et al., 2023; Alok et al., 2020;) and misallocation of capital (Mercure et al., 2018) as well as the issues with estimated and inconsistent data described earlier.

However, the overall evidence on the relationship between climate and broader ESG risks and financial performance is somewhat mixed, although most recent studies show a positive or neutral relationship (Gillan et al., 2021; Friede et al., 2015).

The incorporation of climate risks into market prices is essential to efficiently channel resources to sustainable projects and to mitigate the risk of abrupt repricing highly exposed assets. There is evidence that emissions and climate risks are already being priced in stock markets (Chapple et al., 2013; Matsumura et al., 2014; Clarkson, et al., 2015; Griffin et al., 2017; Jagannathan et al. (2018) Choi & Luo, 2021; Bolton and Kacperczyk, 2021a; Aswani et al, 2023), bond markets (Duan et al., 2021; Seltzer et al., 2022; Gehricke et al., 2023) and in derivatives (Ilhan et al., 2021; Ford et al., 2022, Koelbel et al., 2020). However, these results are sensitive to how emissions are measured (Aswani et al., 2023). Berg et al. (2023) show that MSCI ESG ratings of firms (not the other four major providers) significantly affect fund holdings of those firms, by investment funds with ESG labels.

Further, it has been shown that climate risks are affecting the cost of capital and leading to less favourable financing terms (Chava, 2014; Herbohn et al., 2017; Zerbib, 2019; Javadi & Masum, 2021; Bolton and Kacperzyk, 2021b; Huang et al., 2022; Ehlers et al., 2022; Gingliner and Moreaou, 2023).

Mandatory Climate-related Disclosure effects

There is empirical evidence, which has shown that mandatory GHG emission reporting can affect the subsequent emissions of reporting companies. One of the first mandatory emission reporting rules

was the Greenhouse Gas Reporting Programme (GHGRP) introduced in the U.S. in 2010. Bauckloh et al. (2023), show that the GHGRP reduced affected firm carbon emission intensity, but not absolute emissions.

Since the introduction of the GHGRP, other jurisdictions have launched mandated emission or climate risk reporting (see Figure 2) and several studies have shown that mandated emission reporting leads to decreases in subsequent emissions of the reporting companies in the United Kingdom (Tang & Demeritt, 2018; Downar et al., 2019; Jouvenot & Krueger, 2020). Miller et al. (2023) show that U.S. insurance companies reduced their investments in fossil fuels by 20% relative to non-disclosers after a law required such disclosures and this effect remained even after the policy was rescinded.

The European Union has also issued directives that mandate increased sustainability disclosures (see Figure 2 for examples). Fiechter et al. (2020) show an increase in sustainability related activities and that occurred in the lead up to the Non-Financial Reporting Directive (**NFRD**). Brié et al. (2022), show that the NFRD mandate improved the quality and comparability of disclosures in Europe.

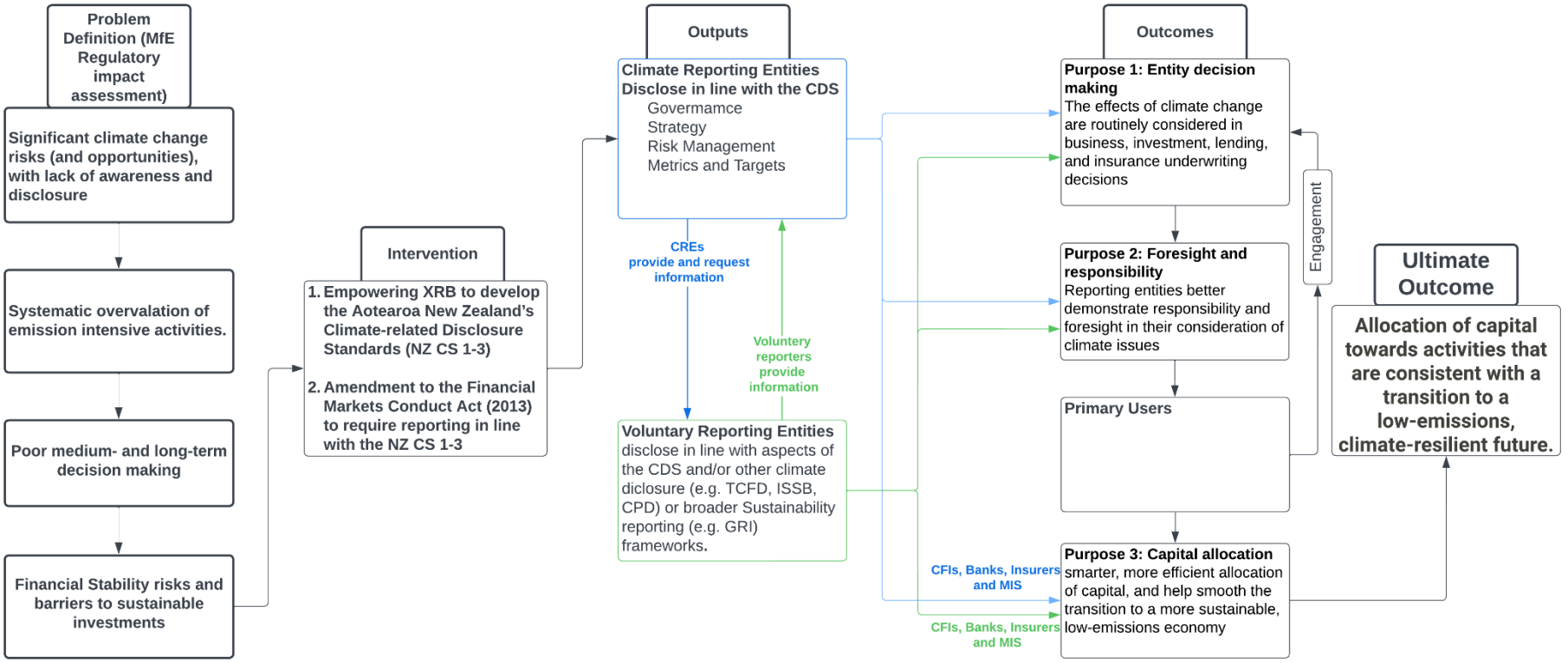
Mesonnier & Nguyen (2020) show that the French Article 173, requiring investors and insurers to disclose on climate risk exposure reduced the regulated entities financing of fossil fuel energy companies.

Overall, the initial evidence in this literature review provides support for the theory of change for the Disclosure Framework conceptualised in Figure 3, which provides the framework for this effectiveness evaluation. That is, mandated climate-related disclosures can affect company and primary user behaviour.

5.4. THEORY OF CHANGE

Figure 3. Theory of Change

This figure presents a theory of change for the Climate-related Disclosure standards policy.



6. EVALUATION METHODOLOGY DESIGN

This research programme aims to develop a methodology to evaluate the effectiveness of the Disclosure Framework toward the purpose of mandatory climate-related disclosures, which leads to the six main research questions below.

Purpose 1: Entity decision making

RQ 1 To what extent does the application of the Disclosure Framework contribute to business, investment, lending, and insurance underwriting decisions by CREs, CFIs and Primary Users relating to climate change?

RQ 2 What difference does the Disclosure Framework make to decisions and what are the contributing factors?

Purpose 2: Foresight and responsibility

RQ 3 Does the Disclosure Framework help CREs and CFIs?

RQ 4 How do CREs and CFIs consider climate-related risks and opportunities?

RQ 5 Do CREs and CFIs demonstrate responsibility and foresight in their consideration of climate issues? If so, how?

Purpose 3: Capital allocation

RQ 6 What indications exist of the Disclosure Framework leading to more efficient and effective allocation of capital, and helping to smooth the transition to a more sustainable, low-emissions economy?

To answer these questions, beyond the insights from the literature review in section 5, as well as a range of supplementary questions (outlined in Appendix 2) we have designed three approaches for primary data collection. Namely these are regular two-yearly interviews and surveys of CREs and Primary Users starting in 2023.[11] Further, we collect and analyse the climate related disclosures from 2015. These approaches to primary data collection are outlined below, while the initial results from the baseline assessment are presented in section 7.

The methodology for answering the research questions further, by combining these datasets and making use of secondary datasets, such as portfolio holdings and company financial and climate-related performance is described in section 6.4.

[11] Ethical approval was sought before any interviews were conducted and before contacting potential participants by email. We also consulted with Ngāi Tahu through the Māori Development Office at the University of Otago.

6.1. INTERVIEWS

Interviews were conducted with 20 organisations that were in various stages of disclosure and from various sectors of the New Zealand economy. The aim was to capture some organisations that had already produced climate or broader sustainability reports before mandatory reporting and to capture a range of potential companies that would be disclosing as mandated CREs. Table 1 outlines the participants involved.

Table 1: Interview participants

Table 1 presents a summary of the interview participants. The number of each type of reporting entity interviewed and the count of Climate Reporting Entity (CRE) interviewed is displayed. Financial entities are those CREs that are Registered Banks, Building Societies, Managed Investment Schemes, Crown Financial Institutions (CFIs), or Licensed Insurers, while Corporate Issuers are the other CREs. Total assets are as of the 2023 financial report, unless this is not available, then this is based on the 2022 financial report. AUM are taken from the entity's websites or annual reports. Mean total assets for financial entities are not reported as this would make the respondent bank identifiable.

Breakdown of interviewees

Type of Entity	No. of entities that are CREs or CFIs	Other entities	Total entities
Corporate issuer	11	2	13
Registered bank or building society	1	0	1
Investment scheme manager	2	0	2
Crown Financial Institution	3	0	3
Licensed insurer	1	0	0
Total	**18**	**2**	20

Interviewee size

Type of Entity	Count	Voluntary reporting	Mean assets (millions)	Mean AUM (millions)
Corporate issuer	13	7	$4,001	-
Financial entity	7	3	-	$17,896
Total	**20**	**10**		

We carried out the interviews via a video call, and interviews averaged around 60 minutes. They were digitally recorded with permission and transcribed using the Otter AI software. The transcripts were subsequently checked against the recordings for accuracy and errors were corrected.

Using a semi-structured interview approach, questions were asked to gain as much participant voice and understanding of the process of disclosing climate risks as well as the impacts and outcomes of the process. The interviews began with an open question asking participants for their story and process of preparing climate risk disclosures. Using a narrative approach enabled participants to tell their own story at the level of detail they were comfortable with and allowed flexibility for the participant to mention aspects that were important and had meaning to them, while also enabling probing from the interviewer. The interview questions focused on aspects of the disclosures and are copied below:

- What is the story or process of your climate risk disclosure? When, how and why did you start the process of disclosing?
- What is your understanding of climate risk?
- What informs your decision-making around climate risk? Can you give an example of this in practice?
- What is the perception of the XRB requirements in your organisation?
- How has creating the climate-related disclosures changed organisational practices and processes?
- In line with the above question, can you speak to your capital allocation and investment decisions?
- Has working towards meeting the XRB requirements affected future decision-making in your organisation? How has the process of scenario modelling been for your organization?

Some of the key trends in the interview data, around common issues and concerns as well as interviewee readiness for and impacts from climate-related reporting are explored in section 7.1.

6.2. SURVEYS

The survey aims to explore how the Disclosure Framework impacts business decision-making and capital allocation toward a low-emission, climate-resilient New Zealand economy. To create a longitudinal analysis of the effects of NZ CS the survey was distributed at the end of 2023 and will be distributed again in 2025, and every two years following.

Survey Design

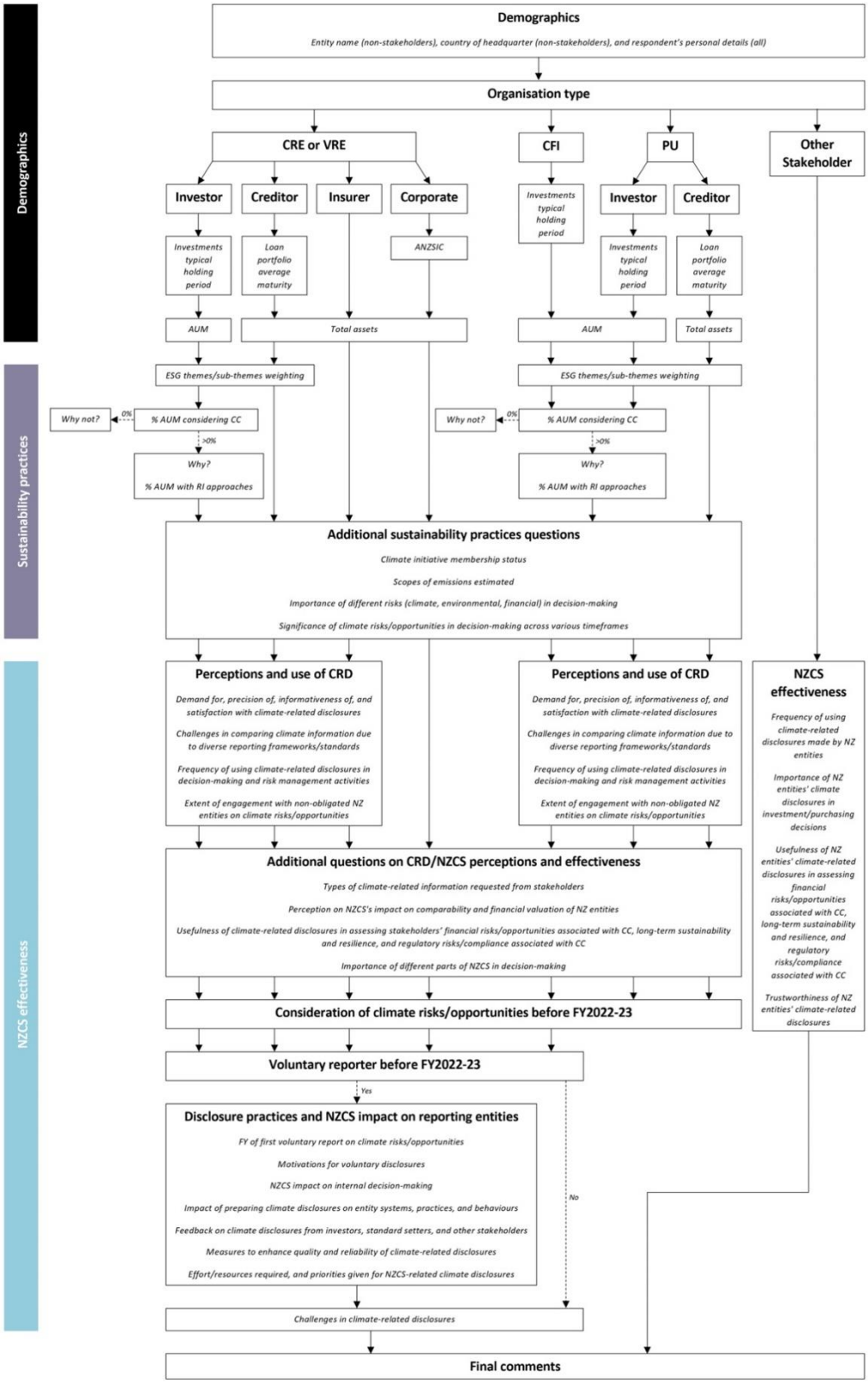
The initial survey was drafted by researchers from the Climate and Energy Finance Group (**CEF Group**), University of Otago, based on insights from the interviews and published literature (see, e.g., Amel-Zadeh, 2021; Krueger et al., 2020; Diaz-Rainey et al., 2023; Ilhan et al., 2023).

The draft survey underwent revisions based on feedback from XRB staff, with questions adjusted accordingly. It was organised into five streams for different stakeholders: investor, creditor, insurer, corporate and other stakeholder. The final version of the survey contains a maximum of 41, 37, 34, 30, and 8 questions for the aforementioned streams respectively.

To prevent respondent fatigue, we used a branching logic to tailor questions based on prior responses (see Figure 4). While most questions were uniform across streams, we changed wording slightly to reflect the different nature of these organisations. The survey was hosted on Qualtrics. We created a separate link for the stakeholder stream as the number of questions they were asked is much lower, and they are not our main focus group.

The survey includes questions on the importance of different climate risks, the significance of climate considerations over time, and stakeholder disclosure quality. It assesses the effectiveness of NZ CS in standardising climate reporting, its influence on financial valuation and stakeholders' information expectations. Additionally, the survey gauges satisfaction with climate disclosures, their utility in assessing financial risks, and integration into decision-making. It addresses challenges in climate disclosure, motivations for disclosure, NZ CS's impact on decision making, and efforts to enhance disclosure reliability. The survey included various question types: multiple-choice, Likert scale, slider, constant sum (point allocation) and text entry.

Figure 4. Diagram of the Survey Logic



Survey Distribution

The survey was distributed through various channels to try and elicit a representative sample of CREs and primary users, including emails, LinkedIn messages, inclusion in various industry body newsletters and others[12].

First, the survey was sent to all CREs (provided by the XRB and Financial Markets Authority) via an invitation email. The direct contact email addresses were either provided by the XRB (with permission), available through the research teams own networks or found online. Where such direct email addresses were not available, generic email addresses for the company were used. The first invitation email was sent on 3 November 2023, where any contact details causing errors were replaced. Reminder emails were sent on 24 November 2023 and 11 January 2024, with the baseline survey scheduled to close at the end of January 2024.

Next LinkedIn posts inviting participation were developed by the XRB and the Centre for Sustainable Finance: Toitū Tahua, in early November 2023 and shared by others. Further, the research team asked several industry bodies such as the Institute of Financial Professionals New Zealand (INFINZ), the Financial Services Council (FSC) and Boutique Investment Group (BIG), who shared the invitation via their newsletters and/or other mailings.

As of 10 January 2024, 45 responses were received, comprising 17 investors, 1 creditor, 2 insurers and 25 corporates. Some preliminary results on these initial responses are presented in section 7.3.

6.3. DISCLOSURE ANALYSIS

Collection and Classification of Reports

To set the baseline of climate-related reporting in New Zealand, we first collect all voluntary climate and broader sustainability, related disclosures from CREs from 2015 to 2022 (Financial Year). It is worth noting that some entities which are not CREs have been voluntarily reporting but are not withing scope of this collection.

First, for the baseline assessment, we download all the voluntary climate and broader sustainability, related reporting by CREs in New Zealand, found in standalone and annual reports from 2015 to 2022. This creates a database to assess climate-related reporting by CREs and the effects of the Disclosure Framework on that reporting, which will be expanded each year as new reports are released.

If the respective CRE does not disclose a standalone climate or sustainability report, then the annual report is analysed and if it has some discussion on climate and/or sustainability related risks and/or issues it is downloaded. The downloaded reports are then classified into TCFD or broader sustainability related reports or annual report sections, following the flowchart presented in Appendix 3. This allows a high-level exploration of the voluntary reporting landscape in New Zealand to date, setting our baseline. The summary results of this part of the baseline assessment are reported in section 7.4.

The database of archived reports is the basis for building deeper analysis through textual and discourse analysis approaches. These will be developed and implement throughout 2024 and implemented again in

[12] We sought and obtained ethical approval before any surveys were distributed. We also consulted in advance with Ngāi Tahu through the Māori Development Office at the University of Otago.

2025 with an updated sample of voluntary and the new mandatory reports CREs are preparing for their 2023 financial year disclosures. The initial conceptualisation of these approaches is described below in this section, but many of the details are currently under development.

Textual Analysis of Reports

In this effectiveness evaluation we first follow a simple indexing approach to get a general sense of climate and sustainability related disclosures. A very simple version of this is already complete with the simple classification of voluntary reporting from 2015 to 2022, presented in section 7.4.

In the next phase of the textual analysis, over the 2024 calendar year, we will develop a more complete indexing methodology, then carry out a keyword/thematic analysis and lastly use Large Language Models (**LLMs**) trained on climate-related information to evaluate the quality and quantity disclosure effects of climate-related disclosures. In the rest of this section, we describe each of these textual analysis approaches, and their use in related research articles, to give an idea of how these may be implemented in this effectiveness evaluation.

Indexing

Several researchers and data sources use indexing methodologies to qualify and quantify climate and disclosure by using a checklist of binary indicators, essentially counting, or scoring elements of climate-related disclosures. For example, the Bloomberg disclosure scores essentially quantify disclosures through a checklist of datapoints that are or are not disclosed (Ioannou & Serafeim (2017); Grewal et al. 2019). In similar approach Fiechter et al. (2022) use some binary indicators, whether firms publish a CSR report, audit the CSR information and report in line with GRI or OECD guidelines. Kim et al. (2022) measure whether U.S. firms report on climate-related risks in the Management, Discussion and Analysis section of the 10-K report mandated by the U.S. Securities and Exchange Commission (**SEC**).

Most of these indexing methods however measure quantity of sustainability related disclosures rather than its true underlying quality (Leuz & Wysocki, 2016).

Keyword and Thematic analysis

Analysing textual disclosures using keywords and thematic analysis in not a new methodology, however its application to climate and broader sustainability-related disclosures is more recent. Many papers use such approaches to identify the quantity and quality of such disclosures and we will explore some of these approaches briefly.

Berkman et al. (2019) use a climate risk measure derived from SEC filings through the climate disclosure search tool from CERES and Cook ESG Research. Cook ESG Research develops their climate risk by first extracting excerpts related to climate risk using a keyword dictionary. They then give each excerpt a relevance score[13]. These excerpts are then aggregated to calculate a score for the entire report.

Marino and Caminero (2022) analyse a sample of European sustainability disclosures by developing a keyword-based index methodology. Essentially, they create a lexicon of words through expert analysis of a selection of disclosures, which allows them to score disclosures against the presence of 91 fine grained disclosure recommendations of the TCFD (making up parts of the 11 main recommendations).

[13] A detailed methodology of this proprietary approach does not seem to be available, but the search tool can be found here: https://www.ceres.org/resources/tools/sec-sustainability-disclosure-search-tool

Dong et al. (2023) develop a climate-change related vocabulary for each county (Australia, the UK, Canada, and the US) and each category of the TCFD, from a small training sample of firms' TCFD disclosures. The remaining disclosures are then scored based on the appearances of the relevant words (weights are adjusted for common and rare words).

Another approach, which may cope better than pre-selected key words is to use a keyword discovery algorithm, such as that proposed by King, Lam, and Roberts (2017). Sautner et al. (2023a) use this algorithm on earnings calls, which can proxy for analyst and management attention to capture exposure, measured as the proportion of conversation devoted to climate change associated opportunity, physical and regulatory shocks. These measures of real-world outcomes such as green patenting, overall innovation, cash holdings, emissions, carbon risk management, leverage, equity prices, option premiums, credit default swap rates and investment choices of responsible investment funds (Sautner et al., 2023a).

Large Language Models

Recent developments in textual analysis have shifted from traditional keyword and thematic methods, which are somewhat rudimentary, to more sophisticated Large Language Models (LLMs). This transition is driven by the need for a deeper, more nuanced understanding of patterns, categories, themes and trends. LLMs not only offer a granular level of analysis but also help mitigate biases inherent in earlier methodologies.

However, widely used general LLMs like OpenAI's ChatGPT and Google's BERT, while powerful, often fall short in specialised, technical fields such as climate-related disclosures (Varini et al., 2020; Webersinke et al., 2022). A promising solution involves pretraining these models on relevant climate-focused materials, enabling them to 'learn' and adapt to this specific type of text (Webersinke et al., 2022; Bingler et al., 2022; Kölbel et al., 2023).

Bingler et al. (2022a) and Bingler et al. (2022b) expand on the ClimateBERT model of Webersinke et al. (2022), which was training on over 1.6 million paragraphs, by finetuning it on more than 17,300 human-labelled sentences relative to TCFD disclosures and 300,000 general language sentences, all extracted from annual reports. Their work focuses on analysing sentiment, commitments, actions and specificity in climate-related disclosures to develop a 'cheap talk index' – a measure of vague versus specific climate commitments in these reports. Bingler et al. (2022a) test the impacts of the TCFD recommendations on climate-related disclosure in annual reports and find little evidence of an increase in reporting quality (decrease in cheap talk). Bingler et al. (2022b) use the same model and show that supporting the TCFD does improve reporting quality, while companies targeted by the Climate Action 100+ institutional investor engagement or that set Science Based Target initiative (SBTi) targets seem to reduce cheap talk in their disclosures.

Similarly, Kölbel et al. (2022) use various specifications of the ClimateBERT model to identify relative importance of climate in U.S. company 10-K reports and their effect on credit default swaps. More specifically, their model identifies the climate-relevant text resulting in a probability metric measuring the likelihood of the text being related to. Their approach includes identifying climate-relevant text and quantifying it through a probability metric, leading to an aggregated document score based on the prevalence of climate-related content.

Further advancing the application of LLMs, Brié et al. (2022) employed the ClimateBERT model to extract and analyse climate-related disclosures from European companies' annual reports. Their methodology,

integrating a Structural Topic Model, has illuminated how the NFRD has enhanced the disclosure and comparability of climate risks in these reports.

A recent innovation in this domain comes from Ni et al. (2023), who have developed a ChatGPT 4-based tool for analysing corporate sustainability reports. This tool, enriched by climate-specific training, expert input, and rigorous validity testing, mimics the analytical capabilities of human analysts, offering scoring and commentary aligned with TCFD recommendations. It also provides interactive features for querying reports.[14]

These LLM-based tools have been developed by an interdisciplinary team from the University of Zurich and the University of Oxford. Dr. Gehricke will collaborate with Professor Markus Leippold, one of the team leaders, during his sabbatical visit to the University of Zurich in 2024, to apply these tools in this evaluation.

Interestingly, some research has found that since the introduction of some of the above techniques, and specifically LLMs, the way reporting entities prepare filings has changed to mitigate linguistic tones that are unfavourably read by the algorithms (Cao et al., 2023). This indicates that there is a sort of race between those developing algorithms and those trying to report in a favourable way, which again highlights the need for mandatory disclosure with strong verification, assurance and enforcement practices.

Discourse Analysis

Although the textual analysis approaches described above have evolved significantly and allow the quantitative analysis of many climate-related disclosures, they can miss some of the qualitative nuance of such disclosures. Therefore, in this effectiveness evaluation of the Disclosure Framework we will also apply a discourse analysis approach, which will be developed during the 2024 calendar year to a selection of climate-related disclosures from New Zealand CREs.

Discourse analysis refers to a process that focuses not just on the use of language but also and perhaps more so focuses on the rules and practices that produce knowledge (Hall, 2001; Burrell, 1988). It involves addressing the conditions of possibility that enable phenomena and concepts to be discussed. This includes examining statements, the construction of knowledge and truths and the constitution of subject positions from which to speak. The discourse analysis of the climate disclosures will examine discursive formations. Discursive formations or commonly and widely used statements that appear in the reports, produce knowledge that is contingent and constituted by the historical, social and political landscape (Howarth & Stavrakakis, 2000). Therefore, this part of the overall project will explore the contingencies (Kendall & Wickam, 1999); that is things in relation to, rather than looking for essences or originalities. To explore the contingencies, the analysis will involve a wider view of the socio-political context (Foucault, 1995; Rabinow, 1991) of climate disclosures. Through this analysis the study will also examine the construction of legitimate positions constituted through the climate disclosures and how these impact on the way in which the organisation constitutes climate risk. Overall, the discourse analysis will provide a deeper understanding of the ways in which climate risks and other elements of climate disclosures are legitimated and become 'common knowledge.'

[14] The tool is available for free here: https://reports.chatclimate.ai/

6.4. SECONDARY DATA AND EMPIRICAL MODELS

Beyond the conclusions and insights, we can draw directly from the primary data we collect (as described above) the main empirical models we will design will follow Multiple Least Squared (MLS), Difference-in-Difference (**DiD**) and/or event study frameworks. These approaches allow us to explore how an event, in this case the Disclosure Framework, affects various variables and relationships between variables of interest.

We will measure business decision making, foresight and responsibility, and capital allocation related to climate-related risks and opportunities through various proxies, which may be sourced from the survey, interviews and textual analysis or secondary data sources.

The secondary data sources we will be exploring for the CREs that are issuers or corporates will include emissions data from sources such as Bloomberg, Toitū Envirocare, Refinitiv and companies' own reporting as well as net-zero and other targets, which companies have committed to. Beyond these we will also collect many more traditional financial and governance variables, as control or instrumental variables. By exploring such empirical relationships over time, we will be able to glean the effects that the Disclosure Framework has had on these key metrics.

For Investment Managers, which are both CREs and Primary Users, we will analyse portfolio holdings (sourced from Morningstar and the Company Registrar), investee company data (from Refinitiv and Bloomberg), and other pertinent disclosures. Collaborations with organizations such as MindfulMoney and Responsible Investment Association Australasia (RIAA) will enrich our dataset with further fund-level insights.

MLS serves as a robust statistical framework for this study, allowing us to examine the relationships between various data points and assess the efficacy of the Disclosure Framework. We plan to model relationships between dependent variables (such as a company's emissions or renewable energy investments) and multiple independent variables (like net-zero commitments or the quality of climate-related disclosures). This model will also incorporate dummy and interaction variables to dissect the Disclosure Framework's specific impacts.

DiD analysis presents another avenue, comparing the temporal changes in outcomes between groups subjected to the policy (treatment group) and those not (control group). This method helps isolate the policy's effect from other external influences. We envision several treatment scenarios, including contrasting New Zealand CREs with similar entities from Australia or other developed nations, which will require a careful matching procedure[15]. Another treatment approach involves dividing entities based on their participation in XRB's consultation and sensitization sessions, exploring how policy awareness and exposure influence CRS policy effectiveness. These two groups are predicated on the literature which highlights the importance of policy knowledge and exposure as an enabling factor in policy effectiveness (Radaelli, 1995) and allows us to quantitatively test if policy knowledge and exposure through the consultation and sensitization sessions has made a difference in the effect of the CRS policy on variables of interest. Further treatments could include splitting entities into mandatory and voluntary reporters, to

[15] In the context of Difference-in-Differences analysis for evaluating a climate-related disclosure mandate, matching techniques involve selecting companies from the control group that closely resemble those in the treatment group in terms of size, sector and pre-mandate disclosure practices.

compare those that engaged in voluntary reporting prior to the Disclosure Framework, to those that did not.

Lastly, the event study methodology will shed light on market reactions to the policy. By defining a specific event window around the policy announcement or implementation, we aim to contrast the actual stock performance of companies with their predicted performance, using models like the Capital Asset Pricing Model (Sharpe, 1964; Lintner, 1965). This approach focuses on identifying abnormal returns (positive or negative) attributable to the policy's influence.

7. INITIAL RESULTS OF THE BASELINE ASSESSMENT

To date the results of the three primary data analysis are at varying stages. The surveys and interviews were prioritised initially as these cannot be explored ex-post, unlike the archived disclosure documents and secondary data sources. The interview studies were completed first and the insights helped support the development of the survey. The survey is currently still open, but we provide some initial analysis of the results, mainly at a descriptive level. This dataset will be explored further after the survey closes at the end of January 2024. Lastly, the collection of all relevant climate and broader sustainability-related disclosures from 2015 to 2022 is completed, with a summary of the voluntary reporting landscape provided in this baseline assessment. The deeper analysis through textual and discourse analysis approaches (described in section 6.3) will be developed and implemented throughout 2024.

7.1. INTERVIEW RESULTS - READINESS

The findings from the interviews are split into two main areas. This first section explores the readiness of companies to disclose and what actions they are taking to be prepared for their disclosures in line with NZ CS. The second section reports on the responses related to impact of the reporting process and regulations, specifically the impacts on organisational decision-making and capital allocation.

There was a high level of knowledge of climate risk, disclosures and reporting amongst the majority of the interviewees. Most of the organisations had already pre-prepared themselves for the climate risk disclosures in the years preceding the mandatory regime, by using either an ESG or, more often, TCFD framework. For example, one participant described ESG frameworks as helping identify material risk for their investment funds. Others discussed drawing on the TCFD framework as a preparatory exercise before the XRB issued the NZ CSs and published accompanying guidance.

The NZ CSs were then seen as an extension to their previous work on the TCFD standards and most organisations were positive and accepting of the XRB climate-risk disclosure framework. Indeed, they felt ready to disclose based on their previous experience with the TCFD framework. Table 2 provides the two main ways that participants described the journey of reporting and their readiness for mandatory NZ CS reporting. It reports the different approaches that interviewee entities were taking to prepare for the Disclosure Regime.

Overall, many participants spoke positively about the XRB's Climate Standards. However, a small number were more critical of the many types of disclosures that are currently being developed. For example, an investment scheme manager also discussed the Government's proposed Modern Slavery Disclosures and stated that it was "getting a bit messy" with everyone stepping on each other's toes" (part 4).

In general, many of the investment schemes managers and the non-corporate issuing participants seemed to be further along the disclosure journey. In some cases, they had already worked to formally define aspects and develop a framework to integrate climate risk into their risk assessment process. Some had already developed their own ESG type measuring tools to assess investments. Some liked the scenario approach e.g. "the less it becomes, I suppose in my view the less it becomes about standards static, backward-looking carbon footprint, the better" (part 5a) and "getting consistent forward-looking data" (part 6). Some were critical of the narrative approach and wanted more robust data to model scenarios.

Some were open in their responses, e.g.

> *"…some elements are a bit pedantic and onerous, like you know, having to disclose every assumption in prose. Like I get why, like, I understand the intent, but you know, really the value is coming out of those insights that, you know, scenario analysis or the conversations internally behind the scenes…I think that's where the richness comes out. And that's where we actually start to think about our response to the climate. And, yeah, how we build a resilience… So we really want to be able to use the insights collected from this exercise and this disclosure and funnel those towards informing our approach going forward." (part 18)*

As well as being relatively aware of climate risks and taking them into account for investments, they also stated being worried about the inconsistency of the data for investment decision-making. One example of this was voiced by Participant 7 who was concerned about having "consistent comparable reports for end users."

Table 2: Interview Themes: Climate-related reporting preparation and process

Theme	Description and examples
Drawing on TCFD to understand climate risk disclosures and testing against the TCFD framework	TCFD provides the baseline work for the XRB reporting. Many participants discussed being on the TCFD journey and that TCFD provided a practice run. They saw the TCFD happening globally and therefore looked to that framework to get them started. For example: - "we started out on TCFD" (part 12) - "let's do a first crack TCFD reporting and understand what value it could add." (part 16) - "Embracing the TCFD guidelines" (part 17)
Undergoing trial runs	Some companies had undergone a trial run to understand how to develop disclosures in accordance with NZ CS. For example: - "And so knowing that was going to become regulation…was also a good hook into the organisation to get agreement to do it. And the idea is that we will run two or three years ahead of what would be regulatory requirements so that we could get ahead of the game, understand where the difficulties were, do our best to be compliant and an agile organization" (part 16) - "Having a dry run at it" (part 18) "readiness assessment as a game plan for how we would start"

Theme	Description and examples
	One company discussed creating an internal TCFD report that was not published externally as a trial run.
The learning journey	A group of participants talked about the reporting journey as an opportunity to learn. The attitudes are aptly summed up by these participant quotes: - "…well, we are still learning. We're all learning, so we don't know what good looks like until we've done so well... That's the journey you're on" (part 17) - Started like a research and development project (part 2)

Defining and understanding risk

Risk is already understood as a concept in organisations and most of the participants, particularly the corporate issuers, described climate risk as being another risk within their risk assessment process. As such, the disclosures generally were supported, because they were seen to add value by providing an understanding of climate change risk. In addition, the NZ CS were seen as a useful framing to help make sense of risks and to embed them into organizational strategic and operational decisions, as the following quote illustrates.

> *"I think the structure helps validate where those risks and opportunities are, how you think you may know them, but you actually step through is quite a strategic approach and you rate those risks and you understand those risks." (part 12)*

Risk assessment and management were often talked about in relation to the maturity of the business. Some participants talked about how sustainability was shifting into strategy and risk and understanding those risks to the business was part of "growing the maturity of the business" (part 14). This was in stark contrast to one of the participants who described their understanding of risk as

> *"We don't have a super sophisticated risk management approach in our company. Our risk management approach is very much on the basis that we have vast experience in what we do." (part 15)*

When asked further this participant stated that "…we care deeply about having a making a profit, and making a profit year after year that we can return to our shareholders and to basically run our company in a way that is responsible for the long term." They saw CRD as compliance and a tick box exercise and that they would get a consultant in to run the scenarios "because I do not want to be a part of it" and stated that it wasn't useful from their perspective.

Sometimes the risk was seen as not just to the company. One participant noted the transition risk to NZ Inc, e.g.

> *"…we would think a whole strategy is about looking to the transition New Zealand needs to make so we need to transform the economy we need to transition into new types of roles and we need to transform those industries probably through new technology and so the big transition risks we see not to ourselves but ultimately to the communities around social cohesion." (part 16)*

For some, transition risk was a new 'language.' Participants discussed that physical risk was language that was used and understood but they found the transition risks quite challenging to get their heads around as these risks were deemed to be vaguer than the identification of physical risks. This is perhaps speaking to the clarity that some of the participants were seeking.

Creating competencies for climate risk disclosures

Participants engaged in the research were mostly in a sustainability role or had roles as responsible investors in the organisations we contacted. They were all involved in the development of their organisation's climate-related disclosures. We did not specifically ask about capability and knowledge, but many of the participants raised issues around competencies for the reporting practice. Specifically, participants noted the capability for reporting and there was also much discussion about the use of consultants in CRDs.

Developing capability for disclosing

One participant stated that "the challenge is not to get people on board [with reporting disclosures], the challenge is resourcing" (part 6). Many participants recognised the importance of having the capability and expertise to be able to compile the disclosures. For example, the following participant notes the complexity of reporting and the level of knowledge required:

> *"…but we have to acknowledge that there are not that many experts in New Zealand who have experience to advise boards or build a trusted relationship with their clients in the space and maybe that's been a little bit of a blind spot of the XRB and that more people. I know, they did a great job of this, but you know, the timeline was there, but it takes people multiple years to understand the intricacies of the financial impacts of climate change. Absolutely. And we're pretty small like country." (part 7)*

In general, a number of ways were discussed in relation to developing the capability to be able to produce a report. These are summarised in Table 3.

One participant noted that the A-NZCS has brought about a specialisation in climate change roles in organisations. They stated: "So now just you can't just be just a climate guy. You kind of have to specialise sort of focus on I've found now a niche and helped me create a whole team, which is, which is a very big niche a team of three" (part 3). Another participant noted that "New Zealand does not have enough people skilled in climate reporting. And so that's creating a real crunch around things like assurance. So, we need to invest in upskilling people" (part 16). Indeed, having skills in the area can be an advantage as one participant pointed out that capability can be seen as attractive to clients -

> *"So therefore, you know, be proactive, it's obviously needing to look at the embodied carbon of your product. So therefore, be proactive. Because you have that sort of early mover advantage and not having to be reactive to changes but also being able to say to your client, hey, look, if you're worried about this thing, don't worry because we've got a category we know what we're doing." (part 19)*

Table 3: Interview Themes: Developing reporting capabilities

Theme	Description and examples
The Big 4 engaged to develop in-house capabilities	Some participants described the consultants as being brought into the process to complement the development of in-house capacity: - "Seemed like xx were quite advanced" (part 12) - "We won't have the capability in-house because we're talking about significant analytical analysis" (part 12)
Industry level to develop capabilities	The industry level was mentioned in two ways, both around the development of scenarios. First, industry associations and groups were being used to develop industry-level scenarios. While it was noted that it was useful to share ideas participants also found issues when integrating these industry scenarios into the specific context of their organisation. Or second, participants discussed sharing their scenarios with customers or clients or industry partners to ensure that they are consistent.
Partnerships across the business were created to developed capabilities	Many participants talked about working with other parts of the organization on the disclosures. This enabled them to extend their knowledge of climate risk through tapping into other areas in the business. For example: - Risk team + sustainability teams - Strategy and risk – sustainability - Finance department - Board-level conversations – legitimating the CRD process. Or Governance support – people on the board who are helping. - Legal team – ensure credibility of the information reported.
Developing whole of business understanding and capabilities for climate risk disclosures	The final method of capability development discussed by participants was that of creating capabilities and understandings across the whole organisation. The following quotes illustrate how participants discussed this: "the strategy team now take ownership of the entire climate area" (part 2) (away from the sustainability team). This participant also mentioned the company developing an Executive Climate Change Steering Committee. "one of the core functions of our team is that of training and capability uplift across all" (part 3) Participants also discussed how the standards force their departments to communicate about climate risk across the organisation. For example, one participant discussed "building skills and capacity" as part of "raising the literacy of the business" to "speak different languages to make it relevant across the business" (part 9).

Engaging and using consultants

As well as developing capability, for many of the participants, there was a reliance on the 'Big 4' accounting firms to help develop and write the climate disclosures. Very few participants had not engaged a consultant for some and most often all the disclosure. Table 4 outlines the main ways that participants spoke about engaging with consultants.

Table 4: Engagement (or not) with consultants

Theme	Description and examples
Industry norms	Others in the same industry had used the same consultants and so they thought that the consultants would have useful knowledge to help.
Providing the detail required for the disclosures	Used the consultants to provide a baseline document and add the relevant and necessary details.
Partnership with consultants	Sometimes they had used them for other consultancy work and then got them to do this too. (part 1)
Working without consultants	One participant noted that it was part of their culture to not work with consultants and stated that they "had a crack at it ourselves" (part 14). Later in the interview they stated that they would get consultants to take a look over their workings and their insurance company to check the identified physical risks. Another participant stated that they did not work with consultants because they were big enough to resource the process and would know the business better than consultants. Some participants questioned whether the 'Big 4' would even have the required experience. For example, one participant asked "do they know what to do" while another participant noted that "it's a money-making machine for the Big Four Consultancy Firms" in relation to the development of scenarios.

7.2. INTERVIEW RESULTS – IMPACT ON DECISIONS

When organisations were asked if the NZ CS process had impacted their decision making or capital allocation the majority replied that they did not know yet as they were too early into the process.

A small number of interviewees indicated they would be treating the mandatory climate reporting as a compliance exercise, and it would not have any impact on decision making or

capital allocation. These participants were from a variety of backgrounds, some had competing priorities such as global supply relationships or recovering from external event impacts, while others were finding the process cumbersome. For example:

> *"So you talk to the chair and CE and management, very passionate about climate change or shows really wanting to get take action on it. Utterly convinced that it's the most important thing that is that is impacting our business. But this is seen as another compliance exercise and in the context of many at the moment, and because we are a listed company, we have an extra sort of compliance, I guess, or reporting burden on us that the others don't and we're smaller, so it's harder for us. (part 1)*

> *"You know what, it's a compliance exercise. For in the first kind of instance, you know, there's timeframes. There's certain things you need to deliver on there's objectives, but I think we're really trying to see the silver lining to that and how do you actually deliver the compliance objective but add value back into the business around embedding those that kind of thinking, building the capability of not just the sustainability and the risk team but the other kinds of groups who have touchpoints with this kind of work." (part 18)*

One company discussed how it was critical for the climate-related disclosure process to not be seen as compliance. This was because the data is seen as useful for decision-making and capital allocation, which was the next step in their reporting and embedding journey. For example:

> *"…it is definitely more than a compliance exercise. The compliance part is boring. In all honesty, what it has done is… it has provided us with a condensed disclosure for corporate strategy. So TCFD documents become the forward-facing strategy document. We don't have corporate strategy apart from that." (part 2)*

Another participant points out the way in which the disclosures were forcing a change of thinking and embedding this across the entity:

> *"What it does is it forces an organisation to think differently and more long-term about the risks that it's facing. And it's working a muscle that we previously perhaps hadn't worked as much because, you know… risk terms are very specific, very prescribed, and they're kind of forced into siloed thinking. This whole climate risk thing has sort of forced us to kind of start, you know, opening our office doors and talking to other people across the island thinking about, you know, playing things around using the scenario analysis thing." (part 3)*

In contrast, some investment companies asked why New Zealand is leading the world in this. They pointed to using guidance from the EU or ISSB e.g. "it's adding a lot of regulatory cost and actually not changing the real-world emissions" (part 7). But then later in the interview, this participant added:

> *"…and I personally am really into the idea of New Zealand being like a beacon for the world. Not at the expense of an everyday person…Like I'm not saying you should reduce the value or*

the returns that they can be getting. Because money and dignity plays such a huge role on somebody's life and these are public servants and I understand the conversations around just transition."

Overall, a small number of interviewees identified that the Disclosure Framework supports existent decision-making, but the entity's decision-making was heading in the direction of the decarbonisation pathway and that NZ CS helped with that path. For example:

"I think there was a real business focus on climate change at the beginning of this year following the flooding, which I think they worked hand in hand because we were the rest of business was saying what are we doing about climate change risks? And because we had disclosed our risks for the past two years and had started thinking about what we do to respond to those risks. We were able to have a really informed discussion on that. Yeah. And it's, it hasn't necessarily changed our decision-making yet. Yeah, but I expect it will." (Participant 20)

In these cases, the climate reporting regime often acted as a justification for conversations regarding prioritising decarbonisation to occur as macro factors such as global trends, conversations, public, regulatory, and investor scrutiny had already prompted the process.

"Yeah, the thing is the thing is it like a parallel track? It really doesn't because it was already happening anyway. So our decision-making is impacted by our conversation about climate change as much as what's happening on the ground, cyclone Gabrielle, for instance .... So it's those conversations that are actually driving the thinking about climate change. As much as my reporting and the two are interlinked. They're like they're not separate. They're interlinked." (participant 17)

"What's been really interesting though, is that despite just being somewhat dragged to, to this topic, the upside of it is that it's given us an opportunity to raise it with the board, to have these sorts of discussions in an open way." (participant 15)

In terms of capital allocation, many participants stated that this process has not been impacted by the reporting process yet. How organisations treat capital allocation because of the decarbonisation pathway has seen asset managers build their portfolios differently; some have adopted carbon budgeting, increased carbon targets, or complete divestment from carbon-intensive assets.

Other organisations have already invested capital into trial projects to establish if a commercial opportunity is present in the decarbonisation of certain business activities. However, these actions have not been prompted by the CRD regime.

"It has set us up for strong conversations to reallocate capital. I wouldn't say it's reallocated capital yet, but it has heightened the responsibility of the board to ask questions around

capital allocation and request stronger metrics for them to understand how capital is allocated today." (participant 7)

7.3. SURVEY RESULTS

In this section we provide some preliminary analysis of the survey responses received by 10 January 2024. In total, 69 respondents have filled in the survey and Table 5 gives a summary of the respondent sample. The sample has a good distribution of climate-reporting entities (voluntary and mandatory) and primary users, with most respondents holding middle or top management roles within the responding entity. Most (68%) have signed up to a climate initiative (such as the United Nations Principles of Responsible Investment). The size of responding entities also shows a good distribution around the median AUM between $1 billion and $20 billion.

Although most of the insights from survey, into the main research questions (see Section 6) and supplementary research question (see Appendix 2), will be more meaningful once the second survey in 2025 is completed, in this section we provide some initial insights from this baseline survey.

Table 5: Survey Respondent Summary Statistics

Organisation Type	Freq	%
CRE/CFI Only	34	49%
VRE Only	4	6%
PU Only	6	9%
Both CRE/CFI and PU	21	30%
Both VRE and PU	5	7%
Total	**70**	
Investor	25	36%
Creditor	7	10%
Insurer	3	4%
Corporate	35	50%
Total	**70**	

Respondent Position	Freq	%
Lower/operating management	8	11%
Middle management	33	47%
Top management	27	39%
Governance-level	2	3%
Total	**70**	

Climate Initiative Signatories		
No	22	31%
Yes	48	69%
Total	**70**	

Assets under management (Investors)	Freq	%
Less than NZD100m	0	0%
NZD100m to 500m	5	20%
NZD500m to 1b	3	12%
NZD1b to 20b	13	52%
NZD20b to 50b	3	12%
More than NZD50b	1	4%
Total	**25**	

Total Assets (Non-Investors)	Freq	%
Less than NZD100m	3	7%
NZD100m to 500m	5	11%
NZD500m to 1b	5	11%
NZD1b to 20b	29	64%
NZD20b to 50b	0	0%
More than NZD50b	3	7%
Total	**45**	

Voluntary Disclosure Motivations, Practices and Effects

Of the 70 responding entities, 31 had claimed to voluntarily disclose on their climate-related risks and opportunities before the 2023 financial year. Table 6 below shows a breakdown of these early reporters.

It is worth noting that most of the early reporters are predominantly made up of CREs, which indicates these entities are preparing for climate-related disclosures in line with the findings of the interviews. However, half of the respondent CREs have not reported on climate risks and opportunities prior to the mandatory regime. This also broadly aligns with the voluntary disclosure stock take, presented in section 7.4, indicating no early reporter response bias in the survey.

Table 6: Early Reporting Entities

Table 6 shows a breakdown of responding entities with respect to their early reporting status, that is an early reporting entity is one which responded stating they have made voluntary climate-related disclosures before the 2023 financial year.

Type of Entity	Reporting Status	Frequency	%
Climate Reporting Entity or Crown Financial Institution	Early reporter	29	41%
	Non-early reporter	26	37%
Voluntary reporter	Early reporter	2	3%
	Non-early reporter	7	10%
Primary User only	Non-early reporter	6	9%
Total		70	

Table 7 shows a summary of the early reporter practices and approaches to climate-related reporting. Most of these early reporters started to provide such disclosures within the last 3 years, in line with findings from the literature (see section 5) and our voluntary disclosure stock take (see section 7.4).

Most of these respondents were driven by the benefits to the entity such as to demonstrate responsibility, improving their strategy and risk management as well as reputational benefits. This may be an initial indication that these voluntary reporters are integrating climate-related risks and opportunities into their entity decision making and capital allocation, in line with the purpose of the Disclosure Framework. Some of the motivations highlighted in the literature, such as attracting capital, primary user pressure, industry peer pressure and legal action were much less prevalent. For corporate respondents demonstrating responsibility was by far the most common motivation for early reporting, while non-corporates (Primary Users and Insurers) were also motivated by climate risk integration.

Further, most of the responding early reporters did not receive feedback on improving their climate-related disclosures, while a small number received feedback from International and New Zealand investors and more often from other stakeholders. Only three early reporters, which are all institutional investors, received feedback from local or international standard setters.

Table 7: Early Reporting Practices

Table 7 shows a summary (number and proportion) of responses of the 30 entities that have been voluntarily disclosing on climate-related risks and opportunities. The first panel presents when these entities started their voluntary disclosures. The second panel summarises the motivations for the voluntary disclosure. The next panel presents the responses to their experience with feedback from potential users of the disclosures. The last panel presents what these entities have done to improve the quality of their Climate-Related Disclosures.

Financial year of first report	Frequency	%
Before 2018	1	3%
FY 2018	1	3%
FY 2019	2	6%
FY 2020	8	26%
FY 2021	11	35%
FY 2022	8	26%
Total	31	

Voluntary climate-related reporting motivation	Non-Corporate		Corporate		Total	
	Freq	%	Freq	%	Freq	%
To demonstrate corporate social responsibility and environmental stewardship	10	91%	18	90%	28	90%
To integrate climate risks and/or opportunities into our entity's strategy	10	91%	11	55%	21	68%
For potential reputation benefits	9	82%	10	50%	19	61%
To improve risk management	7	64%	10	50%	17	55%
To avoid the time pressure and high costs associated with late adoption	4	36%	11	55%	15	48%
To gain a competitive advantage	5	45%	8	40%	13	42%
Pressure from global sustainability or ESG initiatives	2	18%	10	50%	12	39%
To attract capital inflows	3	27%	6	30%	9	29%
Pressure from industry peers or competitors	4	36%	2	10%	6	19%
To enhance employee motivation	2	18%	2	10%	4	13%
Pressure from users	2	18%	2	10%	4	13%
Concerns about potential legal action	1	9%	2	10%	3	10%
Other	1	9%	1	5%	2	6%
Total	**11**		**20**		**31**	

Received feedback or suggestions for improvement on CRD from						
	Freq	%	Freq	%	Freq	%
None	6	55%	13	65%	19	61%
Other stakeholders	4	36%	4	20%	8	26%
NZ investors	0	0%	4	20%	4	13%
International investors	1	9%	2	10%	3	10%
International standard setters	2	18%	0	0%	2	6%
New Zealand standard setters	1	9%	0	0%	1	3%
Total	**11**		**20**		**31**	

Measures taken to increase quality & reliability of climate-related disclosures	Non-Corporate		Corporate		Overall	
	Freq	%	Freq	%	Freq	%
We have participated in sector-level climate scenario analysis	9	82%	18	90%	27	87%
We have implemented processes on regularly informing the governance body on climate risks and/or opportunities	7	64%	15	75%	22	71%
We have defined roles and responsibilities for the management of climate risks and/or opportunities	8	73%	13	65%	21	68%
We have integrated climate risks and/or opportunities within our overall strategy	7	64%	14	70%	21	68%
We have hired climate-related disclosure experts	3	27%	14	70%	17	55%
We have obtained limited assurance over our GHG emissions disclosures	5	45%	9	45%	14	45%
We have added to our data and information internal audit processes	7	64%	6	30%	13	42%
We have built capacity on climate risk and/or opportunity identification and management via external training	4	36%	9	45%	13	42%
We have obtained reasonable assurance over our GHG emissions disclosures	2	18%	10	50%	12	39%
We have incorporated climate risks and/or opportunity-related metrics and targets into remuneration policies	2	18%	10	50%	12	39%
We have made changes to the governance body to ensure that it possesses the skills & competencies to effectively oversee climate risks and/or opportunities	4	36%	6	30%	10	32%
Other	0	0%	0	0%	0	0%
None	0	0%	0	0%	0	0%

The last panel of Table 7 shows which measures the early reporting entities have taken to improve the quality and reliability of their climate-related disclosures. The most common response was that entities participated in sectoral collaborations on scenario development, which was strongly supported and encouraged by the XRB. Most entities were also integrating climate change into their overall strategy, adjusting governance practices and building capability. One difference in corporate and non-corporates is how they have increased their internal capabilities, many corporate early-reporters have hired climate-related disclosure experts bringing in expertise, while non-corporates added to data and information audit processes instead. Corporate early reporters are also integrating climate performance into their remuneration policies. Most of the early reporters have had their emissions disclosures assured with either limited (47%) or reasonable (37%) assurance, but reasonable assurance is more common in corporate entities.

Table 8 explores the responses of early reporters on the effect of the Disclosure Framework on entity decision making, when asked directly. Interestingly the average response suggests that early reporters view the impact of the disclosure framework as having some impact overall and that the impact is highest for disclosure practices and transparency as well the integration of climate risks into decision making. This is an early indication that the Disclosure Framework may already have some effect in line with its purpose. The least impacted type of decision is in the implementation of adaptation and resilience, but this is driven by the non-corporate responses and for corporates this is still impacted.

Table 8: Effect of Disclosure Framework on Decision Making

Table 8 shows the mean response to the question on the impact of the Disclosure Framework on entity decision making for early reporting entities. Firstly, broadly across internal decision making and then more specifically in areas of decision making where climate and sustainability risks may be important. The table shows the mean of the response values from the question using a 0-10 scale (0 = no impact at all; 10 = significant impact). ***, **, and * represent the significance at the 1%, 5%, and 10% levels respectively for the mean difference tests.

	Non-Corporate	Corporate	Difference	All
General effect				
Internal decision-making processes and strategies related to climate change	5.4	5.1	0.26	5.2
Areas of effect				
Disclosure practices and transparency	6.3	6.7	-0.35	6.5
Integration of climate considerations into decision-making	5.4	5.3	0.15	5.3
Stakeholder engagement and collaboration, for addressing climate-related concerns and developing collaborative solutions	4.6	5.1	-0.45	4.9
Adoption of more sustainable business practices	4.6	4.3	0.35	4.4
Implementation of carbon reduction initiatives	4.4	4.3	0.10	4.3
Integration of climate-related considerations into product and service offerings	4.1	4.1	0.00	4.1
Implementation of climate change adaptation and resilience measures (e.g., infrastructure improvements, diversification of supply chains)	1.9	5.1	-3.20***	4.0

Need for Climate-related Disclosures

We asked respondents about the importance of climate-related risks in their decision making. Table 9: shows that although, on average, financial risks are still seen as the most important risk, climate-related physical and transition risks are not far behind. Financial risks and transition risks are significantly more important to early reporting CREs. In terms of timing of climate-related risks, it seems they have been somewhat important over the last 5 years, but are now very important over the last year, next year and next 5 years. Expectedly, early reporters have placed more importance on climate risk in the past and the near future, however importance of these risks aligns for the horizon over the next five years.

Further, Table 9 shows that non-corporates (Primary Users and Insurers) see that social issues are the most important among the ESG themes and climate change is the most important environmental issue by far, in their capital allocation decision making. Interestingly early reporters place much higher priority on Environmental issues relative to social issues and to late reporters. Perhaps this will change in the 2025 after the Disclosure Framework has taken full effect.

Table 9: Importance of Climate-related Risks and Opportunities

Table 9 shows the average (mean) results for several parts of the survey related to the importance of climate-related risks and opportunities in entities' decision making. The first and second panels explores the relative importance of climate, environmental and financial risks. Both panels use a 5-point Likert scale where a

response can range from 1 = completely unimportant to 5 = extremely important. ***, **, and * represent the significance at the 1%, 5%, and 10% levels respectively for the mean difference tests. The last panel presents the mean points (100 to allocate) that primary users allocated to the E, S and G themes, as well as the allocation to issues within the E theme, in the importance to their capital allocation decisions.

Importance in Decision-Making	**Non-Corporate**	**Corporate**	**All**
Financial risk	4.5	4.4	4.4
Climate-related physical risk	4.1	4.3	4.2
Climate-related transition risk	4.1	4.3	4.2
Other environmental risk	3.8	3.9	3.8
Climate-related liability risk	3.9	3.6	3.7
Past 5 years	3.4	3.6	3.5
Last year	4.1	4.3	4.2
Next year	4.2	4.5	4.3
Next 5 years	4.6	4.7	4.7

Importance in Decision-Making	**Early Reporter**	**Late Reporter**	**Difference Early vs Late**	**All**
Financial risk	4.7	4.2	0.43**	4.4
Climate-related physical risk	4.3	4.1	0.23	4.2
Climate-related transition risk	4.5	3.9	0.51***	4.2
Other environmental risk	3.9	3.6	0.27	3.8
Climate-related liability risk	3.8	3.7	0.11	3.7
Past 5 years	3.8	3.2	0.59***	3.5
Last year	4.4	4.0	0.36*	4.2
Next year	4.5	4.2	0.27*	4.3
Next 5 years	4.7	4.6	0.14	4.7
Point Allocation – ESG (Non-corporate entities)	**Early Reporter**	**Late Reporter**	**Difference Early vs Late**	**All**
Environmental	39.05	27.83	11.21*	32.22
Environmental - Climate Change	25.70	20.88	4.82	20.31
Environmental - Pollution & Waste	5.87	4.00	1.87	4.40
Environmental - Natural Capital	2.83	5.54	-2.71	6.60
Environmental - Opportunities	6.93	2.50	4.43	4.52
Social	26.19	41.33	-15.14*	35.56
Governance	34.76	30.83	3.93	32.22

In Table 10 we present results around respondents' views on issues and satisfaction with current climate-related disclosures, which further highlight the importance of mandatory climate-related disclosures. In the first panel we can see that overall respondents currently struggle to compare and analyse climate-related information and that they expect the Disclosure Framework to improve comparability and provide financially material information. Further, non-corporate respondents (primary users and insurers) find it challenging to compare information produced by varying reporting frameworks and believe that they should demand disclosure from their investees, borrowers or insurees, although the latter is much more aligned with non-corporates, which have reported before 2023 (Early Reporters). The second panel shows that non-corporates (Primary Users and Insurers) do not see New Zealand or international entities' disclosures as satisfactory, but all respondents find climate-related disclosures somewhat useful in evaluating and assessing climate-related risks and opportunities.

Table 11 highlights the challenges respondents are facing when preparing climate-related disclosures. The most common challenges are lack of reliable and comparable data (81%) and the cost of preparing disclosures (75%). Mandated climate-related disclosures may be able to help address both challenges, as the benefits of scale of climate-related data, consulting and assurance industries materialise. The next most common challenge is the difficulty in aligning with multiple standards (50%), which is also partially solved when one standard is mandated. Developing or using scenarios (47%), lack of capability (42%) and integrating climate risks into risks assessment (41%) are also common. Surprisingly, revealing commercially sensitive information and lack of leadership support were not very common challenges. Overall, late reporters, those that have not disclosed before the mandatory period, are more often facing the challenges and particularly in uncertainty around regulatory frameworks. Non-corporates (primary users and insurers) are facing more challenges except for the challenge of revealing commercially sensitive information, relative to corporate respondents.

Table 12 shows that all the sections of NZ CS are, on average, seen as important or extremely important in the decision making of respondents. Corporates place higher importance on all areas of climate-related disclosures compared to Non-Corporates and Early Reporters also place higher importance. Looking at the Resource allocation and Priority given to different components of climate-related disclosures by early reporters, the strategy related components seem to be the highest priority, followed by metrics and targets. This could be expected as these components require complex estimations and data sourcing, while governance is more about implementing policies and processes.

Overall, the importance of climate-related risk and opportunities, together with the issues in current disclosures and the challenges faced by reporting entities, highlights the need for the Disclosure Framework, which respondents view as improving comparability and providing financially material information.

Table 10: Issues and Satisfaction with Climate-related disclosures

Table 10 shows the average (mean) results for the agreement with several statements related to the issues with current climate-related information and the impact of climate-related disclosures (first panel) and Primary User and Insurer satisfaction with aspects of climate-related disclosures of New Zealand and international entities. The last panel presents respondents view on the usefulness of climate-related disclosures. These averages are the average of 5-point Likert scale question responses, where responses range from 1 = strongly disagree) to 5 = strongly agree. ***, **, and * represent the significance at the 1%, 5%, and 10% levels respectively for the mean difference tests.

Agreement with the statement	Non-Corp	Corporate	Difference	All
We find it challenging to compare and analyse climate-related information from organisations using varied reporting frameworks or standards	4.0			
Investors, lenders or insurers should demand that portfolio entities disclose their exposure to climate risks and/or opportunities	3.9			
The XRB's Aotearoa New Zealand Climate Standards enhance comparability of climate-related reporting across NZ entities	3.7	3.7	-0.06	3.7
The information required by the XRB's Aotearoa New Zealand Climate Standards affects the financial valuations of NZ entities	3.2	3.3	-0.11	3.3

Investees', borrowers' or insurees' firm-level quantitative information on climate risks and/or opportunities is sufficiently precise	2.4
Climate-related disclosures are currently sufficiently informative regarding investees', lenders' or insurees' climate risks and/or opportunities	2.4

Agreement with the statement	**Early**	**Late**	**Difference**	**All**
We find it challenging to compare and analyse climate-related information from organisations using varied reporting frameworks or standards	4.0	4.0	0.00	
Investors, lenders or insurers should demand that portfolio entities disclose their exposure to climate risks and/or opportunities	4.5	3.4	1.16***	
The XRB's Aotearoa New Zealand Climate Standards enhance comparability of climate-related reporting across NZ entities	3.8	3.7	0.11	3.7
The information required by the XRB's Aotearoa New Zealand Climate Standards affects the financial valuations of NZ entities	3.2	3.4	-0.20	3.3
Investees', borrowers', or insurees' firm-level quantitative information on climate risks and/or opportunities is sufficiently precise	2.1	2.4	-0.30	
Climate-related disclosures are currently sufficiently informative regarding investees', lenders' or insurees' climate risks and/or opportunities	2.1	2.4	-0.35	

Satisfaction with CC information disclosed	**Early**	**Late**	**Difference**	
NZ entities – reliability	3.1	2.8	0.31	
NZ entities – quality	3.0	2.9	0.06	
NZ entities – usability	2.9	2.9	0.02	
Non-NZ entities - reliability	3.2	2.8	0.40*	
Non-NZ entities – quality	3.2	2.8	0.35*	
Non-NZ entities – usability	3.0	2.8	0.22	
Usefulness of climate-related disclosures	**Early**	**Late**	**Difference**	**All**
Evaluating long-term sustainability & resilience	3.7	3.7	-0.05	3.7
Assessing potential regulatory risks or compliance issues associated with climate change	3.4	3.6	-0.22	3.5
Assessing financial risks and opportunities associated with climate change	3.5	3.4	0.09	3.4

Table 11: Challenges with Climate-related Disclosure

Table 11 presents the proportion of respondents (CREs and voluntary reporters), which identified the respective challenge with preparing climate-related disclosures. The reasons given in the "other, please state" response were: *"Just carbon foot printing", "Isolating climate change impacts", "measuring scope 3 emissions", "The process has been unduly hasty - the regulations were issued three months before the first reporting period*

started." and *"Scenario work is too vague to be useful. From an MIS perspective, data is poor for global portfolios and investment risk from climate change is low."*

CRD Challenges	Non-Corporate	Corporate	All
Lack of reliable and comparable data	83%	80%	81%
Cost or resource burden of preparing the disclosures	79%	71%	75%
Aligning with multiple reporting frameworks or standards	55%	46%	50%
Uncertainty surrounding regulatory frameworks & policies	55%	40%	47%
Developing or using climate scenarios	48%	43%	45%
Inadequate capabilities within the organisation for assessing climate risks and/or opportunities	48%	37%	42%
Integrating climate change considerations into existing risk assessment processes	55%	29%	41%
Identifying risks and opportunities posed by climate change	48%	23%	34%
Revealing commercially sensitive information	17%	34%	27%
Lack of stakeholder demand or interest	24%	17%	20%
Lack of support from the board or senior management	10%	3%	6%
Other	21%	14%	17%

CRD Challenges	Early Reporter	Late Reporter	All
Lack of reliable and comparable data	77%	85%	81%
Cost or resource burden of preparing the disclosures	74%	76%	75%
Aligning with multiple reporting frameworks or standards	48%	52%	50%
Uncertainty surrounding regulatory frameworks & policies	29%	64%	47%
Developing or using climate scenarios	42%	48%	45%
Inadequate capabilities within the organisation for assessing climate risks and/or opportunities	32%	52%	42%
Integrating climate change considerations into existing risk assessment processes	35%	45%	41%
Identifying risks and opportunities posed by climate change	29%	39%	34%
Revealing commercially sensitive information	29%	24%	27%
Lack of stakeholder demand or interest	13%	27%	20%
Lack of support from the board or senior management	10%	3%	6%
Other	16%	18%	17%

Table 12: Importance, Effort and Priority of Climate Disclosure Components

Table 12 shows the average (mean) results for the importance of components of NZ CS on a 5-point Likert scale where responses an range from 1= completely unimportant to 5 =extremely important. Further the average effort and priority of each component are given for early reporting entities, also using a 5-point Likert scale. ***, **, and * represent the significance at the 1%, 5%, and 10% levels respectively for the mean difference tests.

		Governance		Strategy					Risk Management	Metrics and Targets		
		Governance body oversight	Management role	Current impacts and financial impacts	Scenario analysis undertaken	Climate risks and/or opportunities	Anticipated & financial impacts	Transition plan aspects		Metrics	Targets	GHG emissions
Importance to Decision Making	Non-Corporate	3.9	3.9	3.8	3.5	4.0	3.9	3.7	4.1	3.6	3.8	3.7
	Corporate	4.2	4.1	4.2	3.9	4.2	4.1	4.1	4.0	3.8	4.0	4.1
	Difference	-0.37**	-0.26	-0.40*	-0.34*	-0.20	-0.17	-0.37*	0.06	-0.20	-0.23	-0.43**
	Early Reporter	4.2	4.1	4.1	3.6	4.2	4.1	3.9	4.1	3.8	4.1	4.1
	Late Reporter	4.0	4.0	4.1	3.8	4.1	4.0	3.8	4.0	3.5	3.6	3.8
	Difference	0.19	0.10	0.00	-0.17	0.13	0.09	0.05	0.06	0.32	0.52**	0.31
	All Early Reporters	4.0	4.0	4.0	3.7	4.1	4.0	3.9	4.0	3.7	3.9	3.9
Effort & Resources Required												
	Non-Corporate	5.0	4.5	7.0	8.2	7.0	8.1	7.1	4.9	6.8	5.9	7.0
	Corporate	4.4	4.2	6.9	7.2	6.4	8.2	7.1	4.9	5.7	5.9	6.7
	Difference	0.60	0.30	0.11	1.05	0.65	-0.10	0.00	0.05	1.10	0.05	0.35
	All Early Reporters	4.6	4.3	6.9	7.5	6.6	8.2	7.1	4.9	6.1	5.9	6.8
Priority Given												
	Non-Corporate	6.3	6.4	6.8	7.3	7.8	6.9	7.0	6.4	7.1	7.3	7.5
	Corporate	5.8	5.5	6.1	6.9	7.4	6.9	6.3	6.3	6.1	6.4	7.1
	Difference	0.50	0.95	0.68	0.40	0.40	0.04	0.70	0.15	1.05	0.90	0.45
	All Early Reporters	6.0	5.8	6.3	7.0	7.5	6.9	6.5	6.3	6.4	6.7	7.2

Emissions Data Estimation and Engagement

Table 13 summarises the scope of emissions measurement and estimation of the responding entities. We can see that at the time of this baseline assessment most respondents are measuring Scope 1, Scope 2 and upstream Scope 3 emissions, while just under half are measuring downstream Scope 3 emissions. Only four entities (all investors) do not measure their emissions at all. Corporate entities are estimating emissions at a higher rate across all categories, except as expected Scope 3 emissions from downstream investments, which non-corporates estimate more often. Early Reporters are measuring emission far more across all categories with almost all of them measuring scope 1 (94%), scope 2 (90%) and upstream scope 3 emissions (90%).

Table 13: Emission Measurement and Estimation

This table shows a summary (number and proportion) of respondents which estimate the different scopes of GHG emissions.

Scope of Emissions Estimated	Non-Corporate		Corporate		Overall	
	Freq	%	Freq	%	Freq	%
Emissions we generate directly (Scope 1)	26	74%	31	89%	57	81%
Emissions from purchased electricity (Scope 2)	23	66%	31	89%	54	77%
Upstream Scope 3 emissions	19	54%	30	86%	49	70%
Scope 3 emissions from downstream investments	20	57%	13	37%	33	47%
Other downstream Scope 3 emissions	8	23%	18	51%	26	37%
None	4	11%	0	0%	4	6%
Total	**35**		**35**		**70**	

Scope of Emissions Estimated	Early Reporter		Late Reporter		Primary User Only		Overall	
	Freq	%	Freq	%	Freq	%	Freq	%
Emissions we generate directly (Scope 1)	29	94%	24	73%	4	67%	57	81%
Emissions from purchased electricity (Scope 2)	28	90%	23	70%	3	50%	54	77%
Upstream Scope 3 emissions	28	90%	19	58%	2	33%	49	70%
Scope 3 emissions from downstream investments	18	58%	14	42%	1	17%	33	47%
Other downstream Scope 3 emissions	12	39%	13	39%	1	17%	26	37%
None	0	0%	2	6%	2	33%	4	6%
Total	**31**		**33**		**6**		**70**	

One of the assumptions within the theory of change (see Figure 3 in section 5.4) is that when large corporates and non-corporates are asked to disclose on climate related risks and opportunities, this will lead to their engagement across their value chain to gather information for estimation of, for example, Scope 3 emissions.

Table below shows that about half of the respondents requested Scope 1 and 2 emissions information, but this is higher for Corporates and Early Reporters. Beyond Emissions information, Non-Corporates and Late Reporters seem to request climate related information more often.

Table 14: Requests of Value Chain Climate-related information

Table 14 shows a summary (number and proportion) of respondents which requested different types of climate-related information from their investees, borrowers, insurees, customers and/or suppliers, as appropriate for Investors, Creditors, Insurers and Corporates, respectively.

Climate Change Related Information	Non-Corporates		Corporates		Overall	
	Freq	%	Freq	%	Freq	%
Scope 1 emissions	17	49%	25	71%	42	60%
Scope 2 emissions	16	46%	22	63%	38	54%
Scope 3 emissions	13	37%	13	37%	26	37%
Climate-related targets and progress	15	43%	9	26%	24	34%
Transition plans	12	34%	4	11%	16	23%
Other climate relevant information	8	23%	7	20%	15	21%
Do not ask	9	26%	6	17%	15	21%
Assets exposed to climate risks and/or opportunities	9	26%	1	3%	10	14%
Adaptation plans	5	14%	5	14%	10	14%
Capital deployed toward mitigating climate risks and/or taking advantage of opportunities	7	20%	2	6%	9	13%
Internal carbon price	1	3%	1	3%	2	3%
Climate-related remuneration	2	6%	0	0%	2	3%
Total	**35**		**35**		**70**	

Climate Change Related Information	Early Reporter		Late Reporter		Primary User Only		Overall	
	Freq	%	Freq	%	Freq	%	Freq	%
Scope 1 emissions	20	65%	17	52%	5	83%	42	60%
Scope 2 emissions	17	55%	16	48%	5	83%	38	54%
Scope 3 emissions	11	35%	11	33%	4	67%	26	37%
Climate-related targets and progress	9	29%	10	30%	5	83%	24	34%
Transition plans	6	19%	8	24%	2	33%	16	23%
Other climate relevant information	7	23%	8	24%	0	0%	15	21%
Do not ask	7	23%	8	24%	0	0%	15	21%
Assets exposed to climate risks and/or opportunities	4	13%	5	15%	1	17%	10	14%
Adaptation plans	2	6%	7	21%	1	17%	10	14%
Capital deployed toward mitigating climate risks and/or taking advantage of opportunities	4	13%	5	15%	0	0%	9	13%
Internal carbon price	1	3%	1	3%	0	0%	2	3%
Climate-related remuneration	1	3%	0	0%	1	17%	2	3%
Total	**31**		**33**		**6**		**70**	

Investor practices and motivations

As the last part of our analysis of the survey respondents, Table 15 summarises responses around investor practices and motivation for incorporating climate-related risks and opportunities. First, most investors have a high proportion of their AUM that consider climate change, although one investor does not consider climate change and a few only have a small proportion of AUM that consider climate change. The most common response is that 100% of AUM consider climate change. Typical holding periods for investors vary, with most stating they decide this on a case-by-case basis. The most important reasons, on average, for integrating climate change considerations in investment decisions were both value and values based, while the fiduciary duty or legal obligation were seen as less important. The most common responsible investment approaches used by these investors and the results are very much in line with what has been found in the literature for international (Amel-Zadeh & Serafeim, 2018; GSIA, 2023) and New Zealand investment managers (Diaz-Rainey et al., 2023).

Table 15: Investor Practices and Motivations

Table 15 summarises responses from Investors (25) around how and why they incorporate climate-related risks and opportunities in their investment decisions. The first panel shows the proportion of investor AUM that consider climate change. The second panel explores the average holding periods for investors. The third panel shows the average importance of motivating factors for considering climate change in the investment decision process, using a 1-10 scale (1 = not important at all to 10 = extremely important). The last panel shows the mean percentage of investors' AUM that incorporate specific responsible investment strategies.

Percentage AUM that considers climate change	**Freq**	**%**
0%	1	4%
>0% to 20%	3	12%
>20% to 40%	3	12%
>40% to 60%	1	4%
>60% to 80%	2	8%
>80% to <100%	7	28%
100%	8	32%
Total	**25**	
Average holding period	**Freq**	**%**
No typical holding period; decide case-by-case	11	44%
Less than 1 year	1	4%
1 year to 5 years	6	24%
5 years to 10 years	2	8%
More than 10 years	5	20%
Total	**25**	

Motivation for climate change consideration	**Average**
We see it as an ethical responsibility	7.0
Climate change information is material to investment performance	6.5
Growing client or stakeholder demand	6.5
Climate change information, although not yet priced, will soon affect investment performance	6.4
We believe this will encourage positive change in individual entity climate actions	6.1
It is part of our mandated investment strategy or SIPO	5.9

Incorporating climate change information in investment decisions is a fiduciary duty	5.1
Incorporating climate change information in investment decisions is a legal obligation	4.3
AUM that incorporates responsible investment approaches	**%**
Negative screening: exposure based	63%
Fundamental analysis incorporating ESG considerations	61%
Negative screening: industry based	58%
Engagement/active ownership regarding ESG issues	49%
Decarbonization of portfolio	35%
Positive (best-in-class) screening	26%
Quantitative ESG factor investing	25%
Thematic investment	23%
Overlay/portfolio tilt	20%
Impact Investing	12%

7.4. VOLUNTARY DISCLOSURE STOCKTAKE

At this stage of the research programme, we have gathered summary information on voluntary climate, and broader sustainability, related reporting by CREs. In Figure 1 (in summary section 1) and Table 16 below we can observe that since 2015 the number and proportion of CREs reporting on sustainability issues has grown significantly. This is in line with the global trends of entities increasing sustainability and climate related disclosures (see section 5).

In recent, years reporting in line with TCFD has become more common that reporting on broader sustainability issues, which may be in line with the anticipation for mandatory disclosures coming into effect from 2023. This would support the findings of the interviews that CREs have started preparing for mandatory reporting.

Table 16 presents the proportion of CREs (177) which reported in line with TCFD, and where broader sustainability is mentioned since 2015. The numbers in parentheses refer to the coding of annual reports as laid out in Appendix 3.

Table 16: Voluntary non-financial disclosures

Voluntary reporting	2015	2016	2017	2018	2019	2020	2021	2022
TCFD aligned (2, 5)	0.0%	0.0%	0.0%	3.4%	6.8%	12.4%	19.2%	27.1%
Stand-alone sustain-ability report (1, 3)	7.3%	7.9%	9.6%	9.6%	11.3%	13.6%	18.1%	20.3%
Sustainability report in annual report (4, 6)	19.8%	25.4%	28.8%	37.3%	38.4%	38.4%	33.3%	28.2%
Total	**27.1%**	**33.3%**	**38.4%**	**50.3%**	**56.5%**	**64.4%**	**70.6%**	**75.7%**

REFERENCES

Achenbach, M. (2021). Transparency of Climate-Related Risks and Opportunities: Determinants Influencing the Disclosure in Line with the Task Force on Climate-Related Financial Disclosures. *Glocality*, 4(1), 1. https://doi.org/10.5334/glo.32

Adams, C.A., & P. McNicholas. (2007). Making a difference: Sustainability reporting, accountability and organisational change. *Accounting, Auditing and Accountability Journal.* 20 (3): 382–402.

Alok, S., Kumar, N., & Wermers, R. (2020). Do fund managers misestimate climatic disaster risk. The *Review of Financial Studies*, 33(3), 1146-1183. https://doi.org/10.1093/rfs/hhz143

Amel-Zadeh, A., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. *Financial Analysts Journal*, 74(3), 87-103.

Armour, J., Enriques, L., & Wetzer, T. (2021). Mandatory Corporate Climate Disclosures: Now, but How? *Available at SSRN*. https://doi.org/10.2139/ssrn.3958819

Amel-Zadeh, A., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. *Financial Analysts Journal*, 74(3), 87-103.

Aswani, J., Raghunandan, A., & Rajgopal, S. (2023). Are carbon emissions associated with stock returns?. *Review of Finance*, forthcoming.

Barko, T., Cremers, M., & Renneboog, L. (2017). Activism on corporate social responsibility. Available at SSRN http://econ.core.hu/file/download/korosi/2015/barko.pdf

Bauckloh, T., Klein, C., Pioch, T., & Schiemann, F. (2023). Under Pressure? The Link Between Mandatory Climate Reporting and Firms' Carbon Performance. *Organization & Environment*, 36(1), 126–149. https://doi.org/10.1177/10860266221083340

Bauer, R., Ruof, T., & Smeets, P. (2021). Get real! Individuals prefer more sustainable investments. *The Review of Financial Studies*, 34 (8), 3976-4043.

Barber, B.M., Morse, A., & Yasuda, A. (2021). Impact Investing. *Journal of Financial Economics*, 139 (1), 162-185.

Berg, F., Fabisik, K., & Sautner, Z. (2020). Is history repeating itself? the (un) predictable past of ESG ratings. The (Un)Predictable Past of ESG Ratings (August 24, 2021). *European Corporate Governance Institute–Finance Working Paper*, 708.

Berg, F., Heeb, F., & Kölbel, J. F. (2022). The economic impact of ESG ratings. *Available at SSRN https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=4088545*

Berg, F., Koelbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, 26(6), 1315-1344.

Berkman, H., Jona, J., & Soderstrom, N. S. (2021). Firm-specific climate risk and market valuation. Available at SSRN https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2775552

Bhattacharya, U., & H. Daouk. (2002). The world price of insider trading. *The Journal of Finance.* 57 (1): 75–108.

Biddle, G.C., & G. Hilary. (2006). Accounting quality and firm-level capital investment. The Accounting Review 81 (5): 963–982. Biddle, G.C., G. Hilary, and R.S. Verdi. (2009). How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics*. 48 (2): 112–131.

Bingler, Julia Anna, Mathias Kraus, & Markus Leippold (2022a). Cheap talk and cherry-picking: What ClimateBert has to say on corporate climate risk disclosures, *Finance Research Letters* 47, 102776.

Bingler, J., Kraus, M., Leippold, M., & Webersinke, N. (2022b). Cheap talk in corporate climate commitments: The effectiveness of climate initiatives. *Swiss Finance Institute Research Paper*, (22-54).

Bloomberg Intelligence. (2022). ESG May Surpass $41 Trillion Assets in 2022, But Not Without Challenges, Finds Bloomberg Intelligence. *Bloomberg.* https://www.bloomberg.com/company/press/esg-may-surpass-41-trillion-assets-in-2022-but-not-without-challenges-finds-bloomberg-intelligence/

Bolton, P., & Kacperczyk, M. (2021a). Do investors care about carbon risk?. *Journal of Financial Economics*, 142(2), 517-549. https://doi.org/10.1016/j.jfineco.2021.05.008

Bolton, P., & Kacperczyk, M. T. (2021b). Carbon disclosure and the cost of capital. Available at SSRN. https://dx.doi.org/10.2139/ssrn.3755613

Borghei, Z. (2021). Carbon disclosure: A systematic literature review. *Accounting & Finance*, 61(4), 5255–5280. https://doi.org/10.1111/acfi.12757

Botsari, A., & Lang, F. (2020). ESG considerations in venture capital and business angel investment decision: evidence from two pan-European surveys. European Investment Fund, Working Paper 2020/63.

Brandon, R., Glossner, S., Krueger, P., Matos, P., & Steffen, T. (2022). Do responsible investors invest responsibly?. *Review of Finance.* 26(6), 1389-1432.

Breuer, M., Leuz, C., & Vanhaverbeke, S. (2019). Reporting regulation and corporate innovation (No. w26291). *National Bureau of Economic Research*.

Brié, B., Stouthuysen, K., & Verdonck, T. (2022). Mandatory CSR reporting in Europe: A textual analysis of firms' climate disclosure practices. Available at SSRN. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4231567

Brodback, D., Guenster, N. K., Pouget, S., & Wang, R. (2021). The Valuation of Corporate Social Responsibility: A Willingness to Pay Experiment. *Netspar, Network for Studies on Pensions, Aging and Retirement.*

Burke, M., Driscoll, A., Lobell, D. B., & Ermon, S. (2021). Using satellite imagery to understand and promote sustainable development. *Science*, 371(6535), eabe8628. https://doi.org/10.1126/science.abe8628

Burrell, G. (1988). Modernism, Postmodernism and Organizational Analysis 2: The Contribution of Michel Foucault. *Organization Studies*, 9(2): 221-235.

Byrd, J., K. Hickman, C.R. Baker, & B. Cohanier. (2016). Corporate social responsibility reporting in controversial industries. *International Review of Accounting, Banking & Finance.* 8(2-4):1–14.

Carney, M. (2015). Breaking the tragedy of the horizon–climate change and financial stability. *Speech given at Lloyd's of London*, 29, 220-230.

Cao, J., H. Liang, & X. Zhan. (2019). Peer effects of corporate social responsibility. *Management Science*. 65 (12): 5487–5503.

Cao, Z., & B. Rees. (2020). Do employee-friendly firms invest more efficiently? Evidence from labor investment efficiency. *Journal of Corporate Finance.* 65: 101744.

Cao, S., Jiang, W., Yang, B., & Zhang, A. L. (2023). How to Talk When a Machine Is Listening: Corporate Disclosure in the Age of AI. *The Review of Financial Studies*, 36(9), 3603–3642. https://doi.org/10.1093/rfs/hhad021

Ceccarelli, M., Ramelli, S., & Wagner, A. F. (2023). Low carbon mutual funds. *Forthcoming, Review of Finance.*

Chapple, L., Clarkson, P. M., & Gold, D. L. (2013). The Cost of Carbon: Capital Market Effects of the Proposed Emission Trading Scheme (ETS). *Abacus,* 49(1), 1–33. https://doi.org/10.1111/abac.12006

Chava, S., 2014. Environmental externalities and cost of capital. Manag. Sci. 60 (9), 2223–2247. https://doi.org/10.1287/mnsc.2013.1863

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.

Chithambo, L., Tauringana, V., Tingbani, I., & Achiro, L. (2022). Stakeholder pressure and greenhouses gas voluntary disclosures. *Business Strategy and the Environment*, 31(1), 159-172. https://doi.org/10.1002/bse.2880

Choi, B., & Luo, L. (2021). Does the market value greenhouse gas emissions? Evidence from multi-country firm data. *The British Accounting Review*, 53(1), 1–24. https://doi.org/10.1016/j.bar.2020.100909

Christensen, H.B., L. Hail, & C. Leuz. (2013). Mandatory IFRS reporting and changes in enforcement. *Journal of Accounting and Economics.* 56 (2-3): 147–177.

Christensen, H.B., L. Hail, & C. Leuz. (2016). Capital-market effects of securities regulation: Prior conditions, implementation, and enforcement. *The Review of Financial Studies.* 29 (11): 2885–2924.

Christensen, H. B., Hail, L., & Leuz, C. (2021). Mandatory CSR and sustainability reporting: Economic analysis and literature review. *Review of Accounting Studies*, 26(3), 1176–1248. https://doi.org/10.1007/s11142-021-09609-5

Cohen, S., Kadach, I., & Ormazabal, G. (2023). Institutional investors, climate disclosure, and carbon emissions. *Journal of Accounting and Economics*, 76(2-3), 101640. https://doi.org/10.1016/j.jacceco.2023.101640

Cooper, S.M., & D.L. Owen. (2007). Corporate social reporting and stakeholder accountability: The missing link. *Accounting, Organizations and Society.* 32 (7-8): 649–667.

Cormier, D., & M. Magnan. (2003). Environmental reporting management: A continental European perspective. *Journal of Accounting and Public Policy.* 22 (1): 43–62.

Core, J. E. (2001). A review of the empirical disclosure literature: Discussion. *Journal of Accounting and Economics*, 31(1), 441–456. https://doi.org/10.1016/S0165-4101(01)00036-2

Cronqvist, H., & F. Yu. (2017). Shaped by their daughters: Executives, female socialization, and corporate social responsibility. *Journal of Financial Economics.* 126 (3): 543–562.

Daradkeh, H., Shams, S., Bose, S., & Gunasekarage, A. (2023). Does managerial ability matter for corporate climate change disclosures?. *Corporate Governance: An International Review*, 31(1), 83-104. https://doi.org/10.1111/corg.12436

Davidson, R.H., A. Dey, & A.J. Smith. (2018). CEO materialism and corporate social responsibility. *The Accounting Review*. 94 (1): 101–126.

Dawkins, C., & Fraas, J. W. (2011). Coming Clean: The Impact of Environmental Performance and Visibility on Corporate Climate Change Disclosure. *Journal of Business Ethics*, 100(2), 303–322. https://doi.org/10.1007/s10551-010-0681-0

Demers, E., & Metzner, M. (n.d.). TCFD Climate Risk Disclosures: Early Evidence on the "Gold Standard".

Diaz-Rainey, I., Gehricke, S., McLean, L., Nguyen, Q., & Zhang, R. (2023). In Holdings We Trust: Uncovering the ESG Fund Lemons. *Available at SSRN*. https://dx.doi.org/10.2139/ssrn.4050964

Dimson, E., Karakaş, O., & Li, X. (2015). Active ownership. *Review of Financial Studies.* 28(12), 3225-3268.

Dimson, E., Karakaş, O., & Li, X. (2021). Coordinated engagements. *European Corporate Governance Institute–Finance Working Paper* (721).

Depoers, F., T. Jeanjean, and T. Jer^ ome, 2016, Voluntary disclosure of greenhouse gas emissions: contrasting the Carbon Disclosure Project and corporate reports, Journal of Business Ethics 134, 445–461. https://doi.org/10.1007/s10551-014-2432-0

Downar, B., Ernstberger, J., Rettenbacher, H., Schwenen, S., & Zaklan, A. (2019). Fighting Climate Change with Disclosure? The Real Effects of Mandatory Greenhouse Gas Emission Disclosure. *Available at SSRN*. https://doi.org/10.2139/ssrn.3352390

Dyck, A., Lins, K. V., Roth, L., & Wagner, H. F. (2019). Do institutional investors drive corporate social responsibility? International evidence. *Journal of Financial Economics.* 131(3), 693-714.

Dyer, T., M. Lang, & L. Stice-Lawrence. (2017). The evolution of 10-K textual disclosure: Evidence from latent dirichlet allocation. *Journal of Accounting and Economics.* 64 (2): 221–245.

Eccles, R. G., Kastrapeli, M. D., & Potter, S. J. (2017). How to integrate ESG into investment decision-making: Results of a global survey of institutional investors. *Journal of Applied Corporate Finance*, 29(4), 125-133

Ehlers, T., Packer, F., & De Greiff, K. (2022). The pricing of carbon risk in syndicated loans: Which risks are priced and why? *Journal of Banking & Finance*, 136, 106180. https://doi.org/10.1016/j.jbankfin.2021.106180

Elliott, J., & Löfgren, Å. (2022). If money talks, what is the banking industry saying about climate change? *Climate Policy*, 22(6), 743–753. https://doi.org/10.1080/14693062.2022.2036090

Fiechter, P., J.M. Hitz, and N. Lehmann. 2022. Real Effects of a Widespread CSR Reporting Mandate: Evidence from the European Union's CSR Directive. Journal of Accounting Research 60 (4): 1499-1549. https://doi.org/10.1111/1475-679X.12424.

Fiedler, T., Pitman, A. J., Mackenzie, K., Wood, N., Jakob, C., & Perkins-Kirkpatrick, S. E. (2021). Business risk and the emergence of climate analytics. *Nature Climate Change*, 11(2), 87-94. https://doi.org/10.1038/s41558-020-00984-6

Flammer, C., Toffel, M. W., & Viswanathan, K. (2021). Shareholder activism and firms' voluntary disclosure of climate change risks. *Strategic Management Journal*, 42(10), 1850-1879. https://doi.org/10.1002/smj.3313

Foucault, M. (1995 [1975]). Discipline and Punish: The Birth of the Prison. (A. Sheridan Smith, Trans.). *New York: Vintage Books.*

Ford, J. M., Gehricke, S. A., & Zhang, J. E. (2022). Option traders are concerned about climate risks: ESG ratings and short-term sentiment. *Journal of Behavioral and Experimental Finance*, 35, 100687.

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210-233. https://doi.org/10.1080/20430795.2015.1118917

Gamerschlag, R., K. Möller, & F. Verbeeten. (2011). Determinants of voluntary CSR disclosure: Empirical evidence from Germany. *Review of Managerial Science.* 5(2-3):233–262.

Gehricke, S. A., Ruan, X., & Zhang, J. E. (2023). Doing well while doing good: ESG ratings and corporate bond returns. Applied Economics, 1-19. https://doi.org/10.1080/00036846.2023.2178624

Gillan, S. L., Koch, A., & Starks, L. T. (2021). Firms and social responsibility: A review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, 66, 101889. https://doi.org/10.1016/j.jcorpfin.2021.101889

Ginglinger, E., & Moreau, Q. (2023). Climate risk and capital structure. *Management Science*, 69(12), 7492-7516. https://doi.org/10.1287/mnsc.2023.4952

Global Sustainable Investment Alliance (GSIA) (2023). *Global Sustainable Investment Review 2022.* https://www.gsi-alliance.org/wp-content/uploads/2023/12/GSIA-Report-2022.pdf

Grewal, J., E.J. Riedl, and G. Serafeim. 2019. Market Reaction to Mandatory Nonfinancial Disclosure. Management Science 65 (7): 3061–3084. https://doi.org/10.1287/mnsc.2018.3099.

Griffin, P. A., Lont, D. H., & Sun, E. Y. (2017). The relevance to investors of greenhouse gas emission disclosures. *Contemporary Accounting Research*, 34(2), 1265-1297. https://doi.org/10.1111/1911-3846.12298

Grougiou, V., E. Dedoulis, & S. Leventis. (2016). Corporate social responsibility reporting and organizational stigma: The case of "sin" industries. *Journal of Business Research.* 69 (2): 905–914.

Hahn, R., & M. Kühnen. (2013). Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production*. 59: 5–21.

Hall, S. (1997). Representation: Cultural Representations and Signifying Practices. *London: Sage*.

Haniffa, R.M., & T.E. Cooke. (2005). The impact of culture and governance on corporate social reporting. *Journal of Accounting and Public Policy*. 24 (5): 391–430.

Haque, S., & Islam, M. A. (2015). Stakeholder pressures on corporate climate change-related accountability and disclosures: Australian evidence*. Business and Politics*, 17(2), 355-390. https://doi.org/10.1017/S1369525800001674

Hart, O., & Zingales, L. (2017). Companies Should Maximize Shareholder Welfare Not Market Value. *Journal of Law, Finance, and Accounting*, 2(2), 247–275. https://doi.org/10.1561/108.00000022

Hartzmark, S.M., & A.B. Sussman. (2019). Do investors value sustainability? A natural experiment examining ranking and fund flows. *The Journal of Finance*. 74 (6): 2789–2837.

Hassan, O. A. G., & Romilly, P. (2018). Relations between corporate economic performance, environmental disclosure and greenhouse gas emissions: New insights. *Business Strategy and the Environment*, 27(7), 893–909. https://doi.org/10.1002/bse.2040

Herbohn, K., Gao, R., & Clarkson, P. (2019). Evidence on Whether Banks Consider Carbon Risk in Their Lending Decisions. *Journal of Business Ethics*, 158(1), 155–175. https://doi.org/10.1007/s10551-017-3711-3

Hoepner, A., Oikonomou, I., Scholtens, B., & Schröder, M. (2016). The effects of corporate and country sustainability characteristics on the cost of debt: An international investigation. *Journal of Business Finance & Accounting.* 43(1-2), 158-190.

Howarth, D. J., & Stavrakakis, Y. (2000). Introducing discourse theory and political analysis. In D. J. Howarth, A. J. Norval & Y. Stavrakakis (Eds.), *Discourse theory and political analysis: Identities, hegemonies and social change* (pp. 1-23). Manchester: Manchester University Press.

Huang, H. H., Kerstein, J., Wang, C., & Wu, F. (Harry). (2022). Firm climate risk, risk management, and bank loan financing. *Strategic Management Journal*, 43(13), 2849–2880. https://doi.org/10.1002/smj.3437

Ilhan, E., Sautner, Z., & Vilkov, G. (2021). Carbon tail risk. *The Review of Financial Studies*, 34(3), 1540-1571. https://doi.org/10.1093/rfs/hhaa071

Ilhan, E., Krueger, P., Sautner, Z., & Starks, L. T. (2023). Climate risk disclosure and institutional investors. The Review of Financial Studies, 36(7), 2617-2650. https://doi.org/10.1093/rfs/hhad002

Ioannou, I., and G. Serafeim. 2017. The consequences of mandatory corporate sustainability reporting. Working Paper, Harvard Business School. Available at SSRN https://papers.ssrn.com/Sol3/Papers.Cfm?Abstract_id=1799589.

Ioannou, I., & G. Serafeim. (2015). The impact of corporate social responsibility on investment recommendations: Analysts' perceptions and shifting institutional logics. *Strategic Management Journal.* 36 (7): 1053–1081.

Jagannathan, R., Ravikumar, A., & Sammon, M. (2018). Environmental, social, and governance criteria: Why investors should care. Journal of Investment Management, 16(1), 18-31.

Javadi, S., & Masum, A.-A. (2021). The impact of climate change on the cost of bank loans. *Journal of Corporate Finance*, 69, 102019. https://doi.org/10.1016/j.jcorpfin.2021.102019

Jouvenot, V., & P. Krueger. (2020). Mandatory corporate carbon disclosure: Evidence from a natural experiment. *SSRN working paper*, available at: https://ssrn.com/abstract=3434490.

Kendall, G. and G. Wickam (1999). Using Foucault's Methods. *London: Sage.*

Kim, J.B., C. Wang, and F. Wu. 2022. The real effects of risk disclosures: evidence from climate change reporting in 10-Ks. *Review of Accounting Studies*. https://doi.org/10.1007/s11142022-09687-z.

Kim, S., & Yoon, A. (2023). Analyzing active fund managers' commitment to ESG: Evidence from the United Nations Principles for Responsible Investment. *Management science*, 69(2), 741-758. https://doi.org/10.1287/mnsc.2022.4394

King, Gary, Patrick Lam, and Margaret E. Roberts, 2017, Computer-assisted keyword and document set discovery from unstructured text, American Journal of Political Science 61, 971–988.

Klenert, D., Mattauch, L., Combet, E., Edenhofer, O., Hepburn, C., Rafaty, R., & Stern, N. (2018). Making carbon pricing work for citizens. *Nature Climate Change*, 8(8), 669-677. https://doi.org/10.1038/s41558-018-0201-2

Kölbel, J. F., Leippold, M., Rillaerts, J., & Wang, Q. (2022). Ask BERT: How Regulatory Disclosure of Transition and Physical Climate Risks Affects the CDS Term Structure. Journal of Financial Econometrics, nbac027. https://doi.org/10.1093/jjfinec/nbac027

Krueger, P., Sautner, Z., & Starks, L. T. (2020). The Importance of Climate Risks for Institutional Investors. *The Review of Financial Studies*, 33(3), 1067–1111. https://doi.org/10.1093/rfs/hhz137

Krueger, P., Sautner, Z., Tang, D. Y., & Zhong, R. (2021). The effects of mandatory ESG disclosure around the world. *Available at SSRN*. https://dx.doi.org/10.2139/ssrn.3832745

Laclau, E. & C. Mouffe (2001[1985]). Hegemony and Socialist Strategy. Towards a Radical Democratic Politics. London: Verso.

Landsman, W.R., E.L. Maydew, and J.R. Thornock. (2012). The information content of annual earnings announcements and mandatory adoption of IFRS. Journal of Accounting and Economics 53 (1-2): 34–54.

Leuz, C., & P.D. Wysocki. (2016). The economics of disclosure and financial reporting regulation: Evidence and suggestions for future research. *Journal of Accounting Research*. 54 (2): 525–622.

Lewis, B.W., J.L. Walls, & G.W.S. Dowell. (2014). Difference in degrees: CEO characteristics and firm environmental disclosure. *Strategic Management Journal*. 35 (5): 712–722.

Li, J.M., S. Lu, & S. Nassar. (2021). Corporate social responsibility metrics in S&P 500 firms' 2017 sustainability reports. The University of Chicago.

Liang, H., Sun, L., & Teo, M. (2020). Greenwashing: Evidence from hedge funds. *Research Collection Lee Kong Chian School of Business Working Paper.*

Liesen, A., Hoepner, A. G., Patten, D. M., & Figge, F. (2015). Does stakeholder pressure influence corporate GHG emissions reporting? Empirical evidence from Europe*. Accounting, Auditing & Accountability Journal*, 28(7), 1047–1074. https://doi.org/10.1108/AAAJ-12-2013-1547

Lintner, J. (1965). The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets*. Review of Economics and Statistics*. 47:1, pp. 13–37.

Matsumura, E. M., Prakash, R., & Vera-Muñoz, S. C. (2014). Firm-Value Effects of Carbon Emissions and Carbon Disclosures. *The Accounting Review*, 89(2), 695–724. https://doi.org/10.2308/accr-50629

McCarthy, S., B. Oliver, & S. Song. (2017). Corporate social responsibility and CEO confidence. *Journal of Banking and Finance*. 75: 280–291.

Mercure, J. F., Pollitt, H., Viñuales, J. E., Edwards, N. R., Holden, P. B., Chewpreecha, U., ... & Knobloch, F. (2018). Macroeconomic impact of stranded fossil fuel assets. *Nature Climate Change*, 8(7), 588-593. https://doi.org/10.1038/s41558-018-0182-1

Miller, G. S., Stockbridge Jr, D. R., & Williams, C. D. (2023). Mandatory Disclosure of Institutional Investors' Fossil Fuel Investments. University of Michigan working paper, available at https://www.herbert.miami.edu/faculty-research/business-conferences/winter-warmup/miller_disclosure_fossil_fuels_miami.pdf

Moreno, A.-I., & Caminero, T. (2022). Application of text mining to the analysis of climate-related disclosures. *International Review of Financial Analysis*, 83, 102307. https://doi.org/10.1016/j.irfa.2022.102307

Newman, R. & Noy, I. (2023) The global costs of extreme weather that are attributable to climate change. *Nature Communications.* 14, 6103. https://doi.org/10.1038/s41467-023-41888-1

O'Dwyer, B. (2011). The case of sustainability assurance: Constructing a new assurance service. *Contemporary Accounting Research*. 28 (4): 1230–1266.

Parker, L.D. (2014). Corporate social accountability through action: Contemporary insights from British industrial pioneers. *Accounting, Organizations and Society.* 39 (8): 632–659.

Peters, G.F., & A.M. Romi. (2013). Discretionary compliance with mandatory environmental disclosures: Evidence from SEC filings. *Journal of Accounting and Public Policy.* 32 (4): 213–236.

Peters, G.F., & A.M. Romi. (2015). The association between sustainability governance characteristics and the assurance of corporate sustainability reports. *Auditing: A Journal of Practice & Theory* 34 (1): 163198.

Pitrakkos, P., & Maroun, W. (2020). Evaluating the quality of carbon disclosures. *Sustainability Accounting, Management and Policy Journal*, *11*(3), 553-589.

Rabinow, P., Ed. (1991). The Foucault Reader. *London: Penguin.*

Radaelli, C. (1995). The Role of Knowledge in the Policy Process. *Journal of European Public Policy.* 2(2):159-183.

Raghunandan, A., & Rajgopal, S. (2022). Do ESG funds make stakeholder-friendly investments?. *Review of Accounting Studies*. *27*(3), 822-863.

Reid, E. M., & Toffel, M. W. (2009). Responding to public and private politics: Corporate disclosure of climate change strategies. *Strategic Management Journal*, 30(11), 1157–1178. https://doi.org/10.1002/smj.796

Revelli, C. (2017). Socially responsible investing (SRI): From mainstream to margin?. *Research in International Business and Finance*, 39, 711-717. https://doi.org/10.1016/j.ribaf.2015.11.003

Robinson, S., Skinner, A.N. and Wang, J. (2023) Does Litigation Risk Shape Environmental Disclosure Decisions? Evidence from Peers' Environmental Disclosure Lawsuits. *Available at SSRN*. http://dx.doi.org/10.2139/ssrn.4406536

Roychowdhury, S., N. Shroff, & R.S. Verdi. (2019). The effects of financial reporting and disclosure on corporate investment: A review. *Journal of Accounting and Economics.* 68 (2): 101246.

Sautner, Z., Van Lent, L., Vilkov, G., & Zhang, R. (2023a). Firm-level climate change exposure. The Journal of Finance, 78(3), 1449-1498. https://doi.org/10.1111/jofi.13219

Sautner, Z., Van Lent, L., Vilkov, G., & Zhang, R. (2023b). Pricing Climate Change Exposure. *Management Science*, 69(12), 7540–7561. https://doi.org/10.1287/mnsc.2023.4686

Seltzer, L. H., Starks, L., & Zhu, Q. (2022). Climate regulatory risk and corporate bonds (No. w29994). National Bureau of Economic Research.

Setzer, J., & Byrnes, R. (2020). Global trends in climate change litigation. London: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy, London School of Economics and Political Science. Available at: https://forourclimate.org/hubfs/Global-trends-in-climate-change-litigation-2022-snapshot.pdf

Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *Journal of Finance*. 19:3, pp. 425– 42.

Siddique, M. A., Akhtaruzzaman, M., Rashid, A., & Hammami, H. (2021). Carbon disclosure, carbon performance and financial performance: International evidence. *International Review of Financial Analysis, 75, 101734*. https://doi.org/10.1016/j.irfa.2021.101734

Steuer, S., & Tröger, T. H. (2022). The Role of Disclosure in Green Finance. *Journal of Financial Regulation*, 8(1), 1–50. https://doi.org/10.1093/jfr/fjac001

Sullivan, R. (2009). The management of greenhouse gas emissions in large European companies. *Corporate Social Responsibility and Environmental Management*, 16(6), 301–309. https://doi.org/10.1002/csr.187

Sullivan, R., & Gouldson, A. (2012). Does voluntary carbon reporting meet investors' needs? *Journal of Cleaner Production,* 36, 60–67. https://doi.org/10.1016/j.jclepro.2012.02.020

Tang, S., & Demeritt, D. (2018). Climate Change and Mandatory Carbon Reporting: Impacts on Business Process and Performance: Climate change and carbon reporting: Impacts on business. *Business Strategy and the Environment*, 27(4), 437–455. https://doi.org/10.1002/bse.1985

Tauringana, V., and L. Chithambo, 2015, The effect of DEFRA guidance on greenhouse gas disclosure, The British Accounting Review 47, 425–444. https://doi.org/10.1016/j.bar.2014.07.002

Thorne, L., L.S. Mahoney, and G. Manetti. (2014). Motivations for issuing standalone CSR reports: A survey of Canadian firms. *Accounting, Auditing and Accountability Journal.* 27 (4): 686–714.

Topping, N. (2012). How Does Sustainability Disclosure Drive Behavior Change? *Journal of Applied Corporate Finance*, 24(2), 45–48. https://doi.org/10.1111/j.1745-6622.2012.00377.x

Varini, Francesco S., Jordan Boyd-Graber, Massimiliano Ciaramita, and Markus Leippold, 2020, ClimaText: A dataset for climate change topic detection, Working paper, ETH Zurich.

Webersinke, Nicolas, Mathias Kraus, Julia Anna Bingler, and Markus Leippold, 2022, ClimateBert: A pretrained language model for climate-related text, Working paper, University of Zurich.

Wedari, L. K., Jubb, C., & Moradi-Motlagh, A. (2021). Corporate climate-related voluntary disclosures: Does potential greenwash exist among Australian high emitters reports?. *Business Strategy and the Environment*, *30*(8), 3721-3739.

Wickert, C., A.G. Scherer, and L.J. Spence. (2016). Walking and talking corporate social responsibility: Implications of firm size and organizational cost. *Journal of Management Studies.* 53 (7): 1169–1196.

Zerbib, O.D., 2019. The effect of pro-environmental preferences on bond prices: evidence from green bonds. Journal of Banking and Finance. 98, 39–60. https://doi.org/10.1016/j.jbankfin.2018.10.012

APPENDIX 1 – DEFINITIONS OF RESPONSIBLE INVESTING

The definitions below present an incomplete list of definitions of different names of responsible investment approaches.

Socially responsible investing (SRI) is an investment discipline that considers environmental, social, and corporate governance (ESG) criteria to generate long-term competitive financial returns and positive societal impact. (The Forum for Sustainable and Responsible Investment, USSIF definition).

Responsible investing (RI) is an approach to investing that aims to incorporate environmental, social and governance (ESG) factors into investment decisions, to better manage risk and generate sustainable, long-term returns. (UNPRI definition).

Environmental, Social and Governance (ESG) investing is a strategy you can use to put your money to work with companies that strive to make the world a better place. ESG investing relies on independent ratings that help you assess a company's behavior and policies when it comes to environmental performance, social impact and governance issues. (Forbes Advisor definition)

Ethical Investing (EI) means aligning our investments with our values. (Ethical Investing NZ definition)

Ethical Investing (EI) is an approach when you choose investments based on your personal values on the expectation that your money will help or not harm industries you care about. (Financial Markets Authority definition)

Impact Investing investments made into private sector companies or organizations with the specific intent to contribute measurable positive social or environmental impact, alongside financial returns. (International Finance Corporation (IFC) definition)

Impact Investing are investments made in companies, organisations, and funds with the intention to generate measurable social and environmental impact alongside a financial return. (Global Impact Investing Network definition)

Impact Investing are investments made into private sector companies or organisations with the specific intent to contribute measurable positive social or environmental impact, alongside financial returns. (International Finance Corporation definition)

APPENDIX 2 – SUPPLEMENTARY RESEARCH QUESTIONS

SRQ 1 How much bearing does the Climate-related Disclosure Framework being mandatory have on its effectiveness?

SRQ 2 What contextual factors (e.g., the National Adaptation Plan, the availability of relevant data) have influenced the effectiveness of the Climate-related Disclosure Framework?

SRQ 3 What lessons can be learnt for other jurisdictions looking to implement mandatory climate-related disclosures, or for other government agencies in New Zealand?

SRQ 4 How do reporting organizations make sense of climate risk and incorporate that into their everyday activities?

SRQ 5 Has climate-related reporting by entities shifted climate change behaviours in organisational practices?

SRQ 6 What has been the effect of the Disclosure Framework on the availability and accuracy of scope 1, 2 and 3 emissions data for New Zealand listed companies?

SRQ 7 Has the introduction of mandatory climate-related reporting significantly affected the Environmental, Social and Governance (ESG) ratings of firms, provided by data vendors?

SRQ 8 Is the disclosure of climate-related risks and opportunities, under NZ CS affecting the equity valuations of New Zealand companies?

SRQ 9 Which aspects of the climate-related disclosures are most impactful on primary user decision making?

APPENDIX 3 – CODING FOR VOLUNTARY DISCLOSURE

Figure 5. Coding for Voluntary Disclosure Flowchart

This flowchart shows the process for a high-level coding of the voluntary non-financial disclosures by CREs from 2015 to 2022. It is important to note that the level of information required for code 4 and 6 relating to broader sustainability and climate related information in the annual reports is quite low and will vary within that category. Some annual reports will present TCFD information, but also broader sustainability information, in this case it is coded as a 4, as climate-related information is the focus of this research.