SDG reporting by Austrian and New Zealand SOEs

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Abstract

Purpose: The 2030 Agenda and its 17 Sustainable Development Goals (SDGs) emphasize global commitments to sustainability. State-owned enterprises (SOEs) play a crucial role in achieving these goals by fulfilling public contracts to provide critical infrastructure and social services. This study analyses SDG reporting trends in 10 SOEs from Austria and New Zealand (NZ) through a comparative longitudinal analysis.

Design/methodology/approach: The empirical analysis is conducted in three stages. Stage 1 examines SDG reporting trends and evolution from 2017 to 2022. Stage 2 provides a statistical analysis of the disclosed data, enabling a more in-depth and objective assessment of the factors influencing SDG reporting. Stage 3 assesses the quality of SDG reporting using the framework proposed by Low *et al.* (2023).

Findings: The findings indicate that corporate governance is the most important factor affecting SDG disclosure by SOEs across both countries. Austrian SOEs generally outperform NZ SOEs in terms of SDG disclosure, both quantitatively and qualitatively. However, the disclosures by the SOEs across both countries have improved over the sample periods.

Originality: By applying the Low *et al.* (2023) framework, this study makes a unique contribution to the literature. This study represents one of the few in-depth analyses of SDG-related disclosures. Furthermore, it provides a robust assessment of the quantity and quality of SDG reporting practices. This study highlights the geographical and regulatory implications for SDG reporting trends and sheds light on the interplay between stakeholder and legitimacy theory in shaping these practices.

Keywords: SDG, non-financial reporting, longitudinal analysis, state-owned enterprises, Austria, New Zealand

1. Introduction

Tackling urgent global problems such as poverty, inequality, climate change, environmental degradation, war and intergenerational injustice are among the most pressing issues of our time, requiring swift and decisive action by nation-states to promote sustainable development (SD). The global adoption of the United Nations (UN) 2030 Agenda and its 17 Sustainable Development Goals (SDGs) in 2015 was a very important initiative encouraging sustainable practices for a more equitable, prosperous, and environmentally conscious world. The UN Agenda 2030 is a comprehensive plan that interrelates economic, ecological, and social issues for a sustainable world (United Nations, 2015; 2017; see Appendix 1). The SDGs are a collection of 17 global goals comprising 169 specific targets aimed at ensuring global peace and prosperity by 2030 (United Nations, 2015). The Agenda 2030 places great emphasis on intersectoral partnerships and pursues a wider range of global goals. Although the SDGs were originally conceived at the state level, enterprises are also assigned a vital role in achieving them (Redman, 2018; Scheyvens *et al.*, 2016). Nation states have committed themselves to report their achievements regarding the Agenda 2030, requiring active implementation of monitoring mechanisms to track progress towards the realization of the SDGs (Fonseca and Carvalho, 2019).

Due to public ownership, state-owned enterprises (SOEs) could play a central role in realizing the SDGs as they have a public mandate to provide key services in sectors such as public infrastructure and social services (Greiling *et al.*, 2015; OECD, 2016). SOEs are hybrid organizations and must position themselves along the continuum between their public mission and business orientation (Grossi *et al.*, 2015). Unlike their private sector counterparts, SOEs face much higher public accountability demands because of their complex societal mandates. SOEs are held accountable not only for their financial bottom line but also for how they serve their public mission (Greiling and Bauer, 2024). Conflicting stakeholder expectations and priorities regarding various bottom lines make SOEs' legitimate or illegitimate behavior a highly contested area, including contributions towards SD. Therefore, legitimacy management for SOEs is much more challenging than for enterprises with only a financial bottom line.

Given the nation-state's commitment to achieving the SDGs, SOEs are first-line candidates for their public owners to pursue the SDGs. Against this background, this study investigates compliance and reporting of the 17 SDGs by 10 SOEs in Austria and New Zealand (NZ). Both Austria and NZ are medium-sized OECD countries, with Austria's population being approximately 9 million and NZ's around 5 million (OECD, 2024a; OECD, 2024b). Both countries have shown commitment to the implementation and advancement of the 2030 Agenda (Austria and the 2030 Agenda, 2020; New Zealand progress towards the SDGs, 2019). While Austria, has regulations governing non-financial reporting (NFR), in particular the European Corporate Sustainability Reporting Directive (CSRD), no such regulation exists in NZ. Furthermore, Austria has adopted the EU- integrated SDG governance framework which aims to integrate the 17 SDGs into the multilevel governance policies and practices. In January 2016, Austrian Council of Ministers advised all the ministers to devise an action plans and appropriate measures in relation to SDGs across all the ministries. A multi-stakeholder approach is adopted in Austria, where stakeholders from federal states to municipalities along with social partners (businesses, the scientific community, and civil society) are engaged in the process (Austria and the 2030 Agenda, 2020). New Zealand, however, has adopted a decentralized approach by integrating specific SDGs into policies and practices at the individual institutional level (such as Climate Change Commission, or Māori Health Authority). Or incorporating specific SDGs through certain Acts (such as Zero Carbon Act incorporates SDG 13, and Child Povety Reduction Act incorporates SDG 1 and 10) rather than having a centralized legislation or framework in relation to SDGs. This approach reflects different legal environments in two countries with Austrian legal system being based on civil law tradition and it is structured hierarchically while the New Zealand legal system is largely based on English common law. This contrast makes the comparison of the practice of SDG reporting between Austria and NZ interesting and provides insights into the effects of regulation and legal environment on SDG reporting. Despite the differences in regulation of NFR, SDG reporting is currently not mandatory in either country. Furthermore, in contrast to the large publicly listed for-profit companies that have begun to voluntarily report on their compliance with the SDGs, there is significantly less information available regarding the SDG reporting practices of SOEs. Consequently, the guiding research questions (RQs) in this paper are:

RQ1: How has SDG reporting in large Austrian and New Zealand SOEs evolved since 2017?

RQ2: What are the organizational factors that are influencing SDG reporting by large Austrian and New Zealand SOEs?

RQ3: What is the quality of SDG reporting by large Austrian and New Zealand SOEs?

Addressing these research questions, the paper is structured as follows: Section 2 provides an overview of the SOEs in both countries. Section 3 outlines the current state of the literature on SDG reporting by SOEs and presents the theoretical background of the study. Section 4 presents the methodology and describes the sample, followed by Section 5, which presents the findings of the study. Section 6 addresses the research questions, discusses the empirical findings, and concludes the paper.

This study contributes to the existing literature on SDG reporting by conducting a comparative analysis of SOEs in two countries geographically wide apart and with different legal environments and regulatory requirements regarding NFR. The paper particularly provides evidence in relation to the effectiveness of SDGs related regulations by comparing two OECD countries. While Austria has adopted a coordinated approach involving multiple stakeholders at different levels of governance (federal ministries to municipalities), New Zealand has adopted a decentralized model, where each government department (institution) adopt policies and practices which are appropriate to their institutional contexts. Moreover, while there is a growing body of literature on SDG reporting by enterprises with a single bottom line, much less is known about SDG reporting by SOEs, which are also judged on how they serve their public missions. Furthermore, this study has been designed to gain an in-depth understanding of the SGDs related reporting by choosing a well-defined sample to triangulate the information combining quantitative and qualitative data analysis. By conducting text mining, SDG related information has been quantified to longitudinally analyze the trends in SDG reporting across the two countries. Furthermore, using the framework of Low et al. (2023), this study examines the quality of SDG reporting through in-depth analyses of related disclosures. Thus, unlike previous studies, this study provides a robust assessment of both the quantity and quality of SDG reporting practices, hence, adds to this emerging stream of literature from the methodological point of view. The study highlights the geographical and regulatory implications for SDG reporting trends and sheds light on the interplay between the stakeholder and legitimacy theories in shaping these practices.

2. Background on SOEs in NZ and Austria

According to the European System of National and Regional Accounts, Austria had 7,759 SOEs at all government levels in 2023 (Statistik Austria, 2024). Austrian SOEs' history goes back to Mercantilism, serving as an income source for the emperor and nobility. Mining, agriculture and forestry, postal services, and the salt monopoly date back to this period. The second wave of SOE establishment began in the late 19th century with municipal utilities and state takeovers of bankrupt private infrastructure. After WWII, a large-scale nationalization took place in 1946-47, covering key industries including banking, mining, petroleum, and steel (Weber, 2011). Until the 1970s, SOEs played a central role in economic policy and prosperity. However, the 1970s recession resulted in the "Verstaatlichtenkrise" (crises of the nationalized industries) accompanied by the full privatization of engineering and steel companies. In 1956, the federal government founded Österreichische Industrie- und Bergbau Gesellschaft (IBV) (renamed to Österreichische Bundes- und Industriebeteiligungs GmbH (ÖBIB) in 2019), to oversee most of the nationalized industries and to manage the federal government's stake in these companies. Since then, the authority to give directives to SOEs lies with the Federal Minister of Finance (Grüb and Greiling, 2021). Reforms since 2000 were aimed at reducing political influence in SOEs but had limited success.

Created under the State-Owned Enterprises Act 1986, NZ SOEs have a much more recent history (Te Ara, 2024). The NZ Government's accounts indicate that in June 2023 there were 15 SOEs and Air NZ as a separate category of a corporation (The Treasury NZ, 2023). NZ Government over time has either fully owned or had a majority stake in enterprises involved in various sectors such as banking and finance, forestry, electricity, rail, postal and telephone services etc. (Te Ara, 2024). NZ SOEs are also registered as limited liability enterprises under the Companies Act 1993 and Companies Act (Amendment) 2023. NZ SOEs are supposed to be 'as profitable and efficient as comparable businesses that are not owned by the Crown' but also 'a good employer' and should exhibit 'a sense of social responsibility' (New Zealand Government, 2023). The Minister of Finance and the Minister for the relevant economic area hold all shares of each SOE on behalf of the NZ Governmentt. While SOEs are under Government ownership, they are primarily governed by the same legal framework as private-sector companies. In terms of governance, each SOE has a board of directors, appointed by the shareholding ministers, with the same obligations under the Companies Act (fiduciary duties and obligations) as directors of private-sector companies (Te Ara, 2024).

In both Austria and NZ SDG implementation in SOEs remains voluntary. In 2016, the Austrian government adopted an SDG mainstreaming approach, monitored by the National Audit Office (NAO). However, in 2022, the NAO criticized the missing alignment between the SDGs and the impact objectives of the federal ministries, thus, requiring a mainstreaming approach (Rechnungshof, 2022). In NZ, the Controller and Auditor General (NZ AOG) issued a report titled 'Follow up on the 2021 performance audit – The Government's preparedness to implement the sustainable development goals, in which he stated that: "*It is difficult to see whether any progress has been made with the sustainable development goals (SDGs) in NZ public sector*", and that the NZ Government's commitment and approach to implementing the SDGs remains unclear (OAG, 2021).

3. Prior literature and theoretical discourse

3.1 SDG reporting in SOEs

While NFR by SOEs is relatively well-researched, SDG reporting is far less explored but rapidly evolving (e.g., Bose and Kahn, 2022; Pizzi *et al.*, 2021). SOEs face regulatory pressures regarding public accountability. Therefore, they provide more comprehensive reports compared to private companies (Alrazi *et al.*, 2016; Greiling and Bauer, 2024; Garde-Sanchez *et al.*, 2018). SOEs reports traditionally focused on broad environmental, social, and governance criteria. However, the importance of SDG reporting has increased in recent years (Bose and Khan, 2022). Empirical studies on SDG reporting by SOEs remain limited but have started to shed some light on the evolving reporting practices (e.g., Bauer and Greiling, 2023; Casciello *et al.*, 2024; Kuswantoro *et al.*, 2023; Manes-Rossi *et al.*, 2021: Muskanan *et al.*, 2024; Stanimirović *et al.*, 2024). For example, the following six articles show different approaches to disclosure and reporting of SDGs across different SOEs (Table 1).

Table 1: Literature overview

Study	Region	Methodology	Key Findings
Manes-Rossi *et al.* (2021)	Europe	Longitudinal content analysis	Gradual inclusion of SDGs in SOE reports, but disclosure remains inconsistent across samples.
Bauer and Greiling (2023)	Europe	Content analysis	Municipal utilities are at an early stage of SDG reporting; measures linked to specific SDGs, but improvements are needed.
Kuswantoro *et al.* (2023)	Asia	Content analysis	SOEs perform better than private enterprises in SDG reporting, but significant gaps remain in achieving SDG targets.
Muskanan *et al.* (2024)	Asia	Content analysis	Found weak strategic planning for SDG implementation in regional SOEs.
Casciello *et al.* (2024)	Europe	Content analysis	Board characteristics (size, independence) positively influence SDG reporting in SOEs.
Stanimirović *et al.* (2024)	Europe	Content analysis	Different levels of compliance with Global Reporting Initiative (GRI) Standards and SDG reporting; SDG 9 receives the most attention.

These studies suggest that while SDG reporting is increasing, there is a need for more strategic and consistent approaches across sectors and regions when reporting on SDGs. Additionally, these studies show that SOEs are beginning to explicitly link their performance metrics and content to specific SDGs thereby improving transparency and accountability in SDG reporting. As SDG reporting continues to evolve, the focus on creating standardized, comparable reporting frameworks and improving the comparability and transparency of SDG-related data remains an important avenue for future research and practice. Furthermore, the previous studies employ a range of methodological approaches to examine SDG reporting. Content analysis is widely used to analyze reports, as seen in Kuswantoro *et al.* (2023), Bauer and Greiling (2023), Casciello *et al.* (2024), Stanimirović *et al.* (2024), and Muskanan *et al.* (2024). In addition, Manes-Rossi *et al.* (2021) conducted a longitudinal content analysis. However, the studies to date are largely limited to European samples, indicating a need for further research into other regions, especially as the UN Agenda 2030 is to be implemented on a global level.

In summary, the research on SDG is still in its infancy. However, SDG-related reporting by SOEs among other reporting entities, has received even less attention. Only one article to date has longitudinally analyzed the SDG reporting by SOEs indicating that there is a need for further research in this area (Manes-Rossi *et al.,* 2021). The present study focuses on Austrian and NZ SOEs in relation to SDG reporting for the years 2017-2022 and aims to extend previous research both geographically and longitudinally. Previous studies are primarily qualitative, whereas this study applies a combination of qualitative and quantitative analysis. Furthermore, by measuring the quality of SDG reporting using the approach by Low *et al.* (2023), this study also provides a new perspective on how to assess SDG reporting. Finally, this study addresses the SDG reporting by Austrian and NZ SOEs providing interesting insights into the impact of different regulatory frameworks and geographies.

3.2 Theoretical discourse

Due to stakeholder complexity and the importance of organizational legitimacy, strategic stakeholder theory and legitimacy theory were chosen as the theoretical lenses for this study. While strategic stakeholder theory offers an instrumental perspective, legitimacy theory has a social and political background (Hansen and Schaltegger, 2016). SOEs are accountable to a diverse group of stakeholders due to their public service commitments (e.g., Greiling and Grüb, 2014; Stefanescu, 2021). Strategic stakeholder theory (Freeman *et al.,* 2004; Freeman, 2010' Hill and Jones, 1992), emphasizes that NFR targets the information needs of the most strategically significant stakeholders (Cantele *et al.,* 2018; Lulewicz-Sas and Godlewska, 2021; Paolone *et al.,* 2020; Tsalis *et al.,* 2019). This results in a narrower stakeholder focus. Addressing the information needs of key stakeholders is essential for organizational success, strategic advantage, enhanced organizational performance, and resource access (Wall and Greiling, 2011). Although Freeman (1994) originally advocated for a broad stakeholder focus, the more constrained instrumental perspective is evident in Freeman *et al.'s* (2004, p. 364) assertion: *"Managers must develop relationships, inspire their stakeholders and create communities where everyone strives to give their best to deliver the value the firm promises".*

The strategic stakeholder perspective assumes that only topics of interest to strategically relevant stakeholders are addressed in reporting (Donaldson and Preston, 1995; Freeman *et al.,* 2010). When strategic stakeholder theory is combined with SDG reporting, it becomes clear that SOEs should prioritize the information needs of their most strategically significant stakeholders. The consequence is selective or limited SDG reporting.

SDG reporting can be used not only to achieve strategic advantages but also to meet societal expectations and thereby secure organizational legitimacy. Organizational legitimacy theory assumes that alignment with societal norms and expectations (Deephouse *et al.*, 2017), such as SDG commitments, is critical for gaining and maintaining public trust. Deephouse *et al.* (2017, p. 42) define this legitimacy as *"the perceived appropriateness of an organization to social systems according to rules, values, norms and definitions"*. The boundaries of stakeholder and legitimacy theory are blurred for Deephouse *et al.* (2017) because the assessment of an organization's actions relies on the judgments of both internal and external stakeholders. They highlight that organizational legitimacy is granted by *"internal and external stakeholders who observe organizations (and other legitimacy subjects) and make evaluations [...] about the overall appropriateness"* (Deephouse *et al.*, 2017, p. 36). Deephouse *et al.* (2017) argue that organizational legitimacy is essential for the survival of companies, financial performance, stakeholder support, and strategic choice.

SDG reporting requires SOEs to demonstrate their commitment to the SDGs and address society's expectations and values. This alignment with the global norms and values of the UN Agenda 2030 not only helps meet societal expectations but also strengthens the perception of the appropriateness of SOEs' actions, which Deephouse *et al.* (2017) call the "social system". By transparently disclosing their contributions to the SDGs, SOEs can aim to increase their organizational legitimacy. While strategic stakeholder theory suggests selective SDG reporting, llegitimacy theory leads to a broader SDG approach aimed at gaining and maintaining organizational legitimacy to seriously pursue SDG implementation.

4. Sample and Methodology

4.1. Sample

Following Manes-Rossi *et al.* (2021), this study conducts a comparative (longitudinal) analysis. The year 2017 has been selected as the baseline for this study because certain SDGs aligned legislative, institutional and policy changes happened in New Zealand in that year. For example, the Social Investment Agency tasked to reduce poverty, inequality, and health disparities was established in July 2017. Furthermore, Pay Equity Settlement Act aimed at reducing gender pay gap and fair wages was also passed that same year. Likewise, New Zealand made strong commitments in relation to protection and conservation of oceans and marine resources during the UN ocean conference in 2017 (Farmers Weekly, 2017). These developments are visible in SDG related disclosures as most of the selected SOEs in NZ started publishing information about SDGs in 2017.

The Austrian sample consists of the largest SOEs, whose federal government ownership is monitored by a special agency, the Österreichische Beteiligungs AG (ÖBAG, 2024). The selection of the five Austrian SOEs for the comparative (longitudinal) analysis is based on their significant role in the Austrian economy and their high levels of public ownership, making them important drivers of national sustainability efforts. Each of the five SOEs represents a critical sector where public influence has a direct impact on SD.

The NZ sample of SOEs is chosen to match the sample of the selected Austrian SOEs under observation and consists of wholly or partially government-owned SOEs in the transportation and electricity industries. Similarly to their Austrian counterparts, the NZ SOEs in the sample have important roles in the national economy.

An overview of the sample is presented in Table 2. The percentage of public ownership ranges from 31.5% to 100%. This allows us to also evaluate whether any differences arise depending on the extent of public ownership.

Table 2: Overview of the sample

Company	**Sector**	**Total revenues** (Million)	**No. of Employees** (YE 2022)	**Public ownership (%)**	**Type of report(s)**
OMV AG	Oil, gas, and petrochemicals & recycling	EUR 62,298	22,308	31.5	Sustainability report
Verbund AG	Energy	EUR 10,346	3,516	51	Integrated report
Österreichische Bundesbahnen (ÖBB)	Transportation	EUR 2,728	42,600	100	Sustainability report
Österreichische Post AG	Logistics, postal service provider	EUR 2,522	27,132	52.85	Sustainability report
Autobahnen- und Schnellstraßen-Finanzierungs-AG (ASFINAG)	Infrastructure	EUR 2,080	3,104	100	Sustainability report
KiwiRail Holdings Limited	Transportation	NZD 701	4,500	100	Integrated report
NZ Post	Logistics, postal service provider	NZD 1,200	7,500	100	Integrated report
TransPower NZ Limited (TPNZ)	Electricity	NZD 930	1,120	100	Integrated report
Genesis Energy Limited	Electricity, gas	NZD 336,000	1,268	51	Sustainability report
Mercury NZ Limited	Electricity, gas, broadband, mobile phone services	NZD 213,000	1,335	51	Annual report

4.2 *Methodology*

The comparative (longitudinal) analysis of 60 non-financial reports was divided into three stages. Together, these three stages of analysis form a comprehensive approach to systematically analyze SDG reporting. An explicit description and explanation of each SDGs can be found in Appendix 1.

In the first stage of the analysis, to answer RQ1, a keyword search regarding terms such as "SDG" and "Sustainable Development Goals" was conducted using the financial statements of the starting sample year (2017) and the final sample year (2022). This allows us to compare the status quo of the start year (2017) with the status quo of the last year of our analysis (2022) and determine whether anything has changed in terms of SDG prioritization. Within this keyword search, the occurrences of each SDG mention can be counted according to a binary system (0 = SDG not mentioned; 1 = SDG mentioned, regardless of how often it is mentioned) and the SDG mentions from 2017 and 2022 can be displayed. Figures 1 and 2 illustrate changes in the SDG reporting at the beginning and the end of the observation periods. These figures show how many SOEs mention the specific SDGs in their reports. They further highlight the changes in SDG prioritization from 2017 to 2022 for all 10 SOEs.

To further explore answers to RQ1, following Bose and Khan (2022), an index comprising 17 items (i.e., United Nations 17 SDGs) is created. Similar to stage one of the analysis, information on each SDG was collected from the 60 NFRs. The content analysis technique employed an unweighted approach to assign a score of 1 (0) for each SDG reported (not reported) in the NFRs under observation. Thus, in this stage of the analysis, each company can attain a maximum score of 17 per year.

In the second stage of the analysis, to answer RQ2, we segregate the sample across each country based on four organizational factors (Casciello *et al.*, 2024; Jian *et al.*, 2023; Rosati and Faria, 2019), including size, ownership structure, economic efficiency, and corporate governance. The sample was segregated based on the median value of each organizational factor across the two countries and then tested for differences in the mean SDG disclosures (SDG_DISC) for each group. Appendix 1 provides definitions of each SDG and variable.

In the final stage of the analysis, we assess the quality of SDG reporting to answer RQ3. The analysis of non-financial information across all 60 annual reports (2017-2022) is performed using systematic coding and analysis with the MAXQDA software. The aim is to measure the quality of SDG reporting, a hierarchical structure of information levels and the basic attributes that outline the standards for the quality of SDG reporting. The framework of Low et al. (2023) was used to enable further analysis. Table 3 shows the hierarchical structure for measuring SDG reporting quality as per Low *et al.* (2023):

Table 3: Structure of measuring SDG reporting quality (based on Low *et al.*, 2023)		
Level (4) **Key attributes**	Value creation Materiality Time orientation Neutrality Assurance	Highly engaged, very useful, specific/extensive

Level (3) Quantitative information	Financial indicators Key performance indicators Percentage of each goal achievement Alignment measures with national SDGs	
Level (2) Qualitative information	Organisational goal, SDGs and sub-targets priorisation Potential risk and opportunities Actions and activities to achieve the SDGs Impact assessment tool	
Level (1) Corporate statement or message	Declaration of SDG commitments 17 SDG icons/labels Adoption of SDG-related guideline for reporting	Least engaged, least useful, generic/limited

Under *Level (1)*, a company issues a declaration committing to the SDGs and/or adopts guidelines or frameworks for SDG reporting. The declaration is accompanied by clearly visible symbols or labels representing the SDGs in the annual reports. At Level 1, no further qualitative or quantitative information is provided, apart from very general statements; therefore, this information is deemed to be of little value to the readers of the report. No matter how many times the term “SDGs” is mentioned, or related images are included, the report remains vague, with no references to specific actions to achieve the SDGs (Low *et al.* 2023).

Level (2) introduces qualitative information that explains how the prioritization of the SDGs aligns with corporate goals. At this level, companies demonstrate their commitment to the SDGs by identifying SDG-related risks, opportunities, actions, and initiatives. Although this information appears useful for assessing SDG integration, the accuracy of these representations remains uncertain. Without further evidence on SDG performance, such qualitative statements without further context lack credibility (Low *et al.*, 2023).

Level (3) disclosures include incorporating quantitative measures on SDG achievements. This is deemed to improve SDG reporting and make the SDG-related disclosures more informative. Quantitative data includes financial indicators, key performance indicators (KPIs) and the percentage of target achievement (Low *et al.*, 2023).

The last level, *level (4)*, proposes that SDG reporting quality is further enriched by five key attributes that are inherent in SDG reporting under that level: value creation, materiality, SDGs prioritization, time orientation (past, present, and future actions), neutrality (unselective reporting) and external assurance on reporting (Low *et al.*, 2023).

5. Findings

5.1 SDG[1] Disclosures Development Over Time

The data presented in Figure 1 and 2 forms the basis for answering RQ1 by representing the evolution of prioritized SDGs from the first year of the analysis (2017) to the final year (2022). This data reveals that SOEs in both countries did not report on all SDGs equally and tended to prioritize specific SDGs.

The SDG reporting by Austrian SOEs indicates a broader reporting of SDGs in 2017 (Figure 1), while NZ SOEs show a much narrower reporting pattern on the SDGs in 2017, with only SDG 8 and SDG 13 being reported on. Following the developments in 2022, Austrian SOEs have increasingly focused on specific SDGs. All five Austrian SOEs place a particular focus on SDG 5 "Gender Equality", SDG 7 "Affordable and Clean Energy", SDG 8 "Decent Work and Economic Growth", SDG 12 "Responsible Consumption and Production, " and SDG 13 "Climate Action". Austrian SOEs did not address SDG 2 “Zero Hunger” in 2017 or 2022. Comparatively, in 2022, there is a noticeable improvement in the SDG reporting by NZ SOEs, with the strongest improvement evidenced in reporting of SDG 8 and SDG 13 related disclosures, followed by SDG 5 and SDG 9 "Industry, Innovation and Infrastructure”. The following SDGs were not addressed in 2017 or 2022 by NZ SOEs: SDG 1 "No Poverty", SDG 2 "Zero Hunger", SDG 14 "Life Below Water" and SDG 16 "Peace, Justice and Strong Institutions".

[1] The detailed and explicit explanation of each SDGs can be found in the A Appendix 1.

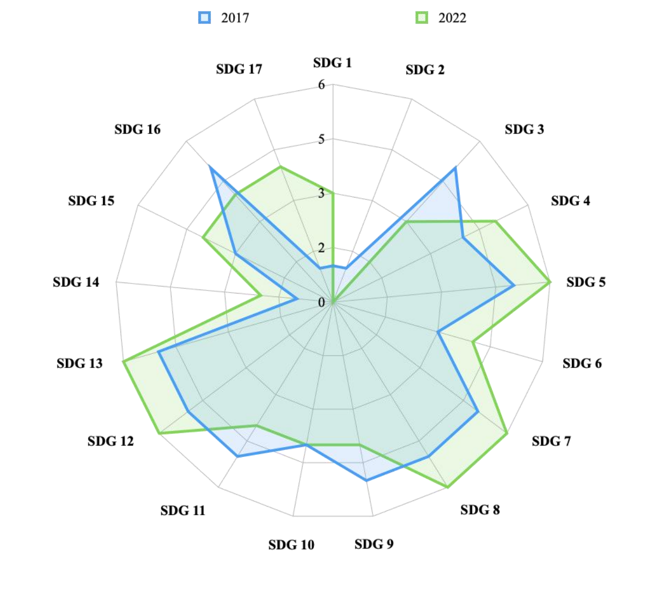

Figure 1: SDG development disclosures Austria

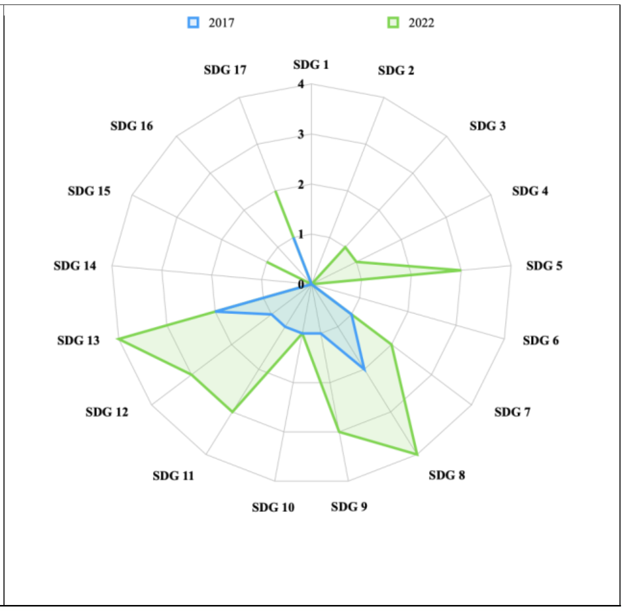

Figure 2: SDG development disclosures NZ

Table 4 further explores the answers to RQ 1. This table illustrates that the Mean SDG score by Austrian SOEs across the sample period is 13.20 indicating that on average, Austrian SOEs provided disclosures for around 13.2 items (out of possible 17). The average score for NZ SOEs is a mere 3.37 items during the sample period, indicating that in terms of SDG disclosure NZ SOEs are far behind their Austrian counterparts. Table IV further provides SDGs reporting trends across the two countries over the sample period. In 2017, on average, 12.60 SDG items (out of 17) were disclosed by the Austrian firms, while only 1.6 items were reported by the selected NZ SOEs in the same year. These results provide evidence of the effects of the regulatory environment on NFR, including SDG-related reporting, with Austrian SOEs working in a more regulated environment than NZ SOEs. Overall, although the trend is not linear across the sample period, there appears to be an increasing trend in SDGs-related disclosures by SOEs in both countries. Table 4 shows an interesting pattern across both countries. There is a drop in SDG-related disclosures in 2020 (Covid year) compared to 2019 (pre-Covid year). In 2020, SDGs disclosed by Austrian SOEs reduced to 13.20 on average (from 13.40 in 2019), while in NZ they reduced to 2.60 (from 4.00 in 2019). This table further indicates that in Austria, five (5) SDGs (SDG 5, 7, 8, 12, and 13) were reported by all the selected SOEs across the entire sample period. SDG 2 and SDG 14 were the least reported items, reported by 23% and 30% of the Austrian SOEs respectively. Similarly, in NZ, SDG 8 and SDG 13 were the most reported SDGs (reported by 57% and 53% of SOEs, respectively) across the sample period. In addition, unlike the Austrian SOEs, five of the SDGs: 1, 2, 4, 14, and 16 were not reported by any of the NZ SOEs across the sample period.

Table 4: Reporting of SDGs over the years

	Austria							NZ						
SDG	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**Mean Max = 1**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**Mean Max = 1**
SDG 1	0.20	0.40	0.40	0.40	0.60	0.60	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDG 2	0.20	0.20	0.20	0.20	0.40	0.20	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDG 3	1.00	1.00	1.00	1.00	1.00	0.80	0.97	0.00	0.00	0.20	0.20	0.00	0.20	0.10
SDG 4	0.80	0.80	1.00	0.80	0.80	0.80	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDG 5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.20	0.40	0.20	0.40	0.40	0.27
SDG 6	0.60	0.60	0.80	0.80	0.80	0.80	0.73	0.00	0.00	0.00	0.00	0.20	0.00	0.03
SDG 7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.20	0.00	0.20	0.20	0.40	0.40	0.23
SDG 8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.40	0.40	0.60	0.40	0.80	0.80	0.57
SDG 9	1.00	1.00	1.00	1.00	0.80	0.80	0.93	0.20	0.40	0.60	0.40	0.60	0.60	0.47
SDG 10	0.60	0.80	0.60	0.60	0.80	0.80	0.70	0.00	0.00	0.20	0.20	0.20	0.40	0.17
SDG 11	1.00	0.80	1.00	0.80	0.80	0.80	0.87	0.40	0.20	0.40	0.20	0.40	0.40	0.33
SDG 12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.20	0.20	0.40	0.20	0.40	0.40	0.30
SDG 13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.20	0.40	0.60	0.40	0.80	0.80	0.53
SDG 14	0.20	0.00	0.40	0.40	0.40	0.40	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDG 15	0.60	0.40	0.80	0.80	0.80	0.80	0.70	0.00	0.00	0.00	0.00	0.20	0.20	0.07
SDG 16	1.00	1.00	0.80	0.60	1.00	1.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SDG 17	0.40	0.40	0.40	0.80	0.80	0.80	0.60	0.00	0.20	0.40	0.20	0.40	0.60	0.30
Σ Max = 17	**12.60**	**12.40**	**13.40**	**13.20**	**14.00**	**13.60**	**13.20**	**1.60**	**2.00**	**4.00**	**2.60**	**4.80**	**5.20**	**3.37**

5.2 Organizational factors Aaffecting SDG disclosures

In the second stage of the analysis and to answer RQ2, we examine the impact of organizational structural characteristics and the corporate governance mechanisms on the SDG related disclosures, (Casciello *et al.*, 2024; Jiang *et al.*, 2023; Rosati and Faria, 2019). Previous studies have indicated that the size of the organization has positively affected social and environmental disclosures, as larger organizations have greater access to resources for such reporting (Aragón-Correa *et al.*, 2008; Udayasankar, 2008). Therefore, we examined whether the size of SOEs (measured by total assets) impacts their SDG-related disclosures. The ownership structure is another variable affecting firms' SDG and environmental disclosures according to previous literature (Jiang *et al.*, 2024). Therefore, we further test whether the degree of government ownership affects the SDG disclosures by SOEs in our sample. In addition, it has been reported that better economic performance often leads to increased willingness to invest in social and environmental initiatives and related reporting (Ullmann, 1985). Based on this premise, we test whether the economic efficiency of SOEs, as assessed by the asset turnover ratio, affects SDG reporting. Finally, prior literature suggests that corporate governance mechanisms including large board size and increased representation of women on the boards positively affect firms' SDG disclosures (Casciello *et al.*, 2024; Jiang *et al.*, 2023). Therefore, we examine whether corporate governance factors (board size and female representation on the board) affect the SDG disclosure behavior by Austrian and NZ SOEs in our sample.

5.2.1 Austria

Table 5 shows that the natural logarithm of Austrian SOE median assets is 16.46 (14,282 million Euro) with median government ownership of 52.85% (51.235) and an asset turnover ratio of around 30 %. Austrian SOEs, on average, have 15 board members, of which approximately 35.36% are women. Panel A of Table 5 indicates that the size of Austrian SOEs does not affect their SDG disclosure behavior. This finding contradicts Rosati and Faria (2018), who reported a positive association between SDG disclosure and firm size. However, this result aligns with Wahyuningrum *et al.* (2022), who argue that a company's size is not an indication of higher disclosure of information. Panel B of Table 5 indicates that the Mean SDG_DISC of Austrian SOEs with high (low) state ownership is 12.08 (13.39), and the mean test (t-statistics) indicates that the difference between the means is significant (-7.04, $p<0.05$) suggesting that high state ownership results in lower SDG disclosures. This result is similar to that of Jiang *et al.* (2023), who reported that institutional ownership has a significant negative association with SDG disclosures. The findings in Panel C suggest that the economic efficiency of Austrian SOEs does not affect their SDG disclosures. This result is consistent with Rosati and Fari (2018). Findings in Panel D of Table V suggest that, on average, Austrian SOEs with larger boards (above median) provide more SDG disclosure (Mean value = 14.43) than SOEs with smaller boards (Mean value =11.50). The difference between the mean SDG disclosure of the two groups is significant (Mean test= 5.16, $p<0.05$). The findings in Panel E of Table V suggest that there is no difference between SOEs with higher versus lower female representation on boards.

5.2.2 NZ

Table 5 shows the natural logarithm of the median assets owned by NZ SOES is 15.40 (4,885 million NZ dollars) with a median government ownership of around 51% and asset turnover of about 38%. NZ SOEs have comparatively smaller boards, with an average of 8 members, but a comparatively higher representation of women on boards (around 42.83%). Findings in Panel A of Table 5 indicate that similar to Austrian SOEs, the size of NZ SOEs is not a determinant of the level of their SDG disclosures. Findings in Panel B of Table 5 are also not significant i.e., the level of government ownership in an SOE does not affect its SDG disclosures. However, findings in Panel C of Table 5 suggest that more efficient NZ SOEs have better SDGs disclosures than less efficient SDGs (Mean SDG-DISC of more efficient (less efficient) SDGs = 4.73 (1.93), Mean test = 2.31, $p<0.05$). Findings in Panel D and E of Table 5 suggest that corporate governance across both countries is a valuable contributor to SDG disclosures. However, in Austria larger boards (SDG_DISC of above (below) median board size = 14.43 (11.50) lead to better SDG disclosures (t-score= 5.16, $p<0.05$), while in NZ higher women representation on boards (SDG_DISC of SOES with above median women representation = 5.43 (2.00), t-score = 2.06, $p<0.05$) leads to better SDG disclosures. Findings in Panel D of Table 5 suggest that the board size of NZ SOEs does not affect the level of their SDG disclosures. However, the findings in Panel E indicate that women's representation on boards as a measure of the effectiveness of corporate governance in NZ leads to higher SDG disclosures. That is, SOEs with a higher representation of women on boards (Mean SDG_DISC = 5.43) compared to those SOEs with a lower representation of women on boards (Mean SDG_DISC = 2.00), mean test = 2.06, p<0.05) tend to report more.

Table 5: Quantitative analysis

	Austria			NZ		
Panel A: SIZE- mean test between large and small SOEs						
	Median Size (Ln Assets) = 16.46			Median Size (Ln Assets) = 15.40		
	Large N = 15	Small N = 15	Mean test	Large N = 15	Small N = 15	Mean test
SDG_DISC	12.53	13.20	-0.85	2.67	4.00	-1.03
Panel B: Ownership structure- mean test between high and low government ownership						
	Median govt. ownership = 52.85%			Median govt. ownership = 51.23%		
	High govt own N = 18	Low govt own N = 12	Mean test	High govt own N = 18	Low govt own N = 12	Mean test
SDG_DISC	12.08	13.39	-7.04*	3.72	2.75	0.73
Panel C: Efficiency- mean test between more and less efficient SOEs						
	Median asset turnover ratio = 0.30			Median asset turnover ratio = 0.38		
	More efficient N = 15	Less efficient N = 15	Mean test	More efficient N = 15	Less efficient N = 15	Mean test
SDG_DISC	13.13	12.60	0.68	4.73	1.93	2.31*
Panel D: Corporate governance- mean test between large and small boards						
	Median board size = 15.00			Median board size = 8.00		
	Large board N = 14	Small board N= 16	Mean test	Large board N = 15	Small board N= 15	Mean test
SDG_DISC	14.43	11.50	5.16*	2.40	4.27	-1.46
Panel E: Corporate governance- mean test between more and less women on board						
	Median women on board = 35.36%			Median women on board = 42.86%		
	Above 35% N = 15	Below 35% N= 15	Mean test	Above 42.86% N = 14	Below 42.86% N= 12	Mean test
SDG_DISC	12.40	13.33	-1.21	5.43	2.00	2.06*

Mean test shows the *t* statistic and significance level (*) at p < 0.05, based on two-tailed tests, for differences between the mean of SDG_DISC (SDG disclosures)

5.3 Quality of SDG reporting per country

This section presents the final stage of the analysis by examining the quality of SDG reporting. This analysis serves to answer RQ3. Quality assessment was based on the framework of Low et al. (2023), as previously explained in Section 3.2.

5.3.1 Austria

Table 6: Overview of qualitative findings in Austria

Level	Description and Findings	Examples and Quotes
Level 1: Corporate Statement or Message	- All five Austrian SOEs make a commitment to the SDGs in their non-financial reports in the period 2017 - 2022. - SDG commitment is highlighted at the beginning of reports. - SDGs are displayed prominently as icons or labels.	- "*The 17 Sustainable Development Goals (SDGs) of the 2030 Agenda were adopted by the United Nations in September 2015. They address the most important challenges of our time, such as climate protection, poverty reduction, and education. […] For these reasons, […] has worked intensively on the 17 goals and the associated 169 targets." (Verbund AG, 2017).* - *"We are also committed to the global goals of the United Nations, the Sustainable Development Goals" (Post AG 2021; 2022; 2023).*
Level 2: Qualitative Information	- From 2017 - 2022 goals, measures and initiatives are linked to the SDGs. - All Austrian SOEs set out their organizational goals and the prioritization of the SDGs and sub-goals in their reports. - SDGs are placed next to related initiatives. - Reports discuss sustainability risks and opportunities. - Gender equality is becoming an important strategic priority for some Austrian SOEs.	- "*Three million tons per year - that is the amount of CO_2 emissions that ÖBB avoids annually through its transport services - and since July 2018, 100% of the electricity required has come from renewable sources. ÖBB also takes responsibility for nature and the environment."* (ÖBB, 2017). - *Targets by 2030: Increase the proportion of women at management level to 30%, At least 20% female members of the Management Board (stretch target: 30%), Increase the proportion of international managers to 65%, Maintain at least 75% of executives with international experience, Increase support for employees with disabilities at our main locations. Relevant SDGs: 5, 8, 10"* (OMV, 2021).

Austrian SOEs currently fulfill the requirements of level 1 and level 2 (Low *et al.*, 2023) for assessing the quality of SDG reporting (Table 6). At level 1, they declare their SDG commitments and adopt SDG icons and guidelines, but their commitments remain limited and are still very general. When the Austrian SOEs under observation reach level 2, they prioritize their organizational goals in relation to the SDGs, recognize potential risks and opportunities, and identify actions to achieve these goals, demonstrating a moderate level of commitment. However, our findings also indicate that Austrian SOEs have not yet improved their SDG-related reporting to level 3 or 4, which requires more detailed and quantitative reporting regarding the SDGs. At level 3, they would need to provide financial indicators and key performance metrics aligning their performance with the national SDGs to show a stronger commitment to measurable findings. At level 4 they would need to show an even greater commitment and focus on value creation, materiality, neutrality, and certainty in SDG management and reporting. The missing improvement in reporting from Level 2 to Level 3 shows that Austrian SOEs need to develop more sophisticated tools to measure and present their SDG performance to meet the higher quality and levels of SDG reporting. It can further be deducted from our analysis, that Austrian SOEs need a more serious commitment to incorporating SDGs in their strategies and routine business performance to reach level 3 and 4 SDG-related reporting. Levels 3 and 4 are envisaged to be transformative and to encompass strategic and business thinking so that the SDG achievements become a part of meaningful business practice, rather than just being a reporting exercise or "SDG washing" exercise.

5.3.2 NZ

Table 7: Overview of qualitative findings in NZ

Level	Description and Findings	Examples and Quotes
Level 1: Corporate Statement or Message	- All five NZ SOEs report on SDGs at least once between 2017-2022. - They report on SDGs inconsistently, with scattered disclosures across various reports. - Some SOEs, like Genesis Energy and Transpower, only started SDG disclosures in 2019. Reporting formats are not standardized, with some SOEs mapping SDGs explicitly and others only mentioning compliance.	- "*For the first time, stakeholders were asked to rate the relevance of the Sustainable Development Goals (SDGs) to NZ Post activities. Our internal and external stakeholders told us that the following seven SDGs are particularly relevant to NZ Post"* **(NZ Post, 2018)**. - *"In the financial year 2018 we engaged an external agency to review material issues we have identified in 2016, refreshing their meaning and comparing the list for comprehensive against international frameworks. That work is influencing KiwiRail's evaluation of the UN Sustainable Development Goals (SDG) as we identify our priorities for the year ahead"* **(KiwiRail, 2018).**
Level 2: Qualitative Information	- Three (60%) of the five NZ SOEs link their projects to SDGs and provide explanations. - Two SOEs remain at Level 1, offering only general SDG commitments.	- *"SDG 8: goals- While KiwiRail has several diversity and inclusiveness programmes which contribute to decent work for New Zealanders, our primary contribution to this goal is through sustainable tourism. Our tourism services help drive regional growth, delivering a million tourists to some of our less visited regions each year. KiwiRail is also signatory to the New Zealand Tourism sustainability Commitment"* **(KiwiRail, 2019)** - *"SDG 13: goals- Reducing emissions is good for the environment and good for business. Actively participating in the creation of a pathway to a low carbon future, is positive for all New Zealanders. Targets by 2030: Committed not to use any coal after 2025 in normal market conditions. Intention to phase out coal use completely by 2030"* **(Genisis, 2020).**

All five NZ SOEs currently fulfill the criteria of level 1 (Low *et al.*, 2023). However, their wider and deeper reporting on commitments to SDGs remains very limited (Table 7). Only slightly more than half of the NZ SOEs prioritize their organizational goals in relation to the SDGs and thus, they are currently demonstrating a moderate level of commitment to the SDGs in general. None of the SOEs in NZ are at level 3 or above, according to Low *et al.'s* (2023) framework, indicating that SDG disclosures by NZ SOEs are still in a very rudimentary and developing stage. The level and quality of SDG reporting are questionable in terms of usefulness for the users and readers of the reports. Furthermore, keeping in mind the generic nature of the disclosures under level 1 of the Low *et al.* (2023) framework, it is hard to conceive whether NZ SOEs are demonstrating genuine commitment to SDGs or have adopted a "tick box" approach and "SDG washing" in their reports.

6. Discussion and Conclusions

The findings regarding RQ1 *"How has the SDG reporting in large Austrian and New Zealand SOEs evolved since 2017?"*, show that the quantity of the SDGs in the 10 SOEs examined in this study has increased significantly from 2017 to 2022. Figures 1 and 2 show that Austrian SOEs had much broader SDG reporting than NZ SOEs from the beginning. Reflecting the findings from the 169 SDG targets, Austrian SOEs also have better quantitative coverage of reported SDGs than NZ SOEs. If one compares the findings against the regulatory requirements for NFR, the better (quantitative) coverage of the SDGs in Austria is understandable as such reporting is not entirely voluntary, unlike in NZ. Furthermore, Austria has adopted a more structured approach to SDG policies and practices by having a centralized model with interministerial coordination and involving multiple stakeholders such as businesses, civil society, and scientific community (Austria and the 2030 Agenda, 2020). New Zealand's approach is decentralized and context specific in relation to each individual organization or specific SDGs. These findings are not corresponding with the fact that both countries have shown, at least on high level, strong commitment regarding implementation of the 2030 Agenda (Austria and the 2030 Agenda, 2020; New Zealand progress towards the SDGs, 2019). These finding indicates that legal environment with a more centralized and legislated approach to NFR, including SDG reporting, that also involves multiple stakeholders in the process is likely to produce more successful outcome in terms of SDGs related output and reporting.

The findings further suggest that both countries are selective in their SDG reporting, and this is a sector-neutral finding. When assessing the balance between reporting on social SDGs and environmental SDGs, NZ SOEs prioritize the latter, despite being less exposed to stringent environmental regulations, such as the CSRD and the EU Taxonomy that Austrian SOEs follow. This is due to NZ Government of the day, at the period of observation in this study, placing heightened importance on environmental issues and related reporting.

The findings also reveal that the examined SOEs show growing awareness and orientation of sustainability matters and SDG-related issues, which is reflected in the increasing SDG disclosures over time, in line with the findings of Stanimirović *et al.* (2024). The strategic stakeholder perspective (Donaldson and Preston, 1995; Freeman *et al.*, 2010) suggests that the surveyed SOEs tend to contribute to SDGs by prioritizing a small number of mostly strategically relevant SDGs, aligned with their strategic role in the national economy, the nature of their core operations and the interests of key stakeholders. The growing SDG reporting since 2017 indicates that SOEs are becoming aware of their social and environmental responsibility and are gradually integrating sustainability into their strategic communication, which is in line with the instrumental perspective (Hansen and Schaltegger, 2016). From a socio-political perspective, this development can be interpreted as an attempt by SOEs to align themselves with societal expectations and maintain legitimacy in response to growing stakeholder demands for transparency. Furthermore, by prioritizing SDG reporting, SOEs are reinforcing their social contract, securing public trust and strengthening their legitimacy at a time when sustainability is politically questioned.

In response to RQ2, *"What are the organizational factors that are influencing the SDG reporting of large Austrian and New Zealand SOEs"*, the quantitative analysis reveals that, in contrast to conventional wisdom, the size of SOEs across both countries does not affect their SDG-related disclosure behavior. It is expected that larger firms with more resources, and being prone to more stakeholders' pressure, should have better financial and NFR, including SDG reporting. Nonetheless, it is pertinent to mention here that the selected SOEs are predominantly larger in size and significance, thus, this potential selection bias might affect the results. Therefore, a study with a larger sample consisting of more diverse SOEs could be a fruitful avenue for future research. The results for government ownership and the impact of operating efficiency on SDG disclosures partially hold. While results for corporate governance are significant across both countries. However, on the Austrian side, board size positively affects SDG disclosures but women on board do not. Contrary to the NZ side, where board size does not affect SDG disclosure, however, more women on the boards do have a positive impact on SDG disclosures. However, it is pertinent to note that NZ boards in the selected sample of SOEs have more female representation than their Austrian sampled counterparts. According to the critical mass theory, the presence of a sufficient number of women on boards increases their effectiveness in governance (Jiang *et al.*, 2023). The results from both countries, indicate the importance of corporate governance on SDG reporting quality. This result warrants further future research i.e., researching large sample size of boards and investigating women representation on such board and the related effects on SDGs related output and reporting.

From the perspective of strategic stakeholder theory, these results refute the assumption that larger SOEs should submit more comprehensive SDG reports. This suggests that other governance and contextual factors play a critical role in shaping SDG reporting. These findings are consistent with legitimacy theory, particularly regarding the role of governance in legitimizing SDG reporting. Different effects of board size and gender diversity in Austria and NZ illustrate how national governance norms and stakeholder expectations influence reporting behavior. The stronger impact of female board representation in NZ suggests that legitimacy pressures are more gender-sensitive in this context, while Austrian SOEs rely on board size as a legitimacy mechanism.

In response to RQ3 *"What is the quality of SDG reporting by large Austrian and New Zealand SOEs?"*, the findings in this study show, that Austrian SOEs perform better, as they all comply with levels 1 and 2 of the reporting Low *et al.* (2023) framework, while only 60% of NZ SOEs fulfill the requirements at level 2, with the remaining NZ SOEs only complying with level 1. Level 1 is the lowest level, where firms just acknowledge the importance of SDGs and indicate a general commitment to incorporate the SDG guidelines and values in their operations. However, such information is of minimal value to the users of the reports, as it does not provide much meaningful information on SDG achievements. In the absence of specific mapping of the disclosures, initiatives and actions in relation to specific SDGs, it is hard to understand whether the information disclosed is a mere 'tick box 'approach or whether the SOEs are making genuine attempts to incorporate SDG-related values into their operations. All sampled SOEs from both countries mention and acknowledge the importance of SDGs and indicate their capacity to contribute to some of the reported SDGs. At level 2, the disclosures are better than level 1 as projects and actions are mapped to specific SDGs, however, they still lack the required credibility and usefulness due to the lack of quantification of the disclosed information (Low *et al.*, 2023).

Level 3 and 4 disclosures, according to Low *et al.* (2023) are high-value disclosures. The lack of such disclosures by both Austrian and NZ SOEs, at levels 3 and 4 highlights a significant gap in the depth and accountability when it comes to SDG reporting. Therefore, sampled SOEs seemingly engage in 'SDG-washing', i.e. claiming to align with SDG principles without providing further meaningful evidence of their impact on the strategy and operations. The lack of levels 3 and 4 disclosures also suggests that SOEs are either unwilling or unable to provide measurable data linking their initiatives and actions to the specific SDG targets. This could be due to regulatory gaps, as there is no mandatory requirement or any related guidance for SOEs to disclose SDG-related metrics, leading to a preference for qualitative and descriptive, rather than quantitative reporting. In addition, organizational constraints such as limited internal capacity, inadequate data collection and/or lack of strategic prioritization may further hinder SOEs' ability to effectively track and report on SDGs-related performance. Finally, some strategic hesitation may also play a role, as more robust disclosure would expose SOEs to greater scrutiny, potentially revealing inconsistencies between commitments and actual findings. This indicates that there is still a long way to enhancing SDG-related disclosures and practices.

The findings of this study are consistent with legitimacy theory and the socio-political approach (Hansen and Schaltegger, 2016) and less consistent with strategic stakeholder theory. According to legitimacy theory, achieving level 1 or 2 would be sufficient to demonstrate some form of compliance with societal expectations without necessarily providing deeper, quantifiable insights. However, to truly address the concerns of key stakeholders and demonstrate meaningful SDG activities, more than just level 1 or 2 disclosures are required. Achieving higher levels of SDG reporting (Levels 3 and 4) requires a shift towards strategic stakeholder engagement to ensure that key stakeholders receive substantive, measurable information on the impact of SDG initiatives that is relevant and meaningful to them. The current state of reporting, as we found, suggests that SOEs are primarily concerned with maintaining legitimacy rather than taking a more in-depth, stakeholder-centered approach to NFR, including SDGs.

In conclusion, the findings of this study show a complex and evolving picture of SDG reporting by large SOEs in Austria and NZ. While progress is evident, significant gaps remain, particularly in terms of the depth and credibility of disclosures. Increasing SDG disclosures suggest that SOEs in both countries are becoming aware of their sustainability-related responsibilities. However, the extent to which these disclosures translate into meaningful actions remains uncertain. The prioritization of SDGs that align with strategic interests indicates a pragmatic approach but also raises concerns about selective reporting and potential "SDG washing", indicating reduced relevance from the users' perspective. Austria's comparatively established regulatory framework, shaped by EU policy, has contributed to better SDG disclosures. However, reporting remains largely at a baseline level, with no SOEs reaching level 3 or 4. NZ SOEs depict improving SDGs disclosure trends, but are still lagging behind, with many largely reporting at level 1. The limited integration of quantifiable and verifiable sustainability data might also suggest SOEs' reluctance to undergo strict scrutiny. The lack of transparency weakens stakeholders' confidence and casts doubt on SOEs' commitments to truly embed SDGs in corporate strategies.

Given that the deadline for achieving Agenda 2030 is nearing, if it is to be taken seriously, one would expect that both the Austrian and NZ governments would be well on their way to achieving Agenda 2030 in many spheres. SOEs could be active partners in achieving Agenda 2030 through SDG implementation. This study provides evidence that this is not the case. The reports by SOEs in both countries do not show that the SOEs have been fully engaged in implementing the SDGs into their operations. In addition to achieving sustainability and SDG-related goals, better engagement in SDG implementation would also be in the self-interest of the individual SOEs. This is due to the potential for reputation management, strategic positioning, and long-term effects on operations and businesses. With a public mission to serve, SOEs are also natural candidates for SDG implementation and are likely to play a more significant role in future developments.

Despite slow and less than satisfactory SDG reporting by SOEs, the general trend is still encouraging. Both Austrian and NZ SOEs appear to be gradually institutionalizing sustainability and related SDGs, reflecting a slow but growing recognition of their social and environmental responsibilities. The evolving stakeholder and regulatory environment may eventually drive SOEs toward more rigorous, measurable and impactful NFR, including SDG-related reporting. However, for SDG reporting to truly achieve change and not serve as a mere compliance exercise, SOEs need to commit to going beyond symbolic gestures, providing and disclosing paths to SDG achievements and accountability and developing more robust mechanisms to capture, measure, disclose and assure their sustainability performance in a transparent and meaningful way.

This study makes several contributions to the academic literature on SDG reporting. Firstly, it conducts a comparative analysis of SOEs in two OECD countries with different regulatory environment i.e., centralized, interministerial coordination, and multi-stakeholders approach versus a decentralized and contextual approach. From the policy point of view, the findings suggests that a holistic approach with inclusion of multiple stakeholders in policy formulation and implementation process are expected to result in a better outcome compared to a decentralized and fragmented approach. While there is a growing body of literature on SDG reporting by various enterprises, much less is known about SOEs, and the important public sector entities that are judged on their public missions as well as their business results. This study adopts a longitudinal approach, offering further insights into trends in this area. Utilizing the framework developed by Low *et al.* (2023), this study makes a distinctive contribution to the existing literature by offering one of the few in-depth analyses of SDG-related disclosures. Thus, this study provides a comprehensive assessment of the quantity and quality of SDG reporting practices. This study also sheds light on the geographical and regulatory implications for SDG reporting trends and the interplay of stakeholder and legitimacy theories in shaping these practices.

Similar to other comparative and exploratory studies, this study has some limitations. The first limitation relates to the methodology as a qualitative and quantitative content analysis can only present what the SOEs report. Therefore, we do not explore in detail the SDG practices that SOEs engage in and their dynamics over time. Analyzing quality based on the framework of Low *et al.* (2023) also represents another potential limitation as it is only one of many ways to assess the quality of SDG reporting. Focusing on only 10 large SOEs in two countries is an additional limitation. However, analyzing the quantity, and quality of SDG related disclosures by a well-defined sample of SOEs allows for far richer and detailed analysis, thus, offers more analytical validity. In addition, this study only provides preliminary insights. The in-depth analysis in this study focuses on 10 Austrian and NZ SOEs, which is in line with the pilot character of this study. Interviews would be beneficial to provide further insights and allow for a more in-depth comparative case study design. Another direction for further research could be to extend the comparison of SDG reporting by SOEs in other jurisdictions with varied legal and regulatory environments and include the exploration of specific policies and strategies regarding a selection of SDGs. Interviews with public owner representatives and government officials responsible for the UN Agenda 2030 could further enrich such findings.

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Appendix 1: Definition of variables	
Panel A: List of 17 SDGs (United Nations, 2015)	
SDG 1	No Poverty
SDG 2	Zero Hunger
SDG 3	Good Health and Well-being
SDG 4	Quality Education
SDG 5	Gender Equality
SDG 6	Clean Water and Sanitation
SDG 7	Affordable and Clean Energy
SDG 8	Decent Work and Economic Growth
SDG 9	Industry, Innovation, and Infrastructure
SDG 10	Reduced Inequality
SDG 11	Sustainable Cities and Communities
SDG 12	Responsible Consumption and Production
SDG 13	Climate Action
SDG 14	Life Below Water
SDG 15	Life on Land
SDG 16	Peace, Justice, and Strong Institutions
SDG 17	Partnerships for the Goals
Panel B: Definition of variables	
Size	Natural logarithm of total assets
Govt ownership	Level of government ownership in percent
Asset Turn Over Ratio	Revenue in year_{t} / Total Assets in year_{t}
Board size	Number of board members in year_{t}
Women on Board	Women percentage representation on board in year_{t}, calculated by, (Number of Women on board/ Board Size)*100
SDG_DISC	Level of SDG Disclosure, maximum = 17, minimum value = 0