



**The Transparency of Carbon Emissions Disclosure within the South African public sector**

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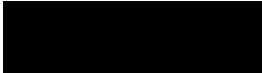
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**(supervisor)**

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## **DEDICATION**

I want to dedicate this work to the following people who were/are important in my life.

Firstly, my late father who made me believe in education, and all 56 of his children believe in education.

He would say that education is a shield for a better future.

Secondly, to my wife and daughter for their support and understanding as the pressure of work and studying meant that I spent less time with them.

Finally, I dedicate this work to all my foundation phase and high school teachers, who planted a seed and now it has grown into a big tree.

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Thank you to my family for their understanding that this degree will be an inspiration for everyone within the community that I came from.

## **ABSTRACT**

The study addressed how the South African public sector discloses its carbon emissions and determines whether the disclosures were transparent. It also determined applicable legislation, regulations and frameworks that govern carbon emission within the South African public sector. Reporting on environmental, social and governance (ESG) of (carbon emissions is part of ESG) is a new concept for both the private and public sectors and is mostly regarded as secondary to traditional financial reporting. Reporting on ESG is currently not a mandatory requirement. Thus, when some entities attempt to report on it, it is not afforded adequate attention by both preparers and those who provide assurance on these reports.

Legislation, regulations, and codes like the King IV and other forms of frameworks exist to guide the governance carbon emission disclosure. The disclosure requirements required by the department responsible for monitoring carbon emission are basic and regarded as level 1 as per the international standards. This legislative requirement resulted in departments, metros and entities adopting integrated reporting as their reporting framework despite its preclusion of the departments. Furthermore, the Accounting Standards Board (ASB) concentrates on traditional financial reporting and neglects ESG reporting. The ASB recently issued an exposure draft on sustainability for comments and discussion. The exposure draft still has to undergo a lengthy consultation process; thus, it will not be used until, at least the 2026/27 financial year.

A quantitative research methodology was applied in this study. The study sampled 21 public sector metros, departments, and entities and assessed their carbon emission disclosure. The disclosure was contained in the integrated/annual reports prepared by the selected metros, departments, and entities. There were pockets of excellence when these were assessed on individual level, like Eskom and City of Cape Town followed by the aviation industry entities like South African Airways and SA Express. City of Cape Town and Eskom can be used as examples of how carbon emissions disclosure can be transparent.

The overall quality of the South African public sector carbon emission disclosure in the respective financial reports was gauged against adopted transparency indexes and covered the following areas: assurance of reports, density of reports, management orientation, reporting strategy, integration of carbon emissions reporting, readability, attributes, and repetition within the reports.

The overall carbon emission disclosures by public sector entities, departments, and metros were found to be below par. Therefore, both null hypotheses of this study are not supported as the disclosures of carbon emissions in the South African public sector are not transparent.

The South African public sector lags behind the country's private sector, and this has a potential of having a negative impact on future funding needed by the public sector. International and local banks

have moved to green funding. Either funding will come at higher costs, or it will be difficult to source for the South African public sector. This might also affect the private sector as well, as the international funders will review the entire country and not just pockets of excellence here and there. South African exports might be penalised by trading the country's partners in Europe because of carbon tax issues, as the country's carbon disclosures are deemed to be not transparent.

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## **LIST OF ACRONYMS**

AGSA	Auditor General South Africa
ASB	Accounting Standards Board
CDP	Carbon Disclosure Project
CEO	Chief Executive Officer
COP	Conferences of the Parties
CPSEs	Central Public Sector Entities
CSR	Corporate Social Responsibility
DEFF	Department of Environment, Forestry and Fisheries
ESG	Environment, Social and Governance
EU	European Union
IIRC	International Integrated Reporting Council
JSE	Johannesburg Stock Exchange
KING III	King Code of Good Corporate III
MFMA	Municipal Finance Management Act
UN	United Nations

## **CHAPTER 1: OVERVIEW OF THE STUDY**

### **1.1 Introduction**

This chapter introduces the study on carbon emissions reporting and why carbon emissions reporting is necessary in the current century. The chapter traces conferences, seminars and events that were organised by multinational institutions like the United Nations (UN) on climate change and consequences thereof. It also discusses other factors like taxes introduced by governments in a bid to curb carbon emission and its impact on the environment and livelihoods. All these factors have an impact on South African public sector entities, departments and municipalities concerning performance reporting and plans to lower carbon emissions. Effective monitoring by the responsible department and compliance with the South African environmental laws will increase the quality of reporting on carbon emission across the concerned organisations.

### **1.2 Background to the study**

For centuries, industries operated without due care or concern for consequences of environmental damages, unfair labour practices and communities not benefiting from companies operating within their land. In the 1970s and 1980s, through environmental and other disasters like Chernobly, Exxon Vladez, British Petroleum (BP) etc., the environment, social and governance (ESG) issues became central to non-financial reporting by firms and industries (Barron et al., 2020; Gill et al., 2012; Peterson et al., 2003; Saenko et al., 2011); Wingard and Vorster (2001) intimate that company practices have given rise to regulations, activism and lobbying for laws to protect the environment, fair labour practices, employment equity, and proper reporting on these issues.

In countries with higher levels of stakeholder activism, laws and acts requiring disclosure and compliance with relevant ESG requirements compel firms and industries to report on ESG in addition to their financial reporting. Firms operating in countries with lax regulations and lesser levels of stakeholder activism have lower reporting on ESG (Datt et al., 2019; Krasodomska et al., 2021; Simnett et al., 2009). Relying on stakeholder activism, laws and regulations to enforce reporting requirements maybe a challenge for many developing countries with weak laws and regulations on reporting and lacking stakeholder activism.

This study is a descriptive or explanatory study by virtue of being quantitative, on carbon emission disclosure within the South African public sector environment. There is currently no evidence of studies that have been conducted on emission disclosure by public sector entities,

departments, and municipalities in South Africa. Environmental matters in South Africa (SA) are regulated by the Department of Environment, Forestry and Fisheries (DEFF)(Government, 1998). This study provides a picture of how entities, departments, and municipalities report on environmental matters and whether these are exemplary of good ESG reporting by the public sector in South Africa. The public sector is expected to comply with legislation, policies and regulations on environmental management and provide high quality reporting on environmental issues like carbon emission.

The study traces the origins of non-financial reporting from reporting on ESG to carbon emissions, which forms part of the section within ESG, namely the environmental part of ESG. Previous studies concentrated on an oil and gas company and compared it to other 19 similar facilities throughout the world, and the top 50 companies listed on the Johannesburg Stock Exchange (JSE) (Pitrakkos & Maroun, 2019; Wegener et al., 2019). A similar study was done in Australia, just before the carbon emissions act was introduced (Murphy & McGrath, 2013). There are few studies conducted on reporting, especially on compliance with the King Code of Good Corporate III (King III) and the International Integrated Reporting Council (IIRC) reporting, and it was found that the reporting had a positive trend, meaning there was an improvement in the review of state-owned entities' reporting for the period between 2013 and 2015 (Surty et al., 2018). Disclosure on carbon emission made by the public sector entities and metros was analysed in the current study using a Mann–Whitney U test (Pitrakkos & Maroun, 2019). The study also identified gaps in the legislation regarding the Environmental Management Act as enacted by the DEFF and reporting frameworks as produced by the Accounting Standards Board (ASB) within the South African environment.

South Africa, as part of global community, is expected to comply with Paris Agreement and other climate change agreements like the UN Conferences of the Parties' (COPs') requirements. The current South African President, Cyril Ramaphosa, is a champion of Foreign Direct Investment. He has conducted a couple of investment seminars and conferences promoting South Africa as an investment destination for foreign investors (Ramaphosa, 2021). In Europe, after the signing of the Paris Agreement on climate change, of which South Africa is a signatory, European countries' firms experienced an increase in cost of debt for polluting firms (Paea & Drogo, 2020; Sibanda & Ndlela, 2020). Both private and public sector entities are affected by the requirements to reduce emissions and proper disclose.

The Paris Agreement on reduction of carbon emissions, which was signed in December 2015, acknowledges that climate change is the responsibility of everyone and it's a human rights issue. However, the Paris Agreement is criticised for lack of strict enforcement to ensure that signatories to the agreement abide by the requirements to reduce greenhouse gases to an acceptable level, because ignoring that, is projected to cause temperatures to increase by no more than two (2) degrees, (1.5 degrees to be exact) over time as compared to the projected 4.5 to 6 degrees. Scientists are extremely concerned that the mixture of El Nino and human induced climate change will breach the 1.5 degrees in the next five years. The Paris Agreement, although having all the necessary stakeholder buy-in, does not state what the consequences of non-compliance are (Ibrahim et al., 2021). Article 15 of the Paris Agreement caters only for the compliance committee, to which signatories are expected to report their carbon emissions. There are no sanctions or other tools necessary to ensure compliance. This might be because of a failure by wealthy nations to provide the pledged \$100 billion per year to assist poor nations to be able to manage their carbon emissions as well.

Recently, youth activists on climate change, such Greta Thunberg founded the Friday for Future Organisation. The organisation advocated for school strikes and boy courts on Fridays, where they highlighted climate issues (Bergmann & Ossewaarde, 2020; Jieun Jung et al., 2020; Sabherwal et al., 2019). On the opposite side are the neoliberalism proponents like former United States of America's (US's) 45<sup>th</sup> President who believed in continuing "as is" and renegotiating a better deal for US. He also drove the climate change scepticism in the US (Hornsey et al., 2018; Schreurs, 2017). Various studies have also been conducted on climate sceptics, like the far-right of the European parliament and sceptics like Australian Andrew Bolt (Forchtner & Lubarda, 2022; Van Rensburg & Head, 2017). There seems to be an equal number of supporters for change for climate change and those who want the situation to remain as it is, driven by consumption.

In addition, Millennium Development Goals (MDGs) were agreed on at the UN in 2000. Some of these goals had already been met at the time of the second meeting in 2012, while others had not been met. The conference in Brazil resulted in changes and setting up of 17 new goals called the Sustainable Development Goals (SDGs). To demonstrate the importance of the environment, six of the 17 goals relate to protecting the ecosystem for the benefit of future generations (Awaworyi Churchill et al., 2020; Chaudhuri, 2015; Durokifa & Ijeoma, 2018; Jacob, 2017). Climate change caused by global warming has dominated political and business throughout the world. The dangers of climate change with regard to food security have been

observed all over the world (Kogo et al., 2021; Masipa, 2017; Myers et al., 2017; O'Brien et al., 2021). The threat to food security has been emphasised by various studies, detailing both extreme droughts and floods, both of which are not good for agriculture.

In South Africa a relationship between carbon emissions and agriculture output was established over a period of 58 years from 1960 to 2017 (Sibanda & Ndlela, 2020). Similar studies in Nigeria covering the period 1975 to 2010 found that there was a relationship between climate change and food production and security. The Nigerian farmers were advised to adapt to planting drought resistant crops (Idumah et al., 2016). There is evidence supporting the climate change effect on food security, the threat being the results of adverse weather such as droughts or floods which affect farming.

A study forecasting carbon emission for Brazil, Russia, India, China, and South Africa, better known as the BRICS countries for the period 2019 to 2025, collected data from 2000 to 2018 on carbon emissions, and found that in South Africa and China's carbon emissions would have peaked in 2019 and expected to decrease in the next several years. For Russia, the carbon emissions fluctuated while Brazil and India showed increases on year to year basis (Wu et al., 2020). The fact that South Africa was expected to have peaked in 2019 and have a forecasted decrease on its carbon emissions going forward, does not mean that the effects of carbon emissions on the South African climate, food security and livelihoods will disappear rapidly.

The need to address the challenges of climate change has been discussed at various levels in countries that are part of the multilateral organisation such as the UN. With it, came the need for organisations to report on their activities that contribute to global warming through carbon emissions. Reporting on carbon emissions is a recent phenomenon and is currently not mandatory in many countries (Bose, 2020; Krueger et al., 2021). This means that such reporting plays second fiddle to traditional financial reporting.

Other scholars believe that climate change should be championed by cities and not at national level for the following three reasons: (1) Cities can raise global ambitions; an example of such city is California in the US, which plans to ban fossil cars by a certain period. (2) Cities by the nature of being urbanised emit too much carbon with more than half of the world population living in urban areas and using carbon fuels for heating, transport, etc. They believe that it is possible to achieve more reduction in carbon emissions by concentrating on urban areas, which are mostly cities. (3) Cities should be aligned with the needs of locals, thus decisions made by cities are expected to accommodate the needs of local citizens (Bai et al., 2018; Mi et al., 2019;

Westman, 2021). Climate change debate is expected to continue in the foreseeable future, unless the world adopts a co-ordinated approach, as evidenced by lack of consequences, commitments not being met (\$100 billion pledge to assist poorer nations was not provided by rich nations) and cities versus national level (appropriate level to tackle carbon emissions). Cities are expected to act as catalysts for a change from carbon emission enablers to zero carbon emission enablers.

Various climate change agreements have been entered into by countries at the multilateral institution levels (like the UN) regarding the reduction of carbon emissions/greenhouse gases to curb rising temperatures, melting ice sheets covering the poles and rising sea levels, which are threatening coastal areas. From the Kyoto Accord to the Paris Agreement and others in between have been agreed on and signed to combat climate change. South Africa is a signature to some of these, such as the Paris Agreement.

In November 2021, global countries headed to Glasgow for the COP 26 chaired by Britain. The theme for the conference was focusing on four areas, namely coal, cars, cash, and trees. The first two are aimed at reducing the use of fossil fuels, while the third focus area is aimed at fulfilling the commitments made at COP 17, providing \$100 billion to poorer nations. The last one is on reforestation (CarbonBrief, 2021). The commitments made by wealthier nations have not been honoured in terms of the \$100 billion dollars pledged to poorer nations, resulting in their reluctance to abandon the use of or reliance on fossil fuels like coal. In June 2022, the COP 26 president visited SA to reassure it of the UK's commitment to SA's Just Energy Transition Partnership (JETP) which wealthy nations committed to at COP 26.

On 24 February 2022, Russia began a "special military action/war" in Ukraine to demilitarise Ukraine and get rid of Nazis, etc. (AlJazeera, 2022b; Guardian, 2022; Leon et al., 2022; Sun et al., 2022). This resulted in the European Union and US/the West imposing economic sanctions on Russia, which included curbing purchasing of Russian fossil fuels like oil, gas, and coal (AlJazeera, 2022a; Mail&Guardian, 2022; Mbah & Wasum, 2022; van Bergeijk, 2022). Europe relies heavily on Russian fossil fuels for heating and lighting, and manufacturing (Bricout et al., 2022; Islamli, 2022; Kammer et al., 2022). These sanctions have resulted in a lot of complications in Europe in search of alternative sources for gas and other heating fossil fuels including temporary replacement for the Russian fossil fuels (Berger et al., 2022; Bloomberg.com, 2022; McWilliams et al., 2022). Russia's special military operation or war in Ukraine will compromise the target date for net zero emissions.

Recent headlines highlight this situation, for example India to reopen 100 coal mines, Britain to mine coal, Europe imports more South African coal as Russian ban looms (Bloomberg.com, 2022; du Venage, 2022; MoneyWeb, 2022; News24, 2022; TheTelegraph, 2022). The Russian special military operation in Ukraine has brought challenges for the entire world. Countries will delay the implementation of zero carbon emissions as agreed, and countries might also revert to dirty fuels as highlighted in headlines and the higher energy costs brought by the war will encourage explorations and revisits to shelved dirty fuel projects.

The other aspect that the special military action in Ukraine has brought is hypocrisy, with the wealthier nations insisting that developing and poor countries continue with transition while they were reverting to dirty fuels.

The other impact of carbon emissions is on air quality which leads to health issues such as heart and respiratory diseases, reduced life expectancy and infant mortality. Various studies have linked the air quality to carbon emissions and the resultant deteriorating health of persons subjected to poor air quality due to carbon emissions. (Chen et al., 2022; Erdoğan, Yıldırım, & Gedikli; Sarwar et al., 2021). Educating citizens on the effects of carbon emissions can also contribute to carbon emissions reduction (Cordero et al., 2020; Sarwar et al., 2021). Some studies estimate that carbon emissions can be reduced by 29% for cars and up to 33% for vans through smart driving and employing technology in urban areas, and adopting online education (Tran & Brand, 2021; Versteijlen et al., 2017). In some cases, a relation between carbon emissions and health expenditure was observed, where higher carbon emissions led to higher health expenditure for a particular country or region (Apergis et al., 2018; Bai et al., 2018; Fan et al., 2022). The link between carbon emissions and health has not been well documented, unlike the link between carbon emissions and climate change.

Another climate change conference, COP 27, was held in Egypt in November 2022. This was a follow up to COP 26, but it did not achieve much in terms of decarbonisation of the world. It had limited success in that rich nations agreed to provide funds to assist poor nations that are bearing the brunt of climate change (Harris, 2023). Africa is seen as bearing the brunt of climate change even though it only contributed 3% of carbon emissions since the beginning of industrialisation, while North America and Europe have contributed 62% of the carbon emissions (Zielinski et al., 2022). These COP conferences make promises but don't provide solutions, and just like COP 26, it seems that COP 27 ended with more promises.

In the South African context, the DEFF is responsible for issuing environmental laws. The National Environmental Management Act, Act 107 of 1998 acknowledges that certain activities of the state institutions damage the environment. The act mandates reporting on environmental plans by state institutions on a four-yearly interval and makes this information available upon request by any person or organisation. How the information should be kept is not specified (Government, 1998). State entities will have to comply with the Act to achieve some legitimacy on environmental matters. There's most likely a monitoring section within the DEFF, which will concentrate on compliance.

The South African government also introduced carbon emissions tax through the Carbon Tax Act, Act 15 of 2019. The Act refers to a taxpayer, and by default seems to exclude government departments that are not taxpayers, as they are not registered for tax purposes (Campbell et al., 2020; Gous et al., 2017; S. A. N. Treasury, 2019). The South African Revenue Service (SARS) works on a self-assessment/self-declaration process, whereby a taxpayer completes a return, and accuracy of these self-assessments are verified against external information, e.g. submission to DEFF or disclosures in the integrated report. The planned tax on carbon emissions will impact cost competitiveness of South African companies, which might lead to alternative energy generation being sought and used by South African companies.

The European Union (EU) has proposed charging carbon emissions tax on imports which will affect most imports from South Africa. Eskom is the monopoly supply of electricity in South Africa supplying households and industry (Lowe, 2019). Eskom has an estimated 93% electricity generation from coal, which as a fossil fuel results in high carbon emissions (Winkler, 2005). How an entity like Eskom reports on its carbon emission will affect carbon emissions tax on goods exported to the EU from South Africa. If it is supposed these goods are transported by rail, Transnet will add its share of emissions contribution. If these carbon emissions cannot be calculated or disclosed in a transparent manner, the EU might ban products they import from South Africa, which will be very dire for an already struggling economy.

The EU is important to South Africa as one of its biggest trading partners, with exports to the EU rising from R20 billion in 1994 to R80 billion in 2003 (Kalaba et al., 2005). The value of goods the European Union countries imported from South Africa in 2021 was \$24.54 billion (Tradingeconomics, 2022). Therefore, a ban on products imported from South Africa because the EU cannot rely on the carbon emissions declared by South African companies will be devastating to the South African economy. The international climate change agreements,

carbon taxes both in SA and Europe (on imported products), South African environmental law and the need to trade with EU countries will result in better reporting and disclosures of carbon emissions by both private and state-owned entities.

### **1.3 Problem statement**

Over the past decades, reporting on ESG took centre stage and some jurisdictions mandated or legislated reporting on ESG. The topical part of ESG has been about the environment, especially climate change due to carbon emissions. Multinational agencies like the UN and studies have highlighted carbon emissions as a problem as it leads to climate change which will induce famine, flooding and disappearance of low-lying places and coastal cities around the world. This has necessitated the need to curb carbon emissions, and transparently disclose carbon emissions by all polluting entities both in private and public. The preparation of integrated reports is a mandatory requirement for listed entities on the JSE for both equity and debt listing. Public sector entities and metros are listed under the debt listing of the JSE.

The assurance concerning the integrated report is currently not mandatory in SA. There's no local or prescribed framework for reporting on carbon emissions. The assurance of carbon emissions disclosures/reports is not known. Not much is known about the transparency of carbon emissions reporting by public sector entities, departments, and metros. The location of public sector carbon emissions reporting/disclosures is not known.

This study has been adapted from a study by (Pitrakkos & Maroun, 2019), "Evaluating carbon emissions disclosures" on the 50 JSE listed companies.

### **1.4 Objectives**

The objectives of the study are to:

- Determine the transparency of the carbon emissions disclosures by public sector entities.
- Determine the impact of assurance on the carbon emissions disclosures.
- Identify gaps in the current legislation and reporting frameworks.
- Determine where the carbon emissions reporting is located within the different public sector entities, departments, and metros.

## **1.5 Research hypotheses**

H1 – Public entities with international loans and loans from local banks who insist on dealing with clients that have better environmental management will have better disclosure than those who rely on state grants (Pitrakkos & Maroun, 2019).

H2 – Public entities with debt/bond listing on the JSE will have more significant environmental disclosures in the integrated report than those who don't have debt/bond listings (Pitrakkos & Maroun, 2019).

## **1.6 Significance of the study**

The South African government is responsible for enacting legislation on protection of the environment and for instituting, inspecting and monitoring to ensure that the National Environmental law is not violated by citizens and organisations, both public and private. The Act also acknowledges that the state through its service delivery might damage the environment. Therefore, a study on carbon emissions disclosure from a public sector perspective will assist in understanding whether the state can hold itself accountable. It could provide further guidance on how the ASB can introduce an accounting standard that will ensure uniform disclosures on environmental impact with the public sector for all layers of government, i.e. from municipalities to national departments and entities. Their study of the 50 JSE listed companies found that more guidance on how to report on carbon emissions may be needed. In February 2021, Pretoria and Johannesburg residents complained about the pungent sulphur smell that engulfed the two metros. This source was only investigated after an outcry, which means that the DEFF is complacent about monitoring environmental issues.

## **1.7 Assumptions of the study**

This study was conducted under the assumptions that there was publicly available secondary data on carbon emissions and related activities of public sector organisation in South Africa. This including secondary data from various sources, such as annual reports, sustainability reports, and regulatory filings. The researcher also assumed that the publicly available secondary data on carbon emissions was accurate, comprehensive, and reliable. This included data that has been audited. The researcher also assumed that there were regulatory frameworks in place within the South African public sector that mandated or encouraged carbon emissions disclosure by the public sector. The frameworks included the national environmental policies, international agreements, and specific regulations that govern public sector reporting. The also

assumed that the public sector organisations reported according to the requirements of the DFFA as well as the King IV.

### **1.8 Delimitations and limitations of the study**

The study was delimited to a desk top research that reviewed available latest annual/integrated and sustainability reports from public sector organisation. Where there were no current reports available, older reports were used. The researcher did not seek to conduct any interviews with the preparers of the reports and that poses a limitation as well as a delimitation on the current study. The other limitation was that the study was limited to publicly disclosed and available secondary data and information.

### **1.9 Outline of the dissertation**

Chapter 1 introduces the study, its background and the situation on carbon emissions. Topical issues discussed are what the factors are that contribute to carbon emissions. The chapter also presents the problem statement and objectives of the research.

Chapter 2 presents the literature reviewed and empirical evidence of carbon emissions. The chapter aligns it with the objectives of the study as stated in Chapter 1. The chapter culminates in the development of hypotheses associated with the study.

Chapter 3 discusses the population, sample size and justifies the sample selected. The chapter also identifies the testing method that was used once the data had been sourced. Further, transparency attributes that were examined as part of the data analysis are discussed in the chapter.

Chapter 4 discusses the transparency indexes that were used to gauge carbon emissions disclosures for the public sector entities, drawn from (Pitrakkos & Maroun, 2019). A table for indexes scoring, which was drawn from the Carbon Disclosure Project (CDP) project climate change questionnaires for the period 2017 to 2022, is presented in this chapter. Finally, the data scores are conferred, and a conclusion is reached on whether the public sector entities' carbon disclosures are transparent or not.

### **Chapter 5**

This chapter concludes study with a summary of everything covered regarding frameworks governing non-financial reporting around the world and in SA specifically and what drives

preference of such frameworks. Chapter 5 also makes recommendations and suggests future research areas.

### **1.10 Chapter synopsis**

This chapter provided an introduction and background to the study, including the research problem, objectives, hypotheses, and the significance of the study. The chapter also provided the outline of the dissertation. The next chapter discusses the literature review and empirical evidence of carbon emissions. The literature review chapter aligns with the objectives of the study as outlined in chapter 1 of the dissertation. The literature review culminates in the development of hypotheses associated with the study.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Chapter inception**

This chapter discusses literature review and analysed on non-financial reporting, the origins of the reporting relating to ESG and carbon emissions disclosures, the applicable reporting frameworks, and current studies on non-financial reporting. The review of literature is informed by the study's research objectives outlined in chapter 1 above.

### **2.2 Theoretical review of literature**

Legitimacy is justification of corporate behaviour through assumptions or general perceptions that society holds about its activities when referenced to customs, ethics, principles or meanings (Janang et al., 2020; Olateju et al., 2021; Zyznarska-Dworczak, 2018). A recent study was conducted on the reasons behind adopting integrated reporting as envisaged by the IIRC by Japanese and English companies listed on both the London and Tokyo stock exchanges. It was found that the drive behind adoption of voluntary disclosure/reporting relating to non-financial information in the form of integrated reports was driven by legitimacy and voluntary disclosure theories (Nishitani et al., 2021). This was also observed in the study of companies listed on the Italian Stock Exchange (Vitolla & Rubino, 2017). Therefore, this study will explore carbon emissions disclosures in the public sector based on the legitimacy theory.

#### **2.3.1 Current legislation and reporting framework**

In a 1991 study of the pyramid of corporate social responsibility, the non-financial reporting can be traced to various acts which were enacted following stakeholder activism in the US. The first non-financial reporting was a sustainability report issued in 1991 (Kolk, 2003, 2004). The enactment of certain acts in the early 1970s in the US, including the following: the Environmental Protection Act (EPA), Equal Employment Opportunity Commission (EEOC), Occupation Safety and Health Administration (OSHA) and the Consumer Product Safety Commission (CPSC) introduced legal frameworks from which corporate behaviour, ethics and morals could be questioned or challenged. In the US, this gave birth to non-financial reporting. This also brought rights (for broader stakeholders other than traditional shareholders) and obligations, as companies had to account for a broader audience than their shareholders. Corporate compliance with enacted legislation led to legitimacy, and it had to be earned through good corporate ethical and moral behaviour (Carroll, 1991; Kolk, 2003). Thus, legitimacy or social licence to operate had added a layer of compliance that US corporations had to comply with and report on.

In Europe, France introduced reporting on social and environmental aspects by quoted companies in 2001, Belgium followed suit in 2003. The European Parliament endorsed voluntary reporting on corporate social responsibility (CSR). The European Parliament also asserted that by reporting on CSR, companies will benefit financially. It also encourages the public sector to select companies to do business with, based on their CSR activities as a selection criteria (Fombrun, 2005). European Union companies will comply with the requirements of voluntary reporting on CSR to have some legitimacy or social licence to operate.

In November 1994, the King I code of corporate governance introduced company governance to the South African landscape with a focus on the board of directors. Amongst others, King I introduced directors' independence (caused by interest) and ethics (need for transparency) in conducting the affairs of the company. It was based on the agency theory – directors being agents of the owners of the company, they were perceived to be representing the owners of the company. This was influenced partly by the Cadbury commission in the UK, which tackled corporate governance (Kakabadse & Korac-Kakabadse, 2001; Rossouw et al., 2002). South African companies are now required to comply with King IV, which has a disclosure and explanatory concept, where companies are expected to comply with the requirements of King IV on ESG or explain non-compliance where these companies do not comply.

The South African government moved swiftly in the new democratic dispensation to enact some acts like the Labour Relations Act (LRA) 1995, Basic Conditions of Employment Act (1997), Employment Equity Act (1998), Insider Trading Act (1998), the Environmental Management Act (1998) Public Finance Management Act (PFMA) 1999, Amendments to Companies Act (1999), Amendments to Banking Act (1999); and the 1995 and 2000 Revisions of JSE stock exchange requirements necessitated a revision of corporate governance which resulted in King II. King II introduced non-financial reporting to the reporting requirements which could be argued that it introduced the social and environmental part of ESG (Kakabadse & Korac-Kakabadse, 2001; Rossouw et al., 2002). From all the Acts enacted above, the Environmental Management Act (1998) addresses environmental protection and is also tacit acknowledgment by the South African government that the public sector; while carrying out its service delivery mandate, this might lead to environmental damage.

In SA the DEFF is responsible for the management of environmental laws and compliance. Its mandate is to give effect to the right of citizens to an environment that is not harmful to their

health or well-being, and to have the environment protected for the benefit of present and future generations. The National Environmental Management Act No.107 of 1998 was gazetted on 27 November 1998. The act is silent on how public entities must disclose environmental information. It only specifies that entities/departments listed under schedule 1 and 2 must submit their environmental plans when the act is gazetted and every four years thereafter (Government, 1998). The department went further and introduced the following acts regarding air quality management: the National Environmental Management, Air Quality Act 39 of 2004 (NEMAQA) which required installation of technology to curb emissions and also, introduced the Minimum Emissions Standards (MES) for South Africa which was published in 2013 and amended in 2018 and which also requires reduction of gaseous emissions. Besides the above acts and calling for the public sector to provide their environmental plans, the DEFF provides for reporting only on items that meet Scope 1 of the Carbon Disclosure Project framework.

Specifically, to try and curb carbon emissions, in May 2019 the South African Government introduced Carbon Tax through the publishing of the Carbon Tax Act, Act no. 15 of 2019. The Act is aimed at charging a tax on carbon emissions by organisations and individuals (S. A. N. Treasury, 2019). The way the act is crafted by the government, it seems like it is aimed at only the private sector carbon emitting companies, as it refers to taxpayers, government departments and other like entities that are not registered as taxpayers and will not pay carbon emissions-related taxes. Thus, the Carbon Tax Act seems to have a gap as it does not cover all carbon emitting entities, the public sector is excluded as the act refers to a taxpayer, while the majority of state entities, departments and metros are not registered taxpayers, as most departments receive government grants to operate, and their main purpose is providing service to the public. Thus, they are exempted from paying taxes.

The demand for reporting (non-financial reporting) that provides more information than the traditional financial reporting has led to demands for additional reporting which covers ESG in a coordinated manner (Bose, 2020; Mervelskemper & Streit, 2017). The demand came from investors and other stakeholders requiring and making investment decisions based on the how companies are conscious of the ESG requirements. The first non-financial report was the Sustainability report (Kolk, 2004). The Sustainability report was criticised for being incoherent and not well coordinated, it seemed like just an information dump rather than reporting and having nothing to do with sustainability while corporations are trying to connect with sustainability (Buhr, 2010; De Villiers et al., 2014). The advantage that an integrated report has

over the sustainable report is that it is well coordinated and may be included in the main report in some jurisdictions.

There are six frameworks recommended for disclosure of ESG from organisations like the United Nations to the IIRC (Bose, 2020). These frameworks cover all aspects of non-financial reporting. All of them are derived from John Elkington's triple bottom line reporting concept which revolutionised non-financial reporting by corporates (Bose, 2020).

These frameworks are listed as follows: (1) Global Reporting Initiative (GRI) from the Coalition for Environmental Responsible Economies, United Nations Environment Program, and the Tellus Institute. This framework is regarded as a stakeholder reporting framework as it treats all stakeholders equally; their information needs have equal prominence. The GRI is highly used (61.9 Faisal 2012) (78% Bose 2020) and most industries report their sustainability reports incorporating some of its elements (Bose, 2020; Faisal, Tower, & Rusmin, 2012). Even though the GRI is the preferred reporting framework by corporations to report on sustainable performance, it is aimed at achieving some legitimacy, i.e. being able to continue to operate or using it as a legitimising tool.

(2) The Integrated Report framework from the International Integrated Reporting Council (IIRC). It has been criticised for its main target as being the providers of capital, they are the main stakeholders to be satisfied, the other stakeholders are treated as secondary users of the reports generated from the framework (Flower, 2015; Simnett & Huggins, 2015). The Integrated Report has been influenced by the King II Corporate Governance Report emanating from South Africa (Bose, 2020), although the King II treated all stakeholders equally (Flower, 2015). This framework is the mandated non-financial reporting framework for companies listed on the JSE. It seems to enjoy more acceptance and is widely preferred around the world as about 25 countries around the world has mandated reporting on the IIRC framework (Krueger et al., 2021). The integrated reporting is mandated in 25 countries, amongst them South Africa (2010), Australia (2003), China (2008) and the UK (2013). This means that companies within these jurisdictions can claim legitimacy through complying and providing non-financial reporting and secure their social licence to operate as they would be reporting on their ESG performance. Public sector entities, metros, and departments listed on the JSE bonds section will be expected to produce integrated reports as is mandated for entities listed on the JSE.

The IIRC integrated report, although widely accepted as a non-financial reporting framework, has also been criticised for the following: much flexibility – management discretion and the

fact that it lacks prescription on what exactly must be disclosed, and that it has no metrics. It might have led to an expectation gap between the needs of users and what the preparers of these integrated reports provide as value-add information to users. It also has a lack of integrated thinking in its application as envisaged by the integrated report (Dumay et al., 2017; La Torre et al., 2019; Naynar et al., 2018). It might have led to it being used as a legitimacy tool and companies practising impression management.

The other four frameworks are, (3) the Sustainability Accounting Standards Board in the United States, which focuses on financial materiality for investors – its primary users are similar to the integrated report from the IIRC (Bose, 2020). The foundation was formed under the patronage of the former mayor of New York, Michael Bloomberg (Bose, 2020). The last three are the Impact Reporting Frameworks for small and medium enterprises (SMEs), that all target SMEs' non-financial reporting (Bose, 2020). The pressure to comply and gain legitimacy by reporting on non-financial performance affect all organisations from big multinationals to SMEs. None of the six frameworks discussed above is a preferred reporting framework and even though the GRI is widely used, no framework has been mandated for worldwide use.

Other factors like climate change have accelerated how the environment part of ESG is given prominence, through reporting on carbon emissions and a need to reduce emissions in order to reduce the average rise in temperature by 1,5%, which is a global goal (Dimitrov, 2010; Sibanda & Ndlela, 2020). From 1931 to 2015, South African carbon emissions contributed more than 2% to the rise in temperatures (Williams, 2021). Agreements have been entered into regarding reduction of carbon emissions, and South Africa is a signatory to some of these agreements, for example South Africa is a signatory to the Paris Agreement (Sibanda & Ndlela, 2020).

Climate change has been a prominent feature in the media for the past two decades. Worldwide concern over climate change led to the Kyoto agreement, which stipulated the emissions goals for the period 2008 to 2012 (Böhringer, 2003). The UN held the 2009 Climate Change Negotiations in Copenhagen (Denmark). At the Copenhagen agreement 193 countries agreed on limiting carbon emissions, which by 2005 was already 20% over the targeted reduction (Ramanathan & Xu, 2010).

This was an attempt at reaching an agreement on reduction of greenhouse gases (GHG). Over the course of the last century (20<sup>th</sup> century), the average temperature rose by .74 degrees and is

expected to reach 1.8 to 4 degrees according to best estimates and a 6.4 degrees rise is possible by the end of this century (Carter et al., 2011; Dimitrov, 2010; Maslin, 2008).

This will be a planet wide problem affecting, amongst others, the following: food production, water scarcity, human health crises due to epidemics, unpredictable and severe natural disasters, and rising sea levels (Carter et al., 2011; Dimitrov, 2010; Maslin, 2008). In a South African context, we have already experienced water scarcity causing alarms through water restrictions in big metros and drought in farming provinces in 2019 (Mogoatlhe, 2020). The effect of climate change on farming and food security has been observed over a period (Sibanda & Ndlela, 2020). The impacts of carbon emissions are no longer theories but real and proven by empirical evidence.

The entity responsible for developing reporting standards for public sector entities in SA is the Accounting Standards Board (ASB). As is, the ASB concentrates only on traditional financial reporting (N. Treasury, 1999). The ASB has not moved forward from prescribing a financial reporting framework to prescribing a non-financial framework. This means that the SA public sector, other than entities with bonds listed on the JSE, has no framework for ESG reporting.

However, recently the ASB has issued a draft exposure document on sustainability reporting for comments – ED 199 titled “*Exposure Draft on IPSASB Consultation Paper, Advancing Public Sector Sustainability Reporting*” (Board, 2023). The approval process is very lengthy, which will result in the document not being readily available and it will take time before the document is released by the ASB for use in non-financial reporting in the public sector space.

Internationally, there are three reporting frameworks aimed at carbon emissions disclosures. Examples of these are the CDP, the Climate Disclosure Standards Board (CDSB), and recommendations from the Task Force on Climate-related Financial Disclosures (TCFD) (Bose, 2020). Like ESG reporting frameworks, none of these is the mandated or prescribed framework for carbon emissions disclosure. This means that companies may select any framework that suits their reporting requirements/ a framework that would help the company achieve legitimacy.

The CDP has an advantage in that in its framework it incorporates items that are borrowed from Taskforce for Climate-related Financial Disclosure, thus, making it a more widely used framework. It refers to 3 Scopes, Scope 1 being the basic disclosures relating to entity carbon emissions and can also be referred to as “entry level disclosures” and is directly linked to carbon emissions on assets that the entity has control over. The disclosures required by Scope 1 are in

line with 2004 required disclosures as per the DEFF, and are, for an example, carbon emission from fleet, electricity consumption, etc. This study only focused on Scope 1 disclosures as it is the minimum disclosure for the CDP and requirements to meet DEFF carbon emissions disclosures.

### **2.3.2 Assurance/verification of carbon emissions disclosures**

There's a need for verification of non-financial reports as the investors and other stakeholders require reporting on non-financial information, how firms ensure their sustainability and longevity. The verification of integrated reports throughout the world depends on stakeholder activity, how the company aims to achieve legitimacy and social footprint, but companies with larger social footprint will tend to verify their non-financial reports (R. R. Datt et al., 2019; Faisal et al., 2012; Simnett et al., 2009). Also, there has been an increase in verification of carbon emissions disclosures, mainly in North America, UK and Japan with SA following behind (R. Datt et al., 2021). Companies that are subjected to regulatory requirements will tend to disclose more on their environmental performance compared to companies with zero regulations, for example Eskom and its high dependency on coal to produce electricity will have more environmental disclosure than other state entities and departments and independent verification of its disclosures, as it's subjected to strict regulation.

Currently there are few jurisdictions or regulatory bodies that require verification/assurance of non-financial reports. The assurance of non-financial reports service is offered by both traditional audit firms and consulting firms like engineering and environmental firms (Dumitru & Guse, 2016; Krasodomska et al., 2021). According to Krasodomska et al. (2021), there are still challenges regarding the appropriate standards to be used in verification/assurance of non-financial reports, also referred to as Extended External Reporting. In June 2020, the United Nations Conference on Trade and Development – International Standards on Accounting and Reporting (UNCAT-ISAR) and the World Business Council for Sustainable Development (WBCSD) cosponsored *Assurance on Sustainability Reports: Practices and Challenges (the webinar)*, which was attended by senior policymakers, regulators, professional accountants, investors and academics (Krasodomska et al., 2021). The challenges identified by the webinar, amongst others, were as follows:

- No guidance on the implementation of International Standard on Audit Engagements (ISAE) 300 which covers audits other than review of historic financial information.

- There was still a need to understand what investors want from the verification of non-financial reports.
- Few issues assure their non-financial reports.
- Most assurance providers are non-audit firms.
- There is no common practice on how non-financial reports are verified or the results of such verification are communicated (Krasodomska et al., 2021).

The non-financial reports have come a long way from the 1970s to date and are increasingly being relied upon by investors and other stakeholders for decision making (Krasodomska et al., 2021; Maroun, 2017; Simnett et al., 2009). Yet the world of preparers, policymakers, regulators, academics, etc. are still discussing the suitable assurance framework and how to communicate the assurance of non-financial reports.

The Auditor General South Africa (AGSA) is mandated by law as a supreme audit institution to audit all government entities. The firm audits all disclosed information, which means that public sector integrated reports, sustainability reports, performance reports and service delivery reports would have been verified by AGSA (Murray, 2006). The reduction of carbon emissions is likely to be include the entities, metros, and departments' annual performance plans and shareholder compact agreement. Therefore, the AGSA will likely audit achievements of targets as disclosed in their individual annual performance plans. This is not an audit or specific assurance on non-financial information.

#### **2.3.4 Location of carbon emissions disclosures within the public sector reports**

As stated, or observed above, the South African public sector does not have a prescribed carbon emissions reporting framework ((ASB), 2020; Government, 1998) just like its international counterparts. The exception is entities that have loans and bonds that are listed under the JSE bond index that are required to produce an integrated report (Krueger et al., 2021). Various international studies were done on integrated reporting being adopted by public sector entities like in Italy, where it was found that the adoption of integrated reporting resulted in integrated thinking by public sector management. (Guthrie et al., 2017). Integrated reporting is expected to facilitate holistic thinking by management of an organisation that has adopted such approach.

The King IV report embraces the six capitals concept that is the cornerstone of integrated reporting. The natural capital encompasses the eco system and how the entities interact or impact the environment; this also captured under principle three (3) of the King IV code (KPMG, 2016). The supplement to the King IV caters for, amongst others, municipalities with

mayoral functions, meaning high-capacity municipalities also referred to as metros. This means that metros will have to apply King IV and integrated reporting in their non-financial reporting. The other types of state institutions that are impacted by the supplement are state-owned entities that are the subject to King IV and integrated reporting as prescribed for non-financial reporting (KPMG, 2016; Maroun & Cerbone, 2020). The exclusion of departments in the supplement to the King IV leaves departments out of the loop, as they are not covered by the King IV through its supplement. Therefore, the location of the carbon emissions disclosures for metros and state-owned entities referred to in the King IV supplement will be the integrated report as these are required to comply with the requirements of King IV. The departments have to submit an environmental plan to the DEFF on a four-yearly basis (Government, 1998); the Environmental Management Act is silent on reporting requirement. Thus, how the carbon emissions should be reported or where the report should be located is not stated by the Environmental Management Act.

### **2.3.5 Transparency of carbon emissions disclosures by public sector**

A study has shown that there's a gap in the carbon emissions disclosures between developing and developed economies. A study that concentrated on the companies operating in the developing and developed economies found that the probability of not reporting on all carbon emissions was higher in the developing economies than in the developed economies. Additionally, factors that drove the difference between developing and developed economies were, amongst others, the following: company sustainability profile – that is its sustainability report, its assurance and existence of CSR committee within a company, gender diversity policy and its size. However, there was no difference in carbon management between the economies (Román et al., 2021). Developed economies tend to have higher stakeholder activism, which might explain the associated higher quality disclosure of carbon emissions.

A study has found that South African listed companies that have higher quality disclosures on their lower carbon risk have access to longer maturity debt, and that funders prefer to provide longer term funding to companies that disclose their carbon emissions and have lower carbon risk (Lemma et al., 2020). This will also apply to the South African public sector entities and metros that are listed on the JSE debt index; and, the higher the quality of the entity's carbon emissions disclosure of the public entity or metro, the easier it will be for a public sector entity or metro to access debt with longer maturity.

## **2.3 Empirical review of literature**

### **2.3.1 Current legislation and reporting framework**

The UK exiting the European Union (better known as Brexit) has had environmental ramifications in Scotland and Wales, whereas these countries are grappling with developing their own environmental legislation (Keating, 2023). This further complicates meeting carbon emissions goals of UK cities like Glasgow which had a target of zero emissions by 2030. A study by (Allan, Waite, & Roy, 2023) has found that Glasgow suffers from multi-layered policy making. This was also noted in the study by (Kythreotis, Jonas, Mercer, & Marsden, 2023) found cities in UK face policy uncertainty from Brexit as they have to develop their own policies which are often incoherent with the UK National policy.

In China, a study has been conducted in calculation of carbon emissions in waste water treatment and its neutralisation measures (Z. Liu et al., 2023). This show that there are improvements in terms of carbon emissions disclosures, especially the calculation of the impact of modern lifestyle. Another Chinese study demonstrated that digital carbon trading resulting in reduction of carbon emissions (Wang, Liu, Zhao, Ren, & Chen, 2023). Another study by (Hu & Man, 2023) uses combination of the following; deep learning, mechanism and data driven method and intelligent algorithms to try to forecast energy consumption and carbon emissions.

This shows that countries like China are willing to lead in the calculation and forecasting of carbon emissions. Another contributing factor is the Chinese government introducing Government Environmental Attention (GEA), which in China, the Chinese government gave carbon emission a special attention, which resulted in lower carbon emission by over 700 000 Chinese firms (Liu, Cifuentes-Faura, Zhao, & Wang, 2023). China is a contrast to the UK in terms of carbon regulation and quantification of the impact of carbon emissions.

In a 2018 Canadian student thesis, which was a study on an oil and gas firm's carbon emissions disclosure's comparability and commensuration with 19 other firms for the period 2004 to 2015. The study found that there was lack of comparability in reported carbon emissions and could be misleading to users in that users might think the firm had lower regulatory costs and/or have less regulatory risk (Wegener et al., 2019). The lack of a prescribed framework for reporting on carbon emissions could have contributed to the lack of comparability in the reported emissions.

A 2017 Australian study on a group of large Australian listed companies found that the current Australian legislation and reporting practices were not fit for purpose. The study covered Australian Stock Exchange listed resources and energy companies that were listed as the top 20 emitters by the Australian National Greenhouse and Energy Reporting data (Foerster et al., 2017). The lack of an appropriate reporting framework and legislation was highlighted as a concern in the Australian carbon emissions disclosures.

In an Asian study of 75 electricity companies, it was found that having strict environmental laws and adopting GRI reporting standards and commitment to the environment leads to better carbon emissions disclosures (Alrazi et al., 2018). The effect of strict environmental laws applied by Asian governments might have led to better environmental disclosures. It is important to note the contrast between the Asian strict environmental laws and the South African Environmental Management Act, which only requires an environmental plan every four (4) years. The South African Environmental Management Act needs to be updated in such a way that it is explicit on reporting requirements, introduces a preferred reporting framework and is strict on sanctions for non-compliance.

In 2019, a South African exploratory study of carbon emissions disclosures by 50 JSE firms comprising high emitters and low emitters was conducted to identify how these firms disclosed the carbon emissions and where they disclosed their company emissions, integrated report vs sustainability report. The study found that the emissions disclosures are used as legitimacy management exercise. Some of these companies used the disclosures to practise impression management. Also it was important to regulate the disclosure and assure the reports produced by these companies (Pitrakkos & Maroun, 2019). Again, the lack of prescribed framework might have led to companies preparing carbon emissions reports just for legitimacy purpose and some even practised impression management.

The findings above are consistent with the earlier finding from a South African study that the integrated reporting guideline is used as a disclosure checklist as integrated thinking has not been incorporated into the business systems, thus, rendering the non-financial reporting as a “by-product” rather than being part of the final product in the business reporting eco-system (McNally et al., 2017). An integrated report is seen as a compliance exercise rather than a result or evidence of integrated thinking applied by management in the business process to ensure that the ESG part has been incorporated in business strategies.

### **2.3.2 Verification of non-financial reports**

There have been numerous studies around the verification of non-financial reports. The studies provided empirical evidence that verification of non-financial reporting is still challenging as there was no consensus on the appropriate standard of auditing and assurance to use. The current verification being done on non-financial reports does contribute to the improved quality of these reports.

In a South African study involving 20 preparers and 20 auditors on assurance of integrated reports, it was found that the International Standards for Auditing and ISAE's standards of auditing and assurance will not be suitable for assurance of integrated reports as these standards are aimed at financial information and integrated reports provide valuable non-financial information to investors and other stakeholders (Maroun, 2017). This is also in line with the challenges identified by the UN webinar held on 30 June 2020, which concluded that ISAE's 300 standard needs to provide guidance on how to verify non-financial reports/EERs.

A similar Australian study focusing on practitioners, academics and investors directly involved in the integrated report assurance debates, found that assurance of the non-financial reports due add value to the reporting process. Other participants in the study were sceptical, as they believed that it is difficult to assure qualitative information, and that management have discretion in the reporting process (Corrado et al., 2019). Assurance of non-financial reports adds value to the reporting process, even though management have discretion. The scepticism around the assurance of qualitative information can be linked to lack of consensus around appropriate standards to be used in the assurance process.

An Italian study on assurance of non-financial reports focusing on 10 audit experts from both audit and non-audit firms was conducted via semi-structured interviews. The study highlighted the following challenges: lack of suitable criteria, difficulty in assuring qualitative and future information within current auditing and assurance standards, and low level of maturity of internal systems and process of companies (Borgato & Marchini, 2021). The findings regarding challenges with the current audit and assurance of non-financial information are similar to what was found by UN webinar.

A South African study was conducted on whether the assurance of ESG in the integrated reports for South African listed companies does improve the quality of these integrated reports. The findings were that the elements of the ESG that were subjected to assurance were of higher quality especially where the audit was done by Big 4 audit firms (Maroun, 2019). This is a

contradiction of the UN webinar, as the webinar highlighted challenges like most of investors not being sure about the kind of report they expect from the assurance of EERs and most assurance being done by non-audit firms.

A similar American study found that regarding the assurance of corporate social responsibility reports, audit firms provide better assurance than non-audit firms, in that they were able to identify inaccuracies in previous reports and likely inaccuracies in future reports (Ballou, Chen, Grenier, & Heitger, 2018). The study focused on restatements of CSR reports. Like the South African study, it means that non-financial reports assured by audit firms are of higher quality, as they can identify inaccuracies that might affect current and future reported non-financial performance.

An Italian study of ESG performance reporting covering big companies around the world which were engulfed with financial reporting scandals, found that the companies that had their non-financial performance verified didn't exhibit changes to their previously report on ESG performance, in the subsequent period after the financial reporting scandal (Del Giudice & Rigamonti, 2020). This means the current practice of assuring non-financial reports does add value to the quality of the reports being prepared.

### **2.3.3 Location of carbon emissions disclosures within the public sector reports**

There's no prescribed non-financial reporting framework in South Africa and internationally, despite the fact that three climate-related frameworks exist (Bose, 2020). Both the ASB and the DEFF have not issued nor recommended a preferred reporting framework. Most studies on public sectors' non-financial disclosures seem to indicate that the South African public sector has adopted the integrated/ annual report and a form of communicating relevant to non-financial information as observed by the studies done (Ackers & Adebayo, 2021; Surty et al., 2018). For the South African public sector as listed in the King IV supplement – being metros and state-owned entities, their carbon emission disclosures will be located within their integrated report (KPMG, 2016; Maroun & Cerbone, 2020). Most of the public sector entities covered in this study are expected to produce integrated reports as mandated by the JSE or by King IV.

### **2.3.4 Transparency of carbon emissions disclosures by public sector**

Various studies were carried out locally and internationally on the transparency of non-financial disclosures by public sectors, from countries like Australia to Spain and South Africa, with differing results on the transparency of non-financial disclosures. The South African

public sector non-financial reporting was found to be of higher quality when compared to its international counterparts. This might be as a result of the King Code of Good Corporate Governance being applicable to all sectors and the IIRC integrated report being mandatory for all entities listed in both the equity and debt listings.

An Australian study of 42 cities' disclosure of carbon emissions using the CPD framework found that the carbon emissions disclosures by these cities were obsolete, inadequate, imprecise and not comparable between the cities (Parvez et al., 2019). This indicates that the disclosed carbon emissions are not uniform, and can also be linked to the fact that there is no mandatory reporting framework.

In a New Zealand study of a state-owned entity (New Zealand Post), covering the period 2001 to 2015, was conducted on its integrated report supplemented with semi-structured interviews with the prepares of those integrated reports. It was found that the integrated reporting process resulted in sensible reporting of material items, while the integrated report enhanced the public sector sustainability reporting, even though it lacked on the inter-generational equity reporting (Montecalvo et al., 2018). This means that the current reporting by the New Zealand Post excluded a long-term approach in its integrated reporting.

In an Indian study was conducted on reporting on corporate social responsibility by Indian state-owned entities referred to as central public sector entities (CPSEs). This study was done following the issuing of the 2010 guide on CSR by the Indian Department of Public Enterprises, and it was found that the CPSEs reported sufficiently on human resources matters and community development, but that all the CPSEs had insufficient disclosures on carbon emissions. The disclosures were narrative rather than quantitative in nature (Kansal et al., 2018). It was also found that it was better for Indian policymakers to concentrate on making the CSR disclosure practices aligned to requirements than making the disclosures mandatory. This is in contrast with the current view where other empirical studies show that making the disclosures mandatory results in better reporting on non-financial performance.

The effect of mandatory disclosure was observed in the Indonesian study of Indonesian listed companies, where the observation covered the period before mandatory disclosure and after the enactment of environmental disclosure requirement. The study found that the disclosures increase by both medium and low emitters (Yaya et al., 2018). Further, the Indian observation is supported by the Spanish study where the introduction of mandatory environmental disclosures, and for making the Spanish public sector an example of a good corporate citizens,

was disappointing as the disclosures by the Spanish public sector was of low quality (Larrinaga et al., 2018).

The Spanish study above was conducted before the EU introduced its own regulatory directive on reporting of non-financial performance by EU state-owned entities. The introduction of the European Union Directive 2014/95 resulted in an increase in the quality of non-financial reporting by EU state-owned entities (Zanellato & Tiron-Tudor, 2021). Although the reporting by Spanish state-owned entities improved it still lagged behind when compared to private entities' disclosure (Peña & Jorge, 2019).

In a South African study of integrated reporting by state-owned entities covering the period 2013 to 2015, it was found that the disclosures in the integrated reports by the state-owned entities improved over the observed period, from providing “minute information” in 2013 to providing some information in 2015 (Surty et al., 2018). The analysis covered the period in which King III was applicable, meaning that management of these entities has discretion to apply or explain, which is different from the requirements of King IV of apply and explain.

The findings above are also supported by a South African study of state-owned entities' integrated reports compared to their international counterparts. The study found that the quality of the South African integrated reports of state-owned entities were of higher quality than their international counterparts (Ackers & Adebayo, 2021). The improvement noted by Surty et al. (2018) and higher quality observed by Ackers and Adebayo (2021) supports the notion that having mandatory integrated reporting does assist in ensuring that the quality of non-financial reporting improves.

However, another study focused on whether the perceived benefits of integrated thinking are real or not, in terms of integrated reports being able to channel management thinking and decision making to be coherent and achieve great performance on sustainability and financial performance. The study found that the integrated reporting does lead to improvements in data quantity and quality. With no proof of a better sustainability performance that could be deduced from the integrated reporting (Kannenberg & Schreck, 2019). The results of this study are not surprising as integrated reporting is new and not universally mandatory, as compared to traditional financial reporting.

Another study on the role played by chief executive officers (CEOs) regarding the quality of integrated reporting was based on 10 819 observations – that is 1 588 firms for the period 2009 to 2017. The study found that CEOs with greater power have greater influence over information

being disclosed as part of the integrated reports with an emphasis on being averse to information perceived to be of value to competitors. And also, that incentives did not play a role on their behaviour (Garcia-Sanchez et al., 2020). The findings of the study are similar to the UK study on 215 Financial Times Stock Exchange (FTSE) 350 listed companies, which found that there was negative relation between the age of a CEO and the disclosure of carbon emissions (Chithambo et al., 2020). This is expected as the most company executives are driven by the traditional value creation which assesses a firm's performance only by bottom line and share price and CEOs will not disclose any information that might be advantageous to their competitors.

All three studies above are in contrast to the South African study based on JSE listed companies which found that analysts' errors in terms of predictions of company performance decreased as a result of reliance on the integrated reports (Zhou et al., 2017). Therefore, the benefits of integrated reports and their quality might be influenced by the maturity of reporting systems (compared to some European countries like Spain, where non-financial reporting was legislated in 2017, effective from 2018 (Sierra-Garcia et al., 2018)) and the period from the adoption of integrated reporting. South Africa is one of the first adopters of integrated reporting and its financial regulatory agency, the JSE, adopted integrated reporting as a listing requirement, which means that the South African companies have to provide their stakeholders with quality non-financial reports.

The notion that countries that early adopted non-financial reporting and legislated it as mandatory will have better quality reports was proven by an empirical study of British companies (Britain, just like South Africa was one of the early adopters of non-financial reporting) and Italian companies which adopted non-financial reporting following the EU Directive on non-financial reporting. The study concluded that the quality of British non-financial reporting was of a higher standard than the Italian reporting (Venturelli et al., 2018). The quality of South African public sector non-financial reporting will depend on whether the department, metro or state-owned entity has debt listed on the JSE on the date the integrated reporting was made mandatory for listed entities. The transparency indexes below were adopted from (Pitrakkos & Maroun, 2019) study of JSE listed companies and will be used to evaluate the transparency of the public sector carbon emissions disclosures.

## **2.4 Transparency indexes**

The attributes that were used for data analysis are further explained in the sections below.

### **2.4.1 Assurance index**

Assurance refers to whether the entity's report containing carbon emissions disclosures is assured/audited or not, with a score of 1 or zero being awarded. One will be awarded where the report is assured by external parties like audit firms, environmental-related firms, or engineering firms. While a zero score will be given where there's no assurance and 0.5 where the report has been assured by internal resources, for example, internal audit or compliance section, etc. (Pitrakkos & Maroun, 2019). Assurance of integrated reports and accompanying reports like sustainability reports increases the quality of these reports in terms of reported quantitative and qualitative aspects.

As stated previously, there is no agreed-upon assurance standard for assuring the non-financial reports. However, empirical studies have shown that non-financial reports assured by accounting firms tend to be of higher quality (Maroun, 2017, 2019). The quality remained high even in cases where there was restatement of financial information, and the quality of assured non-financial information was higher because it was not restated subsequent to the restatement of financial statements (Ballou et al., 2018; Del Giudice & Rigamonti, 2020). Therefore, the following formula adopted from the Pitrakkos and Maroun (2019) was adopted for the calculation of the assurance index:

$$\text{Assurance} = a$$

### **2.4.2 Density index**

Density refers to the total number of pages within a selected entity/department/metro's report that refers to items associated with carbon emissions which must contain material disclosures around carbon emissions, and the disclosures should be about diluting the impact of the public sector on environmental damages made. Therefore, the number of pages that are attributed to carbon emissions disclosures will not necessarily be concluded as depicting quality reporting (Du Toit et al., 2017; Michelon et al., 2015). The content of the carbon emissions will be gauged against the table 1 created below from the CDP questionnaire to ensure that the density of such report is made of substance rather than volume.

The density index is the ratio of total pages within a report containing disclosures in Table 1 relating carbon emissions over the total pages of such integrated report (Hrasky, 2012). A higher index will indicate a report with substance, i.e. a substantiated report (Michelon et al., 2015). The minimum for the index is 0 while the maximum is not limited, and the formula below was used to calculate it:

Density=

$$\frac{1}{A1 \sum_{B=1}^{A1} CDiB}$$

Where A1 is the number of pages found within the integrated report of public sector entity *i*, CDiB is 1 where disclosure item B for company *i* can be categorised as per Table 1 otherwise the CDiB is zero (0) (Hrasky, 2012; Michelon et al., 2015).

### 2.4.3 Management orientation index

Management orientation index – refers to the actions and plans that management disclose regarding carbon emissions, especially relating to its reduction which must be substantiated by commitments that can be verified and easily digested by users or environmental activists of the report. It must not be “empty slogans” around the reduction of carbon emissions. For management orientation a score of 1 will represent committed actions by management on carbon emissions reduction, while a score of zero will represent empty slogans around environmental practices by management (Michelon et al., 2015; Pitrakkos & Maroun, 2019).

Management’s aim must be to reduce carbon footprint and implement initiatives to move away from fossil fuels and related environmental damaging/ carbon producing fossil energy. Thus, the statements must have intent and the result of planned actions must be seen and reported upon. For example, a committee within a company concentrating on environmental matters as per the company’s environmental strategy and ensuring that all plans are executed and under performance is corrected timely, will also display a positive management orientation towards carbon emissions.

Management orientation =

$$\frac{1}{Di \sum_{j=1}^{ki} m * CDij}$$

Where *Di* is the total number of carbon disclosure pages found within a public sector entity *i*, *CDij* is 1 where item *j* for Public sector entity *i* can be categorised by Table 1 below, or *CDij* is equal to zero. *m* represents management orientation and is scored zero if the report contains empty slogans or one where the report contains committed actions (Michelon et al., 2015).

### 2.4.4 Strategy index

The public sector entities’ strategies employed must also include environmental management. The environmental damages from service delivery activities are already explicitly

acknowledged by the government as published in the Environmental Management Act of 1998. Therefore, the public sector management must include environmental management and its risk management as part of their strategies. The environmental management practices of the public sector entities must not be a by-product of their service delivery activities but must be incorporated with their core-strategies. Reports with reference to strategies and incorporating CDP guidelines will be of a higher quality as CDP focuses on climate-related disclosures, while a report with no reference will be a low quality report (Pitrakkos & Maroun, 2019).

Integrated reporting aims to bringing together all aspects of an organisation reporting in a co-ordinated approach, meaning that the silo thinking must be discarded (Flower, 2015). Therefore, the public sector must have a strategy for environmental management and this strategy must be reported on, in terms of envisaged plans and actions taken to actualise it.

Public sector entities' integrated reports will be reviewed for sections dealing with environmental strategies. If the public sector entity deals with environmental management at a generic level, a score of 1 will be given. A score of 2 will be given where climate change is included as an important matter in the strategy but only supported by generic implications of climate change on the business model. A score of 3 will be given where climate-related matters are included in the overall approach of the public sector entity's strategy. Where there is nothing on climate change in the public sector entity's strategy a score of zero will be given. Thus, the following formula below adopted from (Pitrakkos & Maroun, 2019) was applied in determining the impact of climate change on overall organisational strategy.

$$\text{Strategy} = \frac{xi}{c}$$

Where  $xi$  will equate a strategy score for public sector entity  $i$  and  $c$  will be the maximum score given of 3, as explained above. A zero will be scored, where there's no mention of environmental matters in the public sector entity's strategy. And a score of 1 will be given where an entity's strategy included climate change in its approach, meaning climate change is not a "by product" but part of management strategic concerns.

#### **2.4.5 Integration index**

Integration – how carbon emissions are linked to a department/entity/ metro's strategy and included as part of its core risk assessment (Pitrakkos & Maroun, 2019). Furthermore, corporations are using integration of capitals to improve on their legitimacy and meet reporting needs of different stakeholders not only the providers of capital. This is supported by the belief

that integrated thinking will result in overall value creation for a firm, and where strategies and performance are not looked at in silos but are harmonised (Camilleri, 2018). Thus, for the public sector reports to be rated higher in terms of transparency of their carbon disclosure, it is important how a public sector entity views its value creation in relation to how this is reported in terms of applying principles of integrated thinking as envisaged by the IIRC and presents a picture that shows organisational performance on all aspects, not just in financial terms and a glossary picture on other non-financial performance.

An integration means carbon disclosures are integrated with aspects of the integrated report, in terms of sections of carbon disclosures in the report as compared to overall sections (Pitrakkos & Maroun, 2019; Solomon & Maroun, 2012). It must not merely be an information dump, but must make sense of non-financial and financial information relating to climate change, and that it affects many parts of an entity's business process. For example, where an integrated report has five sections and three of these have carbon disclosures, such a report will be regarded as of higher quality as carbon disclosures are integrated at 60% of the report. Thus, the following formula from (Pitrakkos & Maroun, 2019) was used to gauge the integration of public sector entities' integrated reports:

$$\text{Integration} = \frac{xi}{c}$$

Where  $xi$  is the total number per category where a public sector entity has disclosed carbon related data, as per Table 1 (In Chapter 4 below) for entity  $i$  and  $c$  is the total number of categories per table 1.

#### **2.4.6 Readability index**

Readability index refers to how much easier is it for stakeholders to find relevant information from the integrated report that relates to carbon disclosures. The information must be provided in such a way that the user of the integrated report does not have to require interpretation or hire an expert to explain it (Du Toit et al., 2017). In other words, the preparer must avoid using complex jargon and lengthy paragraphs.

The method that was used to assess integrated reports for readability is the Flesch Reading Ease measure as determined by (Du Toit, 2017). The Flesch Reading Ease measure requires a review of syllables used and length of sentences. For this research the following formula was used to assess the readability of the integrated report.

$$\text{Readability} = \frac{Gi}{n}$$

Where  $G_i$  is the Flesch Reading Ease measure as determined by Du Toit (2017) for the public sector entity  $i$ .  $n$  represents the maximum readability and equalises 1, with a score of 1 meaning that the readability of the report is of higher quality and a score of zero means that the report is of poor quality.

#### 2.4.7 Repetition index

Some studies have found integrated reports to contain repetition of information which impacts on the usefulness of the report (Du Toit et al., 2017; Raemaekers et al., 2016) and borders on impression management, as achievements are repeated and accompanying graphs have the best colours applied on them. Also, the studies above found that companies prepared integrated reports as a compliance exercise rather than providing useful balanced information to users. Users require useful information, more than what traditional financial reporting provides for conscious decision-making regarding investing in companies that seem to care about the environment, not only driven by profit motives.

The repetition index is contrary to the density index in that it takes into consideration how often the disclosure around carbon data is repeated within the reports (Pitrakkos & Maroun, 2019). As such, a higher score for repetition index will imply that the quality of reports is low, while a lower score will mean that the quality of reports is high. And the formula used to calculate the repetition index is as follows:

Repetition =

$$\frac{1}{ni} \sum_{j=1}^{k1} CDij$$

Where  $ni$  is the total number of carbon disclosures within the integrated report of company  $i$ ,  $RCij$  is 1 if the repetition is found within items identified under table 1, and zero where items are not found under Table 1.

#### 2.4.8 Attribute index

The attribute index is about how the narrative carbon disclosures are supported by financial figures, in other words, how the public sector entity integrates qualitative and quantitative reporting with financial figures; and this index is derived from (Michelon et al., 2015). The

index was used to score the integrated report of a public sector entity for its attribute, and a score of 3 being the highest would be given for integrating qualitative, quantitative, and financial in carbon disclosures. A score of 2 would be given for qualitative and quantitative in carbon disclosures. And a score of 1 would be given where the carbon disclosures were only qualitative. The adopted formula used was as follows:

Attribute =

$$1/3ni \sum_{j=1}^{k1} (w * CDij)$$

Where ni represents the total number of carbon disclosures found in the report of public sector entity i CDij of 1 where carbon disclosure j for public sector entity i contains items from Table 1, and zero if none of the items from the table can be found within the disclosure of the public sector entity.

#### **2.4.9 Quality index**

This being the final index, combines all the indexes above to produce the quality index of the carbon disclosures by public sector entities. And was calculated as follows:

Quality = (Quality + attribution + management orientation + strategy + assurance + readability + integration – repetition).

#### **2.5 CDP Project**

The widely used or followed carbon emissions disclosure framework is the CDP project. Therefore, the items that are reviewed in the public sector entity’s integrated report were adopted from the climate change questionnaires use by the CDP Project.

#### **2.6 Hypotheses**

A study of carbon risk, carbon risk awareness and cost of debt covering the period 2009 to 2013, using a sample of 255 firm-year observations from eight industries, reviewed their carbon disclosures per CPD and related cost of financing/debt. It was found that there’s a relationship between carbon risk, carbon risk awareness and the cost of debt. Companies that disclosed their carbon risk and carbon risk awareness obtained favourable rates while the ones that did not disclose paid a premium of between 38 and 62 basis points (Juhyun Jung, Herbohn, & Clarkson, 2018). The carbon emissions risks and related disclosure affects the financing

premiums that companies are expected to pay as part of financing, as evidenced by empirical study.

A European study was conducted on non-financial European firms regarding their risk profile and the cost of debt involving EuroStoxx 600 companies. It was found that there was a relationship between the higher cost of debt and the carbon emissions and disclosures. The higher polluting companies tended to pay more/premium on sourcing of funds compared to less polluting or companies that were committed to carbon emissions reduction (Caragnano et al., 2020). A Canadian study on carbon emissions and cost of debt for Canadian firms found that there was a relationship between cost of debt and carbon emissions, with higher emitting companies being penalised for emissions (Maaloul, 2018). A similar study in India found that the cost of debt is influenced by the carbon emissions with higher emitting companies/firms paying a financing premium compared to their environmental friendly competitors (Kumar & Firoz, 2018). The review was done following the CDP principles. Therefore, the premium applicable to private sector firms on cost of debt, noted from studies above, will be expected to be a driving force on the SA public sector as well for those who have international loans and loans from local banks that are environmental conscious.

The CDP project has recently updated its climate change questionnaire with respect to questions addressed to financial services providers that is banks, lenders, investment houses, etc. These financial service providers are required to provide a breakdown of their portfolio holding, for example, in terms of how much finance is provided to borrowers within the gas and oil exploration, coal and mining, etc. (CDP, 2021). This means that both foreign and local banks that are subscribes to the CDP project will have to review their portfolio holdings in terms of climate change exposure. This has been noted by some South African Banks stating that from 2025 or 2026 (News24, 2021) they will no longer fund coal mining or any coal-related activities which might affect state-owned entities like Eskom. The reason given for the targeted date of 2025 or 2026 is that Eskom through its operations and sourcing ensures that 90 000 of South Africans are employed. In an Australian study of 120 bank loans over the period 2009 to 2015, it was found that the banks have incorporated environmental factors into their lending decisions (Herbohn et al., 2019). A lot of state-owned entities, metros and departments will be affected by the decisions around funding of carbon emitting projects. From the literature review and empirical studies above the following hypothesis is drawn:

H1 - Public entities with international loans and loans from local banks who insist on dealing with clients that have better environmental management will have better disclosure than those who rely on state grants (Pitrakkos & Maroun, 2019).

The JSE introduced the requirement for an integrated report as part of its listing requirements applicable for financial years ending on or after 1 March 2010. Therefore, all listed companies had to provide an integrated report as part of their annual submissions (Doni et al., 2019; Hindley & Buys, 2012). The need to prepare an integrated report is also supported by both Kings III (Doni et al., 2019; Raemaekers et al., 2016) and IV (Doni et al., 2019; Ramalho, 2020); and therefore, any public sector company or metro with debt listed on the JSE and having to comply with King IV will have to prepare an integrated report to comply with the listing requirements. The following is the second hypothesis:

H2 – Public entities with debt/bond listing on the JSE will have more significant environmental disclosures in the integrated report than those who don't have debt/bond listings (Pitrakkos & Maroun, 2019).

## **2.7 Chapter synopsis**

Although legislation and frameworks governing environmental management and disclosures exist, there's no universal accepted disclosure framework amongst these frameworks. The integrated report seems to enjoy the universal acceptance as a non-financial reporting framework. There are gaps in the current South African legislation regarding environmental management as it refers only to submissions of four-year environmental plans. These gaps are salient in environmental reporting or reporting frameworks. Likewise, the ASB, as a custodian of public sector reporting, has not moved from prescribing a financial reporting framework to a non-financial reporting framework. The other gap identified is from the Carbon Emissions Tax Act which only refers to a taxpayer, which means exempted entities like departments will not be charged carbon emissions tax or be expected to provide higher quality disclosures as they will have no incentive/pressure to report on it – the majority of departments are not registered taxpayers and don't have bonds listed on the JSE except for National Treasury. The transparency Index from (Pitrakkos & Maroun, 2019) was used in this study to evaluate carbon emissions disclosures by the public sector. Following this chapter is the methodology chapter.

## **CHAPTER 3: METHODOLOGY**

### **3.1 Chapter inception**

The chapter discusses the methodology applicable to the study, the population size and motivation for sample size, the type of statistical analysis that was carried out and the data selection process. The analyses used the Mann-Whitney test overall, after calculating scores for selected attributes.

### **3.2 Overview**

The research methodology for this study was quantitative and statistical analysis was applied to analyse and conclude on the findings/observation. A comprehensive carbon disclosure checklist will be constructed based on professional and academic literature to identify and categorise carbon disclosures. Transparency will be gauged according to a multi-dimensional assessment derived from prior research based on density of reporting, disclosure attributes, management orientation, integration of information, ease of analysis, reporting on strategy, use of independent assurance and repetition. A content analysis will be used to gauge the quantity and quality of carbon disclosures of 21 public entities selected from local government level, national departments, and state-owned entities.

The public sector can be viewed as homogeneous, as it is governed through either the Public Finance Management Act, Act no. 1 of 1999 (as amended) (PFMA) (for departments and entities) and Municipal Finance Management Act, act no. 56 of 2003 (MFMA) which are issued by the National Treasury. Researchers recommend a small sample for a population that is homogeneous (Fowler & Lapp, 2019). Therefore, the selected 21 public entities, departments and metros were deemed adequate for the purpose of this study. Differences in the quantity and quality scores of high- and low-carbon companies were tested using a Mann–Whitney U test. The Mann-Whitney was chosen after careful consideration as per the decision tree below.

### **3.3 Population and sample size**

Municipalities and high-capacity municipalities/metros

The MFMA governs how local government should be governed. The local government, which comprises metros, district and local municipalities, is made up of 278 entities (N. Treasury, 2003). It was decided that only big metros would be sampled as they were likely to have borrowings from local and international financiers and the required skills to report on carbon emissions. These have been included in the ambit of the King IV, through a supplement

(Maroun & Cerbone, 2020). These eight metros in South Africa are Johannesburg, Tshwane, eThekweni, Buffalo City, Nelson Mandela Bay/Gqeberha, Mangaung, Cape Town and Ekurhuleni.

#### State-owned entities

The PFMA identifies 21 major public entities under schedule 2. From the 21, only eight were selected based on their activities which suggested that they may be bigger producers of carbon emissions (N. Treasury, 1999). The selected entities are Transnet Limited, Eskom, Denel, Central Energy Fund (CEF), South African Airways Limited (SAA), South African Express (Pty) Limited (SA Express), Atomic Energy Corporation of South Africa Limited, and Armaments Corporation of South Africa (ARMSCOR).

The PFMA further identifies 155 entities under schedule 3A and these are called other public entities (N. Treasury, 1999). None of schedule 3 A entities were selected as their activities don't indicate significant carbon emissions. Schedule 3B identifies 21 National Government Business Enterprises (NGBEs), therefore, only Rand Water qualified to be included in the sample.

#### National departments

There are 41 national government departments (PSA, 1994), of which only the following national departments were selected; National Departments of Defence and Health they are like to produce carbon emissions, and Environment, Forestry and Fisheries – chosen because it's the custodian of the environment. Lastly National Treasury being the custodian of Public Sector reporting.

### **3.4 Data selection**

The integrated reports and sustainability reports and other reports on environmental management as required by the National Environmental Management Act, were sourced from different entities' websites including the National Treasury. These reports are required by law to be published on each entity's website. These reports are what users are entitled to use from the entity when they want to evaluate key performance by entity. In a public sector environment, other reports like annual performance plans and service delivery reports were used.

The National Environmental Management Act refers to a four-year interval in terms of public sector entities producing reports. These were also sourced from the DEFF to verify if there's any significance.

### 3.5 Data analysis

This being a replication study conducted on JSE listed companies, the study will firstly concentrate on integrated reports, then on other reports like sustainability reports, and then on four-year plans for departments or other reports that might be used by departments to present non-financial reporting. The transparency of public sector carbon emissions will be analysed based on the following transparency index: quality of the reports, assurance, density, management orientation, integration, strategy, repetition, readability and overall quality (Pitrakkos & Maroun, 2019). The Mann-Whitney test will be used to analyse the overall total score for the selected public sector entities, metros, and departments. The transparency indices are discussed further in Chapter 4.

The transparency indexes that were discussed under Chapter 2 and adopted from the study by (Pitrakkos & Maroun, 2019) will be used to gauge the reporting done by the public sector entities and departments. The indexes are as follows:

- The assurance index which deals with weather reports containing carbon emissions disclosures in the integrated report/annual report are audited/assured. Where the formula for calculation is as follows:

$$\text{Assurance} = a$$

The total score of 1 is achieved where the carbon emissions disclosures are audited/assured by an external independent body, and a score of 0.5 is achieved where the disclosures are assured/audited by an internal body like the organisation's internal audit.

- The density index deals with the total number of pages which disclose material carbon emissions without diluting the impact of carbon emissions on the environment.

The density formula is as follows:

$$\text{Density} = \frac{1}{A1 \sum_{B=1}^{A1} CDiB}$$

Where A1 is the number of pages found within the integrated report of public sector entity i, CDiB is 1 where disclosure item B for company i can be categorised as per Table 1, below, otherwise the CDiB is zero (0) (Hrasky, 2012; Michelin et al., 2015).

- The management orientation index which deals with actions and plans from management on dealing with carbon emissions, are steps being taken to ensure commitments are met or the entire exercise is done just for public relations. With its formula for calculation being as follows:

$$\text{Management orientation} = \frac{1}{D_i \sum_{j=1}^{k_i} m * CD_{ij}}$$

Where  $D_i$  is the total number of carbon disclosure pages found within a public sector entity  $i$ ,  $CD_{ij}$  is 1 where item  $j$  for public sector entity  $i$  can be categorised by Table 1 below, or  $CD_{ij}$  is equal to zero.  $m$  represents management orientation and is scored zero if the report contains empty slogans or 1 where the report contains committed actions (Michelon et al., 2015).

- The strategy index deals with strategies employed by the entity to include environmental management; whatever goals that are set should include the impact on environment and how it will be addressed. Its formula is calculated as follows:

$$\text{Strategy} = \frac{X_i}{c}$$

Where  $x_i$  will equate a strategy score for public sector entity  $i$  and  $c$  will be the maximum score given of 3, as explained above. A zero will be scored, where there's no mention of environmental matters in the public sector entity's strategy. And a score of 1 will be given where an entity's strategy included climate change in its approach, meaning climate change is not a "by product" but part of management strategic concerns.

- The integration index deals with how carbon emissions are integrated in an entity, department, or metro's strategy as part of core risk assessments.

$$\text{Integration} = \frac{X_i}{c}$$

Where  $x_i$  is the total number per category where a public sector entity has disclosed carbon-related data, per Table 1 for entity  $i$  and  $c$  is the total number of categories per Table 1.

- The readability index deals with the easiness of finding relevant information from the integrated report/annual report that deals with carbon emissions. Its formula is as follows:

$$\text{Readability} = \frac{G_i}{n}$$

Where  $G_i$  is the Flesch Reading Ease measure as determined by Du Toit (2017) for public sector entity  $i$ .  $n$  represents the maximum readability and equalises 1, with a score of 1 meaning that the readability of the report is higher quality and a score of zero means that the report is of poor quality.

- The attribute index deals with how the carbon emissions disclosures are supported by financial figures. The associated costs are included in the narrative.

$$\text{Attribute} = 1/3n_i \sum_{j=1}^{k1} (w * CD_{ij})$$

Where  $n_i$  represents the total number of carbon disclosures found in the report of public sector entity  $i$ .  $CD_{ij}$  of 1 where carbon disclosure  $j$  for public sector entity  $i$  contains items from table 1, and zero if none of the items from the table can be found within the disclosure of public sector entity.

- The repetition index deals with the reports of the same carbon disclosures with the integrated report/annual report.

$$\text{Repetition} = \frac{1}{n_i} \sum_{j=1}^{k1} CD_{ij}$$

Where  $n_i$  is the total number of carbon disclosures within the integrated report of company  $i$ ,  $RC_{ij}$  is 1 if the repetition is found within items identified under Table 1, and zero where items are not found under Table 1.

- The quality index is calculated from adding the scores of all indexes except for the repetition index which is subtracted to get the overall quality of the disclosures.

### 3.6 Chapter synopsis

Both the PFMA and MFMA administered by the National Treasury provide clarity on public sector governance. From over 270 municipalities as identified by the MFMA, only eight metros were selected based on their likely access to funding and the requirement by King IV through a supplement that these be included within King IV's ambit. From 21 major entities as identified by the PFMA, only eight were selected based on the likelihood that their activities are likely to result in carbon emissions. Schedule 3A and 3B identify other public entities and NGBEs respectively, only Rand Water was selected from the two categories. And from 41 departments as stated in the PSA, only four departments were selected based on the following: two departments were selected based on their service delivery activities, one department being the custodian of environmental management within South Africa, in terms of compliance and

monitoring, and the last one being responsible for public sector reporting standards. The statistical method that was employed to analyse the data was discussed and a brief introduction to the transparency indexes that were used to gauge the disclosures was provided. The next chapter outlines the presentation of data and analysis.

## **CHAPTER 4: DATA PRESENTATION AND ANALYSIS**

### **4.1 Chapter inception**

Chapter 4 details the transparency attributes that were used to gauge the transparency of public sector carbon emissions disclosures and how these attributes were scored. A table of carbon disclosures that was used to review the public sector carbon emission disclosures was created from the CDP project questionnaire. Then the actual data analysis of public sector disclosures was performed on the reports from the selected public sector entities, metros, and departments.

### **4.2 Transparency indexes**

The transparency indexes that were discussed in Chapter 2 and adopted from the study by Pitrakkos and Maroun (2019) were used to gauge the reporting done by the public sector entities and departments. The indexes were as follows:

- The assurance index deals with whether reports containing carbon emissions disclosures in the integrated report/annual report are audited/assured.
- The density index deals with the total number of pages which disclose material carbon emissions without diluting the impact of carbon emissions on the environment.
- The management orientation index deals with actions and plans from management on dealing with carbon emissions. It determines whether steps are being taken to ensure commitments are met or whether the entire exercise is done just for public relations.
- The strategy index deals with strategies employed by the entity to include environmental management, whatever goals that are set should include the impact on environment and how it will be addressed.
- The integration index deals with how carbon emissions are integrated into an entity, department, or metro's strategy as part of core risk assessments.
- The readability index deals on the easiness of finding relevant information from the integrated report/annual report that deals with carbon emissions.
- The repetition index deals with the reports of the same carbon disclosures with the integrated report/annual report.
- The attribute index deals with how the carbon emissions disclosures are supported by financial figures. The associated costs are included in the narrative.
- The quality index is calculated from adding the scores of all indexes except for repetition index which is subtracted to get the overall quality of the disclosures.

### **4.3 Assurance/Audit of annual/integrated reports**

All the selected metros, departments and entities are audited by the office of the Auditor General of South Africa. As already discussed in Chapter 2, currently, there are no agreed-on auditing standards for ESG. The AGSA review of annual reports/integrated reports is limited on ensuring that there's no conflict of financial information disclosed in other reports. Thus, none of the selected entities, departments, and metros scored a score of 1 as their reports were not audited. Eskom and the City of Cape Town had their ESG assured by their internal audit departments, therefore, they received a score of 0,5 on assurance as they had their report assured and disclosed the fact. The rest of the other departments, metros and entities didn't assure their ESG disclosures.

### **4.4 Density of disclosures**

The disclosures in terms of number of pages dedicated to carbon emissions disclosures were precise and complete for Eskom and City of Cape Town. These two were followed by the aviation sector being SAA and SA Express. The other entities, departments and metros' disclosures were not voluminous. Their disclosures were more compliance based; probably a tick box exercise developed in earlier times of ESG disclosures. Their disclosures didn't even meet the minimum requirements of the DAFF.

### **4.5 Management orientation**

The management orientation differs from each entity, department, or metro. City of Cape Town and Eskom have dedicated units/sections dealing with carbon emissions and reporting directly to the Board and a mayoral committee. The two entities in the airline industry, SAA and SA Express, didn't fall behind in terms of their management orientation on carbon emissions. The other entities or metros had similar reporting lines, as they all had some committee led by a Board member or mayoral committee. The departments had no such committees, the management orientation on carbon emissions was a "public relations" exercise or non-existent in the National Treasury.

### **4.6 Strategy index**

The strategies on carbon emissions differed from the ones that had intentions in dealing with carbon emissions, and again, City of Cape Town and Eskom included allocations and plans to move away from carbon inducing sources of electricity. They were followed by the entities in the airline industry, being SAA and SA Express. These seemed to also have plans on carbon emissions reduction. SAA was experimenting with the use of biofuels. Other entities,

departments and metros were only complying with the requirement to report on carbon emissions. They had no plans or strategies on carbon emissions. It was a compliance exercise. The Department of Defence and its associated entities like Denel and Armscor were expected to have strategies for the use of explosives and impact on the environment and how it will be mitigated. Nothing on carbon emissions or environmental damage was covered in their annual reports. Similar shortcomings were observed on the reports from CEF (responsible for exploration of fossil fuels and gas, sale and distribution of fossil fuels and gas products) and Atomic Energy Corporation of South Africa (responsible for nuclear products). These two entities were expected to have strategies on carbon emissions or environmental management. The National Treasury, the custodian of government reporting, did not have a strategy in its annual report.

#### **4.7 Integration index**

Yet again, City of Cape Town, Eskom, SAA, and SA Express had detailed integration in that their plans were detailed and costed (rand-wise), and the reporting followed what was planned. Their plans were derived from company strategies. Entities like Rand Water and Transnet were expected to apply some integration but their disclosures were basic for sophisticated entities involved in transportation of goods and provision of water. They do rely on the use of diesel to provide services and water, yet besides reporting, no integration was found. Departments were always the last ones, no integration at all, much of their reporting is aimed at service delivery type of achievements and plans. Metros, except for City of Cape Town, were also in compliance mode, besides having a Member of Municipal Council (MMC) responsible for the environment. The reporting was basically lacking integration.

#### **4.8 Readability index**

The City of Cape Town, Eskom, SAA, and SA Express have carbon emissions sections that were easier to understand as they were supported by graphs and trends in their reporting and plans. The carbon disclosures of the rest – metros, entities and departments – were hidden with other information and the disclosures were not at a dedicated section. It was a challenge to find the disclosures and to decipher the information. The departments, except for DEFF, had the lowest scores on readability as some like National Treasury had nothing on carbon emissions or reporting on the environment.

#### **4.9 Attribute index**

Eskom, City of Cape Town and the two aviation companies (SAA and SA Express) have integrated the qualitative and quantitative aspects of carbon emissions disclosures on current actions taken and future actions for their carbon emissions. These SOEs' disclosures are accompanied by financial commitments and costs, meaning that they showed integration of financial and non-financial reporting in their disclosures. The financial reporting and non-financial reporting were not treated in isolation. The financial impact of activities detrimental to the environment and how these were being addressed or will be addressed in the future were succinctly disclosed. The rest of the state entities, metros and departments did not integrate their financial and non-financial reports. The financial impact of the activities on the environment were not disclosed or captured, nor was any future plan to mitigate environmental damage disclosed. Thus, they scored low on integration.

#### **4.10 Repeat**

All entities were assessed and found to have repeat disclosures on the reports. Some elements of repeat would fall under a category of emphasis of matter – meaning the disclosure were being emphasised. The repeats were not regarded as detrimental to the information disclosed or that the entities, departments and metros were engaged in impression management (disclosure aimed at deceiving users of reports by using graphs and other means).

#### **4.11 Quality index overall**

The City of Cape Town, Eskom, SAA, and SA Express scored high on the overall disclosure. The disclosures on carbon emissions of City of Cape Town and Eskom when reviewed on their own indicate a level of being transparent. The SAA and SA Express followed. The other state-owned entities, departments and metros scored lower and thus, impacting the overall public sector to score low on the carbon emissions disclosures. The overall quality index for public sector entities, departments and metros is that their carbon emissions disclosures are not transparent.

All the public entities, departments and metros prepare integrated reports, even though departments are not required to prepare integrated reports. The integrated/ annual reports for the selected public sector entities, departments and metros were obtained from their respective websites. The data obtained from these /annual reports was analysed for each index above, and the overall score and overall quality score were also calculated. The table below shows the overall quality scores for each selected entity, department, or metro. A two-tailed statistical

analysis was performed on the data. At 95% and 90% confidence level, only two of 21 entities, departments and metros' carbon emissions disclosures could be regarded as transparent. That was for City of Cape Town and Eskom.

**Table 1: Carbon disclosure items adopted per climate change-related questionnaires for the period 2017 to 2022 from CDP project**

No	Description
1	Discussion of low-carbon transition at public sector entity's integrated report
2	Intention to publish low carbon in the next two years
3	Climate-related strategies include into corporate strategies
4	How climate-related risks and opportunities are included on corporate strategy and financial plans
5	Disclose the standards and protocols or method that were used by the metro, department or state-owned entity to collect data and calculate emissions
6	How the public sector entity, department or metro engages the policymakers
7	How the public sector entity, department or metro is going to report carbon emissions data
8	Board/Council oversight of climate-related matters on the non-financial reports
9	Are the individuals responsible for climate change from the board listed on the integrated report
10	Climate impact scenario analysis
11	Plans on how the public entity, department or metro is going to migrate to low-carbon
12	Reporting on how performance versus plans and how actions which were not achieved are being dealt with – is there consequence management?
13	How detailed are the sourcing strategies of these public sector entities, departments or metros with regard to purchase power from renewables?
14	Breakdown of energy consumption into renewable versus non-renewable sources
15	Do the total carbon emissions disclosed include the total impact of the organisation's carbon emissions, for an example, are carbon emissions from vehicle fleet included, if a fleet is owned?
16	Are transitional plans realistic (transitioning from dirty energy to clean energy) in terms of time versus actual?
17	Did the public sector entity, department or metro appoint an environmental officer, who is responsible for the entire process?
18	Climate change-related research funding
19	Board/Council competence on climate-related issues
20	Spend by public sector entity that is aligned with the 1.5 degrees
21	Gas leaks detection systems, protocols, etc., that detect and prevent atmospheric damage
22	Public entity's influence on service providers and suppliers about them reducing their carbon footprint
23	Were there engagements with suppliers/service providers about reducing greenhouse gases?
24	Disclosed total emissions in metric tons

25	The organisation presents its climate-related contributors other than gases, for example water usage
26	Issues that the public sector entity has directly engaged the policymakers on
27	Power generating capacity/use of power generated from fossil fuel
28	Disclosure of carbon emissions tax paid to South African Revenue Service
29	Low carbon investments disclosures on the integrated report
30	Terms of reference about responding to climate change questions from investors

**Table 2: Calculated overall quality score for each entity, department, or metro**

Entity, department, or metro	Overall scores on quality integrated/ annual reports	Overall scores on quality sustainability reports
Eskom	0,924	0,956
South African Airways Limited	0,603	0 *
Central Energy Fund	0,475	0
Transnet Limited	0,544	0
Atomic Energy Corporation of South Africa Limited	0, 513	0
Armaments Corporation of South Africa.	0,496	0
Denel	0, 556	0
South African Express (Pty) Limited	0,750	0
Rand Water	0,447	0
City of Cape Town	0,940	0,975
eThekweni Metro	0,429	0
Mangaung	0,279	0
Johannesburg Metro	0,554	0
Tshwane Metro	0,496	0
Ekurhuleni Metro	0,634	0
Nelson Mandel Bay Metro	0,425	0
Buffalo City Metro	0,446	0
Department of Defence	0,188	0
Department of Health	0,192	0
Department of Environment, Fisheries and Forestry	0,734	0
National Treasury	0	0

\*A score of 0 means the entity, department or metro do not prepare sustainability report.

#### **4.12 Chapter synopsis**

The previous chapter addressed the study's research design and model specification with the study's variables clearly explained and justified. This chapter detailed the findings of the study on the transparency of the carbon emissions disclosures that were made in the annual report/integrated reports of the public sector entities, departments, and metros. Although some public sector entities, departments and metros like Eskom and City of Cape Town were excellent in their carbon emissions disclosures, others like National Treasury had no disclosures at all. The study therefore found that, overall, the public sector carbon emissions disclosures are not transparent. Following this chapter is the summary, conclusions and recommendations chapter concluding the study.

## **CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Chapter inception**

This chapter presents the summary, conclusions and recommendations of the study on the transparency of carbon emissions disclosure within the South African public sector. The summary, conclusions and recommendations have been drawn from the previous chapter which focused on the data presentation and analysis. The conclusions have been drawn on the findings of the study that informs the recommendations thereto. Further areas for future research consideration concludes the chapter.

### **5.2 Summary of the study**

The evolution of comprehensive reporting on firm-wide performance was not a natural process, it was forced on industries by way of laws which were sometimes championed by activists. This was also accelerated by environmental disasters such as Chernobyl, Valdez, and BP. Most western countries with stricter laws and stakeholder activism apply punitive actions for lax environmental management. This has also been impacted by climate change and the need to ensure that the increase in temperatures over a period are kept below 1.5 degrees.

Various conferences were held, and agreements signed, to combat climate change that were facilitated by the UN. Countries such as Brazil, held the first conference in the early 2000s, followed by cities in other countries – Kyoto, Durban, Copenhagen, Paris, Glasgow, and most recently the Cop 28 was held in the UAE.

Above these, the UN had Millennium Development Goals which were set in 2000 and were replaced in 2012 by 17 Special Development Goals, six of which are focused on the environment. This highlighted the importance of the environment not only for the current period but for future generations as well.

The entire set of reformed reporting requires firms and industries to report on three items, namely environment, social and governance, over and above the traditional financial reporting. Recent changes in environmental management have necessitated that firms/entities and public organisations report on their environmental footprints, and financiers are including environmental reporting in funding assessments. Therefore, going forward, most bonds and loans will be “green bonds/loans” as these institutions want to be seen as caring for the environment.

### **5.3 Conclusions of the study**

All South African public sector entities, metros and departments seem to be aware of the need to expand on their reporting beyond providing traditional financial reports. Also, the guidance from the DEFF and NT on reporting on ESG matters is not coordinated, as some entities like Eskom and City of Cape Town have reported excellently on the matter, even though the overall public sector-wide reporting is lacking. The excellence displayed by Eskom and City of Cape Town might have been due to staff and the need to be seen as environmental conscious by the public and funders.

The recent introduction of the exposure draft from the ASB on public sector sustainability reporting will close the gap once the document is approved and made a mandatory reporting requirement by the NT. From the reporting framework, the next gap that must be closed is auditing ESG, which has its challenges as there is no consensus on how to audit the ESG reports. Recent developments have resulted in the IAASB issuing standards and guidelines on how to audit ESG reports.

The study sampled 21 public sector metros, departments, and entities and assessed their carbon emissions disclosures. There were pockets of excellence when these were assessed on individual level, like Eskom and City of Cape Town followed by the aviation entities like South African Airways and SA Express. Regarding Eskom and City of Cape Town, reviewed on an individual basis, both null hypotheses are supported. The overall carbon emissions disclosures by public sector entities, departments and metros were below par. Therefore, both null hypotheses are not supported as the disclosures of carbon emissions in the South African public sector are not transparent.

### **5.4 Recommendations from the study**

There are gaps between what the DEFF and National Treasury mandates are reporting on. The National Treasury (represented by the ASB) is the custodian of government reporting but its pre-occupied with traditional financial reporting to the detriment of non-financial reporting. Recently, the ASB issued an exposure draft on ESG reporting, which is a start but needs to be accelerated to ensure compliance with international standards on ESG reporting. The DEF is also stuck on items that are regarded as scope 1 in terms of carbon emissions reporting, the bare minimum. Thus, the bar is set low by both departments for public sector entities to transition from traditional financial reporting to non-financial reporting.

The entire scope covered or required to be reported upon by the Carbon Project should be embraced and encouraged to be adopted even by public sector departments and metros excluded from preparing integrated reports – per supplement from the King IV.

The DEFF in conjunction with the National Treasury should have a holistic view of current reporting by public sector entities, departments, and metros. The co-ordination of reporting must be prioritised to ensure that the possible impact on the South African economy of non-compliance with international requirements is reduced. The reporting on non-financial matters like environmental issues, be it carbon emissions, water usage, etc., should be prioritised, as it not only impacts SA's exports but also its tourism – being a source of foreign earnings, as some tourists are particular about the matters relating to green living.

From the study, it is noted that of the public sector entities, departments and metros, City of Cape Town is the leader in carbon emissions-related disclosures, followed by Eskom. These two embraced all the Carbon Project scopes and disclosed future and expected costs on their planned transition to clean energy. Their entire disclosure could not be regarded as a by-product, but a well-integrated approach to non-financial reporting. Their transparency could be used as a benchmark for carbon emissions disclosures within the public sector.

### **5.5 Future research areas**

Proposed areas of future research that will significantly enhance the holistic ESG reporting with the public sector have been identified and some of them are discussed below.

The following areas of future research are proposed:

- a) The skills and competence of staff employed by state-owned entities, departments, and metros, who are responsible for integrated/annual and sustainability reports and reporting on ESG.
- b) The impact of the Chief Sustainability Officer on integrated/annual and sustainability reporting, especially ESG reporting.
- c) The new trend of including ESG in the performance contracts of employees and how these are set and measured, and finally reported upon in a transparent manner.
- d) What gives the edge to City of Cape Town and Eskom on ESG reporting?

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## TURNITIN REPORT

The transparency of carbon emissions disclosure within the South African Public Sector

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## ENGLISH LANGUAGE EDITOR'S LETTER

### Editing certificate TO WHOM IT MAY CONCERN

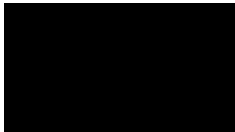
I, Jeanne Enslin, acknowledge that I did the language editing of **Dumisani Owen Maluleke's** thesis to be submitted in partial fulfilment of the requirements for the degree Master of Accountancy at the University of KwaZulu-Natal.

The title of this thesis is:

#### **CARBON DISCLOSURES: THE TRANSPARENCY OF CARBON EMISSIONS DISCLOSURE WITHIN THE SOUTH AFRICAN PUBLIC SECTOR**

Details of the language editing are evident in the version of the document in track changes and with important comments for the student's attention. As agreed with the student, I did not check any in-text references or the reference list.

The quality of the final document, in terms of language, formatting and references remains the student's responsibility.



**Jeanne Enslin**

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**23 May 2024.**

*BA English and History (University of Stellenbosch)*

*Senior Teaching Diploma (University of Stellenbosch)*

*Honours in Translation Studies, Phonetics and Linguistics, cum laude (Unisa)*

*Postgraduate Diploma in Editing, cum laude (University of Stellenbosch)*

# ETHICAL CLEARANCE



14 August 2024  
Mr Dumisani Owen Maluleke (963070094)  
School Of Acc. Economics&Fin  
Westville

Dear Mr Dumisani Owen Maluleke,

Original application number: 00013429  
Project title: Analysis of carbon emission disclosure in South African public sector environment  
Amended title: The transparency of carbon emissions disclosure within the South African public sector

## Exemption from Ethics Review

In response to your amendment application received on 14 August 2024, your school has indicated that the amendment has been granted **EXEMPTION FROM ETHICS REVIEW**.

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

### PLEASE NOTE:

Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours sincerely,



Prof Claire Lauren Vermaak  
Academic Leader Research  
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