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Relative Sustainable Development Goals (SDG) Information Quality: An exploratory analysis of South African state-owned enterprises disclosures

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Relative Sustainable Development Goals (SDG) Information Quality: An exploratory analysis of South African state-owned enterprises disclosures

A research report submitted by:

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to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Commerce in Accountancy

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ABSTRACT

Orientation/context: Following the introduction of the United Nations Sustainable Development Goals (SDGs), there arose significant public anticipation for businesses to conform, in their operations, to these objectives and report on their progress toward alignment. State-owned enterprises (SOEs) in South Africa are created to be sustainable in the short, medium, and long term to advance the social, environmental, and economic needs of the public. It is therefore important to recognise that these entities can be valuable resources to be used in the achievement of the SDGs for South Africa. Against this backdrop, this study underscores the importance for SOEs to adopt sustainable practices and seamlessly incorporate SDG information into their corporate reporting cycle.

Purpose – The purpose of this study is to evaluate the quality of SDG information disclosed in the integrated or annual reports of South African SOEs listed under Schedule 2 and 3B of the Public Finance Management Act (PFMA). This research also focuses on identifying those SDGs to which SOEs contribute the most with respect to corporate reporting quality.

Design/methodology/approach – This study examined the integrated/annual reports of SOEs listed in Schedule 2 and 3B of the PFMA for the 2022 year-end. A detailed content analysis was employed, utilising a constructed quality measure that amalgamates various indicators from sustainability reporting literature, to gauge the quality of SDG disclosures. The emphasis placed on SDG information, the inclusion of qualitative, quantitative, and monetary disclosures, and the substance (boilerplate or committed) of disclosures are considered. The balance and comparability of disclosures as well as the ease with which SDG information can be interpreted based on the use of infographics are also included as quality indicators. These indicators are evaluated at the overall report level as well as within the scope of each of the 17 SDGs.

Findings – The results show that the SDG information disclosed by the SOEs is mainly symbolic, including boilerplate, unbalanced, inaccessible and mainly qualitative information without really showing any information regarding the progress of corporate sustainability performance. Consequently, there is doubt about the degree to which the integrated or annual reports can be readily understood and effectively utilised to assess the SOEs' overall performance concerning their contribution to the SDGs.

Originality/value – Limited research has been conducted on public sector sustainability or SDG reporting in South Africa. The study contributes to the growing body of SDG reporting research in the public sector, by revealing new insights that could provide guidance to policymakers and those charged with governance on how to improve sustainability and SDG reporting. Furthermore, the results reveal the quality of SOEs' SDG disclosures, which can be incorporated in stakeholders' decision-making processes, facilitating more

useful decisions to be taken. The proposed quality measure offers a valuable resource for scholars and professionals who wish to assess and analyse specific elements of report quality.

Keywords: SOE, SDG information, disclosure quality, sustainability, integrated report, annual report

DECLARATION

I, Kayla Hosiosky declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Commerce at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Kayla Hosiosky
31 March 2024

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LIST OF ACRONYMS/ABBREVIATIONS

SOE	State-Owned Enterprise
SDG	Sustainable Development Goal
ATLAS.ti	Archive for Technology, the Life World and Everyday Language, text interpretation
ATNS	Air Traffic and Navigation Services Company
ACSA	Airports Company
Amatola Water	Amatola Water Board
Armscor	Armaments Corporation of South Africa
B-BBEE	Broad-Based Black Economic Empowerment
Broadband	Broadband Infrastructure Company (Pty) Ltd
CEF	CEF Pty (Ltd)
CSIR	Council for Scientific and Industrial Research
CSR	Corporate Social Responsibility
DBSA	Development Bank of Southern Africa
ECIC	Export Credit Insurance Corporation of South Africa Limited
Eskom	Electricity Supply Commision
GDP	Gross Domestic Product
ICT	Information and Communications Technology
IDT	Independent Development Trust
IDC	Industrial Development Corporation of South Africa Limited
IIRC	International Integrated Reporting Council
IR	Integrated Report
JSE	Johannesburg Securities Exchange
Land Bank	Land and Agricultural Bank of South Africa
Lepelle Water	Lepelle Northern Water
NDP	National Development Plan
NPC	National Planning Commission
Ntsika	Ntsika Enterprises

OBP	Onderstepoort Biological Products
Overberg	Overberg Water
PRASA	Passenger Rail Agency of South Africa
PFMA	Public Finance Management Act
PIC	Public Investment Corporation Limited
SABC	SA Broadcasting Corporation Limited
SABS	SA Bureau of Standards
SAFCOL	SA Forestry Company Limited
SDT	State Diamond Trader
SMME	Small, Medium and Micro Enterprise
Necsa	SA Nuclear Energy Corporation
SAPO	SA Post Office Limited
SAA	South African Airways Limited
Telkom	Telkom SA Limited
TCTA	Trans-Caledon Tunnel Authority
Transnet	Transnet Limited
UN	United Nations

CHAPTER I: INTRODUCTION

1.1 Context of the study

The United Nations Brundtland Commission defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987, p. 16). Sustainable development is centred on three essential aspects: economic development, social equity, and environmental protection (Boeva *et al.*, 2017). This definition suggests that the ultimate goal of sustainable development is to attain societal and economic growth while maintaining harmony with nature (Chigudu, 2020). The combination of these three aspects is crucial to achieving corporate sustainability.

The United Nations (UN) introduced a recent sustainable development measurement standard in 2015 (Bebbington and Unerman, 2020, Pizzi *et al.*, 2021, Tsalis *et al.*, 2020) and it has become widely used as a tool for identifying sustainability indicators (Jain and Jain, 2020). In September 2015, the UN’s 2030 Agenda for sustainable development goals (SDGs) was unanimously adopted globally by 193 states at the *United Nations General Assembly* (Chigudu, 2020, UN, 2015). The SDGs consist of 17 goals and 169 targets that aim to stimulate action over the next 15 years across five pillars: people, planet, prosperity, peace, and partnership (UN, 2015).

At a local level, South Africa as a UN member state strives to align the implementation of the SDGs with its National Development Plan (NDP) to the extent feasible (Bronkhorst, 2022, Fourie, 2018, Haywood *et al.*, 2019, NPC, 2011, StatsSA, 2019). Since the implementation of the NDP in 2012, it has had a notable impact on shaping and incorporating the SDGs in South Africa's approach (Haywood *et al.*, 2019, Mamokhere, 2022). Ultimately, this synchronisation implies that the pursuit of the SDGs can have a substantial influence on the attainment of the country's primary objectives outlined in the NDP, and vice versa (PWC, 2016, Haywood *et al.*, 2019).

In 2022 South Africa ranked 108th in the Sustainable Development Report from among the 193 UN member states and obtained a global SDG index score of 63.72 out of 100 (Sachs *et al.*, 2022). This ranking is distinctive for many developing countries and shows that significant work on sustainable development is needed if South Africa is to achieve the SDGs and its NDP goals (Lau and Wong, 2022).

State-owned enterprises (SOEs) are government entities that utilise public funds and are responsible for delivering services that have an impact on people's lives and foster economic expansion (Boros and Fogarassy, 2019, Fourie, 2014, Kikeri, 2018). In emerging nations like South Africa, the population relies on SOEs for fundamental necessities like employment, water, sanitation, electricity, and transportation (Kikeri, 2018, Matsiliza, 2017, Ovens, 2016). The significance of SOEs should not be underestimated, as they play a vital role in generating continuous value for both the nation and its people through their active involvement in key sectors of the economy (Balbuena, 2014, PWC, 2015). Consequently, these enterprises can serve as valuable resources for achieving the SDGs in South Africa (Chigudu, 2020, NPC, 2011).

Following the introduction of the UN SDGs, there arose significant public anticipation for businesses' operations to conform to these worldwide objectives and provide transparent updates on their progress toward alignment (Rosati and Faria, 2019, Subramaniam *et al.*, 2023). SDG reporting is not compulsory for SOEs in South Africa (Chigudu, 2020) but in its Annual Report Guide, the National Treasury (2022) recommends that South African public entities use the country's NDP in preparing their annual reports. The annual report serves as a vital mechanism for SOEs to communicate to stakeholders the actions taken by management to create long-term value for the country (IIRC, 2017, National Treasury, 2022, Surty *et al.*, 2018). This fact, and the alignment between the NDP and SDGs, enables the exploration of SDG-related information disclosed by South African SOEs.

1.2 Research problem

South Africa continues to face significant challenges in achieving its NDP and by implication, the UN's SDGs. Approximately 18.2 million South Africans lived in extreme poverty in 2022 (Statista, 2023). Inequality, crime, corruption, and unemployment rates remain one of the highest in the world; additionally, the electricity supply shortage causing rolling scheduled power cuts (also known as 'loadshedding') has constrained growth in South Africa for years (BusinessTech, 2023, StatsSA, 2023, World Bank, 2023).

As SOEs can be significant drivers for sustainable development, they are facing increasing pressure to make substantial efforts to address these issues and contribute to advancing sustainability (Chigudu, 2020, Matsiliza, 2017). A way for them to do so is by evaluating the sustainability impact of their operations and demonstrating their proactive efforts to handle these

matters within their integrated or annual reports (Ackers, 2022, Surty *et al.*, 2018). The sustainability information that is disclosed should be aligned with the SDGs. This is because the SDGs encompass all areas of sustainability and consider all relevant stakeholders (Bebbington and Unerman, 2018, Freeman, 1984, Gray *et al.*, 2014, UN, 2015).

Further, for stakeholders to gauge their dedication to corporate social responsibility, these disclosures should be meaningful, capable of offering quantifiable data, presented in a manner that enables users to evaluate the performance of the SOEs and comprehend the social and environmental aspects of their corporate activities (Ackers, 2022, Malola and Maroun, 2019, Michelon *et al.*, 2015). In other words, the disclosures should be high-quality or substantive, to enhance the SOE's level of accountability and transparency towards stakeholders regarding sustainability performance (Emma and Jennifer, 2021, Hummel and Schlick, 2016, Michelon *et al.*, 2015, Nikolaou and Tsalis, 2013, Tsalis *et al.*, 2020). In line with stakeholder and legitimacy theory, high-quality reporting can improve stakeholder engagement, reduce information asymmetry, and advance in building trust and integrity between the government and its stakeholders (Datta and Goyal, 2022, Fernando and Lawrence, 2014, Matsiliza, 2017, Silva, 2021).

1.3 Purpose of the study

The aim of this study is to evaluate the quality of SDG information disclosed in the integrated or annual reports of South African SOEs listed under Schedule 2 and 3B of the Public Finance Management Act (PFMA). This research aims to provide insights as to the nature of SOE sustainability disclosures (substantive or symbolic, see section 2.5.1 of Chapter II for these definitions). The study also focuses on identifying those SDGs to which SOEs contribute the most with respect to corporate disclosure quality. Therefore, this study explores the quality of SDG information contained in the integrated or annual reports of South African SOEs, to identify whether their reporting reflects a trend toward the achievement of the SDGs.

1.4 Research questions

To complete the research, the following research questions are addressed:

RQ1: What is the quality of SDG disclosures in the integrated or annual reports of South African SOEs?

RQ 2: Which SDGs are prioritised in terms of corporate disclosure quality?

1.5 Significance of the study

In African countries, particularly in emerging economies where sustainable development is of utmost importance, it is essential to consider corporate sustainability reporting (Erin and Bamigboye, 2021, Erin *et al.*, 2022, Mohammad and Wasiuzzaman, 2021). More specifically, due to their position in society, SOEs are facing increasing pressure to be more transparent and accountable by reporting on sustainability issues (Argento *et al.*, 2019, Ackers and Adebayo, 2022a, Matsiliza, 2017, Sawani *et al.*, 2023). Therefore, the study of SDG information in the integrated or annual reports of SOEs should not be overlooked (Kaur and Lodhia, 2019, Sawani *et al.*, 2023).

Sustainability reporting in the public sector is an emerging area of research (Kaur and Lodhia, 2019). Little research has been conducted on public sector sustainability reporting in South Africa (Ackers and Adebayo, 2022b). More specifically, in line with the growing use of the UN SDGs as a platform for sustainability performance, research that focuses on SDG reporting has also been growing, including in South Africa and other developing countries, e.g., (Ali *et al.*, 2018, Buniamin *et al.*, 2020, Erin and Bamigboye, 2021, Erin *et al.*, 2022, Haywood and Boihang, 2021, Lau and Wong, 2022); however, their focus is on the private sector. Additionally, research on the quality of sustainability and SDG disclosures has been limited to the private sector, e.g., (Amran *et al.*, 2014, Daub, 2007, Diouf and Boiral, 2017, Freundlieb *et al.*, 2014, Hummel and Szekely, 2022, Malola and Maroun, 2019, Michelon *et al.*, 2015, Tsalis *et al.*, 2020). Given the limited research on the quality of SDG disclosures in the public sector, this study aims to contribute to the body of literature on sustainability and SDG reporting quality by analysing the SDG disclosures of South African SOEs through the lens of stakeholder theory together with legitimacy theory.

Additionally, this study assesses the quality of SOEs' SDG disclosures beyond merely the absence or presence of information. Therefore, the results of the study could be incorporated in stakeholders' decision-making processes, facilitating more useful decisions to be taken. Furthermore, this study proposes a quality framework that can be used, together with the findings of this study as a guidance for policymakers and those charged with governance on how to improve sustainability and SDG reporting in the public sector, which can enhance transparency and accountability towards sustainable development. The proposed quality measure offers a valuable resource for scholars and professionals who wish to assess and analyse specific elements of report quality (Malola and Maroun, 2019). Finally, this study highlights the SDGs to

which SOEs contribute the most in respect of reporting quality which gives an indication to users of the prioritisation goals of the SOEs.

CHAPTER II: LITERATURE REVIEW

Section 2.1 offers an overview of the UN 2030 Agenda and its significance within the South African context. Section 2.2 presents the definitions used in this study of an SOE, along with an exploration of their general mandates, their role in sustainability, and their application in South Africa. This section also identifies various challenges faced by SOEs in the South African landscape. Section 2.3 delves into the SDGs within the South African context and examines the connection between SOEs and each of these goals, offering insights into the expected disclosures related to each SDG in the SOEs' reports. Under section 2.4, the study discusses the relevance of sustainability reporting for SOEs, incorporating perspectives from both stakeholder and legitimacy theory. Finally, section 2.5 provides an overview of SDG disclosure quality, including the study's definition of substantive and symbolic disclosures in terms of quality. Additionally, this section offers a detailed description of each quality element utilised in the study's quality assessment.

2.1 The UN 2030 Agenda and its relevance to South Africa

The concept of sustainable development entails that organisations should prioritise creating long-term stakeholder value while also contributing to social welfare and avoiding environmental degradation (Mohammad and Wasiuzzaman, 2021). Sustainable development aims to preserve fairness for both current and future generations, promote sustainable use of resources, integrate development efforts, and ensure environmental protection (Barral, 2012).

In September 2015, the UN member states approved a new sustainable agenda called *Transforming Our World: The 2030 Agenda for Sustainable Development* (UN, 2015). Central to the agenda are the 17 SDGs (see Figure 1) with 169 targets, tackling critical global challenges including climate change, health, poverty, education, social inequality, and environmental degradation (Hák *et al.*, 2016, Gupta and Vegelin, 2016, Rosati and Faria, 2019, Szennay *et al.*, 2019, UN, 2015). The global goals offer practical guidance for present and future development endeavours (UN, 2015). The aim of the SDGs is to systematically foster sustainable growth and development in alignment with the Earth's capacity, society's fundamental needs and priorities,

and the capabilities and stability of the economy (Haywood and Boihang, 2021, UN, 2015). The SDGs offer South Africa a comprehensive framework to tackle and resolve its significant social issues, particularly the critical problems of inequality and ongoing poverty (StatsSA, 2019). More detail on each SDG within a South African context is discussed in section 2.3 below.

As a UN member state, South Africa is dedicated to achieving sustainable development and the SDGs (StatsSA, 2019). The country's National Development Plan (NDP), launched in 2012, outlines a blueprint for a future socioeconomic growth strategy for the country (Fourie, 2018, NPC, 2011, Zarenda, 2013). The NDP has 13 chapters (see Figure 2) with specific objectives in each, and the aim is to realise these goals by 2030 (Fourie, 2018, NPC, 2011). Despite being established before the UN SDGs, the NDP aligns well with their focal points, forming a guide for South Africa's efforts to achieve both the SDGs and the NDP's developmental priorities (Bronkhorst, 2022, Fourie, 2018, Haywood *et al.*, 2019, StatsSA, 2019). Table 1 highlights the overall linkages between the NDP chapters and SDGs.

Figure 1: The UN SDGs



Source: UN (2023)

Figure 2: South Africa's National Development Plan



Source: Domino Foundation (2023)

Table 1: Linkages between the SDGs and NDP

NDP Chapter	SDG
Economy and employment (1)	1, 2, 8, 10
Economic infrastructure (2)	1, 5, 9, 6, 7, 11
Environmental sustainability and resilience (3)	1, 2, 6, 7, 8, 11, 12, 13, 14, 15
Inclusive rural economy (4)	1, 2, 5, 8
Positioning South Africa in the world (5)	2, 17
Transforming human settlements (6)	1, 11
Improving education and training (7)	4, 8, 9
Promoting health (8)	1, 3, 5
Social Protection (9)	1, 2, 4, 10
Building safer communities (10)	3, 5, 10, 11, 16
Building a capable and developmental state (11)	11, 16
Fighting Corruption (12)	16
Nation building and social cohesion (13)	10, 16

Adapted from: StatsSA (2019)

In South Africa, the constitution mandates local government to provide democratic, accountable governance, promote development, and involve communities (StatsSA, 2019). This assigns local

government as a vital driver of SDG realisation, especially for marginalised groups (StatsSA, 2019). Thus, prioritising local SDG implementation across municipalities is crucial, seizing the opportunity to decentralise governance for efficiency, accountability, and responsiveness (StatsSA, 2019). As SOEs hold significant importance within government initiatives that are aimed at enhancing service provision and fostering economic expansion to improve citizens' quality of life, these enterprises can serve as crucial tools for realising the SDGs (Chigudu, 2020, Fourie, 2014, Kikeri, 2018, NPC, 2011).

2.2 SOEs as a catalyst for sustainable development

Chapter 1 of the PFMA defines a state-owned enterprise as:

- *"a juristic person under the ownership control of the national executive;*
- *has been assigned financial and operational authority to carry on a business activity*
- *as its principal business, provides goods or services in accordance with ordinary business principles; and*
- *is financed fully or substantially from sources other than (i) the National Revenue Fund; or (ii) by way of a tax, levy or other statutory money" (PFMA, 1999, p. 5).*

2.2.1 SOEs in general

An SOE is a corporate entity created in accordance with company or statutory regulations, which can be owned either entirely or partially by the government, with the government holding a substantial controlling interest (OECD, 2015). SOEs play a significant role, constituting over one-fifth of the world's largest enterprises (Ackers, 2022). These entities, funded by public resources, contribute to public tasks and are established when achieving a state objective is more efficient through a state-owned business than a budgetary organisation (Boros and Fogarassy, 2019). SOEs wield considerable economic influence and can serve as a platform for the state to promote Corporate Social Responsibility (CSR), establishing market benchmarks in their respective sectors (Garde-Sanchez *et al*., 2018).

SOEs are typically established to fulfill social welfare objectives, providing essential goods and services, or addressing market failures (ibid.). In some instances, governments use SOEs to tackle issues like unemployment or stimulate industrial development (ibid.). According to Kikeri (2018), SOEs are crucial in government initiatives, delivering essential services such as utilities, transportation, and construction to enhance citizens' quality of life. Additionally, SOEs play a major

role as employers, service providers, and resource consumers, making them significant contributors to sustainable development on both national and international levels (Kaur and Lodhia, 2019).

SOEs are profit-oriented entities that exemplify the application of business efficiency principles by the state to deliver goods and services to the public (Garde-Sanchez *et al.*, 2018, Matsiliza, 2017). Therefore, SOEs have a dual objective, to create both societal and economic value (Huang and Zhang, 2007). Balancing these objectives involves safeguarding the interests of diverse stakeholders with conflicting goals, including civil society, employees, private sector, investors, the state, and shareholders (Argento *et al.*, 2019, Chigudu, 2020, OECD, 2009). It is essential for SOEs to create value for their stakeholders and society while simultaneously ensuring their financial sustainability (Argento *et al.*, 2019). Consequently, SOEs play a significant role in economic transactions and hold a leading position in society (Garde-Sanchez *et al.*, 2018).

Due to their impact on people's lives, SOEs are expected to demonstrate responsible conduct to ensure the preservation of sustainable lifestyles for future generations (Argento *et al.*, 2019). As a result, they can serve as exemplars for other organisations in different sectors, demonstrating how to effectively implement CSR in practical terms (Argento *et al.*, 2019, Matsiliza, 2017, Nicolò *et al.*, 2020).

2.2.2 SOEs in South Africa

In South Africa, SOEs are subject to regulation under guidelines such as the Public Finance Management Act of 1999 (PFMA, 1999) and are viewed as a means to promote the socioeconomic progress of the nation (Chigudu, 2020, Fourie, 2014). Several SOEs, including ACSA, Broadband, and Telkom, were established with a developmental mandate in specific sectors to enhance service delivery effectiveness and efficiency to counter the effects of the international sanctions against South Africa during the apartheid era (Ovens, 2016). Additionally, pre-apartheid, SOEs like Eskom, DBSA and Armscor, were created by the South African government to achieve economic independence (Fourie, 2001).

SOEs play a crucial role in stimulating South Africa's gross domestic product (GDP) (Madumi, 2018). The country's stance on SOEs in terms of sustainable development is outlined in the NDP together with other policy documents (Morake, 2017, NPC, 2011). The government mandates

SOEs to enhance the socio-economic status of the country by providing infrastructural services and employment (Chigudu, 2020, Madumi, 2018). SOEs are crucial for addressing market failures and delivering vital infrastructure services like transport, water and energy, fostering economic growth while ensuring equitable access to quality social services for all citizens (Kikeri, 2018). Since 1994, after the apartheid era, SOEs have significantly contributed to economic growth and poverty reduction in South Africa (ibid.). As such, SOEs function as catalytic and strategic instruments for sustainable development for the country (Chigudu, 2020).

The most significant commercial SOEs are outlined in Schedule 2 and 3B of the PFMA (1999), accounting for over 8.5% of the GDP and overseeing vital sectors including infrastructure, finance, national security, and social services (World Bank Group, 2018). The population relies on these SOEs for fundamental necessities like employment, water, sanitation, electricity, and transportation (Kikeri, 2018, Matsiliza, 2017, Ovens, 2016). Due to their relevance and influence, this research used Schedule 2 and 3B SOEs as part of the study (Appendix A).

While SOEs are vital for promoting sustainable development, there is concern about the subpar performance of certain SOEs in South Africa, which cannot be ignored. This performance hinders their potential to effectively contribute to South Africa's overall well-being (Chigudu, 2020, NPC, 2011).

2.2.3 SOE challenges for sustainable development

In the past, South African SOEs have faced public criticism for failing to fulfill their mandates and exhibiting weak financial performance (Matsiliza, 2017). Issues such as high staff turnover rates, irregular and fruitless expenditure, frequent changes in the board, and political interference have hindered sustainable corporate governance and undermined economic progress (Vorster and Konstantinopoulos, 2020). Furthermore, SOEs are marked by other issues such as mishandling of finances, state capture, administrative misconduct, corruption, and poor governance (Chigudu, 2020, Corrigan, 2014, Martin and Solomon, 2016, Links and Haimbodi, 2011, OECD, 2015).

Other concerns have been raised about biased appointment processes amongst the board, compensation and bonuses, and qualifications of board members within SOEs, highlighting conflicts of interest and the need for improved transparency and accountability (Matsiliza, 2017). SOE board members are notorious for prioritising political goals over the public interest, leading

to the misuse of public funds for personal and political gain, resulting in the responsibility of SOEs towards its citizens not being fulfilled (Surty *et al*., 2018). Consequently, the country's GDP growth is slowing to 2% in 2023 from 4.9% in 2021 (World Bank, 2023). This situation is unfavourable for sustainable economic growth (Madumi, 2018).

Nevertheless, considering the close relationship between SOEs and the government that owns them, it is important to recognise that these SOEs can be valuable resources to be used in achieving the UN SDGs for South Africa (Chigudu, 2020). An elaboration of these challenges as well as SOEs' significance for sustainability is discussed in relation to the specific SDGs in the following section.

2.3 The SDGs in a South African context

The purpose of this literature review was to gain an understanding of the importance of each SDG within a South African context as a developing country. The review also includes discussions on the potential contributions of SOEs towards achieving these SDGs.

Goal 1: No Poverty

South Africa faces significant poverty challenges, with approximately 18.2 million people living in extreme poverty in 2022 (Statista, 2023). The government, through its SOEs has made efforts to address poverty through social grants and job creation programmes, but progress has been slow (StatsSA, 2019). The Broad-Based Black Economic Empowerment (B-BBEE) policy was also implemented with the aim to rectify apartheid-induced economic imbalances, by promoting the economic inclusion of black individuals and communities (StatsSA, 2019). This policy encourages businesses, including SOEs to contribute to the economic transformation of South Africa by increasing black participation across sectors (Department of Trade Industry and Competition, 2023a). The B-BBEE scorecard evaluates businesses based on black ownership, management control, skills development, enterprise and supplier development, and socio-economic development (ibid.).

Goal 2: Zero Hunger

In 2021, hunger affected 278 million people in Africa and while most of the world's undernourished people live in Asia, Africa is the region where the prevalence is highest (FAO, 2022). Food insecurity remains a significant challenge in South Africa, particularly in rural areas. According to

a study by Mkhize *et al.* (2023) the South African government needs to prioritise smallholder farmers and invest in rural infrastructure to ensure food security for all. SOEs such as the Land Bank, an institution that provides development finance for farmers, play a significant role in achieving this goal. They have a mandate to invest in farming and agriculture activities, with the goal to promote food security in the country (Department of Agriculture Land Reform & Rural Development, 2022).

Goal 3: Good Health and Well-being

SOEs play an important role in achieving this goal. For example Necsa (2023) supplies nuclear medicine products worldwide and bears the responsibility of ensuring global access to life-saving medical diagnoses or treatments through nuclear medicine. Promoting healthy lifestyles is also critical in achieving SDG 3. Based on interviews of 4988 urban adolescents from five countries, including South Africa, Shinde *et al.* (2023) found that promoting mental health, physical activity, healthy eating, water, sanitation and hygiene practices can improve health outcomes in developing countries. In line with this view, SOEs are accountable for their health and safety issues, including that of employees (National Treasury, 2022). This includes safeguarding their employees through the initiation of health and safety initiatives aimed at preventing workplace injuries and fatalities, as well as employee wellness programmes (National Treasury, 2022).

Goal 4: Quality Education

South Africa has made significant progress towards achieving SDG 4, with the literacy rate of people 15 years and older increasing from 88.7% in 2007 to 95% in 2019 (StatsSA, 2019). However, digital learning, internet connectivity and adequate ICT facilities remain a challenge for the South African educational system (Adu *et al.*, 2022, Aruleba and Jere, 2022, StatsSA, 2019). Additionally, according to Matsiliza (2017), the appointment of board members lacking proper qualifications and skills is a common occurrence in the SOEs. This highlights the need for continuous training and development programmes to keep the board members informed and motivated (ibid). This also extends to the employees where SOEs can provide them with access to education and skills training (Marire, 2022). SOEs must also adopt measures to enlist and attract a proficient and skilled workforce, considering their skills, expertise, and qualifications (National Treasury, 2022, UN, 2015).

Goal 5: Gender Equality

Gender inequality remains a significant challenge in South Africa, with women and girls facing high levels of discrimination and violence in many parts of the country (StatsSA, 2019). The national and provincial parliaments are on their way to achieving the goal of 50% representation of women; however, more needs to be done to ensure that women have fair representation, particularly on a managerial level (ibid). Additionally, a study by Cohen and Moodley (2012) finds that women in South Africa are overrepresented in low-paid and informal jobs and face discrimination in hiring and promotion.

Goal 6: Clean Water and Sanitation

There are numerous water utility SOEs, with the mandate to provide clean water and sanitation as well as infrastructure services to South African citizens (Kikeri, 2018). These SOEs are facing numerous challenges when it comes to the provision of clean water and sanitation services. Some of these challenges include water pollution and scarcity (Dhakal *et al.*, 2022, Donnenfeld *et al.*, 2018, Mamokhere, 2022, Prins *et al.*, 2022), the unequal distribution of water and sanitation services between rural and urban areas, with rural areas having limited access (Donnenfeld *et al.*, 2018, Mamokhere, 2022, Mngadi *et al.*, 2023) and many communities are receiving water that is not safe to drink due to lack of infrastructure or sanitation facilities that are not functioning properly (Mamokhere, 2022, Omotayo *et al.*, 2021). To address the challenges faced, various solutions have been proposed. One solution is to improve the management of water resources, such as water waste management, increasing water conservation and efficiency, implementing water demand management strategies, and investing in water reuse and recycling (Donnenfeld *et al.*, 2018, Otieno and Ochieng, 2004, Prins *et al.*, 2022). Another solution is to increase investment in water and sanitation infrastructure, particularly in rural areas and informal settlements.

Goal 7: Affordable and Clean Energy

South Africa is facing an energy crisis. This is evident through the ongoing power outages that the nation consistently experiences as a result of Eskom's shortcomings (Vorster and Konstantinopoulos, 2020, World Bank, 2023). A study by the International Energy Agency (IEA) found that 70% of South Africa’s energy system is generated by coal (IEA, 2023). This reliance on coal has contributed to high levels of greenhouse gas emissions, exacerbating the country's climate change impacts (Maleka and Islam, 2023).

Other SOEs such as the Central Energy Fund (CEF), also have a mandate to contribute to the security of energy supply of South Africa (Government of South Africa, 2023). South Africans, including SOEs, have several opportunities to achieve SDG 7. The country has abundant renewable energy resources, including wind, solar, and biomass, which could be harnessed to increase the country's renewable energy capacity (Ayamolowo *et al.*, 2022, Maleka and Islam, 2023, van Vuuren *et al.*, 2019). Additionally, the government could promote energy efficiency initiatives in industries and households to reduce the country's energy demand (Ayamolowo *et al.*, 2022).

Goal 8: Decent Work and Economic Growth

As emphasised in section 2.2, SOEs play a crucial role in achieving SDG 8 by creating and sustaining jobs as well as fostering economic growth (Ackers, 2022, Argento *et al.*, 2019, Madumi, 2018, Ovens, 2016, Fourie, 2014).

Decent work

South Africa grapples with high unemployment rates, particularly among young people and faces various challenges related to decent work, such as low wages, informal employment, and insufficient social protection (World Bank, 2023). Policies to promote decent work should prioritise improving working conditions, enhancing access to education and skills training, and addressing labour market discrimination (Marire, 2022). Infrastructure SOEs such as PRASA, Transnet, IDC, and Broadband operate in a labour-intensive environment and bear the obligation to generate job opportunities through investments in infrastructure projects (Department of Public Works and Infrastructure, 2018, National Treasury, 2021).

Furthermore, SOEs are accountable for their management of human resources (National Treasury, 2022). This includes employee compensation, performance assessments, workers' rights, the promotion of inclusivity and teamwork, employee equity and diversity, engagements with labour unions, and ensuring a safe and secure working environment (National Treasury, 2021, National Treasury, 2022, Nilsson, 2016). However, in the past SOEs have struggled to retain staff, primarily attributed to an unethical work environment (Vorster and Konstantinopoulos, 2020). The underperformance of several SOEs has seen has led to substantial layoffs and salary reductions (Madumi, 2018). Consequently, this has given rise to concerns related to job stability, work disruptions, and increased absenteeism (Kikeri, 2018).

Economic Growth

SOEs' stakeholders are invested in the economical and efficient functioning of SOEs to ensure uninterrupted service delivery (Balbuena, 2014, Ovens, 2016). As such, SOEs are accountable for their financial position and performance (PFMA, 1999). However, SOEs like SAA, PRASA, Transnet, Eskom, SABC, SAPO, and various others are grappling with financial sustainability challenges, experiencing declining profits, liquidity issues, and thus deviating from their primary mandates (Merten, 2020, National Treasury, 2021, Vorster and Konstantinopoulos, 2020). Moreover, credit rating downgrades, financial mismanagement, and ongoing load shedding have negatively impacted the financial ratios of SOEs (Chigudu, 2020, National Treasury, 2021). Lastly, the misuse of funds through irregular and fruitless expenditures and corruption has impaired the ability to secure financing, including government aid (Martin and Solomon, 2016, Merten, 2020). Insufficient funding has resulted in decreased production and sales volumes, leading to a loss of market share, ultimately contributing to a decline in the country's GDP growth (Madumi, 2018).

Goal 9: Industry, Innovation, and Infrastructure

As discussed in section 2.2, SOEs play a crucial role in providing essential infrastructure services like transportation, water, energy, and ICT (Ackers, 2022, Kikeri, 2018). For example, TCTA is responsible for financing and executing large-scale raw water infrastructure projects (TCTA, 2021). In the absence of effective water infrastructure, the public is exposed to the potential threat of water insecurity (TCTA, 2021). SOEs are also important for research and development initiatives. For instance, Necsa is responsible for conducting research and development in the field of nuclear energy and radiation sciences (Necsa, 2023). CEF is mandated to research, finance and develop appropriate energy solutions to meet the energy needs of South Africa (Government of South Africa, 2023).

However, South Africa confronts numerous challenges in achieving SDG 9. The country's infrastructure is ageing, and there is a significant backlog in maintenance and upgrades due to challenges in obtaining capital for infrastructure investment projects (Global Infrastructure Hub, 2023). Additional structural challenges have emerged, particularly in the realm of transport and freight, which have suffered from inadequate management at Transnet, incidents of theft, and sabotage, placing constraints on South Africa's export capacity (World Bank, 2023). The construction industry is predicted to decline by 1.9% in real terms during 2023 due to factors such as the energy crisis, supply chain disruptions, inflation, and a decrease in approved building plans

(Global Data, 2023). South Africa also lags in adopting new technologies and innovation, as indicated by its lower ranking on the Global Innovation Index (GII) compared to other countries in the region (GII, 2022).

Goal 10: Reducing Inequalities

Given South Africa's apartheid past, issues of income, ethnicity and gender inequality are particularly important, including consideration of discrimination in the workplace (NPC, 2011, StatsSA, 2019). Setati *et al.* (2019) recommend that institutions implement effective diversity management policies and strategies to create a culture that is inclusive rather than exclusive and thereby improve employee performance. Another motive behind establishing SOEs was to address historical inequalities by implementing equity programmes (Chigudu, 2020, Department of Trade Industry and Competition, 2023b, Madumi, 2018). SOEs are accountable to the public for the effective implementation and continuity of the equity programmes (Ovens, 2016, National Treasury, 2022). This accountability pertains to the opportunities SOEs have generated to address historical social inequalities among previously disadvantaged groups. For instance, the procurement opportunities SOEs provide for disabled, black or women-owned businesses (B-BBEE Act, 2016).

Goal 11: Sustainable Cities and Communities

Acting as catalytic and strategic instruments, SOEs play a vital role in urban development, making them essential contributors to the state's progress (Chigudu, 2020, Ovens, 2016). For example, Eskom is responsible for the sustainable supply of electricity to South Africa (Department of Public Enterprises, 2023).

Informal settlements pose a significant challenge to sustainable development in urban areas of South Africa. Turok and Borel-Saladin (2014) suggest strategies to improve living conditions and achieve SDG 11, emphasising community participation and involvement of local governments. SOEs operate with the goal of benefiting society. Therefore, engaging in community involvement, contributing to regional development, sponsoring initiatives, and creating employment opportunities are crucial tasks for them to fulfill (Fourie, 2014, Ovens, 2016). Transportation is also vital. In their study, Thomas (2016) explores challenges and opportunities for sustainable transportation, stressing the need for integrated planning and sustainable modes like public

transportation and cycling infrastructure. SOEs have a responsibility to actively participate in these initiatives (Ovens, 2016).

Goal 12: Responsible Consumption and Production

Through a review of Africa's transition from fossil fuels to renewable energy, Mutezo and Mulopo (2021) found that South Africa is still heavily reliant on fossil fuels and that a circular economy approach, such as waste reduction, reuse, and recycling, can enable greater renewable energy uptake. The study recommends that governments and finance institutions should provide capital to technologies that enable circular economy and adopt regulations that are guided by circular principles (ibid.).

SOEs in South Africa have a significant environmental impact due to their operations that rely on environmental resources, such as coal for Eskom and air quality for SAA (Matsiliza, 2017). It is crucial for these entities to conduct operations and regulate resource consumption responsibly. For instance, SOEs engaged in nuclear research, like Necsa, hold a pivotal responsibility for safe practices and proper disposal of toxic waste related to nuclear safety (Necsa, 2023). The potential depletion of natural capital poses a threat to SOEs' sustainability, evident in climate change's impact on organisations losing access to raw materials (Leach *et al*., 2019). Therefore, it is imperative for SOEs to fulfill their duty in preserving the environment in which they operate by incorporating practices such as recycling, transitioning to renewable resources like solar or hydro energy, and implementing policies for managing natural capital (Ackers and Adebayo, 2022b, IIRC, 2017). Further, SOEs are required to comply with licence conditions for the discharge of waste and assist with clean-up campaigns (Ovens, 2016).

Goal 13: Climate Action

Climate change is one of the most significant global challenges, with rising temperatures, sea levels, and extreme weather events. A report by the Intergovernmental Panel on Climate Change (IPCC) highlights the urgent need to reduce CO_2 and other greenhouse gas emissions to limit global warming to 1.5°C (IPCC, 2023). The report also emphasises the importance of policies that promote energy efficiency, renewable energy, and sustainable land use (ibid). Ziervogel *et al.* (2022) highlights the need to increase funding for climate change initiatives, mitigation projects and adaptation efforts.

The South African government underscores its continuous dedication to the objectives of the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, and the Paris Agreement, through the implementation of impactful climate change measures (Ackers and Adebayo, 2022b). Additionally, South Africa has pledged to create a low-carbon economy and climate-resilient society, submitting its Low Emissions Development Strategy to the UNFCCC in December 2020 (Ackers and Adebayo, 2022b). Public sector organisations, as entities owned by the state, serve as instruments through which the government can exert control by enacting regulations that showcase its dedication to addressing climate change issues (ibid.). Public sector reporting ought to include comprehensive disclosures regarding their efforts to address climate change issues associated with their operations, as well as the impact of their operations on the environment (ibid.).

Goal 14: Life Below Water

A significant challenge toward achieving SDG 14 is marine pollution. According to the World Wildlife Fund (WWF), the biggest threat to oceans includes oil spills, sewage discharge, plastic waste, and toxic chemicals from illegal dumping (WWF, 2017). The Western Cape Government of South Africa calls for South Africans to reduce plastic consumption, dispose of chemicals properly, choose environmentally friendly detergents and create public awareness of the state of our coastal environment and oceans to promote sustainable use and conservation (Western Cape Government, 2022).

Goal 15: Life on Land

SDG 15 strives to safeguard, rejuvenate, and advocate for the sustainable utilisation of land ecosystems, effectively manage forests, combat desertification, and cease and reverse both land degradation and the decline of biodiversity (UN, 2015). According to a study by Annan-Aggrey *et al.* (2021), global forest area declined by approximately 100 million hectares between 2000 and 2020. Sub-Saharan Africa is one of the contributing regions to this decline mainly due to land conversion to agriculture.

Urbanisation and agricultural expansion drive land degradation in South Africa. Rebelo *et al.* (2011) studied the impact of urbanisation on Cape Town's biodiversity, noting habitat fragmentation and biodiversity loss. They suggest prioritising biodiversity conservation in urban planning (ibid). Similarly, agricultural expansion in sub-Saharan Africa has caused habitat

degradation and soil erosion. Rodenburg *et al.* (2021) researched conservation agriculture, finding it effective in reducing soil erosion and enhancing soil health. This concern is particularly relevant to SOEs like the Land Bank, which ought to offer financial support to farmers engaging in responsible agricultural practices.

SOE operations have a direct impact on our biodiversity (i.e., SDG 14 and 15). The water utilities, for example, have a direct interest in the conservation of rivers and seas because this is their primary source for raw water. For SOEs like Eskom, CEF, and Necsa, who have to engage in environmental rehabilitation, this goal is important to consider (Sawani *et al*., 2023).

Goal 16: Peace, Justice, and Strong Institutions

A study by Hope Sr (2020) evaluated the implementation of SDG 16 of select countries around the world. In Africa and other developing countries, Hope Sr (2020) notes key challenges such as corruption, insufficient highly skilled individuals in institutions, dilapidated infrastructure, outdated procedures, deficient information technology and systems processes, poor data collection and sharing and insufficient financing. These issues are also experienced by South African SOEs (StatsSA, 2019). Frequent court cases and scandals reflect SOEs' self-interest rather than concern for the country's welfare, which erodes public trust and accountability (Philip, 2020). Matsiliza (2017) highlights that board members in SOEs are sometimes appointed without sufficient preparation or relevant qualifications. To improve governance, Matsiliza (2017) suggests adopting a more thoughtful selection process that considers qualified directors with relevant professional degrees and experience.

Goal 17: Partnerships for the Goals

Haywood *et al.* (2019) emphasise the importance of global partnerships for sustainable development in achieving the SDGs in South Africa. The article explores the roles and responsibilities of various stakeholders involved in the SDG landscape, such as civil society, labour, private sector, government, international institutions, and research institutes (ibid). The authors identify the need to strengthen existing partnerships and address weaknesses, including mistrust, inconsistent commitment and lack of clarity and policy direction with regards to partnerships in South Africa (ibid). In the pursuit of SDGs as well as the NDP in South Africa, government institutions, including SOEs, have a crucial role based on their governance and implementation mandates (ibid.). Yet, accomplishing the SDGs and NDP cannot solely be done

by the government. It is contingent on effective partnerships among stakeholders spanning various government spheres as well as the other sectors as previously mentioned (Haywood *et al.*, 2019, NPC, 2011, UN, 2015).

Conclusively, by addressing the challenges of sustainable development, in line with the SDGs, South Africa can foster new directions in its policy debate and progress towards a more inclusive and prosperous future (Munslow and Fitzgerald, 1994, NPC, 2011). This section has also highlighted the significant role that SOEs have to play in this process. With this in mind and considering their notable influence on the economy, society, and the environment, along with their unique challenges (Broadbent and Guthrie, 2008, Kikeri, 2018), SOEs are facing increasing pressure to be more transparent and accountable regarding the utilisation of public funds and resources entrusted to them to generate sustained value (Ackers and Adebayo, 2022a, KPMG, 2012, Matsiliza, 2017, Surty *et al.*, 2018). This heightened level of transparency and accountability can be demonstrated when SOEs report SDG-related information in their integrated or annual reports (Ackers and Adebayo, 2022a, Argento *et al.*, 2019, Matsiliza, 2017, Surty *et al.*, 2018).

2.4 Sustainability reporting and its relevance for SOEs

The demand for sustainability reporting has increased in recent years due to a heightened public awareness of social and environmental issues (Argento *et al.*, 2019, Chan *et al.*, 2014, Tagesson *et al.*, 2009). Organisations now recognise the importance of disclosing information about the economic, environmental, and social impact of their activities in their annual or integrated reports (Widiarto Sutantoputra, 2009).

Integrated or annual reports play a crucial role in corporate reporting, serving as a vital mechanism for transparency and accountability (KPMG, 2012, National Treasury, 2022). For SOEs, the annual report serves as a communication tool with various stakeholders, encompassing information about the SOE's performance in terms of its financial performance as well as service delivery achievements against targeted strategic objectives and outcomes (known as the Performance Report), its future outlook, human resource information, business history, and governance structures (Kathrada *et al.*, 2021, National Treasury, 2022, PFMA, 1999). These disclosures represent a direct means of communicating how public resources are utilised for the socioeconomic development of the nation and thus allow for the exploration of sustainability information disclosed (IIRC, 2017, National Treasury, 2022).

2.4.1 Benefits of SOE sustainability reporting

SOEs are increasingly expected to lead in managing and reporting sustainability issues, considering their societal role (Argento *et al.*, 2019, Kaur and Lodhia, 2019, Sawani *et al.*, 2023). This communication between the SOE and its stakeholders is a fundamental process for building public confidence and trust (Nicolò *et al.*, 2020). Further, this approach positions them as positive models for CSR practices, influencing entities across different industries (Argento *et al.*, 2019, Garde-Sanchez *et al.*, 2018).

A recent expansion of sustainability reporting is disclosing SDG-related information, which involves companies publicly disclosing their commitment to meeting the demands of the 2030 Agenda (Calabrese *et al.*, 2021, Rosati and Faria, 2019). The concept of SDG reporting has gained global significance due to its impact on business sustainability (Erin *et al.*, 2022). For instance, the SDGs can enhance progress in managing business sustainability and reporting practices by providing a widely recognised framework for the sustainable development of reporting firms (Bebbington *et al.*, 2017, Lau and Wong, 2022). It is crucial to address this issue, as business growth is inherently connected to the realisation of the SDGs and is not sustainable in a world marked by significant poverty, income inequalities, and environmental strain (Lau and Wong, 2022). Furthermore, considering the wide range of stakeholders that SOEs have, utilising SDG reporting can serve as a method for them to boost their legitimacy and stakeholder engagement (Farneti *et al.*, 2019, Nicolò *et al.*, 2020, Tsalis *et al.*, 2020).

Stakeholder theory and legitimacy theory have been commonly used in SOE sustainability reporting literature (Ackers and Adebayo, 2022a, Argento *et al.*, 2019, Garde-Sanchez *et al.*, 2018, Nicolò *et al.*, 2020). Stakeholder theory asserts that an organisation's management is responsible for being answerable to and meeting the multiple expectations of various stakeholder groups who have an interest in their performance, not only the shareholders (Fernando and Lawrence, 2014, Ferrero-Ferrero *et al.*, 2018). Transparency and accountability are key in this relationship, with the disclosure of information playing a significant role (Fernando and Lawrence, 2014, Morake, 2017). Given the role of SOEs as a significant driver of sustainable development and their wide range of stakeholders, there is an expectation of increased transparency and accountability from them in terms of how they utilise public resources entrusted to them to generate sustainable value (Ackers, 2022, Argento *et al.*, 2019, KPMG, 2012, Matsiliza, 2017).

Therefore, the information that SOEs disclose should go beyond just financial data and encompass non-financial aspects, including sustainability details such as social, ethical, environmental, human rights and value creation (Erin and Bamigboye, 2021, Fernando and Lawrence, 2014, Gray *et al.*, 1996). This is because, in line with stakeholder theory, all stakeholders have the right to know about other aspects of the organisation's operations, not just financial information (Fernando and Lawrence, 2014, Gray *et al.*, 1996).

According to stakeholder theory, the primary function of managers is to achieve stakeholders' needs, demands, and expectations, while managing conflicting interests of different stakeholders (Erin *et al.*, 2022, Fernando and Lawrence, 2014). Schedule 2 and 3B SOEs of the PFMA (1999) have both economic (are profit-driven) and public service objectives resulting in a wide range of stakeholders which may have different and conflicting objectives (Argento *et al.*, 2019, Chigudu, 2020, Kikeri, 2018). To manage these conflicting objectives and improve stakeholder engagement, SOEs may be incentivised to integrate information about the SDGs into their integrated or annual reports. This is because the SDGs are designed in a way to meet the needs of all stakeholders of an organisation (Erin *et al.*, 2022, UN, 2015). This practice could enhance SOEs' transparency, accountability and strengthen their dedication to sustainable development endeavours (Bebbington and Unerman, 2018, Erin and Bamigboye, 2021, Subramaniam *et al.*, 2023). In addition to improving stakeholder engagement, these disclosures can enhance legitimacy (Deegan, 2002, O'donovan, 2002).

Legitimacy theory, aligned with stakeholder theory, underscores the importance of stakeholders' perceptions, as well as the link between social expectations and organisational behaviours, for an organisation's viability and survival (Fernando and Lawrence, 2014, Nicolò *et al.*, 2020, Suchman, 1995). In the context of SOEs, legitimacy holds significant importance due to the existing social contract between these entities and citizens (Deegan, 2002, Nicolo *et al.*, 2021). SOEs can be significantly influenced by stakeholders, including the state, who wield considerable power in granting licences, funding, and impacting operations (Argento *et al.*, 2019). Moreover, SOEs rely on public funds and bear the duty of ensuring the judicious use of these funds to create public value (Nugraha, 2017). Consequently, they are subject to constant public scrutiny and citizens impose considerable transparency and accountability pressures on SOEs, particularly regarding sustainability matters (Argento *et al.*, 2019, Boros and Fogarassy, 2019, Nicolo *et al.*, 2021). Accordingly, to legitimise their actions, facilitate stakeholder engagement and respond to

these pressures, SOEs can effectively disclose SDG information in their annual or integrated reports (Bebbington and Unerman, 2018, Datta and Goyal, 2022, Deegan, 2002). These disclosures can also serve as a useful tool for allowing stakeholders to participate in sustainability decision-making, aligning services with their needs and enhancing corporate decision quality (Erin *et al.*, 2022, Farneti *et al.*, 2019, Fernando and Lawrence, 2014, Nicolo *et al.*, 2021).

As is evident, the legitimacy and stakeholder theories are not mutually exclusive in elucidating firms' sustainability reporting behaviour; instead, they complement each other (Fernando and Lawrence, 2014, Hummel and Szekely, 2022). Aligned with both theories, the disclosure of SDG information can be viewed as a strategy employed by organisations to respond to societal pressure and as a tool facilitating dialogue between the organisation and its stakeholders (Argento *et al.*, 2019, Fernando and Lawrence, 2014).

2.4.2 Sustainability reporting frameworks

Numerous tools and frameworks have been proposed to assist companies in structuring and disclosing essential sustainability and SDG information, such as the Global Reporting Initiative (GRI), the PWC framework, the International Integrated Reporting Council (IIRC) framework, the Sustainability Accounting Standards Board (SASB), the UN Global Compact and the Carbon Disclosure Project. However, the GRI is one of the most widely used (Bebbington and Unerman, 2018, Calabrese *et al.*, 2021, Pizzi *et al.*, 2021, Rosati and Faria, 2019, Tsalis *et al.*, 2020).

For SOEs of the PFMA (1999), the use of a sustainability reporting framework is not compulsory, however, in its Annual Report Guide for non-financial information, the National Treasury (2022) recommends the country's NDP as one of the documents to be used by public entities in preparing their annual reports. As discussed in section 2.1, the NDP significantly aligns with the SDGs and such synergy enables the exploration of SDG-related information disclosed by South African SOEs.

The GRI & UN Global Impact (2022) created 'An Analysis of the Goals and Targets' – a guide that offers a comprehensive list of potential disclosures for each SDG, covering all 169 targets. These disclosures are compiled from various reputable sources, including globally recognised frameworks and standards and any company can use them (ibid). As such, this study made use of this guide during data collection.

2.4.3 Limitations of SOE sustainability reporting

SOEs deliver public services to generate public value while also simultaneously pursuing market-driven goals, such as profitability (Fourie, 2014, Huang and Zhang, 2007, Kikeri, 2018, National Treasury, 2022). This complexity can impact the ability of SOEs to effectively communicate sustainability information that meets the diverse requirements of various stakeholders (Argento *et al*., 2019). Moreover, each SOE in South Africa possesses unique characteristics in terms of their operations. This diversity poses a key limitation on the SDGs highlighted within their integrated or annual reports (Ionașcu *et al.*, 2020).

Additionally, South African SOEs have faced public scrutiny regarding their poor governance and business practices, placing doubts on their value-creation strategies and calling their legitimacy into question (Kikeri, 2018, Long, 2016, Madumi, 2018, Matsiliza, 2017). Therefore, as reporting on sustainability information is largely voluntary (Hummel and Schlick, 2016, Tsalis *et al.*, 2022), there is potential for SOEs to employ impression management strategies and disclose information to positively influence how stakeholders perceive matters, causing stakeholders to inaccurately think that the company is dedicated to meeting societal norms (Diouf and Boiral, 2017, Merkl-Davies and Brennan, 2007, Michelon *et al.*, 2015, O'donovan, 2002). While this study does not specifically investigate the use of impression management techniques by SOEs, insights into this possibility could potentially be extracted from assessing the quality of their sustainability reporting.

2.5 The quality assessment of SDG disclosures

2.5.1 Overview

Section 2.4.1 highlights the benefits of incorporating SDG information in reporting practices, including enhanced transparency and accountability towards stakeholders (Bebbington and Unerman, 2018, Erin and Bamigboye, 2021, Subramaniam *et al.*, 2023). However, mere disclosure is not enough to enhance transparency and accountability (Ackers, 2022). High-quality reporting enables companies to gain insights, convey information effectively, and more effectively oversee their impact on the achievement of the SDGs (GRI, 2023, Michelon *et al.*, 2015).

Although this research centres on company reports and does not directly delve into internal corporate management, the way companies depict their sustainability endeavours – such as their role in advancing the SDGs – can provide indications of their aspirations and associated intentions (Silva, 2021, Michelon *et al.*, 2015). The quality of SDG information serves as a valuable

indicator of the degree to which SOEs are recognising and integrating economic, governance, social and environmental concerns into their business management practices and interactions with stakeholders (Emma and Jennifer, 2021, Malola and Maroun, 2019, Michelon *et al.*, 2015). It is therefore important to determine the quality of their SDG information.

The quality of SDG information can be substantive or symbolic in nature. This study defines substantive SDG disclosures as concise, measurable, results-driven, action-orientated, understandable, balanced and gives users the ability to assess progress in the SOE's sustainability performance (this definition is in line with the quality framework proposed below) (Adams *et al.*, 2020, GRI 1, 2021, Malola and Maroun, 2019, Michelon *et al.*, 2015). In this approach, disclosure emerges organically from the corporation's adoption of a comprehensive social and environmental management accounting system (Michelon *et al*., 2015). Consequently, it becomes informative and is presented in a manner that allows users to understand both the social and environmental dimensions of corporate activities, along with the fundamental corporate dedication to the SDGs (ibid.).

Further, by using this form of disclosure, SOEs can enhance the level of trust and credibility with their stakeholders as these disclosures are of high quality and aim at reducing information asymmetry and informing stakeholders (Ashforth and Gibbs, 1990, Emma and Jennifer, 2021, Fernando and Lawrence, 2014, Silva, 2021, Tsalis *et al.*, 2022). Hence, this type of information is associated with heightened transparency and accountability to stakeholders and constitutes a detailed account of SOEs' sustainability impact, underscoring a genuine commitment to advancing sustainable development (Silva, 2021, Tsalis *et al.*, 2022).

On the other hand, symbolic SDG information can be characterised in this study as information that is not substantive, including boilerplate, unbalanced, inaccessible and mainly qualitative information without really showing any information regarding the progress of corporate sustainability performance. Typically, this generic disclosure is presented to satisfy stakeholders, while deflecting accountability for inadequate sustainability performance and evading any commitment to alter the business model, especially if it could lower financial profitability (Ashforth and Gibbs, 1990, Malola and Maroun, 2019, Michelon *et al.*, 2015, O'donovan, 2002).

A variety of methods have been adopted by previous studies to assess the quality of sustainability disclosures. For example, Wiseman (1982) created a four-point scale that gauges the extent of disclosed environmental information (0 points: information is not disclosed (1) general information is disclosed; (2) qualitative information is disclosed and (3) quantitative or monetary information is disclosed). Similarly, Tsalis *et al.* (2022) suggested a four-point scale that assesses four distinct types of disclosed information for 186 SDG items. This quality scoring technique has been developed to also extract information regarding the advancement of corporate sustainability performance (0 = no disclosure; 1 = qualitative; 2 = quantitative; 3 = comparative information disclosed to examine firm's performance in relation to its previous year's performance) (Tsalis *et al*., 2022). Moreover, Hummel and Szekely (2022) employ content analysis to evaluate the quality of firms' disclosure on the SDGs based on 11 reporting items.

While these methods are potentially useful to users, they do not consider other crucial dimensions that characterise the disclosed SDG information (Malola and Maroun, 2019, Michelon *et al.*, 2015). Hence, in line with the view of Michelon *et al*. (2015), this study argues that the quality of disclosure relies on both the quantity of information revealed and the depth provided by supplementary details. The depth of SDG information can be considered as the degree to which the information aids stakeholders in understanding the social and environmental impact of corporate activities and deducing the management approach to sustainability (ibid.). In essence, it emphasises not only the quantity but also the nature of the disclosed information and how it is presented (Emma and Jennifer, 2021, Michelon *et al*., 2015, Silva, 2021, Tsalis *et al*., 2022).

This study therefore makes use of frameworks by Malola and Maroun (2019) and Michelon *et al.* (2015) for integrated reporting and CSR disclosure respectively, to SDG disclosure. In line with their work, this framework involves a multi-dimensional examination of disclosure quality, making SDG information quality dependent on:

- The emphasis placed on SDG information in the integrated or annual report relative to the total information presented to stakeholders (a *density indicator*);
- The inclusion of qualitative, quantitative, and monetary disclosures (a *measurement indicator*);
- The substance of disclosures (boilerplate or committed) (a *relevance indicator*);

- The ease with which SDG information can be interpreted by stakeholders (*an ease of interpretation indicator*);
- Disclosures that give users the ability to assess progress in the SOE's sustainability performance (a *performance indicator*); and
- The balance of disclosures, incorporating both positive and negative impacts (*a balance indicator*).

A detailed exploration of each of the quality dimensions is provided below, and these individual elements contribute to forming an ordinal quality score for a sample of South African SOEs. The themes of disclosure are classified under the 17 SDGs.

2.5.2 Density Indicator

The objective of this indicator is to gauge the emphasis placed on SDG information relative to the total information presented to stakeholders in SOEs' integrated or annual reports (Malola and Maroun, 2019). This indicator addresses the recent criticisms of integrated or annual reporting for its overemphasis on financial metrics at the expense of explaining a company's non-financial or sustainability performance (Malola and Maroun, 2019). Research highlights the value of non-financial information, which includes SDG information, in providing context to financial performance (Malola and Maroun, 2019, National Treasury, 2022).

The SDGs encompass all areas of sustainability which include environmental, social, economic and governance matters (GRI & UN Global Impact, 2022, StatsSA, 2019, UN, 2015). Further, stakeholder theory advocates considering the interests and concerns of all stakeholders, and incorporating SDG information in reports suggests that the SOE is acknowledging the impact that its actions can have on various stakeholders (Fernando and Lawrence, 2014, Farneti *et al.*, 2019, Erin and Bamigboye, 2021). Lastly, SOEs are designed to promote a country's sustainable development and their operations include those which would contribute to the 2030 Agenda (Kikeri, 2018, Matsiliza, 2017, Ovens, 2016). Therefore, there could be an inherent expectation that a significant portion of information in the integrated or annual report constitutes SDG information which can enhance SDG information quality (Adams *et al.*, 2020).

However, while the volume of disclosure can symbolise importance (Chan *et al*., 2014), the GRI 1 (2021) and Adams *et al.* (2020) recommend that for a report to provide clarity, it should be

concise and not contain unnecessary and excessive detail that would obscure relevant information. Additionally, Malola and Maroun (2019) highlight that certain integrated or sustainability reports have faced criticism for their excessive length and repetitive content, which ultimately hinders the clarity of essential information and makes the reports challenging to comprehend. Taking this into consideration, the Density Indicator was developed based primarily on Malola and Maroun (2019) and Michelon *et al.* (2015) and is measured as the ratio of the number of sentences which deal with SDG content, controlled for repeated SDG sentences, to the total number of sentences in the integrated or annual report:

$$DI_i = \frac{N_i}{K_i}$$

where: DI_i is the Density Indicator, N_i is total number of SDG-related sentences in the report of SOE *i,* and K_i is the total number of sentences in the report. The closer the DI score is to 1, the more SDG information is provided per unit of the report and the higher the apparent level of SDG information quality (Malola and Maroun, 2019). The DI penalises reports that exhibit excessive elaboration by eliminating redundant disclosures, leading to a decreased DI score (ibid). To achieve this objective, if multiple disclosures addressed the same SDG within the same context, they were considered only once in the calculation of the DI score[1] (ibid).

2.5.3 Measurement Indicator

The presumption is that users of sustainability reports have a preference for quantitative or monetary disclosures, considering them to be more comparable, less subjective, and easier to integrate into the mathematical models traditionally employed to express value (Malola and Maroun, 2019, Wiseman, 1982). Although qualitative disclosures offer stakeholders a comprehensive understanding of an organisation's value creation process, lacking quantification makes it challenging to demonstrate the effectiveness of the organisation in addressing key matters and to establish a relative scale for assessing the firm's performance in comparison to other industry members (Hummel and Schlick, 2016, Malola and Maroun, 2019).

[1] For instance, a company detailed its healthcare service provision via trains to rural communities and the number of patients assisted within the Chairperson's review section of its integrated report. Additionally, this initiative was discussed in both its operating context section and its sustainable development outcomes for 2022. This was regarded as a singular instance of disclosing SDG 3 and its role in enhancing the good health and wellbeing of citizens.

By reporting monetary and quantitative SDG information, SOEs can provide concrete and objective data on their performance in relation to sustainability, thereby enhancing accountability and transparency to stakeholders (Ionașcu *et al*., 2020, Nikolaou and Tsalis, 2013, Tsalis *et al*., 2022). Thus, disclosures that involve quantifiable or monetary values are perceived as having superior quality compared to disclosures that lack quantification (Malola and Maroun, 2019, Wiseman, 1982). Therefore, based on the approach used by Malola and Maroun (2019); Michelon *et al.* (2015); and Wiseman (1982), each sentence was coded as qualitative, quantitative or monetary as it was analysed. The Measurement Indicator was then computed for each SOE as the "ratio of the sum of the weighted value of all sentences that contain SDG information over the total number of SDG sentences contained in the report" (Michelon *et al*., 2015, p. 67).

$$MI_i = \frac{1}{3N_i} \sum (n_i \cdot w)$$

where: MI_i is the Measurement Indicator; N_i is the total number of SDG sentences in SOE *i*'s report; n_i is a sentence with SDG disclosures; *w* = 3 for a sentence which is expressed in financial or monetary terms, 2 if non-monetary quantitative measures are used and 1 if qualitative measures are used. A higher MI score (ranging from 0 to 1) points toward a greater use of monetary or quantitative SDG disclosures and suggests higher quality SDG information (Malola and Maroun, 2019).

2.5.4 Relevance Indicator

Firms ought to report not only their intentions but also the concrete actions taken to mitigate adverse environmental or social impacts and the outcomes of those actions (Emma and Jennifer, 2021, Malola and Maroun, 2019, Michelon *et al.*, 2015, Rosati and Faria, 2019, Van der Waal and Thijssens, 2020). However, environmental disclosure often leans more towards detailing strategies, plans, and intentions rather than emphasising actual results (Michelon *et al*., 2015).

Sustainability disclosures can either convey standardised and generic statements about broad future expectations or existing policies and programmes in place that are not supported by the results of those initiatives (boilerplate approach) (Malola and Maroun, 2019, Michelon *et al.*, 2015). Contrastingly, disclosures can provide stakeholders with the company's objectives and goals accompanied by a report on the outcomes and results from actions taken to address stakeholders' needs. The latter form of SDG disclosures suggests that a company is providing readers with insights into the company's fundamental commitment to sustainability (a committed

approach) (Michelon *et al.*, 2015). Examples include the results of engagements with stakeholders, disclosures of steps already taken to reduce water consumption and the results of those steps (past information) or steps the company plans to take in future, in other words specific goals or objectives, to reduce CO_2 emissions (future information).

'Committed' SDG disclosures should be distinguished from those that merely touch upon an organisation's mission statement or exclusively address company policies without being substantiated by actual actions taken and their outcomes (Malola and Maroun, 2019). These boilerplate SDG disclosures encompass sustainable initiatives, involving specific agendas, philanthropic activities, or green strategies, even though they do not signify any consistent or tangible change in the firm's business strategies (Emma and Jennifer, 2021, Van der Waal and Thijssens, 2020). These actions are more conspicuous and overt measures taken to gain legitimacy, such as involvement in voluntary environmental initiatives, awareness campaigns, or the creation of an environmental board committee (Michelon *et al.*, 2015).

Table 2 is used to distinguish between boilerplate and committed SDG disclosures. The categorisations align with those employed by Malola and Maroun (2019) and Michelon *et al*. (2015). They assess whether or not a company is disclosing information about measures taken to ensure long-term sustainability in the reporting period, evaluating the outcomes, or a well-justified explanation of intended future actions (Malola and Maroun, 2019, Michelon *et al.*, 2015). Therefore, the focus is on whether or not a company furnishes readers with insights into the organisation's fundamental commitment to sustainability (ibid.).

Table 2: Relevance Indictor

Approach	Future information	Past information
Boilerplate/generic	Context – expectations, desires, or mission statements	Policies, strategies, or programmes
Committed/substantive	Objectives – quantified or justified goals	Results and outcomes of actions or initiatives

Source: Malola and Maroun (2019) and Michelon et al. (2015)

As the integrated or annual reports were analysed, each SDG sentence was assessed and categorised as boilerplate (expectations/desires or policies/strategies/programmes) or committed (objectives/goals or results/outcomes). As 'committed' information is more useful to stakeholders

than boilerplate disclosures, they are assigned a value of 1 and boilerplate information is scored 0 (Malola and Maroun, 2019, Michelon *et al.*, 2015). Following Malola and Maroun (2019) and Michelon *et al.* (2015), the Relevance Indicator measures the ratio of the sum of all the 'committed' SDG disclosures to the total number of SDG sentences in the report:

$$RI_i = \frac{1}{N_i} \sum (n_i \cdot Sub)$$

where: RI_i is the Relevance Indicator; N_i is the total number of SDG sentences in SOE *i*'s report; n_i is a sentence dealing with the SDG disclosures. Sub is 1 if the sentence contains 'committed' information and 0 if this is not the case. A score closer to 1 implies that most of the SDG disclosures represent a committed approach to sustainability, and that SDG information quality is high. A score tending to 0 suggests lower-quality SDG information.

2.5.5 Ease of Interpretation Indicator

For sustainability reporting to achieve a high level of quality, it should be clear and understandable, facilitating ease of use during stakeholders decision-making procedures (Adams *et al.*, 2020, GRI 1, 2021, Malola and Maroun, 2019, National Treasury, 2022). Incorporating graphical information can improve understandability and offer a practical gauge of the accessibility and interpretability of data, potentially impacting the quality of the report (Malola and Maroun, 2019).

Graphs are visual representations of quantitative data, allowing statistical information and relationships to be conveyed visually through a combination of words and numbers (Kathrada *et al*., 2021). As quantitative data is more useful than qualitative data, the use of these may result in higher-quality reporting. However, in some cases, visual medium such as graphs may be susceptible to distortion by management, potentially aimed at portraying a positive image to users (Kathrada *et al*., 2021).

Nevertheless, the use of visual medium can enhance the understandability of SDG information and can impact the perceived level of quality (Freundlieb *et al.*, 2014, Malola and Maroun, 2019). Therefore, report preparers have given significant attention to employing infographics as a method to condense extensive data and concisely explain complex relationships among variables (Malola and Maroun, 2019). Supporting this perspective, Chan *et al.* (2014) notes that graphs,

tables, charts and other infographics have the potential to be highly effective and powerful communication tools.

This research follows a similar approach to Malola and Maroun (2019). It assesses how easily SDG information can be understood by evaluating the degree to which graphs, diagrams, and tables are employed to consolidate and elucidate this information for stakeholders (ibid). Therefore, this indicator measures the proportion of a page devoted to SDG infographics in the integrated or annual report:

$$EII_i = \frac{NSA_i}{KSA_i}$$

where: EII_i is the Ease of Interpretation Indicator; NSA_i is the surface area of all SDG infographics in the report of SOE *I* and KSA_i is the surface area of the integrated or annual report. Following Malola and Maroun (2019) the surface areas are calculated using the length and breadth of the pages in the report and the individual diagrams, graphs, charts and tables. As integrated or annual reports can vary in terms of print and page sizes, this study standardised the pages of the reports (Chan *et al.*, 2014). This ensured consistency, comparability and eliminated potential measurement errors. A detailed explanation of how this was done can be found under section 3.3 of the Methodology. A higher EII (ranging from 0 to 1) suggests that a higher proportion of the integrated or annual reports contains infographics to depict SDG information and the higher the presumed level of SDG information quality (Malola and Maroun, 2019).

2.5.6 Performance Indicator

Michelon *et al.* (2015) note that for companies to fulfill their accountability, it is essential not only to report their intentions but also to disclose their results and subsequent performance. Quantifying indicators for sustainability performance or providing actionable SDG disclosures offers valuable insights to stakeholders, yet what proves even more valuable and useful is comparing these against well-defined targets or performance from previous years (Malola and Maroun, 2019, Michelon *et al.*, 2015, Nikolaou and Tsalis, 2013, Tsalis *et al.*, 2022). This is a notable indicator of higher quality sustainability reporting as it allows stakeholders to examine a firm's sustainability performance and progress (ibid.).

This indicator is particularly relevant for South African SOEs. They are required by the PFMA and Public Audit Act, to incorporate a dedicated section, known as the Performance Report, in their

annual or integrated reports (IRBA, 2011, National Treasury, 2022). The Performance Report is unique to SOEs, encompassing key performance measures and indicators to evaluate the entity's delivery of the desired objectives and outcomes (ibid.). It also includes the entity's actual performance in comparison to the strategic objectives and outcomes (ibid.). Performance information plays a crucial role in directing public and oversight bodies' attention towards evaluating whether SOEs are effectively delivering public services (National Treasury, 2007). This is achieved by comparing their performance against planned targets and budgets (KPMG, 2016, National Treasury, 2022).

As a result, adapted from Michelon *et al.* (2015), the disclosures of SDG **results** (see Table 2, 'past information') were further coded if they were compared to a benchmark in terms of space, time, or a specific goal/target in the report. Compared results receive a score of 1, and 0 if otherwise. The Performance Indicator measures the ratio of all SDG sentences that contain compared results to all SDG sentences that contain results, i.e., with or without comparisons:

$$PI_i = \frac{1}{R_i} \sum (r_i \cdot Comp)$$

where: PI_i is the Performance Indicator; R_i is the total number of SDG sentences that disclose results in SOE *i*'s report; r_i is an SDG sentence dealing with results. $Comp$ is 1 if the sentence contains comparable information and 0 if otherwise. The closer the PI score is to 1, from 0, the more disclosures are provided on SOEs' progress toward the SDGs, signalling higher disclosure quality.

2.5.7 Balance Indicator

A hallmark of a high-quality annual report, as noted by the National Treasury (2022) and GRI 1 (2021), is its presentation of both positive and negative information. This entails balanced reporting, highlighting successes while addressing shortcomings (National Treasury, 2022). Adams *et al.* (2020), in their SDG Disclosure Recommendations, express concerns that companies tend to emphasise positive impacts on the SDGs over negative ones. This tendency might also apply to South African SOEs, given their public scrutiny. In an effort to boost stakeholder confidence and legitimacy, these SOEs could potentially avoid disclosing negative outcomes and overly emphasise positive impacts in their reports (Boiral, 2016, Deegan *et al.*, 2002, Melloni *et al.*, 2016, Merkl-Davies and Brennan, 2011, O'donovan, 2002, Schleicher and Walker, 2010).

From a stakeholder perspective, reporting both negative and positive impacts on sustainability factors helps build trust and credibility and SOEs can demonstrate transparency and accountability through this approach (Adams *et al.*, 2020). This approach allows stakeholders to have a comprehensive and reasoned assessment of the organisation's overall sustainability performance and its commitment towards sustainable practices (Freundlieb *et al.*, 2014).

With this in mind, and following Michelon *et al.* (2015), the disclosures of SDG **results** (see Table 2) were further coded as either negative, neutral or positive. The Balance Indicator measures the ratio of SDG sentences that disclose negative results to SDG sentences that disclose positive results:

$$BI_i = Neg_{ri}/Pos_{ri}$$

where: BI_i is the Balance Indicator, Neg_{ri} is the number of negative SDG sentences dealing with results or outcomes in the report of SOE *i* and Pos_{ri} is the number of positive SDG result sentences. The closer the score is to 1 the more balanced the SDG results are and the higher the apparent quality level of SDG information. In cases where a company disclosed more negative SDG results than positive, the ratio was inverted to $BI_i = Pos_{ri}/Neg_{ri}$ in order to maintain the score range of 0-1. For example, if SOE A disclosed 75 positive SDG results and 125 negative SDG results, the score will be calculated as: $75(pos_{ri})/125(neg_{ri}) = 0.6$.

2.5.8 SDG Information Quality

To assess the quality of SDG information in total (SDGQ), the scores of the six indictors are combined. The quality components each have equal weight (Malola and Maroun, 2019).

$$SDGQ = \frac{1}{6}[Density\ Indicator(DI) + Measurement\ Indicator(MI) + Relevance\ Indicator(RI) + Ease\ of\ Interpretation\ Indicator(EII) + Performance\ Indicator(PI) + Balance\ Indicator(BI)]$$

Then, to identify those SDGs which SOEs prioritise the most in respect of quality corporate disclosures, the quality elements are also evaluated within the scope of each of the 17 SDGs as follows:

- **Density Indicator (DI)*:*** the ratio of all sentences that related to a *specific* SDG, controlled for repeated sentences, to the total number of SDG sentences in the report.

- **Measurement Indicator (MI):** the ratio of the sum of the weighted value of all sentences that contain information about *specific* SDG over the total number of *specific* SDG sentences.
- **Relevance Indicator (RI):** ratio of the sum of all the 'committed' *specific* SDG disclosures to the total number of *specific* SDG sentences in the report.
- **Performance Indicator (PI):** the ratio of all *specific* SDG sentences that contain compared results to all *specific* SDG sentences that contain results.
- **Balance Indicator (BI):** the ratio of *specific* SDG sentences that disclose positive results to *specific* SDG sentences that disclose negative results.
- **Ease of Interpretation Indicator (EII):** this indicator will not be assessed at the individual SDG level as infographics may be used to depict more than 1 SDG and difficulties may be encountered when separating the surface area of 1 infographic into individual SDGs.

In summary, the quality elements (except for the EII) are also assessed at the individual SDG level, with the focus moving from SDG-related sentences overall, to sentences dealing with the specific SDG under review. These quality indicators are also combined for each SDG to determine an overall SDGQ score for each SDG. Table 3 summarises the SDG information quality indicators at the overall report level as well as the SDG level.

Table 3: Summary of quality indicators at the overall report and SDG level

Quality element	Description: Overall level	Description: SDG level
Density Indicator: $\boldsymbol{DI_i = \frac{N_i}{K_i}}$	where: DI_i is the Density Indicator, N_i is total number of SDG-related sentences in the report of SOE *i,* and K_i is the total number of sentences in the report.	where: N_i is total number of *specific* SDG sentences in the report and K_i is the total number of SDG-related sentences in the report.
Measurement Indicator: $\boldsymbol{MI_i = \frac{1}{3N_i}\sum(n_i \cdot w)}$	where: MI_i is the Measurement Indicator; N_i is the total number of SDG sentences in SOE *i*'s report; n_i is a sentence with SDG disclosures; *w* = 3 for a sentence which is expressed in financial or monetary terms, 2 if non-monetary quantitative measures	where: N_i is the total number of *specific* SDG sentences in SOE *i*'s report; n_i is a sentence with *specific* SDG disclosures; *w* = 3 for a sentence which is expressed in financial or monetary terms, 2 if non-monetary quantitative measures are used and 1 if qualitative measures are used.

	are used and 1 if qualitative measures are used.	
Relevance Indicator: $\boldsymbol{RI_i = \frac{1}{N_i}\sum(n_i \cdot Sub)}$	where: RI_i is the Relevance Indicator; N_i is the total number of SDG sentences in SOE *i*'s report; n_i is a sentence dealing with the SDG disclosures. Sub is 1 if the sentence contains 'committed' information and 0 if this is not the case.	where: N_i is the total number of *specific* SDG sentences in SOE *i*'s report; n_i is a sentence dealing with *specific* SDG disclosures. Sub is 1 if the sentence contains 'committed' information and 0 if this is not the case.
Ease of Interpretation Indicator: $\boldsymbol{EII_i = \frac{NSA_i}{KSA_i}}$	where: EII_i is the Ease of Interpretation Indicator; NSA_i is the surface area of all SDG infographics in the report of SOE *i* and KSA_i is the surface area of the integrated or annual report.	N/A
Performance Indicator: $\boldsymbol{PI_i = \frac{1}{R_i}\sum(r_i \cdot Comp)}$	where: PI_i is the Performance Indicator; R_i is the total number of SDG sentences that disclose results in SOE *i*'s report; r_i is an SDG result sentence. $Comp$ is 1 if the result sentence contains comparable information and 0 if otherwise.	where: R_i is the total number of *specific* SDG sentences that disclose results in SOE *i*'s report; r_i is a *specific* SDG result sentence. $Comp$ is 1 if the result sentence contains comparable information and 0 if otherwise.
Balance Indicator: $\boldsymbol{BI_i = Neg_{ri}/Pos_{ri}}$	where: BI_i is the Balance Indicator, Neg_{ri} is the number of negative SDG sentences dealing with results or outcomes in the report of SOE *i* and Pos_{ri} is the number of positive SDG result sentences.	where: Neg_{ri} is the number of *specific* negative SDG sentences dealing with results or outcomes in the report of SOE *i* and Pos_{ri} is the number of positive *specific* SDG result sentences.
SDG Information Quality	$SDGQ = \frac{DI + MI + RI + EII + PI + BI}{6}$	$SDGQ = \frac{DI + MI + RI + PI + BI}{5}$

CHAPTER III: METHODOLOGY

Section 3.1 discusses the research design adopted by this study. The population, sample, and data sources are described under section 3.2. Data collection and the development of the coding instrument is outlined in section 3.3. Section 3.4 expands on the analysis and interpretation of the data. The achievement of validity and reliability is discussed under section 3.5. This chapter concludes with section 3.6, highlighting the assumptions, limitations, and delimitations of the study.

3.1 Research design

To determine the quality of SDG disclosures, a quantitative content analysis approach was followed to capture qualitative SDG information from the integrated or annual reports of the SOEs. This method has been used extensively in analysing SDG disclosure, e.g., (Ali *et al.*, 2018, Buniamin *et al.*, 2020, Calabrese *et al.*, 2021, Erin *et al.*, 2022, Haywood and Boihang, 2021, Hummel and Szekely, 2022, Ionașcu *et al.*, 2020, Kuswantoro *et al.*, 2022, Pizzi *et al.*, 2021, Sawani *et al.*, 2023, Tsalis *et al.*, 2020, Van der Waal and Thijssens, 2020) which informs the primary reason for adopting this method. Content analysis is a systematic method of analysing and categorising text, images, graphs and symbols contained in documents and other communication artifacts to identify themes or patterns (Krippendorff, 2004). This is a method for drawing conclusions by systematically pinpointing specified features within the text (Stemler, 2000). Content analysis was deemed appropriate for this study as it sought to deduce the quality of SDG disclosure in sentences from integrated or annual reports.

The content analysis approach of this study involved the segmentation of text into meaningful units and coding and scoring them according to a set of criteria or well-established rules (Guthrie *et al.*, 2004, Leedy and Ormrod, 2010). In quantitative content analysis, information extracted from the text is presented by expressing the frequencies in the form of percentages or actual numbers for key categories (Bengtsson, 2016, Krippendorff, 2004). This approach can be known as the quantitative analysis of qualitative data, or mixed methods, and it was the methodology adopted in this study (Leedy and Ormrod, 2015). This is because the data extracted from the qualitative information was numerical and analysed using quantitative methods (descriptive and inferential statistics).

3.2 Population, sampling, and data sources

The population for this study represents the SOEs listed in the PFMA, since the PFMA makes it mandatory for all SOEs to submit an annual report (Ackers, 2022, PFMA, 1999). Public entities of the PFMA are classified into one of the three schedules based on their nature and level of autonomy (National Treasury, 2022). The sample of this study is confined to the SOEs classified as Major Public Entities in Schedule 2 and National Government Business Enterprises in Schedule 3B of the PFMA (Appendix A). Schedule 2 and 3B SOEs have the same characteristics in that they both operate under general business principles and are profit-driven, except Schedule 2 SOEs possess extensive borrowing powers and have more autonomy as they operate in a competitive marketplace (National Treasury, 2022). The schedules selected comprise 21 companies each; however, four of the Major Public Entities and three of the National Government Business Enterprises have not published 2022 annual or integrated reports (Appendix A) thereby reducing the sample size to 35 SOEs. Chapter II, section 2.2.2 contains an elaborate rationale for the selection of Schedule 2 and 3B SOEs as the sample. Table 4 displays the number of annual or integrated reports that are included for the scope of this study.

Table 4: Sample size

Total SOEs in Schedule 2 of the PFMA	21
Total SOEs in Schedule 3B of the PFMA	21
Less: SOEs that did not publish 2022 integrated/annual reports	(7)
Total sample selected	**35**

The 2022 integrated or annual report for each SOE was analysed for this study as these were the most recently available reports. The reports were downloaded in PDF form from the SOEs' official online websites. The entire report and each SDG sentence were analysed in detail, resulting in a time-consuming data collection process. Therefore a smaller sample size was chosen to ensure sufficient time was given to each report allowing for more accurate results (Boddy, 2016, Dattalo, 2008, Mansoor and Maroun, 2016, Merkl-Davies *et al.*, 2011). Further, the small sample size aligns with the exploratory study's aim, which is not to extrapolate results but to assess the quality of SDG information in the integrated or annual reports of South African SOEs (Malola and Maroun, 2019, Mansoor and Maroun, 2016, Merkl-Davies *et al.*, 2011).

3.3 Data collection and instrumentation

Similar to the approach used by Michelon *et al.* (2015) and Malola and Maroun (2019), the researcher structured the process of gathering data into three stages. Given the flexibility offered by the content analysis method in constructing the analysis process, the stages of the analysis were developed to enable the identification of answers to the research questions (Hsieh and Shannon, 2005, Ionașcu *et al.*, 2020).

Phase 1: Unit of analysis

Following the content analysis approach, the unit of analysis was defined as individual sentences because they are generally considered more reliable than words, pages or paragraphs (Chan *et al.*, 2014, Michelon *et al.*, 2015). Furthermore, individual words were not selected, as they lack significance without a sentence to offer contextual understanding (Chan *et al.*, 2014, Malola and Maroun, 2019).The information presented in a table was not ignored considering it can provide effective and relevant information (GRI 1, 2021). As a result, each line in a table was counted as one sentence (unless there were separate sentences within the table line, then those were counted individually). Pictures were not considered due to the inherent subjectivity of their nature, making it difficult to combine them with sentences (Chan *et al*., 2014).

One prerequisite for content analysis involves repeatedly reading the documents to gain a deeper understanding of the data (Hsieh and Shannon, 2005, Ionașcu *et al.*, 2020). Accordingly, during this phase, each SOE report was read in its entirety to create an overview of the documents and to pinpoint sections that were not related to the SDGs. Pages relating to the financial statements and the notes, table of contents, list of abbreviations and the external auditor's report were then deleted (see section 3.6 for more details on limitations and delimitations).

Phase 2: Code list created on ATLAS.ti

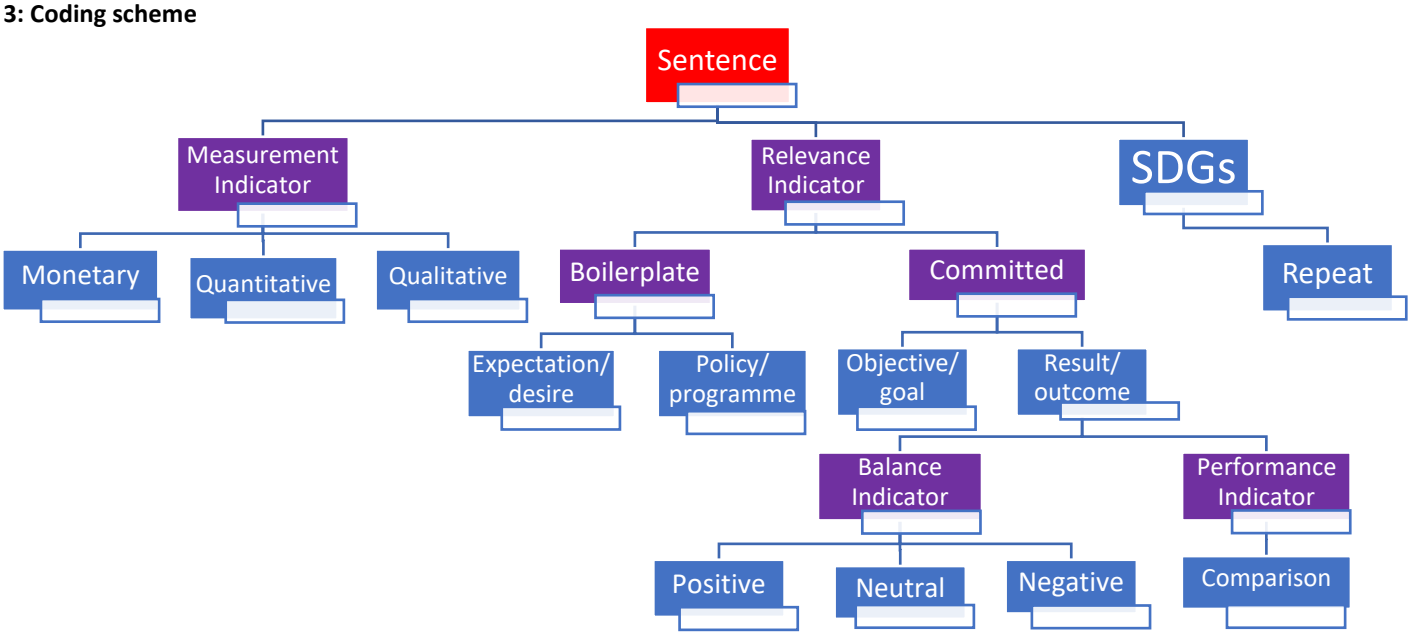
The coding procedure to capture the disclosure of SDG information was conducted on ATLAS.ti, a computer software that assists in qualitative analysis of large bodies of texts and graphics (ATLAS.ti, 2023). In the second phase, a list of codes was created on ATLAS.ti that contained the 17 SDGs and quality indicator definitions found under Appendix B, C and D and explained in the Literature Review. In total, the list comprised 18 SDG and 12 quality codes. An additional SDG code was created because this study split the SDG 8 code into two separate ones, namely Decent Work and Economic Growth. Sentences that related to SDG 8: Decent Work were coded

separately to those relating to SDG 8: Economic Growth. The idea is that it is more valuable to analyse this goal in further detail considering a critical mandate of SOEs in South Africa is to provide for employment as well as to stimulate economic growth (Chigudu, 2020, Fourie, 2014, Madumi, 2018).

Phase 3.1: Coding the sentences on ATLAS.ti

In the third stage, the integrated or annual reports were uploaded onto ATLAS.ti and analysed individually[2]. It is important to emphasise that ATLAS.ti does not perform the coding work automatically; the researcher is still responsible for interpreting the texts (Hwang, 2008). Accordingly, for each report, the researcher analysed and manually applied the relevant codes to each individual sentence on the software. Figure 3 provides a visual representation of how each sentence identified in the reports was coded. The blocks in blue represent the actual codes given to each sentence, and the purple blocks represent the code category.

Figure 3: Coding scheme



For each report, when a sentence contained information about a specific SDG, it was coded as such. The same sentence was simultaneously coded according to the Measurement Indicator (qualitative, quantitative, **or** monetary), the Relevance Indicator (expectations/desires,

[2] The version of ATLAS.ti used in this study enables users to analyse multiple reports at once, however, during the pilot test of the coding process, analysing each report separately was found to be more efficient and accurate.

policies/strategies/programmes, objectives/goals, **or** results/outcomes)[3], the Performance Indicator (comparison) and the Balance Indicator (positive, neutral, **or** negative). These code definitions were drawn from the studies of Malola and Maroun (2019) and Michelon *et al.* (2015), as explained in depth in section 2.5 of Chapter II. They can also be found under Appendix C and D.

When coding for the SDGs, it was recognised that they are interconnected in various ways, meaning the accomplishment of one goal can contribute to the achievement of another (StatsSA, 2019). Therefore, if one sentence related to multiple SDGs, the number of applied SDG codes was limited to three SDGs per sentence i.e., the top three SDGs that were most impacted by each case. This prevented having to determine the underlying SDGs that were indirectly affected by each sentence, thereby minimising the subjectivity inherent in the data collection process (Malola and Maroun, 2019). There were some cases where a sentence directly referred to more than three SDGs; however, this did not impact researcher subjectivity as these sentences were coded according to all the SDGs directly mentioned. Moreover, only SDG sentences that related directly to the company and its contribution were coded. For example, if a company stated 'South Africa faces high levels of poverty' in its report, this was not considered to be an SDG-related sentence.

When coding for the Measurement Indicator, if a sentence included both monetary and quantitative information, it was coded as monetary (Malola and Maroun, 2019, Michelon *et al.*, 2015). This approach circumvented the need to differentiate between the emphasis placed on monetary versus non-monetary quantitative matters in each recording unit, thereby reducing the subjectivity inherent in the data collection process (Malola and Maroun, 2019).

When coding for the Balance Indicator, this study only coded negative or positive results where a growth or decline was noted. Key words such as 'improvement'; 'decline'; 'positive'; 'negative'; 'increase'; and 'decrease' were used when evaluating the sign of the result disclosed (Appendix C). In other words, the coding process focused on information that was explicitly presented and readily apparent in the text without delving into deeper interpretations or underlying sentiments. This same logic was applied when coding for the other quality indicators. Assessing the tone or implied emotions was not the aim of this study as it could introduce complexity and subjectivity to

[3] Each sentence was coded as either one of the four codes under the Relevance Indicator, i.e., a sentence was not coded as a 'policy/strategy/programme' and 'result/outcome' simultaneously, for example.

the analysis (Cho and Lee, 2014). Furthermore, results disclosed in a table were regarded as 'matter of fact' disclosures and were coded as neutral results for consistency purposes. A more comprehensive list of rules for coding the quality indicators can be found under Appendix C.

Phase 3.2: Calculation of surface areas

To collect data for Ease of Interpretation Indicator, a different approach was employed. To calculate the surface area of the reports as well as the infographics, an application called Notability was used. Notability is a versatile note-taking app that permits users to take handwritten or typed notes, annotate PDFs, and record audio (Tool Finder, 2023).

First, the integrated or annual reports were uploaded onto the app. To calculate the surface area of the report pages, Notability allows for the standardisation of a page by providing paper size options (Notability, 2023). This study used the A4 size option as the standard paper size for each report. This allowed for consistency and removed potential measurement errors, making the data more reliable for analysis. The surface area of each report was thus calculated as the standardised page size multiplied by the number of pages in the report that were not deleted in phase 1. To calculate the surface areas of the infographics in each report, the Notability app has an embedded ruler that allows for the measurement of precise lines (Notability, 2023). Using this ruler, the length and breadth of each infographic was calculated.

Exporting the data for analysis

While the researcher manually conducted the coding process within the software, ATLAS.ti serves as a research assistant, helping to save time, particularly when dealing with extensive datasets (Hwang, 2008). This study analysed individual sentences from 35 reports, and ATLAS.ti made it more manageable to handle such a large number of units. Each time a sentence was coded, ATLAS.ti automatically processed that code into code frequencies (ATLAS.ti, 2023). Code frequencies refer to the number of times a specific code is applied throughout a report (ATLAS.ti, 2023). Furthermore, ATLAS.ti has a data analysis tool called *Code Co-occurrence*, which can be used to identify the number of instances where different codes have been applied together in a report (ibid.). The objective is to establish connections between codes that have been applied to the same sentences (ibid.). This analysis tool was used for identifying the frequency of quality codes that occurred for each SDG code, providing data for the analysis of reporting quality at the individual SDG level.

Once the data capturing was complete in phase 3, for each report the code frequencies from ATLAS.ti were recorded in Excel in a frequency table. A frequency table was also created for each SDG. ATLAS.ti also enables the export of the raw data to Excel, i.e., each individual sentence and the codes assigned to it (an example of what it looks like is provided in Appendix D). In the frequency table, for each report, as well as for each SDG, the total number of sentences, as well as the number of repeated, qualitative, quantitative, monetary, boilerplate, committed, comparison, positive, neutral, and negative SDG disclosures were recorded. The total surface area of each report as well as the infographics were also recorded.

The data from the frequency tables was used to calculate each quality element score and the total quality score (SDGQ) for each SOE, at the overall report level as well as at the specific SDG level (except for the EII, see section 2.5.8 of Chapter II). In order to prevent the influence of scale effects, the quality scores spanned from 0 to 1 (Malola and Maroun, 2019). The scores were calculated on Excel according to each quality indicator equation described in section 2.5 of Chapter II and summarised in Table 3. An example of how the indicators were calculated, using data from Eskom's integrated report is provided in Table 6. The collected data from Eskom's report is presented in Table 5.

Table 5: Data from Eskom's integrated report

SOE	No. Sentences Total	No. SDG Sentences	Repeat sentences	Excl. repeat	Monetary	Quantitative	Qualitative	Policy/program	Expectations	Objectives	Results	Comparison results	Negative results	Positive results	Neutral results	Page Surface Area (cm^2)	Infographic Surface Area (cm^2)
ESKOM	4158	3619	522	3097	279	780	2560	2099	337	36	1147	525	324	190	633	22222,2	4161,25

Table 6: Example of how the quality indicators were calculated using Eskom's data

Quality indicator	Quality score
Density Indicator: $$DI_i = \frac{N_i}{K_i}$$	$$\frac{3097}{4158} = 0.74$$
Measurement Indicator: $$MI_i = \frac{1}{3N_i}\sum(n_i \cdot w)$$	$$\frac{(279 \times 3) + (780 \times 2) + (2560 \times 1)}{(3619 \times 3)} = 0.46$$

Relevance Indicator: $$RI_i = \frac{1}{N_i}\sum(n_i \cdot Sub)$$	$$\frac{0(2099+337)+1(1147+36)}{3619} = 0.33$$
Ease of Interpretation Indicator: $$EII_i = \frac{NSA_i}{KSA_i}$$	$$\frac{4161.25}{22222.2} = 0.19$$
Performance Indicator: $$PI_i = \frac{1}{R_i}\sum(r_i \cdot Comp)$$	$$\frac{525}{1147} = 0.46$$
Balance Indicator: $$BI_i = Neg_{ri}/Pos_{ri}$$	$190/324$[4] $= 0.59$
SDG Information Quality: $$SDGQ = \frac{DI + MI + RI + EII + PI + BI}{6}$$	$$\frac{0.74+0.46+0.33+0.19+0.46+0.59}{6} = 0.46$$

3.4 Analysis and interpretation

RQ 1: What is the quality of SDG disclosures in the integrated or annual reports of South African SOEs?

To determine the SDG disclosure quality of the SOEs at the overall report level, a combination of descriptive and inferential statistics was used. For the descriptive statistics, the data from the frequency tables were used to calculate each quality element score and the total quality score (SDGQ) for each SOE report (as described in section 3.3). Further, descriptive statistics will be used to show differences in the quality elements (Malola and Maroun, 2019).

For the inferential statistics, this study posits that the quality elements are not mutually exclusive. Therefore, correlations among the quality indicators were presented using the Spearman's rho and Kendall's tau-b tests (Malola and Maroun, 2019). The correlations were also performed to support and enhance the robustness of the descriptive statistics results. In other words, for example, high, positive correlations among the indicators would imply high quality reporting. The following paragraph outlines the decision-making process for selecting the type of correlation test to be used.

[4] In this case, Eskom's report disclosed more negative than positive results.

A Shapiro-Wilk and Kolmogorov-Smirnov test was used to determine whether the data is normally distributed. The Shapiro-Wilk test was used as this study contains a small sample (Argento *et al.*, 2019). While the assumption of bivariate normality is met, as indicated by the tests presented in Table 7 (sig.>0.05), the data are ordinal and have non-linear relationships. The small number of data points prevented the conclusion that the data had all linear relationships. The Spearman's rho correlation and Kendall's tau-b have been developed to be more sensitive to non-linear relationships. These tests are also less responsive to the impact of shrinkage effects due to a small sample (Malola and Maroun, 2019). Therefore, the decision was made to use the Spearman's rho and Kendall's tau-b tests as opposed to the Pearson's correlation test. Originally, a 5% significance threshold was used; however, all correlations significant at the 5% level are also found to be significant at 1%. Correlations that are significant at the 10% threshold are also reported (Malola and Maroun, 2019, Michelon *et al*., 2015). These tests were performed through SPSS (a statistical program).

Table 7: Tests of normality

Quality Indicator	Kolmogorov-Smirnov	Shapiro-Wilk
	Sig.	Sig.
DI	0.20*	0.06*
MI	0.20*	0.27*
RI	0.20*	0.22*
EII	0.15*	0.28*
PI	0.20*	0.37*
BI	0.20*	0.27*
SDGQ	0.20*	0.08*
*Assumed normally distributed at the 5% level		

RQ 2: Which SDGs are prioritised in terms of corporate disclosure quality?

At the SDG level, to determine the SDGs to which the SOEs contribute the most in respect of corporate reporting quality, descriptive statistics were used. As mentioned in section 3.3, the data from the frequency tables were used to calculate each quality element score and the total quality score (SDGQ) for each SOE, at the overall report level as well as the specific SDG level. The SDGs are ranked according to the calculated scores for each of the quality elements.

3.5 Validity and reliability

The scoring system and method of this study is based on the methods used by Michelon *et al.* (2015) and Malola and Maroun (2019) who are experienced researchers. This increases the reliability of the study as their methods have already been approved and are credible. Additionally, the quality codes were also constructed based on these studies, ensuring that the codes were accurate and reliable. To ensure code completeness, the 17 SDGs were also categorised as codes. Despite being limited in number, the codes sufficiently covered the research topic, ensuring content validity. The simplicity of the code categories facilitated an uncomplicated coding process. The code categories were explicitly defined and explained to ensure uniform application, regardless of the individual conducting the data analysis (Morse *et al.*, 2002). To further achieve reliability in the codes created, the coding instrument was approved by two independent supervisors.

To avoid inter-coder reliability issues, this study made use of one coder, being the researcher (Malola and Maroun, 2019, Michelon *et al.*, 2015). Each report was analysed in immense detail, and therefore a smaller sample was selected to avoid the risk of information overload, thereby ensuring more accurate results (also see section 3.2) (Boddy, 2016, Dattalo, 2008, Mansoor and Maroun, 2016, Merkl-Davies *et al.*, 2011, Unerman, 2000).

Lastly, this research recognises that the method employed to assess disclosure quality and assign scores to each report is inherently subjective (Malola and Maroun, 2019). As a result, various measures were put in place to limit researcher subjectivity and ensure consistency, as detailed under the following heading.

Development of the normative framework

Content analysis serves as a tool for coding and scoring various types of disclosures based on a normative framework (Guthrie *et al.*, 2004, Malola and Maroun, 2019). With this in mind, a checklist of common themes, examples, ideas and identification and classification rules was formulated for each of the code categories (Michelon *et al.*, 2015) (Appendix B and C). This normative framework served as a reference point against which the content in the reports was assessed to ensure consistency and objectivity in the coding process. For instance, referring to SDG 1, if the SOEs disclosed sentences relating to poverty, job creation, B-BBEE or donations to charity; this was coded as such. For detailed specific examples on coding rules for the SDGs,

the Balance Indicator and Measurement Indicator, refer to the heading ‘Phase 3.1’ under section 3.3.

As this is an exploratory study, the framework was partially developed at first and then updated during the coding process. For the SDG codes, a list of key words and phrases was initially developed primarily using the 17 SDGs and the 169 targets as well as the literature review on the SDGs found under section 2.3 of Chapter II. The SDG disclosure recommendations developed by the GRI & UN Global Impact (2022) were also considered (for more detail, see section 2.4.2 of the Literature Review). The 17 SDGs outline the objectives intended for achievement, while the 169 targets explain how the SDGs should be implemented (Kuswantoro *et al*., 2022). These served as the primary keywords for the analysis. Numerous authors regard the selection of disclosure categories and codes from reputable, pertinent literature as an effective approach to enhance the reliability when recording and analysing data (Guthrie *et al.*, 2004, Ionașcu *et al.*, 2020, Krippendorff, 2004). While this study did not perform the SDG literature review to develop codes, it contributed to a comprehensive understanding of each SDG in the context of South Africa and its SOEs. This understanding aided in correctly applying the relevant SDG code to sentences, ultimately improving the accuracy of the collected data.

For the quality codes, to limit subjectivity, an initial set of rules for coding sentences in terms of reporting quality was developed, primarily drawing upon the coding examples provided in a table by Michelon *et al.* (2015). The quality descriptions provided by Malola and Maroun (2019) in their study were also used.

The partially developed checklist as well as the codes were reviewed and then approved by the two supervisors for the pilot test to be conducted. A pilot test of five SOEs was conducted by the researcher for validity and reliability. Building on the evidence gathered in the pilot test, the researcher updated the checklist for new items (Ionașcu *et al.*, 2020, Michelon *et al.*, 2015). The coded results from the pilot study as well as the updated checklist were reviewed, analysed, and compared by the two supervisors to ensure agreement, consistency and accuracy regarding the codes applied to the sentences. Any discrepancies were discussed and resolved. The checklist was then updated further. This process also provided clarification for interpreting the code definitions when applying them to the sentences and further ensured consistency during coding.

The adjusted checklist was then approved by the supervisors and final coding began after this stage.

Items that were discovered during final coding were also included in the checklist. Each time a new theme/rule was discovered, the analysis of completed reports was reperformed to ensure completeness and consistency. In other words, the older reports were scrutinised for the new rule. The final normative framework after completion of the coding process, which was used for this study, can be found under Appendix B and C. Detailed examples of coding rules can also be found under section 3.3.

As an additional check to ensure that all SDG disclosures were considered, and that no codes were missed in a sentence, this study cross-referenced the SDG sentences to the disclosure guidance provided by the GRI & UN Global Impact (2022). This source also provides a reliable reference to confirm that disclosures categorised are appropriate.

Finally, this study focused on narrative disclosures, and subjectivity related to analysing these disclosures was eliminated by coding only the face value of text, without considering the underlying or subjective tones that might be open to interpretation (Cho and Lee, 2014). For more detail, refer to the discussion on the Balance Indicator coding rules under section 3.3.

3.6 Assumptions, limitations, and delimitations

This study assumed that SOEs do disclose SDG-related information. This research focused only on the integrated or annual reports of the SOEs. Other means of communication with stakeholders, such as interim results, separate sustainability reports, social media platforms, webpages and press releases were not considered in the analysis (Malola and Maroun, 2019). In addition, the section in the report that contains the financial statements, the notes and the external auditor’s report was also not included in the analysis. This is because these sections do not convey direct information about sustainability factors (SASB, 2017). Moreover, this research explored only a single jurisdiction, being South Africa and focused on the SOEs listed under Schedule 2 and 3B of the PFMA. The period of investigation is limited to one financial year, namely the 2022 financial year-end.

Furthermore, this study acknowledges that there are other SDG disclosure quality measures, such as completeness, reliability and the integration of the SDGs into the risk and materiality assessment, stakeholder engagement process and strategy, e.g., (Adams *et al.*, 2020, Daub, 2007, GRI 1, 2021, Haywood and Boihang, 2021, Silva, 2021, Subramaniam *et al.*, 2023, Van der Waal and Thijssens, 2020). However, these measures were not addressed due to the subjective nature of the scoring assessment. The quality measure proposed in this study is therefore not definitive (Malola and Maroun, 2019). The exclusion of the other quality measures does not pose a significant threat to the validity and reliability of the study, as it resulted in a scoring assessment that is more objective (ibid.). Additionally, as this study is exploratory and based on a small sample, it cannot prove a causal relationship between the quality elements (Malola and Maroun, 2019, Michelon *et al.*, 2015).

Finally, in their study, Malola and Maroun (2019) used the quality scores reported in the *EY Excellence in Integrated Reporting Awards* as an independent quality check to verify any conclusions reached, drawn from their integrated report quality score. Their study was based on the integrated reports from the top 40 JSE listed companies by market capitalisation. This current research was unable to utilise the EY scores since they were assigned to the top 100 companies listed on the JSE, making them incomparable with the public sector (EY, 2022). Therefore, the reporting quality in this study was concluded based on the results of the sampled SOEs relative to one another. As a result, this may not serve as a representation of all SOEs in the PFMA as well as outside of South Africa. Acknowledging this limitation as well as the small sample, for external validity, the results cannot be extrapolated to the entire population of SOEs under the PFMA.

CHAPTER IV: RESULTS AND DISCUSSION

In this chapter, the results are presented and discussed. Section 4.1 provides the descriptive statistics at the overall report level. The quality scores are presented and discussed under each indicator. Section 4.2 presents and discusses the correlations among the quality indicators. Lastly, section 4.3 presents the descriptive statistics at the SDG level. The SDGs that are prioritised the most in terms of each quality element are discussed under this section.

4.1 Overall report level descriptive statistics

Table 8 shows the total number of observations under each code category. A total of 56484 SDG sentences were analysed and coded. Table 9 presents the descriptive statistics for each quality indicator at the overall report level. Appendix E provides examples of the output of the coding process.

Table 8: Number of observations

Codes	No. Sentences
SDG	56484
Repeats	2750
Monetary	3146
Quantitative	9684
Qualitative	43654
Policies/programmes/strategies	37869
Expectations/desires/mission statements	6927
Objectives/goals	1546
Results/outcomes	10142
Comparisons	5089
Negative	1929
Positive	4084
Neutral	4129

Table 9: Descriptive statistics at the overall report level

Quality indicator	Minimum	Maximum	Average	Std. Deviation
Density Indicator (DI)	0,67	0,97	0,85	0,08
DI without repeats	0,75	0,97	0,89	0,06
Measurement Indicator (MI)	0,39	0,49	0,43	0,03
Relevance Indicator (RI)	0,09	0,39	0,20	0,07
Ease of Interpretation Indicator (EII)	0.11	0.29	0.21	0.04
Balance Indicator (BI)	0,12	0.93	0,51	0,22
Performance Indicator (PI)	0,31	0.87	0,52	0,12
SDG Information Quality (SDGQ)	0,39	0,54	0,45	0,05

4.1.1 Density Indicator

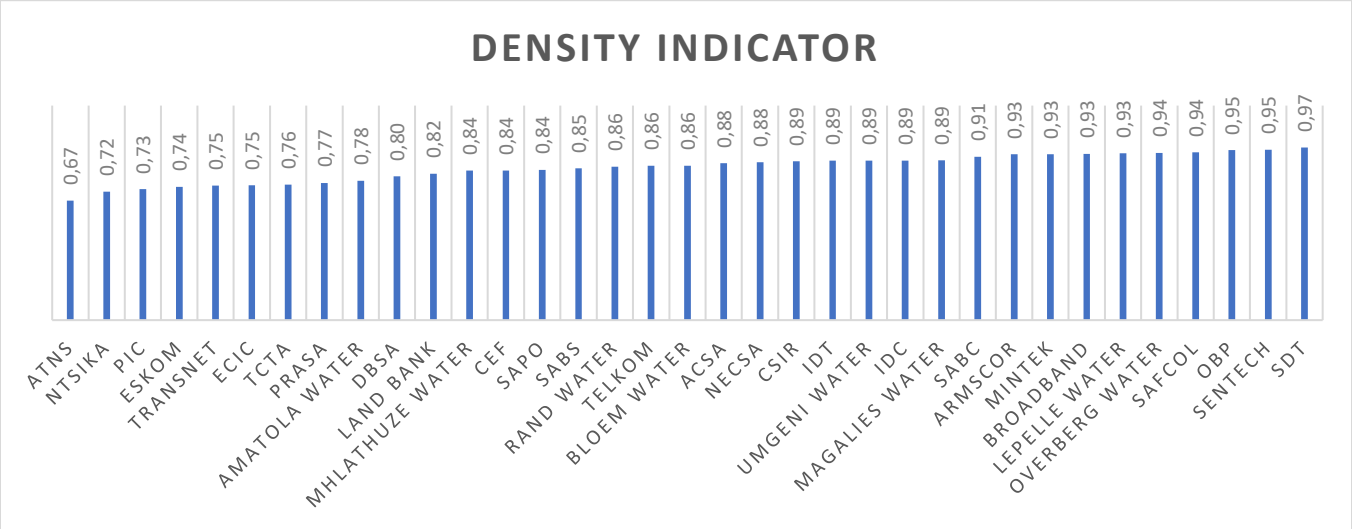
56484 SDG sentences from a total number of 64103 sentences were coded and analysed. The overall DI mean is 0.85 and suggests that, on average, the integrated or annual reports of South African SOEs place a substantial emphasis on SDG information relative to the total information presented. The high mean and the overall emphasis on SDG information suggests that SOEs acknowledge the impact of their actions on all relevant stakeholders, in alignment with stakeholder theory (Erin and Bamigboye, 2021, Freeman, 1984). Furthermore, SOEs, as entities designed to promote sustainable development, seek to maintain legitimacy by demonstrating their commitment to SDGs (Fernando and Lawrence, 2014). This is consistent with the anticipation that SOEs, established to advance sustainable development, would give precedence to SDG-related information. The findings are in line with the expectation that since the SDGs cover a wide range of areas, and given that SOEs' operations intersect with the SDGs, the analysed sections of the report would contain a substantial amount of SDG information.

The standard deviation of 0.08 indicates that there is not a wide variation in the DI scores among the SOEs. This suggests a degree of consistency in the emphasis placed on SDG information across the sampled reports. However, while the standard deviation is low, there is variability in the DI score among some SOEs, given the range from 0.67 (minimum) to 0.97 (maximum). Referring to Figure 4, ATNS with a minimum score of 0.67 emphasises SDG information to a lesser extent, while SDT, with a maximum score of 0.97 places a particularly high emphasis on SDG information. As mentioned in section 3.3 of Chapter III, only SDG sentences that related directly to the company and its contribution were coded. The main difference between the DI scores was due to some companies disclosing general information about the external environment that does not relate to the SOE’s impact on the SDGs specifically, the economic and environmental state of South Africa, or case studies about other organisations and their success stories. For example, PIC, with a below average DI score of 0.73, performed a review and outlook on global economic conditions in its annual report. Ntsika, with a score of 0.72, disclosed many success stories about SMMEs that it had supported.

It is thus evident that the variations in the DI score were not primarily attributable to repetition. This is confirmed by a further analysis that was performed on the average DI score without subtracting the repeat SDG sentences that were coded. The DI mean without considering repetition is 0.89 which is only a 4% difference from the DI mean after excluding the repeated

sentences (0.85). Consistent with earlier research findings of Malola and Maroun (2019) this suggests that SOEs seem to be placing increased emphasis on incorporating SDG disclosures within their integrated or annual reports, all the while being mindful to steer clear of repetition and unnecessary detail. Figure 4 presents the DI scores for each SOE in ascending order.

Figure 4: Density Indicator score for each SOE



4.1.2 Measurement Indicator

Appendix E provides examples of qualitative, quantitative, and monetary SDG disclosures. Of the total number of SDG sentences, 77% were qualitative (N = 43654), 17% were quantitative (N = 9684) and 6% were monetary (N = 3146). The mean score of 0.43 slightly differs from prior research of Malola and Maroun (2019) and Michelon *et al.* (2015) which found a greater use of qualitative disclosures (i.e., a lower MI score). One explanation for this divergence could be attributed to the distinct nature and timeframe of the studies. Malola and Maroun (2019) focused on the years 2015 and 2016, examining private sector entities listed on the JSE whereas Michelon *et al.* (2015) scrutinised reports of companies listed on the London Stock Exchange spanning the years 2005 to 2007. However, the main reason for the higher occurrence of quantitative disclosures in this study stems from the inclusion of the Performance Report. Notably, the Performance Reports predominantly featured quantitative data with little accompanying narratives, thereby contributing to the heightened quantitative disclosures.

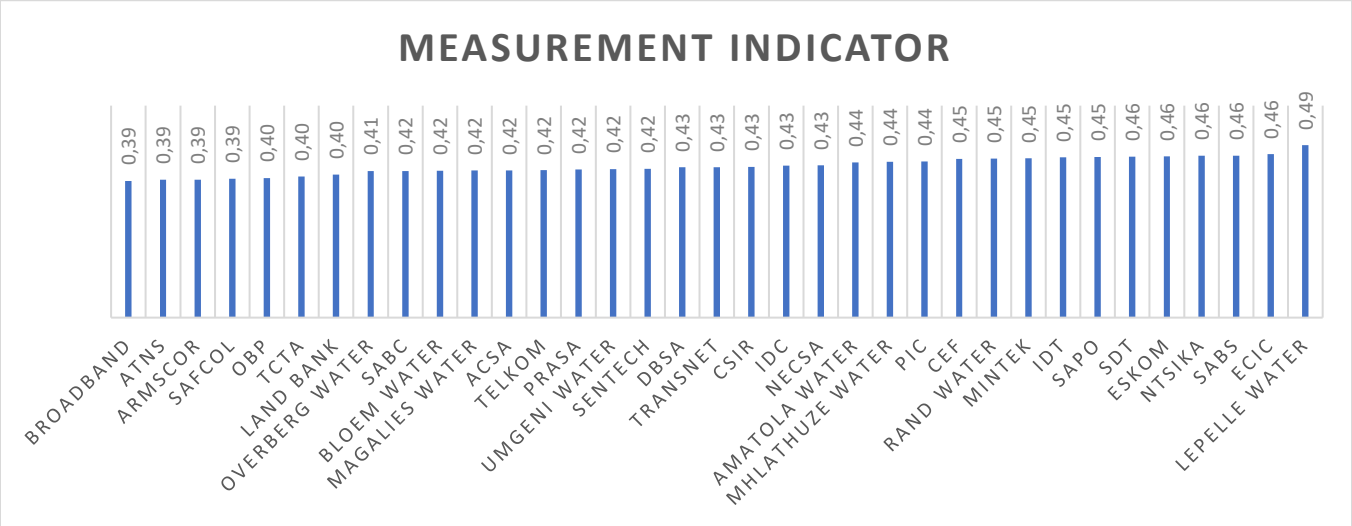
Nonetheless, the mean indicates that the majority of SDG information is presented in a qualitative rather than quantitative form, limiting the comparability and precision of the disclosed information (Adams *et al.*, 2020). This is also confirmed by the weak correlation, presented in section 4.2, between the MI and PI (T_b=0.069; r_s=0.101, p>0.1) which suggests that a higher use of monetary and quantitative SDG information is not associated with an increase in the extent of comparisons with targets or prior years' performance.

By reporting monetary and quantitative SDG information, SOEs can provide concrete and objective data on their performance in relation to sustainability, thereby enhancing accountability and transparency to stakeholders (Nikolaou and Tsalis, 2013, Tsalis *et al.*, 2022, Wiseman, 1982). The average MI score is below the midpoint (0.5), which indicates that there is room for improvement in the extent of quantifiable disclosures, which infers that SOEs should be more accountable and transparent to stakeholders regarding their use of public funds to create sustained value (Fernando and Lawrence, 2014, Matsiliza, 2017).

The low standard deviation of 0.03 indicates a low variability in the MI scores among the SOEs. The range from 0.39 (minimum) to 0.49 (maximum) further shows a narrow spread of scores. This implies that the sampled SOEs share a similar pattern in their use of quantitative or monetary SDG disclosures. The consistent approach is reasonable as the SOEs have specific reporting requirements from the PFMA and use the standard reporting templates provided by the National Treasury (National Treasury, 2022).

The low standard deviation (0.03) as well as the maximum score (0.49) suggests that all SOEs e disclose mainly qualitative SDG information which lowers the overall SDG information quality. Notably, this infers that the reporting guidelines suggested by the National Treasury do not adequately encourage sufficient quantitative sustainability reporting, pointing to a need for improved reporting policies and standards. Referring to Figure 5, Broadband achieved the lowest MI score at 0.39 and Lepelle Water achieved the highest at 0.49.

Figure 5: Measurement Indicator score for each SOE



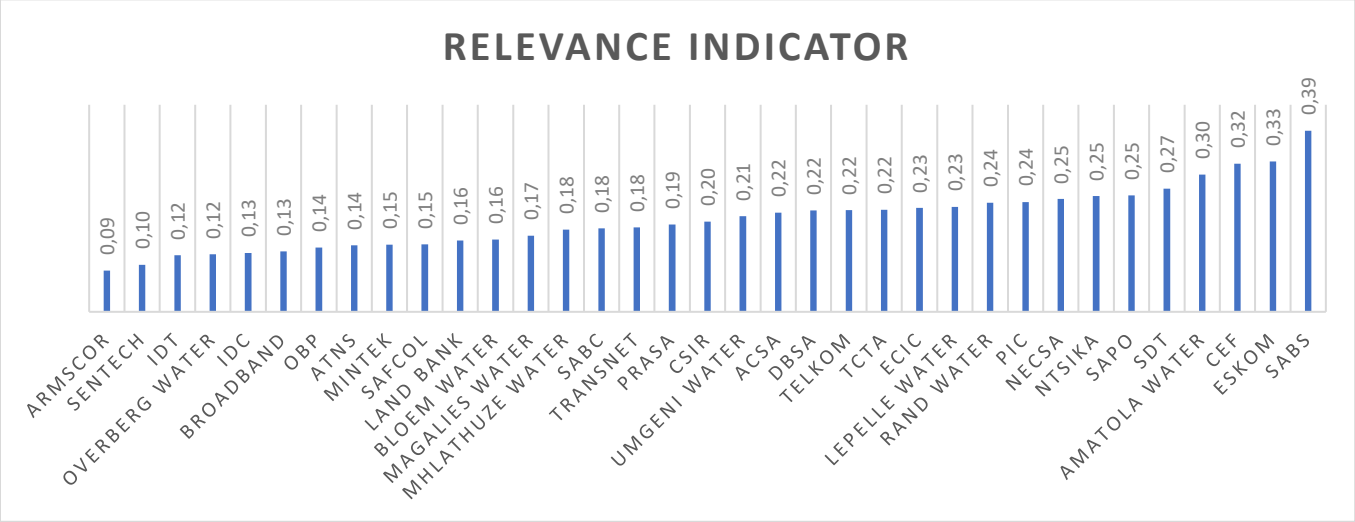
4.1.3 Relevance Indicator

For this indicator, the categorisation involved distinguishing between disclosures that provide standard or generic statements (boilerplate) and those that include quantified or justified goals, objectives, and the results or outcomes of actions (committed/substantive). Examples of these disclosures are provided in Appendix E. Given the mean score of 0.2, it suggests that, on average, there is a low proportion of committed and substantive information in the SDG disclosures, implying a low level of commitment to sustainability (Buniamin *et al.*, 2020).

Consistent with prior research of Malola and Maroun (2019) and Michelon *et al*. (2015), most SDG disclosures are mainly descriptive and the SOEs were more inclined to provide generic statements, policies, expectations, or mission statements rather than specific and justified goals or the results of sustainability actions. Stakeholder theory emphasises the importance of providing information that is valuable and relevant to stakeholders (Fernando and Lawrence, 2014). The low average RI score implies that the SDG disclosures do not fully meet stakeholder expectations for detailed and substantive information (Matsiliza, 2017). In terms of legitimacy theory, the literature review highlights the difference between symbolic or 'boilerplate' actions and substantive actions that lead to real improvements (Emma and Jennifer, 2021, Michelon *et al.*, 2015). The RI score suggests that SOEs are engaging in symbolic actions to enhance their perceived legitimacy without making substantial changes in core practices (Emma and Jennifer, 2021, Michelon *et al.*, 2015, Van der Waal and Thijssens, 2020).

The standard deviation of 0.07 indicates a low degree of variation among the SOEs in terms of their use of committed SDG disclosures. However, while most scores are clustered around the mean, the range from 0.09 to 0.39 highlights significant differences in the extent to which some SOEs provide committed or boilerplate information in their SDG disclosures. This diversity could be due to differences in organisational priorities, strategies, or stakeholder engagement approaches. Referring to Figure 6, the maximum score of 0.39 was achieved by SABS while the minimum of 0.09 was achieved by Armscor. The low standard deviation (0.07) as well as the maximum score (0.39) suggests that all SOEs disclosed mainly boilerplate SDG information which lowers the overall SDG information quality. In conclusion, there is room for improvement in enhancing the quality of SDG information in the integrated or annual reports of SOEs through the provision of more specific, quantified, or justified goals and reporting on results of actions.

Figure 6: Relevance Indicator score for each SOE



Additional Analysis

The GRI 1 (2021); IIRC (2013); and Adams *et al.* (2020), encourage organisations to disclose information about their future plans, targets, and strategies to help stakeholders understand the company's commitment to sustainability and its long-term impact. Hence, an additional analysis was performed on the frequency of code categories under the RI in terms of past and future-looking information.

Referring to Table 8, SOEs disclosed a total of 48,011 backward-looking sentences (policies = 37,869; results = 10,142) and 8473 forward-looking (expectations = 6927; objectives = 1546). Therefore, 85% of SDG information is past-orientated which shows that companies are placing little focus on their future prospects and may be too fixated on the past. In the reports, many SOEs revisited past issues that they encountered, indicating that they are reforming. The main factor contributing to the limited disclosure of future-oriented SDG information stems from the inherent nature of the National Treasury guidelines, which predominantly showcase the historical accomplishments and objectives of the SOE (National Treasury, 2022).

Clearly defined objectives, directed toward future transformation, as well as the communication of past progress, are crucial for understanding a company's historical performance and its trajectory going forward (Silva, 2021). This serves as an indicator of the extent of commitment and implementation of SDG information (Silva, 2021). Too much emphasis on the past may detract from the information's overall effectiveness.

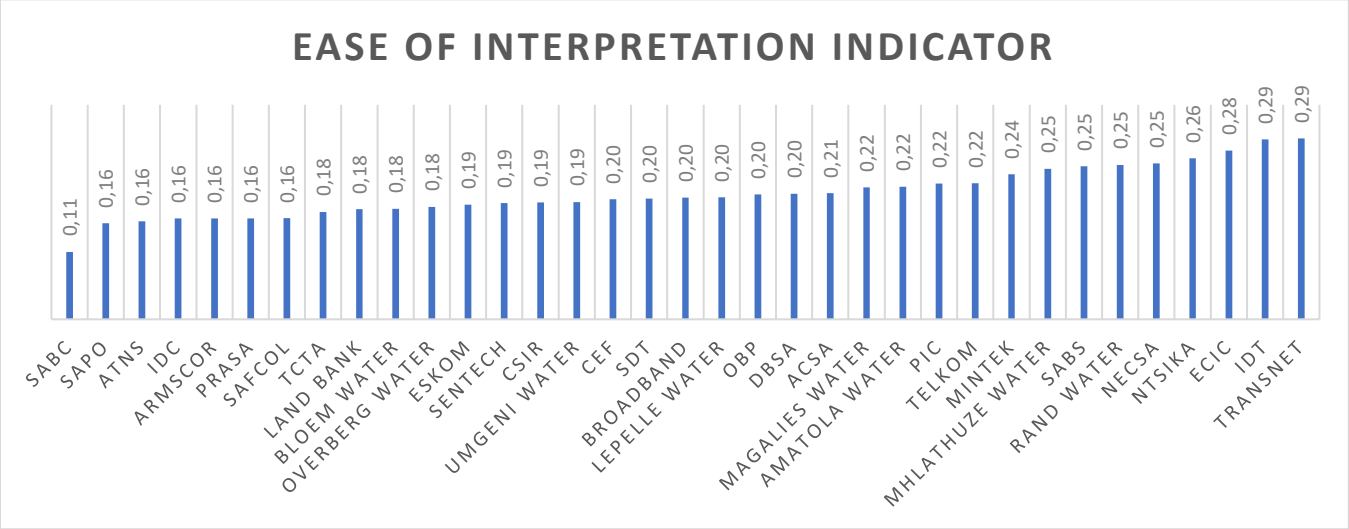
4.1.4 Ease of Interpretation Indicator

The mean EII score of 0.21 suggests that, on average, the SOEs have a relatively low emphasis on incorporating graphical information, such as graphs, diagrams, and tables, to enhance the ease of interpretation of SDG information in their integrated or annual reports. The literature review emphasises that sustainability reporting should be clear and understandable, facilitating ease of use during stakeholders' decision-making processes (Freundlieb *et al.*, 2014, GRI 1, 2021, Malola and Maroun, 2019). The mean score suggests that there is much room for improvement in this aspect. While the use of tables, graphs and other infographics is somewhat prevalent, there is potential for companies to further enhance the clarity of SDG information. From a stakeholder theory perspective, clear and understandable reporting is crucial as it caters to the needs of stakeholders who rely on this information for decision-making (GRI 1, 2021). The lower EII score indicates a lower presumed level of SDG information quality, as these SOEs, on average, are not fully addressing stakeholders' preferences for visually clear and understandable SDG information (Adams *et al.*, 2020, GRI 1, 2021).

The standard deviation of 0.04 indicates a low degree of variation among the SOEs in terms of their use of graphical information for SDG reporting. The scores are clustered around the mean, suggesting a certain level of consistency in reporting practices across the sampled SOEs.

Nevertheless, the range from 0.11 to 0.29 suggests some variability in the extent to which SOEs use graphical information for SDG reporting. Referring to Figure 7, the minimum score of 0.11, achieved by SABC, suggests that there are companies with a lower emphasis on graphical representation in their reports, potentially making their SDG information less clear. Conversely, the maximum score of 0.29, achieved by Transnet, implies that some companies are making a more significant effort to use infographics to enhance the understandability of their SDG information. In the context of legitimacy theory, the use of infographics and visual elements in SDG reporting can be seen as a strategy to enhance the perceived legitimacy of sustainability efforts (Herbert and Graham, 2022, Kathrada *et al.*, 2021). The variation in scores among companies may reflect different approaches to managing their legitimacy through the presentation of SDG information.

Figure 7: Ease of Interpretation Indicator score for each SOE



Out of the graphs, charts, diagrams, tables and other infographics, tables were the most frequently used by the SOEs to present and consolidate SDG information. The tables were mainly used to present quantitative and monetary information. Two examples of infographics are provided in Figures 8 and 9. The one is an example of a table disclosed by SABS using quantitative and comparable information, the other example is an infographic from Transnet consolidating information regarding the SOE's use of the six capitals.

Figure 8: Infographic example

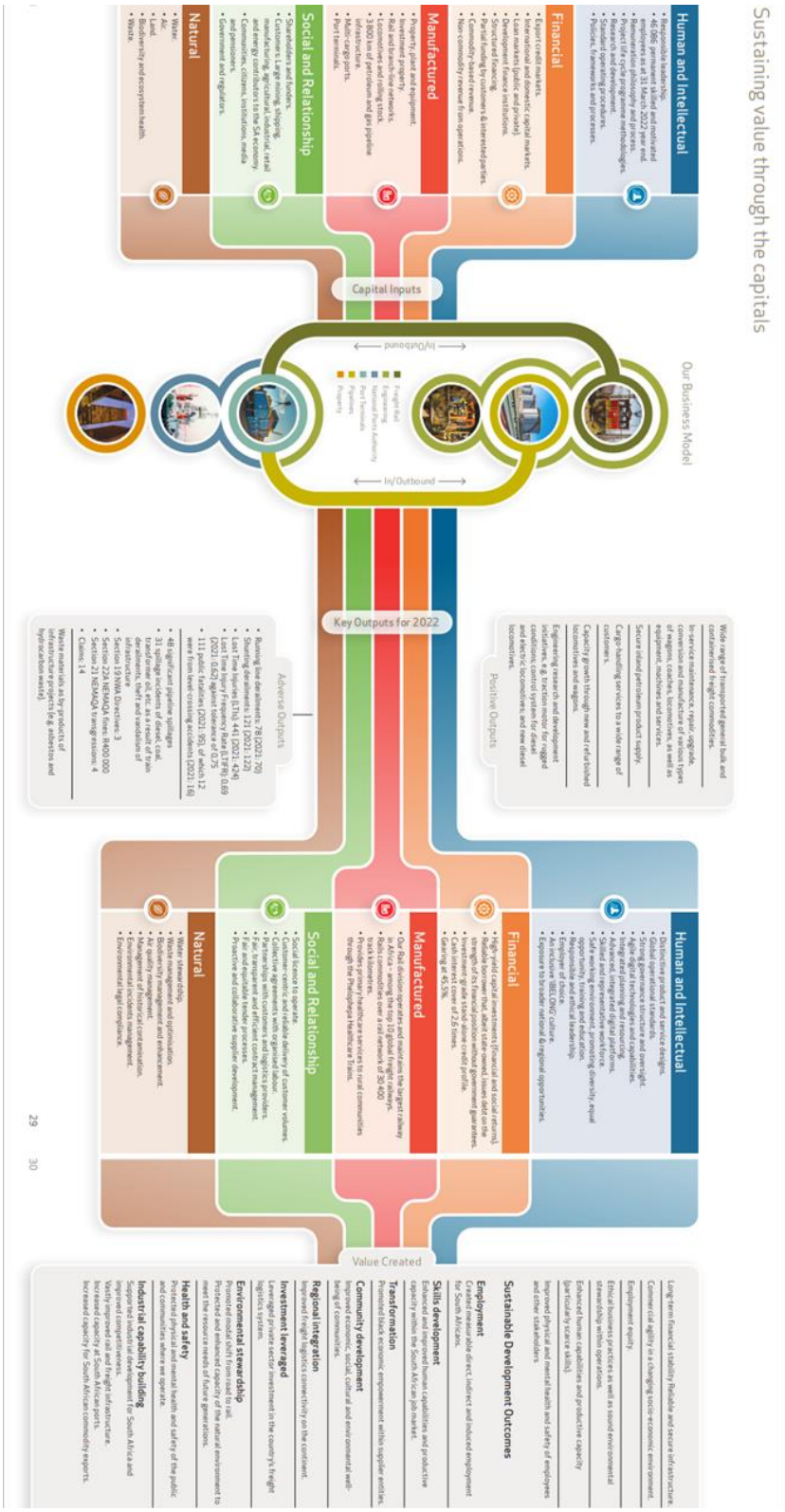
Key Performance Area	Internal Focus (Actual)	Total		March 2022 (Target)
		March 2022 (Actual)	March 2022 (%)	
Percentage of women supported	160	**160**	21.7%	27.0%
Percentage of youth supported	13	**13**	1.8%	1.9%
Total supported / headcount	738	**738**		

Performance Against Strategic Objectives FY2021/22

Strategic Objective	Output and Key Performance Area	Annual Target	FY2021/22 Target	FY2021/22 Actual	Status
Develop, promote and increase the use of standards	SANS supporting reimagined industrial priority sectors as defined by **the dtic**	80% standardisation commitments	80% standardisation commitments	79% standardisation commitments	
	Conduct Government Stakeholder engagements	7 stakeholder engagements	7 stakeholder engagements	11 stakeholder engagements	
	Number of reports submitted	4 reports	4 reports	4 reports	

Source: SABS Integrated Report (2022)

Figure 9: Infographic example



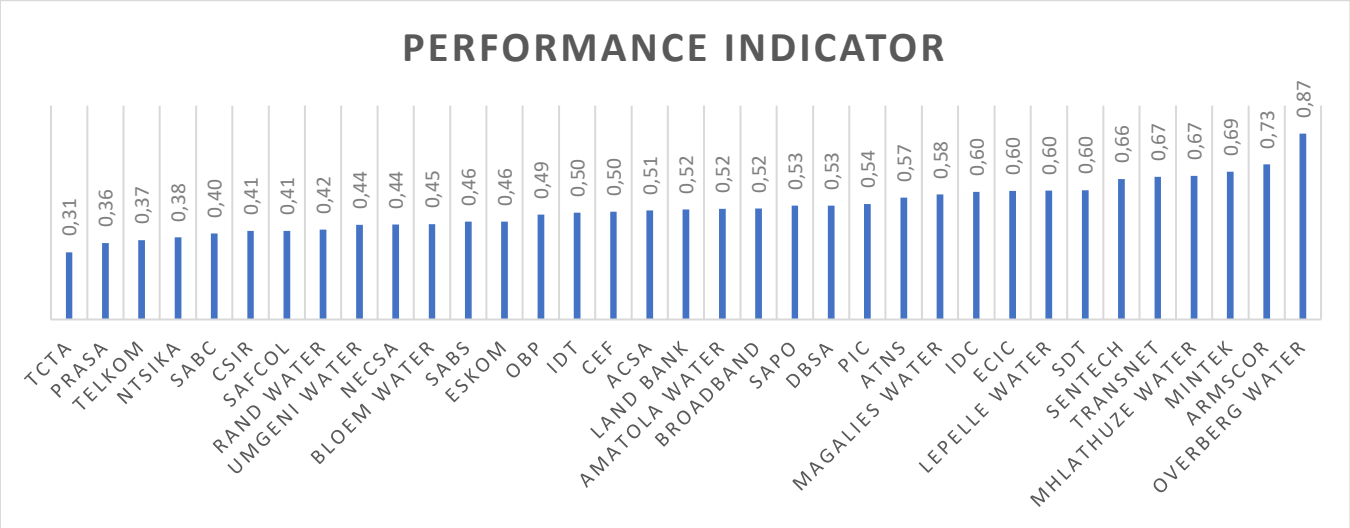
Source: Transnet Integrated Report (2022)

4.1.5 Performance Indicator

The mean PI score of 0.52 suggests that, on average, the SOEs are moderately emphasising the comparison of their sustainability performance against benchmarks, targets, or past performance in their integrated or annual reports. This means that a moderate proportion of SDG sentences that include information about results are accompanied by comparisons or benchmarks to show performance. This enhances the overall quality of the annual or integrated report (Michelon *et al.*, 2015, Tsalis *et al.*, 2022). In terms of stakeholder and legitimacy theory, the PI score suggests that SOEs are partially addressing stakeholder information needs by moderately comparing their SDG performance against prior years, established standards or targets – contributing to perceived legitimacy (Nikolaou and Tsalis, 2013, Tsalis *et al.*, 2022). A contributor to the higher PI score in comparison to the other indicators is due to the inherent nature of the Performance Reports, which includes the SOE's actual performance in comparison to desired objectives and outcomes (IRBA, 2011, National Treasury, 2022) (see section 2.5.6 of Chapter II for more detail). However, the score is only just above the midpoint (0.5) and well below the maximum possible score, indicating that there is room for improvement in terms of providing comparisons or benchmarks with their results. This observation may once more underscore the necessity for the National Treasury, which has influence over the reporting practices of SOEs, to improve their reporting guidelines.

The standard deviation of 0.12 indicates a moderate degree of variation among the SOEs in terms of how extensively they compare their sustainability performance. The scores are somewhat dispersed around the mean, suggesting variability in reporting practices in terms of benchmarking sustainability performance. However, the range from 0.31 to 0.87 indicates significant differences among some SOEs in terms of their extent of compared SDG result disclosures. Referring to Figure 10, the maximum score of 0.87, achieved by Overberg suggests that some SOEs are more proactive in comparing sustainability results, while the minimum of 0.31, achieved by TCTA reflects those with a lower emphasis on performance comparisons. Appendix E provides examples of compared SDG results disclosures.

Figure 10: Performance Indicator score for each SOE



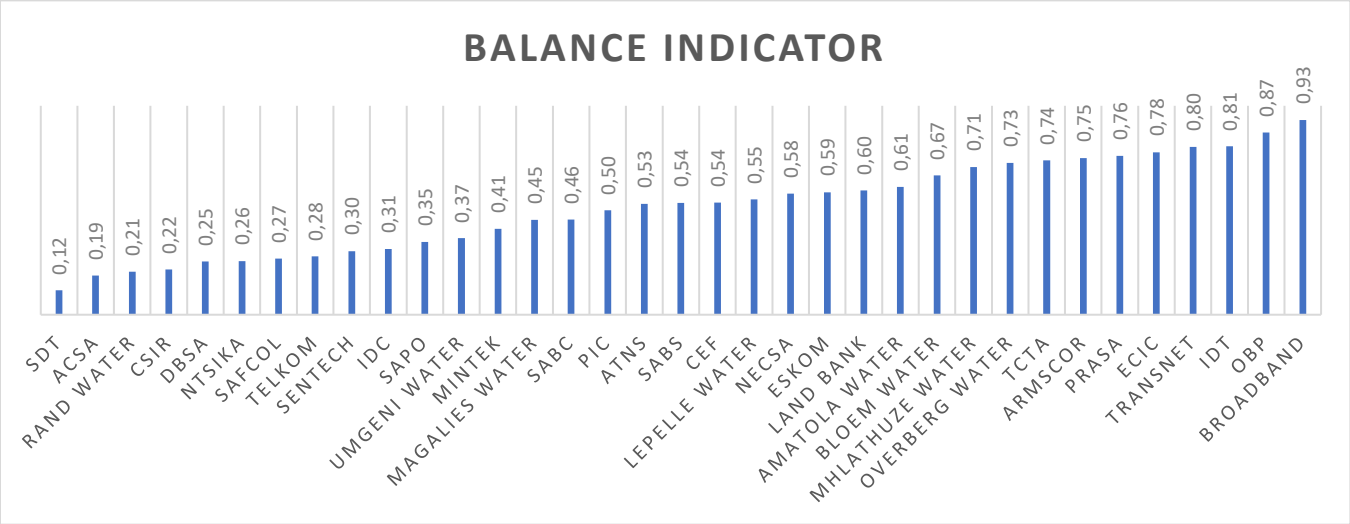
4.1.6 Balance Indicator

The literature review highlights that balanced reporting, presenting both positive and negative impacts, is considered a characteristic of high-quality annual reports (GRI 1, 2021, National Treasury, 2022). The mean score of 0.51 suggests that, on average, the SOEs are providing a moderately balanced representation of positive and negative SDG results in their reports. This indicates that there is an attempt to present a balance of both successes and shortcomings in their sustainability performance. However, the average score is only just above the midpoint and the maximum score of 0.93 suggests that there is much room for improvement for SOEs with lower scores in disclosing balanced SDG information. From a stakeholder theory perspective, balancing positive and negative results in reporting aligns with stakeholder interests, promoting transparency, credibility and trust in an organisation's sustainability impact (Adams *et al.*, 2020). Thus, the need for an improvement in the balanced approach is important as it allows stakeholders to make reasoned evaluations of overall performance (Freundlieb *et al*., 2014).

The standard deviation of 0.22 indicates some variability among SOEs in terms of how they balance the disclosure of positive and negative results. A higher standard deviation suggests that companies differ in their approaches to reporting. Some entities were inclined to emphasise positive impacts, while others adopted a more balanced approach. However, the range from 0.12 to 0.93 indicates significant deviations among some SOEs, suggesting that some companies need to improve in this aspect. Referring to Figure 11, the minimum score of 0.12, achieved by

SDT, suggests that some SOEs are heavily emphasising positive results and potentially neglecting negative outcomes or vice versa. Conversely, the maximum score of 0.93, achieved by Broadband, implies that certain companies are making a substantial effort to present a balanced view of their SDG results. Appendix E provides examples of balanced SDG result disclosures.

Figure 11: Balance Indicator score for each SOE



Additional Analysis

An additional analysis was performed to determine the proportion of disclosure of positive, neutral, and negative results. Referring to Table 8, 40% of the total SDG results were disclosed as positive results (N = 4084) and only 19% were negative (N = 1929). Neutral results (N = 4129) were the dominating (41%) disclosures because this study only coded negative or positive results where growth or decline was noted. Moreover, results disclosed in a table were regarded as 'matter of fact' disclosures and were coded as neutral results for consistency purposes.

Despite SOEs facing negative scrutiny, the prevalent theme in integrated reports is positive with SOEs disclosing 21% more positive SDG results than negative. This may indicate that SOEs, in an attempt to enhance stakeholder confidence and legitimacy, are employing impression management techniques in their SDG disclosures. This could involve the avoidance of disclosing negative results and an intentional emphasis on positive impacts in their reports (Boiral, 2016,

Deegan *et al.*, 2002, Melloni *et al.*, 2016, Merkl-Davies and Brennan, 2011, O'donovan, 2002, Schleicher and Walker, 2010).

Further analysis was performed on the proportion of positive and negative results considering the audit opinion achieved by the sampled SOEs. Some of the SOE's received modified audit opinions on their financial statements. Table 10 presents the SOEs that obtained a modified audit opinion and whether the SOEs disclosed more negative than positive results.

Table 10: SOEs with modified audit opinions

SOE	Type of Modified Audit Opinion	Negative > positive
Eskom	Qualified	
SAPO	Disclaimer of Opinion	
SABC	Qualified	
Necsa	Disclaimer of Opinion	
IDT	Qualified	
Mhlathuze Water	Qualified	
Amatola Water	Qualified	
PRASA	Disclaimer of Opinion	

Eight of the sampled SOEs obtained modified audit opinions. 63% of SOEs that obtained an adverse or qualified audit opinion disclosed more positive than negative results. This discovery aligns with the research conducted by Schleicher and Walker (2010) which revealed that entities experiencing financial losses or facing risks tend to refrain from offering more negative information when underperforming. Instead, they prefer to highlight certain positive aspects they may have accomplished during the respective period. Given the financial struggles faced by SOEs, it is plausible that they are attempting to maintain a positive tone in the narrative sections of their reports, potentially as a strategy to divert attention from the negative financial aspects disclosed in the statements. Nevertheless, since this study does not specifically delve into the realm of impression management in the context of SDG information, additional research is necessary to provide more conclusive evidence in this regard.

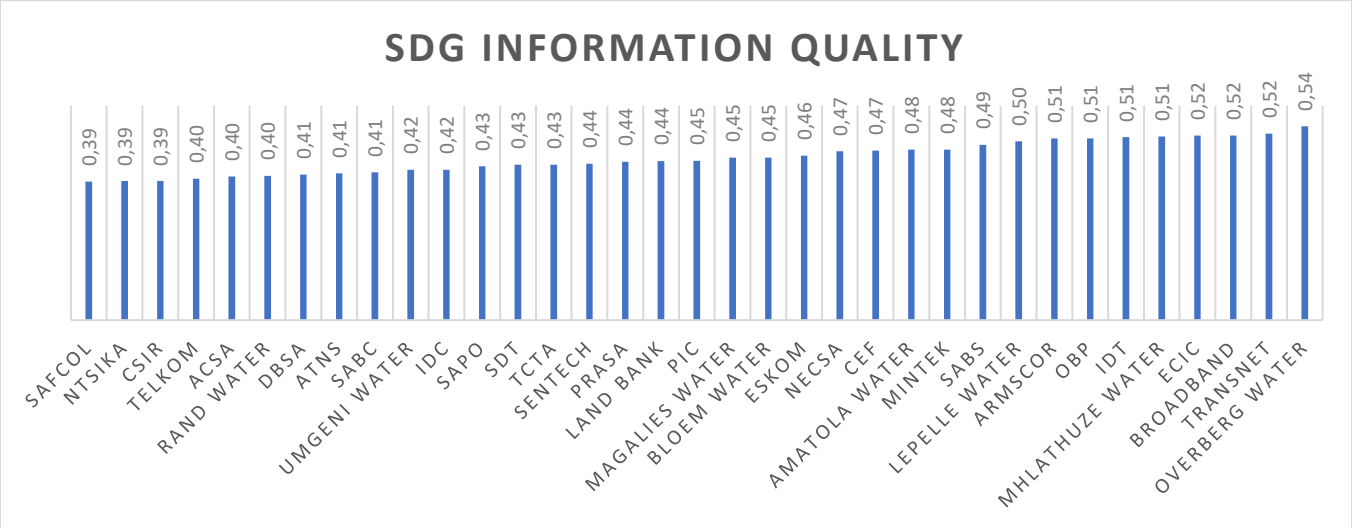
4.1.7 SDG Information Quality

The mean score of 0.45 suggests that, on average, most of the SDG disclosures are symbolic rather than substantive. This is consistent with prior research (Emma and Jennifer, 2021, Michelon *et al.*, 2015, Malola and Maroun, 2019, Silva, 2021, Van der Waal and Thijssens, 2020). Typically, this generic disclosure is presented to satisfy stakeholders, while deflecting accountability for inadequate sustainability performance and evading any commitment to change the business model (Ashforth and Gibbs, 1990, Malola and Maroun, 2019, Michelon *et al.*, 2015, O'donovan, 2002). The score is below the midpoint (0.5) and well below the maximum possible score indicating that there is much room for improvement in SDG information quality. The average quality, according to the composite measure, falls between the lower and upper bounds of the individual quality indicators' means.

The low standard deviation of 0.05 indicates a relatively consistent level of quality across the sampled SOEs. This suggests that, on average, the reporting quality is not highly variable among the entities. Referring to Figure 12, the minimum score of 0.39, achieved by SAFCOL, and the maximum score of 0.54, achieved by Overberg, represent the range of SDGQ scores observed. This diversity in scores suggests that some entities performed below the mean, while others exceeded it. The relatively consistent SDG information quality across entities, as indicated by the low standard deviation, implies a degree of uniformity in reporting practices among the sampled SOEs which is reasonable considering SOEs that are part of the PFMA (1999) have specific reporting requirements (National Treasury, 2022). However, the standard deviation as well as the maximum score suggests that the majority of SOEs disclose symbolic SDG information, resulting in lower SDG information quality in their integrated or annual reports. This reinforces the call for policymakers to revise their guidance on non-financial reporting in the public sector.

The Relevance Indicator and Ease of Interpretation Indicator have notably lower scores on average; these have negatively impacted the overall SDGQ score. However, the Density Indicator has a high score, which contributed positively to the overall SDGQ score. The results suggest that SOEs should improve on their SDG information quality overall. Primary focus should be placed on the relevance of SDG information as well as its understandability.

Figure 12: SDG Information Quality score for each SOE



4.2 Correlations among quality indicators

Table 11 presents the correlations among the quality indicators.

Table 11: Correlations among quality indicators

	DI	MI	RI	EII	PI	BI	SDGQ
DI	**1.000**	-0.170	-0.348**	-0.126	0.129	-0.096	0.066
MI	-0.229	**1.000**	0.472**	0.385**	0.069	-0.156	0.092
RI	-0.471**	0.642**	**1.000**	0.207*	-0.230*	-0.187	-0.113
EII	-0.188	0.513**	0.288*	**1.000**	0.066	0.029	0.230*
PI	0.229	0.101	-0.329*	0.080	**1.000**	0.103	0.398**
BI	-0.125	-0.208	-0.281	0.062	0.154	**1.000**	0.597**
SDGQ	0.097	0.105	-0.186	0.303*	0.548**	0.820**	**1.000**
**Correlation is significant at the 1% level (2-tailed) *Correlation is significant at the 10% level (2-tailed)							
Kendall's tau-b is above the diagonal; Spearman's rho is below the diagonal							

MI and DI

The negative correlation between the MI and DI (T_b=-0.170; r_s=-0.229, p>0.1) indicates a weak negative relationship between the extent to which SDG information is measured and quantified (MI) and the volume of SDG information in the reports (DI). This finding is consistent with that of Malola and Maroun (2019). The weak negative correlation between the MI and DI suggests that as the quality of monetary and quantitative information increases, the density of SDG information may decrease, and vice versa. However, the result is not statistically significant at the 10% level,

meaning there is not enough evidence to confidently conclude that this relationship is not due to chance. Despite the lack of statistical significance, it is still valuable to consider the negative correlation. It indicates a potential trade-off between the depth of SDG information (monetary and quantitative) and the overall amount of SDG information (density). However, this does not mean lower quality, as quantifiable information is generally more concise than narrative disclosures, which are more lengthy (Malola and Maroun, 2019). Thus, it is reasonable that the reports that disclose more quantified SDG information do not disclose a larger volume of SDG information. While it is essential to include quantitative details (Wiseman, 1982), the negative correlation suggests that as the level of measurement increases, there might be a tendency to avoid excessive density in the reports, potentially for the sake of clarity and readability. This observation is confirmed by the positive correlation between the EII and MI scores (T_b =0.385; r_s=0.513, $p<0.01$) which is discussed further below.

EII and DI

The above analysis can be similarly applied to the correlation between the EII and DI (T_b=-0.126; r_s=-0.188, $p>0.1$). The negative correlation indicates a weak negative relationship between the ease with which SDG information can be interpreted and the density of SDG information in the report. The result suggests that, on average, reports that are more focused on providing a higher density of SDG information might be slightly associated with lower ease of interpretation, and vice versa. This weak negative correlation might imply a potential trade-off between the density of SDG information and its ease of interpretation. Reports that densely pack SDG information may face challenges in presenting it in a way that is easily understandable. Thus, SOEs may adopt different reporting strategies, where some prioritise comprehensive SDG information (higher density), potentially leading to a sacrifice in the ease with which stakeholders can interpret the information.

Conversely, while graphs, charts, or diagrams do not inherently ensure high-quality reporting, they serve as effective tools for elucidating key issues and emphasising crucial interrelationships more efficiently than lengthy narratives (Malola and Maroun, 2019, Freundlieb *et al.*, 2014, Chan *et al.*, 2014). Thus, it is reasonable that reports that make use of more infographics to consolidate lengthy information do not disclose a larger volume of SDG information. The negative correlation suggests that as the use of infographics increases, there might be a tendency to avoid excessive density in the reports, potentially for the sake of clarity and understandability.

RI and DI

The correlation between the RI and DI (T_b=-0.348; r_s=-0.471, p<0.01) indicates a moderate negative relationship between the RI and DI. The negative sign implies that as the relevance of the information increases, the density of SDG information tends to decrease, and vice versa. The negative sign is consistent with the findings of Michelon *et al.* (2015). The negative correlation suggests that there may be a trade-off between the relevance of SDG information (focused on objectives, results, and outcomes) and the overall density of SDG information in the reports. A more relevant presentation of SDG information (emphasising objectives and outcomes) might result in a lower overall density of SDG information. This raises doubt as to the usefulness of some of the SDG disclosures in the reports (Malola and Maroun, 2019, Michelon *et al.*, 2015). However, once again, this finding does not necessarily equate to low-quality SDG information disclosure. This negative correlation could align with the idea that a more substantive and relevant approach to SDG reporting may involve a more focused and less dense presentation of SDG information.

RI and MI

The strong, positive correlation between the RI and MI (T_b=0.472; r_s=0.642, p<0.01) suggests a robust relationship between the relevance of SDG information and the extent to which SDG information is measured and quantified in the reports. In other words, as the relevance of information increases, so does the level of measurement and quantification. The sign and significance of the correlation are consistent with that of Michelon *et al*. (2015) and Malola and Maroun (2019) however, these studies only found moderate correlations which suggest that, when 'committed' information was presented, it lacked support from quantified disclosures. In this study, SOEs that prioritised providing results and objectives (as captured by the RI) often incorporated quantitative and monetary details related to their sustainability efforts. This is consistent with the idea that substantive reporting includes not only qualitative but also quantitative aspects (Emma and Jennifer, 2021, Malola and Maroun, 2019, Michelon *et al.*, 2015, Subramaniam *et al.*, 2023).

The positive correlation indicates that SOEs focusing on providing substantive and relevant information are more inclined to offer specific, quantifiable details about their sustainability performance, thereby enhancing transparency, pointing to higher-quality SDG information (Nikolaou and Tsalis, 2013). This supports informed decision-making by stakeholders who seek concrete evidence of a company's commitment and progress toward sustainability. This study

posits that companies should consider not only the relevance of their SDG disclosures but also the incorporation of measurable indicators. This approach contributes to a more comprehensive and transparent disclosure strategy.

EII and MI

As previously noted, the negative correlation between the MI and DI (T_b=-0.170; r_s=-0.229, p>0.1) infers that as the level of measurement increases, so seems to be an inclination to mitigate excessive density in the reports, possibly to enhance clarity and readability. This observation is further supported by the positive correlation between the EII and MI scores (T_b=0.385; r_s=0.513, p<0.01). This result suggests that reports that are more focused on providing measurable and quantifiable details about SDG information tend to also be designed in a way that enhances the ease of interpretation, hence, clarity and understandability. This seems reasonable considering the main infographic used in the reports was tables and these tables were mainly used to present quantitative or monetary SDG information (for example, see section 4.1.4). This reflects a strategic effort to not only provide data but to ensure stakeholders can easily comprehend and interpret the SDG information.

However, it is also important to consider the mean scores of the EII and MI, and while the above paragraph may be true for some SOEs, the moderate correlation between MI and EII implies that the emphasis on qualitative SDG disclosures (MI=0.43) goes hand-in-hand with SOEs restraining the utilisation of visual media in their reports (EII=0.21) (Malola and Maroun, 2019). In combination, the MI and EI scores indicate that, on average, the SDG information in SOE annual reports might pose a challenge for readers to understand and integrate into their evaluations of SOEs' sustainability performance (Malola and Maroun, 2019).

This result suggests that, for SOEs aiming to improve the ease with which stakeholders interpret their SDG information, a focus on enhancing measurement and quantification practices could be beneficial. Future reporting strategies may benefit from a combined emphasis on clarity and comprehensive measurement.

EII and RI

The correlation between the EII and RI (T_b=0.207; r_s=0.288, p<0.1) indicates a weak positive relationship between the ease with which SDG information can be interpreted and the relevance

of the information presented. These findings are consistent with that of Malola and Maroun (2019). The result suggests that, on average, reports that are easier to interpret (higher EII) might be somewhat associated with higher relevance of SDG information (RI), and vice versa. This positive correlation implies that SOEs producing reports that are more easily interpretable may also tend to provide more relevant SDG information. However, the correlation is weak which infers that there is room for improvement in focusing on clarity of presentation while ensuring that the information provided remains highly relevant to stakeholders. This study posits that SOEs should recognise the importance of not only presenting information in an understandable manner (EII) but also ensuring that the information is relevant to stakeholders' interests and concerns (RI). Stakeholders are likely to value information that is both easy to comprehend and meaningful in the context of sustainability goals (GRI 1, 2021). Thus, the alignment between interpretability and relevance can contribute to more effective and meaningful communication with stakeholders.

PI and DI, MI

The weak PI correlations with the DI (T_b=0.129; r_s=0.229, p>0.1) and MI (T_b=0.069; r_s=0.101, p>0.1) indicates a minimal association between the disclosure of SDG results that are compared to benchmarks or targets (PI) and the volume of SDG disclosures (DI) or quantified SDG disclosures (MI). In practical terms, it might suggest that the SOEs' use of compared results, as measured by the PI, does not consistently predict the density or measurability of SDG information that SOEs disclose. Further, the weak and non-significant correlation suggests that SOEs may independently determine the extent of use of compared SDG results (PI) and the density (DI) or quantifiability (MI) of SDG information in their reports, without a strong interdependence between these factors.

This can be confirmed by the means of the indicators. Taken together, the moderate PI mean (0.52), and high DI mean (0.85) indicates that SOEs are disclosing a large volume of SDG information in their reports; however, a substantial proportion of that information is not being compared to targets or benchmarks to show sustainability performance. Similarly, the low MI mean (0.43) and the moderate PI mean (0.52) indicate that SOEs are disclosing a moderate level of compared results in their reports; however, the majority of the SDG information is mainly qualitative. Further, the lower MI mean indicates that a substantial portion of SDG information is presented in a qualitative form, limiting the comparability and precision of the disclosed information (Adams *et al*., 2020). The correlations indicate that there is room for improvement for

SOEs to provide SDG results that are compared to show performance simultaneously with dense and measurable SDG information, providing more useful information to stakeholders.

PI and RI

The moderate, negative correlation between the PI and RI (T_b=-0.230; r_s=-0.329, p<0.1) suggests that there is a moderate tendency for the disclosure of compared results to decrease as the disclosure of SDG results and objectives (relevant information, as measured by the RI) increase, and vice versa. The correlation suggests a potential trade-off or tension between the quality of performance-related SDG information and the relevance of the information. This finding, together with the low RI score (0.2) and the moderate PI score (0.52), indicates that as efforts are made to enhance performance-related disclosures, there might be challenges in maintaining the relevance of the disclosed SDG information, resulting in lower quality SDG disclosures. Stakeholders are likely to value SDG information that is both relevant and contains detailed performance metrics. Thus, striking a balance between performance-related information (PI) and relevance (RI) is key to producing a comprehensive yet focused report.

EII and BI, PI

The weak, positive EII correlations between the PI (T_b=0.066 r_s=0.080, p>0.1) and BI (T_b=0.029; r_s=0.062, p>0.1) indicate a minimal association between the disclosure of compared (PI) or balanced (BI) results and the ease of interpretation of SDG disclosures (EII). In practical terms, it suggests that the SOEs' use of compared or balanced results, as measured by the PI and BI respectively, does not consistently predict the extent of use of SDG infographics that SOEs disclose.

This can be confirmed by the low EII score (0.21) and the moderate PI (0.52) and BI (0.51) scores, which indicate that SOEs are disclosing a moderate level of compared or balanced results in their reports; however, they are limiting their use of visual media. The results suggest that while performance-related and balanced disclosures are essential for conveying the company's SDG achievements, the ease with which stakeholders can interpret the information involves separate considerations by the SOEs. This study therefore posits that SOEs should consider optimising all aspects to ensure a comprehensive and accessible report.

BI and DI, MI, RI

The weak, negative BI correlations between the DI (T_b=-0.096; r_s=-0.125, p>0.1), MI (T_b=-0.156; r_s=-0.208, p>0.1) and RI (T_b=-0.187; r_s=-0.281, P>0.1) suggest that as the balance between positive and negative SDG results (BI) decreases, there is a slight tendency for the density (DI), quantifiability (MI) and relevance (RI) of SDG information in the report to increase and vice versa. The weak and non-significant correlation suggests that SOEs may independently determine the balance of their SDG disclosures (BI) and the density (DI), quantifiability (MI) or relevance (RI) of SDG information in their reports, without a strong interdependence between these factors. Further, it suggests that the SOEs' use of balanced results, as measured by the BI, does not consistently predict the volume (DI), the measurability (MI) or the relevance (RI) of SDG information that SOEs disclose.

This result can be confirmed by the high DI score (0.85) and the moderate BI score (0.51) which indicates that SOEs might be disclosing a large volume of SDG information in their reports; however, a substantial portion of that information is not balanced. Similarly, the low MI score (0.43) and the moderate BI score (0.51) suggests that SOEs are disclosing a moderate level of balanced results in their reports; however, the majority of the SDG information is mainly qualitative. Lastly, the low RI score (0.20) and the moderate BI score (0.51) also confirm the correlation and indicates that SOEs are disclosing a moderate level of balanced results in their reports; however, the majority of the SDG information is mainly descriptive with policies and mission statements instead of results and objectives. SOEs aiming to maintain a balance between positive and negative disclosures should be cautious about a potential decrease in the relevance of their SDG information. This study posits that achieving a balance in reporting is important, but it should not compromise the substantive and relevant nature of SDG disclosures.

In addition, companies may also not necessarily need to compromise the balance of disclosures to enhance the density and/or quantification of their SDG information, and vice versa. A comprehensive approach that includes dense, balanced reporting and quantitative measurement can contribute to higher SDG information quality.

BI and PI

The weak correlation between the BI and PI (T_b=0.103; r_s=0.154, p>0.1) indicates a minimal association between the disclosure of balanced SDG results and compared SDG results. In

practical terms, it suggests that the SOEs' use of balanced results, as measured by the BI, does not consistently predict the extent of compared SDG results that SOEs disclose. Further, the weak and non-significant correlation suggests that SOEs may independently determine the balance of their SDG results (BI) and the use of compared SDG results in their reports (PI), without a strong interdependence between these factors. This is an unexpected result, considering that both scores indicate moderate SDG information quality (PI=0.52; BI=0.51). One would anticipate that compared SDG results would reflect a corresponding positive or negative result, leading to moderate or strong correlations between these two indicators. More research is required to understand the reasons behind these contradictions. Nonetheless, this weak correlation suggests a lower quality of SDG disclosure.

SDGQ and EII

The correlation between the EII and SDGQ (T_b=0.230; r_s=0.303, $p<0.1$) indicates a moderately positive relationship between the SDGQ and EII. This finding is consistent with that of Malola and Maroun (2019). As the quality of SDG information increases, there is a moderate tendency for the ease of interpretation of SDG information to increase. The positive correlation suggests that, on average, reports with higher SDG information quality may also be somewhat easier to interpret (higher EII), and vice versa. In addition, the results infer that SOEs should recognise that improving the interpretability of SDG information in integrated or annual reports may contribute to a moderate enhancement in SDG information quality. Further, an alignment between SDGQ and EII could possibly lead to improved stakeholder engagement, as stakeholders may find it easier to comprehend and engage with more interpretable SDG information (Malola and Maroun, 2019, Freundlieb *et al.*, 2014).

SDGQ and PI

The correlation between the SDGQ and PI (T_b=0.398; r_s=0.548, $p<0.01$) indicates a strong, positive relationship between the SDGQ and PI. As the quality of SDG information increases, there is a strong tendency for the disclosure of compared SDG results to increase as well. The strong positive correlation suggests a robust connection between the overall SDG information quality and the performance-related aspects of SDG information. Further, the results imply that companies aiming to boost their overall SDG information quality may strategically focus on enhancing the quality and depth of compared SDG results in their reports. Stakeholders, particularly those interested in assessing a company's performance related to SDGs, may find

reports with higher SDGQ scores more aligned with their expectations (Nikolaou and Tsalis, 2013). The strong correlation implies that improvements in SDG information quality may contribute significantly to providing stakeholders with better information for decision-making, particularly regarding performance outcomes related to SDGs.

SDGQ and BI

The correlation between the SDGQ and BI (T_b=0.597; r_s=0.820, p<0.01) indicates a very strong positive relationship between the SDGQ) and BI. As the quality of SDG information increases, there is an extremely strong tendency for the disclosure of balanced SDG results to increase. The very strong positive correlation suggests that the overall SDG information quality is intricately linked to the balance between positive and negative aspects of SDG disclosures. Companies seeking to enhance their SDG information quality may strategically focus on achieving a better balance in the disclosure of positive and negative results related to SDGs. The very strong correlation implies that SDG reports with higher SDGQ scores are more likely to be perceived as trustworthy and credible by stakeholders, given the emphasis on balanced reporting (Adams *et al.*, 2020). Lastly, the very strong correlation underscores the importance of integrating both positive and negative aspects when presenting information related to SDGs.

SDGQ and DI, MI, RI

The correlations between the SDGQ and DI (T_b=0.066; r_s=0.097, p>0.1), MI (T_b=0.092; r_s=0.105, p>0.1) and RI (T_b=-0.113; r_s=-0.186, p>0.1) suggests a minimal association between the SDGQ and these indicators. As the quality of SDG information in terms of the DI, MI and RI indicators increases or decreases, there is a weak tendency for the overall SDG Information Quality score to increase or decrease. While there is a slight correlation, it is not statistically significant. Thus, the relevance, volume, or quantifiability of SDG information, as measured by the DI, MI, and RI respectively, may not be strong determinants of the overall SDGQ score. This implies the need for SOEs to improve in creating a report with SDG information that considers all aspects of quality including the relevance, volume and quantifiability of that information.

4.3 SDG level results

In the following section, descriptive statistics for each indicator under each SDG are presented and the SDGs that are most prioritised in terms of corporate disclosure quality are discussed. Tables 12-18 present the descriptive statistics for each quality indicator at the SDG level. Figures

13-18 below display the scores for each SDG in descending order, in terms of each quality element. The reader's attention is drawn to the SDG 8 labels. This study split the analysis of the SDG 8 goal into two separate ones, namely Decent Work and Economic Growth. The type of disclosures that were coded in terms of each SDG is presented in Appendix B. A detailed representation of all the SOE scores under each indicator for each SDG is available on request.

4.3.1 Density Indicator

Table 12: Density Indicator descriptive statistics for each SDG

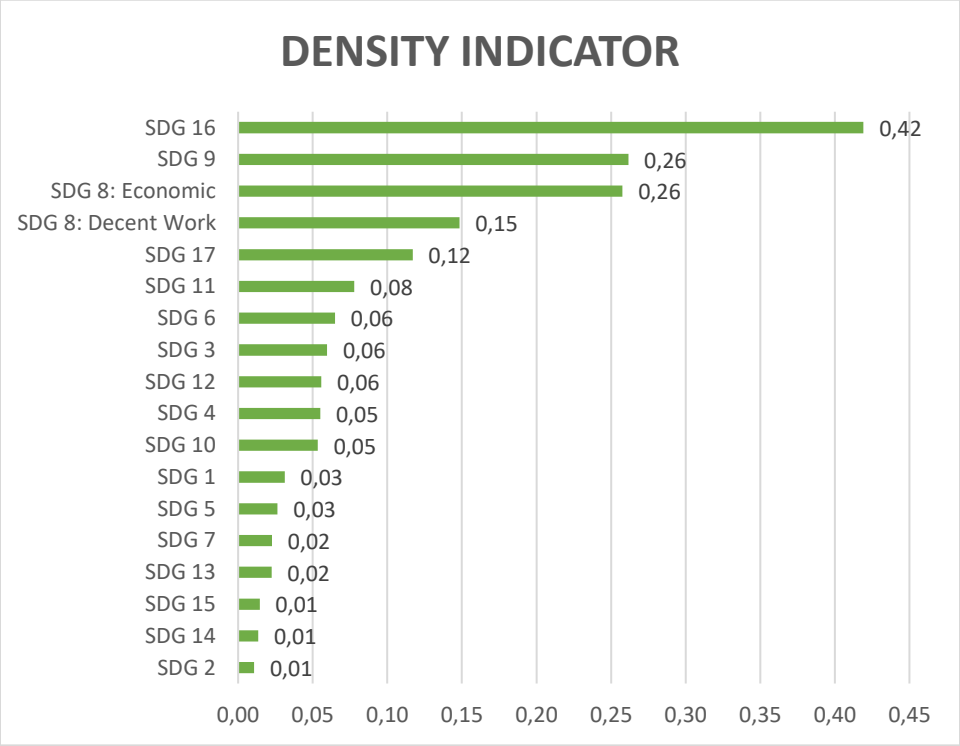
SDG	Minimum	Maximum	Average	Std. Deviation
1	0,01	0,08	0,03	0,02
2	0,00	0,13	0,01	0,02
3	0,01	0,16	0,06	0,04
4	0,01	0,16	0,05	0,03
5	0,00	0,07	0,03	0,01
6	0,00	0,29	0,06	0,10
7	0,00	0,16	0,02	0,04
8: Decent Work	0,09	0,29	0,15	0,04
8: Economic Growth	0,07	0,45	0,26	0,10
9	0,09	0,50	0,26	0,11
10	0,01	0,11	0,05	0,02
11	0,01	0,27	0,08	0,05
12	0,00	0,16	0,06	0,04
13	0,00	0,07	0,02	0,02
14	0,00	0,05	0,01	0,02
15	0,00	0,15	0,01	0,03
16	0,27	0,57	0,42	0,09
17	0,04	0,27	0,12	0,06

Table 13: Density Indicator (without repeats) descriptive statistics for each SDG

SDG	Minimum	Maximum	Average	Std. Deviation
1	0,01	0,08	0,03	0,02
2	0,00	0,13	0,01	0,02
3	0,01	0,16	0,06	0,04
4	0,01	0,16	0,06	0,03
5	0,00	0,07	0,03	0,01

6	0,00	0,30	0,07	0,10
7	0,00	0,16	0,02	0,04
8: Decent Work	0,09	0,29	0,15	0,04
8: Economic Growth	0,07	0,47	0,27	0,10
9	0,09	0,63	0,28	0,12
10	0,01	0,11	0,06	0,02
11	0,01	0,35	0,08	0,06
12	0,00	0,17	0,06	0,04
13	0,00	0,08	0,02	0,02
14	0,00	0,06	0,01	0,02
15	0,00	0,15	0,01	0,03
16	0,28	0,64	0,44	0,09
17	0,04	0,30	0,12	0,07

Figure 13: Density Indicator score for each SDG



On average, five[5] goals were prioritised under this indicator, namely, SDGs 16, 9, 8 (Decent Work and Economic Growth) and 17. SDG 16, with an average DI score of 0.42, was the most disclosed

[5] SDG 8: Decent Work and SDG 8: Economic Growth are considered as two separate goals in this study.

in the annual reports. With reference to the graph length in Figure 13, this goal was disclosed extensively more than all other SDGs with a 62% increase from SDG 9 (DI = 0.26), the second most disclosed SDG. One reason for the very high amount of SDG 16 disclosures is due to all reports containing a whole section dedicated to corporate governance (IODSA, 2016, National Treasury, 2022). One additional factor is the extensive array of stakeholders associated with SOEs, necessitating the disclosure of their relationships with these diverse parties. The results can be considered appropriate, given the strained relationships between SOEs and various stakeholders resulting from their failures and inability to meet public expectations (Madumi, 2018, Vorster and Konstantinopoulos, 2020). To rebuild trust and rehabilitate their image, there is a notable emphasis on disclosing information related to stakeholder relations (Madumi, 2018, Vorster and Konstantinopoulos, 2020). Moreover, frequent disclosures about company culture and business ethics appear justified, considering the corruption, mismanagement of funds, and state capture investigations that have plagued SOEs in recent years (Ackers, 2022, Chigudu, 2020, Martin and Solomon, 2016, Vorster and Konstantinopoulos, 2020). Further, as part of efforts to rectify past inefficiencies and enhance customer satisfaction, SOEs are implementing quality management controls, leading to an increase in disclosures related to SDG 16 (see Appendix B for more detail on the types of SDG 16 disclosures). Comparing the average DI score (0.42) to the DI without considering repeat disclosures (0.44) indicates that 5% of SDG 16 disclosures are repeated.

SDG 9 was the second most disclosed in the annual reports. The average DI of 0.26 and the ranking suggests that, on average, SOEs include a high amount of information related to SDG 9 compared to the other SDGs. This is reasonable as the majority of the sample SOEs are infrastructure SOEs. There are also SOEs such as Necsa, Mintek and CEF, involved in research and development, disclosing their contributions to innovation and technology. Considering that SOEs in South Africa play a particularly crucial role in delivering essential infrastructure services, including energy, transport, and water, it is expected that they prioritise this goal in their reports (Chigudu, 2020, Kikeri, 2018, Madumi, 2018, Ovens, 2016). Comparing the DI score of 0.26 to the DI score without considering repeat disclosures (0.28), 7% of the total SDG 9 disclosures are being repeated.

SDG 8: Economic Growth with an average DI score of 0.26, was the third most disclosed in the annual reports. Similarly to SDG 9, on average SOEs include a high amount of information related

to Economic Growth compared to the other SDGs. This is reasonable as a primary duty of SOEs is to address market failures and drive economic growth, through for example, providing assistance to SMMEs (Madumi, 2018, NPC, 2019). Schedule 2 and 3B SOEs operate with a profit motive, and stakeholders are particularly interested in their financial position and performance, which is another factor contributing to the heightened Economic Growth disclosures (Balbuena, 2014, Ovens, 2016). Furthermore, considering issues such as wasteful expenditure, misappropriation of funds, and the reliance on government aid to sustain the entity, it appears justified that Economic Growth emerged as a frequently disclosed SDG, among the others (Ackers, 2022, Madumi, 2018, Matsiliza, 2017) (see Appendix B). Comparing the DI score of 0.26 to the DI score without considering repeat disclosures (0.27), 4% of the total Economic Growth disclosures are being repeated.

SDG 8: Decent Work ranked fourth under this indicator. The average DI of 0.15 and the ranking seems reasonable as each report has a section dedicated to human resources – a requirement of the National Treasury (National Treasury, 2022). As SOEs are significant employers in South Africa, their pivotal role in achieving this goal necessitates a focus on prioritisation in their reports (Kikeri, 2018). See Appendix B for more detail on types of Decent Work disclosures. Positively, comparing the average DI score (0.15) to the DI without considering repeat disclosures (0.15) indicates that the SOEs are disclosing new information about Decent Work each time without excessive repetition.

Finally, SDG 17 ranked fifth under the DI, similar to prior research (Ali *et al.*, 2018, Ionașcu *et al.*, 2020, Sawani *et al.*, 2023). This seems reasonable as SOEs collaborate with many organisations to achieve a commcon goal, including municipalities, other SOEs, the government and private sector organisations (OECD, 2018). Disclosures on these partnerships as well as their initiatives would be required. Comparing the average DI score (0.12) to the DI without considering repeat disclosures (0.12) indicates that the SOEs are disclosing new SDG 17 information each time without excessive repetition.

Next, particular mention is made regarding SDGs 1, 6, 10 and 11.

South Africa’s NDP emphasises the country’s triple challenge of poverty, inequality and unemployment (NPC, 2011). These challenges directly relate to SDGs 1, 8 and 10 (StatsSA,

2019). SDG 1 (DI = 0.03) and 10 (DI = 0.05) ranked 12th and 11th under the DI respectively. The average scores suggest that the emphasis of content related to SDG 1 and 10 is not extensive in the reports. In aspiring to become a developmental state, it is crucial for SOEs to assist the South African government in addressing socio-economic issues such as poverty and mitigating prominent inequalities (Chigudu, 2020). Therefore, this DI scores are well below satisfactory within a South African context, indicating that SOEs are not placing much emphasis on poverty and inequality reduction efforts. Furthermore, comparing the average DI score for SDG 10 (0.05) to the DI without considering repeat disclosures (0.06) indicates that 17% of the total SDG 10-related sentences consist of similar ideas within the same context. However, on a positive note, comparing the average DI score for SDG 1 (0.03) to the DI without considering repeat disclosures (0.03) indicates that the SOEs are disclosing new SDG 1 information each time without excessive repetition.

The above can similarly said for SDG 11, with a DI score of 0.08 and ranking of 6. SOEs are also not disclosing an extensive amount of SDG 11 information in their reports. Comparing the average DI score (0.08) to the DI without considering repeat disclosures (0.08) indicates that the SOEs are disclosing new SDG 11 information each time without excessive repetition. In South Africa, SOEs are crucial mechanisms supporting the government in service delivery and urban development across key sectors like infrastructure, energy, water, transport, telecommunications, and manufacturing (Ackers, 2022, Ovens, 2016). As such, more disclosure would be expected in this regard. However, comparing the average DI score (0.08) to the DI without considering repeat disclosures (0.08) indicates that the SOEs are disclosing new SDG 11 information each time without excessive repetition.

SDG 6 is the seventh most disclosed under this indicator. The average DI of 0.06 suggests that, on average, SOEs include a low density of SDG 6-related sentences in their reports. Comparing the average DI score (0.06) to the DI without considering repeat disclosures (0.07) indicates that 14% of the total SDG 6-related sentences consist of similar ideas within the same context. It is worth noting that all nine water utilities achieved the top nine DI scores for SDG 6 indicating that they are prioritising this goal more than the other SOEs, which should be expected. This provides evidence that SDG prioritisation is context-specific (Lau and Wong, 2022).

In relation to the other SDGs, SDG 2 was a least disclosed goal, with a DI score of 0.01. This is consistent with prior research (Buniamin *et al.*, 2020, Lau and Wong, 2022, Sawani *et al.*, 2023). The mean scores DI of the other SDGs (SDG 3 = 0.06; SDG 4 = 0.05; SDG 5 = 0.03; SDG 7 = 0.02; SDG 12 = 0.06; SDG 13 = 0.02; SDG 14 = 0.01; SDG 15 = 0.01) suggests that SOEs include sentences in their reports related to these SDGs, but the density is low. Referring to the maximum score of these SDGs (SDG 3=0.16; SDG 4=0.16; SDG 5=0.07; SDG 7=0.16; SDG 12=0.16; SDG 13=0.07; SDG 14=0.05; SDG 15=0.15), even entities with higher scores have a minimal density of sentences related to them. However, comparing the average DI scores to the DI without considering repeat disclosures (SDG 3=0.06; SDG 5=0.03; SDG 7=0.02; SDG 12=0.06; SDG 13=0.02; SDG 14=0.01; SDG 15=0.01), indicates that the SOEs are disclosing new SDG information each time without excessive repetition – with the exception of SDG 4 (DI = 0.05) which obtained a DI without a repetition score of 0.06, indicating that 17% of the total SDG 4-related sentences consist of similar ideas within the same context.

Overall, the DI score seems to reflect a reasonable effort by SOEs in terms of disclosure. It is evident that achieving an equal distribution of disclosures across each SDG is not feasible. Therefore, it is reasonable that the prioritised SDGs under this score were chosen based on their significance. However, there is room for improvement in SDG 1 and 10, given their critical relevance in the context of South Africa. Additionally, enhancing disclosure on SDG 11 is important, considering the developmental mandate of SOEs.

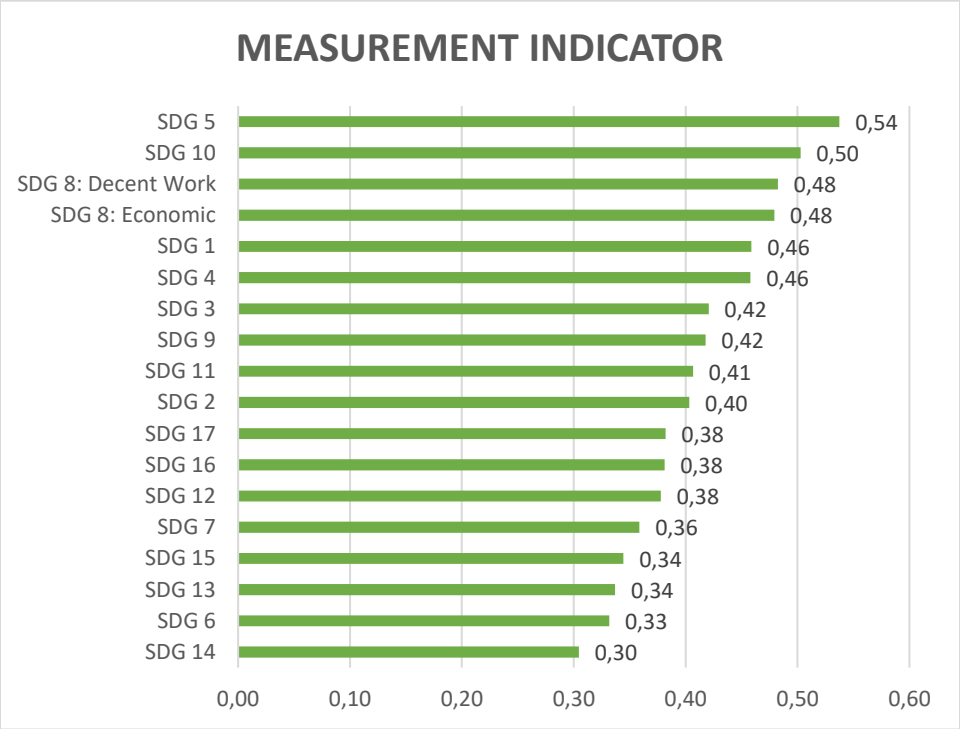
4.3.2 Measurement Indicator

Table 14: Measurement Indicator descriptive statistics for each SDG

SDG	Minimum	Maximum	Average	Std. Deviation
1	0,33	0,67	0,46	0,07
2	0,00	0,67	0,40	0,14
3	0,32	0,73	0,42	0,07
4	0,35	0,62	0,46	0,06
5	0,33	0,70	0,54	0,09
6	0,00	0,58	0,33	0,16
7	0,00	0,67	0,36	0,15
8: Decent Work	0,36	0,71	0,48	0,07
8: Economic Growth	0,40	0,63	0,48	0,05
9	0,35	0,55	0,42	0,04

10	0,39	0,67	0,50	0,07
11	0,33	0,69	0,41	0,06
12	0,09	0,55	0,38	0,06
13	0,00	0,67	0,34	0,14
14	0,00	0,67	0,30	0,17
15	0,00	0,67	0,34	0,13
16	0,35	0,44	0,38	0,02
17	0,33	0,51	0,38	0,04

Figure 14: Measurement Indicator score for each SDG



Referring to the graph in Figure 14, one can see that the scores do not vary much between the SDGs. This is confirmed by the low standard deviation of 0.07. On average, nine SDGs were prioritised under this indicator, namely SDGs 5, 10, 8 (Decent Work and Economic Growth), 1, 4, 3, 9, and 11.

SDG 5 was the only goal that achieved an MI score above the midpoint (0.50), with an average score of 0.54. In the annual reports, SOEs are making efforts to show quantifiable SDG 5 information compared to all other SDGs. This ranking is interesting because other SDGs, such as SDG 8 and 9 are economic SDGs and are more likely to relate to quantitative details when

compared to SDG 5, a social SDG (StatsSA, 2019). Nevertheless, quantitative disclosures relating to the number of males and females at each level of employment, monetary spending on training employees by gender, financial contributions to women-owned businesses, and the number of women-owned businesses supported were often found in the reports, contributing to heightened quantitative SDG 5 disclosures.

SDG 10 ranked second under this indicator. The MI score (0.50) is equal to the midpoint and similarly to SDG 5, SOEs are making efforts to show quantifiable SDG 10 information compared to most other SDGs. This score makes more sense as SDG 10 is broader than SDG 5, incorporating other aspects of equality other than gender. For example, extensive quantitative disclosures were found relating to the average ages at each level of employment, the number of White, African, and Indian employees at each level of employment, monetary spending on external bursaries provided to the youth (particularly those vulnerable), monetary spending on training employees by gender, race and disability, financial contributions to black and women-owned businesses, and the number of black-owned businesses supported.

SDG 8: Decent Work ranked third under this indicator with an average MI score of 0.48. This is mainly due to SOEs extensively disclosing the number of jobs created during a project, employee turnover, employee awards, salaries and other compensation, number of staff at each occupational level, and training costs. The average MI of 0.48 suggests a moderate level of quantification and measurement in reporting on Decent Work. However, while SOEs provide some measurable details, the majority of these disclosures are qualitative. The results suggest that SOEs should improve emphasising the inclusion of measurable SDG 8: Decent Work information in their reports. South Africa has one of the highest unemployment rates in the world and enhancing the measurement approach could lead to a more objective and informative portrayal of efforts to address this pressing issue (Calabrese *et al.*, 2021, StatsSA, 2023, Wiseman, 1982).

SDG 8: Economic Growth ranked fourth under this indicator with an average score of 0.48. This is mainly due to SOEs disclosing financial ratio percentages, the volume of production/sales, revenue, profits, operating costs, financial assistance provided to SMMEs, and debt outstanding. The average MI of 0.48 suggests a moderate level of quantification and measurement in reporting on Economic Growth. However, while the ranking and average show a moderate performance in

this SDG, a higher MI score was expected, considering the nature of Economic Growth disclosures. Most Economic Growth disclosures relate to financial capital, which is primarily monetary and quantitative in nature (StatsSA, 2019, Tsalis *et al.*, 2022). The average (0.48) is below the midpoint (0.50) suggesting SOEs are using predominantly qualitative narratives to present Economic Growth disclosures.

The above can also be said for SDG 9 and 11, ranking eighth and ninth with a score of 0.42 and 0.41, respectively. In South Africa, the state of public infrastructure and urban development has been found to be deficient, and substantial investments in infrastructure by SOEs, involving significant public funds, would logically be anticipated to be disclosed in a quantitative manner (Global Infrastructure Hub, 2023, Ovens, 2016, World Bank, 2023). Further, since the majority of the sampled SOEs are developmental SOEs that disclose their investments in infrastructure upgrades, it is odd that this SDG ranked so low under the MI. Hence, the low score could suggest that SOEs may not be sufficiently investing in infrastructure developments or may not be adequately presenting their investment efforts in their reports. Considering that the mandate of SOEs is to provide developmental services to the state, more concrete and objective evidence of their contribution to these goals is necessary (Fourie, 2014, Ovens, 2016).

SDG 1, 4 and 3 ranked fifth, sixth, and seventh under this indicator, with average scores of 0.46, 0.46 and 0.42 respectively. For SDG 1, this ranking is mainly due to SOEs disclosing monetary contributions to those poor and disadvantaged, and the number of jobs created during a project. It indicates that SOEs, on average, are making efforts to quantify and measure their contributions toward eradicating poverty. The same can be said for SDGs 3 and 4. Examples of quantitative SDG 3 disclosures include financial assistance provided to healthcare services, the number of employees assisted in counselling and Lost Time Injury Frequency Rates (LTIFR). Examples of quantitative SDG 4 disclosures include monetary spending on training for employees, the number of employees trained, the number of internal and external bursaries provided, and the monetary spend in this regard. However, while SOEs provide some measurable details about their initiatives to address No Poverty, Good Health and Well-being and Quality Education, the majority of these disclosures are qualitative.

Moving on to the unprioritised SDGs with lower rankings, it is noteworthy to specifically mention SDGs 6, 12, and 13:

SDG 12 and 13, with average MI scores of 0.38 and 0.34, ranked 13th and 16th under this indicator, respectively. This ranking was somewhat surprising, as previous research has indicated that disclosures concerning natural capital typically adopt quantitative measures, such as cubic metres of water usage or metric tonnes for carbon emissions (Ackers and Adebayo, 2022b, Ionașcu *et al.*, 2020, Kundu, 2017). Additionally, SOEs like Transnet, CEF, Eskom and Necsa, which are involved in environmental rehabilitation, the disclosure of environmental liabilities is often presented in monetary terms.

SDG 6 ranked second-last under this indicator, with an average score of 0.33. Compared to the other SDGs, SOEs are making minimal efforts to disclose quantifiable information regarding their contributions to Clean Water and Sanitation. This score is intriguing since water utilities make up 26% of the sampled SOEs and have mandates of meeting certain water quality percentages according to standards, water consumption, water losses, litres of water supplied and produced, as well as investing in water infrastructure (Government Communication and Information System, 2016).

For the remaining SDGs (MI scores: SDG 2=0.40; SDG 7=0.36; SDG 14=0.30; SDG 15=0.34; SDG 16=0.38; SDG 17=0.38) improvements are also required. Such as SDG 7, reflecting the need for more measurable efforts to address the energy crisis in South Africa, or SDG 16, reflecting the need for improved accountability and transparency (UN, 2015, World Bank, 2023).

Overall, except for SDG 5 and 10, the average MI scores of each SDG suggests that while SOEs provide some measurable details about their initiatives to address them, the majority of these disclosures are qualitative. The results suggest that there is room for improvement in terms of enhancing the level of quantifications for each of the 17 SDGs, thereby enhancing accountability and transparency to stakeholders (Nikolaou and Tsalis, 2013, Tsalis *et al.*, 2022, Wiseman, 1982). Furthermore, the results suggest that quantity (DI) does not necessarily equate to quality and other quality dimensions need to be considered (Malola and Maroun, 2019). For example, while SDG 5 ranked low under the DI score, SOEs are providing measurable details in this regard above all other SDGs.

As an additional observation, qualitative disclosures are more susceptible to impression management (Leung *et al., 2015)*. For example for SDG 8: Economic Growth, it cannot be ignored

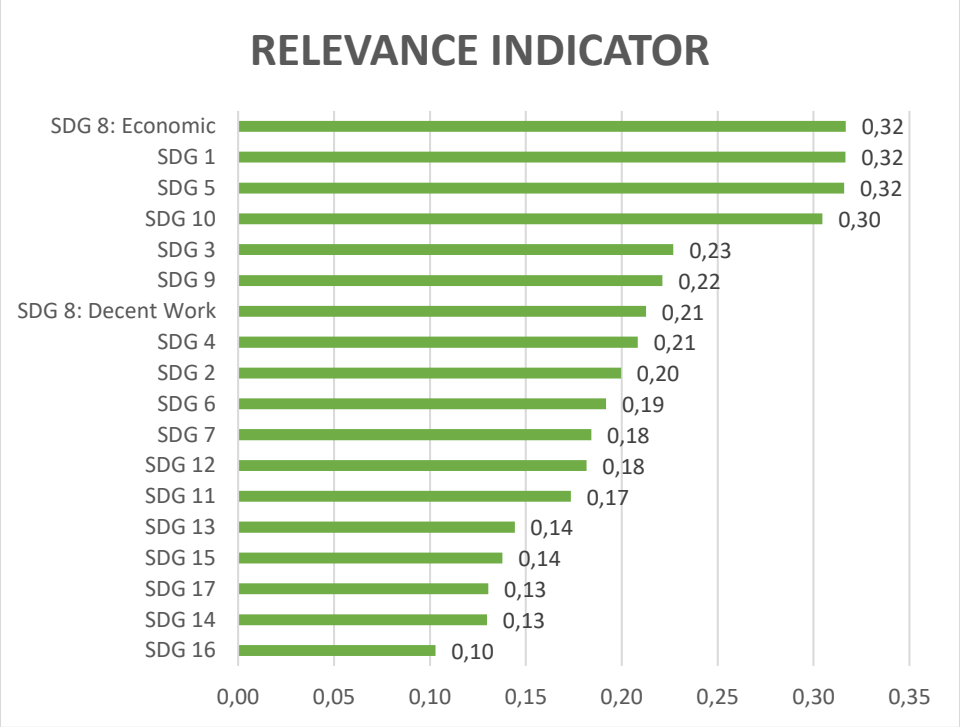
that South African SOEs have been publicly criticised for displaying subpar financial performance, leading to challenges in meeting their growth mandates (Matsiliza, 2017). Therefore, the SOEs' weak financial performance may be obscured through narrative justifications, highlighting potential use of impression management by the SOEs (Leung *et al*., 2015). With SOEs opting for a qualitative reporting approach on Economic Growth, there's a possibility that the concrete, and potentially material, information regarding the challenges in economic growth could be downplayed or understated (Chou *et al.*, 2018). The same logic could be applied to other SDGs such as SDG 16, where South African SOEs have been plagued by corruption, lack of governance or accountability (Ackers, 2022, Matsiliza, 2017).

4.3.3 Relevance Indicator

Table 15: Relevance Indicator descriptive statistics for each SDG

SDG	Minimum	Maximum	Average	Std. Deviation
1	0,00	0,72	0,32	0,17
2	0,00	1,00	0,20	0,26
3	0,00	0,54	0,23	0,13
4	0,06	0,50	0,21	0,10
5	0,00	0,77	0,32	0,21
6	0,00	1,00	0,19	0,23
7	0,00	1,00	0,18	0,22
8: Decent Work	0,07	0,48	0,21	0,10
8: Economic Growth	0,16	0,58	0,32	0,11
9	0,06	0,56	0,22	0,10
10	0,02	0,59	0,30	0,14
11	0,00	0,42	0,17	0,12
12	0,00	0,59	0,18	0,13
13	0,00	0,50	0,14	0,13
14	0,00	0,67	0,13	0,19
15	0,00	0,50	0,14	0,16
16	0,02	0,24	0,10	0,05
17	0,01	0,50	0,13	0,10

Figure 15: Relevance Indicator score for each SDG



On average, eight SDGs were prioritised under this indicator but from the view of the graph, SDGs 8: Economic Growth (RI=0.32, ranked 1st) 1 (RI=0.32, ranked 2nd), 5 (RI=0.32, ranked 3rd) and 10 (RI=0.30, ranked 4th) were prioritised more than the rest, with a significant drop in the RI score from SDG 3 (RI=0.23, ranked 5th). This high rank for the top four SDGs is the result of SOEs placing importance on addressing economic growth, poverty, gender equality and inequalities over the other SDGs through the disclosure of their results and objectives of initiatives to address these SDGs. In terms of the country's NDP this is promising, as two of the country's triple challenges are prioritised here (poverty and reducing inequalities) and suggests that SOEs are providing readers with some insights into the company's fundamental commitment to these SDGs (Michelon *et al.*, 2015, NPC, 2011). Furthermore, the rank of SDG 8: Economic Growth makes sense as a primary objective for SOEs is to drive economic growth and readers would expect relevant information in this regard (Madumi, 2018, NPC, 2019). However, the average RI scores suggest that the majority of the specific SDG disclosures consist of generic policies, programmes and mission statements as opposed to specific objectives and results of actions, inferring that there is room for improvement. Nevertheless, SOEs, on average, are providing information that is deemed somewhat relevant to stakeholders interested in economic growth, poverty, gender equality and reducing inequalities.

In terms of the other prioritised SDGs (ranked from 5th to 8th respectively: SDG 3=0.23; SDG 9=0.22; SDG 8: Decent work= 0.21; SDG 4=0.21) these rankings suggests that SOEs are more focused on prioritising these goals in terms of disclosing results and specific goals compared to many other SDGs. However, the average RI scores are well below the maximum possible score and suggests that these SDG disclosures are more focused on disclosing policies, strategies, plans, and intentions than results and objectives. The same can be said for the other 10 SDGs with lower RI scores and rankings (ranked from 9th to 18th: SDG 2 = 0.20; SDG 6 = 0.19; SDG 7 = 0.18; SDG 12 = 0.18; SDG 11 = 0.17; SDG 13 = 0.14; SDG 15 = 0.14; SDG 17 = 0.13; SDG 14 = 0.13; SDG 16 = 0.10).

For example, SDG 16 ranked last under this indicator, with a low average RI score of 0.10. In the annual reports, SOEs are making less effort to show their commitment to achieving SDG 16, compared to all other SDGs. In their SDG 16 disclosures, SOEs provided information about their connections with stakeholders, but there was limited revelation regarding the concrete actions taken to actively engage with these stakeholders. This finding suggests questionable quality of the SOEs' stakeholder engagement processes. Moreover, the prevalence of unethical activities, such as the misappropriation of public funds through state capture, compelled SOEs to disclose the ethical policies they had implemented to address the loss of transparency and accountability within their organisations, which contributed to the increase in SDG 16 policy disclosures (Kikeri, 2018, Matsiliza, 2017, Philip, 2020). Another notable instance related to 'objectives' disclosures is that certain SOEs would declare their intention to investigate matters involving unethical conduct, but fail to disclose the steps taken to ensure a thorough investigation in the future, such as specifying who will be conducting the investigation, and so forth.

Under this indicator, 11 SDGs had a minimum score of 0 indicating that some SOEs are not disclosing any justified goals or actions taken to mitigate adverse effects on the SDGs and the result of those actions. Even SDGs with maximum RI scores are not prioritised well under this indicator. Overall, the results suggest that SOEs are more focused on disclosing philanthropic strategies, plans, and intentions regarding their contribution towards the SDGs even though they do not signify any consistent or tangible change in the firm's business strategies (Emma and Jennifer, 2021, Michelon *et al.*, 2015, Van der Waal and Thijssens, 2020). This infers that the actions of the SOEs are more overt measures taken to gain legitimacy as opposed to genuinely being committed to the cause (Michelon *et al.*, 2015). Thus, there is room for improvement in

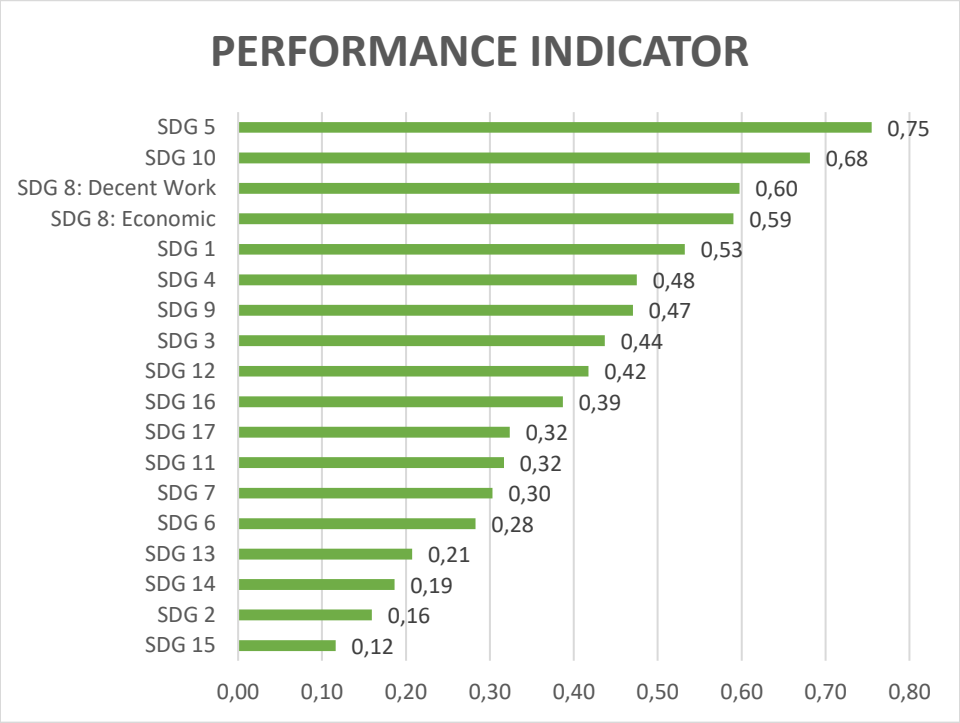
disclosing specific plans to address the SDGs as well as the outcomes of past efforts in this regard.

4.3.4 Performance Indicator

Table 16: Performance Indicator descriptive statistics for each SDG

SDG	Minimum	Maximum	Average	Std. Deviation
1	0,00	1,00	0,53	0,26
2	0,00	1,00	0,16	0,30
3	0,00	1,00	0,44	0,27
4	0,00	1,00	0,48	0,26
5	0,00	1,00	0,75	0,29
6	0,00	1,00	0,75	0,29
7	0,00	1,00	0,30	0,37
8: Decent Work	0,26	1,00	0,60	0,19
8: Economic Growth	0,32	0,87	0,59	0,14
9	0,14	1,00	0,47	0,18
10	0,13	1,00	0,68	0,22
11	0,00	1,00	0,32	0,28
12	0,00	1,00	0,42	0,34
13	0,00	1,00	0,21	0,29
14	0,00	1,00	0,19	0,32
15	0,00	1,00	0,12	0,23
16	0,04	0,77	0,39	0,20
17	0,00	1,00	0,32	0,30

Figure 16: Performance Indicator score for each SDG



On average nine SDGs were prioritised under this indicator, namely, SDG 5, 10, 8 (Decent Work and Economic Growth), 1, 4, 9, 3, and 12. Of those nine SDGs, five of them achieved PI scores above the midpoint (SDG 5=0.75; SDG 10=0.68; SDG 8: Decent Work=0.60; SDG 8: Economic Growth=0.59; SDG 1=0.53) indicating that the majority of results disclosed in relation to those SDGs were accompanied by comparisons with either a benchmark, prior year's performance or a target.

SDG 5 ranked first under this indicator. The average PI score of 0.75 suggests a high level of performance reporting. On average, SOEs tend to provide a high level of comparisons with results related to gender equality in their reports. Examples of disclosures include representation of women compared to men in leadership positions, percentages of women at all levels of employment in relation to set targets and training spend on women employees over time. The PI scores for SDG 5 range from 0 (minimum) to 1 (maximum). 12 (34%) SOEs achieved the maximum (1) which shows promising performance in relation to SDG 5 information quality (a detailed representation of all the SOE scores under each indicator for each SDG is available on request). SOEs are performing well under this indicator for SDG 5 and should continue emphasising the inclusion of performance-related SDG 5 information in their reports, ensuring

that results are compared over time or to targets or benchmarks. SDG 10 ranked second under this indicator. The average PI score of 0.68 suggests that SOEs tend to provide a moderate-to-high level of comparisons with results related to Reduced Inequalities in their reports. Examples of disclosures include representation of White, African and Indian women compared to men in leadership positions, percentages of disabled individuals at all levels of employment in relation to set targets and training spend on employees by age, disability, race and gender over time. SOEs are performing relatively well under this indicator for SDG 10, increasing the overall SDGQ, and should continue emphasising the inclusion of performance-related SDG 10 information in their reports, ensuring that results are compared over time or to targets or benchmarks.

SDG 8: Decent Work ranked third under this indicator. The average PI score of 0.60 suggests a moderate-to-high level of performance reporting. On average, SOEs tend to provide a moderate-to-high level of comparisons with results related to Decent Work in their reports. Examples of disclosures include employee turnover over time (including the number of appointments and terminations), employee costs overtime, salary increases or decreases and employee diversity in relation to set targets. The results indicate that SOEs are performing better under this indicator for Decent Work compared to most SDGs; however, there is room for improvement.

SDG 8: Economic Growth ranked fourth under this indicator. The average PI score of 0.59 suggests that SOEs tend to provide a moderate level of comparisons with results related to Economic Growth in their reports. This is probably because Economic Growth result disclosures include SOEs' contribution the GDP, financial performance ratios, revenue or profits generated, operating costs incurred, and the number of SMME's supported which were commonly compared to prior year's performance or targets, leading to an increased PI score. The results indicate that while SOEs are performing better under this indicator for Economic Growth compared to most SDGs, there is room for improvement. As discussed previously, the sampled SOEs have a profit motive, and stakeholders, particularly investors, the minister, and the government, are interested to know SOEs' financial performance and contribution to the country over time (Argento *et al.*, 2019, Balbuena, 2014, OECD, 2009). SOEs should thus continue including performance-related Economic Growth information in their reports, ensuring that results are compared over time or to targets or benchmarks.

SDG 1 ranked fifth under this indicator which implies that in the annual reports SOEs are making efforts to show their performance in poverty eradication either over time or compared to targets. Examples of compared SDG 1 results include the number vulnerable people supported and the number of jobs created over time or compared to targets. The average PI score of 0.53 suggests a moderate level of performance reporting. On average, SOEs tend to provide comparisons with results related to poverty eradication efforts in their reports.

In terms of the other prioritised SDGs (ranked from sixth to ninth respectively: SDG 4=0.48; SDG 9=0.47; SDG 3=0.44; SDG 12=0.42) these rankings suggests that on average, SOEs tend to somewhat provide comparisons with results related to these SDGs in their reports; however, the majority of results are not disclosed with comparisons. Thus, improvements can be made in this regard. For example, most SOEs have a mandate for infrastructure, aiming to contribute to the overall development of the country (Kikeri, 2018, Ovens, 2016). Therefore, stakeholders may be inclined to evaluate SOEs based on their performance in infrastructure developments that are crucial for the country's progress. Consequently, SOEs should improve emphasising the inclusion of performance-related SDG 9 information in their reports, ensuring that results are compared over time or to targets or benchmarks.

The same can be said for the other nine SDGs with lower PI scores and rankings (ranked from 10^{th} to 18^{th}: SDG 16 = 0.39; SDG 17 = 0.32; SDG 11 = 0.32; SDG 7 = 0.30; SDG 6 = 0.28; SDG 13 = 0.21; SDG 14 = 0.19; SDG 2 = 0.16; SDG 15 = 0.12). In the annual reports, SOEs are making lower efforts, compared to the other SDGs, to show their performance in these SDGs either over time or compared to targets. The average PI scores suggest a low level of performance reporting relating to the SDGs. On average, SOEs tend to provide minimal comparisons with results related to the SDGs in their reports.

Providing performance-related information, especially comparisons of results, is crucial for stakeholders to assess the effectiveness of poverty eradication efforts (GRI 1, 2021, Michelon *et al.*, 2015, Tsalis *et al.*, 2022). Overall, the results suggest that there is an opportunity for improvement and SOEs should continue emphasising the inclusion of performance-related SDG 5, 10, 8 and 1 information in their reports, ensuring that results are compared over time or to targets or benchmarks. The results also call for the need to improve compared disclosures in the

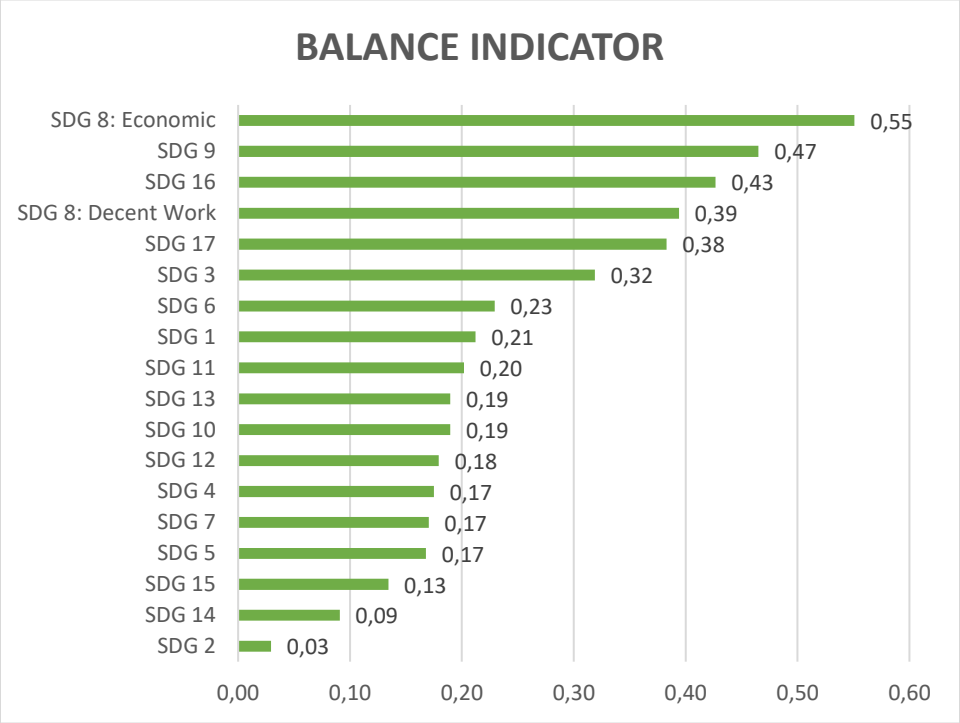
other SDGs which will contribute to a more informed assessment of the impact of their initiatives in achieving the SDGs.

4.3.5 Balance Indicator

Table 17: Balance Indicator descriptive statistics for each SDG

SDG	Minimum	Maximum	Average	Std. Deviation
1	0,00	1,00	0,21	0,31
2	0,00	0,25	0,03	0,08
3	0,00	1,00	0,32	0,30
4	0,00	0,67	0,17	0,22
5	0,00	1,00	0,17	0,29
6	0,00	1,00	0,23	0,34
7	0,00	1,00	0,17	0,32
8: Decent Work	0,00	1,00	0,39	0,28
8: Economic Growth	0,05	1,00	0,55	0,26
9	0,00	1,00	0,47	0,27
10	0,00	1,00	0,19	0,23
11	0,00	1,00	0,20	0,28
12	0,00	0,78	0,18	0,24
13	0,00	1,00	0,19	0,30
14	0,00	0,75	0,09	0,21
15	0,00	1,00	0,13	0,28
16	0,05	0,97	0,43	0,28
17	0,00	1,00	0,38	0,38

Figure 17: Balance Indicator score for each SDG



On average, six SDGs were prioritised under this indicator, namely, from 1st to 6th, SDG 8: Economic Growth (0.55), SDG 9 (0.47), SDG 16 (0.43), SDG 8: Decent Work (0.39), SDG 17 (0.38) and SDG 3 (0.32). Overall, the SOEs disclosed more positive than negative SDG results (see Table 8). However, as the disclosures relating to these SDGs are more balanced than the others, it implies that SOEs are disclosing a higher level of negative results when compared to the other SDGs. Nevertheless, the average scores suggest that there is still a tendency for SOEs to emphasise either positive or negative results for each SDG, rather than providing a balanced view.

SDG 8: Economic Growth was the only SDG with a score above the midpoint (0.55), indicating that the majority of Economic Growth results are balanced. On average, SOEs are disclosing a higher level of negative Economic Growth results when compared to the other SDGs. This appears justified, given that many SOEs are experiencing a decline in revenue, escalating costs, and facing challenges such as cash constraints and a lack of financing (Balbuena, 2014, Madumi, 2018, National Treasury, 2021, Vorster and Konstantinopoulos, 2020). These factors collectively contribute to an overall negative impact on their performance (National Treasury, 2021). While

there is room for improvement, SOEs are on their way to achieving a balanced account of their Economic Growth endeaveours.

The same can be said for SDG 9 (0.47). SOEs are disclosing a higher level of negative SDG 9 results when compared to the other SDGs which indicates that SOEs are recognising their infrastructure challenges (World Bank, 2023). Examples of negative SDG 9 results include discussions around ageing infrastructure and examples of positive results include upgrades or improvements to infrastructure.

Similarly for SDG 16 (0.43), SOEs are making efforts for SDG 16, out of most SDGs to present a balanced view of results. SOEs are disclosing a higher level of negative SDG 9 results when compared to the other SDGs which infers that they are acknowledging the unjust issues such as fraud and corruption with which they have been plagued (Matsiliza, 2017, Vorster and Konstantinopoulos, 2020). Examples of negative SDG 16 results include legal action taken against the SOE, the outcome of a court case, vandalism due to weak security, fines and penalties as a result of non-compliance with laws and regulations, fraud and corruption of staff. Examples of positive results include stolen assets recovered and court cases won.

SDG 8: Decent Work (0.39) ranked fourth under this indicator. SOEs are also disclosing a higher level of negative Decent Work results when compared to most other SDGs. The working environment of SOEs has been unpleasant over the years leading to industrial action and union interventions (Kikeri, 2018, Madumi, 2018, Merten, 2020, Vorster and Konstantinopoulos, 2020). SOEs are acknowledging this issue in their reports. Other examples of negative/positive results include an increase/decrease in absenteeism, injuries or fatalities, increase/decrease in salaries, jobs created, or retrenchments.

On average, there is also a relatively moderate level of balance in SDG 17 (0.38) result disclosures when compared to the other SDG BI scores. SOEs are disclosing a higher level of negative SDG 17 results when compared to most other SDGs. These results can be deemed fitting given that the connections between SOEs and all stakeholders, including partners, have become strained owing to the SOEs' shortcomings and their inability to meet public demands (Madumi, 2018, Vorster and Konstantinopoulos, 2020).

Finally, for SDG 3 (0.32), examples of positive or negative SDG 3 results include an increase/decrease in the LTIFR or high/low staff satisfaction scores. Similarly, to SDG 8: Decent Work, SOEs are somewhat disclosing the negative impacts their actions have on the well-being of individuals, such as low staff morale.

As for the other 12 SDGs with lower BI scores and rankings (ranked from 7th to 18th: SDG 6 = 0.23; SDG 1 = 0.21; SDG 11 = 0.20; SDG 13 = 0.19; SDG 10 = 0.19; SDG 12 = 0.18; SDG 4 = 0.17; SDG 7 = 0.17; SDG 5 = 0.17; SDG 15 = 0.13; SDG 14 = 0.09; SDG 2 = 0.03), SOEs are making lower efforts, compared to the other SDGs, to show a balance of negative and positive impacts. The average BI scores suggest a low level of balance reporting relating to these SDGs. On average, SOEs tend to provide minimal balanced SDG results in their reports.

SDG 2 has a notably lower score on average (0.03) and ranked last under this indicator. Referring to the BI graph in Figure 17, readers can observe that the balance of SDG 2 reporting is significantly lower than the other SDGs. On average, there is a tendency for SOEs to emphasise only positive SDG 2 results, rather than providing a balanced view. Even entities with higher scores (maximum = 0.25) have a minimal balance of results related to SDG 2.

Overall, these results highlight the need for an improved, balanced account towards the achievement of the SDGs in the annual reports, particularly regarding to least prioritised goals. Enhancing the level of balanced disclosures could improve credibility in this regard (Adams *et al*., 2020). To enhance the quality of SDG information, SOEs should strive to provide a comprehensive picture of their efforts. This includes not only highlighting successes but also addressing challenges and areas for improvement, contributing to a more transparent and credible narrative (GRI 1, 2021, National Treasury, 2022).

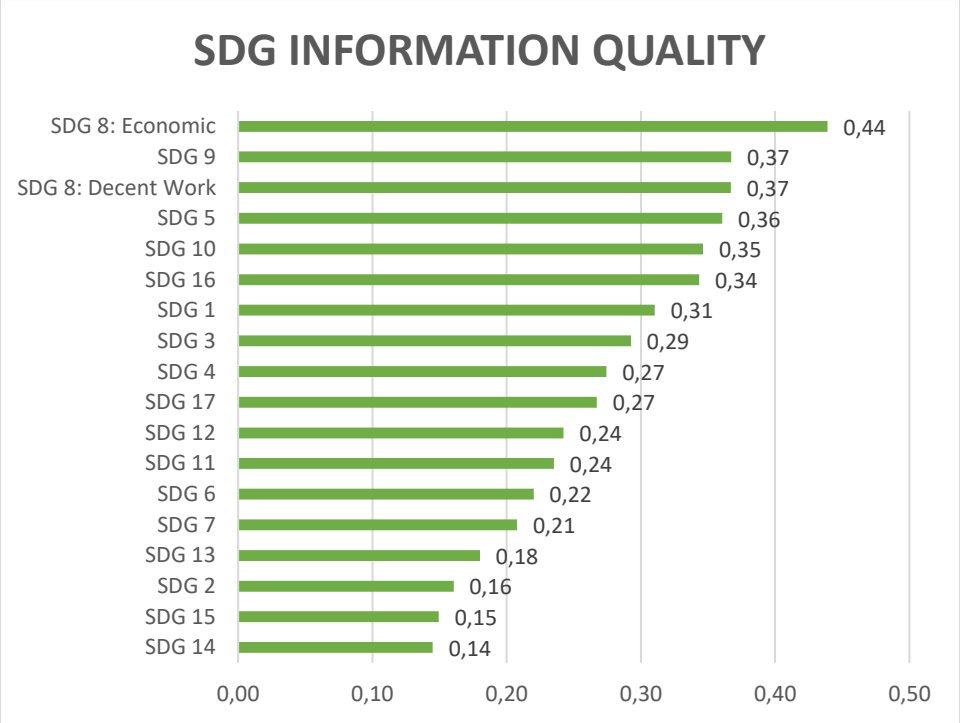
4.3.6 SDG Information Quality

Table 18: SDG Information Quality descriptive statistics for each SDG

SDG	Minimum	Maximum	Average	Std. Deviation
1	0,07	0,50	0,31	0,11
2	0,00	0,45	0,16	0,11
3	0,07	0,44	0,29	0,09
4	0,12	0,45	0,27	0,07

5	0,07	0,56	0,36	0,11
6	0,00	0,55	0,22	0,17
7	0,00	0,53	0,21	0,16
8: Decent Work	0,21	0,55	0,37	0,08
8: Economic Growth	0,30	0,57	0,44	0,07
9	0,15	0,50	0,37	0,08
10	0,17	0,54	0,35	0,08
11	0,07	0,52	0,24	0,11
12	0,03	0,44	0,24	0,10
13	0,00	0,51	0,18	0,13
14	0,00	0,51	0,14	0,14
15	0,00	0,40	0,15	0,11
16	0,23	0,52	0,34	0,08
17	0,09	0,50	0,27	0,12

Figure 18: SDG Information Quality score for each SDG



SDG 1

SDG 1 was the seventh most prioritised goal in terms of reporting quality (SDGQ) which is not similar to prior research that found SDG 1 to be placed either last or second-last (Buniamin *et al.*,

2020, Ionașcu *et al.*, 2020, Sawani *et al.*, 2023). This is probably because poverty is a key issue in South Africa and SOEs, being entities closest to society, play a pivotal role in attaining this goal (NPC, 2011). This serves as proof that the prioritisation of the SDGs is typically dependent on the specific context (Lau and Wong, 2022). However, the mean SDGQ score of 0.31 suggests that, on average, most of the SDG 1 disclosures are symbolic rather than substantive. The score is well below the maximum possible score indicating that there is much room for improvement in SDG 1 information quality.

While some quality indicator ranks for SDG 1 indicate a moderate level of SDG information quality, there is an opportunity for improvement, particularly in areas where individual quality indicators contribute negatively to the composite score. These results suggest that SOEs need to focus on enhancing the volume of their SDG 1 information to enhance the overall SDGQ score. The low average density score (0.03) suggests that there is room for improvement in incorporating more content related to SDG 1. Poverty eradication is a significant aspect of an SOE's social responsibility, particularly in South Africa, and stakeholders might expect more comprehensive reporting in this regard (Kikeri, 2018). An example of SDG 1 information is provided in Figure 19.

Figure 19: SDG 1 disclosure example

Socio-Economic Development

In line with Rand Water's Socio-Economic Development (SED) imperatives, there are projects that contributed to the surrounding communities. The projects contributed in this reporting period are Vlakfontein Reservoir construction project, S4 Pipeline project and Mapleton Upgrade project. Four hundred and seventy four (474) communities were employed to work in these communities, and 47 sub-contractors were hired. The total amount spent amounted to R28,2 million, which is value created for these communities.

Number of people employed from surrounding communities	474
Total spend to date	R 28,2 million
Number of sub-contractors from the surrounding communities	47

Source: Rand Water report (2022)

SDG 2

SDG 2 ranked third-last in terms of SDG information quality. Hunger is also a key issue in South Africa and SOEs, especially those part of the agriculture sector such as the Land Bank, play a vital role in achieving this goal (Department of Agriculture Land Reform & Rural Development, 2022, Mkhize *et al.*, 2023). The mean score of 0.16 is low and suggests that most of the SDG 2

disclosures are symbolic rather than substantive. The score is well below the maximum possible score, indicating that there is much room for improvement in SDG 2 information quality.

For SDG 2 information quality, there is also an opportunity for improvement, particularly in the Balance, Performance, and Density indicators. These results suggest that SOEs need to focus on enhancing the comparability, and balance of their SDG 2 information to enhance overall the SDGQ score. These improvements will reflect the direction towards achieving zero hunger in South Africa. Figures 20 and 21 provide examples of SDG 2 disclosures.

Figure 20: SDG 2 disclosure example

INDICATOR	MEASUREMENT	FRUITS			VEGETABLES	GRAINS, OILSEEDS AND INDUSTRIAL					ANIMALS AND PRODUCTS		
		Citrus	Deciduous	Sub-tropical		Maize	Wheat	Soy-bean	Sugar	Cnnabis	Beef	Poultry	Sheep and Goat
MICRO-ECONOMIC	Value (R billion in 2018)	19	12	5	25	37	8	8	14	15	44	48	8
	Production Growth (% pa:2008-18)	1.5%	0.7%	0.8%	0.1%	-0.2%	-0.1%	2%	0%	N/a	2.3%	3%	2.8%
	Investment Attractiveness Index	High Margin	High Margin	High Margin	Low Margin	Low Margin	Low Margin	Moderate Margin	Moderate Margin	High Margin	Moderate Margin	Low Margin	Moderate Margin
TARDE	Trade Balance (Value)	Net Exporter	Net Exporter	Net Exporter	Net Exporter	Net Exporter	Net Importer	Net Importer	Net Exporter	Net Exporter	Net Exporter	Net Importer	Net Importer
	Export Value Growth (% pa:2009-19)	9%	6%	7%	16%	3%	-17%	-25%	3%	17%	18%	10%	7%
NATIONAL INTEREST	Labour intensity (job/hectare)	1.3	1.1	2.0	2.25	0.03	0.04	0.05	0.2	2	0.06	0.03	0.08
	Food Security (Weight in SA Food Basket)	2	2	2	3	5	4	1	3	1	3	4	3
	Agro-processing (Economic Multiplier)	0.49	0.45	0.40	0.68	0.88	0.88	0.71	0.47	0.8	0.58	0.53	0.56
LEGENDS		Good				Sub-Optimal					Poor		

Source: Land Bank report (2022)

Figure 21: SDG 2 disclosure example

Table 58: 2022 EV programmes and impacts

Initiative: Food security	Value: R2 000 000
Location: Glencoe and Warrenton	Transnet identified food insecurity, hunger and poverty key challenges in communities where we operate, because they could lead to heightened crime and high levels of anti-social behaviour.
Developed a business concept and currently rolling out two food farms in Warrenton and Glencoe to address the socio-economic need of food security and its impact on the local community. Both sites are identified as Transnet hotspots. Intervention is aimed at providing a sustainable social solution through the provision of food as well as a sustainable economic solution through economising the produce from the food farms. A total of 150 households are targeted in Glencoe. These are all tenants in Transnet properties. In Warrenton a total of 50 households are targeted. Two strategic partnerships will be entered into with two NGOS to operate the food farms.	

Source: Transnet report (2022)

SDG 3

SDG 3 was the eighth most prioritised goal in terms of reporting quality, which is not consistent with prior research that found companies to prioritise SDG 3 more (Buniamin *et al.*, 2020, Lau and Wong, 2022, Sawani *et al.*, 2023). The reason for this could be that there are no sampled SOEs in the healthcare sector. The mean score of 0.29 suggests that, on average, most of the SDG 3 disclosures are symbolic rather than substantive. In summary, while the MI and PI scores for SDG 3 indicate a moderate level of SDG information quality, there is an opportunity for improvement as well as for the other indicators. Figures 22 and 23 provide examples of SDG 3 disclosures.

Figure 22: SDG 3 disclosure example

	FY2018	FY2019	FY2020	FY2021	FY2022
Telkom[1,2]					
Total recordable injury frequency rate	1.39	1.24	0.93	0.76	0.79
Lost-time injury frequency rate	1.18	0.98	0.68	0.56	0.70
Fatal injury frequency rate	0.02	0.02	-	0.01	-

Source: Telkom report (2022)

Figure 23: SDG 3 disclosure example

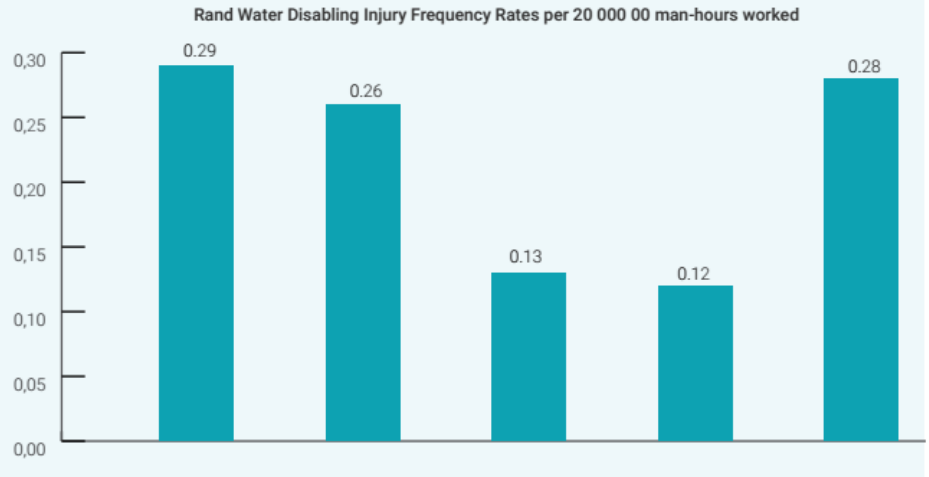


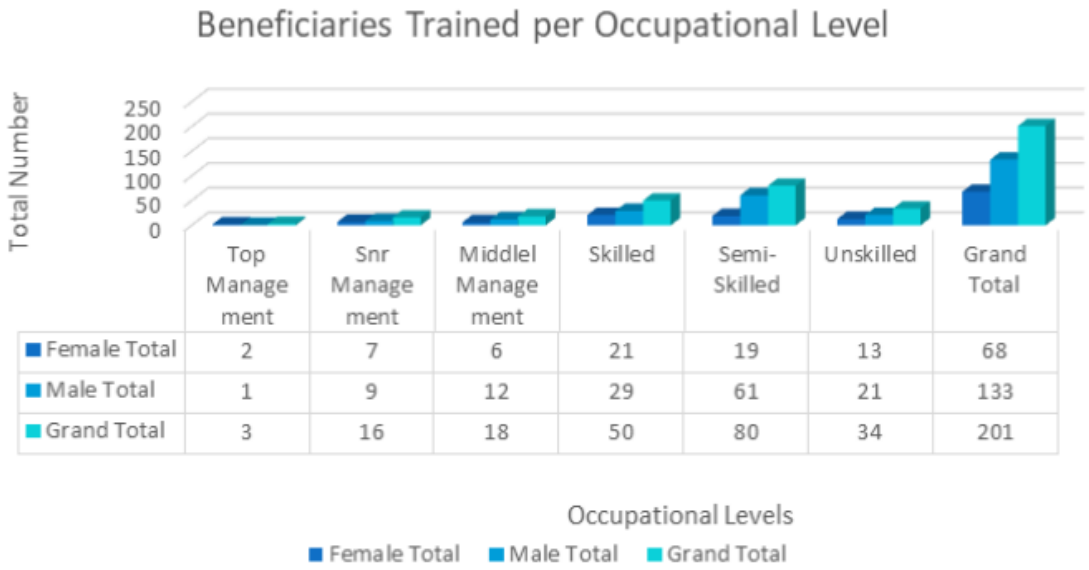
Figure 10: Rand Water Five-Year DIFR Comparison

Source: Rand Water report (2022)

SDG 4

SDG 4 was the ninth most prioritised goal in terms of reporting quality which is similar to prior research (Ionașcu *et al.*, 2020). The mean score of 0.27 suggests that, on average, most of the SDG 4 disclosures are symbolic rather than substantive. Similarly for SDG 3, while the MI and PI scores for SDG 4 indicate a moderate level of SDG information quality, there is an opportunity for improvement. Figures 24 and 25 provide examples of SDG 4 disclosures.

Figure 24: SDG 4 disclosure example



	Top Management	Snr Management	Middle Management	Skilled	Semi-Skilled	Unskilled	Grand Total
Female Total	2	7	6	21	19	13	68
Male Total	1	9	12	29	61	21	133
Grand Total	3	16	18	50	80	34	201

Source: Bloem Water report (2022)

Figure 25: SDG 4 disclosure example

EDUCATION

	2022	2021	2020	2019	2018
New schools built	1	11	4	8	8
Schools refurbished	104	51	110	107	128
New ventilated improved pit (VIP) latrines at schools	237	68	–	–	–
Water, sanitation, fencing and modular structure at schools	6	–	–	–	–

Outcomes

	2022	2021
Learners benefitting from refurbished schools	56 958	33 125
Learners benefitting from newly built schools	931	6 909
Learners benefitting from new ventilated pit latrines	77 585	16 042
Learners benefitting from water, sanitation, fencing and modular structure at schools	491	–

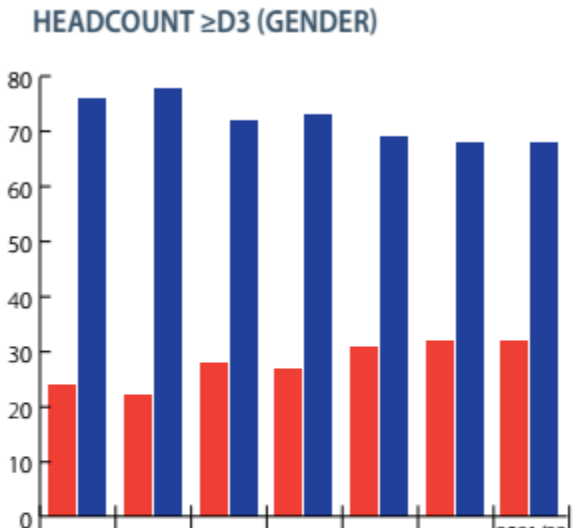
Source: DBSA report (2022)

SDG 5

SDG 5 was the fourth most prioritised goal in terms of reporting quality. Which is not similar to prior research that ranked this goal much lower (Ali *et al.*, 2018, Buniamin *et al.*, 2020, Erin and Bamigboye, 2021, Ionașcu *et al.*, 2020, Lau and Wong, 2022). SOEs are prioritising this goal overall, moving in the direction of achieving gender equality. Nevertheless, the mean score of 0.36 suggests that, on average, most of the SDG 5 disclosures are symbolic rather than substantive.

In summary, while the DI and BI scores for SDG 5 indicate a low level of SDG information quality, SOEs are performing well overall, especially in disclosing performance-related and quantifiable SDG 5 information. This performance reflects the direction towards achieving gender equality in South Africa. An example of SDG 5 information is presented in Figure 26.

Figure 26: SDG 5 disclosure example



	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22 March
Female	24%	22%	28%	27%	31%	32%	32%
Male	76%	78%	72%	73%	69%	68%	68%
Headcount (Female)	39	34	43	41	42	44	41
Headcount (Male)	122	123	113	113	94	93	88

Source: Necsa report (2022)

SDG 6

SDG 6 ranked 13th in terms of SDG information quality which is consistent with prior research (Ali *et al.*, 2018, Buniamin *et al.*, 2020, Hummel and Szekely, 2022, Lau and Wong, 2022, Sawani *et al.*, 2023). However, this low rank was unexpected as there are nine water utilities in the sample. Further, SOEs are vital for delivering key social services, including water and sanitation, to all citizens (Kikeri, 2018). The mean score of 0.22 is thus low within a South African context and suggests that most of the SDG 6 disclosures are symbolic rather than substantive. The score is also well below the maximum possible score indicating that there is much room for improvement in SDG 6 information quality.

These results suggest that SOEs need to focus on enhancing the relevance of their SDG 6 information to enhance overall the SDGQ score. SOEs are important for ensuring quality service delivery in the water sector, thus this goal is important for them to prioritise (Government Communication and Information System, 2016, Kikeri, 2018). These improvements in corporate reporting will reflect the direction towards achieving SDG 6 in South Africa. Figure 27 provides an example of SDG 6 information.

Figure 27: SDG 6 disclosure example

Table 17: Organisational Efficiency and Effectiveness against Pre-Determined Objectives

Strategic objective	Key performance indicator	Annual target	Annual Actual performance	Variance
To provide quality potable water	Acute health risk ≥97	Acute health microbi-ological risk ≥97	99.98%	2.98%
	Acute health ≥97%	Acute health chemical risk ≥97%	99.96%	2.96%
	Chronic health chemical risk ≥95%	Chronic health chemi-cal risk ≥95%	98.19%	3.19 %
	Operational risk ≥93%	Operational Risk ≥93%	96.96%	3.96%
	Aesthetic risk ≥ 93%	Aesthetic risk ≥ 93%	99.53%	6.53%
To provide reliable and sustainable water services to customers	Avoidable water lost as a percentage of water produced at plants	Plants: ≤5%	5.50%	0.5%
	Avoidable water lost as a percentage of water distributed	Distribution: ≤6%	5.78%	0.22%
	Number of incidents of continuous service interruption exceeding 48 hours	≤4 Incidents	1	3

Source: Magalies Water report (2022)

SDG 7

SDG 7 ranked 14th in terms of SDG information quality which is consistent with Ali *et al.* (2018) in a South African context. The mean score of 0.21 is low and suggests that most of the SDG 7 disclosures are symbolic rather than substantive. In South Africa, SOEs are considered a crucial mechanism for achieving service delivery in key sectors, including energy (Ackers, 2022, Fourie, 2014). South Africa is currently experiencing an energy crisis and SOEs, especially those part of the energy and public utility sectors such as Eskom, play a vital role in achieving this goal (Chigudu, 2020, World Bank, 2023). This score is thus well below satisfactory within a South African context, indicating that there is much room for improvement in SDG 7 information quality.

These results suggest that SOEs need to focus on enhancing the balance and relevance of their SDG 7 information to enhance overall the SDGQ score. Given the current electricity supply shortages in South Africa, ensuring access to affordable and reliable energy is ever more important. It is thus imperative for SOEs to engage in energy conservation and transition to the utilisation of renewable energy as a fundamental responsibility to safeguard the environment in which they operate (IIRC, 2017, World Bank, 2023). Additionally, it is crucial for SOEs to effectively communicate these endeavours to stakeholders; elevating the quality of SDG 7 information will signify progress toward the realisation of SDG 7 in South Africa. Figure 28 presents an example of SDG 7 information.

Figure 28: SDG 7 disclosure example



Source: IDC report (2022)

SDG 8: Decent Work

SDG 8: Decent Work was the third most prioritised goal in terms of information quality, moving in the direction of achieving Decent Work. Nevertheless, the mean score of 0.37 suggests that, on average, most of the Decent Work disclosures are symbolic rather than substantive.

The RI (0.21) has a notably lower score on average, negatively impacting the overall SDGQ score. However, the PI (0.60) has a higher score, contributing positively to the overall SDGQ score. These results suggest that SOEs need to focus on enhancing the relevance of their Decent Work information to enhance overall the SDGQ score. In summary, while the Relevance Indicator score for Decent Work indicates a lower level of SDG information quality, SOEs are performing well overall compared to the other SDGs, especially in disclosing performance-related Decent Work information. This reflects the direction towards achieving Decent Work in South Africa. Figures 29 and 30 provide examples of SDG 8: Decent Work disclosures.

Figure 29: Decent Work disclosure example

NR	OW Strategic Goal	OW Strategic Objective	Performance perspective	Unit of Measure	Annual Target	Actual	Prior year Actual	Variance	Comment	Reasons for variance and corrective measures
					2021/22	2021/22	2020/21	2021/22	2021/22	
37.	IMPROVE AND INCREASE REVENUE AND MANAGE COST DRIVERS	4,3	Percentage of annual staff turnover	%	10%	58,7%	5%	48,7%	Not Achieved	Due to the target being too low
38.		4,2	Number of learnerships implemented to increase skill and capacity building	Number	5	4	2	-1	Partially Achieved	At yearend 1 intern contract ended
39.		4,2	Number of training programmes/ workshops conducted for staff members	Number	10	13	3	3	Over-Achieved	All trainings was conducted through implementation of the Enterprise Reporting Program (ERP) system. Training was conducted in Supply Chain, Payroll, Billing and Finance
40.		4,1	Number of ERP systems going live	Number	1	1	0	0	Achieved	The Entity has started working on the following modules: Finance, SCM, HR and Billing has gone live

Source: Overberg Water report (2022)

Figure 30: Decent Work disclosure example

To date, the PIC's investment in the transport and logistics sector facilitated 9 883 jobs, 80% of which (7 992) are permanent. Of the total, 1 780 are women, 1 426 of whom are black.

INVESTEE COMPANY	TOTAL JOBS	PERMANENT	TEMPORARY	MEN	WOMEN	BLACK MEN	WHITE MEN	FOREIGN MEN	BLACK WOMEN	WHITE WOMEN	FOREIGN WOMEN	BEE LEVEL
Trans-African Concessions	616	581	35	216	400	135	14	67	281	20	99	2
Lanseria Holdings	296	242	54	205	91	173	29	3	84	7	-	2
RTT Holdings	6 929	6 208	721	6 172	757	5 885	281	6	550	203	4	2
N3 Toll Concession	1 796	724	1 072	1 342	454	1 270	72	-	443	11	-	N/A
Zamalwandle Transport Logistics	90	130	-	115	15	111	1	3	10	4	1	7
Bakwena Platinum Corridor Concessionaire	116	107	9	53	63	40	11	2	58	5	-	3
TOTAL	9 883	7 992	1 891	8 103	1 780	7 614	408	81	1 426	250	104	

Source: PIC report (2022)

SDG 8: Economic Growth

SDG 8: Economic Growth was the most prioritised goal in terms of information quality. SOEs are prioritising this goal overall, moving in the direction of achieving Economic Growth. The reason for this ranking and score is consistent with the explanation provided for the DI score mentioned above. It appears justified that Economic Growth emerged as the most prioritised SDG. However, the mean score of 0.44 suggests that, on average, most of the disclosures are symbolic rather than substantive.

In summary, while the Density Indicator score for Economic Growth indicates a lower level of SDG information quality, SOEs are performing well overall compared to the other SDGs, especially in disclosing balanced and relevant Economic Growth information. While it must also be noted that the quantifiability of the disclosures can be improved, this prioritisation aligns with the trajectory towards achieving Economic Growth in South Africa. Figure 31 provides an example of SDG 8: Economic Growth information.

Figure 31: Economic Growth disclosure example

Outcomes	Output	Outputs Indicator	Audited 2020/21 Achieve-ment	Planned Annual Target	Actual Achieve-ment	Variance	Reasons for Variance
Improve SMMEs and Cooperatives growth through the development of competitive local products and services with access to local and international markets	Facilitate Busi-ness develop-ment through ecosystem support	Number of SMMEs & Cooperatives assisted through the ecosystem	Not mon-itored in 20/21	70 000	52 830	17 170	The number of clients supported by ecosystem partners were below the anticipated performance.
	Improve stakeholder management	Percentage of Identified Stakeholders participating in the Ecosystem	Not mon-itored in 20/21	75%	100%	25%	All stakeholders that were identified participated in the ecosystem support
	Improve SMMEs and Cooperatives competitive-ness	Number of SMMEs and Cooperatives whose turnover has increased	Not mon-itored in 2020/21	2 783	2990	207	Some of the supported businesses showed an improvement in their business turnover.
	Facilitate sector specific support	Number of SMMEs and Cooperatives supported in the manufacturing sector	Not mon-itored in 20/21	2 783	9 839	7 056	There was a great demand expressed by clients in the manufacturing sector and the organisation provided more interventions to these clients.
		Number of SMMEs and Cooperatives supported through sector specific training	Not mon-itored in 20/21	2 783	4 692	1 909	A number of clients were offered training based on their needs which was relevant to their sector.
		Number of SMMEs and Cooperatives supported enterprise coaching	Not mon-itored in 20/21	2 783	2 794	11	The target was marginally achieved because the coaching and mentorship takes longer compared to other interventions.

Source: Ntsika report (2022)

SDG 9

SDG 9 was the second most prioritised goal in terms of information quality. SOEs are prioritising this goal overall, indicating a high commitment by SOEs to provide better infrastructure to the country (Sawani *et al.*, 2023). Nevertheless, the mean score of 0.37 suggests that, on average, most of the disclosures are symbolic rather than substantive.

While the RI score for SDG 9 indicates a lower level of SDG information quality, SOEs are performing well overall compared to the other SDGs, especially in disclosing balanced SDG 9 information. These results suggest that SOEs need to focus on enhancing the relevance of their SDG 9 information to enhance the overall SDGQ score. Similarly to SDG 8, while the quantifiability

of the disclosures can also be improved, this performance reflects the direction towards achieving SDG 9 in South Africa. Figures 32 and 33 provide examples of SDG 9 disclosures.

Figure 32: SDG 9 disclosure example

Table 2: Mintek Performance - Foster industry establishment and expansion

Key Performance Indicator	Target 2021/22	Performance 2021/22
No. of prototypes, processes and/or models demonstrated/validated in a relevant environment	20	14
Income from the sale of products & services, royalties and licences, (Rm)	108.78	142.17
No. of IP Licences	1	0
No. of certified reference materials	6	6
No. of accredited methods	19	17

Source: Mintek report (2022)

Figure 33: SDG 9 disclosure example

2. BULK WATER SERVICES INFRASTRUCTURE PLANNING AND DEVELOPMENT

Key Performance Area	Key Performance Indicator	Target 2021/22	Actual	Achieved/ Not Achieved	Reasons for non-achievement	Remedial Action
2.1. Expansion and renewal of infrastructure	2.1.1. Average % completion of LNW infrastructure projects per approved project execution plan	75%	89,8%	☺		
	2.1.2. Average % completion of ministerial directives per approved project execution plan	65%	66,2%	☺		
	2.1.3. Actual Capex spend on expansion-related projects as % of budget (initiative by the Minister)	65%	74,0%	☺		
	2.1.4. Overall % project completion dates within targets	N/A	N/A	N/A	N/A	N/A

Source: Lepelle Water report (2022)

SDG 10

SDG 10 was the fifth most prioritised goal in terms of reporting quality. SOEs are prioritising this goal overall, moving in the direction of achieving Reduced Inequalities. However, the mean score of 0.35 suggests that, on average, most of the SDG 10 disclosures are symbolic rather than substantive.

SOEs serve as pivotal entities in ensuring equity through access and the quality of social services for all citizens (Kikeri, 2018). While the DI and BI scores for SDG 10 indicate a low level of SDG information quality, SOEs are performing well overall, especially in disclosing performance-related and quantifiable SDG 10 information, thus overall contributing toward high-quality SDG 10 information. These results suggest that SOEs need to focus on enhancing the volume, relevance, and balance of their SDG 10 information to enhance the overall SDGQ score. Figure 34 provides an example of SDG 10 information.

Figure 34: SDG 10 disclosure example

Employees Living with Disabilities – Race and Gender

The representation of employees with a disability is 1.79%, as opposed to a target of 2.55%. The recruitment of employees with disabilities remains a challenge.

2021/2022	Employees with Disabilities			
Levels	Male		Female	
	Current	Target	Current	Target
Top management	0	1	1	0
Senior management	0	1	1	1
Professionally qualified and experienced specialists and mid-management	0	1	0	1
Skilled technical and academically qualified workers, junior management, supervisors, foremen, and superintendents	2	1	0	1
Semi-skilled and discretionary decision making	3	1	0	0
Unskilled and defined decision making	0	2	0	0
TOTAL	5	7	2	3

Source: Bloem Water report (2022)

SDG 11

SDG 11 ranked 12th in terms of SDG information quality. This is not similar to prior research that found SDG 11 to score higher (Ionașcu *et al.*, 2020, Sawani *et al.*, 2023). The mean score of 0.24 is low and suggests that most of the SDG 11 disclosures are symbolic rather than substantive.

Acting as catalytic and strategic instruments, SOEs in South Africa play a vital role in urban development, making them essential contributors to the state's progress (Chigudu, 2020, Ovens, 2016). This score (0.24) is thus well below satisfactory within a South African context. There is much room for improvement in SDG 11 information quality.

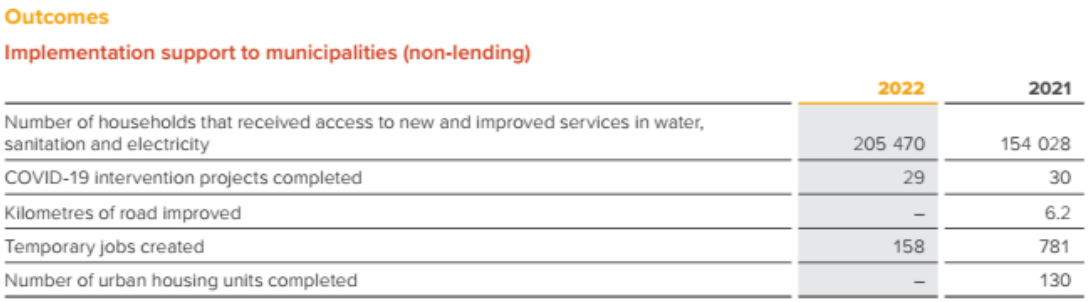
In summary, while the MI score for SDG 11 moderately contributed to a higher level of SDG information quality, there is opportunity for improvement, as well as for the other indicators. These results suggest that SOEs need to focus on enhancing the volume and relevance of their SDG 11 information to enhance the overall SDGQ score. These improvements in corporate reporting will reflect the direction towards achieving SDG 11 in South Africa. Figures 35 and 36 present examples of SDG 11 disclosures.

Figure 35: SDG 11 disclosure example

Performance objective	Outcome/Impact	Key performance indicator	Actual audited performance outcome 2020/21	Annual target 2021/22	Annual result 2021/22	Variance
Bulk supply agreements concluded with municipalities/ other customers	Statutory and service level agreements in place	Total number of signed contracts with municipalities/Other customers (bulk supply agreements) in place during the period of review	3	4	3	-1
Implementation of Ministerial directives	New Ministerial directives issued are implemented on time	Percentage progress against Ministerial Directives implementation plan	122.8%	100%	99%	-1%
Support rural development	Total number of identified rural municipalities supported	Number of signed contracts/MOUs in place with rural Municipalities for the provision of support i.r.o. rural development initiatives	5	4	5	+1

Source: Amatola Water report (2022)

Figure 36: SDG 11 disclosure example



Outcomes

Implementation support to municipalities (non-lending)

	2022	2021
Number of households that received access to new and improved services in water, sanitation and electricity	205 470	154 028
COVID-19 intervention projects completed	29	30
Kilometres of road improved	–	6.2
Temporary jobs created	158	781
Number of urban housing units completed	–	130

Source: DBSA report (2022)

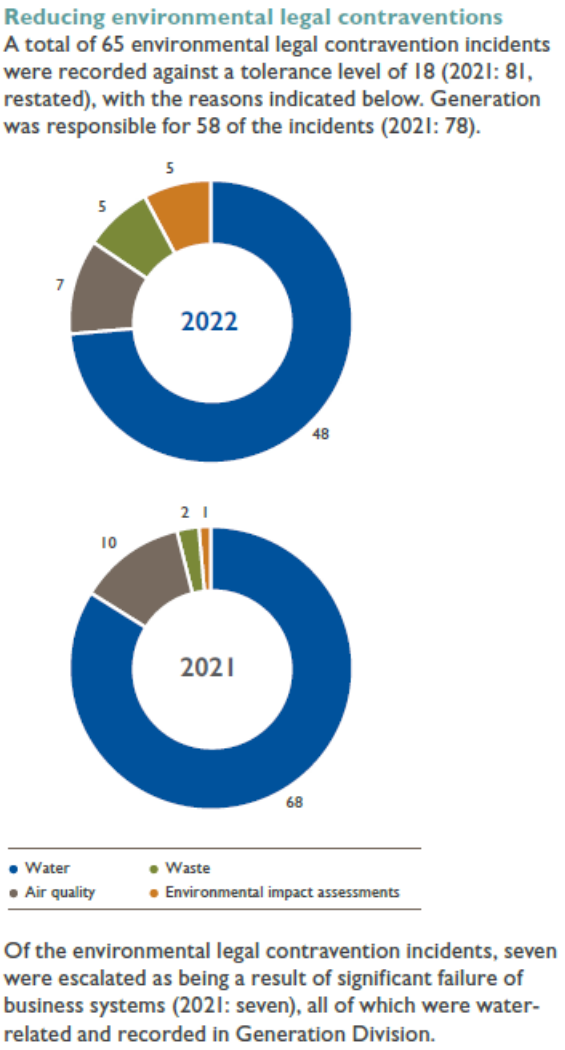
SDG 12

SDG 12 ranked 11th in terms of SDG information quality which is consistent with prior research in a South African context (Ali *et al.*, 2018) but not in terms of other studies in the public sector (Sawani *et al.*, 2023). This might be because South Africa has more pressing issues to address than focusing on environmental stewardship, such as poverty, unemployment and inequality (StatsSA, 2019). Nevertheless, this does not imply that disclosing environmental information is deemed unimportant. South African SOEs represent some of the largest entities in the country, and their impact on the environment is undeniable (Mikulcak *et al.*, 2015). A notable illustration is Eskom, which has emerged as the leading emitter of sulphur dioxide globally, surpassing the cumulative emissions of the power sectors of nearly all countries worldwide, with the exception of India (CREA, 2021).

The mean score of 0.24 is low and suggests that most of the SDG 12 disclosures are symbolic rather than substantive. The score is well below the maximum possible score indicating that there is much room for improvement in SDG 12 information quality.

While the PI score for SDG 12 contributed moderately to a higher level of SDG information quality, there is opportunity for improvement, as well as for the other indicators. These results suggest that SOEs need to focus on enhancing the balance, and relevance of their SDG 12 information to enhance the overall SDGQ score. The imperative to preserve the environment and natural resources has intensified for major entities like SOEs. While the SDGQ score might suggest that policies are implemented to oversee natural resource management, disclosures concerning SDG 12 remain notably low. Figure 37 provides an example of SDG 12 information.

Figure 37: SDG 12 disclosure example



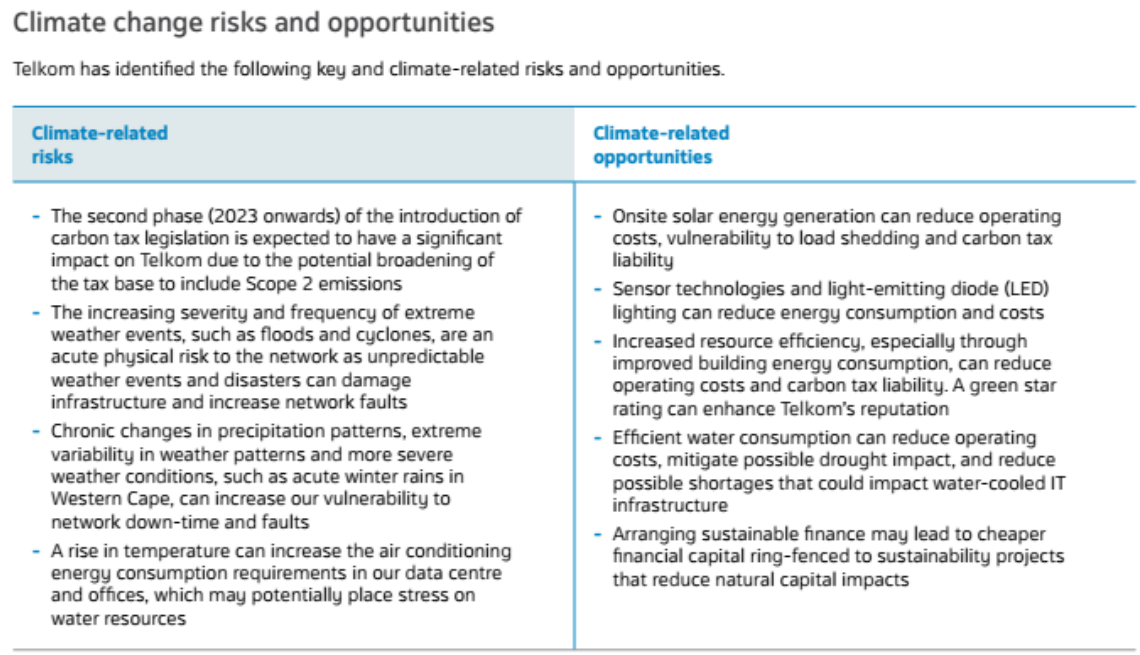
Source: Eskom report (2022)

SDG 13

SDG 13 ranked 15th in terms of SDG information quality. The mean score of 0.18 is very low and suggests that most of the SDG 13 disclosures are symbolic rather than substantive. The environmental impact of SOEs in South Africa is substantial, as their expansive operations, such as Eskom's reliance on coal and ACSA's need for air cleanliness, necessitate significant environmental resources (Matsiliza, 2017). Similarly to SDG 12, this SDGQ score is thus well below satisfactory within a South African Context.

In summary, while the MI score for SDG 13 contributed moderately to a higher level of SDG information quality, there is opportunity for improvement, as well as for the other indicators. These results suggest that SOEs need to focus on enhancing the balance, and relevance of their SDG 13 information to enhance the overall SDGQ score. These improvements will reflect the direction towards mitigating climate change. Figures 38 and 39 provide examples of SDG 13 disclosures.

Figure 38: SDG 13 disclosure example



Climate change risks and opportunities

Telkom has identified the following key and climate-related risks and opportunities.

Climate-related risks	Climate-related opportunities
- The second phase (2023 onwards) of the introduction of carbon tax legislation is expected to have a significant impact on Telkom due to the potential broadening of the tax base to include Scope 2 emissions - The increasing severity and frequency of extreme weather events, such as floods and cyclones, are an acute physical risk to the network as unpredictable weather events and disasters can damage infrastructure and increase network faults - Chronic changes in precipitation patterns, extreme variability in weather patterns and more severe weather conditions, such as acute winter rains in Western Cape, can increase our vulnerability to network down-time and faults - A rise in temperature can increase the air conditioning energy consumption requirements in our data centre and offices, which may potentially place stress on water resources	- Onsite solar energy generation can reduce operating costs, vulnerability to load shedding and carbon tax liability - Sensor technologies and light-emitting diode (LED) lighting can reduce energy consumption and costs - Increased resource efficiency, especially through improved building energy consumption, can reduce operating costs and carbon tax liability. A green star rating can enhance Telkom's reputation - Efficient water consumption can reduce operating costs, mitigate possible drought impact, and reduce possible shortages that could impact water-cooled IT infrastructure - Arranging sustainable finance may lead to cheaper financial capital ring-fenced to sustainability projects that reduce natural capital impacts

Source: Telkom report (2022)

Figure 39: SDG 13 disclosure example

EMISSION TYPE	ACTIVITY	TONS OF CO2 EQUIVALENTS PER ACTIVITY				
		2018	2019	2020	2021	2022
Direct (Scope 1)	Combustion: Generators, Cars, boats & Mobile Plant Methane from Anaerobic wastewater treatment	2 071	2 303	2 112	1 442	1 066
		1 434	1 401	132	1 182	-
Indirect (Scope 2)	Electricity	153 076	143 332	142 166	123 228	15 752 648
Indirect (Scope 3)	Travel: Air & Car Hire	2 494	425	327	305	-
TOTAL		159 075	147 461	144 738	126 157	15 753 714

Source: Umgeni Water report (2022)

SDG 14 and 15

These SDGs relate to biodiversity and are part of the natural capital of organisations (GRI & UN Global Impact, 2022, Adams, 2017). SDG 14 and 15 ranked last and second-last respectively, in terms of SDG information quality. The mean scores of 0.14 (SDG 14) and 0.15 (SDG 15) are very low and suggest that most of the disclosures are symbolic rather than substantive. This score and the ranking are consistent with prior research within a South African, private sector, and public sector context (Ali *et al.*, 2018, Buniamin *et al.*, 2020, Lau and Wong, 2022, Sawani *et al.*, 2023). SOE operations have a direct impact on our biodiversity in South Africa. For example, Necsa deals with toxic nuclear waste that needs to be safely disposed to conserve the land and water (Necsa, 2023). SOEs like SAFCOL or OBP are interested in land, health of animals and agriculture. The SDGQ scores are thus considered low within a South African context. The results suggest the need for an improvement in SDG 14 and 15 information quality.

While the MI score for SDG 14 and 15 contributed moderately to a higher level of SDG information quality, there is an opportunity for improvement, as well as for the other indicators which all have low scores, bringing down the SDGQ. Many SOEs scored 0 under each quality element. These results suggest that SOEs need to focus on enhancing the relevance, balance, and comparability of their SDG 14 and 15 information to enhance overall the SDGQ score. Figures 40 and 41 provide examples of SDG 14 and 15 disclosures.

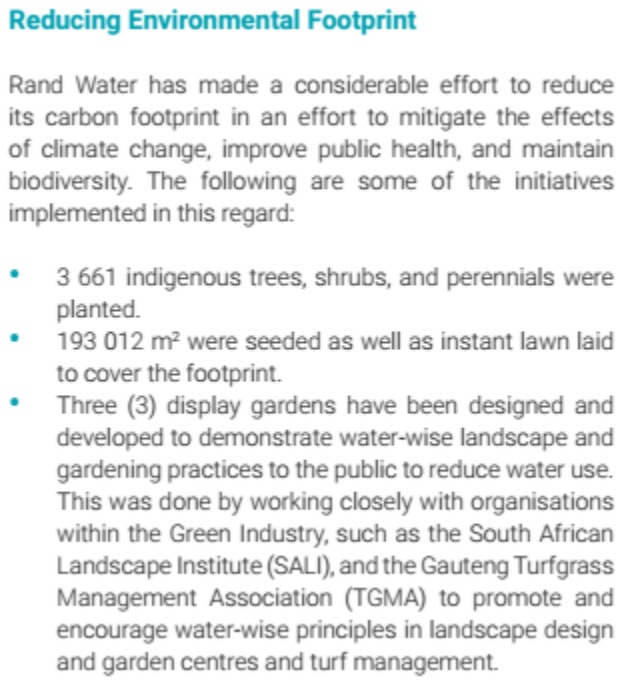
Figure 40: SDG 14 disclosure example

Table 21: The key performance indicators for liquid effluent treatment at LEMS for the period 2021/22

KEY PERFORMANCE AREA	TARGET	ACTUAL
Limit environmental Impact	Annual dose ≤ 150 µSv	**2.878 µSv (1.91%)**
All releases to Crocodile River authorised and within regulatory requirements	100% Authorised releases	**100%**
Limit effluent releases to the Crocodile River	Total annual releases ≤ 250 000 m^3	**94676 m^3 (37.87%)**
Zero downtime to Customers	100% Plant availability	**100% (365 days)**

Source: Necsa report (2022)

Figure 41: SDG 15 disclosure example



Reducing Environmental Footprint

Rand Water has made a considerable effort to reduce its carbon footprint in an effort to mitigate the effects of climate change, improve public health, and maintain biodiversity. The following are some of the initiatives implemented in this regard:

- 3 661 indigenous trees, shrubs, and perennials were planted.
- 193 012 m² were seeded as well as instant lawn laid to cover the footprint.
- Three (3) display gardens have been designed and developed to demonstrate water-wise landscape and gardening practices to the public to reduce water use. This was done by working closely with organisations within the Green Industry, such as the South African Landscape Institute (SALI), and the Gauteng Turfgrass Management Association (TGMA) to promote and encourage water-wise principles in landscape design and garden centres and turf management.

Source: Rand Water report (2022)

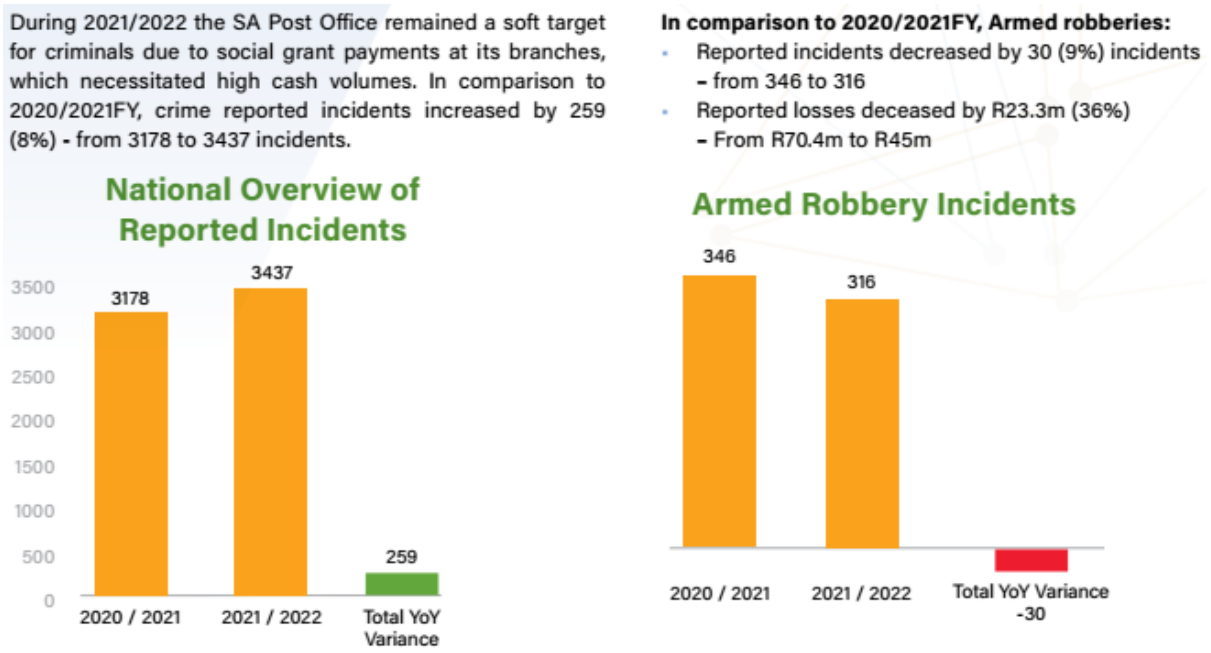
SDG 16

This goal was the sixth most prioritised goal in terms of SDG information quality. This is consistent with Sawani *et al.* (2023), in a public sector context but not consistent with Ali *et al.* (2018) in a South African context which found SDG 16 to be the most prioritised goal. The reason for this inconsistency is primarily due to the Relevance Indicator score for SDG 16 in this study (0.10). The RI score is very low and negatively contributed towards the overall SDGQ. The mean score of 0.34 suggests that, on average, most of the disclosures are symbolic rather than substantive.

In summary, while the DI and BI scores for SDG 16 contributed moderately to a higher level of SDG information quality, there is an opportunity for improvement, as well as for the other indicators. The results suggest that SOEs need to focus on enhancing the relevance of their SDG 16 information to enhance the overall SDGQ score. SOEs in South Africa have been plagued with fraud, corruption, accountability issues which have undermined their prospects for being peaceful, just and strong (Matsiliza, 2017, Vorster and Konstantinopoulos, 2020). By enhancing their transparency and accountability through better quality SDG 16 disclosures, SOEs can begin to

move in the direction of achieving SDG 16. Figures 42 and 43 provide examples of SDG 16 disclosures.

Figure 42: SDG 16 disclosure example



Source: SAPO report (2022)

Figure 43: SDG 16 disclosure example

Performance objective	Outcome/Impact	Key performance indicator	Actual audited performance outcome 2020/21	Annual target 2021/22	Annual result 2021/22	Variance
Board effectiveness	Improved performance of fiduciary duties/ governance	Percentage of board member attendance of all Board/committee meetings	94.62%	80%	90.46%	+10.46%
Effective internal controls and risk management	Internal audit findings dealt with	Number of repeats internal audit findings	6	5	6	-1
		Number of unresolved internal audit findings	8	10	15	-5
Good governance	Improved controls and risk mitigation	Number of breaches of materiality and significance framework	2	5	11	-6
Corporate social responsibility initiatives	Good corporate citizenship	Number of community/ schools initiatives undertaken	17	14	44	+30

Source: Amatola Water report (2022)

SDG 17

SDG 17 was the tenth most prioritised goal in terms of reporting quality. Recognising the pivotal role of partnerships in the success of the SDGs and South Africa's NDP agendas, it is imperative for South Africa to not only establish but also sustain functional partnerships (Haywood *et al.*, 2019). The mean score of 0.27 suggests that, on average, most of the SDG 17 disclosures are symbolic rather than substantive. This score is well below satisfactory within a South African context. There is much room for improvement in SDG 17 information quality.

In terms of governmental partnerships, which include SOEs, in South Africa, Haywood *et al.* (2019) highlights some of key challenges. These challenges encompass a scarcity of partnerships within and between the national, provincial, and local levels of government, as well as between the government and various actors crucial for SDG achievement (Haywood *et al*., 2019). The government is also confronted with difficulties in developing the necessary mechanisms and expertise to establish such partnerships (ibid.). These remarks reflect the findings of this study, due to the low SDGQ score (0.27) and ranking for SDG 17.

While the MI and BI scores for SDG 17 moderately contributed to a higher level of SDG information quality, there is an opportunity for improvement, as well as for the other indicators. The results suggest that SOEs need to focus on enhancing the relevance of their SDG 17 information to enhance overall the SDGQ score. These improvements in corporate reporting will reflect the direction towards achieving SDG 17 in South Africa. Figures 44 and 45 present examples of SDG 17 disclosures.

Figure 44: SDG 17 disclosure example

Table 2 – Overall training costs

Skills Development (SD)	Budget (R'000)	Actual spend (R'000)	EE spend (R'000)
University collaboration	**R4 500**	R4 500 000.00	R4 500

Source: Sentech report (2022)

Figure 45: SDG 17 disclosure example

Outcome 3: A knowledge-based and innovative organisation.

Outcome Indicator	Planned Annual Target	Actual Achievement	Deviation From Planned Target	Comments
Collaboration in promoting and investing in research and innovation for sustainable development of the diamond beneficiation industry.	2 producers added.	**Not Achieved:** Letters were sent to 2 (two) non-compliant producers, however there was no response received.	The State Diamond Trader was not able to add producers to its compliance list.	Further engagement with the Shareholder and the SADPMR to be pursued regarding non-compliant producers.

Source: SDT report (2022)

Conclusively, regarding SDGQ, SOEs give priority, on average, to nine SDGs, namely, SDGs 8 (Decent Work and Economic Growth), 9, 5, 10, 16, 1, 3 and 4, which means that just under half of the goals are neglected by them. The number of goals prioritised does not vary widely from one SOE to another, given the standard deviation of 0.09. While the scores for high-ranked SDGs, especially the top five, reflect progress toward achieving these goals compared to others, the quality of disclosures remains low. Overall, the evaluated integrated or annual reports present low-quality information aligned with the scope of the 2030 Agenda, as evidenced by very low

average SDGQ scores for each SDG (Tsalis *et al.*, 2022). None of the average SDGQ scores approached the maximum possible score, and the average performance for each SDG fell below the midpoint.

From the perspective of stakeholder and legitimacy theory, the prioritisation of goals suggests that SOEs may not be fully considering the needs of all relevant stakeholders and may instead focus only on those they perceive as holding greater importance (Fernando and Lawrence, 2014, Garde-Sanchez *et al.*, 2018, Nicolò *et al.*, 2020). However, this is not necessarily a bad thing, as this prioritisation aligns with the goals deemed significant for South Africa (Lau and Wong, 2022, NPC, 2011). The study's results indicate that, as a collective unit, SOEs could contribute to achieving the SDGs, but much work is to be done in reporting quality in this regard.

The findings at the SDG level are consistent with those at the overall level. However, this does not mean that the results at the SDG level were not useful as they are valuable for identifying the most prioritised SDGs and highlighting areas for improvement in disclosures, particularly concerning specific quality indicators for each SDG.

CHAPTER V: CONCLUSION AND FUTURE RESEARCH

Given that SOEs play a crucial role in promoting sustainable development, it becomes essential to carefully assess and acknowledge their contributions to this endeavour (Sawani *et al.*, 2023, Chigudu, 2020). Effectively integrating SDG-related information into reporting cycles forms part of this contribution (UN, 2015).

The purpose of this study is to evaluate the quality of SDG information disclosed in the integrated or annual reports of South African SOEs listed under Schedule 2 and 3B of the PFMA. This research also focuses on identifying those SDGs to which SOEs contribute the most in respect of corporate reporting quality. To gauge the quality of SDG disclosures, a quality measure was developed that amalgamates various indicators from sustainability reporting literature. The measure takes into account the emphasis placed on SDG information (DI), the inclusion of qualitative, quantitative, and monetary disclosures (MI) and the substance (boilerplate or committed) of disclosures (RI). The balance (BI) and comparability (PI) of disclosures as well as the ease with which SDG information can be interpreted based on the use of infographics (EII)

are also considered. These quality indicators were combined to formulate a total SDG information quality score (SDGQ).

Firstly, the quality elements were evaluated at the overall report level. The results suggest that SOEs are placing increased emphasis on incorporating SDG disclosures within their integrated or annual reports, while avoiding repetition and excessive detail (Malola and Maroun, 2019). However, the majority of SDG information is presented in a qualitative form rather than quantitative, with a limited use of infographics to enhance the understandability of the information. Most SDG disclosures mainly deal with generic statements, policies, expectations, or mission statements than with specific and justified goals or the results of sustainability actions (Malola and Maroun, 2019, Michelon *et al.*, 2015). While an attempt was made, there is also room for improvement in terms of disclosing comparisons with results to allow stakeholders to assess the SOEs' sustainability performance and progress. Lastly, improvements in balancing positive and negative SDG disclosures can be made, promoting transparency, credibility, and trust in the organisation's sustainability impact. The correlations confirm the idea of the need for improved disclosure quality, suggesting that the quality elements are not mutually exclusive, thus companies should strive to excel in all the indicators to maximise SDG information quality.

The findings at the SDG level reveal that, in terms of disclosure quality (SDGQ), SDG 8: Economic Growth received the highest priority, while SDG 14 received the least. On average, SDG 16 dominates the density of SDG information, with SDG 2 being the least mentioned. SDG 5 featured the most quantitative disclosures, while SDG 14 had the highest proportion of qualitative disclosures. Regarding relevance, SOEs seemed most dedicated to SDG 8: Economic Growth, closely followed by SDG 1 and 5, while SDG 16 contained the most boilerplate disclosures. SDG 8: Economic Growth presented the most balanced mix of positive and negative disclosures, whereas SDG 2 had the least. Lastly, in terms of performance reporting, SOEs showcased their progress in actual performance most prominently for SDG 5 and least for SDG 15. The Relevance Indicator emerged as the most subpar indicator for each SDG. Overall, both the average SDGQ and other quality element scores indicate that the disclosed quality of SDG information is low, with all scores falling well below the maximum possible score.

The study contributes to the growing body of SDG reporting research in the public sector. At an empirical level, this study is among the first to define and evaluate the quality of SDG information

reported by South African SOEs in the public sector. The suggested quality framework serves as a valuable tool for both scholars and professionals interested in assessing and appraising specific components of report quality (Malola and Maroun, 2019). From a practical perspective, the results show that the SDG information disclosed by the SOEs is mainly symbolic, including boilerplate, unbalanced, inaccessible and mainly qualitative information without really showing any information regarding the progress of corporate sustainability performance. Consequently, there is doubt about the degree to which the integrated or annual reports can be readily understood and effectively utilised to assess the SOEs' overall performance concerning their contribution to the SDGs. This points to the influence of policy makers (in this case, the National Treasury) for prescribed standard reporting guides and how the guides encourage symbolic reporting. The findings of this study call for improved reporting guidelines from the policy makers and standard setters. To tackle this issue, further investigation is needed to identify barriers to high-quality SDG reporting and offer practical suggestions for preparers. Standard setters and academics may also have to concentrate on creating additional guidance, such as procedures for collecting, analysing, and reporting various data types to encourage the incorporation of more quantified and substantive disclosures in integrated or annual reports (Malola and Maroun, 2019). An alternative perspective suggests that the low disclosure quality may be indicative of the well-known challenges faced by South African SOEs, thereby not reflecting a trend toward the achievement of the SDGs in terms of corporate reporting.

From a theoretical perspective, by using the proposed form of disclosure, SOEs can enhance the level of trust and credibility with their stakeholders as these disclosures are high in quality and aim at reducing information asymmetry and informing stakeholders (Ashforth and Gibbs, 1990, Emma and Jennifer, 2021, Fernando and Lawrence, 2014, Silva, 2021, Tsalis *et al.*, 2022). Hence, this type of information is associated with heightened transparency and accountability to stakeholders and constitutes a detailed account of SOEs' sustainability impact, underscoring a genuine commitment to advancing sustainable development (Silva, 2021, Tsalis *et al.*, 2022).

Nevertheless, this study has some limitations which could be addressed by future research. This research explored only a single jurisdiction and focused on the SOEs listed under Schedule 2 and 3B of the PFMA. The results of this study can be expanded by assessing the remaining SOEs in the PFMA or other countries where a cross-country analysis could be conducted. Further, the period of investigation in this study is limited to one financial year and the study is based on a

small sample. The study could be extended to consider a larger sample of SOEs over more than one year, evaluating changes in SDG information quality over time to understand the reporting behaviour of SOEs. Another limitation is that the only source of information used in this study was the integrated or annual reports, which primarily focus on the triple-bottom line. This observation could explain the subpar reporting performance in the analysed reports, as it is possible that not all SDGs were covered. Consequently, future research should consider incorporating data from SOEs sustainability reports, websites, social media, or other sources. Additionally, the use of weight factors can be explored to assess the importance of SDGs concerning the public sector and its activities.

Furthermore, this study acknowledges that the proposed quality measure is in no way definitive. Further research is necessary to formulate a more sophisticated quality measure, paving the way for a definitive conclusion on the quality of SDG disclosures. This can include other SDG disclosure quality measures such as completeness, reliability, and the integration of the SDGs into the risk and materiality assessment, stakeholder engagement process and strategy. Additionally, the proposed scoring measure assesses the content of integrated or annual reports. However, future research could investigate how these techniques can be applied to gauge the tangible sustainability performance of companies and their impact on advancing the attainment of SDGs.

Another interesting avenue for future research involves expanding this study to compare the quality of SDG disclosures across the PFMA schedules that separate SOEs according to their level of autonomy. This could provide valuable insights into whether the degree of autonomy influences the quality of SDG disclosures. Furthermore, the findings from this study can be utilised to explore additional factors affecting SDG reporting quality, including board independence, company size, industry, and financial performance.

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APPENDICES

Appendix A: PFMA Schedule 2 and 3B SOEs

PFMA Schedule 2 Major Public Entities
1.Air Traffic and Navigation Services Company
2. Airports Company
3. Alexkor Limited No 2022 report yet published, audit not finalised (Yes Media, 2023a, Parliamentary Monitoring Group, 2023)
4. Armaments Corporation of South Africa
5. Broadband Infrastructure Company (Pty) Ltd
6. CEF Pty (Ltd)
7. DENEL No 2022 report yet published, audit not finalised (defenceWeb, 2023, Parliamentary Monitoring Group, 2023, Yes Media, 2023b)
8. Development Bank of Southern Africa
9. Eskom
10. Independent Development Trust
11. Industrial Development Corporation of South Africa Limited
12. Land and Agricultural Bank of South Africa
13. SA Broadcasting Corporation Limited
14. SA Forestry Company Limited
15. SA Nuclear Energy Corporation
16. SA Post Office Limited
17. South African Airways Limited No 2022 report yet published, audit not finalised (Yes Media, 2023d)
18. South African Express (Pty) Limited Liquidated (News24, 2022, Yes Media, 2023e)
19. Telkom SA Limited

20. Trans-Caledon Tunnel Authority
21. Transnet Limited
PFMA Schedule 3B National Governance Business Enterprises
1. Amatola Water Board
2. Aventura Liquidated (Parliamentary Monitoring Group, 2018)
3. Bloem Water
4. Council for Scientific and Industrial Research
5. Export Credit Insurance Corporation of South Africa Limited
6. Inala Farms (Pty) Ltd Liquidated (News24, 2005)
7. Lepelle Northern Water
8. Magalies Water
9. Mhlathuze Water
10. Mintek
11. Ntsika Enterprises
12. Onderstepoort Biological Products
13. Overberg Water
14. Passenger Rail Agency of South Africa
15. Public Investment Corporation Limited
16. Rand Water
17. SA Bureau of Standards
18. Sasria Limited No 2022 report yet published, audit not finalised (Yes Media, 2023c)
19. Sentech
20. State Diamond Trader
21. Umgeni Water

Source: National Treasury (2023)

Appendix B: List of common disclosure types coded for each SDG

Code: SDG	Common themes/ideas/phrases for SDG sentences identified during coding
1	Job creation / improving quality of life of the poor / projects for poor communities / donations to charity / B-BBEE scores / equity programmes / community involvement / distribution of wealth to assist vulnerable and previously disadvantaged groups / provision of employees to equal access to healthcare / financial or other benefits / business resources or assets.
2	The provision of food to poor communities / financial assistance to farming businesses or small-scale food producers / investments in agricultural sector projects / initiatives undertaken to plan land use efficiently in accordance with the community's requirements / fruit tree planting.
3	Injuries or fatalities as a result of company operations / healthcare benefits provided to employees / provision of equipment to hospitals / sport initiatives / health and safety initiatives for all stakeholders / policies to promote the health and wellbeing of employees, local communities and other stakeholders / counselling or psychologists provided to employees / employee wellness programmes / promoting mental health, physical activity, healthy eating, water quality, sanitation and hygiene practices.
4	Learning opportunities for all stakeholders such as internships, bursaries, ICT skills development / financial support or upgrades to education facilities including ICT, internet connectivity and digital learning / workshops for education on sustainability / board and employee training and skills development / measures to recruit and attract a proficient and skilled workforce, considering their skills, expertise, and qualifications.
5	Gender representation at each level of employment / representation of women in leadership positions / training provided to employees by gender / support of women-owned businesses / policies to prevent gender discrimination.
6	Water waste management / water or effluents discharge / water consumption / water quality / water conservation / water use efficiency / water reuse and recycling / water facilities and infrastructure upgrades such as pipes, the construction of bathrooms, and wastewater treatment / access to water and sanitation services in rural areas.

7	Energy efficiency / energy source categories such as fossil fuels and renewable energy / electricity consumption, investments in energy infrastructure and clean energy technology / greenhouse gas emissions.
8: Decent Work	Job creation / employee benefits / youth work opportunities / employee involvement with the community / employee equity and diversity / human resources management / staff feedback / talent management / performance assessments / wages, salaries, awards / industrial action / staff by occupational category / health and safety of employees / work culture and ethics / staff turnover / recruitment / vacancies / inclusivity and teamwork / salary incentives / engagements with labour unions / absenteeism / staff injuries or fatalities / terminations, resignations and reasons for so / staff morale / employee access to education and skills training / policies to address work discrimination job opportunities through investments in infrastructure projects.
8: Economic Growth	SOE's financial sustainability/position/performance / profits / liquidity/ credit ratings / financial ratios / irregular, fruitless and wasteful expenditure / contribution to GDP / financial or technical assistance provided to SMMEs / distribution of revenue and costs across markets / market share / production/sales volume / financial forecasts / B-BEE businesses supported / debt outstanding (receivables/payables) / taxation / government aid / sources of financing/funding / revenue and operating expenditure.
9	Maintenance and upgrades to company infrastructure as well as public infrastructure / technological upgrades / transport, freight and trade / imports and exports / supply chain and distribution channels / supporting small-scale industrial enterprises / green infrastructure / green industrial technologies and processes / investments in property, plant and equipment / strategies to improve customer satisfaction / product quality / building/project plans and approval / investments in research and development.
10	Equal opportunities for employees including those with disabilities or from disadvantaged backgrounds / diversity of the board of directors and employees in terms of race, gender and age / opportunities provided for the youth such as internships or other learning opportunities / training provided to employees by gender, race, disability and age / B-BEE scores / equity programmes / equal access

	to services for all stakeholders / support provided to disabled, black or women-owned businesses / efforts to reduce income inequalities.
11	Construction of safe, affordable, and adequate housing and workspaces / urban development in informal/rural settlements / sustainable/resilient infrastructure developments / community involvement / municipality engagements, sustainable public transport such as road to rail / public injuries or fatalities caused as a result of operations / safety policies/programmes concerning all stakeholders / product safety / safe disposal of hazardous waste / efforts to protect the cultural and natural heritage of South Africa / access to inclusive and sustainable public green spaces.
12	Waste management, reuse and recycling / fossil fuel usage / energy efficiency / electricity consumption / sustainable manufacturing processes / adherence to environmental standards / compliance with licenses / fines and penalties for non-compliance / water conservation / land or water spills / responsible and safe disposal of hazardous waste / clean-up campaigns / efficient use of natural resources (including the source, quality and consumption of raw materials) / procurement practices (such as purchasing from a responsible supplier) / sustainability reporting practices (such as statements about reporting in line with GRI standards) / reduction of greenhouse gas emissions.
13	Reductions in carbon and greenhouse gas emissions / planting of trees / fossil fuel usage / resilience and ability to adapt to natural disasters / risks and mitigations relating to climate change / integration of climate change adaptation measures into the business strategy / energy efficiency / renewable energy / sustainable land use.
14	Water conservation / water consumption / risks associated with depletion of aquatic ecosystem resources and measures to address those risks / environmental incidents / compliance with environmental regulations / conservation and impact of operations on marine life, oceans, seas, and rivers / water spills/discharge.
15	Land/forest/biodiversity conservation / future risks associated with depletion of terrestrial ecosystem resources and measures to address those risks / tree planting / environmental incidents / conservation of wildlife/biodiversity areas / compliance with environmental regulations / soil erosion / impact of operations on animal life on land / sustainable land use and agriculture practices.
16	The media (access to information) / engagements and relationships with all stakeholders / anti-corruption practices / transparency / accountability / business

	ethics / company culture / inclusivity / whistle-blowing policies / educational campaigns on discrimination or violence / codes of conduct / security measures / information systems and ICT / legal action taken against the company / outcome of court cases / corporate governance (King IV) / recovery of assets / investigations / the board of directors and their skills, qualifications, competence, and diversity / succession planning / board structure, committees and meetings / dismissal/suspension of unethical staff / quality control management / corporate citizenship / brand/reputation / corruption / irregular expenditure, /compliance/non-compliance with laws and regulations / directors' and committee responsibilities / teamwork / directors appointment/resignation / talent management / recruiting excellence / performance assessments / performance compensation/awards/incentives / fraud / customer satisfaction / efficiency reforms.
17	The value of investments in partnerships / partnerships made up of several stakeholders / strategic alliances / whenever there was a third party mentioned in a sentence / taxation / government / collaborations / partners / general statement about the SOE's contribution towards sustainability / information sharing / if the company speaks about broader environmental, social, and economic issues in one sentence.

Source: Own representation using the UN SDG targets, the guide from GRI & UN Global Impact (2022), the literature review, as well as common themes from the annual reports throughout the coding process.

Appendix C: Coding rules for the quality elements

Indicator	Rules/framework
Density Indicator	○ Only SDG sentences that relate to the company. ○ Sentences on external environment, global information, sectorial information must be excluded. ○ Many SDGs are interrelated so you will often find that you will code one sentence according to multiple SDGs. Limit the number of SDG codes to three per sentence. The SDGs must be directly affected by the sentence.
Measurement Indicator	○ Each sentence must be coded as **either**: 1. Monetary (speaks about money/currency), **OR** 2. Quantitative (speaks about numbers other than money, note: the numbers can be written as, for example '2' or 'two' or '2%'), **OR** 3. Qualitative (just words, no numbers or money) 4. If a sentence includes a mix of quantitative and monetary information, it must be coded as monetary eg: "we spent $2 billion on five trucks" → this would be monetary. 5. The logic behind it is that quantitative information is better, more useful information than qualitative information (it is stronger, more concrete evidence) and monetary information is even better than quantitative.

Relevance Indicator	○ Each sentence can be coded as **either** policies/strategies/programmes **OR** expectations/desires/mission statements **OR** results/outcomes **OR** objectives/goals. ○ If an SDG sentence has both policies/strategies/programmes and results/outcomes information in it, code it as a **result.** ○ Future/forward looking information wording → 'looking forward' 'we will' 'we expect' 'we aim to' 'our goal/objective is' 'we strive to' 'our intention is to' etc. ○ Material matters/risks = future looking = expectations. ○ Risk mitigation/response strategies = future looking = expectations/objectives. ○ Opportunities = future looking = expectations. ○ Outcome of response/mitigation strategy = objectives (because it is justified). Remember SMART framework. ○ Focus areas for 2023 = future tense. ○ <u>Example of expectations/desires/mission statements (**future tense**):</u> – "New mobile work practices can enable people to continue working safely, but it could widen governance gaps, strain work-life balance, and impair data management." – This is a goal or aim that a company wishes to achieve without any justification for it. – "While needing to maintain present productivity levels, we need to invest in the skills, technology, and know-how required for the new world of work". – Generic goals (**<u>not</u>** SMART goals – Specific, Measurable, Achievable, Relevant, Time-bound) "We aim to end poverty in all forms." ○ <u>Example of objectives/goals **(future tense)**</u> (SMART goals framework): – "Over the next five years we plan to cut our UK energy consumption by another 20% which will also reduce our CO2 emissions even further". – This is a quantified goal or a goal that a company wants to achieve and has explained detailed, specific steps it will take to achieve it (each step will be

	an objective which will most likely be a sentence each). 'We plan to achieve XXX by doing YYY.' – "Transnet plans to approach the market to increase private sector participation on the freight railway line by offering rail slots to the market in the 2022/23FY." – A clearly justified explanation of planned future actions or strategies. – Disclosure of clear steps that will be taken in the future to achieve objectives. – Expected completion date of a project or expected length of a project. ○ <u>Example of policies/strategies/programmes (**past or present tense**):</u> – An initiative developed by a company without any results of the initiatives disclosed. – Basically, any time a company mentions a programme or initiative. – "A web-based database is currently being piloted which allows the sharing of learning from accident and incident investigations across the whole of AstraZeneca worldwide." → here, no result was given. – "In order to encourage the roosting bats away from the main building, a £20,000 bat loft was constructed in addition to the numerous bat boxes installed around the perimeter of the site". – Anything that is mentioned about a company's policy, strategies, or management resolutions to achieve sustainable development that is not supported by results. – Number of research and development initiatives in partnership with local organisations. – Broad, generic statements. – "Accordingly, all people working and thriving within the commodity sectors where we operate – including our own employees and vulnerable communities – share in the consumption of our natural and manufactured resources and should, therefore, also share in the positive value created within the sectors' value chains, as produced through our joint operations with private and public sector partners." → **this one is not necessarily a**

	policy/strategy or programme but it is a statement about sustainability <u>relating to the company</u>, so it must be coded. – An initiative that drives gender equality in the community. o <u>Examples of results/outcomes of actions</u> **<u>(past or present tense):</u>** – These can be sentences followed by initiative/programme/strategy statements. – A review of ESG performance against key indicators or targets (this will most likely be found in tables). – The results of engagement with stakeholders. – Number of individuals with increased access to healthcare services or medicines as a result of an inclusive business initiative. – Number of individuals receiving training from the company as a result of a skills development initiative (e.g., employees). – Number of individuals who achieved a qualification/degree/certification as a result of a learning initiative. – The estimated number of people who have improved access to sanitation as a result of an initiative to install sanitation facilities in public areas. – Estimated number of affordable housing units constructed or refurbished as a result of an initiative. – Awards/achievements e.g., “We are one of the top 10 infrastructure companies in the country”. – “As a result, we are a market leader”. = SDG 16, 9, 8 – If it is compared to a benchmark, it is most likely a result. – “In 2022 we saw major improvements in our operations” → result, qualitative, SDG 16, 8, positive. But this claim must be justified, if not justified, code it as a policy/strategy statement. – “Unfortunately, we did not meet our strategy targets for 2022” → result, qualitative, SDG 16, 8, negative, comparison.
Ease of Interpretation Indicator	o All graphs / tables / charts / diagrams/ that relate specifically to the company and its contribution to the SDGs.

Performance Indicator	○ Of the sentences that you have coded as **'results,'** further code it if the result is compared to a set target, benchmark, or previous year's performance. ○ This code is called **"comparison."** ○ A lot of these sentences will be found in tables. ○ Tables with a target or prior year performance. ○ E.g.: men vs women = comparison ○ E.g.: age group comparison
Balance Indicator	○ Of the sentences that you have coded as **'results,'** further code it if the result is **'negative' or 'positive' or 'neutral.'** ○ Negative = words like decreased, reduced, failed, decline etc. ○ Positive = increased, improved etc. ○ Neutral = matter of fact sentences. More to do with spending. ○ Results disclosed in a table must be regarded as 'matter of fact' disclosures and coded as 'neutral' results for consistency purposes. ○ If unsure whether positive or negative = neutral ○ Only obvious answers must be given a sign.
	○ <u>Examples of **results** that are **comparable** and **negative/positive/neutral** (with other codes provided as further examples):</u> – "In the past year, our average Incident Rate (per 1000 employees) was 7.2" → neutral, no comparison, quantitative. – "Improvements in energy efficiency in our UK vehicle fleets and buildings". → positive, no comparison, qualitative. – "We were all deeply saddened by the tragic accident in December 2006 that took the lives of three subcontractors working on one of St James' projects". → negative, no comparison, quantitative. – "Our company uses less water than comparable mines." → positive, comparison, qualitative. – "As a result, by the end of 2005 we had reduced the total emissions of these chemicals by 96%". → positive, no comparison, quantitative. – "We are doing better in terms of revenue comparable to other companies" → Positive, comparison, qualitative. – "Fine worth R20 000" → negative, no comparison, monetary.

	– Legal action/lawsuits taken against the company → (negative, usually no comparison). – Outcome of a court sentence/hearing → (positive or negative depending on the outcome). – Fines/claims/penalties (negative). – "The decision not to institute pay cuts while revenue was reduced due to the effects of COVID strained our financial reserves, particularly for work not desk-bound, such as operating trains or cranes." → negative, no comparison, qualitative. – Dismissal/suspension of an employee for misconduct/unlawful behaviour → positive, no comparison, SDG 16, qualitative
	○ <u>Repeat sentences</u> – Every time you see that the company has repeated something that they have already spoken about, code it as a 'repeat.' – This can be an exact repeat or a repeated idea or in the same context. – Must still code these sentences in terms of the other codes above. The repeat code is just an additional code if the sentence or idea has already been mentioned.
	○ <u>Examples of sentences that relate to sustainability but **not** to the company:</u> – If a sentence is about the general state of South Africa or the world – **do not code it.** – "As we prepare for the emerging 4th Industrial Revolution, many industrial-heavy jobs could be displaced, while the new divisions of labour will create new jobs." – Case studies about other company's activities.
	○ <u>Semi-relevant sentences:</u> – Still code these. – An example: "We have always had a close relationship with water, water truly is life". This would be coded as → qualitative, policy/programme/strategy, SDG 6, SDG 14. This is because it still <u>relates to the company</u> as they have said "<u>we</u> have always...."

Source: Own interpretation based on the studies of Malola and Maroun (2019) and (Michelon et al., 2015) as well as themes identified during coding.

Appendix D: Instrument

SOE: _____

Sentence	a	b	c	d	e
SDG 1	1	0	0	0	0
SDG 2	0	0	0	0	0
SDG 3	1	0	0	0	0
SDG 4	0	1	0	0	0
SDG 5	0	1	0	0	0
SDG 6	0	0	0	0	0
SDG 7	0	0	1	1	0
SDG 8: Decent Work	1	1	0	0	1
SDG 8: Economic Growth	0	0	1	0	0
SDG 9	0	0	0	0	1
SDG 10	0	1	0	0	0
SDG 11	1	0	1	0	1
SDG 12	0	0	1	1	0
SDG 13	0	0	0	1	0
SDG 14	0	0	0	1	0
SDG 15	0	0	0	1	0
SDG 16	0	0	0	0	0
SDG 17	1	0	0	0	1
Repeat	1	1	0	0	0
Monetary	1	0	0	0	0
Quantitative	0	1	0	1	0
Qualitative	0	0	1	0	1
Policy/ strategy/ programme	1	0	0	0	0
Expectation/ desire/mission statement	0	0	1	0	0
Objective/goal	0	0	0	1	0
Result/outcome	0	1	0	0	1
Comparison	0	1	0	0	0
Negative	0	0	0	0	1
Positive	0	1	0	0	0
Neutral	0	0	0	0	0

Appendix E: Examples of coding

Disclosure	Assigned codes
"The Entity is still falling short of reaching its 2021/2022 target for people with disability and African females' representation overall" (Overberg Water 2022 report, p. 68).	Result, comparison, negative, qualitative, SDG 5, SDG 10
"Scope 1 emissions increased by 9.4%, which resulted from high usage of diesel by standby generators due to load shedding" (Telkom 2022 report, p. 92).	Result, comparison, negative, quantitative, SDG 13, SDG 12
"For the 2021/2022 financial year, the Entity witnessed a slight increase in training initiatives offered compared to the previous financial year" (Overberg Water 2022 report, p. 71).	Result, comparison, positive, qualitative, SDG 8: Decent work, SDG 4
"Overall, water loss levels have been maintained below the entity's target level of 5% over the years" (Umgeni Water 2022 report, p. 117).	Result, comparison, positive, quantitative, SDG 6, SDG 12
"The current employment equity statistics reflect that 88% of staff in the organisation are black and 37% are female" (Sentech 2022 report, p.30).	Result, comparison, neutral, quantitative, SDG 5, SDG 10, SDG 8: Decent work
"This year we sponsored seven postgraduate learners through a R740 000 investment (FY2021: eight learners, R820 000) and placed four postgraduate learners in permanent employment in the Group (FY2021:3) postgraduates placed)" (Telkom 2022 report, p. 81).	Result, comparison, neutral, monetary, SDG 8: Decent work, SDG 4
"We have continued to limit safety incidents below our estimations in our rail network due to an improved safety culture" (PRASA 2022 report, p. 29).	Result, positive, qualitative, SDG 11, SDG 3
"We aggressively increased homes passed with fibre by 52.7%" (Telkom 2022 report, p. 49).	Result, positive, quantitative, SDG 11
"The existing N3 expansion project is envisaged to facilitate approximately 320 direct jobs with additional supply chain expenditure and related jobs" (PIC 2022 report, p. 98).	Objective, quantitative, SDG 1, SDG 8: Decent Work
"The expected completion date of the modular packaged plant project is December 2022" (Amatola Water 2022 report, p. 83).	Objective, qualitative, SDG 9
"To upgrade the Sandile WTW to improve the quality of life and create socio-economic growth by increasing water provision to meet the minimum standard of 750ml/household per day" (Amatola Water 2022 report, p. 117).	Objective, quantitative, SDG 11, SDG 6

“Transnet plans to spend R98,9 billion on capital investment over the next five years, of which 79,7% (R78,9 billion) will be spent on maintenance and sustaining capital investment” (Transnet 2022 report, p. 26).	Objective, monetary, SDG 8: Economic Growth, SDG 9
“Transnet plans to approach the market to increase private sector participation on the freight railway line by offering rail slots to the market in the 2022/23FY” (Transnet 2022 report, p. 131).	Objective, qualitative, SDG 9, SDG 17
“We continue to support companies owned by black people and other designated groups as proposed in the B-BBEE Act (No. 53 of 2003)” (Sentech 2022 report, p.35).	Policy, qualitative, SDG 16, SDG 8: economic growth, SDG 10.
“We implemented a number of initiatives to enhance our natural capital, including environmental preservation initiatives and policies and procedures aimed at lowering carbon emissions” (Sentech 2022 report, p. 36).	Policy, qualitative, SDG 13, SDG 12
“Thirty indigenous trees and 20 fruit trees were planted at various households, communities and government institution” (SAFCOL 2022 report, p. 53).	Policy, quantitative, SDG 2, SDG 15, SDG 11
“A special R13 million CSI initiative provided humanitarian assistance to those affected” (IDC 2022 report, p. 76).	Policy, monetary, SDG 1, 2, 11
“R13 million spent on tertiary education for employees and their children, as well as training and development” (DBSA 2022 report, p. 104).	Policy, monetary, SDG 8: Decent Work, SDG 4
“The DBSA’s mission is to advance development impact in the region, by expanding access to development finance, and effectively integrate and implement sustainable development solutions to: Improve the quality of life through the development of social infrastructure” (DBSA 2022 report, p. 11).	Expectation, qualitative, SDG 8: Economic Growth, SDG 11
“We aim to grow our footprint in the energy sector, to be the catalyst for economic growth and energy poverty alleviation through security of supply, and access to acceptable affordable energy in South Africa” (CEF, 2022 report, p. 35).	Expectation, qualitative, SDG 1, SDG 7, SDG 8: Economic Growth
“Support provided to the township and rural businesses will be improved, and capacity building offered to small businesses will be enhanced” (Ntsika 2022 report, p. 14).	Expectation, qualitative, SDG 11, SDG 8: Economic Growth