

# A COMPARATIVE STUDY OF EFFECTIVENESS OF GREEN TAXES IN SOUTH AFRICA AND DEVELOPED COUNTRIES

by

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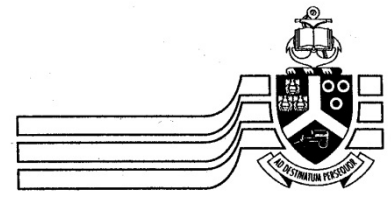
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at the

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## Declaration

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I, Jonathan Maphosa, hereby declare that this dissertation is my own unaided work. It is being submitted in partial fulfilment of the prerequisites for the in partial fulfilment of the requirements for the degree LLM Tax Law at the University of Pretoria. It has not been submitted before for any degree or examination in any other University.

Jonathan Munyaradzi Maphosa

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Signature

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Date

## DEDICATION

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I dedicate this dissertation to my loving sister Anna Munchandigona who has consistently encouraged my studies and selflessly made personal sacrifices to enable me to have the opportunity to pursue under-graduate studies in law which ultimately led to my pursuing this post-graduate study in Tax Law.

## ACKNOWLEDGEMENTS

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I give and acknowledgment and thanks to God for giving me the determination and will to further my studies. Thank you also to my family and good friend Billy for supporting me.

## ABSTRACT

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South Africa has been going through a series of political, economic and social changes since 1994. These changes have transformed it into a state that shows increased commitment to sustainable development. Although the country is considered as one of the largest developing country emitters of pollution, the South African government has recognised the need to move towards a low-carbon society. The country's participation in international climate mitigation bodies has seen its commitment to reduce greenhouse gas (GHG) emissions of 34% by 2020 and 42% by 2025. South Africa has committed to achieve these goals provided that it receives the necessary finance, technology and support from the international community.

The major objective of this study was to conduct a comparative analysis of the effectiveness of green taxes in SA and developed countries. Four countries were chosen for the analysis in this study; South Africa, China, the United States and the United Kingdom. The study depends on secondary analysis obtained from published articles, databases and websites providing research on various organisations and government bodies. From my analysis, this study observed that many developed and developing countries have already implemented environmental taxes, and many other countries are considering similar instruments.

The findings of this study are that green taxes and environmental taxes in general, are intended to protect the environment. By levying higher taxes on activities and products that harm the environment, businesses are discouraged from developing industries that destroy nature. Based on the findings, this study recommends that South Africa should address the inconsistencies in its policies across various government departments. The study also recommends the need for tax policy reconsideration so as to improve the relevance of environmental and green taxes. However, the study observed that since South Africa is still hampered by the triple constraints of unemployment, poverty and inequality, and in order to address the negative impacts of carbon taxes, it needs to put in place certain mitigation agreements with high pollution emitting companies.

## LIST OF ACRONYMS

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ACCA	Association of Certified Chartered Accountants
ADP	Durban Platform for Enhanced Action
BRICs	Brazil, Russia, India, China and South Africa
CAC	Command and Control
CDP	Carbon Disclosure Project
CO <sub>2</sub>	Carbon Dioxide
COP17	United Nations Climate Conference
DBSA	Development Bank of Southern Africa
DEA	Department of Environment Affairs
DoE	Department of Energy
DWA	Department of Water Affairs
EU	European Union
EUR	Europe
FY	Financial Year
G20 DWG	G20 Development Working Group
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GTBR	Green Taxes and Budget Reform
IPRs	Intellectual Property Rights
JSE	Johannesburg stock exchange
LCV	Light car vehicles
LTMS	Long Term Mitigation Scenarios
HCV	Heavy car vehicles
HC	Hydrogen Carbon
IEIA	International Energy Information Administration

IPAP	Industrial Policy Action Plan
KPMG	Klynveld Peat Marwick Goerdeler
MMTCO <sub>2</sub>	Million Metric Ton of Carbon Dioxide
NAAMSA	National Association of Automobile Manufacturers of South Africa
NEMA	National Environmental Management
NCCR	National Climate Change Response
NCCRWP	National Climate Change Response White Paper
NO <sub>x</sub> ,	Nitro Dioxide
NT	National Treasury
OECD	Organisation for Economic Co-operation and Development
OPEC	Organisation of the Petroleum Exporting Countries
PRSPs	Poverty Reduction Strategies
SA	South Africa
UNFCCC	United Nations Framework Convention on Climate Change
UK	United Kingdom
UN	United Nations
USA	United States of America
USD	United States Dollar
VBN	Value-Belief-Norm
WTO	World Trade Organisation

## GLOSSARY OF KEY TERMS

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**Carbon tax:** This is an environmental tax levied on the carbon content of fuels, especially those used by motor vehicles, with the purpose of reducing the emission of carbon dioxide. It is a form of carbon pricing on fossil fuels, and is charged per volume of greenhouse gases (mainly dominated by CO<sub>2</sub> emissions) released when combustion takes place.<sup>1</sup>

**Environmental tax:** A type of tax whose base is a physical unit (or a proxy of it) of something that has proven to have an explicit negative impact on the environment. Environmental taxes are used to signify emphasis on the potential effect of a given tax in terms of its impact on costs and prices.<sup>2</sup>

**Green tax:** Green taxes (also called “environmental taxes” or “pollution taxes”) are excise taxes on environmental pollutants or on goods whose use produces such pollutants. It is a tax placed on people or organisations for goods and services that could be categorised as not environmentally friendly. The major aim of imposing green taxes is to reduce the environmental impacts of that object.<sup>3</sup>

**Kyoto Protocol:** The Kyoto Protocol<sup>4</sup> is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its parties by setting internationally binding emission reduction targets. It was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh, Morocco, in 2001, and are referred to as the ‘Marrakesh Accords’. Its first commitment period started in 2008 and ended in 2012.

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<sup>1</sup> UNFCCC, 2011.

<sup>2</sup> Steinbach et al., 2009.

<sup>3</sup> Levinson, 2007

<sup>4</sup> Available at [http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php).



**Proxy Tax:** is a type of tax penalty, sometimes accompanied by other penalties paid by a company that fails to provide notices of the amounts of membership dues allocable to non-deductible lobbying expenditures. In relation to carbon taxes two options are considered before such a tax is applied. Upstream, where fuels enter the economy according to a fuel's carbon content or downstream, on emitters at the point where fuels are combusted.<sup>5</sup>

**Tax Control Framework:** A tax control framework is a system (process) to identify, mitigate, control and report tax risks. It focuses and contributes to, the effectiveness, efficiency and transparency of a tax function.<sup>6</sup>

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<sup>5</sup> Steinbach, 2009; National Treasury, 2010.

<sup>6</sup> Hoyng, et al., 2010.

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# CHAPTER 1: INTRODUCTION

## 1.1. Introduction to the study

The world today is facing a multitude of environmental challenges. Many of these challenges may be attributed to particular geographical locations due to the extent of industrial growth; several others are at a global level. The exigent factor is that regardless of the level of contribution to the environmental degradation, the impacts are generally distributed evenly. Hence, these global challenges require a collective effort and global leadership. Therefore, this calls for governments to put in place strict goals for the reduction and control of greenhouse gas emissions. At the same time, governments should endeavour to develop and implement effective policy instruments to achieve the set goals. However, this should be done by keeping in mind that the lower the economic cost of reduction and control, the more these policies are likely to be accepted politically.

To respond to the call of “saving the environment”, many governments have put in place environmental taxes. Many governments have periodic increases in fuel duty, vehicle excise duty, and air passenger taxes. Many of these taxes are to a large extent meant to achieve environmental benefits. These include encouraging people to reduce private vehicle use, purchase “greener” cars, and in large cities to make greater use of rail transport and other public transport. Taxation is utilised by many governments as the best way to protect the environment since it is an effective policy tool that is easily implementable.<sup>7</sup> Green taxes also commonly known as “environmental taxes” or “pollution taxes” are among the policy tools implemented by many countries, including South Africa.<sup>8</sup> In general, most people have little or no interest in paying taxes; however, their gradual increase provides a modest environmental benefit.

Researchers Avi-Yonah and Uhlmann<sup>9</sup> also argue that a carbon tax or green tax would be easier to implement and enforce. It is posited that it is simpler to adjust such taxes in the event that the

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<sup>7</sup> Avi-Yonah & Uhlmann, 2009.

<sup>8</sup> Bashmakov *et al.*, 2001.

<sup>9</sup> 2009.



resulting market-based changes are either ineffective or too extreme. Such taxes are capable of producing revenue that could be used to fund the research and the development of alternative energy and tax credits. Such alternatives could be used to offset any regressive effects of the carbon tax. These researchers further assert that when green taxes are immediately implemented, they could serve as a more effective measure for reducing greenhouse gas emissions than a cap and trade system.

Green taxes are excise taxes on environmental pollutants or on goods whose use produces such pollutants.<sup>10</sup> From the economic theory point of view, green taxes could be used to reduce environmental harm in the least costly manner. This could be done by encouraging changes in behaviour by companies and households that can successfully reduce pollution at the lowest cost.<sup>11</sup> This study therefore explores green tax implementation in South Africa as compared with developed countries in order to fully establish an understanding of the various impacts of this policy instrument.

Global environmental degradation is a major challenge facing most countries. Regardless of the root cause of this global challenge, all nations need to jointly undertake significant efforts to ensure a beneficial reduction. This should be mandatory for all countries so as to avoid the possibility of catastrophic environmental impacts. This study, therefore, comparatively investigates the effectiveness of green taxes in South Africa and developed countries. The study is informed by the analysis of secondary data of four countries namely; South Africa, the United States of America, China and the United Kingdom.

## **1.2. Background of the study**

It is generally the objective of every nation to achieve “greener” development by putting in place economic and environmental policies that are compatible and mutually reinforcing. Apart from the application of policies and taxes, many countries advocate the use of new technologies and renewable energy. Government-sponsored awareness programmes calling for citizens to change

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<sup>10</sup> Tol, 2005.

<sup>11</sup> Bailey, 2002.

the way they live, consume, recycle, and re-use are common place. As Bailey<sup>12</sup> notes, well-designed environmental taxes could help achieve objectives but would be complex to administer.

According to Schofield and Theodosiou,<sup>13</sup> there is a need for a clear set of guiding principles that should be endorsed by the international community and followed by all nations. They posit that even if governments do not levy the same taxes at the same levels, or enforce similar laws and regulations, these guiding principles will serve as a cornerstone in the control of the climate change. They, however, note that much as this global effort may seem to be praiseworthy, the economic inequalities and political turbulence of some countries may prevent them from cohesive action. Several countries face the need to protect national revenues, and as such, this may hinder the global effort to effectively fight global climate change. They also point out that many developing countries face the challenge of political interference where good government policies are politically challenged. Therefore governments need to put in place effective national policy through collaboration across various political parties, such that a change in political emphasis does not undermine environmental or green policies.

Williams<sup>14</sup> also adds that many countries have decided to do nothing about environmental issues. He asserts that those who picked this option did so for fear of undermining economic sustainability; i.e. that if they choose to implement a managed process or policies such policies may include elements of regulation, carbon trading, and/or environmental taxation, which could interfere with business investments, hence leading to loss of economic activity. He emphasises that governments should avoid tax measures that simply “export the problem” by driving economic activity to other jurisdictions.

Regardless of the approach, it is worthwhile that governments set out the basic neo-classical theory of environmental taxation.<sup>15</sup> Levinson<sup>16</sup> also states that whether the taxes paid are directly

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<sup>12</sup> 2002.

<sup>13</sup> 2009.

<sup>14</sup> 2009.

<sup>15</sup> Williams, 2009.

<sup>16</sup> 2007.

or indirectly, their motive is sound. He asserts that those companies that find it cost effective to pay taxes will choose to continue inappropriate activities rather than paying taxes. Alternatively, those that find it less costly to comply will cut their pollution. However, much as the environmental issues could be thought of as having negative side effects on economic development, the dilemma associated with solving them is more challenging. Countries that are considered to have a poor environmental track record (like South Africa) have many challenges that could hinder the effective implementation of green taxes.

Like many developing and developed countries, South Africa's economy is just recovering from the recession crisis.<sup>17</sup> Under such circumstances, the government is facing its own domestic challenges, apart from considering global environmental issues. It is a priority to achieve structural reforms to enable growth, such as the need to make the public sector effective and efficient while ensuring the private sector remains globally competitive. In achieving this, they have to take into consideration that non-friendly economic policies could drive away investors, hence reducing the country's economic strength. Hepburn<sup>18</sup> suggests that organisations will only strive to exist and persist in those situations which are economically conducive; otherwise they will withdraw by changing the nature of their business or move to other countries where their businesses will survive.

Another dilemma for South Africa arises from the ever increasing upheavals relating to the social dimension. The rate of unemployment among the youth, poverty, corruption and black empowerment are among the many challenges the country is facing. Finding solutions to these problems requires well-articulated social and employment policies, and the creation of jobs in both public and private sectors. At the same time there is a need to build institutional capacity and mobilise domestic resources.<sup>19</sup> Achieving such goals requires conducive relationships with companies that have invested in the country. Thus, setting up favourable circumstances for investors may impinge on the practice and imposition of green taxes.

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<sup>17</sup> Hugh, 2009

<sup>18</sup> 2006.

<sup>19</sup> Hugh, 2009.

### 1.3. Problem statement

Post-apartheid South Africa has been engaged with the challenges of re-integration into world markets and the global economy. This it has been doing with caution by positioning itself as willing to comply with international expectations. South Africa's need for economic growth has not only made it the centre of attraction for citizens of under-developed African states, but also to investors from developed countries. Striking a balance to gain economic growth through competitiveness on one hand, and employment generation and income redistribution on the other, has put the implementation of South Africa's green taxes in a potential dilemma.

***The gap identified by this study is the lack of clarity of the extent of commitment and how South Africa's green tax laws could contribute to environmental alleviation and economic growth while maintaining international economic competitiveness.***

### 1.4. Objectives of the study

According to economic theory, government intervention in the marketplace and the application of monetary policies is the best method of ensuring economic growth and stability.<sup>20</sup> The theory also suggests that taxes on polluting emissions will reduce environmental harm in the least costly manner. However, much as the economic theory defends the environmental laws, many issues relating to their effective implementation still need to be investigated. There is a need to investigate and establish a practical approach by understanding all the factors that influence the environmental and economic effectiveness of green taxes.<sup>21</sup>

The major objective of this study therefore, was to carry out a comparative analysis of the effectiveness of green taxes in South Africa and developed countries. The study reviews the implementation of green taxes in developed countries in comparison with the implementation process in South Africa.

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<sup>20</sup> Varian, 1989.

<sup>21</sup> Levinson, 2007; Tol, 2005.

### **1.4.1 Specific objectives**

The specific objectives of this study were:

1. To investigate and determine the effectiveness of green taxes in controlling and eliminating environmental degradation.
2. To investigate the potential and the rationale of green taxes in determining cost-effectiveness in economic growth and its contribution to the country's economic competitiveness.
3. To re-examine the South Africa's green taxes policy framework, and assess its effectiveness in comparison with those of developed countries.
4. To develop a framework that could be used to improve environmental protection in cases where tax incentives prove difficult or costly to generate.

## **1.5. Justification of the study**

It is the duty of every citizen to adopt better practices that are environmentally sustainable. This should be a journey based on deep conviction, rather than once-off actions. Greening should start directly in people's homes and should create a mindset change that motivates reduced costs in favour of planet-friendly actions. Therefore, whether green taxes are directly or indirectly imposed should be seen as a sign of development, rather than be considered punitive.

According to Levinson,<sup>22</sup> imposing a carbon tax has been one of the successful ways of saving the environment as well as gaining economic growth. He asserts that the excise levy imposed on the carbon-based content of fossil fuels has helped reduce greenhouse gas emissions which add to

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<sup>22</sup> 2007.

global warming. However, Bailey<sup>23</sup> asserts that determining the exact influence of environmental taxes and business behaviour is a difficult task. This is because before companies could succumb to environmental taxes, they first weigh the numerous endogenous and exogenous pressures. He adds that when the pressures mounting on a company are great, such a company may decide to change the nature of its business, hence leading to unemployment. This could worsen South Africa's already high unemployment rate and increase the loss of jobs.<sup>24</sup> Hence governments need to make informed decisions if such laws are to be effectively implemented.

Currently in South Africa there are two main environmental taxes utilised; these are the electricity and the fuel levy. These two taxes have been widely criticized as not acknowledging the bulk of the current environmental tax system, resulting in a call for their review and a revised tax framework to address the ever-increasing greenhouse gas emissions.<sup>25</sup> Some approaches that have been noted as missing in the current South Africa green taxes system are the inclusion of financial incentives that encourage clean technology and the shifting of the economy away from its current energy and capital-intensive basis. Such shortfalls have necessitated research in this direction to address these growing concerns.

On the other hand, South Africa, like many similar countries, has tax gaps. These mostly arise from various factors that could be categorised as tax avoidance and evasion.<sup>26</sup> Such a mentality may lead many organisations to evade environmental taxes if such taxes are seen to be lacking. This therefore calls for a systematic understanding of the cause of these loopholes. This study's major objective was to carry out a comparative analysis of the South African green taxes with those of developed countries. Since these countries are in a similar stage of development as South Africa regarding pollution, attention is given as to how to avoid the identified loopholes.

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<sup>23</sup> 2002.

<sup>24</sup> Hugh, 2009.

<sup>25</sup> Deloitte, 2009.

<sup>26</sup> Naidoo, 2005; Deloitte, 2009.

## 1.6. Research contribution

This research contributes to the literature of taxation, and more especially to the scarce academic literature on green taxes. Furthermore, the framework that is developed in this study is intended to practically act as a guideline in the restructuring of environment taxes in South Africa. A more detailed contribution of this research includes the practice and management of green taxes that are discussed in the last chapter of this dissertation.

## 1.7. Limitations of the study

To limit the scope and boundaries of this study, the following expectations and assumptions will be applied in the process of conducting this research. Due to the limited availability of green tax literature in the South African context, this study's discussion mainly depends on government reports and magazines articles from the internet. The study also uses journal articles written by authors in the developed countries context to substantiate the researcher's arguments.

The comparison of taxes in the context of South Africa will mainly depend on the two major forms of green taxes that are currently utilised; namely the electricity and the fuel levy. The many proposed green taxes that are not currently operational will be mentioned for discussion purposes but are not included in the analysis.

During the comparison phase, the study is limited to four countries namely; China, United States of America (USA), United Kingdom (UK), and South Africa. South Africa, which leads Africa, stands at 13 globally due to certain forms of human activity carbon dioxide (CO<sub>2</sub>) emissions in thousands of metric tons per annum. The above four countries have been rated as high polluters.<sup>27</sup>

This study was also conducted on the assumption that if effectively implemented, South Africa is technologically advanced and has a high potential to collect its taxes.

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<sup>27</sup> Deloitte, 2009:8; UNFCCC, 2011.

## 1.8. Research position

The current chapter discusses the background of the study, the research problem, and the objectives that determine the path of the research. This chapter further illustrates how the set research objectives are achieved in order to solve the identified research problem. This chapter also details the background of green taxes and the measures that have been taken by some countries to remedy them. Lastly, this chapter discusses the research limitations, giving reasons why such limitations were experienced.

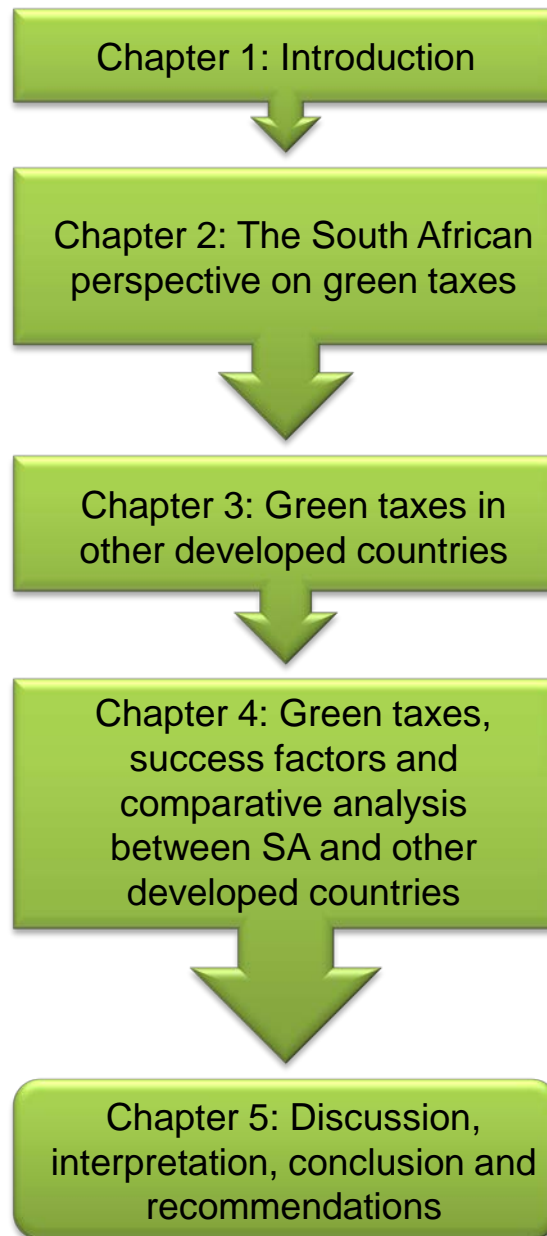
Chapter 2 discusses the South African perspective on green taxes. In this chapter a detailed analysis of the taxes and policies that are put in place to serve as a controlling factor for carbon gases is made. The chapter also discusses the successes and challenges faced during the implementation of these taxes and policies.

Chapter 3 presents the discussion about the green taxes and policies in other developed and developing countries. This chapter outlines the factors that are key to the success and failure of green tax implementation. From these success factors a generic framework is proposed that should serve as a cornerstone for green tax implementation in South Africa.

Chapter 4 gives a comparative analysis of approaches between developed countries and South Africa, in terms of methods and controls of green taxes. Four countries whose data were used to inform this study are compared. For each of these countries a comprehensive analysis is carried out so as to give a clear picture of how South Africa is fairing compared with other countries.

Chapter 5 presents the discussion, implications and recommendations. This chapter details the contribution this study has made and also gives the research limitations. The limitations cited in this chapter acted as the basis for the recommendations of this research and the suggested direction for future studies. This chapter also evaluates whether the objectives that were suggested were achieved. Figure 1.1 below demonstrates the research position giving a summary of flow of the chapters in this dissertation.





**Figure 1:1: Research position**

# CHAPTER 2: THE SOUTH AFRICAN PERSPECTIVE ON GREEN TAXES

## 2.1. Introduction

This chapter discusses the green tax perspective in the South African context. It discusses the role played by the South African government, and the environmental sector in particular, to promote the greening of South Africa. Furthermore, this chapter discusses the policies that have been put in place to promote the green economy. This chapter ends by detailing the taxes that have been implemented to reduce carbon emissions in the South African environment.

South Africa has been classified as the highest polluter among developing countries and also ranks among the top 20 worldwide for carbon dioxide (CO<sub>2</sub>) emissions.<sup>28</sup> With a view to ensuring continued economic growth, increased employment, and reduced poverty and inequality, the South Africa government is working to achieve the reduction of the greenhouse gas emissions.<sup>29</sup> To achieve this goal, environmentally related taxes have been proposed and theoretically implemented so as to discourage continued pollution, and ensure economic growth and development sustainability. However, as much as green policy instruments like carbon taxation and emissions trading schemes have been widely advocated, their level of effectiveness in South Africa needs a thorough investigation.

When effectively and efficiently applied, carbon taxes could assist in internalising a negative externality. This could be achieved by integrating external costs to the producers' costs and consumer prices, hence causing stimuli for changes in production behaviours. Carbon taxes could be a source of revenue, and could potentially serve as good remedies as compared with regulatory policy instruments.<sup>30</sup> However, for any developing country like South Africa, additional

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<sup>28</sup> UNFCCC, 2011; Deloitte, 2009.

<sup>29</sup> National Treasury, 2010.

<sup>30</sup> National Treasury, 2010.

environmental control expenses could hold back industrial and commercial progress. This implies that South Africa could then focus more on socio-economic goals than the CO<sub>2</sub> emission reduction.<sup>31</sup>

Furthermore, the dilemma could rise from the over-reliance of South Africa on fossil-fuel-generated energy. With the high dependence on coal and liquid fuel, it could be hard for South African companies to achieve significant reductions in CO<sub>2</sub> emissions. The South African Treasury's policy attitude is against revenue recycling which could, on the other hand, reduce their flexibility to effectively allocate tax revenues. Hence, taxes could be directly imposed on companies who in turn pass such costs onto consumers. With the South African government bid to offer consumers of electricity some relief, this would end up defeating the cause.<sup>32</sup>

Some developed countries like United Kingdom, the Netherlands, Finland, Sweden, and Denmark have undertaken environmental tax reforms. This they have done by transforming existing energy taxes to focus on carbon content. In many of these countries, carbon tax rates are made lower than the marginal external costs of climate change. This has been mainly due to a lack of a global carbon pricing indexes, ensuring competitiveness of private companies, and the technicalities involved in estimating the actual external costs.<sup>33</sup> This is an approach South Africa has not taken and could be a major remedy for the effective collection of carbon taxes.<sup>34</sup>

South Africa's hosting of the 17<sup>th</sup> United Climate Change Conference in Durban in 2011 is an indication of its commitment to fight against climate change. Also, the voluntary effort applied by South Africa to lessen its domestic greenhouse gas emissions by 42% by 2025 is another indication that shows its determination.<sup>35</sup> However, its dependency on the use of a proxy tax basis could defeat its cause.<sup>36</sup> As Fullerton *et al.*<sup>37</sup> note, such dependence could lead to unexpected

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<sup>31</sup> Lewis, 2012.

<sup>32</sup> Lewis, 2012; National Treasury, 2010.

<sup>33</sup> National Treasury, 2010.

<sup>34</sup> Naidoo, 2005.

<sup>35</sup> Lewis, 2012:1.

<sup>36</sup> National Treasury, 2010.

drawbacks since proxy taxes could only target emissions rather than measured-emissions taxes, and it consequently leads to an inefficient pattern of polluter responses. Furthermore, premature application of carbon tax would neither indicate economic incidence of the tax nor its environmental effectiveness.

## 2.2. Role of the South African government

The indicators that South Africa is determined to join the global team for a better environment are evidently strong. As Lewis<sup>38</sup> puts it, South Africa has shown tremendous efforts to balance its green initiatives with economic growth, as well as addressing poverty and unemployment. The 2011 National Climate Change Response (NCCR) target that anticipated that the first half of 2012 would show change in enforcing green taxes was another good indication. These targets were expected to embrace the future environmental policy, including a carbon tax for businesses.

The role played by carbon taxes as a policy measure to price carbon emissions in stimulating behavioural change is laudable. However, this policy was skewed towards less energy intensive, low carbon emitting alternatives.<sup>39</sup> On the other hand, the 2011 South African National Climate Change Response White Paper<sup>40</sup> also added value. It articulated that economic measures like market-based instruments that include carbon taxes, emissions trading schemes, and incentives, are critical for climate mitigation efforts. It asserts that if such policies are enforced, they would assist in environmental protection as well as help generate revenue. This view concurs with previous researchers<sup>41</sup> who argue that, when effectively implemented, environmental taxes could make a considerable contribution to tax revenues.

However, implementation of these taxes has faced serious challenges. It has been argued that several environmental taxes are imposed out of the desire for revenue-raising and mostly for

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<sup>37</sup> 2008:11.

<sup>38</sup> 2012.

<sup>39</sup> Deloitte, 2009; Hemraj, 2012.

<sup>40</sup> NCCRWP, 2011.

<sup>41</sup> Fullerton *et al.*, 2008.

targeted revenues for expenditure on environmental protection.<sup>42</sup> This weakens the intention of such taxes and also makes their efficacy very limited.<sup>43</sup> Fullerton *et al.*<sup>44</sup> add that the political mongering in environmental tax measures could lead to unviable and unsustainable tax reforms. ACCA<sup>45</sup> also notes that environmental taxation should not be seen as a panacea, but rather as one tool to be used alongside other policy measures including regulation, voluntary agreements, and other instruments. It is therefore important to note that sustainability of environmental taxes should not only be dependent on profitability and efficiency, but also on human development and the needs of future generations.<sup>46</sup>

Similarly, South Africa approaches the environmental tax phenomena mindful of the impact on income distribution and international industrial competitiveness, and the regressive impact of carbon taxes on low income households.<sup>47</sup> However, in the process of minimising the marginal social cost, the principles of a “good tax”, like equity, neutrality and simplicity may be compromised.<sup>48</sup>

Amidst these uncertainties, it is not clear whether the proposed tax rate of \$16 a tonne of CO<sub>2</sub>, at an incremental annual rate of 10% targeted to reach \$28 a tonne by 2019/2020<sup>49</sup> will not face the same predicament. Hence, there is need to establish the potentiality of the green taxes of South Africa.<sup>50</sup> This call aligns with the major objective of this study that seeks to establish the effectiveness of South African green taxes in comparison with those of developed countries.

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<sup>42</sup> Opschoor & Vos, 1989.

<sup>43</sup> Winkler & Marquard, 2012.

<sup>44</sup> 2008:52.

<sup>45</sup> 2009.

<sup>46</sup> Hemraj, 2012.

<sup>47</sup> *Ibid.*

<sup>48</sup> Deloitte, 2009:9.

<sup>49</sup> Lewis, 2012:2; NCCRWP, 2011:13.

<sup>50</sup> Winkler & Marquard, 2011.

## 2.3. The South African green economy

As noted by researchers Kennet and Jocuite<sup>51</sup>, “green economy” is such a broad term that it cannot be pinned down to a specific, neatly defined activity. Its immenseness and variation to cover numerous aspects makes it difficult to provide a particular definition. They assert that as much as green economy is an ill-defined entity embracing various activities, there exist some common threads that link these diverse industries and services. Such diverseness has made the green economy a vital and a rapidly growing force in the world today.

The green economy has also been attributed to improved human well-being and social equity.<sup>52</sup> It is essential in reducing environmental risks and ecological scarcities. From this understanding, a green economy is considered as an economy, or economic development model, that is based on justifiable development and knowledge of ecological economics.<sup>53</sup>

According to the South African Department of Environmental Affairs report<sup>54</sup>, the green economy is a fast growing and dynamic sector in the overall economy, generating revenue and employment. Many industries and sectors are embraced by the green economy. These include, though are not limited to, renewable energy production and electric energy distribution; energy efficiency and storage; organic agriculture; green transportation and green building. It also covers areas of energy efficient lighting, electric passenger trains, cellulosic bio fuels, carbon capture and home insulation. The idea of a green economy is to encourage working to lower raw material and energy consumption. It also emboldens the production of goods and services in a less damaging and more sustainable manner to the environment.<sup>55</sup>

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<sup>51</sup> 2011.

<sup>52</sup> Ulrich, 2012.

<sup>53</sup> Kennet & Jocuite, 2011; Ulrich, 2012.

<sup>54</sup> DEA, 2007.

<sup>55</sup> Kennet & Jocuite, 2011.

Given the global economic crisis and the need for a government to achieve sustainability, many countries are committed to greening their economies. However, as Ulrich<sup>56</sup> puts it, the successful greening of the economy is faced with numerous challenges. Addressing these challenges calls for a holistic understanding of all political, economic, and cultural constraints that are paramount for success. Governments therefore need to put into consideration effective green economy strategies that consider the end of environmental degradation as well as reduce poverty.

The Department of Environment Affairs report<sup>57</sup> posits that the loss of biodiversity and ecosystem degradation due to an energy intensive economy has affected many economic sectors. These include agriculture, fishing and forestry which have been depended upon by many of the country's poor for their livelihoods. It further emphasises that moving to a green economy is to create "green" jobs and to increase access to basic services and infrastructure. These also include the provision of infrastructure as a means of alleviating poverty and improving the overall quality of life. More so, having a green economy mind set has led to the provision of energy access through solar power heating to the deprived.

### **2.3.1 South African government approach to green economy**

The South African government has emphasised the need for a green economy as core to the new growth path and for industrial policy action plan.<sup>58</sup> The Development Bank of Southern Africa<sup>59</sup> puts it that the South African green economy strategy has two inter-linked developmental outcomes; the first aim is to have a growing economic activity that leads to investment, jobs and competitiveness in the green industry sector; and the second objective is to have a transfer in the economy so as to achieve cleaner industries and sectors with a low environmental impact compared with its socio-economic impact. On this note the DEA<sup>60</sup> emphasises that the role of a green economy is multidisciplinary. It is essential in creating green jobs, ensuring real sustainable

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<sup>56</sup> 2012.

<sup>57</sup> DEA, 2013.

<sup>58</sup> Ibid.

<sup>59</sup> DBSA, 2011

<sup>60</sup> 2007.

economic growth, and preventing environmental pollution, global warming, resource depletion and environmental degradation. It should therefore embrace economic growth and natural bionetworks, as well as controlling the impact of economic activities that could cause harm to the environment.<sup>61</sup>

According to DBSA<sup>62</sup>, greening the South African economy is vital for structural transformation that is essential for an equitable and inclusive economy. However, such achievement calls for coordinated activities. Achieving this goal will lead to the envisioned economic shifts of transitioning the country to a low-carbon and greener economy. The major challenge South Africa is facing is the creation of new labour-absorbing industries that also mitigate impacts on the environment.<sup>63</sup> This has seen South Africa developing different strategies to mitigate climate degradation and to enforce its green policies.

Among the many strategies the government has put in place are South Africa's Long Term Mitigation Scenarios (LTMS).<sup>64</sup> The LTMS have enabled the development of a national climate policy. This policy was based on the scientific means of reducing and limiting industry temperatures to 2°C above the pre-industrial levels. Consequently, the government has also adopted strategies that enable accelerated energy efficiency across all sectors. It is anticipated that if these strategies are effectively implemented, South Africa's emissions will reduce tremendously by 2030.

### ***2.3.2 Green jobs as a remedy to green economy***

In a bid to balance the green approach, the South African government had to re-examine all the challenges and their possible causes. The South African environmental policy, on the other hand, was developed in such a way that it does not only meet the environmental needs but also the developmental needs of the South African people. These needs include, but are not limited to,

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<sup>61</sup> Ulrich, 2012.

<sup>62</sup> 2011.

<sup>63</sup> Molewa, 2012.

<sup>64</sup> DEA, 2007.



hunger, disease, poverty, powerlessness, unemployment, illiteracy, inequity with regard to access to resources, and lack of services. However, these needs have been looked at with the aim of improving the quality of life of the South Africa citizens yet without unfavourably affecting future generations.<sup>65</sup> Such remedies have taken into account improved pollution and waste control, including focusing on people and their participation in environmental decision making. It has also taken into consideration the development of improved systems of governance, including the economies of the economically disadvantaged communities.<sup>66</sup>

To achieve this objective, the government has generated and encouraged the creation of green jobs in both private and government sectors. Such areas have included the creation of jobs in agricultural, administration, manufacturing, research and development, and service activities that contribute substantially to preserving or restoring environmental quality.<sup>67</sup> As also noted by Ulrich<sup>68</sup>, these have been jobs that help to protect ecosystems and promote biodiversity. Such jobs are also meant to reduce energy and materials, decarbonise the economy, reduce water consumption through high efficiency strategies, and minimise or altogether avoid the generation of all forms of waste and pollution.

According to the DBSA,<sup>69</sup> in order to be accepted and to strike a good balance, green jobs need to be “decent” work spanning a wide array of skills, educational backgrounds, and occupational profiles. They should offer adequate wages, job security, safe working conditions, worker’s rights, and reasonable career prospects. Researchers<sup>70</sup> argue that for green jobs to achieve their objectives, they should include all employment areas. Such areas include research and development; and professional fields such as engineering and architecture, project planning and management, auditing, administration, marketing, retail, and customer services.

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<sup>65</sup> Molewa, 2012.

<sup>66</sup> DEA, 2013.

<sup>67</sup> Molewa, 2012.

<sup>68</sup> 2012.

<sup>69</sup> 2011.

<sup>70</sup> Kennet & Jocuite, 2011; Ulrich, 2012.

### **2.3.3 The environment sector role in the green economy**

The environment sector under the Department of Environment Affairs has put in place several strategies for a green economy.<sup>71</sup> These working programmes are meant to demonstrate the practicality of the green economy approach in the country. The department has included among its strategies fire management, coastal management, and water conservation groups. All these groups work together to promote and support the greening of South Africa. Consequently, the South African government has also put in place environmental legislation and encourages, through marketing campaigns, greater innovation in the sector. Among the campaign's objectives are training of environmental professionals, reversing environmental deterioration, and increasing efforts towards environmental sustainability.

The DEA has pursued awareness programmes and campaigns at both municipal and community levels through workshops and information sessions. These programmes are intended to inform the public about environmental issues. Such issues include desertification, land degradation and drought.<sup>72</sup> The DEA intends to achieve a fundamental shift in the public mind set to ensure that they deter actions that could lead to environmental degradation. By so doing it is the aim of government to ensure that the green economy strategies are significantly decentralised to include all levels of government.

### **2.3.4 Challenges on the South African road to a green economy**

Several challenges have been cited that hinder South Africa's achievement of a fully-fledged green economy when compared with other developed countries. These challenges include, but are not limited to, the following:

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<sup>71</sup> Molewa, 2012; DEA, 2013.

<sup>72</sup> DEA, 2013.

#### 2.3.4.1 *Sustainable solid waste management*

The government has initiated several waste projects and a national waste programme that are primarily targeted at local government.<sup>73</sup> Based on the South Africa Constitution, waste management service delivery is the responsibility of local government. The Constitution compels municipalities to carry out this function. To achieve waste management sustainability, the waste is intended to be recycled. The 2007 recycling indicators<sup>74</sup> show that South Africa's recycling rate of approximately 1.5 billion tonnes of packaging and paper waste per year is relatively low.

#### 2.3.4.2 *Policy and regulatory implementation*

Several policy and regulatory challenges have also been cited as contributors to the achievement of sustainability of the green economy. The DBSA<sup>75</sup> asserts that the slowness of the creation of policy and regulatory steps impacts on environmental sustainability and the transition to a green growth development path. They also note that regulation and pricing steps put in place by the government remain insufficient to encourage accelerated investment by the private sector and in changing consumer behaviour. Other challenges identified are the mobilisation of domestic resources, costing of externalities needed for economic development interventions, coordination of state interventions for scalable and replicable outcomes, and the complexity of global negotiating platforms in the accessing of climate finances.

#### 2.3.4.3 *Income inequality*

There is still a significant social inequality in South Africa with 39% of the population living in poverty.<sup>76</sup> Greening South Africa implies the reduction of coal production whilst coal-fired power plants employ a significant population of South Africans. South Africa is dependent on coal-fired

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<sup>73</sup> DBSA, 2011.

<sup>74</sup> Available at [http://www.wastepolicy.co.za/nwms/home/nwms\\_v1/2/4](http://www.wastepolicy.co.za/nwms/home/nwms_v1/2/4).

<sup>75</sup> 2011.

<sup>76</sup> Cock, 2011:12.

power stations, which provide over 90% of its electricity.<sup>77</sup> The reduction of coal production from these two perspectives could lead to the loss of thousands of jobs and the undermining of economic stability, given that millions of people are employed in these energy-intensive industries.

#### 2.3.4.4 *Gender perspective*

According to the International Labour Foundation (ILA) for Sustainable Development,<sup>78</sup> many countries that have advocated for green jobs are still failing to address the gender perspective. The ILA points out that if such policies on the green economy do not address the gender perspective, women may be excluded from the green economy. The ILA emphasises that many countries have remained silent on gender balances, and this has caused employment segregation and discrimination of women.

#### 2.3.4.5 *Quality of green jobs*

Currently, little is said about the quality of green jobs in terms of labour standards and wage levels. Most individuals would be attracted to jobs that pay a fair wage. In addition, these jobs should extend training opportunities and economic and social security. As Cock<sup>79</sup> notes, there is a disparity between the “green jobs” and “decent” work. Hence, the green economy *per se* as a means of alleviating poverty by creating jobs is still a myth. This has been highlighted by the large-scale industrialised privately-owned commercial farms where exploitation, abuse of labour and ecological resources has resulted in many strikes.

#### 2.3.4.6 *Generalisation in the green economy*

In this examination of the green economy there are many instances where a wide generalisation in the discourse of the green economy arises. Ecological crises, more especially climate change,

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<sup>77</sup> Cock, 2011:5.

<sup>78</sup> Sustainlabour, 2009.

<sup>79</sup> 2011.

have been taken as the only challenges faced by developing countries, but this overshadows the unemployment and food crisis. Giving the green economy a greater emphasis over other equally critical issues could lead to destroying hopes for a just and sustainable future.

#### 2.3.4.7 *Lack of proper vision for green economy*

Even though there are several policy documents on the green economy in South Africa, there is still a lack of vision on what the green economy really is. According to Cock,<sup>80</sup> the vagueness of some of the policy documents and the narrow definition of the green economy from a technical sense has ignored the common man's understanding of it. There is still a great need for a transformation concept of the green economy. There is also a need to effectively explain how the green economy is going to solve the problems of unemployment and food scarcity which are vital to the average South African. On the other hand, there is still a need to clear the uncertainty about the impact of the green economy and the intended outcomes of global agreements in this regard. Furthermore, South Africa has to localise the greening exercise so that society can understand the role it needs to play in environmental protection.

#### 2.3.4.8 *Compartmentalisation of the green economy*

According to NCCRWP,<sup>81</sup> there is a great need in South Africa to promote and expand green economic sectors. Trollop and Tyler<sup>82</sup> argue that there is still a misconception in treating the green economy as a separate entity of the overall economy. The view of the green economy as an annexure to the main-stream economy negates its potential. Such an approach could cause South African society to fail to appreciate the value of the green economy. Given the South African development challenges, it is paramount to link environmental sustainability with human and economic development. South Africa's policy development should also endeavour to clearly show the link between environmental and human development. This will also help to convince society

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<sup>80</sup> 2011.

<sup>81</sup> 2011.

<sup>82</sup> 2011.

that they are an integral part of, and beneficiary of, environmental development, and hence they should embrace it.

#### 2.3.4.9 *Social and environmental justice*

There is still a big question as to whether ecological sustainability encompasses the protection of limited resources and the sustainability of justice. The Endangered Wildlife report of 2006<sup>83</sup> indicates that as South Africa is a water-scarce country, less attention is paid to the wasteful consumption practices. It reported that the privileged rich waste water in their swimming pools and golf courses amounting to millions of litres a day, while the poor struggle to get piped and metered water supplies. Consequently, the DBSA<sup>84</sup> recommended the extension of metered water to the poor. Hence, for the green economy to be appreciated by the poor, it should embrace both ecological sustainability and social justice. It is therefore a justifiable view that greening the economy may only continue to support the prevailing paradigm. There is much that needs to be done in order to reduce disproportionate consumption that is seen as also undercutting the green economy effort.

#### 2.3.4.10 *Skills*

Compared with other developed countries, the number of experienced engineers in South Africa is considered low. These engineers could assist in the implementation of wind energy projects. According to Seggie,<sup>85</sup> the ratio of engineers to the population is 1:3166. This not high in comparison with other developed countries. He asserts that when compared with Brazil and India, which have ratios of 1:277 and 1:157 respectively, the South African ratio is alarming. This implies that the South African Wind Energy Association (SAWEA) needs to consider the provision of incentives in order to attract more South Africans into the engineering profession.

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<sup>83</sup> Available at <http://www.in.gov/dnr/fishwild/3347.htm>.

<sup>84</sup> 2011.

<sup>85</sup> 2011:16.

#### 2.3.4.11 *Lack of green economy models*

New innovations like the green economy need systematic guidelines for successful implementation. Such guidelines or models should act as a cornerstone during the process of implementation. A green economy model should indicate the elements of “green growth” such as sustainable economic, environmental and social progress.<sup>86</sup> It should also include the linkages between the expected green economy plan, how to promote the use of green technologies, and making the green industries more systemic. Ulrich<sup>87</sup> also notes that an effective green economy model should guarantee the decoupling of unsustainable resource usage and the environmental impacts from the economic growth. It should also differentiate the role of business, trade unions and civil society in the green economy. Based on the green economy model, the government should be able to assess and predict the consumer and market demand for greener goods and services. This will also help in gauging the political and financial capacity, and the technological outcomes that can sustain green economic growth.

#### 2.3.4.12 *Harnessing Innovation*

In South Africa there is still a great need to promote innovation in management, processes and production systems, whilst developing new technologies. For the successful greening of South Africa the government needs to encourage priority sectors to be ready to roll-out initiatives and also encourage them to identify new areas for further investment. The DEA needs to do more to stimulate the right kind of innovations relative to the green economy. It should also speed up the phase of delivery to the market and reduce prices to ensure rapid mass take-up.<sup>88</sup> Molewa<sup>89</sup> further emphasises the need to balance intellectual property rights and the role of more open research models in accelerating green economy innovation. She asserts that this will increase investment in strategic research and development that supports green industry development.

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<sup>86</sup> Kennet & Jocuite, 2011.

<sup>87</sup> 2012.

<sup>88</sup> Molewa, 2012.

<sup>89</sup> 2012.

#### 2.3.4.13 *One dimensional approach*

The green economy has been widely defined or operationalised in a one dimensional manner. It has been taken out of the sustainable development framework and promoted in a purely environmental manner. Much of its development and the equity dimensions have not been fully exploited, and the international dimension is overlooked. South Africa, as a developing country, may experience negative effects after the full implementation of the green economy. Situations such as letting the green economy concept gain prominence while reducing sustainable development may lead to sub-optimal outcomes. This may also lead to loss of a holistic sustainable development approach and imbalances in the economy.<sup>90</sup>

#### 2.3.4.14 *Attempt to gain market access through the guise of environment*

There is also a challenge for the government of South Africa to convince its people of the merits of the green economy. Green economy promotion is often seen as a method to promote the access of goods and services into the markets of other countries.<sup>91</sup> There is a fear that the green economy concept could be used as a front for entrepreneurial interests. This is also a challenge in many developing nations where some developed countries have been attempting to get them to eliminate the tariffs on many of their goods so that the proponents can claim that they are “environmental goods”.

Another fear in this regard has been the lack of clear definitions of what constitutes “environmental goods”. The developing nations argue that what is listed as tariff liberalisation goods only reflects those products of export interest to developed countries. As researchers Trollop and Tyler<sup>92</sup> note, the suggested tariff elimination assumption that they will benefit developing countries is far from the truth. Many developed countries are against tariff elimination on environmental goods since their aim is to promote their products and also the companies producing them.

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<sup>90</sup> Kennet & Jocuite, 2011.

<sup>91</sup> Available at <http://urbanearth.co.za/>.

<sup>92</sup> 2011.



## 2.4. Major threats of the green economy and manufacturing

As noted by researchers (e.g. Montmasson-Clair<sup>93</sup>), the South African government is expecting to bridge the economic gap with a green economy. It is further expected that the green economy will bridge the employment gap by creating over 462 0000 employment opportunities by 2025. The manufacturing sector comprises about 10% of the total number of jobs, while the bulk of jobs are associated with operations and services. However, the carbon disclosure report<sup>94</sup> of 2010 indicates that there are numerous threats to the green economy and manufacturing that include the carbon emissions from many major South African companies. Appendix 1 summarises the carbon emissions from energy and carbon intensive industries. These include petroleum products (Sasol), chemicals (Afrox, AECI, Air Products South Africa) and plastics; wood, pulp and paper (Mondi, Sappi); cement (PPC) and glass; food and beverages (SABMiller, PnP); metal and metals products such as aluminium smelting (Rio Tinto Alcan); and iron and steel (ArcelorMittal South Africa).

Finally, it is important to note that if the green economy is to succeed, the concept of sustainable development should embrace both environmental protection as well as meet the basic human needs of the present and future generations. Furthermore, and as a critical factor, it is paramount to consider equity among and within countries in the control and use of resources in ecologically prudent ways. In addition, for the strategic implications of climate change to be more broadly appreciated and acted upon by the business sector as a whole, there is a need for a significant shift in the level of engagement.

## 2.5. South African policies and taxes for the green economy

The transition to a green economy as a ground-breaking way forward has positioned South Africa in a unique position to exploit the emergence of a global green economy. As Molewa<sup>95</sup> notes, the post-apartheid era has seen South Africa achieving far-reaching political, economic and social

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<sup>93</sup> 2012.

<sup>94</sup> Available at <https://www.cdproject.net/CDPResults/CDP-2011-South-Africa-JSE-100-Report.pdf>.

<sup>95</sup> 2012.

changes. This has enabled the country to improve on its commitment to sustainable development. In this regard, South Africa has developed its own national framework for a shift to a green economy, as per the 1996 Constitution. The country is party to both the Kyoto Protocol and the UNFCCC, including commitments under the Cancun Agreement.<sup>96</sup>

In addition, South Africa is party to many international conventions and agreements on biodiversity and pollution issues.<sup>97</sup> The Department of Trade and Industry (DTI) provides support for the green industry; however, it has to rely on other departments to implement measures aimed at green industries. These departments carry responsibility in relation to their line duty. The National Treasury (NT) deals with the environmental fiscal reform, whereas the DEA is responsible for the setting of environmental standards that include pollution or emissions. The Department of Energy (DoE) deals with issues relating to fossil fuels and renewable energy, while the Department of Water Affairs (DWA) deals with environmental issues relating to water. To enhance technology policy, research and development, the Department of Science and Technology (DST) is entrusted to support the DTI.<sup>98</sup>

As Cock<sup>99</sup> notes, the decentralisation of green economy policies has led to many policies and strategies for the green economy. Different bodies and departments entrusted with policy development and management have developed policies with vested interests that have resulted in inconsistencies. Many policies were often developed from the bottom up with more holistic approaches being informed by one (or several) others dealing with more specialised aspects. This would be acceptable but for the inconsistencies between multiple policies and poor coordination among the various departments and other government actors responsible for their implementation.<sup>100</sup>

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<sup>96</sup> DEA, 2013.

<sup>97</sup> DBSA, 2011.

<sup>98</sup> DBSA, 2011.

<sup>99</sup> 2011.

<sup>100</sup> DBSA, 2011.

## 2.6. South African environmental legislation framework

In an effort to have a clean and safe environment, the South African Constitution<sup>101</sup> grants the rights to a healthy environment. In Act 108 section 24, the Constitution imposes a constitutional responsibility for the government of South Africa to protect the environment by providing reasonable and related measures to safeguard the environment. The compendium of South African environmental legislation<sup>102</sup> asserts that before this entrenchment in the Constitution, environmental laws existed but with numerous inconsistencies. The poor administrative procedures created loopholes that need to be avoided in the future so as to ensure the success and effectiveness of South African green laws.

In the same positive direction, The National Environmental Management Act<sup>103</sup> (NEMA) became operational in 1999. After its inception, NEMA became the flagship environmental statute of South Africa. Its primary purpose is to provide for co-operative environmental governance by establishing principles for decision-making on all matters affecting the environment. For instance, in the case of Section 24 and Section 38 of the Constitution, NEMA provides for procedures and institutions that empower the public and promote participation in environmental management.

The Compendium<sup>104</sup> details the operational South African environmental Acts that were put in place to safeguard the environment. These are intended to prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development. In addition, the government has increasingly prepared measures to regulate all activities that impact on the environment. Most of these activities will have either positive or negative impacts on the environment. Therefore, environmental obligations become mandatory for everyone conducting business within South Africa.

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<sup>101</sup> Act 108 of 1996.

<sup>102</sup> Compendium, 2006:7.

<sup>103</sup> No. 107 of 1998.

<sup>104</sup> 2006: 175-553.

### **2.6.1 South African policy instruments**

South Africa, like many other developed or developing countries that have introduced carbon taxes or environmentally-related taxes on energy have generally used new excise taxes.<sup>105</sup> As Levinson<sup>106</sup> puts it, these types of taxes are applicable to the quantity of energy sold, and levied at a specific point in the supply chain. He further asserts that such a tax serves as a proxy for an emissions tax, rather than a tax levied directly on emissions.

According to the National Treasury,<sup>107</sup> there are two main policy approaches used to address environmental challenges. These two are command and control (CAC) regulations, and market-based instruments. The NT states that CAC regulatory policy measures usually specify standards for emissions or prescribe technologies that polluters should use to maintain emissions below a certain limit. On the other hand, the market-based instruments use price mechanisms to encourage efficient pollution abatement responses and emission reductions in a cost-effective manner. The two main market-based instruments used to price CO<sub>2</sub> are carbon taxes and emission trading schemes.

An environmentally-related Pigouvian tax seeks to correct the market price of a good or service by imposing a tax equivalent to the cost of the negative environmental externality or marginal external cost. In this accord, South Africa tends to recognise the need to balance encouraging investment and growth with protecting the environment and promoting sustainable use. Hence, the country has institutionalised social dialogue through NEDLAC. However, from the business point of view, this is skewed towards the potential cost and effort involved in complying with new regulations and taxes. On the other hand, trade union interests lie in poverty eradication and employment quantity and quality. The implication of this is the need for more awareness of the South African Environmental Laws<sup>108</sup>.

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<sup>105</sup> National Treasury, 2010.

<sup>106</sup> 2007.

<sup>107</sup> 2010: 25.

<sup>108</sup> Available at <http://www.jutalaw.co.za/products/3742-environmental-laws-of-south-africa>.

## 2.6.2 Legal and policy framework of the South African green economy

The South African green economy legal and policy framework is compartmentalised by nine key sectors. These are complemented by sectoral, local and time-specific policies, as well as a monitoring and evaluation system.<sup>109</sup> The compartments are as illustrated in Figure 2.1 below.



Figure 2.1: Green Economy Legal and Policy Framework (Source: Montmasson-Clair, 2012)

## 2.7. Summary

This chapter discussed the South African perspective on green taxes. The chapter discussed the green economy and highlighted the South African challenges on its road to a green economy. The chapter also highlighted the South African Constitutional position on the environment and its

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<sup>109</sup> Montmasson-Clair, 2012.

protection. Environmentally-related Acts and their regulating bodies were also considered. Lastly, this chapter looked at South Africa's policies relating to carbon emissions and the future trends of carbon emissions.

## CHAPTER 3: SOUTH AFRICAN ENVIRONMENTAL TAX LEGISLATION

### 3.1. INTRODUCTION

In his 2007 budget speech, the South African minister of finance, Trevor Manuel<sup>110</sup> acknowledged that "[t]he Income Tax Act has not kept pace with changes to the local and international environmental regulatory regime", and soon after the speech, section 378 was inserted in the Income Tax Act 58 of 1962 (from here on referred to as the "Income Tax Act") as a general environmental income tax incentive measure.

### 3.2. The Income Tax Act - Section 378

#### 3.2.1 *The wording of the section: Capital allowances*

South Africa's most evident pollution tax-related legislation is the newly-enacted section 378 on capital allowance incentives mentioned above. This section grants the taxpayer:

- In the case of an "environmental treatment and recycling asset", an allowance of 40 percent of the cost of the asset in the year of assessment that it is brought into use for the first time by that taxpayer, and 20 percent in the remaining three years thereafter; and
- In the case of an "environmental waste disposal asset", an annual allowance of 5 percent of the cost of the asset.

"Environmental treatment and recycling asset" is defined in section 37(1) as any new and unused plant or equipment applied towards or the treatment the recycling of water, air, solid waste pollution or recycling as well as any plant and equipment applied towards controlling or monitoring such

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<sup>110</sup> 2007:25.

pollution. The asset must be utilised in the course of the taxpayer's trade in a process that is ancillary to any process of manufacture or a similar process.

Finally, there must be a requirement placed on the taxpayer by any law of the Republic to comply with measures that protect the environment, before the deduction can be claimed.

"Environmental waste disposal asset" is defined in section 37(1) as any new and unused air, water, and solid waste disposal site, dam, dump, reservoir, or other similar structure, or any improvement thereto. The structure must be of a permanent nature and be utilised in the course of a taxpayer's trade in a process that is ancillary to any process of manufacture or a similar nature. Finally, there must be a requirement placed on the taxpayer by any law of the Republic to comply with measures that protect the environment, before the deduction can be claimed.

### **3.2.2 Interpretation of the wording on the capital allowances**

The term 'new and unused', cited above, could conceivably contain some ambiguity. This term occurs in several parts of the Income Tax Act, but has not been defined within the confines of the Act; however South African case law has provided taxpayers with a clear frame of reference as to how the phrase should be interpreted.

One case that summarises the meaning succinctly and presents a clear indication as to how the phrase is to be interpreted is the Income Tax Case No 672 (16 SATC 227, 1948). In this case, the taxpayer argued that certain machinery that he had purchased (which was required by the Act of that time to be 'new and unused' if the taxpayer was to qualify for an accelerated allowance), while not absolutely brand new, was new for him. In delivering his judgement, Judge CJ Ingram (1948:229) rather amusingly commented on arguments raised by the taxpayer in his appeal, when he said:

*"[The taxpayer} first of all would attribute the word "new" meaning new to the taxpayer and he puts somewhat drastically the illustration - I buy a new house or acquire a new wife. But in each of those cases we quite understand that neither the house nor the wife is new in the sense that it has not been used before."*



In this case, it is made clear that, when an asset is acquired from someone else, and that asset has been used by the previous owner (even if for a different purpose), that asset is second-hand and can never again be "new and unused". Thus, for any expenditure related to environmental treatment and recycling assets and environmental waste disposal assets to qualify for the allowance, the asset must be absolutely "new and unused" and may not have been used before.

A second question that arises concerns the extent to which the law requires the taxpayer to comply with measures to protect the environment. Section 27 of the National Environmental Management Act of 1998 places a legal obligation on every person who causes, has caused or may cause, significant pollution or degradation of the environment to take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring. The section also stipulates that whereas any harm to the environment is authorised by law or cannot reasonably be avoided or stopped, that all persons must undertake such efforts to minimise and rectify such pollution or degradation of the environment.

In consequence it would seem that all taxpayers are required by a law of the Republic to comply with measures that protect the environment as required by section 378(1)(c). Moreover, under the heading of section 378 in the explanatory memorandum (2007:51), the legislator explains that environmental capital expenditure should be permitted some level of depreciation, even if the capital outlays are only supplementary to the process of manufacture. Taxpayers are compelled to make capital investments that ensure that the environment is protected, as an ordinary legal precondition during the operation of the business. Therefore, such investments should be encouraged as a matter of sound government policy.

It is therefore also evident that the provision should not be interpreted as being restrictive for the scope of application of this section, but that it serves simply as an anti-avoidance measure to prevent companies from deducting any kind of expense under the cloak of environmental protection.

### **3.2.3 Cession of trade**

Where a taxpayer has ceased, or is in the process of ceasing, a trade and that taxpayer incurs expenditure or losses in respect of the decommissioning, remediation or restoration of that trade,

by motivation of the fact that the taxpayer is complying with any law of the Republic that provides for the protection of the environment upon the cessation of trade; such expenditure or losses are deductible in terms of section 368(6). Nevertheless the taxpayer may only deduct such expenses or losses if they would otherwise have been allowed as a deduction in terms of section 11 had that taxpayer still been carrying on that trade and if the expenditure or losses is not allowed as a deduction in any other section of the Act.

Following from section 378(6), subsection 7 confers that any "assessed loss" as defined in section 20(2) that arises because of the above mentioned deduction may be set off against income derived by that taxpayer subsequent years of assessment notwithstanding the fact that the taxpayer was not carrying on any trade.

Expenses related to the protection or restoration of the environment during, or after, the closure of a trade would typically not be allowed as a deduction under section 11(a), because "decommissioning, remediation and restoration generally fall outside the ongoing process of trade and production requirements" stipulated in that section.<sup>111</sup> For this reason, subsections 6 and 7 effectively allow non-trade-related expenses to be deductible. Unlike the treatment of pre-trade expenditures and losses under section 11A, these post-trade losses and expenditures are not ring-fenced, and assessed losses arising from the above mentioned activities may be set off against income derived by a taxpayer without having to consider whether or not the taxpayer has actively carried on trade during the relevant year.

### **3.3. The Income Tax Act- other sections in the Income Tax Act**

#### **3.3.1 *Mining companies***

Section 378 also eliminates the inequity purported to have existed, seeing that, in terms of section 37A (and previously section 11(hA)), only companies involved in mining activities are allowed to deduct cash contributions made to a company or trust which applies its property solely for

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<sup>111</sup> Explanatory Memorandum on The Revenue Laws Amendment Bill, 2007:52.

rehabilitation of land impacted by the mining activities, after closure or decommissioning of those activities. The amount is deductible in full, in the year in which it is paid, irrespective of whether it is of a capital or revenue nature.

The requirement that the amount must be paid in cash is unusual, as it means that no liability may be recognised in respect of such a transaction and that the payment may not be made in kind. However, the body that receives the cash is exempted from tax in terms of section 10(1)(cP).

### **3.3.2 Farming activities**

In terms of the provisions of paragraph 12 of the First Schedule to the Income Tax Act, a person involved in farming activities can deduct, in full, any expenditure (whether of a capital or revenue nature) laid out in respect of the eradication of noxious plants and the prevention of soil erosion. These expenses can be deducted even if it creates an assessed loss and the deduction is not limited to taxable income derived from farming activities.<sup>112</sup>

## **3.4. Customs and excise duties**

The only other reference in South African taxing laws to "environmental" or "pollution" enactments is in part three of the Customs and Excise Act, 91 of 1964 (hereafter referred to as the "Customs and Excise Act"). Part three of the Customs and Excise Act, entitled "Environmental Levy", was inserted into the Act by the second Revenue Laws Amendment Act of 2003, with effect from 1 July 2004.

In terms of the provisions in 'Environmental levies', the import or manufacture of plastic flat and carrier bags with a thickness of less than 24 microns is prohibited, except for the following types of bags: bread bags, refuse bags, bin liners, household plastic bags, primary packaging and plastic bags for export. In addition, an environmental levy of three cents per bag is imposed on manufacturers for all plastic carrier bags and flat bags, with a thickness of more than 24 microns

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<sup>112</sup> Huxam & Haupt, 2007:215.

that they produce, excluding bags manufactured for used for packaging, refuse bags and refuse bin liners.

The explanatory memorandum for the above mentioned amendment act makes it clear that the levy is charged in addition to any duty prescribed in the Customs and Excise Act. VAT is also charged on the duty, as shown in this example from SARS' Environmental Levy external policy revision document (number 2):

DESCRIPTION	AMOUNT
10 000 x carrier plastic bags	R 5 000-00
Levy due @ 0.03c / per bag	R 300-00
SUB-TOTAL	R 5 300-00
VAT @ 14%	R 742-00
PRICE inclusive of VAT @ 14%	R 6 042-00

In a media statement released by the Department of Environmental Affairs and Tourism<sup>113</sup> on the subject of the plastic bag regulations, the reason stated for specifying a minimum thickness of no less than 24 microns was that this thickness was judged to be reasonable for promoting plastic bag recycling, because thicker bags make recycling economically more viable. Secondly, the aim of the levy, along with the thicker bags, is to encourage the final users of the bags to re-use them, thereby reducing litter and raising public awareness about environmental issues.

The government's general fiscal policy is not to allocate tax revenues to any specific purpose, but to divide the entire pool of funds as determined in the budget on a pro-rata basis. However, the government decided to deviate from this policy and to utilise a portion of the funds from the plastic bag levy to set up a Black Economic Empowerment entity which will undertake to market the re-use of plastic bags, as well as to collect and recycle them. It could not be established whether such enterprises are currently operational. However, in several newspaper articles it has been

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<sup>113</sup> DEAT, South Africa, 2004.

reported that no amount of the plastic bag levy revenues that the government pledged to the program has to date been applied as promised.

### **3.5. Case law**

To date, no tax court cases have dealt specifically with any environmental or pollution related issues, although numerous court cases have dealt with matters of contraventions of environmental law. However, because these cases did not concern any matters of taxation, they fall outside the scope of this study.

A tax case that does bear some significance for the purposes of this study is Commissioner for Inland Revenue v Manganese Metal Company (Pty) Ltd (58 SATC 1, 1995) - a court case dealing with the issue of whether expenditure incurred for the purpose of creating a long-term disposal facility to ensure the avoidance of pollution and protection of the environment was of a capital nature. The taxpayer argued that, unlike, for example, an ordinary water dam which remains usable over and over again as water is impounded and released, this dam (the disposal facility), as it fills up, ceases to provide any further use. The dam thus provided no enduring benefit and consequently formed part of the working capital of the business.

However, the judge held that the dam was of a capital nature, being an improvement that was a fixed asset forming part of the income-earning structure. More significantly, though, it was held that getting rid of the waste was an essential and material aspect of the taxpayer's operations and that he should be granted an allowance to overcome a measure of hardship, considering that farmers, for example, can deduct capital expenses for erosion works.

### **3.6. Conclusion**

It is apparent that the sections that encumber deductions for environmental expenses in the Act are restricted to limited applications and the legislator has, thus far, not been very generous in providing deductions to the common taxpayer for such expenditure, whether of a capital or income nature. Furthermore the wording of section 378 does contain some ambiguities and its wording is somewhat complicated, which could make it difficult to administrate.

Conversely, in considering the punitive taxation measures, it has emerged that only the tax enacted specifically for this purpose of deterring environmentally damaging actions, is the plastic bag levy. Although fuel and electricity levies may also serve to reduce pollution, such levies have not purposely been created for environmental conservation.

The next chapter will discuss the perspective of developed countries on green taxes.

# CHAPTER 4: THE PERSPECTIVE OF DEVELOPED COUNTRIES ON GREEN TAXES

## 4.1. Introduction

This chapter discusses the perspective of developed countries on green taxes. This study aims to provide a comparative analysis of four countries South Africa, The United States of America, China and the United Kingdom. The discussion covers the role of taxation on green growth, and details of environmental tax design are discussed. Further, the uncertainties that surround the design of green growth policies are explored. The chapter further discusses the green growth policy options and details of green growth strategies. The tools that are essential in the development of green growth strategies are also discussed. The chapter concludes by exploring the statistical analysis of the values of green environmental taxes. Comparisons between countries in the European Union are provided. Finally, the chapter discusses green tax incentives in the four selected countries of this study.

Addressing environmental problems could significantly contribute to the economic growth of any nation. However, better strategies that include administration and leveraging of information technology need to be in place. Developed countries where technological innovation has been extensively used to solve environmental problems have, to a noticeable extent, moved a step ahead. The literature shows that OECD governments are increasingly using environmentally-related taxes and have found them effective policy tools. The desire to look at the beneficial side of changing strategies to save the environment has spurred innovation in economic developments. This has been achieved by placing a price on pollution, and strategies for designing taxes. This paradigm shift has assisted the birth of the green economy.

According to Fullerton *et al.*,<sup>114</sup> devising better strategies for tax administration is key to its success. This is because tax administration and enforcement are known to be sources of public

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<sup>114</sup> 2008.

discontent. As Cock<sup>115</sup> also notes, the major problem undermining green taxes is tax administration, rather than the taxes themselves. Eventually taxes, tax incentives, and laws and regulations must all be effective in addressing environmental” challenges. A collective effort worldwide has been necessary for the “greening the environment campaign to succeed.<sup>116</sup> If an international voice is not generated for the saving of the environment, and measures put in place by governments that cause an incremental increase in tax rates do not succeed, the planet will be at risk.

The Organisation of Petroleum Exporting Countries (OPEC) has continually advocated responsible oversight of the environment. In terms of this approach, OPEC also recommended a broad review of the scope and use of “green taxes” in developed countries.<sup>117</sup> This therefore mandates all stakeholders to play a role in the global fight against environmental degradation. Considering the composition of OPEC’s membership (mainly the largest oil-producing countries), much is expected from the organisation. From the researcher’s understanding, this could imply that a *pro rata* tax system (that levies taxes on all forms of energy) is needed.

The complexities involved in implementing environmental taxes makes the perception of the policies associated with them problematic in terms of the alternative policy instruments. Hence, environmental policy instruments could be categorised as regulatory instruments, economic instruments, and moral persuasion.<sup>118</sup> It is therefore important for governments to achieve a balance between the generation of revenues and the environmental objective underpinning the policy. This therefore requires the synchronisation and coordination of international environmental taxes. ACCA<sup>119</sup> argues that lack of international coordination and synchronisation of policies will see companies with the pollution problems relocating from one country to another to evade taxes.

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<sup>115</sup> 2011.

<sup>116</sup> ACCA, 2009.

<sup>117</sup> Deloitte, 2009.

<sup>118</sup> Opschoor & Vos, 1989.

<sup>119</sup> 2009.



Many developed countries are the worst polluters. Developed countries have varying effective rates of tax on the emission of greenhouse gases. At the same time, even within an individual country, there are various rates based on the source of emissions.<sup>120</sup> These variations have been considered to be the cause of environmental taxes imposed differently in developed countries.<sup>121</sup>

Unlike their counterparts in developing countries, developed countries have a different perspective on carbon taxes. The general consensus is that the harm done to the economy by energy and carbon taxes is significantly lower than that imposed by conventional taxes.<sup>122</sup> Hence, a belief that there should be taxes in any form aimed at protecting the environment.

The United Nations Committee of Experts on International Cooperation in Tax Matters<sup>123</sup> affirms that the developed countries' efforts to reduce carbon emissions have resulted in advocating a common standardised global taxation approach. From this perspective it is envisaged that those governments that fail to participate could cause tax arbitrage and international competitiveness, thus rendering carbon emissions reduction ineffective.

## **4.2. Energy policies, public finances and environmental goals**

The Organisation for Economic Cooperation and Development report – OECD<sup>124</sup> (2012) provided numerous indications of how energy policies, public finances and environmental goals can be aligned. The OECD suggests that revolutionising subsidies and tax breaks for fossil fuels and streamlining fuel taxes is essential for economic growth that meets green objectives. It argues that taxing energy use is core for an efficient, comparative analysis of the structure and level of energy taxes. The report articulates that such taxes should vary between different types of fuel and different uses of fuel for each country. Figure 3.1 illustrates the graphical summary representation of taxes on gasoline and diesel for road use in some OECD member states.

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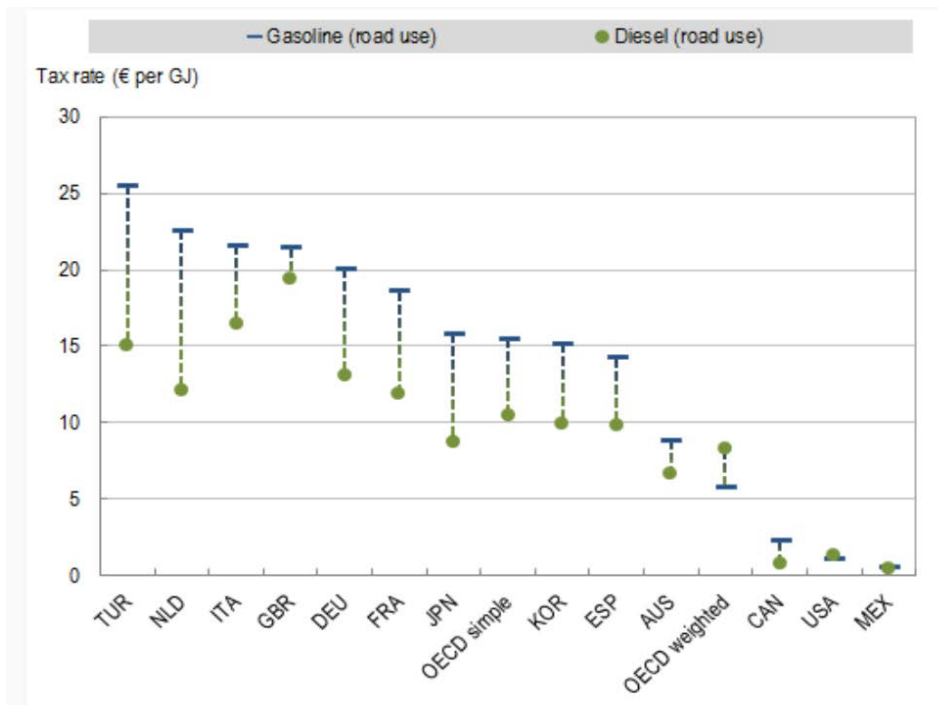
<sup>120</sup> Sandmo, 2003.

<sup>121</sup> Levinson, 2007.

<sup>122</sup> Schofield & Theodosiou, 2009.

<sup>123</sup> 2010.

<sup>124</sup> Available at <http://www.oecd.org/iea-oecd-ffss>.



**Figure 4:1: Tax rates of gasoline and diesel for road use (Source: OECD, 2012)**

The calculations for the statutory tax rates on the various fuels considered indicate the taxation per unit of energy and per unit of carbon dioxide (CO<sub>2</sub>) emission. From these calculations, it is evident that there are significant variations in the tax rates between countries. Furthermore, it also indicates that for a given country, there also exist notable variations of tax rates for different types of fuel; even for those used for the same purposes.

Scientifically speaking, the effect of CO<sub>2</sub> on the environment is the same regardless of which fuel or carbon fossil is producing it. The only scientific and logical difference is the amount that is being emitted. The variation of tax rates depending on the type of fuel could generate diverse reactions within countries or organisations that are taxed heavily. However, as also suggested by Lewis (2012), the tax disincentives to emit should be measured in terms of carbon emissions. This is because CO<sub>2</sub> has the same impact on atmospheric greenhouse gas concentrations, leading to climate change. Such an approach is paramount in the elimination of fragmentary laws in the international efforts to mitigate climate change.

According to the OECD (2012), even though there are contradictions in the tax rates, many developed countries have reduced their budgetary support for fossil fuels. It asserts that this has

led to progress and support for the green economy initiative. The report quoted Germany that reduced its total amount of support for fossil-fuel production by more than half, to about EUR 2 billion (0.1% of GDP) in 2011, and that it is likely to phase out support for the hard coal industry by 2018. On the other hand, it is noted that the United States of America (USA) will announce in its financial year budget FY2013 the elimination of numerous tax preferences benefitting fossil fuels. From this green innovation, the USA is expected to increase its revenues by more than USD 23 billion over the period 2013-17.

According to ACCA,<sup>125</sup> global measures to reduce environmental degradation are essential to harmonise green taxes. Such actions will result in international pressure on governments' support of fossil fuel production. Such controls could include market intervention, direct transfers of funds, undercharging of government-supplied goods or assets, and tax concessions. At the same time, this will put in place international controls on rebate schemes and tax relief. As Lewis<sup>126</sup> states, these controls will create a balanced international comparison of the CO<sub>2</sub> emission mitigation and a gateway for the green economy.

### 4.3. The role of taxation on green growth

The road to green growth requires a paradigm shift in the behaviour of households, business and governments.<sup>127</sup> It has been argued that if such a paradigm shift is to be achieved, formulation of good tax policies is required.<sup>128</sup> This is so because taxes and other market-based instruments are essential policy instruments relevant for environmental degradation remedies. On the other hand, companies require a good degree of certainty in order for them to reduce the scale of environmental damage. Consequently, the use of related policy instruments like information campaigns are key incentives for households and businesses to change positively towards environmental maintenance. Such policy instruments include awareness campaigns on the use of fuel efficient cars, using "smart" meters for water, gas and electricity, and waste recycling.

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<sup>125</sup> 2009.

<sup>126</sup> 2012.

<sup>127</sup> Deloitte, 2009.

<sup>128</sup> Hemraj, 2012.

As Bailey<sup>129</sup> notes, many OECD member states are increasingly using environmentally-related taxes. This has provided significant incentives for innovation, as companies and consumers tend to find new cleaner solutions to avoid the taxes on pollution. In addition, the incentives lead to commercial attraction of companies to develop technologies and consumer products that are environment friendly. Furthermore, increasing the use of environmentally-related taxes could also be influential in growth-oriented tax reform. This is because governments will be shifting the burden from corporate and personal income taxes and social contributions to those taxes with less negative effect on investment and the labour market.<sup>130</sup>

#### **4.3.1 Environmental tax design in a single externality distorted economy**

The traditional Pigouvian framework indicates that environmental taxes should be proportional to marginal damages and be directly levied on the source of emissions.<sup>131</sup> However, the framework is limited on how the collected revenue should be used. It also does not address other sources of economy distortion. The Pigouvian framework is intended to address the fact that the levied taxes should lead to a reduction in the emission.<sup>132</sup> It applies to both flow pollutants and stock pollutants, which implies that in case of CO<sub>2</sub>, the marginal damage is the present value of future (worldwide) damages from an extra ton of emissions.

Figure 4.2 demonstrates the welfare effects of the environment taxes in the Pigouvian framework. From the figure, the flat marginal benefit curve implies that the Pigouvian tax is independent of the emission reduction. The shaded triangle in Figure 4.2 demonstrates the revenue gains from the corrective tax.

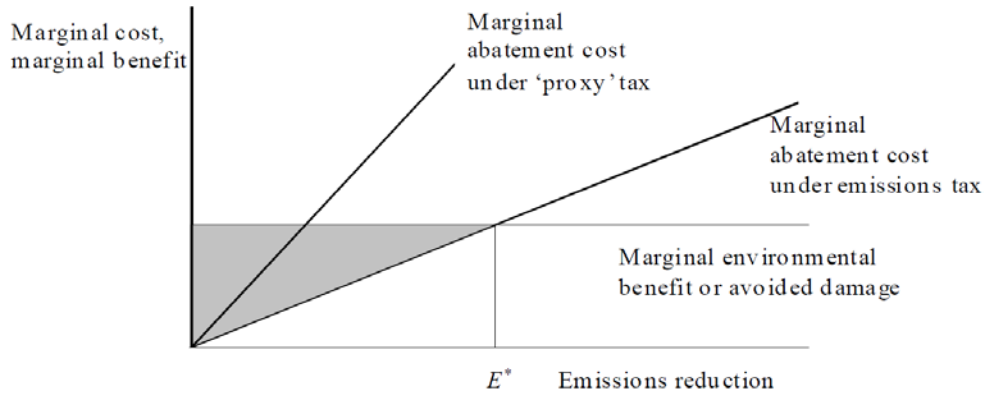
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<sup>129</sup> 2002.

<sup>130</sup> OECD, 2012.

<sup>131</sup> Pigou, 1920.

<sup>132</sup> Heine *et al.*, 2012.



**Figure 4:2: Revenue from environmental taxes in Pigouvian framework (Source: Heine et al., 2012)**

### **4.3.2 Uncertainties in measuring local pollution damages**

Muller and Mendelsohn<sup>133</sup> suggest that three steps should be followed when assessing the local pollution damages from fuel combustion. These three steps are:

- a) Using an air quality model that links emissions to atmospheric concentrations. They assert that this should take into account both primary and secondary pollutants. The secondary pollutants in this case could include, but are not limited to, fine particulates and ozone that likely to be formed through subsequent chemical reactions. Consequently, this should be done in respect of wind speeds and other geographical factors that influence pollution dispersion, such as the height the of the smokestack.
- b) Consideration should also be given to the human health effects of the pollution concentrations that need to be modelled. This should take into account the local population exposure and “dose-response” relationships based on epidemiological evidence. In this respect, issues of morbidity, building corrosion, crop damage, and impaired visibility should be included in the assessment.

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<sup>133</sup> 2009.

- c) Furthermore, the physical effects need to be monetised using evidence; for example, about people's willingness to pay for mortality risk reductions.

According to the National Research Council<sup>134</sup> (2009), following these steps in developed countries involves much uncertainty that causes many countries to contest the procedure. It asserts that monetising physical effects is a major dilemma that makes the process impossible. Developed countries like the USA have devised other alternatives in which monetary values could be obtained.

Blackman *et al.* note that much as environmentally-related taxes are a practical means of curbing environmental degradation, they are often opposed in developed countries due to distributional grounds. They assert that various factors limit policymakers' ability to reduce environmental challenges using conventional command-and-control measures. They cite some factors which include maintenance and inspection programmes, fuel economy standards, legal frameworks, technology mandates, and tax administrative structures.

As the OECD<sup>135</sup> notes, the most powerful and efficient way to green innovation is tax system reformation. However, this calls for a shift in the composition of taxes that include the use of environmental taxes to create green incentives. At the same time this will enable governments to reduce taxes on corporate and personal income, hence promoting entrepreneurship, employment and growth. This approach has been advocated for by various researchers<sup>136</sup> who recommend the refinement of environmental taxes administration and an international position on the matter. This implies that tax rates should be made to match the environmental damage and should apply consistently to all sources of pollution.

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<sup>134</sup> 2009.

<sup>135</sup> 2012.

<sup>136</sup> Sandmo, 2003; ACCA, 2009; Lewis, 2012; Heine *et al.*, 2012.

### 4.3.3 Green growth policy options

A country's sustainable economic growth and the green economy sustainability go hand-in-hand with environmental preservation.<sup>137</sup> It is mandatory that resources are utilised with the intention of meeting human needs. However, achieving green growth needs good policies and policy administration and control. Hence, this requires the introduction of environmental taxes, and pricing the use of scarce natural resources and pollution, including carbon pricing. In addition, it calls for the need to enforce property rights, and the reformation of the inefficient and non-operational subsidies. At the same time, it is important to note as critical the integration of policy approaches to growth. Doing so will enable the private sector to commence with valuable investments and innovations. It will also make individual consumers and businesses internalise the true cost of their behaviour towards the environment.<sup>138</sup>

According to the G20 Development Working Group,<sup>139</sup> the policy package necessary for the successful implementation of inclusive green growth instruments differs across countries. The report posits that this will depend on the country's national circumstances and level of development. It suggests that as compared to developed countries, developing countries are likely to opt for sustainable agriculture more than improved industrial practices. Furthermore, it emphasises that the different socio-economic development plans could stand as a major challenge for the implementation of inclusive green growth policies. Among the many challenges cited by the report that could cause such differences are the following:<sup>140</sup>

- High dependence on natural resources for both livelihoods and economic growth.
- High degree of vulnerability to climate change.
- Lack of basic infrastructure and services.

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<sup>137</sup> Molewa, 2012.

<sup>138</sup> Heine *et al.*, 2012.

<sup>139</sup> G20 DWG, 2012.

<sup>140</sup> G20 DWG, 2012.

- Large informal economies.
- High levels of poverty and inequality.
- High population growth rates.
- Rapid urbanisation processes and growth of urban areas.
- Limited capacity for policy development, financing and implementation.
- Limited public and private capacity for technological innovation and investment.
- Severe economic, social and ecological threats from energy, food and water security.
- Premature deaths due to pollution, poor water quality, and diseases associated with a changing climate.
- Underdeveloped financial markets and limited access to savings, credit and insurance products.

Hence, as ACCA<sup>141</sup> recommends, for green growth, environmental taxation should be designed to work effectively, matching the level of the tax with the cost of the environmental damage. Furthermore, it asserts that there is a need for modification of the environmental taxes. Such modification should transform environmental taxes so as to become more explicit and transparent and to coordinate globally.<sup>142</sup>

#### **4.3.4 Development of an inclusive green growth strategy**

Generally speaking, taxes unavoidably involve political interventions and international concerns. Governments strive to strike a balance in meeting their committed targets under the Kyoto Protocol as well as their political needs. This has necessitated governments to make voluntary agreements

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<sup>141</sup> 2009.

<sup>142</sup> ACCA, 2009.



and businesses to forge a way of achieving CO<sub>2</sub> emissions reduction targets.<sup>143</sup> As a result, governments need to develop better strategies for green growth. These governments should aim to integrate green growth into policy processes and national development plans. This is a more appropriate approach than creating standalone policy documents for green growth. Furthermore, the integration will increase the acceptability of green costs by both the public and the private sector. As Cock<sup>144</sup> notes, the integration will also reduce the inconsistencies among policies and foster policy certainty.

The G20 DWG<sup>145</sup> gives a detailed seven-step methodology for developing an inclusive green growth strategy. These steps include the shared vision, stocktaking of issues, lessons and opportunities, setting of concrete and realistic country goals, and the identification and analysis of technical options. These steps are intended to generate a reform agenda and/or investment plan with clear actions, timelines and resource implications. The steps are as demonstrated in Figure 4.3.

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<sup>143</sup> Schofield & Theodosiou, 2009.

<sup>144</sup> 2011.

<sup>145</sup> 2012.

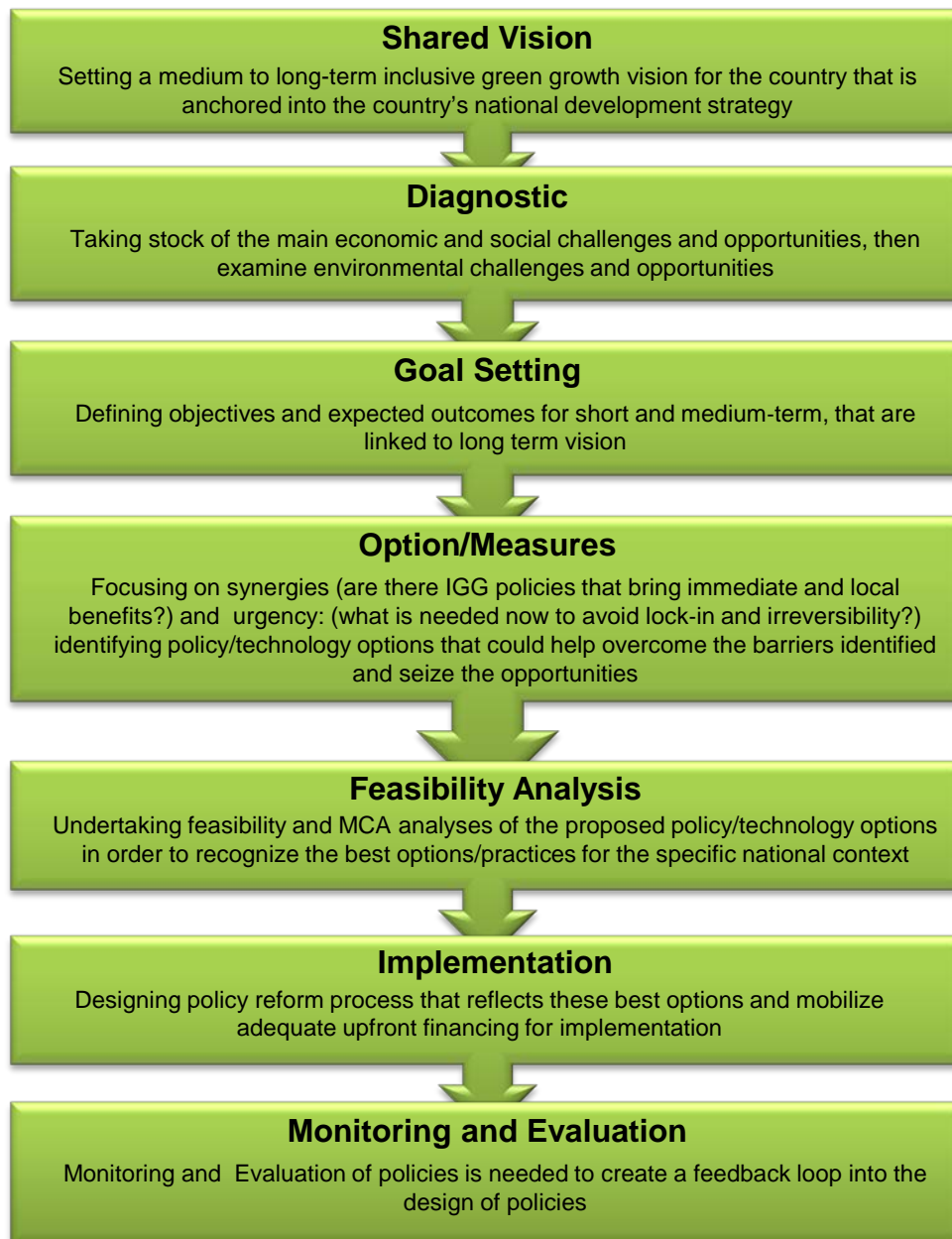


Figure 4:3: Steps for green growth strategy development (*Adapted from: G20 DWG, 2012*)

### **4.3.5 Inclusive green growth tools**

The success of green growth is largely dependent on the inputs of major players like the OECD into the policy making process and the design of market-based instruments.<sup>146</sup> National economies need to be flexible enough to enable the transition to a greener growth path. Hence, OECD diagnostics policy and measurement frameworks are paramount for both developing and developed countries to realise their green growth and sustainable development objectives. The G20 DWG<sup>147</sup> put in place a policy toolkit that could help countries to identify and address bottlenecks and constraints for the inclusive green growth. Table 4.1 illustrates the topology of these tools and the function they serve.

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<sup>146</sup> OECD, 2012.

<sup>147</sup> 2012.

**Table 4-1: Inclusive green growth tools topology (Source: G20 DWG, 2012)**

	INCENTIVIZE			DESIGN	FINANCE	MONITOR
	Tools for pricing pollution and natural resource use	Tools to complement pricing policies	Tools to foster inclusiveness	Tools to manage uncertainty	Financing and investment tools	Monitoring tools
Environmental Fiscal Reform and Charges	✓		✓			
Public Environmental Expenditure Review	✓	✓		✓		
Sustainable Public Procurement		✓	✓		✓	
Strategic Environmental Assessment		✓	✓			
Social Protection Instruments		✓	✓		✓	
Payment for Environmental Services	✓		✓		✓	
Certification for Sustainable Production			✓		✓	✓
Tools to frame environmental policies: communication and nudging		✓	✓			
Green Innovation and industrial policies		✓			✓	
Decision Making under uncertainty				✓		
Project level Impact assessment			✓	✓		
Analysis of Labor Markets and Income Effects		✓	✓			
Sustainable land management– Framework & Guidelines on Land Policy	✓	✓	✓			
Integrated Water Resources Management	✓	✓	✓			
Green accounting						✓

#### 4.4. Environmental taxation in developed countries

Governments worldwide have the aim of achieving environmental goals through tax policies by levying environmental taxes. Such taxes are levied in areas like energy consumption, the disposal of waste, and on transportation. According to ACCA,<sup>148</sup> Finland was the first country to introduce a carbon tax in 1990. It notes that Sweden has taxes with the double aim of reducing energy consumption as well as providing subsidies or exemptions for energy derived from sustainable or renewable sources. Several other developed countries followed, with the USA implementing tax measures with the intention to increase investment in renewable energy sources. By so doing, the US ratified tax credits for the developmental growth of wind, solar, biomass and other renewable energy technologies. Currently the US administration intends a new climate change treaty so as to put in place a “cap and trade” system.

ACCA<sup>149</sup> further asserts that other developed countries like China, Germany, Australia and Denmark have implemented taxation on emissions that are calculated directly on the level of emissions. It further notes that China has introduced taxes on the disposed household and commercial waste, including water waste, while offering companies income tax allowances for reducing their water consumption. It is noted that although some countries are not making significant amounts of revenue from environmental taxation, other countries like Denmark are collecting a significant 5.9% of tax revenues. The UK, on the other hand, has implemented various environmental taxes, such as the climate change levy, end-use of taxable commodities like electricity, gas and coal by commercial customers, and the landfill tax that taxes anyone that disposes waste in landfill sites.

The OECD publications on taxation, innovation and the environment<sup>150</sup> indicate that the use of environmental taxation is increasingly becoming the most efficient and effective way of promoting green growth. Environmental taxes have registered a clear positive impact on the environment. However, despite the many documented advantages of environmental taxes, their use is still

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<sup>148</sup> 2009:5.

<sup>149</sup> 2009:5.

<sup>150</sup> Available at <http://www.oecd.org/env/tools-evaluation/taxationinnovationandtheenvironment.htm>.

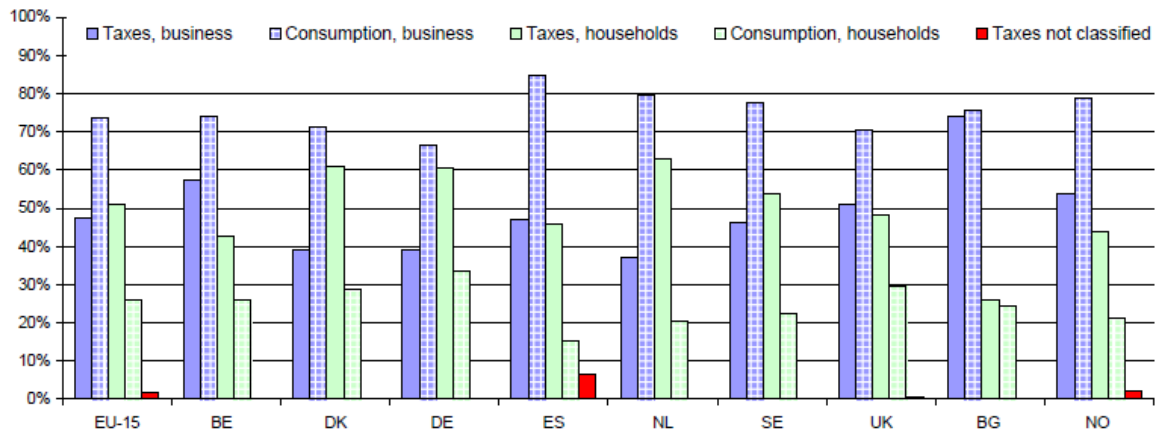
limited in many countries. Currently much revenue is raised from taxes on motor vehicles and various transport activities. As noted by OECD (2012), if countries don't join hands in the fight against environment degradation, air pollution is set to become the world's top environmental cause of premature mortality by 2050.

#### **4.4.1 Statistical values of environmental taxes in developed nations**

Steinbach *et al.*<sup>151</sup> note that environmental taxes are increasingly becoming a vital tool in adjusting revenues in national budgets. They have largely served as an enticement to change the behaviour of citizens. This has been achieved by many countries that have increased the costs on some products that have a negative impact on the environment. In the European economy, different strategies, such as the Lisbon strategy, have been devised to promote both protection and competitiveness for growing economies. They argue that in the same way, the green tax reform should also target the decrease of labour taxes, hence putting the weight on environmental taxes. Figure 4.4 illustrates the share of the business sector and households in total energy taxes in Europe in 2003. Analysed data came from the countries of European Union households and business sectors from nine EU member states including, Belgium, Denmark, Germany, Spain, the Netherlands, Sweden, the United Kingdom, Bulgaria and Norway. The distribution in Figure 4.4 indicates that more effort is needed to redistribute the green tax among the polluters, hence giving way to less taxes on other economic activities.

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<sup>151</sup> 2009.



**Figure 4:4: Share of total energy taxes and consumption between households and business sector**  
 (Source: Steinbach *et al.*, 2009)

#### 4.4.2 Contribution of environmental taxes in developed nations

Environmental taxes are increasingly used to influence the behaviour of economic operators. It is evident that environmental taxes generate revenue that is essential in fighting environmental degradation. As Steinbach *et al.*<sup>152</sup> state, the level and rate of environmental taxation varies across European countries. In some cases, low revenues from environmental taxes could be a result of lower environmental tax rates, whereas in others it could be a result of higher tax rates that have had the effect of changing behavioural patterns among producers and consumers. On the other hand, high environmental tax revenue could be the result of individuals or businesses purchasing taxed products outside their own country. This is mainly because tax rates in another country could be lower than those of the home country.

Arising from the understanding of researchers of environmental taxes,<sup>153</sup> this section looks at all those taxes whose tax base is a physical unit of something that has a proven, specific negative impact on the environment. Therefore, Figure 4.5 indicates the total revenues for environmental taxes, including taxes on transport, energy, pollution and resources as a share of total revenues from taxes and social contribution in the EU.

<sup>152</sup> 2009.

<sup>153</sup> Steinbach *et al.*, 2009; Williams, 2009; Heine *et al.*, 2012.

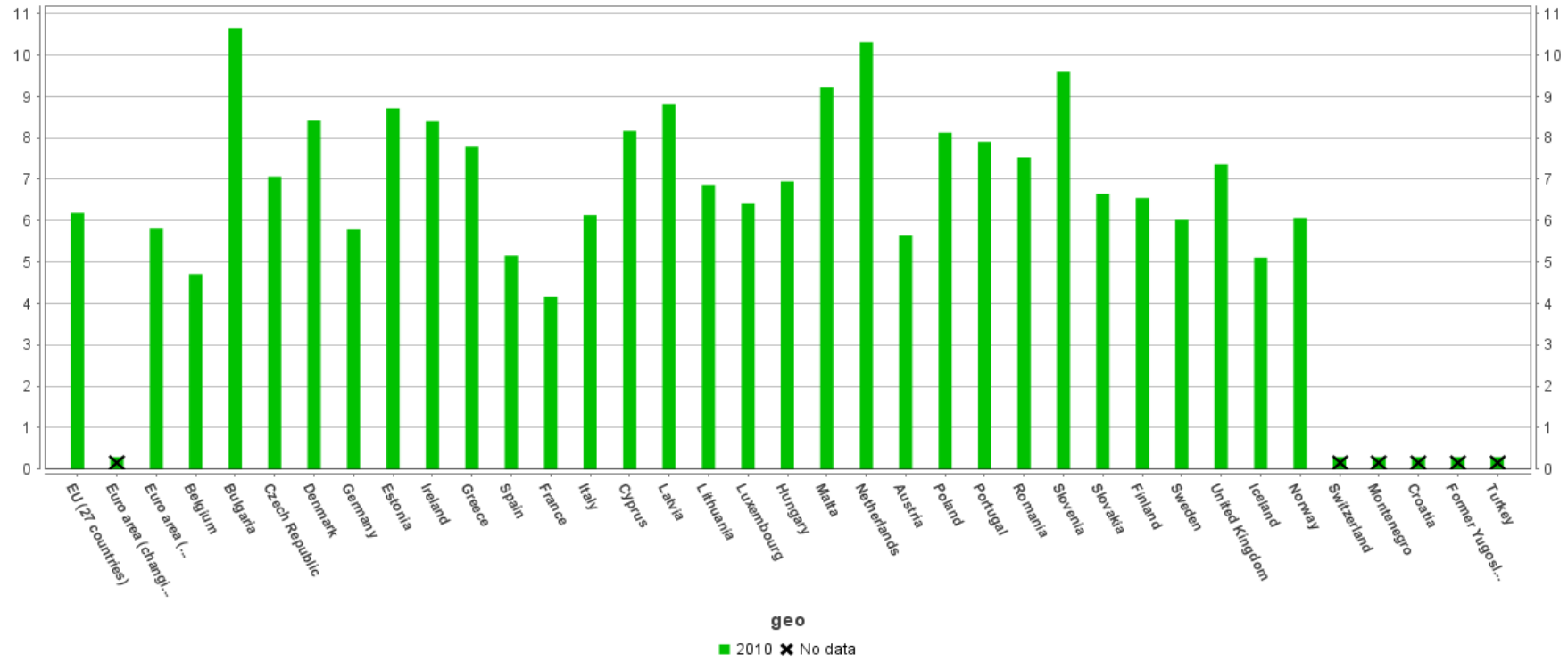


Figure 4:5: Environmental tax revenues from taxes and social contribution in EU (Source: Eurostat,<sup>154</sup> 2013)

<sup>154</sup> Available at <http://epp.eurostat.ec.europa.eu/tgm/graph.do?pcode=ten00064&language=en>.



It has been noted that many OECD countries are collecting significant revenues from environmentally related taxes. Figure 4.6 illustrates the revenues from OECD countries as a percentage of GDP.

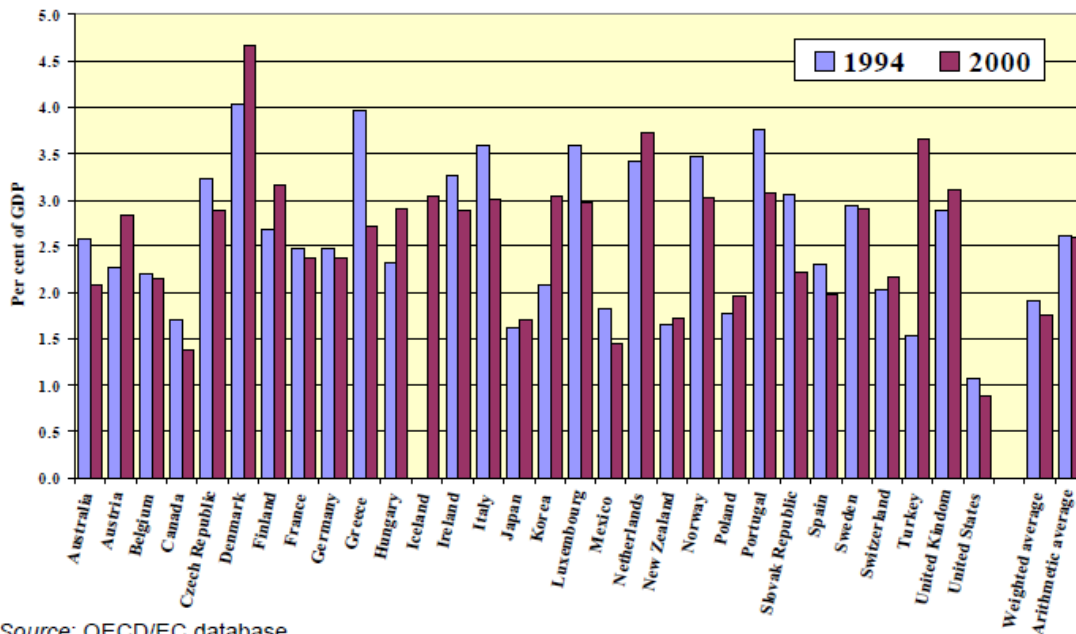


Figure 4:6: Revenue from environmentally related taxes (Source: OECD, 2012)

#### 4.4.3 Green tax incentives in the selected countries of this study

Governments plan tax incentives with the aim of reaping greater benefits. This could be in terms of increased investments, or other benefits like creation of new jobs, and creating and sustaining an environmentally friendly industry.<sup>155</sup> It is therefore important to measure the costs and benefits and monitor incentive effectiveness. It should also be noted that governments need to create a conducive climate for their investors. This should be in the form of encouraging and facilitating the investment in the form of easing conditions for import

<sup>155</sup> Deloitte, 2009.

and export. Additionally, the government should enhance the availability of local suppliers, regulatory frameworks, adequate infrastructure, and the country's geographic location (Cock, 2011). Appendix 2 shows the green tax incentives of countries that are the major players in the field of the green economy.

## **4.5. Summary**

This chapter discussed the role of taxation in green growth. It detailed the environmental tax design and the uncertainties involved when designing green growth policies. The chapter further discussed the green growth policy options in which the inclusive green growth strategies were detailed. Furthermore, the tools that are needed in the development of green growth strategies were also discussed.

The chapter concluded by discussing the statistical analysis of the values of green environmental taxes. Comparisons between countries in the European Union were provided in a graphical form. Finally, the green tax incentives in the four selected countries (e.g. China, South Africa, UK and the USA) of this study were discussed.

# CHAPTER 5: GREEN TAXES SUCCESS FACTORS AND COMPARATIVE ANALYSIS BETWEEN SA AND OTHER DEVELOPED COUNTRIES

## 5.1. Introduction

It is important to note that though carbon taxes are imposed on fossil fuel use, there are other ways of implementing green taxes. Many countries have imposed taxes on retail consumers, industrial consumers, or fossil fuel producers, and different types of fossil fuel usage. Furthermore, the literature shows that there is little discussion of an internationally coordinated carbon tax. European countries, for instance, have introduced different types of tax incentives at the national level to reduce carbon use. It is also considered in this study that even though this policy option has received considerable attention, fewer countries have implemented it. This chapter discusses success factors that have enabled countries to effectively implement carbon taxes.

## 5.2. Actions and strategies for green taxes

Many strategies and actions have been set out upon to achieve a successful green economy. The focus has been mainly on the developed countries, but there are significant actions being taken to globalise them.

### 5.2.1 *The Kyoto Protocol*

The Kyoto Protocol has been recognised as one important first step towards a truly global emission reduction effort that will benefit the extent of greenhouse gas emissions. Considering the Kyoto Protocol principle of the common, but differentiated, responsibilities, some developed countries are on a path to make sure that large scale polluters take responsibility for their actions. In this regard, developed countries like China and India call

for strict adherence to policies, whereas others argue that developing countries have similar challenges and should be treated equally.

Ellis *et al.*<sup>156</sup> note that there is an increased awareness in developed countries due to the Kyoto Protocol. They observe that such awareness and compliance with the Kyoto Protocol have given birth to the emissions trading scheme (ETS) in the European Union. The ETS has so far 15 European member states and is considered to be the largest scheme in the world.

The compliance with the Kyoto Protocol has also led to the introduction of a cap and a trade emissions permit market in Australia by 2011.<sup>157</sup> Other similar schemes have been established in New Zealand and North America based on the Kyoto Protocol. On the other hand, the Climate Change Exchange (CCX) has also been established to cover Brazil and North America. Consequently, China and India are in the process of developing national emissions trading schemes. It is noted that the more the countries get involved in emissions trading, the lower the costs of mitigation.

### **5.2.2 Durban Platform for Enhanced Action**

In line with the Kyoto Protocol, the Durban Platform for Enhanced Action<sup>158</sup> (ADP) has been established. The ADP objective was to develop a protocol that will ensure that members adopt a universal agreement on climate change by 2015. The Durban outcome recognises the fact that smart government policy, smart business investment, and the demands of an informed citizenry, all motivated by an understanding of mutual self-interest, must go hand-in-hand in pursuit of the common goal. The adoption of ADP and its legal agreement is to come into effect and be implemented from 2020.

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<sup>156</sup> 2010.

<sup>157</sup> Ellis *et al.*, 2010.

<sup>158</sup> Available at [http://unfccc.int/key\\_steps/durban\\_outcomes/items/6825.php](http://unfccc.int/key_steps/durban_outcomes/items/6825.php).

### **5.2.3 The United Nations Framework Convention on Climate Change**

The United Nations Framework Convention on Climate Change<sup>159</sup> came into force on 21 March 1994. It has so far been endorsed by 195 countries that are referred to as “Parties” to the Convention. The similar “Rio Convention” was adopted by the “Rio Earth Summit” in 1992. The UNFCCC’s critical role is to prevent detrimental human interference with the climate system by stabilising greenhouse gas concentrations. It states that:<sup>160</sup>

*“... such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change. By so doing its target is to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner”.*

### **5.2.4 The Bali Road Map**

The Bali Road Map<sup>161</sup> was adopted at the 13th Conference and the 3rd Meeting of the Parties in December 2007 in Bali. It includes the Bali Action Plan, which charts the course for a new negotiating process designed to tackle climate change. The Bali Action Plan has various categories; namely shared vision, mitigation, adaptation, technology and financing. The shared vision refers to a long-term vision for action on climate change, including a long-term goal for emission reductions.

### **5.2.5 The Doha Climate Gateway**

During the 2012 UN Climate Change Conference in Doha,<sup>162</sup> Qatar (COP18/ CMP8), participants considered the previous efforts on international climate change negotiation and

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<sup>159</sup> Available at [http://unfccc.int/key\\_steps/the\\_convention/items/6036.php](http://unfccc.int/key_steps/the_convention/items/6036.php).

<sup>160</sup> UNFCCC, 1994.

<sup>161</sup> Available at [http://unfccc.int/key\\_steps/bali\\_road\\_map/items/6072.php](http://unfccc.int/key_steps/bali_road_map/items/6072.php).

<sup>162</sup> Available at [http://unfccc.int/key\\_steps/doha\\_climate\\_gateway/items/7389.php](http://unfccc.int/key_steps/doha_climate_gateway/items/7389.php).

opened a way forward. This was done to increase participation as well as actions at all levels to prevent further climate changes and to cut down greenhouse gases. The conferences further enacted the completion of activities under the Bali Action Plan, amalgamated the work of the ad hoc Working Group on the Durban Platform for Enhanced Action (ADP), and also implemented changes to the Kyoto Protocol. The Doha Climate initiative was driven by the fact that in spite of known successes in climate change mitigation, the global emissions of greenhouse gases continue to rise.

The member governments observed that there is a further need to review achieved mitigation benefits arising from previous actions. They also agreed to give financial and physical support to achieve ways to further reduce environmental degradation.

### **5.3. Success factors for green taxes**

Amidst these international efforts to reduce greenhouse gas emissions, many new cases of climate change have been encountered. The OECD argues that member states should continue with campaigns to enable developing countries to undertake emission reduction activities.<sup>163</sup> Such steps, like the development and transfer of environmentally friendly technologies, policies and various economy-wide packages and policy instruments, and the identification of all possible potential issues and factors that could contribute technically or economically to greenhouse gases reduction.

One of the solutions in this area is the implementation of green taxes. This section therefore identifies factors that are critical for the success of green taxes in developed and developing countries.

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<sup>163</sup> OECD, 2012.

### **5.3.1 Policy design**

In many instances the demand for environmental measures like green taxes arises from outside producer policy networks. In developed or developing countries, where business has limited political power, it is difficult for the business fraternity to oppose politicians who design green taxes. Conversely, if a business has political powers, the design of green policies tends to be done in consideration of their interests. In such a situation, business is likely to effectively oppose the political masters if they try to introduce unfavourable policies.<sup>164</sup>

### **5.3.2 Application across the board**

Several researchers<sup>165</sup> argue that for environmental taxes to be effective, the level of the tax should be proportional to the environmental damage.

Further, it should be applied evenly to business and such businesses should accept and support the fact that it should be within the boundaries of climate change parameters. However, even though most businesses seem to support environmental taxation, many have a negative attitude towards it. The argument here is that the application of an environmental tax policy for business could result in business migration to other countries where policies are not in place. As ACCA<sup>166</sup> notes, the UK statistics show 27% of the CO<sub>2</sub> coming from homes, whereas 28% comes from road transport. Hence, in such a situation the application of policies across the board may be considered an unfair practice.

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<sup>164</sup> Heine *et al.*, 2012.

<sup>165</sup> Muller & Mendelsohn, 2009; Blackman *et al.*, 2009; ACCA, 2009; Heine *et al.*, 2012; Lewis, 2012.

<sup>166</sup> 2009.

### **5.3.3 Consultation**

The debate surrounding green taxes around the world has been met with mixed feelings.<sup>167</sup> There is still a great deal of scepticism on the part of developing countries as to whether green taxes are not an instrument for achieving a neo-liberal economic model, window dressed as “sustainable development”. Many are still cautious and have placed emphasis on the protection of sovereignty to ensure that they are not held hostage by developed countries in the name of development.<sup>168</sup> Hence, as ACCA<sup>169</sup> notes, governments need to consult widely before a policy decision is taken or they introduce a green tax. Such consultation should be at all stages of the policy formulation and implementation. More so, consultation should be with tax professionals, businesses and other key stakeholders.

### **5.3.4 Measurement and analysis of results**

Economically, green taxes are recommended as an essential instrument to measure and reduce pollution, rather than regulations and environmental subsidies.<sup>170</sup> However, this economic perspective may overlook the political aspects of the use of green taxes. Furthermore, Cock<sup>171</sup> argues that a lack of consideration of the political perspective may lead to a sound policy being rejected. Since the economic view may concentrate on the technical design of green taxes rather than its political attractiveness and feasibility, the results of green tax implementation should be regularly reviewed. Hence governments have to thoroughly and regularly analyse green tax results. They should also be prepared to amend or reverse the green policies in cases where they are viewed to have politically damaging consequences.

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<sup>167</sup> Levinson, 2007.

<sup>168</sup> Hoyng, *et al.*, 2010.

<sup>169</sup> 2009.

<sup>170</sup> Avi-Yonah & Uhlmann, 2009.

<sup>171</sup> 2011.



### **5.3.5 Raising awareness**

Another important aspect to consider with green taxes is awareness. In order to reduce business' and citizens' opposition to green taxes, governments have to create awareness campaigns and programmes. This will help to show the clear relationship between what is taxed and what is pollution.<sup>172</sup> By doing this the green tax stands a better chance of being perceived as fair by stakeholders. As ACCA<sup>173</sup> notes, fairness and equity are critical values among citizens and politicians. It further argues that when businesses pay environmental taxes and realise clear benefits from them, they are more likely to change their behaviour. Hence, awareness is needed to clarify environmental taxes and their benefits and purpose.

### **5.3.6 Participatory approach**

According to OECD,<sup>174</sup> in order to bring every nation to the green economy, there must be dialogue and negotiation between the developing and the developed nations. Negotiations should also be stressed within the individual countries between the political actors, business and civil society. In the case of inclusive participation, the polluters will realise and appreciate the need for greening the environment. Society and business will become willing participants in their own environmental policy development, rather than just passive beneficiaries.

The DEA<sup>175</sup> posits that the road to a green economy should involve every citizen, because everyone contributes to environmental pollution. They argue that there must be a balance and a level of involvement of business and citizens in the environmental decision-making processes and in the implementation of environmental programmes. They assert that the involvement of everyone in such programmes will lead to behaviour change, which is paramount for environment safety.

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<sup>172</sup> Deloitte, 2009; National Treasury, 2010.

<sup>173</sup> 2009.

<sup>174</sup> 2012.

<sup>175</sup> 2013.

### **5.3.7 Clear allocation of authority and responsibilities**

According to Cock,<sup>176</sup> South African environmental taxes have been suffering from mal-administration. On the other hand, Fullerton, *et al.*<sup>177</sup> assert that a proper allocation of power within and between various levels of society is central to the green tax debate. They assert that a pollution-free environment as well as a green economy requires natural resource governance. The administration of green taxes, as well as ensuring environmental protection, requires some degree of decentralisation. At the lower levels of administration, local communities should be given legislative powers to enable them to enact by-laws among other actions in environmental conservation and land use planning. This will help the citizens incorporate greening the environment into their day-to-day activities and hence lead the way towards the easy administration of green taxes.

### **5.3.8 Agreed values**

As McAuslan<sup>178</sup> states, effective legal systems are best founded on the beliefs and values of the societies whose behaviour they govern. Researchers such as Haring and Jagers<sup>179</sup> note that pro-environmental behaviour, including pro-environmental policy acceptance, has its roots in an individual's personal values. These personal values are determinants of the individual's selection of actions and evaluation of people and events. They assert that from the value-belief-norm (VBN) theory, personal value priorities will lead an individual to believe and appreciate the general environmental beliefs. This will also instil in an individual a sense of awareness of environmental consequences so as to ascribe his/her personal responsibility for the consequences. Hence from this understanding, it can be concluded that people's political trust, interpersonal trust, and personal values have significant effects on their attitudes toward the tax on CO<sub>2</sub> emissions.

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<sup>176</sup> 2011.

<sup>177</sup> 2008.

<sup>178</sup> 1993.

<sup>179</sup> 2013.

### **5.3.9 Accepted rules and institutions**

For the effective transaction of green taxes, many countries will have to put in place new institutional arrangements. Such institutions will help in providing guidance for the development of green growth strategies. In the case of developing countries, including South Africa, such an approach will assist in capacity building. It will also help in the integration of environmental issues into the broader national development planning processes, like the Poverty Reduction Strategies (PRSPs).<sup>180</sup>

According to the OECD,<sup>181</sup> such rules are instrumental in the establishment of governance structures and to ensure co-ordination between different areas and levels of government. This is vital as it will help with the integration of green growth into policy processes.

It is also important to note that green taxes are not simply taxes on emissions only, but have other general environmental governance benefits. Specific rules should therefore be put in place to guide different tax levels. Thus they will include tax bases, revenue distribution, and tax collection.<sup>182</sup> Hence, to avoid unnecessary competition between nations, and to avoid opposition within individual countries, clear international rules and guidelines should be put in place. ACCA<sup>183</sup> advises on the need for international rules and standards for green taxes. On the same note, Deloitte<sup>184</sup> emphasises that, in the absence of internationally uniform green taxes, competition from economies with lower (or no) green tax burdens will prevail and this will defeat the cause of green taxes.

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<sup>180</sup> DEA, 2013.

<sup>181</sup> 2012.

<sup>182</sup> Deloitte, 2009.

<sup>183</sup> 2009.

<sup>184</sup> 2009.

### **5.3.10 Negotiation processes when different views exist**

The literature shows that the introduction of green taxes directed towards groups which are less organised, such as consumers, can be less problematic. However, when such groups are well-organised (economic sectors like industries and business), the application of such taxes may be problematic. According to Pigou,<sup>185</sup> in such cases different views may exist that would necessitate extended negotiations in order to achieve set goals. Fullerton *et al.*<sup>186</sup> note that governments could find it difficult to apply an equivalent tax on the offending producer if they cannot accurately gauge the social cost. Hence, there should be appropriate negotiations between the stakeholders so as to reach an agreement as to what should be monitored and evaluated.<sup>187</sup>

## **5.4. Standards and regulations**

The increasing awareness of greenhouse gas emission reduction has resulted in pressure on governments to put in place regulatory measures and standards on environmental issues. ACCA<sup>188</sup> argues for the need for international regulatory frameworks and standards that could provide certainty of outcome. It asserts that without international regulations some countries may fail to implement their policies.

### **5.4.1 Economic instruments**

Fullerton *et al.*<sup>189</sup> note that environmental policies are increasingly being transformed by the use of environmental taxes, emissions trading, and other economic instruments. They assert that such incentives allow rigorous environmental protection to be introduced at a

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<sup>185</sup> 1920.

<sup>186</sup> 2008.

<sup>187</sup> Heine *et al.*, 2012.

<sup>188</sup> 2009.

<sup>189</sup> 2008.

lower economic cost than with the use of less-flexible forms of conventional regulation that dictate particular abatement technologies. These cost-reduction economic instruments are thought to play a vital role when promoting higher standards of environmental protection.

It should be noted that the successful usage of emissions trading and other economic instruments, like incentives and taxes, is primarily a matter of efficiency. When used effectively, economic instruments may be able to reduce the costs of achieving a given level of environmental protection.<sup>190</sup> However, as Fullerton *et al.*<sup>191</sup> posit, these economic instruments should be used with caution as different economic instruments may have different advantages and disadvantages.

#### **5.4.2 Education, skills and capacity development**

There is an increasing need for continual development of science, research, education and training priorities to support the transition to a green economy.<sup>192</sup> This is because politicians, professionals, workers and local community administrators need knowledge and skills to enable them to make meaningful decisions that could lead to the green economy. Furthermore, skills development, training, and education will improve the chances of innovation, adoption and implementation of green technologies. Developing countries need to engage in academic partnerships with the developed countries to enable them improve and facilitate technology transfers, with positive knock-on effects for local innovation.

#### **5.4.3 Technology transfer**

Green technological innovation and technology transfer is anticipated to reduce the cost of mitigation. It is also expected to make low carbon growth more achievable for developing countries.<sup>193</sup> Green technological progress and transfer could effectively impact on a

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<sup>190</sup> ACCA, 2009.

<sup>191</sup> 2008.

<sup>192</sup> OECD, 2012.

<sup>193</sup> Ellis *et al.*, 2010.

country's overall growth provided the interaction between the two is clear. If this interaction is significant, then green technology will facilitate general economic growth, as well as making it less carbon intensive.

The widespread effort to promote green growth could easily be achieved by accelerating the dissemination internationally of green technologies. In the case of developing countries, South Africa, Egypt, Algeria, Morocco and Kenya are considered to have better climate change mitigation technologies that have been developed and patented.<sup>194</sup> If such technologies are shared with other developing countries a reasonable degree of climate mitigation could be achieved. Lewis<sup>195</sup> notes that if climate mitigation technological innovations in Africa, like biofuels, marine and tidal energy, waste-to-energy and solar thermal energy are spread, positive outcomes would be registered. The OECD<sup>196</sup> emphasises that if advanced green innovation in Brazil, China and India are effectively transferred to developing countries, then meaningful climate mitigations could be registered.

#### **5.4.4 Intellectual property rights**

Even though green technology transfer is considered a better way to mitigate climate degradation, it can be impeded by intellectual property rights (IPRs). As noted by the OECD,<sup>197</sup> green patents based on climate change mitigation technologies remain few worldwide. There is a global need for protecting and enforcing IPRs, providing incentives for investment in innovation, and establishing the framework for IPR protection and diffusion. Strategies that could help reduce the cost of green technologies for developing countries need to be devised. Such strategies may include covering licensing fees, and buying out patents on key technologies and collaborations between developed and developing countries.

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<sup>194</sup> OECD, 2012.

<sup>195</sup> 2012.

<sup>196</sup> 2012.

<sup>197</sup> 2012.

### **5.4.5 Financing**

Climate finance refers to local, national or transnational financing, which may be drawn from public, private and alternative sources of financing. It is a core factor in addressing climate change since large-scale investments are needed to significantly reduce emissions. Climate finance is also a critical success factor for adaptation. It is important to note that significant financial resources are needed in order for countries to be able to adapt to the contrary effects of climate change.

Because of the importance of the financial factor, the UNFCCC tasked its members to continually identify financial sources and to compel developed nations to financially support activities intended to control climate change. The UNFCCC also argues that its members emphasise and encourage governments and stakeholders to understand and assess the financial needs of developing countries so that such countries can undertake activities that address climate change.

### **5.4.6 Policy and strategy**

The road to effective green taxes calls for continuous building of enabling strategies and policies planned in the green context. Both in South Africa and developed nations, there is a need for an adoptive understanding of the green economy. It should be made clear to all stakeholders that the green economy is a framework for all economic activity and a mechanism to address the limitations within the economic pillar of sustainable development.<sup>198</sup> Hence there is a need for a continual improvement of policy, plans, regulations, investments and incentives.

Fullerton *et al.*<sup>199</sup> observe that even though environmental taxes and other market mechanisms are efficient enough, many areas may still require more straight forward

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<sup>198</sup> DBSA, 2011

<sup>199</sup> 2008.

regulatory approaches as part of the policy mix. They suggest that better policies and strategies could be applied to ensure minimum environmental standards. Such standards could be significant in situations where responses to economic incentives suffer from inertia. On the other hand, DBSA<sup>200</sup> emphasises that for South Africa to realise its voluntary carbon emission commitments by 2020 and 2025, considerable policy reforms will have to be made. It notes that the increased policy monitoring and reforms will enable the internalisation of the negative externalities generated by emitters into the price of their outputs.

#### **5.4.7 Infrastructure**

The success of greening the economy will depend much on better infrastructure. However, many developing countries are constrained by weak infrastructure in transport, communication and energy.<sup>201</sup> Even though addressing these limitations is crucial, the implications for greenhouse gas emissions are required to be put into perspective. Large financial institutions such as the World Bank's Clean Investment Funds are promising support to provide developing countries with low-emission public transportation systems.<sup>202</sup> This will assist the developing countries to reduce emissions from the transport sector. Better infrastructure is needed for small countries if they are to adapt to low-carbon transport options.

Also, access to energy is another bottleneck for many developing nations. The OECD<sup>203</sup> indicates that many developing countries have a lack of grid electricity. With such a lack, citizens in those countries will opt for cheaper available options. In South Africa, for example, many people prefer to use coal, charcoal or wood; and all of these options are antecedents of environmental degradation.

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<sup>200</sup> 2011.

<sup>201</sup> G20 DWG, 2012.

<sup>202</sup> OECD, 2012.

<sup>203</sup> 2012.



There is a worldwide campaign for the use of renewable energy technologies. However, few developing countries can afford such approaches without the intervention of donor funding. Lewis<sup>204</sup> notes that new and improved technologies in energy production, such as solar power, biomass, micro-hydro power and biofuels, are better approaches to electricity generation. However, for developing countries to effectively adopt these they need financial and technical support. Such support will help them to develop and implement them in the disadvantaged rural communities.

#### **5.4.8 Green foreign direct investment**

It is important to note that much of the technical knowledge on the control of pollution or other environmental services exists in the industrialised developed countries.<sup>205</sup> Hence, there is a need for foreign direct investment (FDI) to disseminate this knowledge from the highly industrialised to the developing countries. This will enable developing country producers to lessen pollution and to operate in a more resource efficient manner.

### **5.5. Comparative analysis for the selected countries**

There is acknowledgement of a tax shift that is intended to lead to green tax reform and ecological taxing. This fundamental policy is set to create a tax revolution that could transform economic, social and environmental dynamics in all nations. Its major goal is to revise the fundamental purpose of taxes. This has led to environmental taxes being increasingly used to change the behaviour of economic players. These economic operators may be producers or consumers. When carefully administered, the environmental taxes could generate revenue needed for environmental protection campaigns.

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<sup>204</sup> 2012.

<sup>205</sup> OECD, 2012.

Eurostat<sup>206</sup> classifies environmental taxes in four categories. The first is the energy taxes that include taxes on products used for both transport and stationary purposes like fuel oil, natural gas, coal and electricity. In their classification, CO<sub>2</sub> taxes are grouped under energy taxes rather than under pollution taxes. The second category is the transport taxes that relate to those taxes on ownership and the use of motor vehicles. The third is the pollution taxes that include taxes on emissions into the air and water, management of waste, and noise with the exception of CO<sub>2</sub> taxes. Lastly are the taxes on resources. This includes taxes on the extraction of all raw materials apart from oil and gas.

It is important to note that the USA prefers tradable permits that are mostly freely allocated, while Europe prefers taxation. This is highly influenced by the stronger belief in individual private rights in the US.<sup>207</sup> Consequently, the European Union has widely advocated for common environmental regulations. This has been mainly to counteract the cross-boundary pollution between countries.

In practice, the global landscape of green tax is both complex and dynamic. From their survey, KPMG produced “The Green Tax Index”<sup>208</sup> to increase awareness of the complex, fragmented, and rapidly evolving green tax landscape worldwide. The survey’s major objective was to inspire organisations to take advantage of green tax incentives so as to reduce their green tax penalties. The survey focused on 21 major economies. KPMG’s selection included 15 of the G20 countries that are believed to represent a major share of global corporate investment activity. The survey analysed tax systems to determine the number and range of incentives and penalties that influence corporate activity in relation to nine green policy areas including:

- Energy efficiency.

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<sup>206</sup> Available at [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Environmental\\_taxes](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Environmental_taxes).

<sup>207</sup> Ellis *et al.*, 2010.

<sup>208</sup> Available at <http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/green-tax/Pages/Default.aspx> .

- Carbon and climate change.
- Green innovation.
- Renewable energy and fuels.
- Green buildings.
- Green vehicles.
- Water efficiency.
- Material resource efficiency and waste management.
- Pollution control and ecosystem protection.

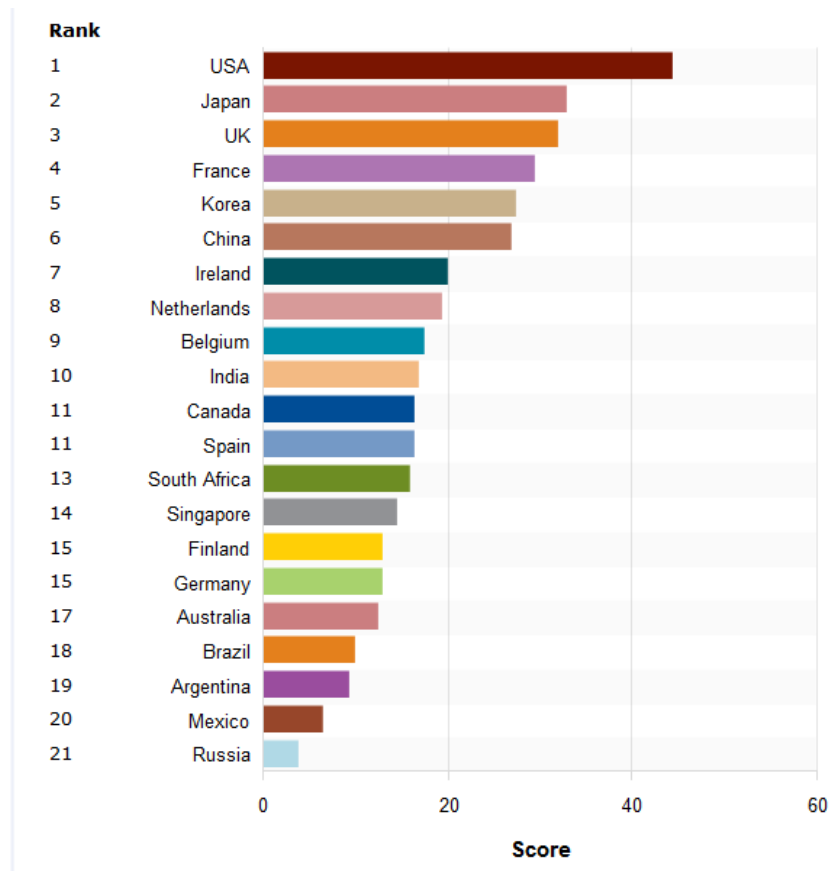
The survey used a measuring scale of a point award methodology<sup>209</sup> on which the analysis was based. As demonstrated in Figure 5.1, the United States (US) ranked first on the overall score of the nine green policy areas. Results indicated that US has an extensive programme of Federal tax incentives for energy efficiency, renewable energy and green buildings. However, results show that when only green tax penalties are considered, the US drops to the 14<sup>th</sup> position. This shows that the US green tax policy is weighted heavily in favour of incentives.

The United Kingdom (UK) ranked third on the overall score and has a green tax approach balanced between penalties and incentives. The UK scores most highly in the area of carbon and climate change. On the other hand, China ranked sixth with a green tax policy balanced between incentives and penalties and focused on resource efficiency and green buildings. Of the four countries compared in this study, South Africa ranked last as number 13 in the overall rankings. However, the results showed that South Africa scores level with the US and China on issues regarding energy efficiency. It is important to note that since the introduction of the carbon disclosure project (CDP) in South Africa, there has been an

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<sup>209</sup> Available at <http://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/green-tax/Pages/methodology.aspx>.

increase in the number of companies reporting on their carbon emissions.<sup>210</sup> This has seen an increase in South African company's carbon disclosure from 59% in 2008 to 83% in 2011.



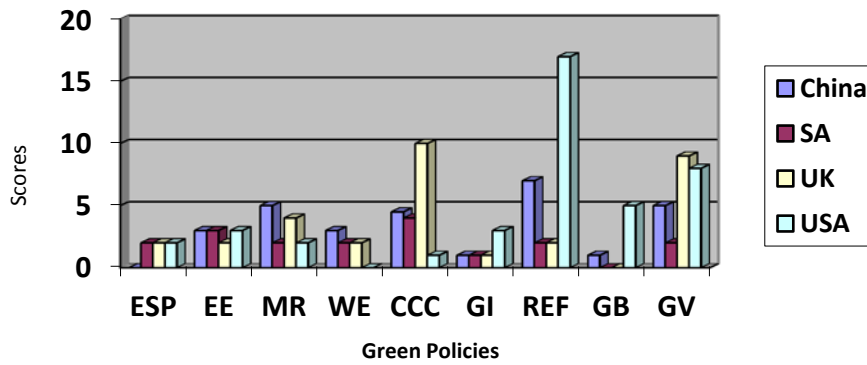
**Figure 5.1: Green Tax Index (Source: KPMG, 2013)**

From the results of the survey, a detailed analysis of the tax incentives and penalties offered by the four countries is shown in Figure 5.2.

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<sup>210</sup> Available at <http://www.urbanearth.co.za>.

### The Four Countries Scores on the Nine Green Policies



**KEY:**

**ESP**- Eco System Pollution

**EE**- Energy Efficiency

**MR**-Material Resources

**WE**- Water Efficiency

**CCC**- Carbon and Climate Change

**GI**- Green Innovation

**REF**- Renewable Energy and Fuel

**GB**- Green Building

**GV**- Green Vehicles

**Figure 5:2: Scores as per the Nine Green Policy Areas (Source: Summarised from KPMG, 2013)**

Figure 5.2 demonstrates that all four countries scored high on renewable energy and fuel, with the USA ranking the highest. This implies that there is an effort by the countries to promote the green environment. Furthermore, the results show that the four nations are

moving slowly towards green innovations, even though the US appears to be doing better than its counterparts.

The survey also analysed how the four countries perform on tax incentives and penalties. The results show that the US uses green tax penalties less than the three other countries, whereas UK ranked higher than its counterparts. China and South Africa are both more active than the US in imposing Federal green tax penalties. The overall comparison is as demonstrated in Figure 5.3.

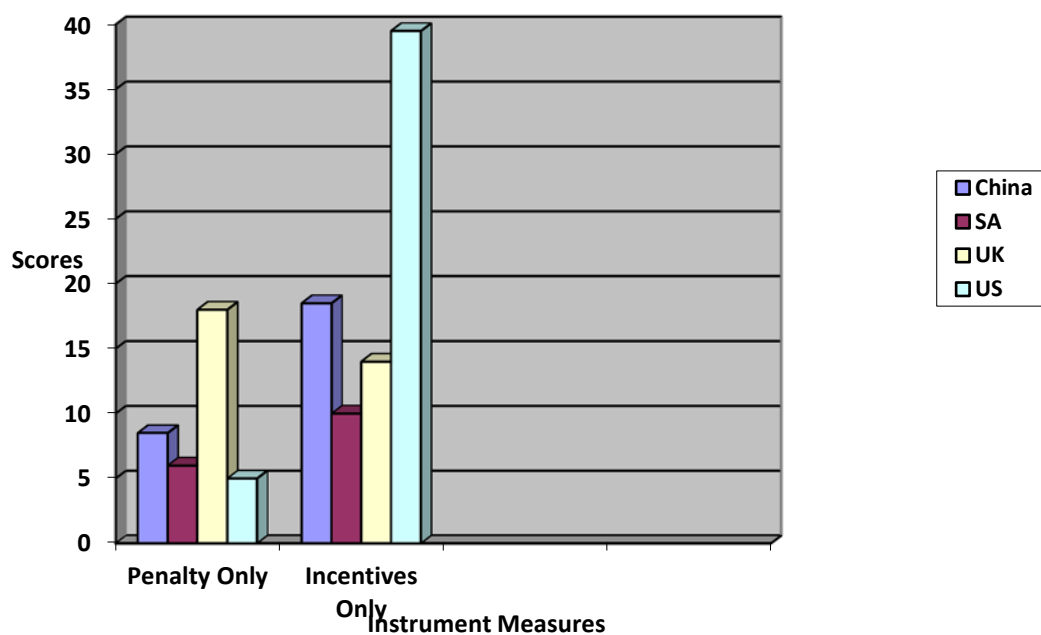


Figure 5:3: Comparison of instrument measures (Source: Summarised from KPMG, 2013)

### 5.5.1 Comparison of green taxes effectiveness

Environmental taxes operate on the principal that if a product is made more expensive, behaviour will change and there will be less purchased.<sup>211</sup> If the activity is associated with

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<sup>211</sup> Heine *et al.*, 2012.

excessive environmental damage, then the tax applied will discourage the purchase and hence reduce its damage to the environment. Generally speaking, this may not be accurate in practice. Hence, it is important that this ideology is evaluated to check how it applies, and if there is an environmental improvement. Evaluations of green taxes following their implementation should be undertaken to check their effectiveness as well as to refine their implementation. This will also help to communicate their impact and value to the policy-makers and stakeholders.

The challenge in evaluating the effectiveness of green taxes is that there are various factors that influence people's choice in buying a commodity. The price of the commodity is just one of the many influencing aspects. The Green Fiscal Commission<sup>212</sup> notes that there may be numerous changes in price that are not as a result of taxes. These include market price changes and growth, or contraction of the economy and incomes. It argues that since green taxes are normally packaged in several other environmental policies, their effectiveness may not easily be isolated. Appendix 3 illustrates the comparison of the impact of energy and carbon-based taxes of the four selected countries.

### **5.5.2 Comparison of greenhouse gas emissions**

There is a global call for the highly industrialised developed and developing countries to take on differentiated responsibilities towards greenhouse gas (GHG) emissions. The approach requires that binding emission reduction goals must be put in place for these countries to counter their emissions output. The National Environmental Trust<sup>213</sup> argues that the GHG that have been emitted since the 1750s are already having demonstrably harmful effects on human welfare. It asserts that this long-lived accumulation of gases will continue to push global temperatures up, leading to catastrophic climate change.

Table 5.1 demonstrates a comparison of greenhouse gas emissions between the selected countries.

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<sup>212</sup> 2009.

<sup>213</sup> 2007.

**Table 5-1: Comparison of Greenhouse Gas Emissions (Adapted from National Environmental Trust, 2007)**

Country	2006 Cumulative GHG Emissions (MMTCO <sub>2</sub> )	2007 Cumulative Population Estimate	Cumulative Country's Emissions (MMTCO <sub>2</sub> )	Cumulative Country's Emissions per Million People (MMTCO <sub>2</sub> )
China	5,032.81	1,325,082,380	12,400.34	3.80
SA	509.76	51,300,989	5,686.31	2.14
UK	583.16	60,363,602	533.53	9.66
US	5,877.00	301,967,681	5,686.31	19.46

### **5.5.3 Comparison of the efforts to reduce greenhouse emissions**

A comparison of the four countries in this study shows that the US is the only country of the 42 industrialised nations in Annex I of the UNFCC that does not ratify the Kyoto Protocol. Furthermore, of the many developed and developing nations that convened in Washington, D.C. in September 2007, it is only the US that has taken fewer steps to reduce emissions. Many of these nations have either set greenhouse gas reduction goals or have enacted policies to directly reduce emissions (National Environmental Trust, 2007). In contrast, the US has exhibited four major differences from the many Annex I countries of the UNFCC.

These differences are:

- Has limited goals to reduce greenhouse gas emissions.
- Lacks a standard for electricity generation from renewable sources.
- Has adopted one of the lowest vehicle fuel economy standards.
- Is one of two industrialised, Annex I countries that have not ratified the Kyoto Protocol.



South Africa, on the other hand, acknowledges that significant emissions come from the motor industry (Cock, 2011; Lewis, 2012). As a result South Africa has put in place strategic key market targets that need to be achieved by the motor industry by 2015. Among these are the prohibition of used vehicles imports, legislation of new vehicle requirements at Level ECE 83.03 (Euro 2) for passenger car and light car vehicles (LCV) by Jan 2008, and Level ECE 49.02 (Euro 2) applying to the MCV and heavy car vehicles (HCV) by Jan 2010. On the other hand, it has introduced a homologation system for new models for Level ECE 83.03 (Euro 2) and for Level ECE 49.02 (Euro 2) applying to the MCV and heavy car vehicles (HCV) by Jan 2006.<sup>214</sup>

South Africa has also put in place a target of a 9% reduction by 2015 to promote vehicle energy efficiency on its roads and to have technology upgrades that would lead to more efficient vehicles/turnover.<sup>215</sup> Through the National Treasury, South Africa put in place environmental-based taxation proposals by April 2006 and the CO<sub>2</sub> taxation for new passenger cars and D/Cab LCV's.<sup>216</sup>

By following Europe EU2, South Africa has enforced fuel standards to improve air quality. As also noted by Rayner,<sup>217</sup> it requires a reduction in gaseous substances like NO<sub>x</sub>, HC, CO, and CO<sub>2</sub> through a harmonious relationship between vehicle technologies and fuel quality to improve air quality. For this matter, South Africa's standards require the new passenger cars to have a comparative fuel consumption of 6.8 litres per 100 Km and with CO<sub>2</sub> emission of 159 gms per Km.

In addition to the transport industry, South Africa's Department of Energy, through its Energy Efficiency Strategy 2009, has set other strategies that need to be achieved by 2015. These strategies include the achievement of a 15% final energy demand reduction in the industry and mining sector, a 15% reduction in parasitic electrical usage in the power generation

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<sup>214</sup> Rayner, 2012.

<sup>215</sup> *Ibid.*

<sup>216</sup> National Treasury, 2010.

<sup>217</sup> 2012.

sector, a 15% final energy demand reduction in commercial and public sector buildings, and a 10% final energy demand reduction in the residential sector.<sup>218</sup>

Table 5.2 illustrates a comparison of efforts that has been made by countries to reduce greenhouse gas emissions.

**Table 5-2: Comparison of effects to reduce GHG emissions (*Adapted from National Environmental Trust, 2007*)**

Country	Party to the Kyoto Protocol?	Absolute Emissions MtCO <sub>2</sub> Equivalent	GHG Intensity Tons CO <sub>2</sub> eq/ \$mil. GDP-PPP	Mandatory GHG reduction target?	Intensity Goal	Auto fuel efficiency standards (in miles per gallon)	Renewable energy target
China	Yes	4,938	1,023	Yes	40% by 2020, and 80% by 2050	35.8 by 2009	10% by 2010 & 16% by 2020 (primary energy goal)
SA	Yes	417	999	Yes	4.9% by 2020		4% about 10 000 GWh by 2013
UK	Yes	654	416	Yes	4.5% to 59% below historical levels	48.9 by 2012	10% by 2010 & 20% by 2020
US	No	6,928	722	No	18% reduction in emissions intensity between 2002 and 2012	27.5.3 mpg for cars 24(by 2011)	No

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<sup>218</sup> Rayner, 2012.

## 5.6. Future trends of carbon taxes in South Africa

Although South Africa has produced a Green Economy Accord in the run-up to the December 2011 United Nations Climate Conference (COP17), its major economic drivers still utilise “dirty technologies”. It is important to note that, even as late as 2008–2009, the World Bank and African Development Bank approved loans for the development of new coal-fired generators.<sup>219</sup>

South Africa is regarded as one of the largest greenhouse gas emitting countries in the world and this trend is likely to continue for the foreseeable future.<sup>220</sup> However, its commitment to sustainable development is significant. Because of various economic reasons, South Africa is still locked into coal-fired electricity for the next five years.<sup>221</sup> Of the many factors influencing this position are political factors and the high rate of unemployment.<sup>222</sup> These two major factors have allowed the local extractive industry giants to continue pressurising the country to continue with the extraction of abundant coal reserves.

The current trend is a progressive movement in the transition to a green economy. South Africa also promotes nuclear energy as clean energy, in spite of a strong local environmental lobby against it. At the same time, many international sustainable development trends are moving in the direction of de-nuclearisation.<sup>223</sup> It is worth noting that developed countries like Germany and Japan have closed down many of their nuclear plants, with the former closing eight nuclear plants and the latter 54 nuclear reactors.

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<sup>219</sup> Farouk, 2012

<sup>220</sup> Cock, 2011; Lewis, 2012.

<sup>221</sup> Cock, 2011.

<sup>222</sup> Farouk, 2012.

<sup>223</sup> Farouk, 2012.

### 5.6.1 South Africa's contribution to global CO<sub>2</sub> emissions

Although the South African government is striving towards greening, many factors are still impeding progress. As illustrated in Figure 5.2, the country's CO<sub>2</sub> emissions are still high. The International Energy Information Administration (IEIA) indicates that South Africa's emissions are 1.49% of total global CO<sub>2</sub> emissions, while China is the highest, followed by the US. Figure 5.4 demonstrates the SA statistics.

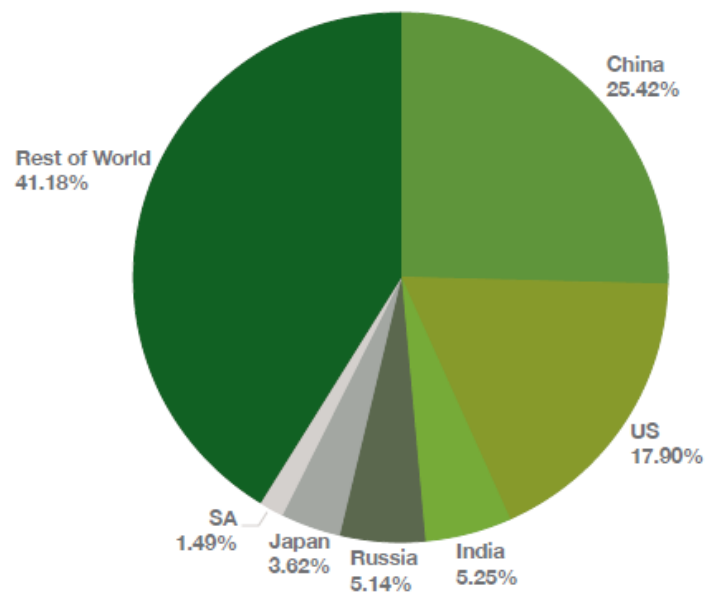


Figure 5.4: South Africa's contribution to global CO<sub>2</sub> emissions (Source: *Urban Earth*)

### 5.6.2 South Africa's emission per capita

Of concern is, as shown in Figure 5.4, South Africa's contribution to the global CO<sub>2</sub> emissions of 1.49%, and its per capita emissions are relatively high compared with other countries (Urban Earth, 2012). The International Energy Information Administration (IEIA)<sup>224</sup> study of 2009 puts South Africa's emission per capita at 9.18 tonnes of CO<sub>2</sub>. This emission

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<sup>224</sup> Available at <http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=90&pid=44&aid=8>.

per capita exceeds the world's threshold of 4.49 tonnes of CO<sub>2</sub> per capita. Figure 5.5 demonstrates South Africa's per capita CO<sub>2</sub> emissions in relation to other countries in the BRICs consortium (Brazil, Russia, India, China and South Africa) member countries and the USA.

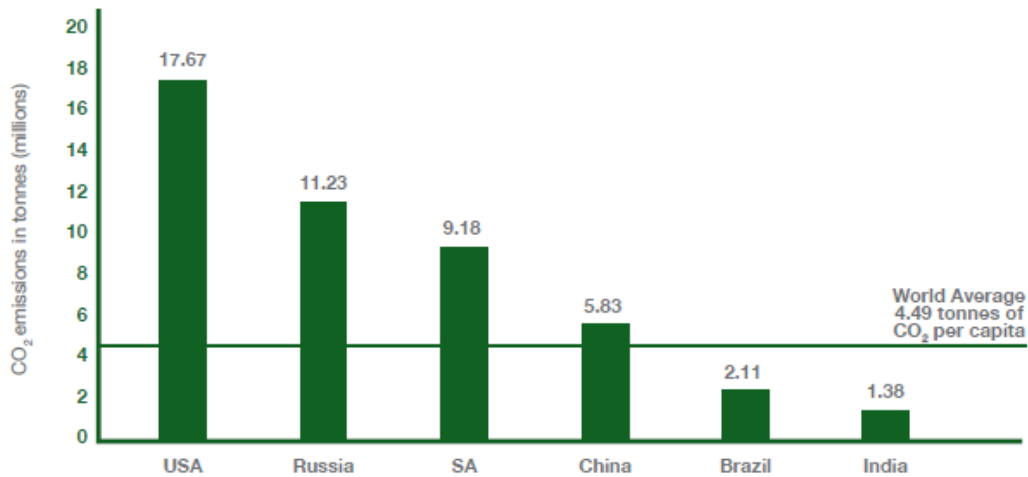
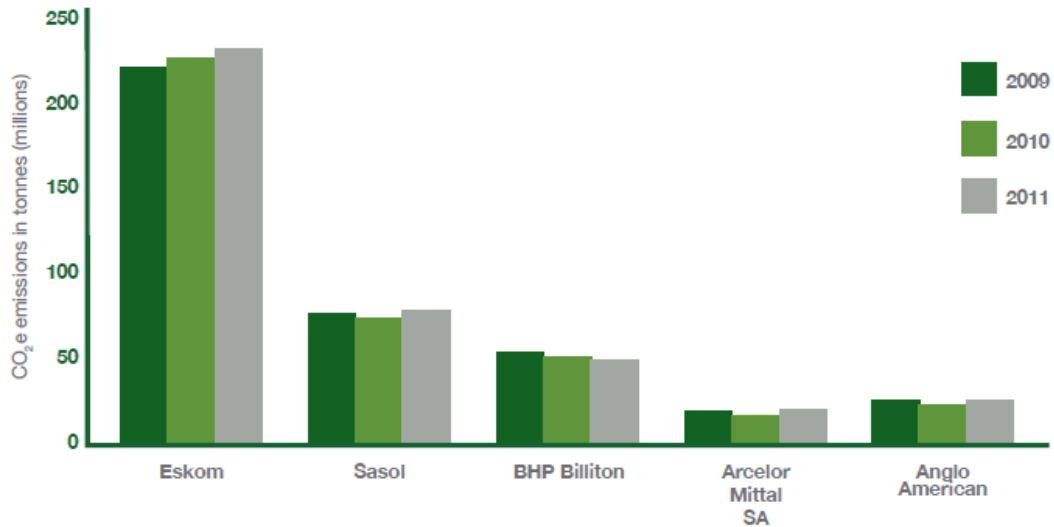


Figure 5:5: South Africa's emissions per capita (Source: IEIA, 2009)

### 5.6.3 Emission rates in South Africa

According to Urban Earth,<sup>225</sup> despite the increase in green economy campaigns in South Africa, the emission rate of its major contributors is increasing. The analysis conducted by the Carbon Disclosure Project (CDP) and the Johannesburg Securities Exchange (JSE) for the period 2009 to 2011 indicates that emissions are increasing, rather than declining. Figure 5.6 demonstrates the emission rates for the five top emitters in South Africa. The graph shows that four of the five top emitters had increased rates, with only one company, BHP Billiton, recording a decrease in emissions.

<sup>225</sup> 2012.



**Figure 5.6: Emission rates of South Africa’s top 5 major emitters between 2009 to 2011**  
 (Source: *Urban Earth*, 2012)

#### 5.6.4 South Africa’s way forward

Amidst these challenges the country is determined to promote the greening of the environment. It has proposed numerous measures to fight for the environment. These include tougher fines, wider powers for inspectors, and the right to expropriate privately held servitudes.<sup>226</sup> Furthermore, it has made amendments to the National Environmental Management Act (NEMA) to seek court orders in the process of recovering environmental-related costs from those who fail to comply with the environmental directive.

The country’s active participation in the international debate and global trade development, such as the Durban Conference, is another indication of moves in a positive direction. These actions provide positive prospects for green growth. There is also increasing pressure for South Africa to lower emissions, and the government has committed to a two-

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<sup>226</sup> DEA, 2013.

fifths reduction by 2025.<sup>227</sup> However, it should be noted that serious challenges could arise as South Africa's economic development has a significant dependency on mining and heavy industry. Reducing the country's carbon intensity is the way forward but the country will have to undertake a substantial economic transformation to resolve these challenges.

## 5.7. Summary

This chapter comprised a comparative analysis of the green taxes of four countries; viz. the US, UK and China with South Africa. The chapter examined the efforts and strategies that have been put in place to implement environmental taxes. It also discussed some success factors that have been influential in the implementation of green taxes. Furthermore, the chapter highlighted some aspects of green taxes and the differences between the four countries. Lastly, the chapter discussed the future trends of green taxes in South Africa. In addition, a comparison of South Africa's CO<sub>2</sub> emissions, emissions per capita, and overall emission rates was made and discussed. The chapter closed by giving some insight into the future expectations of green taxes in SA.

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<sup>227</sup> National Treasury, 2010.

# CHAPTER 6: DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

## 6.1. Introduction

This chapter evaluates the significance of the study in relation to its contribution and achievement of the objectives that were set. This study's major objective was to carry out a comparative analysis of the effectiveness of green taxes in South Africa and developed countries. Three countries, UK, USA and China, were selected for inclusion in the comparative analysis with South Africa. From the identified factors of successful green taxes, this study considered the development of a framework for green taxes effectiveness in South Africa.

This chapter is organised as follows. The chapter commences by detailing an overview of the whole study by recapping each previous chapter. This is followed by revisiting the research objectives and how the objectives of the study have been achieved. Having revisited the study objectives, an evaluation of the study and a discussion of the contributions this research provides is undertaken. In closing, this chapter discusses the study's limitations and suggests the direction for further research.

## 6.2. Overview of the research

This section recaps the complete study by summarising the activities of each chapter. The chapters are abridged and in chronological order.

Chapter 1 introduced the study by highlighting key and important aspects of green taxes and the environmental taxes in general. It provided the background of the study by underlining some of the challenges faced by South Africa in its green tax policy implementation. From the identified challenges, the chapter discussed the problems this study identified. The objectives to be achieved by the study were discussed and the justification as to why a study of this type is significant was also explored. In the limitations section, it was indicated that



due to the nature of the study secondary data were used for the analysis. This chapter also provided a brief discussion of the contribution this study makes.

Chapter 2 discussed green taxes from the South African perspective. It detailed the role of the South African government in green gas implementation, including the role played by the environmental sector. Moreover, the chapter discussed South Africa's roadmap and the country's approach to the green economy. Green job creation, as a remedy to poverty eradication arising from the implementation of the green economy, was also explored. The researcher observed that the implementation of green taxes will have a number of challenges for South Africa and some of these challenges were discussed. On a similar note, the possible threats to the green economy and manufacturing were discussed. The last portion of the chapter discussed the South African policies and planned taxes for the green economy, the legislation framework, the policy instruments, and the legal and policy framework of South Africa's green economy.

Chapter 3 discussed green taxes from South Africa's point of view, while Chapter 4 illustrated the developed countries' perspective in which the energy policies, public finances and environmental goals were detailed. It also examined the role of taxation in green growth and the environmental tax design in a single externality distorted economy, as well as the uncertainties in measuring local pollution damages. The chapter further discussed the green growth policy options that led to the development of inclusive green growth strategies. The green growth tools were discussed as where the statistical values of environmental taxes in developed nations. Moreover, the chapter also examined the contribution of environmental taxes in developed nations. Finally, the chapter discussed the green tax incentives in the four countries compared in this study.

Chapter 5 discussed the success factors that are influential for green tax implementation. Based on these factors, the discussion included a comparative analysis of South Africa and some developed countries. The chapter also looked at the efforts and strategies that have been put in place to support environmental reclamation. In the comparative analysis, aspects of green tax effectiveness, greenhouse gas emissions, and efforts to reduce greenhouse emissions were compared between the four countries. The last portion of the

chapter discussed the future trends of carbon taxes in South Africa by examining the country's progress in reducing its global CO<sub>2</sub> emission and its way forward.

This final chapter presents the discussion, interpretation and implications of the findings. This chapter also evaluates the research process of the study in detailing whether the set objectives were achieved. Finally, the chapter provides the recommended framework that is expected to contribute significantly to the effective implementation of green taxes in South Africa and other countries.

### **6.3. Discussion and implications of the findings**

This study's major objective was to carry out a comparative analysis of the effectiveness of green taxes in SA and developed countries. In order to achieve this objective, the following specific objectives were set to guide the flow of the research process.

1. To investigate and determine the effectiveness of green taxes in controlling and eliminating environmental degradation.
2. To investigate the potential and the rationale of green taxes in determining cost-effectiveness in economic growth and its contribution to the country's economic competitiveness.
3. To re-examine the South Africa's green taxes policy framework, and assess its effectiveness in comparison to those of developed countries.
4. To develop a framework that could be used to improve environmental protection in cases where tax incentives prove difficult or costly to generate.

### **6.3.1 Discussion and Implications in Relation to Research Objective One**

The first research objective: *To investigate and determine the effectiveness of green taxes in controlling and eliminating environmental degradation.* To achieve this objective this study reviewed literature on environmental taxes in South Africa and developed countries in general.

The literature research shows that there are contradictions regarding the success of green taxes as applied to the major polluting countries. Although many countries have not achieved complete effectiveness of green taxes in eradicating environment degradation the noble question remains “*What would have happened without the tax?*” The comparative analysis undertaken in this study demonstrates that even in the USA where there are no mandatory environmental taxes, the effect of the incentives has been significant. Further analysis from Urban Earth<sup>228</sup> indicates that even though South Africa is still emitting high levels of CO<sub>2</sub> the serious commitment to reduce emissions is significant.

The implications of this commitment are that there is a need to re-examine all the pertinent economic, environmental and societal factors and their mutual relationship frameworks to enable the green taxes to fully take effect. In this respect, the underlying contradicting effects of other regulations on the tax scheme should be re-considered. Furthermore, as it has been shown in many of the environmental taxation studies, there is a great need to show the exact purpose of the tax and to measure the taxation revenues relative to the degree of environmental damage. Such an approach will help to clearly identify the effectiveness and the impacts of the tax.

It is important to note that many new tax scheme policies are implemented through permits, standards, bans, agreements and incentives. Hence, clear measuring of the exact green tax impact requires an in-depth analysis. Clarity of effectiveness will arise by reconstructing the current taxes and adjusting relative prices. In this case, polluting products and activity taxes should be increased, while reducing taxes on those that are non-polluting. Governments

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<sup>228</sup> 2012.

need to decrease the taxes on constructive activities while increasing those on destructive activities, like carbon emissions or the generation of toxic waste. The analysis from the National Association of Automobile Manufacturers of South Africa (NAAMSA)<sup>229</sup> indicates that South Africa is achieving this objective.

Effectively applying green taxes in this direction with reinforcing controls/permits and other elements of policy packages will create incentives for producers and consumers to move away from environmentally damaging behaviour. Hence, this will not only help to change the behaviour of the polluters but also help in the prediction of future environmental trends. This study observed that on average the performance of the various types of taxes is variable. Hence, there is a need for more studies on the functions of environmental taxes.

### **6.3.2 Discussion and Implication in Relation to Research Objective Two**

The second research objective was: *To investigate the potential and the rationale of green taxes in determining cost-effectiveness in economic growth and its contribution to the country's economic competitiveness.*

This study established that green taxes and budget reform (GTBR) are vital fiscal policy instruments. They are effective in poverty reduction, fiscal revenues creation, and for the improvement of eco-efficiency and public health. By imposing taxes on environmentally relevant activities and products, like the extraction of natural resources or pollution, green taxes add to the country's revenues. Furthermore, this study established that by the gradual elimination of counterproductive subsidies that favour unsustainable development and redirecting funds towards areas that support green growth and poverty reduction, a country's economic position can improve significantly.

This study further established that the reported revenues from environmental taxes in the OECD countries from 1994 to 2000 (Figure 5.6) were highly significant. The revenues

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<sup>229</sup> As cited by Rayner, 2012.

presented indicated the total tax revenues achieved ranged from 2.5% to 7% of GDP. The study also established that the green economy initiative launched in the OECD countries in 2008 provided a way forward for each country's policy reforms and investment initiatives.

Another observation is that implementing green taxes could often achieve more cost effective pollution control than regulations. In this regard, this study established that instead of continuing to pay significant taxes, producers should consider other actions, such as green innovation. For instance, this study established that when governments decide to tax items like energy, water and raw materials, as well as solid, fluid or volatile emissions, producers develop new modes of production. Other examples include green cars, green buildings, and renewable and solar energy to reduce their tax liability. This in turn helps to achieve more eco-efficiency by implementing the precautionary measures and subsequently improve sustainability and international competitiveness.

Analysis also showed that by promoting green technologies, countries may achieve a competitive advantage. This could be achieved by improvements in green energy innovations and patents for innovations. In this case, countries could promote the use of local products and impose a ban, or levy higher taxes, on similar imported goods. To support this argument, the OECD<sup>230</sup> cites scenarios where several disputes in relation to green growth innovations have been presided over by the World Trade Organisation (WTO).

Countries can improve both direct and indirect green job creation in support of the green economy by supporting locally produced goods. This study observed that, such a shift in the environmental footprint to developing countries could raise opportunities for increased exports, growth and poverty reduction. The implication of this requires that the creation of effective green growth policies should aim at decoupling consumption in developed countries from environmental impacts. Hence, such a design should consider the protection of the developing countries' economies so as to motivate new greener growth opportunities.

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<sup>230</sup> 2012.

Finally, this study observed that supporting and financing technology transfer and improved green technological innovations like solar power, biomass, micro-hydro power and biofuels in developing countries will increase electricity generation and distribution in rural communities. Such green innovation, plus the involvement of the rural communities, will encourage society to support the green economy initiative as they will recognise the positive benefits. Hence, winning societal support for the green economy is a critical success factor for the success of green taxes.

### **6.3.3 Discussion and Implications in Relation to Research Objective Three**

The third research objective was: *To re-examine the South Africa's green taxes policy framework, and assess its effectiveness in comparison with those of developed countries.*

With regard to this objective, the study established that even though South Africa is still preoccupied by the triple developmental challenges of unemployment, poverty and inequality, the government is striving to promote the green economy. It is observed that as late as 2012 the country's economic growth model was still heavily resource and energy-intensive and tends to perpetuate environment degradation.

As illustrated in Table 4.1, South Africa has put in place a framework that is responsible for guiding the development of a green economy and subsequently green jobs. Further observation of this framework reveals that South Africa has numerous policies and strategies regarding the green economy, dating back to 2009. In addition to this, the study also established that South Africa has also implemented a comprehensive monitoring system. This monitoring system with a 12 outcome structure framework identifies and sets the targets to be achieved, the means of achieving them, and the tools to assess progress. As demonstrated in Figure 2.1, these goals embrace the 12 spheres of sustainable development. The domains of education, health, safety and security, employment, skills, infrastructure, rural development, human settlement, local government, environment, international relations, and public service are well covered.

This study further established that the green economy decree in South Africa is embedded in the country's Constitution. The South African Constitution highlights sustainable

development in the Bill of Rights. The government commenced implementing the green economy in 2008. Since then, the green economy initiative has been complemented through a number of policies and frameworks, as demonstrated in Figure 2.1. Along this path, the government's proposal to introduce a “green”, or carbon, tax of R120 per tonne of CO<sub>2</sub> by 1 January 2015 is another commendable effort. As established from the National Treasury report of 2010, the government has produced several Green Papers on the mitigation of climate change, including the 2010 Green Paper on a carbon tax and a proposal to introduce a related tax by 2018–20. These developments show the country's commitment to the green path.

Several comparisons that are detailed in Chapter 5 and demonstrated in Figure 5.1, Table 5.1 and by KPMG, indicate positive developments for green taxes. This implies that, amongst other all challenges, South Africa needs to put in place more economic measures, including carbon taxes and emission trading schemes to enable the green economy.

#### **6.3.4 Discussion and Implication in Relation to Research Objective Four**

The fourth and last study objective was: *To develop a framework that could be used to improve environmental protection in cases where tax incentives prove difficult or costly to generate.*

This study established that South Africa has numerous policies relative to green taxes. However the challenges arise from the fact that the country needs to strike a balance between the economic, social and environmental considerations amidst the high levels of unemployment, poverty and income inequalities. To achieve this, the country needs to critically reconsider the success factors as discussed. However, the country should also keep in mind that by implementing the suggested factors, many related issues could arise and need to be mitigated. Such issues include concerns over a reduction of jobs and potentially high job losses in the carbon-intensive sectors like mining and energy industries, and adjustment costs for workers and companies dependent on these sectors.

Moreover, this study established that South Africa is also facing the dilemma of the alignment of policies in its respective departments. This implies that the government will have to:

- Put in place relevant support for capital and energy (carbon) intensive sectors through the Industrial Policy Action Plan.
- Patent and localise the available green technologies in order to avoid the high costs of the transitions to a greener economy, and also improve on the revenues through technology transfer.
- Balance the inconsistencies that could arise from departmental policy misalignments. Such inconsistencies include the example of having one department introducing a carbon tax while another is introducing carbon budgets.
- Invest in energy planning that would result in the sourcing of cheap and clean electricity as a measure to reduce emissions.
- Endeavour to establish and maintain coherence among the many policies and ensure coordination and collaboration between the departments and other government actors responsible for green tax implementation. It was observed that numerous initiatives and policy proposals are being formulated and implemented in isolation, hence coherence between these is paramount.
- Address through the South African National Development Plan the identified inconsistencies and incoherencies between policies by developing and implementing a Green Growth Policy and supporting strategies.
- Endeavour to put in place an independent Climate Change Centre. This should be implemented in collaboration with academic and other appropriate institutions. This will help facilitate the actions of government, business and civil society.
- Develop a regulatory framework for land use to ensure the conservation and restoration of protected areas.



- Impose new building standards to encourage the implementation of green buildings. It should also levy a carbon price on buildings and vehicle emissions. In this regard more support should be given to waste recycling and in retro-fitting buildings.
- Invest in research so as to support innovations for agricultural technologies needed for commercial farming. Such support should be extended to the rural and small-scale farmers.

## **6.4. Research contributions**

This section discusses the implications of the findings and how these implications contribute to the body of knowledge.

### ***6.4.1 Contribution to practice and management***

The South African economy is highly dependent on carbon energy resources. Greening the economy, in many instances, contrasts with other economic initiatives. If government is to implement cleaner and renewable resources so as to transform to a low carbon economy, caution must be applied and systematic steps need to be taken. This study highlights that these factors need to be taken into consideration in order for South Africa to successfully achieve a green economy. This is a significant contribution to management and practice as government policy makers may leverage on the outcome of this study to make informed decisions.

Furthermore, having a good foundation for carbon tax implementation is paramount for changing the collective mind sets in the economy and to incentivise clean-economy behaviour. It is also essential for creating a specified revenue stream, necessary for climate change mitigation and adaptation. It should also be noted that carbon tax is a mechanism that prevents capital investment carbon infrastructure projects. The guidance this study provides may be used by project developers who are contemplating large scale carbon intensive infrastructure projects so as to either avoid known pitfalls or to realign projects.

### **6.4.2 Theoretical contributions**

The major challenge this study faced was the limited availability of green tax data and literature. The findings of this study can then be used by other researchers as a source of secondary data. This literature could be used as a baseline by information systems researchers for other studies. Hence, this study makes a significant contribution to the literature on green taxes and to the taxation body of knowledge.

### **6.5. Limitations of the study**

This study depended on secondary data for its analysis. However the study was constrained by the data availability. Retrieving relevant data was difficult and delayed the process of the comparative analysis. In most cases the available data was not detailed enough or not directly relevant to the subject of this study. Another aspect of limitation was that although there was available literature was for environmental taxes in general, information on green taxes in particular was very limited.

### **6.6. Recommendations and future work**

From the literature and analysis of this study it is evident that on average countries which have implemented green taxes or environmental tax in general achieved a decrease in CO<sub>2</sub> emissions. On the other hand, some companies in South Africa registered an increase in CO<sub>2</sub> emissions, as demonstrated in Figure 5.6. There were others that registered a decrease in the emissions. From this understanding, the following are recommendations:

- The taxes that are levied on non-environmentally friendly products and services should be significant enough to deter production and protection of environmental quality. Consequently, to speed up the reduction of environment pollution in South Africa, in particular air pollution, the following measuring tools should be implemented and made effective; urban tolls, parking fees, congestion charges, e-road tolls, and increased airport fees.

- This study also recommends that in spite of the fact that in South Africa the restrictions of CO<sub>2</sub> emissions are reinforced by compliance with the Kyoto Protocol and the Durban conference, greening the economy requires more stringent enforcement.
- Another observation is that green taxes are needed, especially to help reconcile model differences, and to integrate dynamic and multiple effects into the analysis of policy packages. This study therefore recommends that future studies should focus on addressing the factors necessary for identifying and developing new tax bases in areas such as aviation, hazardous chemicals, tourism, and land use in the South African context.
- This study also recommends that future work should also investigate how the developing field of externality evaluation (both “negative” and “positive”) should be in the South African context and to address the priority areas, such as forestry, intensive agriculture and organic farming. Furthermore, investigation and analysis of the distributional (or equity) of externalities should be focused on; especially in the poor communities of SA.
- Finally, this research acknowledges the fact despite advancement in the tax administration, more research is needed to investigate the political economy of tax administration. Such research should also examine the role of interest groups in policy development and the public acceptance of green tax reforms.

## 6.7. Conclusion

This study addressed the context of green taxes in South Africa. It has made a comparative analysis of green taxes in South Africa and other developed countries. Additional analysis was based on four countries; South Africa, China, USA and the UK. The study identified 19 success factors that are critical for the development and implementation of green taxes. The study also highlighted the following important aspects about green taxes in South Africa and throughout the whole world.

Emissions of GHG are harmful to the world, whether derived from developed or developing nations, hence placing an unnecessary cost burden on society. The effects of GHG

emissions are distributed worldwide, including developing countries. The costs associated with GHG emissions should therefore be directly aligned with the consequences of climate change. Green taxes should be implemented as a mechanism to make the external costs of GHG the responsibility of those who generate the main emissions. Governments should leverage on this process of internalisation of the external costs so as to create incentives and disincentives for GHG emitters. By so doing, products and services will be levied with the external cost of carbon thus stimulating a behaviour shift by companies and consumers to change to the low carbon substitute products and services.

In the process of implementing green taxes, a number of impeding factors will need to be addressed. These factors, such as the creation of strong linkages between the tax paid and the tax base, will reduce the inconsistencies between the policies and regulations, distributive implications and industrial competitiveness. Governments need to clearly state the objectives of taxation so as to have the stakeholders (that include producers and citizens) buy-in to the taxation strategy. On the other hand, policy mixes would be an added advantage, such as a combination of regulation and standards, voluntary agreements and trade permits. However, this will still require more involvement of the stakeholders in the tax formation processes.

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## Appendices

### Appendix 1: Carbon emissions by company

Company	Scope 1 tCO <sub>2</sub> -e	Scope 2 tCO <sub>2</sub> -e
ESKOM	224,700,000	0
Sasol	61,678,000	9,553,000
BHP Billiton	21,355,000	27,688,000
ArcelorMittal SA	10,730,360	4,330,419
Anglo American	8,850,000	10,252,000
Pretoria Portland Cement Company	5,129,030	577,990
Sappi	4,778,698	2,118,889
Mondi	4,420,810	1,447,991
SAB Miller	1,449,442	1,182,614
Gold Fields	1,308,764	5,093,511
AngloGold Ashanti	1,183,000	3,489,000
Tongaat Hulett	787,711	309,388
Imperial Holding	758,011	156,468
Impala Platinum Holdings	693,145	2,930,324
African Rainbow Minerals	647,720	1,735,289
Exxaro Resources	542,000	2,238,749
Murray & Roberts Holdings	513,739	286,767
Tiger Brands	470,522	274,972
Anglo Platinum	427,290	5,152,793
Ramgro	303,616	349,311
AECI	299,114	176,980
MTN Group	280,246	281,201

<b>Company</b>	<b>Scope 1 tCO<sub>2</sub>-e</b>	<b>Scope 2 tCO<sub>2</sub>-e</b>
The Bidvest Group	277,009	387,943
Kumba Iron Ore	246,909	454,104
Pick n Pay Holdings	155,098	586,268
Harmony Gold Mining Company	146,036	3,444,600
Barloworld	115,241	91,148
Lonmin	81,277	1,488,755
Netcare	27,906	366,360
Woolworths Holdings	27,706	329,024

**Appendix 2: Green incentives in the four selected countries of this study (Source: UN DESA, 2010)**

Country	Favoured Activity	Incentives
China	Primary sector activities	Tax reduction and exemption treatments for agriculture, forestry, and fishing
	Investment in environmentally friendly equipment	Tax credit for purchases and use of certain equipment for environmental protection
	Engagement in environmentally friendly projects	3-year tax exemption + 3-year 50% reduction for certain environmental protection projects
	Special funds for environmental protection	Funds allocated for environmental protection and restoration are fully deductible
South Africa (SA)	Primary sector activities	Accelerated depreciation for environmental treatment and disposal assets, plants used for generation of electricity through natural resources and waste disposal assets; deduction for expenditure on assets related to prevention of soil erosion, construction of dams, irrigation plants, etc.
	Other Activities	Tax deduction for contributions to rehabilitation funds; tax exemption for rehabilitation fund income; tax exemption for NGOs that qualify as public benefit organisations; deduction for donations to PBOs
United Kingdom (UK)	Primary sector activities	Free depreciation on certain ships and certain allowances on expenditures by reference to the CO <sub>2</sub> emissions of cars
	Investment in environmentally friendly equipment	Capital allowance of 100% on specific categories of environmentally-friendly assets
	Engagement in environmentally friendly projects	Deduction for expenditures on the remediation of contaminated land or vacant business properties
United States of America (USA)	Primary sector activities	Certain payments received as compensation for converting erodible cropland to less intensive use are excluded from self-employment income; pollution control facility and qualified environmental remediation expenditures deductible; 50% additional depreciation for qualified cellulosic biofuel plant and recycling plant property; accelerated depreciation of qualified smart electric meter or grid systems; soil/water conservation for land used in farming; small business refiners; energy-efficient commercial building property; costs for qualified clean fuel vehicles deductible

Country	Favoured Activity	Incentives
	Investment in environmentally friendly equipment	Tax credits for environmentally-friendly vehicles, energy efficient homes and appliances, alcohol fuels, biodiesel fuels, low-sulphur diesel fuels, renewable electricity production, advanced nuclear power facility production, qualifying advanced coal project, qualifying gasification project, CO <sub>2</sub> sequestration
	Investment in environmentally friendly projects	Tax credit for clean renewable energy bonds
	Special funds for environmental protection	Deduction of payments made to the Nuclear Decommissioning Reserve Fund
	Other activities	Exclusions from gross income for cost-sharing payments received under certain conservation programs, qualified transportation fringe benefits, subsidies for the purchase of energy conservation measure; extended carry-back for capital expenditures related to electric transmission and pollution control facilities or losses related to environmental liabilities

### Appendix 3: Impact of green tax effectiveness

Country	Tax	Period Evaluated	Impact
UK	Industrial energy tax	2001-2010	UK CO <sub>2</sub> emissions reduced by 2 per cent in 2002 and 2.25 per cent in 2003 and cumulative savings of 16.5 million tonnes of carbon up to 2005  - Reduction in UK energy demand of 2.9 per cent estimated by 2010
	Fuel duty escalator	1993-1999	Increases in fuel duty are estimated to have produced annual carbon savings of between 1 and 2.5 MtC by 2010. <sup>1</sup>  Average fuel efficiency of lorries over 33 tonnes increased 13 per cent between 1993 and 1998
	Vehicle excise duty	2002-2005	Business mileage reduced by over 300 million miles per year  Overall effect has been estimated to have reduced by 2005 the emissions of carbon from the company car fleet by 0.7-1.8 MtCO <sub>2</sub> , or up to 1.5 per cent of all CO <sub>2</sub> emissions from road transport in 2005 in the UK
	Landfill taxes	1996 - 2006	Active waste disposed of to landfill fell by 14 per cent between 1997-98 and 2005-06, while overall landfilled waste fell by 25 per cent
	Energy and Climate Change Package including revisions to the EU-ETS 2008	Effective from 2013, if agreed	The allocation of free carbon permits, post 2012, for industries considered to be at risk of carbon leakage.
US	US Clean Energy and Security Act 2009 (Waxman-Markey House Bill)	2014- 2025, if agreed	Requires some importers of heavily traded energy-intensive products to purchase emissions allowances, a measure tantamount to a tariff.  Energy intensive and trade exposed industries are allocated a percentage of total allowances (free) from 2014 (to be further reviewed in 2025).  The US House of Representatives inserted a provision in its draft climate bill that allows the country to impose a 'border adjustment' after 2020 on certain products from countries which do not limit their global warming emissions



Country	Tax	Period Evaluated	Impact
			(including non-Annex 1 countries).
	Biofuels policy	2007	Subsidized biofuel production in the US contributed to the high food price crisis of 2007, by reducing the proportion of food stuffs sold onto global markets which in turn pushed up prices. The net effect was negative (Ellis et al., 2010)
	Carbon Tax	2006	
	Carbon Tax on Businesses	2008	
	Carbon Tax on Stationary Sources	2010	
China	Advanced policy framework	2006 -2009	Environmental criteria listings for eco-friendly products and producers that required the compulsory procurement of some category of products including lighting products and air conditioning units.
South Africa	Alignment of public procurement rules with the Broad-based Black Economic Empowerment (BEE) policy framework,	2006	Support of disadvantaged groups and communities, particularly black people, women and rural communities. Helped the steering of government spending
	Framework for Environmental Fiscal Reform (NT, 2006)	Mid - 2012	Taxes and levies have been implemented on plastic bags, incandescent light bulbs, ecosystem restoration costs related to water use, liquid fuel, non-renewable electricity and new vehicle carbon dioxide emissions performance
	Innovation Plan (DST, 2008)	2012	Support for innovation in electric vehicles, fuel cells and carbon capture and storage, but cancellation of the country's largest clean energy R&D programme (the Pebble Bed Modular Reactor) and delay in the implementation of renewable energy demonstration projects (e.g. solar tower)
	Medium-Term Strategic Framework	2009 -02014	Numerous policy responses implemented in line with the Medium-

Country	Tax	Period Evaluated	Impact
	2009-2014 (NPC, 2009)		Term Strategic Framework, particularly the NSSD, the creation of an enabling environment for renewable energy, several water management projects and the National Climate Change Response
	Integrated Resource Plan 2010-2030 (DoE, 2011)	2010 -02030	Limits emissions from electricity generation to 275 Mt per year Expects renewable energy to make up 42% of all new electricity generation over the next 20 years
	New Growth Path (EDD, 2010)	2010	Targets the growth of a green economy, resulting in 400 000 new and additional jobs.  Enabling regulation passed in other departments
	Industrial Policy Action Plan (the DTI, 2010, 2011 and 2012)	2010 - 2012	Around 200 000 SWHs installed by mid-2012 and a procurement process started for around ZAR 120 billion worth of large-scale renewable electricity generation
	National Climate Change Response	2010- 2030	Voluntary emissions commitment and approved an emissions-limited energy plan (Integrated Resource Plan 2010-2030) prior to the publication of the policy
	National Strategy for Sustainable Development (DEA, 2011)	2011	A large variety of indicators and goals spanning social, economic and environmental issues, but no budgets, timelines or responsibilities