An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

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RESEARCH AND POLICY DEVELOPMENT TO ADVANCE A GREEN ECONOMY IN SOUTH AFRICA
GREEN ECONOMY RESEARCH REPORT
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa
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TABLE OF CONTENTS

Executive Summary ..........................................................................................................................6
1 Introduction ..................................................................................................................................9
  1.1 Background ..............................................................................................................................9
  1.2 Design of the Carbon Tax .......................................................................................................9
  1.3 Role of Carbon Offsets in South Africa ..................................................................................10
  1.4 Design of the Carbon Offset Mechanism .............................................................................11
  1.5 Development of a South Africa Carbon Offset Market .........................................................12
  1.6 Role of a Carbon Exchange .....................................................................................................12
  1.7 Objectives of this Study ..........................................................................................................13
  1.8 Project Approach and Report Structure ..................................................................................13

2 Creation of an Enabling Policy Environment .............................................................................15
  2.1 Relevant Polices for Trading Platform ..................................................................................15
  2.2 Policy Alignment and Regulatory Uncertainty ........................................................................19
  2.3 Limited Initial Supply of Carbon Credits ..............................................................................21
  2.4 Overview of Key Barriers and/or Fatal Flaws to Establishment of a Carbon Exchange in South Africa ..............................................................................................................22

3 Carbon Offset Market Characteristics ......................................................................................23
  3.1 Approach and Methodology: Estimating Supply and Demand ofCarbon Credits ...............23
  3.2 National Domestic Offset Market .........................................................................................27
  3.3 Supply Projections ..................................................................................................................29
  3.4 Final Supply And Demand Estimate ......................................................................................33
  3.5 Forecasting trading volumes in the South Africa offset market .............................................34
  3.6 Implications for a Carbon Offset Exchange .........................................................................35

4 Financial Sustainability of a South African Carbon Offset Exchange ........................................37
  4.1 Carbon Offset Exchange Business Models ..........................................................................37
  4.2 Resource Requirements and Cost Estimations ........................................................................40
  4.3 Capital and Operating Cost Estimations ................................................................................41
  4.4 Transaction Volume Scenarios and Additional Modelling Assumptions ...............................43
  4.5 Determining the Financial Feasibility of a Carbon Offset Exchange ....................................44
  4.6 Conclusions ............................................................................................................................45

5 Governance and Design .............................................................................................................47
  5.1 Roles of Carbon Offset Exchange Participants ....................................................................47
  5.2 Institutional Arrangements ......................................................................................................48
  5.3 Oversight Mechanisms and Institutions ...............................................................................52
  5.4 Key Considerations for Market Participants .........................................................................54

6 Conclusions and Potential Policy Options ................................................................................55
  6.1 Conclusions ............................................................................................................................55
  6.2 Recommendations and Potential Policy Options ....................................................................56

References .......................................................................................................................................61
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

Executive Summary

In 2009, South Africa committed to reduce its greenhouse gas emissions (GHGs) by 34% by 2020, and 42% by 2025, contingent on there being adequate technology support and finance to assist in meeting these targets\(^1\). The commitment was re-iterated in the publication and approval of the cabinet as the National Climate Change Response White Paper (NCCWP), in 2011 (DEA, 2011).

During this period, the introduction of a carbon tax in South Africa was envisioned as a suitable mechanism to support the meeting the international emission reduction commitments under the UNFCCC and also the objectives of the NCCWP. The first detail of the carbon tax was published by National Treasury in the Carbon Tax Discussion Paper in 2010 and further refined by the Carbon Tax Policy Paper in 2013. The carbon offsets mechanism to support the tax was also further described in the Carbon Offsets Paper (2014).

These policy decisions, e.g. the carbon tax and its associated carbon offset mechanism, are the driving force behind the creation of a carbon offset market in South Africa and have been developed in line with the statement in the National Development Plan (NPC, 2012: 208) which calls for “the creation of a properly regulated domestic market in carbon offsets that will enable industry to identify least-cost approaches to emissions reductions and drive private sector investment in renewable energy and mitigation”.

The potential carbon offset market cannot therefore be seen as a traditional carbon market, as it has not been established spontaneously as there is limited natural demand for carbon offsets within South Africa without the introduction of the carbon tax. As a result, the local market is an artificial creation and its market fundamentals (supply and demand) are determined through the legal and regulatory framework that is developed and implemented in the country.

To facilitate this market, the NDP further calls for the development of a regulatory framework for carbon offsets in conjunction with the Department of Environmental Affairs (DEA), National Treasury (NT) and the Johannesburg Stock Exchange (JSE). While the regulatory framework has been proposed in the Carbon Offsets Paper (2014), the incorporation of the JSE into this statement implies that there is a desire to develop a regulated carbon exchange to facilitate the creation of a domestic carbon market in South Africa.

The key rationale for the creation of a carbon offset exchange in South Africa is to support an effective offsetting mechanism under the carbon tax and facilitate the linking of buyers and sellers in order to reduce transaction costs. Due to the proposed structure of the South African carbon offset market, the exchange also has the potential to facilitate transactions amongst market participants that channels funding to projects that have additional sustainable development benefits such as job creation, rural development, biodiversity protection and community upliftment within South Africa.

The overall aim of this report is to assess the feasibility of establishing an exchange platform for carbon offsets in South Africa in accordance with the current policy direction. This report also aims to provide recommendations to policy makers (through the mandate of the South African Green Fund) around how the carbon offset market can be supported. To determine the feasibility of establishing a carbon exchange this reports investigates number of different dimensions to feasibility, including political, economic, social and financial characteristics.

Enabling Policy Environment

As the South African carbon market will be created by regulation and not spontaneously developed through traditional demand and supply forces, the establishment of any exchange is only feasible based on the development and structure of an enabling policy environment which creates the market.

The finding from this section is that there is widespread policy support for the inclusion of carbon offsets and the development of a carbon exchange, but there are some key policy and regulatory uncertainties that could influence both the development of, and participation in, a South African carbon exchange. These uncertainties have to be addressed; including alignment between the carbon tax and other climate change policy, e.g. the Desired Emissions Reduction Outcomes (DEROs), the classification of carbon offsets under the financial regulations, defining the roles of supporting institutions and providing clarity on the carbon offset modalities and frameworks.

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\(^1\) South Africa’s emission reduction commitment, made at the fifteenth session of the Conference of the Parties (COP 15) to the United Nations Framework Convention on Climate Change (UNFCCC), held in Copenhagen in 2009.
Carbon Offset Market Characteristics

To understand the feasibility of a carbon exchange, it is essential to understand the potential trading that could take place via an exchange, through projections of the supply of, and demand for, carbon offsets. The approach to calculating demand and supply in this study utilises the information presented in the Carbon Tax Policy Paper (2012) and the Carbon Offsets Paper (2014). These documents are used as the overarching guidance for these calculations, in particular relating to estimating the tax net (demand) and defining eligible and ineligible projects (supply).

Maximum demand for carbon offsets is estimated to be between 42,916,162 metric tonnes of carbon dioxide equivalent (tCO₂e) emissions of greenhouse gases in 2016, rising to 48,134,286 tCO₂e (2020) in the first phase of the carbon tax. This would further rise to 89,886,425 tCO₂e in 2040. It is anticipated that during Phase 1 (and subsequent phases) the demand for carbon offsets will sit between 95% and 100% of maximum demand due to the potential to utilise them to lower the cost of compliance. This prediction of demand is predicated on the fact that 83% of the potential demand for carbon offsets could come from just three covered sectors (Electricity, Other Energy Industries and Iron and Steel) and thus covered entities within these sectors could dominate the market, if they can secure sufficient supply from many smaller sellers.

The potential supply of carbon offsets has been determined by both the supply from previously registered carbon offset projects, and potential registration of new mitigation projects in South Africa. The potential projects were then risked for registration and issuance and allocated to low, medium and high demand scenarios. The range of potential supply of carbon credits in South Africa varies from the low scenario of 7,348,486 tCO₂e to 17,149,384 tCO₂e in the high scenario in 2016. This supply is expected to increase over time as more projects are developed and registered.

Achieving full issuance and realisation of all mitigation potential is however unlikely, due to the complexities of registering many of the potentially eligible project types. A number of these project types have traditionally been difficult to incorporate under carbon credit mechanisms as they are implemented at small individual scales across a large geographical area and have complex project level monitoring and verification processes to ensure GHG emissions reductions.

It is clear from this study that the supply of carbon offsets will be the constraint in the market. As such, there are a number of options for policy makers to support the supply side of the market, including providing technical support to projects developers and allowing new project types to be eligible under the carbon tax. This could include designing support programmes for specific project types, providing low-cost financing for investment, developing standardised baselines or emissions factors to reduce the costs for project types, or allowing currently ineligible project types, or potential new project types to apply to become eligible.

Financial Sustainability of a South African Carbon Offset Exchange

Any offset platform has to be financially feasible and sustainable as it will be managed and run by private sector institutions. The financial viability of a carbon offset exchange is however contingent on the market dynamics of supply and demand and how many of the market participants join the exchange, the volume of transactions that pass through the exchange and the liquidity of the market.

Financial sustainability was assessed by applying two different exchange business models, based on international best practice. These business models were low membership fee and high transaction costs and high membership fee and low transaction costs. These models were applied based on a number of market assumptions, including the number of buyers and sellers which participate in the exchange, membership fees, costs and the average price of carbon offsets. These cost inputs were then assessed against the supply scenarios to determine financial feasibility of an exchange.

The scenario-based modelling (and using fee structures consistent with existing platforms) demonstrates that a robust revenue stream can be generated in South Africa from the expected volumes that could be transacted through the exchange. Under all scenarios, the level of membership fees and transaction costs, when combined, indicate that the offset platform will be financially sustainable.

The South African market will be constrained by the supply side dynamics. Accordingly, for an exchange to be functional, it will have to encourage the participation of the majority of potential suppliers of carbon credits, who are likely to be small, to satisfy the demand. The buy-side of the exchange is likely to be dominated by large companies in South Africa due the nature of the GHG emissions profile through the economy. These large buyers are likely to crowd out smaller buyers due to the higher tax savings they can achieve through the purchase of carbon offsets. As such, the participation of these buyers in the exchange is important, but it is anticipated that they will only participate if the sellers are present. Offset suppliers are likely to be, on average, smaller, with more limited cash reserves or funds to pay high membership fees. In the short term, and with a shortage of supply, it will be a sellers’ market. To encourage sellers, it is likely that a South African exchange would look to combine diverse membership and transaction fees for buyers and sellers, including keeping the joining fees low for sellers.
Governance and Design

While the technical and financial components of an exchange are fundamental to determining its feasibility, it is also necessary to understand if there is demand for an exchange and how key stakeholders (i.e., infrastructure providers, buyers and sellers) would engage and participate. In turn, participation on any carbon exchange will be determined by the design and governance structure employed to manage participants, ensure fairness and promote integrity, ease of access, transparency and the costs of joining and transacting via the exchange.

Encouraging regulation of a carbon market, and by extension, the exchange, in South Africa has been promoted by various stakeholders to overcome many of the challenges to establishing a market. There are two levels of regulation that need to applied, that of governance of the exchange and those that support the creation of the required market institutions.

The major aspect where policy potential market participants are holding back investment and planning until certainty is provided. This needs to be supported through providing detail on the modalities and frameworks of the carbon offseting policy options will be followed or how they will interact. This is a result of the limitations on project types allowed to participate in the South African market.

Carbon Offsets Paper (2014) provides an indication of the policy direction, they are not as yet policy documents and thus of clarity on the structure of the market and the oversight institutions. While the Carbon Tax Policy Paper (2013) and Carbon Offset Paper (2014) and stakeholders would be willing to participate if it is developed. The current policy uncertainty is hampering the development of the market and the supporting infrastructure, including the carbon offset exchange. This is restricting the crucial market readiness time and could result in an under utilisation of the carbon offset allowances, and thus increase the cost of compliance, for many of the covered entities during the first phase of the carbon tax.

As the carbon market in South Africa will be developed as a direct result of regulation, there is a need to ensure that the appropriate market oversight institutions are created and capacitated to support market functioning. The institutions that will be involved in the creation and management of the South Africa carbon market are the National Treasury, Department of Environmental Affairs, Department of Energy and the South African Designated National Authority (DNA). If the DNA is to play the envisioned role of acting as the standard body and custodian of the South African certified emissions reduction (SACER) process and South African registry, it will require a change in the current regulation and its mandate. To manage the process of reviewing projects effectively, issuing SACERs and maintain the South African registry the DNA would require additional resources and capacity. This would need to be done in combination between the Department of Environmental Affairs and the Department of Energy.

It is imperative that the process of transforming the DNA into this institution, and clarifying the carbon offset frameworks and modalities, is undertaken during 2015 to allow all market participants and exchange infrastructure to develop in time for the introduction of the carbon tax. The creation of this link between market participants is essential to support market functioning effectively on the start date of the carbon tax and carbon offsets mechanism.

Conclusion

In order to invest in the establishment of the exchange, the operator and any participants will require policy certainty and clarity on the roles of oversight institutions and how they will interact. This clarity is currently not available and thus market participants have held off on investing resources into preparing for a South African carbon market. Without further clarity being forthcoming from Government, this situation may be expected to persist.

One of the largest concerns to covered entities is whether there will be sufficient supply to meet demand for carbon offsets in South Africa. This is a result of the limitations on project types allowed to participate in the South African market. In the first phase of the carbon tax, it is expected that demand for carbon offsets will significantly exceed supply, thus pushing prices higher. Supply will therefore be the limiting factor to the establishment of an exchange and will impact liquidity and participation of both buyers and sellers. It is expected that because of these liquidity constraints, some smaller emitters will not utilise their carbon offset allowances and will rather prefer to pay the tax directly due to the costs of participating in the exchange.

The development of a carbon offset exchange is both technically and financially feasible based on the provisions in the Carbon Offset Paper (2014) and stakeholders would be willing to participate if it is developed. The current policy uncertainty is hampering the development of the market and the supporting infrastructure, including the carbon offset exchange. This is restricting the crucial market readiness time and could result in an under-utilisation of the carbon offset allowance, and thus increase the cost of compliance, for many of the covered entities during the first phase of the carbon tax.

The current source of uncertainty in the establishment of the carbon offset exchange is the political environment and lack of clarity on the structure of the market and the oversight institutions. While the Carbon Tax Policy Paper (2013) and the Carbon Offsets Paper (2014) provides an indication of the policy direction, they are not as yet policy documents and thus potential market participants are holding back investment and planning until certainty is provided.

The major aspect where policy clarity is needed is the alignment between the DEROs process and the carbon tax, and which policy options will be followed or how they will interact. This needs to be supported through providing detail on the modalities and frameworks of the carbon offset component and the institutional framework to support the market. Without these clarifications and details provided during 2015, the market will not be ready in time for the start of the carbon tax in 2016.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

1 Introduction

1.1 Background

In 2009, South Africa committed to reduce its greenhouse gas emissions (GHGs) by 34% by the year 2020, and 42% by 2025, contingent on there being adequate technology support and finance to assist in meeting these targets.

The commitment was re-iterated in the publication of the National Climate Change Response Green Paper by the Department of Environmental Affairs (DEA, 2010) which outlined the steps that South Africa will take to meet its commitments. Following stakeholder consultation, this strategy was approved by the cabinet as the National Climate Change Response White Paper (NCCWP), in 2011 (DEA, 2011).

During this period, the introduction of a carbon tax in South Africa was envisioned as a suitable mechanism to support the meeting of its international emission reduction commitments under the UNFCCC and also the objectives of the NCCWP. As a result, National Treasury released the Carbon Tax Discussion Paper in 2010 (National Treasury, 2010) to encourage debate and input on the role of a carbon pricing mechanism in South Africa. Following the public debate surrounding the carbon tax, it was announced in the 2012 National Budget Speech (National Treasury, 2012) that a carbon tax was identified as being the best option for South Africa and further discussion would be held on the design and modalities for implementation.

The role of a carbon tax was also supported in the publication of the National Development Plan (National Planning Commission, 2012). The NDP stresses that the carbon tax should be implemented in a flexible manner that is sensitive to other social and economic challenges within South Africa.

To accommodate these requirements, the revised Carbon Tax Policy Paper was released in 2013 for public comment and outlined the structure of the proposed carbon tax (National Treasury, 2013). It stated that Phase 1 (2015 – 2020) would begin on the 1st of January 2015 and that eligible emissions would be taxed at a rate of R120 per tonne of carbon dioxide equivalent emission (tCO₂e), escalating at 10% per year during Phase 1.

Following extensive inputs and debate from interested and affected stakeholders, it was announced in the 2014 National Budget Announcement that Phase 1 implementation of the carbon tax would be deferred to 2016 (National Treasury, 2014a). This deferment was primarily to ascertain how they carbon tax would align with the development of the Desired Emissions Reduction Outcomes (DEROs) as outlined in the NCCWP.

During 2014, further detail was released on the envisioned structure and role that carbon offsets would play in the carbon tax. This was provided in the Carbon Offsets Paper (National Treasury, 2014b). This paper provided some clarity on the mechanisms for offsets including limiting these to South Africa, certain eligible project types, carbon standards and possible institutional arrangements. Following a process of stakeholder input and feedback, the carbon offsets mechanism is currently being updated to take into account the inputs from stakeholder.

National Treasury indicated in September 2014 and February 2015 that the next steps on the process will be the development of a carbon tax bill and entering into legislative process to be passed, pending any unforeseen challenges, towards the end of 2015 and implementation in 2016. During this process, the approval of carbon offset mechanisms will be undertaken simultaneously with the approval of the Carbon Tax bill.

1.2 Design of the Carbon Tax

The carbon tax has also been proposed as the most appropriate option in the short- to medium-term due the oligopolistic structure of the energy sector in South Africa, and its skewed contribution to the overall emissions profile (National Treasury, 2013). National Treasury has argued that a carbon tax allows for flexibility, while not limiting South Africa to an absolute amount (or cap) on GHG emissions that could hamper development. The design of the carbon tax has therefore been proposed to allow for flexibility and provide a clear price signal to covered entities.

The carbon tax policy paper proposes that for Phase 1 (now revised to 2016 - 2020) of implementation, the tax rate is set at R120 per tCO₂e in 2016, escalating at 10% per annum and reaching R176 per tCO₂e in 2020. This tax is to be levied on direct, stationary sources of GHG emissions, including process emissions. To support flexibility and reduce the liabilities for covered entities, there are four allowance mechanisms outlined.

The first allowance is an initial tax free provision of 60% of direct emissions that is granted to all covered entities, this

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2 South Africa’s emission reduction commitment, made at the fifteenth session of the Conference of the Parties (COP 15) to the United Nations Framework Convention on Climate Change (UNFCCC), held in Copenhagen in 2009.


4 This was announced at the Carbon Policy Paper Stakeholder Feedback Workshop held during October 2014.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

Threshold can be adjusted on a company level either up or down depending on the GHG emissions efficiency of a company as compared to competitors.

The second and third allowances are only applicable to covered entities that are either trade-exposed or have high levels of process emissions that can’t be mitigated. In each of these allowances, a covered entity can qualify for maximum additional tax free allowance of up to 10% of their emission, provided they can prove and demonstrate that they qualify. The fourth allowance mechanism provides for a covered entity to purchase carbon offsets and utilise these to reduce their tax liability through gaining access to least cost mitigation opportunities. The extent to which covered entities can purchase and utilise carbon offsets differs per sector and this ranges from 5 – 10% of their overall carbon tax liability. The allocations of allowances for each sector are presented in Table 1-1.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Basic tax free threshold (%)</th>
<th>Maximum Allowance for trade exposure (%)</th>
<th>Maximum Allowance for Process Emissions (%)</th>
<th>Total Taxable Emissions (%)</th>
<th>Maximum allowance for the use of carbon offsets (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>60</td>
<td>10</td>
</tr>
<tr>
<td>Petroleum (coal to liquid; gas to liquid)</td>
<td>60</td>
<td>10</td>
<td>-</td>
<td>70</td>
<td>10</td>
</tr>
<tr>
<td>Petroleum – oil refinery</td>
<td>60</td>
<td>10</td>
<td>-</td>
<td>70</td>
<td>10</td>
</tr>
<tr>
<td>Iron and steel</td>
<td>60</td>
<td>10</td>
<td>10</td>
<td>80</td>
<td>5</td>
</tr>
<tr>
<td>Cement</td>
<td>60</td>
<td>10</td>
<td>10</td>
<td>80</td>
<td>5</td>
</tr>
<tr>
<td>Glass and Ceramics</td>
<td>60</td>
<td>10</td>
<td>10</td>
<td>80</td>
<td>5</td>
</tr>
<tr>
<td>Chemicals</td>
<td>60</td>
<td>10</td>
<td>10</td>
<td>80</td>
<td>5</td>
</tr>
<tr>
<td>Pulp and Paper</td>
<td>60</td>
<td>10</td>
<td>-</td>
<td>70</td>
<td>10</td>
</tr>
<tr>
<td>Sugar</td>
<td>60</td>
<td>10</td>
<td>-</td>
<td>70</td>
<td>10</td>
</tr>
<tr>
<td>Agriculture, forestry and land use (AFOLU)</td>
<td>60</td>
<td>-</td>
<td>40</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>Waste</td>
<td>60</td>
<td>-</td>
<td>40</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>Fugitive emissions from coal mining</td>
<td>60</td>
<td>10</td>
<td>10</td>
<td>80</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>60</td>
<td>10</td>
<td>-</td>
<td>70</td>
<td>10</td>
</tr>
</tbody>
</table>

To reward early mitigation action (i.e. mitigation actions that have been implemented pre-tax), there is an adjustment mechanism that will be applied to the basic tax free threshold. This allowance, known as the z-factor, will adjust a company’s basic free allowance either up or down, depending on their comparison to a sector-specific GHG emissions intensity benchmark. If a company’s existing mitigation efforts exceed the benchmark, they may be granted a higher tax free threshold (up to a maximum of 5%). If a company’s mitigation efforts fall below the threshold, then the tax free thresholds may be adjusted downwards by a maximum of 5%.

1.3 Role of Carbon Offsets in South Africa

Due to the inclusion of the carbon offsets allowance mechanism, the structure of South Africa’s carbon tax has been classified as a ‘tax and trade hybrid system’ (Promethium Carbon, 2014). This is because a carbon tax is the dominant pricing instrument within which limited carbon offset trading is allowed, in order to reduce the costs of compliance to covered entities.

This structure is considered unique in the developing carbon pricing environment, as the dominant pricing mechanism adopted internationally has been the introduction of cap and trade mechanisms, typified by the European Union Emission Trading Scheme (EU ETS). To date, there have been 30 carbon pricing mechanisms implemented at regional, national or sub-national scale; with 18 of these being trading schemes, and 12 carbon taxes (World Bank, 2014).

Currently, the only similar carbon tax and carbon offset hybrid mechanism that has been developed has been implemented in Mexico, where a carbon tax is applied to the sales and imports of fossil fuels at a rate of 3% of the sales price. This tax does not apply to the full carbon content of fossil fuels, but only in comparison to emissions from natural gas (which is not taxed). Companies within Mexico are allowed to pay the tax through purchasing and surrendering carbon offsets from Clean Development Mechanism (CDM) carbon offset projects registered within Mexico.

The proposed South African scheme differs in two fundamental aspects from the system implemented in Mexico. Firstly, the tax is applied to the full carbon content of all fossil fuels combusted. Secondly, carbon offsets can only be used to meet a set proportion of each covered entity’s liability (Table 1-1).
The envisioned role of the carbon offset component, as outlined by National Treasury, is two-fold. The first is to provide some flexibility to entities covered by the carbon tax to lower the cost of compliance. The second role is that carbon offsets can be utilised to support GHG emissions mitigation in sectors not covered by the carbon tax (e.g. AFOLU and waste) or by supporting projects that will contribute to meeting strategic country objectives; by channeling finance to these projects in the form of their eligibly under the carbon offsets system.

It has been consistently stated by National Treasury that the carbon offset mechanism has not been designed, or incorporated, as a mechanism to allow companies to meet their carbon tax liabilities fully. The system has been designed to complement and support the carbon tax, while offering flexibility and assistance to covered entities to meet compliance and lower the cost of mitigation.

1.4 Design of the Carbon Offset Mechanism

The Carbon Offsets Paper (2014) provides an indication of the direction and design of some of the key elements of the carbon offsets mechanism and its role under the carbon tax. These include key determinants of the structure of the mechanisms, such as eligible and ineligible project types, carbon standards, and administrative processes. The key elements of the carbon offset mechanism (for Phase 1), as presented in the Carbon Offsets Paper (2014) are outlined in Table 1-2.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical Restrictions</td>
<td>In order to use carbon offsets to assist in meeting tax compliance, only those generated from projects within South Africa will be allowed</td>
</tr>
<tr>
<td>Carbon Standards</td>
<td>In the first phase (2016 – 2020) only carbon offsets registered under the CDM, Verified Carbon Standard (VCS) and Gold Standard (GS) will be allowed for use. The development of a South African carbon offset standard has been proposed for future phases.</td>
</tr>
<tr>
<td>Eligible Activities</td>
<td>Entities covered by the carbon tax will not be allowed to generate and sell carbon offsets from their taxed activities (e.g. activities that result in direct emissions through the combustion of fossil fuels). Activities that result in the reduction of indirect emissions could be allowed.</td>
</tr>
</tbody>
</table>
| Eligible Projects  | A number of eligible project types have been proposed that fulfil the dual objective of the carbon offset mechanism, these include:  
- Energy and energy efficiency projects in the residential and commercial sector, small scale renewable energy and fuel switching;  
- Projects in the transport sector (e.g. public transport);  
- Projects in the AFOLU sector; and  
- Projects in the waste sector |
| Ineligible Projects | A number of project that could generate carbon offsets are excluded from the scheme, these include:  
- Energy efficiency projects implemented on activities owned or controlled by covered entities;  
- Projects that benefit from other government incentives (e.g. Energy Efficiency Tax Incentive);  
- Cogeneration projects implemented on activities owned or controlled by covered entities;  
- Fuel switch projects implemented on activities owned or controlled by covered entities; and  
- Renewable energy projects developed under the both the large and small scale Renewable Energy Independent Power Producer Programme (REIPPPP) |

The Carbon Offsets Paper (2014) states that the carbon offset mechanism has been developed based on current international best practices and that it is intended to align with the developing international environment for carbon market design. This is evident in the inclusion of international, independent carbon standards that have developed and implemented the requisite infrastructure to ensure the integrity of any carbon offsets projects. This infrastructure includes the approval and availability of appropriate methodologies for the eligible project types, established carbon registries, third party verification and carbon credit issuance processes.

The identification of eligible and ineligible projects, and the restriction of location to South Africa, is also in line with the stated objectives of the carbon offset component, as the eligible projects are either not in covered sectors or they are in line with strategic developmental objectives.
1.5 Development of a South Africa Carbon Offset Market

The carbon tax and its associated carbon offset mechanism is the driving force behind the creation of a carbon offset market in South Africa. This market cannot therefore be seen as a traditional carbon market, as it has not been established spontaneously as there is limited natural demand for carbon offsets within South Africa without the introduction of the carbon tax. As a result, the local market is an artificial creation and its market fundamentals (supply and demand) are determined through the legal and regulatory framework that is developed and implemented in the country.

In South Africa, this is evident through the design of the carbon tax (which places limits on potential demand) and the carbon offsets mechanisms (which places restriction on supply). As a result, there are many comments, debates and criticisms from potential participants surrounding the development of a carbon market within South Africa. Key issues and concerns surrounding the carbon offsets market relate to:

- **Market liquidity**: due to the limits placed on supply from select project types and a cap on demand introduced through the offset allowance, market liquidity will be reduced and the price of carbon offsets will be pushed higher, thus increasing the costs of mitigation;
- **Exclusion of projects**: the exclusion of some project types will reduce the effectiveness of the carbon offset allowance through a reduction in the supply of offsets. This reduced supply will not allow some covered entities to utilise their granted offset allowances, thus increasing the cost of compliance for these entities;
- **Price ceiling**: the level of the carbon tax (e.g. R120 per tCO₂e in 2016, increasing at 10% per annum to 2020) will effectively place a cap on the price that could be obtained for a carbon offset, thus potentially limiting the feasibility of some projects; and
- **Time delays for market readiness**: many of the eligible project types will take a number of years before they are generating sufficient carbon offset volumes to meet demand, thus rendering the allowance mechanism during Phase 1 less effective.

There are a variety of strong arguments from a range of actors that propose to alter the design of the carbon tax and the carbon offset mechanism to overcome these challenges, particularly relating to increasing the list of potential projects that can supply carbon offsets (e.g. inclusion of renewable energy projects), allowing all projects registered prior to 2016 to be eligible and increasing the carbon tax to raise the price ceiling and encourage project development.

It has been constantly reiterated by National Treasury that the carbon allowance mechanism is designed as a support mechanism to reduce the costs of compliance and meet additional sustainable development objectives and not as a mechanism to determine a carbon price through market dynamics. As a result, it is anticipated that many of the design features of the carbon offset mechanism (Table 1-2) will remain in place for Phase 1 of implementation and thus dictate the initial structure of the market.

1.6 Role of a Carbon Exchange

The developments relating to the carbon tax and carbon offset mechanism are in line with the statement in the National Development Plan (NPC, 2012: 208) which calls for “the creation of a properly regulated domestic market in carbon offsets that will enable industry to identify least-cost approaches to emissions reductions and drive private sector investment in renewable energy and mitigation”.

To facilitate this market, the NDP calls further for the development of a regulatory framework for carbon offsets in conjunction with the Department of Environmental Affairs, National Treasury and the Johannesburg Stock Exchange (JSE). While the regulatory framework has been proposed in the Carbon Offsets Paper (2014), the incorporation of the JSE into this statement implies that there is a desire to develop a regulated carbon exchange to facilitate the creation of a domestic carbon market in South Africa.

Carbon exchanges have been developed in the majority of jurisdictions in which a carbon pricing scheme has been implemented that allows some form of carbon allowance or offsets trading. Examples include the exchanges developed in the EU, Mexico and China. In many cases, these exchanges are operated by private, regulated entities.

Carbon exchanges have also been developed to facilitate both spot and derivative markets. To understand these different markets, there is a need to differentiate between carbon credits and carbon allowances. Carbon credits relate to the verified and issued certificate representing 1 tCO₂e arising from a project developed to reduce, avoid or sequester GHGs. A carbon allowance is the permit allocated to a covered entity under a cap-and-trade system that provides a holder of this certificate the right to emit 1 tCO₂e.

Derivative trading in carbon credits is generally related to futures markets, where it is agreed that a set number of credits will be purchased on a future date for a set price. Such a market has been designed to provide certainty for both the buyers and sellers surrounding volumes required (buyers) and future cash flows and requirements (sellers). This in turn reduces the risk in the market for both participants.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

Trading of options on carbon credits has been less prevalent, but more focused on the trade in allowances through providing covered entities the option, but not the obligation, to purchase additional or sell excess allowances at a given point in time. This allows for a reduction in risk for covered entities through gaining access to, or selling, excess allowances. The main purpose of these carbon exchanges is to promote market efficiency through providing a transparent and trustworthy platform that connects buyers and sellers. A carbon exchange therefore aims to provide the platform for gaining access to the market, facilitate market price discovery, promote transparency and information exchange and ensure clearing and settlement of all trades, thereby reducing risks and transaction costs for both buyers and sellers.

1.6.1 Key Components of a Carbon Exchange

The development of a carbon exchange is in principle no different to the development of a traditional exchange platform for commodities and securities. They all entail the same function of ensuring the economic integrity of a market through providing the relevant infrastructure to support trading, facilitate price discovery and reduce transaction costs.

The carbon market is different in that the primary item traded is an environmental instrument that is intangible and cannot be translated into physical goods (as in traditional commodity markets) at any stage of the process. This particularly applies in the spot market and can influence the fungibility of carbon offsets as those generated from different project types face different risks of issuance, particularly when a process of invalidation is introduced into a scheme. Those risks can have a direct impact on the price, even though each carbon offset represents 1 tCO\(^2\)e. As such, the elements that need to be considered in the development of a carbon offset exchange include:

- **Communication and information exchange**: The exchange platform should provide the requisite information to allow participants to bid on or offer carbon offsets in a transparent manner. This includes vital information such as full project details and documentation (e.g. verification statement, etc.), volumes available for sale or required, price requested or offered, and details on the previous settlement prices for each trade and project type;

- **Clearing**: An exchange must provide a secure and efficient way of ensuring proper clearing of all trades in which the carbon offset purchased is transferred from the seller to the buyer. This requires clear linkages with existing carbon registries to ensure that an offset is not traded elsewhere while it is listed on an exchange and that the carbon offsets purchases are transferred to the buyer’s account when the trade is complete; and

- **Settlement**: Settlement functions include ensuring that the money is transferred from the buyer’s account to the seller’s to complete the transaction. This involves ensuring that buyers have requisite funds available in their trading accounts and an independent function that ensures transfer between accounts has occurred.

Ensuring the integrity of all of these components of an exchange is essential to support a carbon offset market and will be addressed further in this report.

1.7 Objectives of this Study

The key rationale for the creation of a carbon offset exchange in South Africa is to support an effective offsetting mechanism under the carbon tax and support the linking of buyers and sellers to reduce transaction costs. Due to the proposed structure of the South African carbon offset market, the exchange has the potential to facilitate transactions amongst market participants that channels funding to support projects that have additional sustainable development benefits such as job creation, rural development, biodiversity protection and community upliftment within South Africa. The overall aim of this project is to assess the feasibility of establishing an exchange platform for carbon offsets in South Africa and to provide recommendations to policy makers (through the mandate of the South African Green Fund) around how the carbon offset market in South Africa can be supported. The related objectives of the research are therefore to:

1. Draw key lessons from international experience in the field of carbon exchange platforms;
2. Ensure an alignment between the national policy, regulatory and institutional context, to support a viable offset market in South Africa; and
3. Provide a clear knowledge base to inform decision making regarding the application of the offsetting mechanism under the proposed Carbon Tax.

1.8 Project Approach and Report Structure

A report by Promethium Carbon (2015) determined that it is technically possible to establish a carbon offset exchange within South Africa based on the existing trading infrastructure in South African through the JSE, and proved this through conducting a demonstration carbon trade utilising the JSE and silocerts infrastructure. This project aims to determine the feasibility of establishing a carbon exchange through the assessment of a number of different dimensions to feasibility, including political, economic, social and financial characteristics.

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\(^\text{6}\) Invalidation refers to the risk that a carbon credits could be removed or cancelled if it is deemed to be non-compliant after issuance.
The key components for determining whether the development of an exchange is feasible which will be addressed in this report are outlined in Table 1-3.

Table 1-3: Determinants of Feasibility

<table>
<thead>
<tr>
<th>Section</th>
<th>Determinant of Feasibility</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Enabling Policy Environment</td>
<td>The development of an exchange in South Africa is contingent on there being an enabling policy environment for the development of a carbon offset market. This section will review the current policies that could affect the establishment of a market and an exchange to identify key risks for market design, implementation and functioning.</td>
</tr>
<tr>
<td>3</td>
<td>Market Characteristics</td>
<td>An assessment of the market characteristics, including supply and demand estimates, will be undertaken. Modelling and projections will be conducted based on the latest research reports and data for South Africa. This includes the South African Mitigation Potential Analysis and the updated 2010 Greenhouse Gas inventory (GHGI). This section will aim to provide an indication of demand and supply, by way of different scenarios, for the feasibility of a carbon offsets market in South Africa that would allow trading either through the exchange or OTC.</td>
</tr>
<tr>
<td>4</td>
<td>Financial Attractiveness</td>
<td>As the development and management of an exchange is generally undertaken by the private sector, it needs to be financially feasible. This is determined based on the liquidity of the market and the structure of fees implemented. High fees could discourage participation on the exchange, while low fees and volumes could make it unattractive to develop and manage. This section will evaluate the different financial structures of an exchange and potential revenues based on the market characteristics defined in Section 3.</td>
</tr>
<tr>
<td>5</td>
<td>Governance and Design</td>
<td>The effective governance and design of a system is essential to ensure transparency and trust. This includes providing clear information, linking with relevant registries and facilitating clearing and settlement. This section will provide an overview of the potential governance and design structures for a South African carbon exchange.</td>
</tr>
</tbody>
</table>

In all cases, this report uses the information provided in the Carbon Tax Policy Paper (2013), the Carbon Offset Paper (2014) and recent announcements by National Treasury and other relevant government departments on the structure and design of the carbon offsets mechanism. This report does not intend to make any judgements on the nature of the market, but rather aims to assess whether the proposed measures will be conducive to the establishment a viable carbon offsets market and an exchange to support all market participants.
2 Creation of an Enabling Policy Environment

As the South African carbon market will be created by regulation and not spontaneously developed through traditional demand and supply forces, the establishment of any exchange is only feasible based on the development and structure of an enabling policy environment which creates the market.

This section presents an assessment of the current relevant policy context in South Africa, in order to understand the impact that these policies may have on the feasibility of a carbon exchange in South Africa.

2.1 Relevant Policies for Trading Platform

This assessment will identify all current government policies, incentives, regulations, strategies or other relevant pronouncement related to carbon offsets, or an exchange and the role these play in supporting or hindering the development of a carbon exchange in South Africa.

The policies, incentives or announcements for review were selected based on their direct impact on the establishment of a carbon pricing mechanism, development of carbon offsets or on the establishment of a carbon exchange. The policy documents reviewed in Table 2-1 include:

- Carbon Offsets Paper, National Treasury 2014;
- National Budget Review, National Treasury, 2014;
- National Climate Change Response White Paper (NCCWP), Department of Environmental Affairs, 2011;
- Green Economy Accord, Department of Economic Development, 2011;
- Section 12I of the Income Tax Act (No. 58 of 1962) - Tax Allowance Incentive;
- Section 12K of the Income Tax Act (No. 58 of 1962) - Exemption of Certified Emissions Reductions; and
- Financial Markets Act (FMA), 2012
### Table 2-1: Overview of relevant policy and legislation and its impact on a carbon offset market in South Africa

<table>
<thead>
<tr>
<th>Document Details (Name, Author and Date)</th>
<th>Discussion of any document aspects referencing or relevant to carbon offsets, or the use of a carbon exchange</th>
<th>Ways in which policy could specifically hinder the establishment of a Carbon Exchange? (Any barriers or fatal flaws to specifically establishing a carbon exchange?)</th>
<th>Support for establishing a Carbon Exchange? (Any support for an enabling environment to aid establishment of a carbon exchange?)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Carbon Offsets Paper (National Treasury, 2014)</strong></td>
<td>The carbon offsets paper expands on Annexure E of the Carbon Tax Policy Paper (2014). The paper provides additional detail around eligible project types, standards and administration of the carbon offsets programme.</td>
<td>The carbon offsets paper provides additional clarity on eligible project types. Projects that could provide large volumes of credits, such as all renewable energy projects under the REIPPPP, industrial gases and co-generation projects, remain excluded. The exclusion of these project types will lead to reduced supply from potential sources into the market. This document is still a discussion document and as such could be altered in future iterations, based on comments received.</td>
<td>The carbon offsets paper explicitly recognises the need for a trading facility to enhance liquidity and facilitate third-party investment in carbon offset markets. The paper states that a credible facility would be appointed. It does not however, make it clear which body will appoint the facility nor does it clarify the criteria to be used to appoint an entity.</td>
</tr>
<tr>
<td><strong>National Budget Review (National Treasury, 2014)</strong></td>
<td>In the 2014 National Budget Speech and National Budget Review, it was announced that the implementation of the Carbon Tax would be postponed to 2016. The National Budget Review re-emphasised the envisaged use of offsets within the carbon tax policy and announced a “soon-to-be-released” discussion document relating to offsets (see above).</td>
<td>The further delay in implementation of the carbon tax and ongoing need to provide certainty around the details of offsets and their eligibility for use in reducing compliance costs for covered entities will lead to increased uncertainty for project developers and potential buyers, and thus lead to distrust in the carbon offset market in South Africa. This could lead to unwillingness/reductance to participate in an exchange during the early stages.</td>
<td>The National Budget Review maintains that offsets will be eligible for use under the carbon tax. This demonstrates continuing support for the use of offsets under the Carbon Tax and the potential need for a carbon exchange to facilitate this process.</td>
</tr>
<tr>
<td><strong>Carbon Tax Policy Paper (National Treasury, 2013)</strong></td>
<td>The Carbon Tax Policy Paper is the basis for the proposed use of carbon offsets under the tax. This paper provides further detail around the use of carbon offsets under the proposed South Africa carbon tax - in Annexure E of that document. This includes indications on usage percentages, eligible project types, carbon standards and geographic limitations.</td>
<td>If the offsets component is removed from the final tax design or altered, then this could render the establishment of an exchange to facilitate compliance redundant. Annexure E lists the proposed eligible project types, which are the same as those listed in the Carbon Offsets Paper, 2014. The exclusion of project types such as renewable energy under the REIPPPP and projects that use energy efficiency tax incentives could lead to a reduced supply into the market.</td>
<td>While the policy paper does not explicitly outline the need for a carbon exchange, it does serve as the primary policy document to introduce carbon offsets. If this policy is introduced, then companies liable under the tax would need to comply and utilising carbon offsets could be one way to achieve partial compliance. As a result, the exchange could be developed to facilitate the trading of carbon offsets and thus ease the compliance burden for liable companies.</td>
</tr>
<tr>
<td><strong>National Development Plan (NDP): Vision 2030 (National Planning Commission, 2012)</strong></td>
<td>The NDP highlights that there is a need to create a properly-regulated, domestic market in carbon offsets that will enable industry to identify least-cost approaches to emission reductions and drive private</td>
<td>None</td>
<td>The NDP specifically supports the development of a carbon offset market and the enabling national policy environment to establish a carbon exchange in South Africa with the purpose of facilitating least-cost options.</td>
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<td>Document Details</td>
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<td><strong>National Climate Change Response White Paper (NCCWP)</strong> (Department of Environmental Affairs, 2011)</td>
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<tr>
<td>Discussion of any document aspects referencing or relevant to carbon offsets, or the use of a carbon exchange</td>
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<tr>
<td>To facilitate the creation of an offsets market, the NDP directs the National Treasury and the Department of Environmental Affairs to develop the regulatory framework for a domestic market in carbon offsets, together with the Johannesburg Stock Exchange.</td>
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<tr>
<td>Ways in which policy could specifically hinder the establishment of a Carbon Exchange? (Any barriers or fatal flaws to specifically establishing a carbon exchange?)</td>
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<td>Alignment is needed between the two carbon regulatory mechanisms proposed: the Carbon Tax and the Desired Emissions Reductions Objectives (DEROs).</td>
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<tr>
<td>Support for establishing a Carbon Exchange? (Any support for an enabling environment to aid establishment of a carbon exchange?)</td>
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<tr>
<td>The NCCWP supports the implementation of carbon pricing, whether a carbon tax or cap-and-trade mechanism. The NCCWP does not, however, promote any specific mechanism. If either of the mechanisms in the NCCWP relating to carbon pricing is fulfilled then there will be a need for a carbon exchange in South Africa.</td>
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<td><strong>Green Economy Accord</strong> (Department of Economic Development, 2011)</td>
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<td>The New Growth Path contains the Green Economy Accord which commits signatories to promoting the green economy.</td>
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<tr>
<td>While there is no specific mention of carbon offsets or a carbon exchange, the Green Economy Accord is a key policy to promote green economy initiatives, including energy efficiency, renewable energy, solar water heaters, biofuels and recycling. There is no alignment between the Green Economy Accord and other carbon pricing policies and as a consequence, this misalignment could cause policy uncertainty for market participants.</td>
<td></td>
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<tr>
<td>If the objectives of the Green Economy Accord are met through encouraging the development of initiatives in the energy, agriculture and waste sector then there could potentially be new projects for the generation and supply of carbon offsets under the carbon tax.</td>
<td></td>
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</tr>
<tr>
<td><strong>National Strategy for Sustainable Development and Action Plan (NSSD 1) 2011 - 2014</strong> (Department of Environmental Affairs, 2011)</td>
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<tr>
<td>The NSSD 1 affirms the response to climate change, sustaining our ecosystems and moving towards a green economy as key strategic priorities. The NSSD 1 therefore provides the basis for encouraging sustainable development in South Africa and provides the support for placing the focus on carbon offset projects that contribute to sustainable development within South</td>
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<td>None</td>
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<td>None</td>
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<tr>
<td>Section 12L of the Income Tax Act (No. 58 of 1962) – Energy Efficiency Tax Incentive</td>
<td>Allows income tax deductions of R0.957 for every verified kWh saved through energy efficiency interventions.</td>
<td>The uptake of this policy by companies to fund energy efficiency measures could lead to a reduction in the potential supply of carbon offsets from energy efficiency projects. As stated in the Carbon Tax Policy Paper (2014), offsets generated from projects receiving other incentives are not eligible for use under the Carbon Tax.</td>
<td>None</td>
</tr>
<tr>
<td>Section 12i of the Income Tax Act (No. 58 of 1962) - Tax Allowance Incentive</td>
<td>Allowance for investment in new manufacturing assets and training to support job creation, training and energy efficiency.</td>
<td>Section 12i provides for an incentive to encourage the development of energy efficiency projects. If this is combined with Section 12L then it could reduce the supply of carbon offsets from energy efficiency projects (see 12L above).</td>
<td>None</td>
</tr>
<tr>
<td>Section 12K of the Income Tax Act (No. 58 of 1962) - Exemption of Certified Emissions Reductions</td>
<td>Section 12K provides for income tax exemptions for the sale of all qualifying certified emissions reductions (CERs) from Clean Development Mechanism (CDM) projects in South Africa.</td>
<td>None</td>
<td>The incentive could provide encouragement for the development of CDM projects within South Africa, as all sales are exempt from income tax. This is likely to increase potential supply through the carbon exchange.</td>
</tr>
<tr>
<td>Financial Markets Act (FMA), 2012</td>
<td>The Financial Markets Act (2012) outlines the requirements for establishing and operating an exchange, security depositories, clearing house and the role of participants. As a result, it is the overarching legislation that governs the operations of any exchange.</td>
<td>The development of a new, standalone carbon exchange would have to abide by all requirements outlined in the FMA. This could make the development of a new exchange complex and costly. The FMA also lists reporting requirements that any carbon exchange, whether standalone or within an existing exchange, would have to comply with. Carbon has also not, as yet, been considered by the FSB as a tradable commodity or security and thus there is uncertainty surrounding the classification of carbon trading in South Africa and the related legislation that it will have to abide by.</td>
<td>The FMA would constitute the regulatory framework (and therefore certainty to potential market participants) for a carbon exchange.</td>
</tr>
</tbody>
</table>

7 As updated in the National Budget presented in 2015 (National Treasury, 2015)
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

2.2 Policy Alignment and Regulatory Uncertainty

While there is widespread policy support for the inclusion of carbon offsets and the development of a carbon exchange, there is material policy and regulatory uncertainty that could influence both the development of, and participation in, a South African carbon exchange. In particular the key gaps identified include the following:

2.2.1 Alignment between the Carbon Tax and Desired Emission Reduction Outcomes (DEROs)

Due to the delays in releasing discussion documents relating to the carbon tax and carbon offsets, as well as in finalising the design of the tax, there is a lingering element of uncertainty amongst potential buyers and suppliers of carbon offsets. The market uncertainty was not diminished by the announcement of a delay in the implementation of the carbon tax until 2016 during the 2014 National Budget Speech. The reason given for the delay was to allow for alignment between the design of the carbon tax and the Desired Emission Reductions Objectives (DEROs), another key component of Government’s mitigation response under the NCCRWP.

The establishment of DEROs will include the setting of clear sector-level emission reduction objectives, which will be devolved further to company level carbon budgets. The DEROs process also calls for the development of a number of measures, known as a Mix of Measures (MoMs) that will be established to assist companies to meet their set budgets. While it is currently unclear how the carbon budgets would be set, National Treasury (2014) has confirmed that carbon offsets are envisioned as one of the Mix of Measures (MoMs) that companies will utilise to comply with their emission reduction obligations.

The lack of clarity regarding how carbon budgets and the carbon tax will align is causing further uncertainty amongst potential carbon market participants relating to the future and final design of the carbon tax and the role of carbon offsets. It is anticipated, however, that regardless of how the alignment is achieved, carbon offsets will still be included, although the design of this mechanism could change to facilitate alignment with the DEROs.

2.2.2 Uncertainty Regarding the Design and Functioning of the Carbon Tax

The précising design and functioning of the carbon tax remains uncertain. While the various carbon tax discussion and policy documents provide some detail, there are some crucial areas where clarity is still needed. These areas include:

- how the intensity-based adjustment will be calculated;
- how process emissions and trade-exposed companies will be determined; and
- the final design of the carbon offset component, including eligible and ineligible project types and administrative design (e.g. coordinating entity, project approval and retirement process, as well as an overview of the design, function and organisational structure of the registry).

Further clarification of the design is needed for both project developers and liable entities to make decisions about project development or carbon offset strategies.

2.2.3 Clarification of Entities Covered Under the Carbon Tax

Adding to the uncertainty is the fact that the 2013 Carbon Tax Policy paper also does not, as yet, provide the sufficient detail needed for liable entities to begin to understand their tax liability and identify potential mitigation options or invest in carbon offset projects. Additional detail that is required relates to the various threshold mechanisms which will be applied and how they will be calculated, the definition of the carbon tax net and finalised eligible project types.

This uncertainty also creates indecision for potential carbon offset project developers as many projects that could be eligible under the identified project types, particularly those with large social development benefits are long-term, complex and costly; thus requiring high levels of confidence surrounding market development in order to secure investment.

2.2.4 Financial Classification of Carbon for Trading

It is essential that carbon is defined as either a commodity or financial instrument in the early stages of market development [Promethium Carbon, 2014]. There is a large variety of carbon instruments in the market that fulfil different functions and purposes and this makes their classification as financial instruments challenging. There are two predominant instruments for carbon: that of emissions allowance (EAs) and carbon credits (including all components of CERs and VERs). These instruments are not the same. EAs are permits that entitle a holding entity to emit a specified amount of greenhouse gas emissions (usually quantified in terms of tCO2e), while CERs or VERs are certificates which certify that a project has reduced, avoided or sequestrated a known quantity of carbon dioxide equivalent emissions.
Carbon credits are an intangible article of trade in that there is no physical exchangeable good produced. They provide a certificate stating the reduction, avoidance or sequestration of carbon dioxide equivalents (tCO₂e) that takes place within a project boundary or site. This creates the opportunity, through the generation of a carbon credit, for an external entity to purchase the right to claim an emissions reduction (in the case of a CER or VER) or the right for additional emissions, under a regulated scheme, through the purchase and surrendering of EAs.

Based on the carbon tax provision, the South African carbon pricing system will focus on utilizing carbon credits and not EAs. The classification of carbon between a commodity and derivative is not straightforward; however, as carbon credits exhibit characteristics of both a commodity and a derivative. A commodity can be defined as a basic good used in commerce where there is little differentiation across producers. A derivative is a financial security whose price is dependent on the characteristics of an underlying asset.

Carbon credits might be classified as a commodity as they can be fungible: while credits may originate from different projects, all credits issued represent one (1) tCO₂e. There can also be different grades of carbon credits depending on the standards, e.g., the CDM is considered to be the most rigorous certification standards and thus a CER may not necessarily be directly fungible with a VER.

In some carbon offset schemes, for example California, carbon credits between projects also face the risk of project invalidation, or removal of these credits from the market (e.g., as a result of non-compliance with laws and regulation or overstatement of emissions reductions), if they are deemed to be non-compliant following registration and issuance (Climate Action Reserve, 2013). In these cases, the buyer takes on this invalidation risk as they will use them for compliance and would need to replace any invalidated credits (Climate Action Reserve, 2013). In this market such risks need to be considered when purchasing from a project. As a result these factors do not make carbon credits directly fungible and impact risk profiles and the price between projects and carbon credits issued.

Carbon credits also may have characteristics of derivatives, as carbon credit certificates are only representative of the underlying intangible asset (the emission reduction) rather than a physical tangible commodity. As carbon would be a new form of tradable good in South Africa, the asset class has not been given the required attention by various regulatory bodies, and the implications for trading are not fully understood. The latest carbon policy papers, including the Carbon Offsets Paper (2014) do not make any distinction or comment on the classification of carbon in the South African market. The rationale for a clear definition has been particularly evident in the European Union, which has established the largest and most advanced carbon market through the European Union Emissions Trading Scheme (EU ETS). Existing trading in carbon credits is split between over-the-counter (OTC) and spot trade of carbon credit instruments being classified as commodities and futures; and options being classified as securities or derivative instruments.

In the EU ETS, trades of carbon credits (particularly those associated with EAs) occur in all three major market types of OTC, spot and futures (Bennet, 2010). This has caused some confusion in the EU ETS, as trades taking place in the OTC and spot market have been classified as commodities, and are thus unregulated, while credits sold in the futures markets are classified as securities and are regulated accordingly (Bennet, 2010).

This status quo has begun to be reassessed and efforts to classify carbon credit mechanisms as financial instruments have been initiated, in particular:

- The European Union (EU) recommended regulation to classify spot trades of carbon allowances (EUAs) as financial instruments under the Markets in Financial Instrument Directive (MiFD II). This allowed for alignment with existing derivative markets (European Union, 2014);
- France directed their French Financial Markets Authority (AMF) to oversee carbon trading in terms of the French Banking and Finance Regulation Act which effectually designates European Union Allowances (EUAs) as financial instruments (AMF, 2010); and
- Romania has also classified EUAs as financial instruments to eliminate the over the counter trading of assets and therefore combat tax fraud (Thomson, 2010).

The trend of classifying EUAs as derivatives is also evident in Australia with the classification of emissions units as regulated financial instruments under the Australian Corporation Act (2001) and the Australian Securities and Investments Commission (ASIC) Act (2001) (Baker and McKenzie, 2011). Australia has also classified all eligible international emissions units or carbon credits which can be generated form carbon offset projects within Australia as financial instruments, including CERs, ERUs and Australian Carbon Credit Units (ACCUs) (ASIC, 2013).

The voluntary carbon market, or the sale of VERs and carbon credits, has not been immune to incidences of fraud due to the fact that it is unregulated. Particular concerns have arisen in the offer of an investment opportunity through the OTC purchase of VERs by individuals for future resale at a profit. This development has been observed in the United Kingdom (UK) with the Financial Services Authority (FSA) issuing a warning relating to investing in VERs (FSA, 2012).
The trend towards classifying all carbon instruments as financial instruments has arisen around concerns in developed markets relating to the potential for fraud and tax evasion associated with OTC trading (Promethium Carbon, 2014). This has led to a move to regulate carbon through classifying it as a financial instrument to enable disclosure and transparency in the market. This classification in turn could require participants providing advice on carbon credit transactions, or dealing in carbon credits, to hold a relevant financial services licence and comply with all regulations. This is consistent in the EU and in Australia for some activities involved in the trading of carbon units or carbon offsets.

Both Promethium Carbon (2014) and the Johannesburg Stock Exchange (JSE) argue that the preferred option for South Africa is that carbon credits be classified as financial instruments for regulatory purposes. This classification is proposed to support market integrity, but also allows integration of carbon credits under existing exchange platform licences and will institute sufficient safeguards around incidents of misrepresentation.

The classification of carbon credits is a key regulatory gap and as demonstrated in the EU and other carbon markets globally this is still under discussion with the trend being towards classification as a financial instrument and requirements for some participants to be registered as financial service providers. The classification as a financial instrument will also reduce the need for invalidation in a South African market as any incidences of misrepresentation or fraud could result in large financial penalties or legal action.

The classification of carbon for trading purposes will need to be defined in South Africa before implementation of the tax, to allow for the development of the exchange, understanding information disclosure requirements and potential tax implications. The implication of this classification also needs to be considered in terms of requiring registration of participants or advisers as a financial services provider with the Financial Services Board (FSB). If required, this could limit participation from smaller project developers as it would render the compliance burden onerous. It is recommended that only those providing trading and financial advice to project buyers or sellers have to be licenced, while those that are providing project support or who directly participate on the exchange would not be required to be licenced (as in the Australian market).

2.2.5 Carbon Credits and Section 12K of the Income Tax Act

Section 12K of the Income Tax Act (No. 58 of 1962) currently exempts the primary sale of all qualifying CERs from CDM projects from income tax payments. This incentive is designed to encourage the development of CDM projects in South Africa and was implemented when South African projects still had access to the EU ETS.

This incentive could encourage the development of CDM projects over the other eligible standards under the carbon tax (e.g. VCS and GS). These standards have been included in the tax as they have the potential to encourage the development and certification of projects with higher levels of sustainable development benefits that have been excluded from the CDM. It is therefore recommended that Section 12K be expanded to provide the same exemptions for the primary sale of all qualifying VCUs from VCS projects and GS VERs from Gold Standard projects.

2.3 Limited Initial Supply of Carbon Credits

The Carbon Offsets Paper (National Treasury, 2014a) provides an overview of the potentially eligible project types and those that are excluded from selling carbon credits under the tax. In particular, the following project types are currently excluded:

- Projects claiming other government incentives (e.g. energy efficiency tax rebates under Section 12L of the Income Tax Act – Energy Efficiency Tax Incentive);
- Cogeneration or fuel switch projects implemented on activities that are owned or controlled by companies covered by the tax; and
- Renewable energy projects under the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP).

The rationale behind the exclusion of these project types is to encourage the investment in projects with broader sustainable development benefits, and in some cases to avoid the provision of a double incentive, or providing two incentives for undertaking one emission reduction action (National Treasury, 2014a).

The majority of currently registered carbon offset projects in South Africa fall under one of these categories and while projects registered prior to the introduction of the tax could be eligible, they will have to undergo a retroactive evaluation against the proposed eligibility criteria (National Treasury, 2014a).
This exclusion of existing projects could result in the reduction of a large proportion of initial market supply and result in suppressed trading via a carbon exchange and elevate prices. In turn this could reduce willingness to participate in the exchange, or utilise the carbon offset mechanism, from a buyer’s perspective due to low supply and higher prices.

2.4 Overview of Key Barriers and/or Fatal Flaws to Establishment of a Carbon Exchange in South Africa

While there is sufficient policy support to the development of carbon pricing mechanisms, there are potentially some key barriers or fatal flaws that could hamper the establishment of a carbon exchange. These include:

- **Carbon Tax Not Implemented.** If the carbon tax is not implemented then the need for an exchange will be purely to facilitate voluntary trades. This is the current status quo and as both supply and demand has been suppressed this is unlikely to make the development of a carbon exchange feasible.

- **Carbon Offsets Excluded From Carbon Pricing Policy.** If offsets are not eligible to reduce a covered entity’s carbon tax liabilities, or any other carbon emissions regulatory mechanism, then this will reduce the need for a carbon exchange that enables price discovery, transparency and market efficiency to lower the cost of compliance. This is unlikely, as the carbon offset component has policy support and has been a consistent feature of all announcements concerning the introduction of carbon tax.

  There is remaining uncertainty around how the carbon tax (and its offsets component) will align with any alternative carbon regulatory mechanism, such as the DEROs process. It is anticipated, based on recent announcements, that carbon offsets will play a role in any future carbon pricing mechanism in South Africa through being identified as a MoM.

- **Uncertainty over Criteria for the Appointment of a Carbon Exchange.** The Carbon Offsets paper (2014) states that the appointment of an exchange will be undertaken over the medium-term. This statement is recognised as support for the development of a carbon trading platform, but more clarity is needed around the criteria and process for appointment including the regulatory authority.

  This uncertainty could delay the development of an exchange to facilitate trading on implementation of the tax. This will also have implications for credible entities (such as the JSE) to commit to allocating resources to the development of a carbon exchange.
3 Carbon Offset Market Characteristics

The feasibility of a carbon exchange in South Africa is directly dependent on the size and dynamics of the market for carbon offsets created through the introduction of the relevant regulation. This regulation will have a direct impact on both the supply and demand components of market development.

During the development of the regulations governing carbon offsets, there have been a number of studies that have aimed to determine the potential market dynamics and the interaction between supply and demand. These studies include those of Camco Clean Energy (2012), Promethium Carbon (2012 and 2014) and C4 EcoSolutions (2013). As these studies were conducted either prior to or during the development of the carbon tax and carbon offset papers, they all present different assumptions, methods of calculation and utilise different data sources.

This has resulted in widely-differing projections of supply and demand for carbon credits into the South African market. Projections of demand for carbon credits has been particularly divergent, ranging from 5 million tCO₂e (Promethium Carbon, 2014) to between 25 and 30 million tCO₂e per annum (Camco Clean Energy, 2012; Promethium Carbon, 2012). This demand varies widely due to the uncertainties in the definitions associated with the coverage of the carbon tax net (or which entities would be covered by the carbon tax and thus eligible to purchase carbon credits). This has led to assumptions being made relating to the thresholds on the tax net (e.g. 100,000 tCO₂e) or if the tax will apply to all emissions within covered sectors.

Estimates and projections of supply have also been divergent due to the assumptions and data used to project potential supply. This includes assumptions on the eligible and ineligible project types, the use of roll-out multiplication factors to provide estimates of potential implementation and use of existing or ongoing studies, such as draft versions of the Mitigation Potential Analysis (2014) or the National Carbon Sinks Assessment.

Potential supply in these studies is estimated to be between 20 million tCO₂e in 2015 rising to 29 million tCO₂e in 2030 (Camco Clean Energy, 2012; Promethium Carbon, 2014). It has also been estimated that the carbon sequestration potential from land use, land use change and forestry (LULUCF) projects alone could be between 8 million tCO₂e and 54.8 million tCO₂e per year by 2020 (C4 EcoSolutions, 2013).

To understand the feasibility of a carbon exchange, it is essential to understand the potential trading that will take place via the exchange, through the projections of supply and demand. Therefore the approach to calculating demand and supply in this study will utilise the information presented in the Carbon Tax Policy Paper (2012) and the Carbon Offsets Paper (2014). These documents are used as the overarching guidance for these calculations, in particular relating to estimating the tax net (demand) and defining eligible and ineligible projects (supply). To complement these reports, the latest data on GHG emissions and mitigation potential for each sector in South Africa was obtained from South Africa’s Mitigation Potential Analysis (Department of Environmental Affairs, 2014a).

3.1 Approach and Methodology: Estimating Supply and Demand of Carbon Credits

The detailed approach and assumptions used to calculate demand and supply for carbon credits is presented in Section 3.1.1 and Section 3.1.2 respectively.

3.1.1 Demand

3.1.1.1 Key Determinants of Demand

The potential demand for carbon offsets in South Africa is explicitly dictated by the design of the Carbon Tax Policy Paper (2013). The two fundamental determinants of demand are:

1) How many entities, and their respective GHG emissions, are liable and covered by the carbon tax?; and
2) What portion of a covered entity’s carbon tax liability can be offset using carbon credits (i.e. the determination of the extent of the allowance mechanism in each individual case)?

As outlined in Section 2 the determination of which entities will be eligible for the carbon tax is still unclear. It has previously been assumed that the entities liable for the carbon tax will be the same entities which will be required, through regulation, to report their annual GHG emissions. The threshold that has been proposed for mandatory reporting is 100,000 tCO₂e per annum (it remains unclear whether only direct emissions, indirect emissions or both will contribute to the threshold) (Department of Environmental Affairs, 2014b), and thus it has been assumed by some potential participants that this will be the level over which the carbon tax will start to apply (Promethium Carbon, 2014).

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Camco is aware that further clarity on the potential mitigation projects in the AFOLU sector will be available in the Carbon Sinks Assessment Report (CSA), currently being undertaken on behalf of the DEA. Unfortunately by the time of publication this report was not available to the public.

*RESEARCH AND POLICY DEVELOPMENT TO ADVANCE A GREEN ECONOMY IN SOUTH AFRICA*
It has been stated by National Treasury that the carbon tax will only apply to direct emissions (therefore excluding indirect emissions from electricity use) and that no threshold for liability will apply. This statement is therefore interpreted, for the purposes of this report, to mean that all emitters of direct GHGs within the specified sectors (detailed in Table 1-1) will be liable to pay the carbon tax on their direct emissions, and thus also eligible to utilise the carbon offset allowance.

The second determinant of demand for carbon offsets - the offset allowance - has been proposed in the Carbon Tax Policy Paper (2013). The carbon offset allowance allocations have been a consistent feature since the design of the carbon tax was first proposed; and are expected to remain part of tax package. It has been proposed by Promethium Carbon (2014) that these allowances could be extended to allow for covered entities to purchase greater amounts of carbon offset, and thus reduce the cost of compliance and support least cost mitigation. It has however been reiterated by National Treasury that the allowance mechanisms will remain as announced in the first phase of the carbon tax (2016 – 2020). As a result it is assumed for the purposes of this report, that the carbon offset allowances will remain the same after the first phase.

### 3.1.1.2 Methodology to Estimate Demand

The projections of GHG emissions for the South Africa’s economy up to 2050 at a sector and sub-sector level from the Mitigation Potential Analysis (MPA) (Department of Environmental Affairs, 2014a) have been used to calculate potential demand for carbon offsets in South Africa. The “With Existing Measures” (WEM) projection for GHG emissions between 2010 and 2050 from the MPA was utilised as this incorporates the outcomes of climate change mitigation actions implemented prior to 2010 and excludes all additional mitigation potential identified in the MPA study.

In effect, the WEM projection acts as a reference case and a projection of South African GHG emissions across sectors up to 2050. The MPA (Department of Environmental Affairs, 2014) and the WEM scenario, presents the GHG emissions projections per sector and subsector, and these were used to compare and align with the sub-sectors outlined in the Carbon Tax Policy Paper (2013). This is particularly relevant to the GHG emissions projections for the Energy and Industry sectors from the WEM scenario.

Given that no thresholds for liability apply under the carbon tax, it is assumed that all direct GHG emissions within these sectors, and sub-sectors, will be liable for the carbon tax, regardless of the individual company or facility level emissions (i.e. all companies within these sectors will be liable for the carbon tax). As a result, it is also assumed that all companies within these sub-sectors will be entitled to purchase carbon offsets up to the limit provided in the carbon offset allowance (e.g. either 5 – 10%, depending on the sector).

It is also recognised that the WEM scenario is the reference case with no new mitigation actions implemented across the South African economy. WEM has been selected as it represents the maximum demand scenario. If South African manages to meet their peak, plateau and decline targets then the demand for carbon offsets will be lower as the GHG emissions profile of the country changes.

### 3.1.2 Supply

#### 3.1.2.1 Key Determinants of Supply

The potential supply of carbon offsets into a South African market will be dictated by the provision outlined in the Carbon Tax Policy Paper (2013) and further detailed in the Carbon Offsets Paper (2014). This supply will be influenced in three fundamental ways:

1. Restricted to projects developed in South Africa only;
2. Limits on entities eligible to generate carbon credits; and
3. The specification of eligible and ineligible project types.

The first aspect that dictates supply relates to limiting supply of carbon credits only from projects developed within the borders of South Africa. National Treasury (2014) has proposed this restriction to ensure that mitigation occurs within South Africa and financing is channelled to projects that contribute to overall socio-economic development.

The second aspect is the classification of which entity or activity is allowed to generate carbon credits for sale. It is stated that an entity liable under the tax may emit both direct and indirect emission, but a taxable activity only relates to direct emissions. As a result, no carbon offsets can be generated from activities that result in direct emissions within entities covered by the carbon tax. However, the interpretation of the existing Carbon Offsets Policy Paper (2014) used in this analysis is that projects implemented on activities that result in reductions or avoidance of indirect emissions of covered entities (i.e. those from electricity consumption), will be eligible.

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10 This is deemed to be the most appropriate assumption following announcements by National Treasury at the Carbon Offsets Stakeholder Feedback session in October 2014.
Therefore, it is assumed that covered entities within the energy and industry sectors will be allowed to generate carbon credits from projects implemented to reduce their indirect emissions (except in cases where there isn't an prevailing government incentive, e.g. energy efficiency), while entities within the AFOLU, waste and transport sectors will be able to generate carbon credits from any projects implemented to reduce, avoid or sequester direct or indirect GHG emissions. The third aspect to determining potential supply is the specific designation by National Treasury of eligible and ineligible project types. The criterion for the inclusion of eligible project types is premised on the ability of a project to contribute to the transition towards a low-carbon economy and maximise sustainable development benefits (National Treasury, 2014a). Ineligible project types have been determined based on a number of criteria, including a desire to avoid double counting of emissions reductions and to ensure that projects do not benefit from dual incentives. The criteria therefore include:

a) Projects that would be developed to reduce or avoid direct emissions of entities covered by the carbon tax; and
b) Projects benefitting from other government incentives or programmes related to the mitigation of GHG emissions (e.g. the energy efficiency tax incentive).

As a result any carbon offsets generated from project types on the ineligible lists will not be allowed to be used to meet compliance obligations.

The proposed eligible and ineligible project types are presented in Table 3-1.

**Table 3-1: List of Eligible and Ineligible Project Types (National Treasury, 2014a)**

<table>
<thead>
<tr>
<th>Project Types</th>
<th>Eligible Project Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy and Energy Efficiency</td>
<td>• Energy efficiency in the residential and commercial sector.</td>
</tr>
<tr>
<td></td>
<td>• Energy efficiency in buildings</td>
</tr>
<tr>
<td></td>
<td>• Small scale renewable energy</td>
</tr>
<tr>
<td></td>
<td>• Community based and municipal energy efficiency and renewable energy</td>
</tr>
<tr>
<td></td>
<td>• Fuel switching projects</td>
</tr>
<tr>
<td></td>
<td>• Electricity transmission and distribution efficiency</td>
</tr>
<tr>
<td>Transport</td>
<td>• Public transport</td>
</tr>
<tr>
<td></td>
<td>• Transport energy efficiency</td>
</tr>
<tr>
<td>AFOLU</td>
<td>• Restoration of sub-tropical thicket, forests and woodlands</td>
</tr>
<tr>
<td></td>
<td>• Restoration and management of grasslands</td>
</tr>
<tr>
<td></td>
<td>• Small scale afforestation</td>
</tr>
<tr>
<td></td>
<td>• Biomass energy</td>
</tr>
<tr>
<td></td>
<td>• Anaerobic biogas digesters</td>
</tr>
<tr>
<td></td>
<td>• Reduced tillage</td>
</tr>
<tr>
<td>Waste</td>
<td>• Municipal waste projects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ineligible Project Types</th>
<th>Energy efficiency projects implemented on activities that are owned or controlled by companies covered by the carbon tax</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Projects that benefit from the Energy Efficiency Tax Incentive (Section 12L of the Income Tax Act)</td>
</tr>
<tr>
<td></td>
<td>Cogeneration projects implement on activities that are owned or controlled by companies covered by the carbon tax</td>
</tr>
<tr>
<td></td>
<td>Fuel-switch projects implemented on activities that are owned and controlled by companies that are covered by the carbon tax</td>
</tr>
<tr>
<td></td>
<td>Renewable energy projects developed under the Renewable Energy Independent Power Producer Programme (REIPPPP)</td>
</tr>
</tbody>
</table>
3.1.2.2 Methodology to Determine Supply

The potential supply of carbon offsets is calculated based on the existing carbon credit projects which are already registered or in the pipeline under the eligible carbon standards (CDM, VCS and Gold Standard). Potential project types that could be developed to issue carbon credits have been analysed in accordance with the assumptions listed above and shown in Table 3-1. This analysis was conducted in the three steps, described below:

Step 1: Analysis of current carbon offset projects

The analysis included an assessment of the current projects that have been registered or are in the pipeline to be registered as CDM, VCS or Gold Standard Projects. To develop carbon credits from projects, there are two tracks that can be followed, namely individual projects or inclusion in a programmatic approach. All the eligible standards accommodate these means of registration and both of them were analysed for potentially-eligible carbon offset projects. All CDM projects and Component Programme Activities (CPAs) \(^1\) were identified from the Institute for Global Environmental Strategies (IGES) Market Mechanisms Databases (CDM Projects and CDM Programme of Activities) \(^2\). Projects that were classified as being “rejected”, “withdrawn” or “inactive” were excluded. The remaining projects were assumed to be in the pipeline and further analysis was conducted on these.

All projects registered under the VCS as well as under the Gold Standard were identified from the respective registries and project databases \(^3\). These databases only highlight the registered projects, and thus all were assumed to be currently active. The project documentation of each project was analysed to gain a further understanding of the project and the associated project emission reductions (and potential carbon credits).

These projects were then assessed for alignment with the eligible project types as outlined in Table 3-1. If a project was determined to be ineligible, it was excluded. Renewable energy projects were further analysed, as only those developed under the REIPPPP process are deemed to be ineligible according to the Carbon Offsets Paper (2014). As such, each renewable energy project was researched to determine if it has been successful (i.e. reached financial close), or been submitted, under the REIPPPP. If a project was entered under the REIPPPP it was excluded, either because it had been successful in the bidding process (thus an ineligible project), or if not successful, it is unlikely to become operational as it won’t be granted a generation licence under the current Electricity Regulation Act (2006).

Step 2: Projections of Potential Supply

The projections of potential supply of carbon credits from eligible project types were determined from the MPA study on all the potential mitigation actions at a sector and sub-sector level in South Africa. These mitigation actions across sectors were assessed according to the criteria in Table 1-2 and Table 3-1 and it was determined that potentially eligible projects would be in the AFOLU, waste, transport, and industry sectors. In other sectors, e.g. energy and industry, the majority of mitigation projects identified in the MPA related to either being on their direct, taxed emissions, or have the potential to receive additional government incentives (e.g. the energy efficiency tax incentive) and thus were excluded.

These projects were further analysed according to their likelihood to be successfully-implemented. This likelihood this can be determined through assessing potential additionality of projects. Additionality has the main purpose and function to overcome barriers related with the implementation of a project.

1) **Investment additionality**: A project is deemed to be additional if the value of the carbon credits generated significantly improves the financial or commercial viability of a project;

2) **Regulatory additionality**: A project is deemed to be additional if it exceeds current mandated regulatory behaviours or performance; and

3) **Barrier additionality**: A project is deemed to be additional if the incentive from the sale of carbon credits overcomes barriers related with the implementation of a project.

It has been argued that if a project in South Africa’s has a marginal abatement cost (MAC) which is lower than R0 per tCO₂e or greater than R150 per tCO₂e (according to the MPA, 2014), then it is unlikely to be developed under present conditions (Promethium Carbon, 2014). If the MAC is negative, then a project is deemed to be business as usual or not financially additional (Promethium Carbon, 2014). If the project MAC exceeds R150 per tCO₂e, then it is assumed that potential revenues from carbon credits would be lower than the project costs, rendering the project uneconomic and unlikely to be developed, at least for the purposes of carbon credits.

While this test is relevant, it is also assumed in this assignment that projects with a MAC negative or greater than R150 per tCO₂e could still be developed, and qualify for carbon credits through being not regulated or the not the current prevailing common practice in South Africa. These projects could also face technical or social barriers to implementation

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\(^1\) Each project included under a Programme of Activities (PoA) is classified as a Component Project Activity (CPA).

\(^2\) Available at [http://www.iges.or.jp/en/climate-energy/mm/publication.html](http://www.iges.or.jp/en/climate-energy/mm/publication.html)

An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa and any revenues from carbon credits could help overcome these. While these cases are often difficult to prove, it is envisaged that they could be included in a positive list of eligible projects that are strategic to South Africa’s mitigation actions, and thus would be eligible to generate carbon offsets. This possibility has been alluded to in the Carbon Offset Paper (2014) through the publication of an eligible and ineligible list of project types.

**Step 3: Projecting Potential Supply**

The findings from Step 1 and Step 2 were then used to project the potential supply of carbon credits from eligible projects in South Africa. To project potential levels of supply, two key considerations were factored into the projections:

1. The risk of carbon credit non-issuance from current projects; and
2. The likelihood that potential projects would be developed.

Carbon credits are only eligible for use in any scenario once they have been issued by a relevant issuing authority (e.g., the CDM Executive Board). Issuance is based on the verification of emissions reductions that have occurred after the implementation and operation of a project and thus can either be lower, or higher, than the stated volumes before project implementation. To account for this, the average global issuance success for individual project types under the CDM was used to guide the potential issuance for different project types in South Africa.

The potential supply from projects, as determined in Step 2, was also weighted by applying appropriate scenarios and risk factors in terms of potential project development and implementation. This has been done due to the unlikelihood that the total mitigation as identified in the MPA will be achieved due to technical, regulatory, financial or other challenges that would hinder the development of projects within these sectors.

As such, the potential development of carbon offsets projects has been weighted to represent scenarios project development. It is assumed that a 25% scenario represents a low uptake of mitigation actions developed as carbon offset projects that are successfully registered and issued with credits, with 50% medium and 75% high scenarios.

To develop an overall projection of potential supply from eligible South African projects, the risked projection of supply from the current projects and potential implementation scenarios from the MPA were combined.

### 3.2 National Domestic Offset Market

#### 3.2.1 Demand Projections

Using the methodology and assumptions outlined in Section 3.1 the maximum estimated demand for carbon offsets in each sector covered by the carbon tax in 2016, 2020, 2030 and 2040 respectively is demonstrated in Table 3-2.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Sub-Sector</th>
<th>Offset Allowance (%)</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2016</td>
</tr>
<tr>
<td>Energy</td>
<td>Electricity and Heating</td>
<td>10%</td>
<td>27,608,493</td>
</tr>
<tr>
<td>Energy</td>
<td>Coal Mining</td>
<td>5%</td>
<td>375,434</td>
</tr>
<tr>
<td>Energy</td>
<td>Oil and Gas</td>
<td>10%</td>
<td>8,450</td>
</tr>
<tr>
<td>Energy</td>
<td>Other Energy Industries</td>
<td>10%</td>
<td>5,662,262</td>
</tr>
<tr>
<td>Energy</td>
<td>Petroleum Refining</td>
<td>10%</td>
<td>345,822</td>
</tr>
<tr>
<td>Industry</td>
<td>Aluminium Production</td>
<td>10%</td>
<td>413,101</td>
</tr>
<tr>
<td>Industry</td>
<td>Ferroalloys</td>
<td>10%</td>
<td>805,901</td>
</tr>
<tr>
<td>Industry</td>
<td>Iron and Steel</td>
<td>5%</td>
<td>2,543,954</td>
</tr>
<tr>
<td>Industry</td>
<td>Cement</td>
<td>5%</td>
<td>816,441</td>
</tr>
<tr>
<td>Industry</td>
<td>Lime</td>
<td>10%</td>
<td>291,282</td>
</tr>
<tr>
<td>Industry</td>
<td>All Chemicals</td>
<td>5%</td>
<td>228,442</td>
</tr>
</tbody>
</table>

*Available at [http://www.iges.or.jp/en/climate-energy/mm/publication.html](http://www.iges.or.jp/en/climate-energy/mm/publication.html)*

**RESEARCH AND POLICY DEVELOPMENT TO ADVANCE A GREEN ECONOMY IN SOUTH AFRICA**
It is therefore estimated that the maximum potential demand for carbon offsets in the first phase of the carbon tax is between 42,916,162 tCO$_2$e (2016) and 48,134,286 tCO$_2$e (2020). This may be expected to rise in subsequent phases, but these figures are dependent on any changes in the design of the carbon tax and the offset allowance.

Due to the uncertain nature of demand, various scenarios have been constructed that demonstrate the potential uptake of this demand from covered entities. As such, it was assumed that a 25% scenario represents low demand, 50% medium demand and 75% high demand. The potential demand for carbon offsets based on these scenarios is outlined in Table 3-3.

Table 3-3: Carbon Offset Demand Scenarios

<table>
<thead>
<tr>
<th>Demand Scenario (tCO$_2$e)</th>
<th>Year</th>
<th>2016</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (25%)</td>
<td></td>
<td>10,729,040</td>
<td>12,033,572</td>
<td>16,129,396</td>
<td>22,471,606</td>
</tr>
<tr>
<td>Medium (50%)</td>
<td></td>
<td>21,458,081</td>
<td>24,067,143</td>
<td>32,258,792</td>
<td>44,943,213</td>
</tr>
<tr>
<td>High (75%)</td>
<td></td>
<td>32,187,121</td>
<td>36,100,715</td>
<td>48,388,187</td>
<td>67,414,819</td>
</tr>
<tr>
<td>Maximum (100%)</td>
<td></td>
<td>42,916,162</td>
<td>48,134,286</td>
<td>64,517,583</td>
<td>89,886,425</td>
</tr>
</tbody>
</table>

The projection of demand based on the different scenarios is presented in Figure 3-1:

Figure 3-1: Projection of Demand Scenarios for carbon offsets in South Africa

The projections of potential demand shown in Table 3-3 and Figure 3-1 vary considerably; with upper and lower limits of 10,729,040 tCO$_2$e (low scenario) and 32,187,121 tCO$_2$e (high scenario), respectively, in 2016, rising to 12,033,572 tCO$_2$e (low scenario) and 36,100,715 tCO$_2$e (high scenario) in 2020 during Phase 1 of the carbon tax.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

The total demand for carbon offsets during the five years of Phase 1 (2016 – 2020) is expected to be between 57,024,347 tCO₂e (low scenario) and 228,097,389 tCO₂e (high scenario).

3.3 Supply Projections

As outlined in Section 3.1, the potential supply of carbon credits is based on the application of the eligibility criteria in the carbon offset paper (2014) to the current pipeline of carbon offset projects within South Africa that are seeking registration with the CDM, VCS or Gold Standard and to the potential carbon offset supply from eligible mitigation opportunities identified in the Mitigation Potential Analysis.

3.3.1 Current Carbon Offset Projects

South Africa’s overall participation in global carbon markets and the successful development of carbon offset projects has been limited. Table 3-4 provides an overview of the total number projects that are currently in the pipeline for each eligible carbon standard.

Table 3-4: South African Carbon Offset Projects Pipeline

<table>
<thead>
<tr>
<th>Project Type</th>
<th>CDM Individual Project</th>
<th>VCS</th>
<th>Gold Standard</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrous Oxide (N2O) decomposition</td>
<td>5</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Hydro power</td>
<td>3</td>
<td>1</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Other renewable energies(^{15})</td>
<td>5</td>
<td>37</td>
<td></td>
<td>42</td>
</tr>
<tr>
<td>Fuel switch</td>
<td>4</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Biomass</td>
<td>4</td>
<td>1</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Wind power</td>
<td>16</td>
<td>6</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Biogas</td>
<td>4</td>
<td>1</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Methane avoidance</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Methane recovery &amp; utilization</td>
<td>9</td>
<td>2</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>12</td>
<td>8</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Waste gas/heat utilization</td>
<td>9</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Transport</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Afforestation &amp; reforestation</td>
<td>3</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>53</td>
<td>7</td>
<td>146</td>
</tr>
</tbody>
</table>

There are 146 carbon offset projects that have either entered into the registration process, made it to validation or have been registered in South Africa. The majority of the current carbon offset projects in South Africa have been developed under the CDM, in an attempt to gain access for these credits to be used for compliance within the EU ETS before the 2012 exclusion deadline. To date, there has been limited participation in other markets through developing projects under either the VCS or Gold Standard.

The current project types that have seen prominent development as carbon offset projects includes renewable energy technologies related to solar PV and solar thermal technologies, promotion of energy efficiency, support for wind power projects, methane avoidance projects, waste gas/heat utilisation and nitrous oxide decomposition.

While the list in Table 3-4 provides a list of all projects in South Africa that are seeking registration as carbon offset projects, not all of them will be eligible under the South African carbon tax. This list was therefore assessed according to the eligibility criteria in the Carbon Offsets Paper (2014) and the projects deemed to eligible, and potentially available, under the carbon tax is outlined in Table 3-5.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

### Table 3-5: Potentially eligible carbon offset projects in South Africa

<table>
<thead>
<tr>
<th>Project Type</th>
<th>CDM Individual Project</th>
<th>CDM CPA</th>
<th>VCS</th>
<th>Gold Standard</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro power</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other renewable energies</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Biomass</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Biogas</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Methane avoidance</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Methane recovery &amp; utilization</td>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>4</td>
<td>6</td>
<td>1</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Transport</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Afforestation and reforestation</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>21</td>
<td>7</td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

It is estimated that only approximately 60 of the 146 projects currently seeking registration, or that have been registered, will be eligible under the South African carbon offsets mechanism. The current projects that would be eligible are mainly in the residential and commercial energy efficiency, household renewable energy (e.g. solar water heaters), afforestation and reforestation and biogas sectors.

### 3.3.2 Projections of Potential Supply

As described in Section 3.1, the projections of potential supply are based on the findings of the MPA. The MPA identified a number of GHG mitigation projects across the industry, energy, waste, AFOLU and transport sectors. The projects were analysed for their eligibility under the carbon offset mechanism (as defined in the Carbon Offsets Paper [2014]), and the potential for them to be developed as carbon offsets projects, i.e. the potential to be classified as being additional.

Using this approach, 32 project types were identified that could potentially supply carbon credits under a South African carbon offset mechanism. These project types, and the GHG mitigation potential for the year 2016, 2020, 2030 and 2040, are presented in Table 3-6.

### Table 3-6: Mitigation Actions eligible for carbon offsets

<table>
<thead>
<tr>
<th>Sector</th>
<th>Project Type</th>
<th>Mitigation Potential (tCO₂e)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2016</td>
</tr>
<tr>
<td>AFOLU</td>
<td>Biochar addition to cropland</td>
<td>371,178</td>
</tr>
<tr>
<td>Waste</td>
<td>Treatment of livestock waste</td>
<td>92,880</td>
</tr>
<tr>
<td></td>
<td>Rural tree planting (thickets)</td>
<td>835,392</td>
</tr>
<tr>
<td></td>
<td>Urban tree planting</td>
<td>323,252</td>
</tr>
<tr>
<td></td>
<td>Restoration of mesic grasslands</td>
<td>115,248</td>
</tr>
<tr>
<td></td>
<td>LFG recovery and generation</td>
<td>2,905,877</td>
</tr>
<tr>
<td></td>
<td>LFG recovery and flaring</td>
<td>1,245,376</td>
</tr>
<tr>
<td></td>
<td>Paper recycling</td>
<td>903,791</td>
</tr>
<tr>
<td></td>
<td>Energy from waste</td>
<td>521,590</td>
</tr>
<tr>
<td></td>
<td>Home composting</td>
<td>49,913</td>
</tr>
<tr>
<td></td>
<td>Windrow composting</td>
<td>105,842</td>
</tr>
</tbody>
</table>

16 It is noted that these figures will diverge from the Carbon Sinks Assessment (to be published), currently being undertaken by the Department of Environmental Affairs.
### An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

#### Mitigation Potential (tCO$_2$e)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Project Type</th>
<th>2016</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In-vessel composting</td>
<td>113,658</td>
<td>189,431</td>
<td>681,950</td>
<td>726,601</td>
</tr>
<tr>
<td></td>
<td>Anaerobic digestion</td>
<td>140,410</td>
<td>234,016</td>
<td>1,198,162</td>
<td>1,276,056</td>
</tr>
<tr>
<td>Transport</td>
<td>Road - Shifting passengers from cars to public transport</td>
<td>492,245</td>
<td>820,409</td>
<td>3,087,281</td>
<td>6,241,406</td>
</tr>
<tr>
<td></td>
<td>Efficient Lighting</td>
<td>403,924</td>
<td>686,047</td>
<td>1,570,002</td>
<td>963,877</td>
</tr>
<tr>
<td></td>
<td>Heat pumps - Existing Buildings</td>
<td>117,074</td>
<td>198,846</td>
<td>455,054</td>
<td>279,373</td>
</tr>
<tr>
<td></td>
<td>Heat pumps - New Buildings</td>
<td>135,992</td>
<td>230,976</td>
<td>528,583</td>
<td>324,515</td>
</tr>
<tr>
<td></td>
<td>HVAC: with heat recovery - New Buildings</td>
<td>421,570</td>
<td>715,219</td>
<td>1,641,978</td>
<td>1,021,874</td>
</tr>
<tr>
<td></td>
<td>HVAC: Variable speed drives - Existing Buildings</td>
<td>267,047</td>
<td>453,567</td>
<td>1,037,977</td>
<td>637,249</td>
</tr>
<tr>
<td></td>
<td>HVAC: Variable speed drives - New Buildings</td>
<td>324,271</td>
<td>550,760</td>
<td>1,260,401</td>
<td>773,802</td>
</tr>
<tr>
<td></td>
<td>HVAC: Central air conditioners - New Buildings</td>
<td>96,804</td>
<td>164,418</td>
<td>376,267</td>
<td>231,003</td>
</tr>
<tr>
<td></td>
<td>Energy efficient appliances</td>
<td>87,188</td>
<td>148,085</td>
<td>338,890</td>
<td>208,056</td>
</tr>
<tr>
<td></td>
<td>Passive building/improved thermal design - New Buildings</td>
<td>1,154,300</td>
<td>1,958,338</td>
<td>4,495,893</td>
<td>2,797,987</td>
</tr>
<tr>
<td>Industry</td>
<td>Energy efficient appliances</td>
<td>636,930</td>
<td>795,748</td>
<td>1,260,713</td>
<td>1,039,102</td>
</tr>
<tr>
<td>Commercial Energy Efficiency</td>
<td>Geyser Blankets</td>
<td>101,600</td>
<td>314,469</td>
<td>909,797</td>
<td>357,498</td>
</tr>
<tr>
<td></td>
<td>Improved Insulation - New Buildings</td>
<td>502,379</td>
<td>818,873</td>
<td>1,714,566</td>
<td>948,503</td>
</tr>
<tr>
<td></td>
<td>Improved Insulation - Existing Buildings</td>
<td>301,427</td>
<td>491,324</td>
<td>1,028,739</td>
<td>569,102</td>
</tr>
<tr>
<td></td>
<td>Efficient Lighting - Fluorescent Lamps</td>
<td>5,583,818</td>
<td>6,272,264</td>
<td>8,150,123</td>
<td>8,190,438</td>
</tr>
<tr>
<td></td>
<td>Efficient Lighting - LEDs</td>
<td>41,645</td>
<td>134,559</td>
<td>422,724</td>
<td>175,710</td>
</tr>
<tr>
<td></td>
<td>Solar water heating</td>
<td>269,176</td>
<td>841,814</td>
<td>2,486,670</td>
<td>991,828</td>
</tr>
<tr>
<td></td>
<td>LPG for cooking</td>
<td>146,768</td>
<td>373,940</td>
<td>1,036,203</td>
<td>449,995</td>
</tr>
<tr>
<td></td>
<td>Passive building/improved thermal design - New Buildings</td>
<td>793,230</td>
<td>1,292,958</td>
<td>2,707,209</td>
<td>1,497,636</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>19,601,795</td>
<td>30,136,624</td>
<td>61,597,480</td>
<td>63,459,679</td>
</tr>
</tbody>
</table>

The potential maximum supply from all project types deemed to be compliant with the Carbon Offset Paper (2014) is 19,601,795 tCO$_2$e in 2016, 30,136,624 tCO$_2$e in 2020, rising to 61,597,480 tCO$_2$e in 2030 and 63,459,679 tCO$_2$e in 2040. The figures in Table 3-6 provide an indication of the maximum potential carbon credits that could be generated in South Africa, if all project types were developed, registered as carbon offset projects, implemented to meet maximum potential and emission reductions were successfully verified and carbon credits issued.
Achieving full issuance and realisation of these project types is however unlikely, due to the complexities of registering many of the potentially eligible project types. A number of these project types have traditionally been difficult to incorporate under carbon credit mechanisms as they are implemented at small individual scales across a large geographical area and have complex project level monitoring and verification processes to ensure GHG emissions reductions. To reach appropriate scale they are often incorporated under programmatic registration processes which come with their own challenges including identifying projects, ensuring they remain operational over the lifetime of the registration process (and thus result in issued credits) and the complications that could arise in developing a rigorous monitoring and evaluation system for each individual project.

### 3.3.3 Carbon Offset Supply Scenarios

As stated in Section 3.3.1, the potential supply of carbon credits in a South African market is premised on two assumptions:

1. The risk of carbon credit issuance from current projects; and
2. The likelihood that potential eligible GHG emission mitigation projects would be developed and registered as carbon offset projects.

The potential volume of carbon credits from the risked pipeline\(^{17}\) of eligible projects is highlighted in Table 3-7.

#### Table 3-7: Risked pipeline of existing carbon offset projects

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Issuance Risk Factor (%(^{11}))</th>
<th>Risked Volumes (tCO(_2)e)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2016</td>
</tr>
<tr>
<td>Hydro power</td>
<td>87%</td>
<td>9,672</td>
</tr>
<tr>
<td>Other renewable energies(^{18})</td>
<td>66%</td>
<td>399,543</td>
</tr>
<tr>
<td>Biomass</td>
<td>77%</td>
<td>12,995</td>
</tr>
<tr>
<td>Biogas</td>
<td>58%</td>
<td>45,575</td>
</tr>
<tr>
<td>Methane avoidance</td>
<td>58%</td>
<td>72,215</td>
</tr>
<tr>
<td>Methane avoidance &amp; utilization</td>
<td>52%</td>
<td>707,036</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>66%</td>
<td>186,899</td>
</tr>
<tr>
<td>Transport</td>
<td>37%</td>
<td>14,721</td>
</tr>
<tr>
<td>Afforestation &amp; reforestation</td>
<td>125%</td>
<td>7,651</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1,456,307</strong></td>
</tr>
</tbody>
</table>

If the current carbon offset projects seeking registration and issuance in South Africa are risked against being developed, registered and issuing carbon credits, then the potential supply volumes are 1,456,307 tCO\(_2\)e in 2016; 1,309,242 tCO\(_2\)e in 2020 and 350,030 tCO\(_2\)e in 2030. These potential volumes fall off towards 2040 due to the stated crediting periods (between 10 and 21 years) of the projects being depleted close to this time.

The carbon offset projects identified in Table 3-6 have also been risked for development and issuance according to low, medium and high scenarios. The low project development scenario is classified as being 25% of GHG emissions reduction potential realised from mitigation actions, while 75% represents the estimated highest scenario from mitigation actions. Realising all of the identified mitigation project development opportunities and registering them as carbon projects is not determined to be realistic due to the challenges associated with GHG project registration and issuance, and the unlikelihood that all projects would be developed.

Table 3-8 highlights the supply scenarios of carbon offsets available from potentially eligible GHG mitigation projects implemented after 2015.

\(^{11}\) Defined as the potential issuance of carbon credits based on issuance success of equivalent project types under the CDM.

\(^{18}\) All of these projects relate to the installation of household solar water heaters.
Potential volumes range from 4,900,449 tCO₂e to 14,701,346 tCO₂e in 2016, increasing to between 7,534,156 tCO₂e and 22,602,468 tCO₂e in 2020.

The overall project potential supply of carbon credits into the South African market is estimated to be the sum of the mitigation potential from the risked pipeline of current projects and the estimated GHG emissions reductions potential from future mitigation projects. The different potential supply of carbon credits in South Africa scenarios are illustrated in Figure 3-2.

<table>
<thead>
<tr>
<th>Supply Scenario (tCO₂e)</th>
<th>Year</th>
<th>2016</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (25%)</td>
<td></td>
<td>4,900,449</td>
<td>7,534,156</td>
<td>15,399,370</td>
<td>15,864,920</td>
</tr>
<tr>
<td>Medium (50%)</td>
<td></td>
<td>9,800,898</td>
<td>15,068,312</td>
<td>30,798,740</td>
<td>31,729,839</td>
</tr>
<tr>
<td>High (75%)</td>
<td></td>
<td>14,701,346</td>
<td>22,602,468</td>
<td>46,198,110</td>
<td>47,594,759</td>
</tr>
</tbody>
</table>

The range of potential supply of carbon credits in South Africa varies from the low scenario of 7,348,486 tCO₂e to 17,149,384 tCO₂e in the high scenario in 2016. This supply is expected to increase over time as more projects are developed and registered. The decrease in projected supply which occurs after 2035 is the result of reduced mitigation potential and associated supply of carbon credits from residential energy efficiency projects, which reach their theoretical maximum penetration at that time, according to the MPA study.

The current, eligible, carbon offset projects that were developed or operational between 2005 and 2015 could potentially contribute a once-off 9,086,041 tCO₂e (the absolute total in the pre-tax period) if they successfully obtain registration and issuance for emission reductions achieved during this period. These projects could be used to support compliance and the market during Phase 1 and overcome some of the expected lag between the tax introduction and the development of carbon offset projects.

### 3.4 Final Supply And Demand Estimate

The overall picture of supply and demand for carbon offsets is presented in Figure 3-3. In this figure, the potential demand scenarios are illustrated for low, medium, high and maximum (as calculated in Section 3.2.1). The low to high supply scenarios are illustrated as the green shaded area (as presented in Section 3.3.3).
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

Figure 3-3: Potential Market Scenarios for a South Africa Carbon Offset Market

If demand for carbon credits is low (25%) then it is predicted that the supply during Phase 1 (if the pre-tax period credits are included) could be sufficient to meet demand. If demand is approximately 50% of the maximum then the potential supply from eligible projects (if the pre-tax projects are included) could meet demand in Phase 1. This would however require approximately 50% to 75% of all GHG mitigation projects to be successfully implemented, registered and issued as carbon offset projects before or during 2016.

If demand during Phase 1 is higher, at 75% or 100% (as expected), then supply will be significantly lower, this trend is consistent throughout Phase 1. In Phase 2 and 3 of the carbon tax it is predicted that the gap between supply and demand will decrease with potential supply exceeding predicted demand (at the 50% levels) around 2020. If, as expected, demand is high (at 75% or greater) supply could only meet demand around 2030, and then fall of sharply in 2036 and will be unable to satisfy demand.

It is anticipated that during Phase 1 (and subsequent phases), the demand for carbon offsets will lie between 95% and 100% of maximum demand due to the potential to utilise offsets to reduce the cost of compliance. This prediction of demand is predicated on the fact that 83% of the potential demand for carbon offsets could come from just three covered sectors (electricity, other energy and iron and steel) and thus covered entities within these sectors could dominate the market, if they can secure sufficient supply from many smaller sellers.

3.5 Forecasting trading volumes in the South Africa offset market

While it is necessary for all offsets to pass from a project owner to a buyer (appreciating that South African corporates under the carbon tax may choose to develop their own offset projects), not all transactions will pass through the carbon offset exchange. Trades could also be conducted bilaterally.

Estimating the proportion of the traded versus non-traded sector is challenging in a market with no trading history. Looking at the European offset market, a reasonable proportion of the annual CER issuance flowed into exchange traded volume. The approximate annual CER issuances were as follows:19

- 2007 = 75m tonnes
- 2008 = 140m tonnes
- 2009 = 125m tonnes
- 2010 = 130m tonnes
- 2011 = 315m tonnes

CER trading on European exchanges was higher, but included three forms of trades: spot trades, options and futures. There were also some minor ERU trading volumes (only ever a maximum of a few percent of the total trades). Traded volumes were 1.8 billion tonnes in 2011, compared to 1.3 billion tonnes in 2010. Of this, futures were approximately 80%, spot 10% and options 10%. At the peak of the market, 550m offsets were traded in Q4 of 2011.

---

3.6 Implications for a Carbon Offset Exchange

These demand and supply scenarios have implications for the design and feasibility of establishing a carbon exchange in South Africa. During Phase 1 of the carbon tax, demand will exceed supply, and thus the market will be effectively capped by the levels of supply available (if the carbon offset eligibility criteria, as proposed and modelled, remain). This will have a direct impact on the development of a carbon exchange due to the fact that a constraint will be placed on the potential volumes of trade that could be transacted via the exchange. Not all trade will occur via the exchange, with a portion being conducted in the OTC markets, thus reducing the volumes passing through the exchange.

It is expected that in the short-term, the market will be relatively unbalanced between buyers and sellers; as buyers will be present in the first few years of the tax, while there could be limited sellers due to delays in project development, registration and issuance of carbon credits. The market will therefore be in favour of the sellers who have credits to trade and pushing the price of carbon credits up to the marginal carbon tax rate.

To some extent, the impact the potential imbalance of demand and supply could be reduced by the validation, verification and issuance of existing eligible CDM, VCS and GS projects and support for the development and registration of projects that can be implemented relatively quickly. This would require project development, registration and issuance before or during 2016 to satisfy a portion of the unmet demand.

To be used for compliance under the carbon tax, any carbon offset will have to be surrendered for retirement, either by the purchasing entity or transferred to a designated authority. As a result, this will take that specific carbon credit out of the market and reduce the overall volume available for sale. It is anticipated that trading by market participants will be relatively infrequent, with those looking for compliance purchases entering, exiting and retiring these credits once there demand is fulfilled.

It is also possible during Phase 1 of the carbon offsets scheme that the price of carbon offsets from eligible and issued projects could exceed the marginal carbon tax rate in year 1. This would result in limited supply being purchased in year 1 and thus this would not conflict with National Treasury’s stated intention that projects cannot benefit from double incentives.

This scenario could support the secondary trading of offsets via an exchange, but due to the upper and lower price caps imposed by the carbon tax, it is also expected that this will be limited. This will affect the liquidity of the market and could have an impact on price discovery through tilting the balance of the market to favour the asking prices of sellers.

In the short term, it is predicted that the market for carbon credits in South African will be relatively illiquid due to supply constraints, and low market activity. This will have a direct bearing on the financial feasibility and structure of a South African carbon offset exchange. While this won’t mean that there will be no trading, it is anticipated that trading will take place close to the compliance period or for future compliance processes, with buyers entering the market to fulfil compliance needs and then exiting or holding credits.

It is clear from the findings in this section that the supply of carbon offsets will be the limiting factor in the market. As such, there are a number of options for policy makers to support the supply side of the market, including providing technical support to projects developers and allowing new project types to be eligible under the carbon tax. In particular, further consideration could be given to the types of projects that could be included as eligible, to support the market and the objectives of carbon offset mechanism.

Specifically, the potential project types that could be explicitly included to bolster supply and support the market relate to GHG mitigation projects implemented to provide electricity from alternative energy sources. It is further proposed that these projects could be implemented to supply electricity to liable or non-liable entities and still be eligible to generate carbon credits. This is proposed as there is no existing incentive or process encouraging the development of projects of this nature and thus this would not conflict with National Treasury’s stated intention that projects cannot benefit from double incentives.
Liable entities should also be eligible to generate carbon offsets from these projects types for use to reduce their own liabilities, or for sale to other covered entities, as these projects will reduce their indirect emissions and not their taxed direct emissions. These projects types would also support sustainable development in South Africa through supporting electricity supply and creating a new sector for job creation, local manufacturing and other additional benefits.

The Integrated Resource Plan for Electricity Update Report (IRP 2013) (Department of Energy 2013) states that the uptake of embedded generation (with a focus on solar photovoltaic systems installed on residential buildings as a proxy) could reach approximately 10,000 MW by 2020. While the IRP 2013 update (Department of Energy, 2013) is not official policy, there is anecdotal evidence that the installation of solar PV systems on residential and commercial facilities is increasing, with an estimate of over 10 MW of installed capacity already achieved. If only half the IRP 2013 projections up to 2020 are realised (approximately 5,000 MW of installed solar PV on residential rooftops) this could result in an additional 8,584,800 tCO₂e in 2020 for the carbon offset market.

The inclusion of these projects would not ensure that supply meets maximum. It would, however, offer increased supply and options for covered entities. It would also support the installation of renewable energy sources and support electricity supply in South Africa. While the inclusion of small scale renewable energy as an eligible project could boost supply, more detail needs to be provided on the eligible and ineligible project types.

In an effort to boost the supply side of the market, taxed entities should not have a blanket exclusion applied from participating in the carbon offsets mechanism. While projects that reduce the direct emissions of a covered entity should not be eligible to generate carbon offsets, consideration for participation should be given to project types that reduce indirect emissions (e.g. reduce electricity consumption). If a covered entity implements a project on this emission source (e.g. through implementing low-carbon electricity generation or energy efficiency measures) they should have the option to pursue either the option to obtain an existing government subsidy, e.g. the energy efficiency tax incentive (and thus be unable to use these as carbon offset projects in South Africa), or register the project to generate carbon offsets for use against their own tax liability or for sale into the market.

This provision could allow for increased supply of carbon offsets, but also provide covered entities with a choice on how to finance mitigation measures and clarity on which options (market or non-market) offer lower costs of implementation and participation.
4 Financial Sustainability of a South African Carbon Offset Exchange

A robust and sustainably-financed carbon offset platform in South Africa will support both energy intensive industries and carbon offset suppliers. The extent of the potential demand for offsets, and limited sources of large-scale offset projects within South Africa means that an exchange platform is crucial to ensure smaller providers of offset projects can interact with larger buyers at minimum transaction costs to both sides.

Any offset platform has to be financially feasible and sustainable as it will be managed and run by private sector institutions. The financial viability of a carbon offset exchange is however contingent on the market dynamics (Section 3) of supply and demand and how many of the market participants join the exchange, volume of transactions that pass through the exchange and the liquidity of the market.

Accordingly, this section aims to understand whether the dynamics of the South African market are able to sustain a carbon offset exchange. This is achieved through investigating international best practice in carbon exchange design, key requirements for both capital and operating costs and by modelling potential scenarios of market dynamics and different business models as they may be applied in the South African market.

In this section, we have not attempted to value the economic benefit of a trading platform over a fragmented market where bilateral trades need to be negotiated between buyers and sellers, nor do we recommend which model is the most suitable for adoption in South Africa. These scenarios are for illustrative purposes, based on the experience and current practices in other market to determine whether a South African carbon offset market is likely to sustain a carbon offset exchange.

4.1 Carbon Offset Exchange Business Models

It is possible to levy a diverse range of fees when operating a carbon offset exchange. These fees may include:

- **Membership fees:** are levied to participants wishing to gain access to the market and become a member of the exchange. In some cases, such as in the InterContinental Exchange Futures Europe (ICEFE), this does not necessarily permit the trading of offsets.

- **Emissions trading licenses:** are applied, in the case of Intercontinental Exchange Future Europe (ICEFE), to members wishing to trade in the emissions or offsets markets.

- **A Market User ID:** provides the participant with a user ID and access to online market data. The fee can vary depending on the quantity of information made available and level of service purchased.

- **Transaction fees:** are applied on every purchase or sale of offsets on the exchange, and can take many forms:
  - A plain fee, i.e. of equal value regardless of volume or value;
  - A fee as a percentage of trade value, or
  - A fee per tonne of carbon dioxide equivalent traded

Established carbon exchange platforms such as ICEFE and Carbon Trade Exchange (CTX) apply membership fees, fixed and variable transaction fees and other forms of licence and auction fees (see Table 4-1). These fees are not mutually exclusive and a combination is generally applied such as general membership fee and a standard transaction fee, with an additional charge per tonne of emissions reduced on the same transaction.

Fees can also vary between buyers and sellers, and different fee structures may be applied depending on the value and volume of trades. For example, the CTX Renewable Energy Certificate (REC) market applies a transaction fee of $30 for any trade up to 999 RECs, while trades exceeding this quantity are levied at $0.03 per Renewable Energy Certificate.²⁰

Other fees may be applied in more complex trade situations, or when the exchange must carry out additional services to complete the transaction. These include:

- **Discounted Unit Transaction Fee:** A service fee payable by a buyer when the value of the units within a transaction is above the Discounted Unit Price Threshold; and

- **International Trade Transaction:** A fee payable by a buying member on completion of an international trade.

The different fee structures that are applied by the ICEFE and CTX are illustrated in Table 4-1.

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An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

Table 4-1: Comparison of fee structures for the CTX and ICEFE offset platforms

<table>
<thead>
<tr>
<th>Revenue streams</th>
<th>CTX</th>
<th>ICEFE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership fee (buyer) ($)</td>
<td>$ 4,000</td>
<td>$ 11,500</td>
</tr>
<tr>
<td>Membership fee (seller) ($)</td>
<td>$ 2,500</td>
<td>$ 11,500</td>
</tr>
<tr>
<td>Transaction fee % of value (buyer) (%)</td>
<td>2.0%</td>
<td></td>
</tr>
<tr>
<td>Transaction fee % of value (seller) (%)</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Transaction fee: per tonne (buyer) ($)</td>
<td></td>
<td>$ 0.00090</td>
</tr>
<tr>
<td>Transaction fee: per tonne (seller) ($)</td>
<td></td>
<td>$ 0.00090</td>
</tr>
<tr>
<td>Clearing fee: per tonne (buyer) ($)</td>
<td></td>
<td>$ 0.00211</td>
</tr>
<tr>
<td>Clearing fee: per tonne (seller) ($)</td>
<td></td>
<td>$ 0.00211</td>
</tr>
<tr>
<td>Emissions trading license</td>
<td></td>
<td>$ 2,500</td>
</tr>
<tr>
<td>Market User ID</td>
<td></td>
<td>$ 85</td>
</tr>
</tbody>
</table>

The set-up and combination of fees can have a significant impact on the type and size of organisations taking part in the exchange, and equally the supply and demand of offsets. Selecting a careful balance of fees can ensure a steady revenue stream for the exchange, while incentivising traders of all sizes to use its services in preference for bilateral OTC trading.

A large basic membership fee will dis-incentivise smaller organisations from entering the market, as the costs will be too high. Furthermore, applying significantly different membership fees to buyers and sellers may create an imbalance in supply and demand, or represent lost revenues for the registry where one group is charged disproportionately less. The transaction fees applied can also influence the relative attractiveness of the exchange to both large and small traders. If a large plain transaction fee is applied, organisations trading in smaller volumes can pay significantly more per tonne relative to larger players, and the exchange may not represent an attractive financial proposition. The use of varying levels of fees structure observed in existing exchanges suggests that larger trades are favoured, as the administration cost for the exchange is comparatively lower. A consideration for distribution of expected trade volumes can ensure a fair, viable transaction fee is applied.

A relatively low fee per tonne will encourage larger traders to participate in the exchange, in preference to bilateral trading. These are applied in conjunction with other fees to ensure that adequate revenues are made from smaller traders, without the capacity to trade bilaterally.

Accordingly, to understand how the differing business models could be applied to a South African carbon offset exchange these were modified, based on a number of assumptions, to reflect the potential scenarios in South Africa.

4.1.1 The CTX Business Model

The CTX has been designed to facilitate the exchange of carbon credits in the voluntary carbon market, from a wide variety of participants and buyers. This includes corporate buyers (large, medium and small) seeking to purchase carbon offsets for corporate social responsibility purposes, and to provide smaller project developers and originators with access to the voluntary carbon markets.

The revenue model of the exchange has been designed with the exchange operators overall purpose in mind and aims to provide relatively easy access to the exchange for both buyers and sellers through a low annual membership fee and additional revenue being generated through transaction fees. This low membership fee makes it attractive and easy to join for all participants, whether large or small, and thus increases potential participants in the market. The revenue modelling assumptions in this section are consistent with the approach used by CTX, i.e. generating revenues from a membership fee plus a transaction fee based on percentage of value of each transaction applied to both buyers and sellers.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

exchange is assumed at R 30,000 for buyers and R 20,000 for sellers. These figures are lower than for the CTX, given the fact that the South Africa exchange is likely to be smaller and not as mature. These figures are also assumed to be attractive to both buyers and sellers as it is anticipated that the larger buyers will participate in the exchange, and thus will be willing to pay a slightly higher fee, while not excluding smaller sellers. In addition to the annual membership fee, a transaction fee is charged as a percentage of value: 0.5% for the buyer and 2.0% for the seller (as shown in the Table 4-2).

Table 4-2: Assumptions for the CTX business model approach

<table>
<thead>
<tr>
<th>Revenue streams</th>
<th>CTX</th>
<th>SA Exchange scenario (CTX approach)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership fee: (buyer) ($)</td>
<td>$ 4,000</td>
<td>R30,000</td>
</tr>
<tr>
<td>Membership fee: (seller) ($)</td>
<td>$2,500</td>
<td>R20,000</td>
</tr>
<tr>
<td>Transaction fee: % of value (buyer) (%)</td>
<td>2.0%</td>
<td>0.50%</td>
</tr>
<tr>
<td>Transaction fee: % of value (seller) (%)</td>
<td>5.0%</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

4.1.2 The ICEFE Business Model

The ICEFE has been established to support the European compliance carbon market and allows for the trading of EUAs, CERs and Emission Reduction Units (ERUs). The movement of EUAs is primarily responsible for the majority of transaction through this exchange.

The revenue model of this exchange has been designed to take into account the dynamics of the carbon market in which it is situated. The trades of EUAs are generally between large, established businesses throughout the EU territory for compliance purposes. Limited trading of CER futures has been conducted through the exchange, but in turn this is from larger holders of CERs and compliance buyers.

The ICEFE model therefore is designed to align with the participants on the exchange and requires higher, and equal, annual membership fees for buyers and sellers, participants to hold an emissions trading licence and purchase a market user ID. The fees also include equivalent transaction and clearing fees for both buyers and sellers.

The ICE fees (per tonne rather than as a percentage of the trade value) are significantly lower than the CTX fees. This is likely to be because the European market is large with multiple exchanges in operation and considerable liquidity in the trade of EUAs.

If the ICEFE model was followed in South Africa, the key assumptions are highlighted in Table 4-3. These assumptions include levying a higher and equal membership fee for both buyers and sellers and requiring participants to hold an emissions trading licence and market user ID. This model that is more in line with the approach used in ICEFE (higher membership fee and a per-tonne transaction fee) may include a basic annual membership fee of R 50,000 for buyers and sellers, a per tonne transaction fee of R 0.01 and a clearing fee of R 0.02 on both the buyer and seller. Other fees have been added as set out in the following table.
Table 4-3: Assumptions for the ICEFE business model approach

<table>
<thead>
<tr>
<th>Revenue streams</th>
<th>ICEFE</th>
<th>SA Exchange scenario (ICEFE approach)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Membership fee</strong> (buyer) ($)</td>
<td>$11,500</td>
<td>R50,000</td>
</tr>
<tr>
<td><strong>Membership fee</strong> (seller) ($)</td>
<td>$11,500</td>
<td>R50,000</td>
</tr>
<tr>
<td><strong>Transaction fee</strong>: per tonne (buyer) ($)</td>
<td>$0.00090</td>
<td>R0.01</td>
</tr>
<tr>
<td><strong>Transaction fee</strong>: per tonne (seller) ($)</td>
<td>$0.00090</td>
<td>R0.01</td>
</tr>
<tr>
<td><strong>Clearing fee</strong>: per tonne (buyer) ($)</td>
<td>$0.00211</td>
<td>R0.02</td>
</tr>
<tr>
<td><strong>Clearing fee</strong>: per tonne (seller) ($)</td>
<td>$0.00211</td>
<td>R0.02</td>
</tr>
<tr>
<td><strong>Emissions trading license</strong></td>
<td>$2,500</td>
<td>R15,000</td>
</tr>
<tr>
<td><strong>Market User ID</strong></td>
<td>$85</td>
<td>R500</td>
</tr>
</tbody>
</table>

### 4.2 Resource Requirements and Cost Estimations

While the different revenue models outlined in Sections 4.2.1 and 4.2.2 provide an indication of the current models being utilised in carbon offset exchanges to generate revenue, the additional considerations relate to gaining understanding of the required resources and the costs (both capital and operating costs) of establishing a carbon offset exchange in South Africa. This is imperative to understand whether possible revenue from operations could cover the costs of the entity operating the exchange.

Any exchange platform will be relatively expensive to build “from scratch”. However, there are already trading exchanges that could be re-tasked, expanded or copied for use in South Africa, e.g., the CTX. Alternatively, existing trading platforms within South Africa (for example as used by JSE) could also be developed to include carbon offsets, as demonstrated by Promethium Carbon (2015).

Each option for development of a carbon offset exchange, whether the development of a new system or utilisation of existing operations, comes with its own challenges, costs and resource requirements. In each case, there are various technical requirements for a carbon trade exchange to function suitably including infrastructure, security and online trading platforms.

#### 4.2.1 Exchange Functionality and Operational Modules

Important technical considerations that need to be detailed (and budgeted for) when designing or establishing a carbon trading exchange include:

- **Security**: As a platform expands, the value of assets will also grow and security is essential to safeguard the credibility of a web-based exchange platform. Important elements of security include defining how users are granted access to the system (Registration or Know Your Customer), mitigating the risk of leakage of ‘live’ data from operational and technical staff to reduce the risk of ‘Denial of Service’ attacks on the infrastructure. Building in security from the start ensures trust in the system.

- **Core modules**: An offset platform can both track carbon assets and act as a reporting tool. Should consist of the following modules when designing the key technical specifications:
  - **Unit management**: Module for the creation of unit types, unit blocks, serial numbers along with management of issuance limits and rules for holding, transacting and fungibility;
  - **Transaction management**: Module for managing all transaction types and rules including issuance, cancellation and transfer;
  - **Verification**: Module for management of verification entities along with definition of verification activities and rules; and
  - **Authentication and security**: Module for enforcing any security and authentication rules such as dual-factor authentication or password expiry rules.

- **User interface/trading platform**: An important element for the carbon exchange is the user interface, which needs to be clear and informative. A robust and well-designed interface (such as the CTX or ICEFE platform) will allow user control for trading multiple products on offer, including filters for vintages, project documentation, offer or buy price

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21 Based on industry expertise and research conducted by Verco and SFW.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

and origin of credit. In early stages of development, all of these features may not be necessary and it is important to balance user needs with cost considerations. Additional features can be developed as the market matures. 22

- **Hosting:** An exchange that has to handle significant data load will need to be hosted on a server that is secure and capable of responding to transactions at peak times. Some exchanges have started using cloud hosting which supports increased access, rapid scalability and reduced operating costs, reducing concerns over hardware operation.

- **Data management:** A robust data management plan will focus on defining the information and business requirements, the concepts to be reported, the relations between them, the main users in the data value chain and what functions the users will execute at each step of the value chain. Additionally the plan will specify quality controls, procedures and overall management of the data, how it will be validated and stored and importantly how the security controls will be implemented.

While the technical requirements need to be considered in establishing the exchange, there are also the critical areas of staffing and management to ensure effective implementation and operation.

### 4.2.2 Expertise and Staff

There are three main aspects off staffing and expertise that need to be considered when establishing an exchange, these are:

- **Build staff:** Professional software and hardware maintenance expertise will be required to support systems design and integration, procurement of software licenses, website and platform design and build;

- **Operational staff:** Operational staffing of the system will need to be reviewed during the definition and design of the exchange platform. The number of members and transactions on the exchange platform will be a key aspect in operational planning (in particular for the finance team, with invoicing and debt management activities); and

- **System administrators:** will need to have expertise that is in line with financial/banking protocols and financial transactions. Other key on-going staff requirements include marketing, IT / systems manager and accounting staff. A dedicated support facility may be required to receive, handle and resolve ongoing questions from users.

Additional user and legal support may be required at certain times, but full time employees covering these roles will not be needed. An example of an organisational chart for the management and operation of a carbon exchange is provided in Figure 4-1.

4.3 Capital and Operating Cost Estimations

The costs to establish and operate the platform are driven by the technical and staffing requirements outlined above. The business model is flexible (as trading activity and revenues grow over time, additional staff can be recruited as required).

#### 4.3.1 Capital Costs

The capital costs could include the following:

- Systems design and integration;
- Procurement of software licences;

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22 Based on industry expertise and research conducted by Verco and SFW.

RESEARCH AND POLICY DEVELOPMENT TO ADVANCE A GREEN ECONOMY IN SOUTH AFRICA
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

- Consultancy;
- Marketing upfront; and
- Website / platform design and build

The upfront costs involved in establishing a carbon offset exchange in South Africa will however vary depending on the party that develops or operates an exchange. There are three envisioned models that could be pursued to establish an exchange, these include:

- utilising existing South African exchange infrastructure;
- establishing existing carbon offset exchanges; or
- developing a new platform.

As a result, estimating these costs is difficult, because it is not yet clear whether an existing carbon exchange (e.g. CTX or ICEFE), an existing commodity exchange (JSE) or a brand new platform will be preferred. The model pursued to develop an exchange is also contingent on the regulatory regime that will be developed to support carbon offset trading and any licences required to participate (e.g. according to the FSA, 2012).

It has been widely proposed and envisioned that existing South African-based exchange infrastructure will be utilised, e.g. the JSE commodity derivatives platform, to cost and support effectively and rapidly the development of an exchange. Promethium Carbon (2015) highlight that utilising existing infrastructure will not only support the rapid development of the market, but also ensure economies of scale are achieved through utilising already-established, functioning and trusted technical infrastructure.

It is therefore assumed that minimal upfront costs will be required to establish the exchange in South Africa and any costs could be sourced from or covered by grants from international (or local) climate finance funding sources or recovered from the market directly.

### 4.3.2 Operational Costs

To ensure the effective functioning of a carbon offset exchange a dedicated team will have to be established by the exchange operator to facilitate trades, assist members and ensure functionality. The costs therefore include many of the aspects related to the basic staffing requirements and costs involved in operating an exchange.

It has to be noted that these costs are for indicative purposes and represent the generally estimated expenses involved in operating an exchange. It is also recognised that depending on the developer of an exchange that these costs will vary based on their unique cost profiles. These costs also represent the costs involved in establishing a stand-alone carbon offset exchange, and if existing exchange infrastructure is utilised then the costs could be substantially lower particularly many of those related to offices costs and overheads.

The estimated direct involved in operating a carbon offset exchange platform in initial years are provided in Table 4-4 and Table 4-5. These costs assume a small, lean team (sized in relation to the initially smaller market volumes) and the fact that no complex transactions, such as auctions, are expected in the short term.

Based on the organisational chart presented in Figure 4-1, it is expected that the management of the exchange will require approximately four full time staff members. The median annual salary for these potential employees is provided in Table 4-4.

**Table 4-4: Indicative Staffing Costs**

<table>
<thead>
<tr>
<th>Role</th>
<th>Annual Cost (ZAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing manager</td>
<td>316,000</td>
</tr>
<tr>
<td>IT / systems manager</td>
<td>398,000</td>
</tr>
<tr>
<td>Accounting 1</td>
<td>250,000</td>
</tr>
<tr>
<td>Accounting 2</td>
<td>250,000</td>
</tr>
</tbody>
</table>

Furthermore, the estimated costs for housing, operating and supporting the exchange are outline in Table 4-5. These costs include aspects such as office rental, insurance costs, incidentals, staff training and ad-hoc legal and professional assistance as required.

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23 All average salary figures sourced from Payscale at http://www.payscale.com/research/ZA/Country=South_Africa/Salary

RESEARCH AND POLICY DEVELOPMENT TO ADVANCE A GREEN ECONOMY IN SOUTH AFRICA
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

Table 4-5: Estimated Support Costs

<table>
<thead>
<tr>
<th>Operating Expense</th>
<th>Annual Cost (ZAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office rent / rates</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Electricity, insurances</td>
<td>60,000</td>
</tr>
<tr>
<td>Other office costs</td>
<td>40,000</td>
</tr>
<tr>
<td>Staff training</td>
<td>80,000</td>
</tr>
<tr>
<td>IT &amp; communications</td>
<td>160,000</td>
</tr>
<tr>
<td>Staff travel</td>
<td>16,000</td>
</tr>
<tr>
<td>Marketing</td>
<td>400,000</td>
</tr>
<tr>
<td>Legal and Professional</td>
<td>100,000</td>
</tr>
</tbody>
</table>

As the market matures, and offset volume transactions grow, staffing costs and overheads are not likely to increase by more than revenues.

The costs outlined in Table 4-4 and Table 4-5 are further utilised in understanding if the development of a carbon offset exchange is financially feasible.

4.4 Transaction Volume Scenarios and Additional Modelling Assumptions

As has been mentioned, the financial viability of a carbon offset exchange in South Africa will be contingent on the volume and liquidity of carbon credits being traded through it and the business model selected. Based on the current design of the South African carbon offset market, supply side activities will be the ultimate determinant and cap on the transaction volumes traded in the market, particularly in the early years.

Accordingly, this report has utilised the supply scenarios in Section 3 as the three “volume scenarios”, assuming that either 25% (low), 50% (medium) 75% (high) of total supply will be transacted through the South Africa exchange platform. This is an important assumption because it materially affects the revenue streams from the %-of-transaction-value business model.

- **Scenario 1**: 25% of supply is transacted through the exchange. Where there are a significant number of large projects producing offsets, and therefore a relatively small number of offset sellers it is possible that bilateral relationships could be developed between buyers and sellers. Smaller volume trades would still need to be matched through an offset platform, and therefore 25% is our low-end scenario. This volume scenario is also applicable to a situation where the transaction pricing is higher (e.g. the CTX model), as this could discourage participants from joining the exchange.

- **Scenario 2**: 50% of supply is transacted through the exchange. Once clarity is provided on the carbon tax and offset proposals to all market participants, the development of some additional carbon offset projects is likely to start. These new entrants to the sales of offsets would be unlikely to have the scale and bilateral relationships to participate OTC and this would join the exchange. The timing is uncertain, but several projects types have long lead times, whilst others could be quicker to market (smaller scale renewables, for example).

- **Scenario 3**: 75% of supply is transacted through the exchange. This scenario assumes high levels of project development activity in the period between now and the carbon tax starting, with many new sellers looking to join the exchange. Buyers will have a greater choice of supply and will be less likely to draw on existing offset projects or trading relationships. With supply overall strong, the offset platform is well placed to capture a larger share of transactions. This volume scenario is also applicable to a situation where the transaction pricing is low (e.g. the ICEFE model), as this could increase the number of participants active in the exchange.

Each of these scenarios have then been tested against the two business cases presented in 4.2.1 and 4.2.2 for comparison, and utilising the cost assumptions presented in Section 4.3. The general assumptions guiding the revenue projections are presented in Table 4-6.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

**Table 4-6: General modelling assumptions for carbon offsets exchange**

<table>
<thead>
<tr>
<th>General Modelling Assumptions</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discount Rate</td>
<td>7.50%</td>
</tr>
<tr>
<td>Cash Invoicing Delay</td>
<td>3 months</td>
</tr>
<tr>
<td>DCF Period Start</td>
<td>6 months</td>
</tr>
<tr>
<td>Year of Establishment</td>
<td>2015</td>
</tr>
<tr>
<td>First year of Operation</td>
<td>2016</td>
</tr>
<tr>
<td>Period for Analysis</td>
<td>10 years</td>
</tr>
<tr>
<td>Membership (Buyers)</td>
<td>200</td>
</tr>
<tr>
<td>Membership (Sellers)</td>
<td>150</td>
</tr>
<tr>
<td>Average Transaction Size</td>
<td>20,000 tonnes</td>
</tr>
<tr>
<td>Average Offset Trading Price</td>
<td>80 ZAR</td>
</tr>
<tr>
<td>Annual Offset Price Increase</td>
<td>10%</td>
</tr>
</tbody>
</table>

For the general assumptions, it is assumed that there will be approximately 200 registered buyers and 150 registered sellers. On the buyers’ side, it is uncertain how many companies will be covered by the carbon tax, and thus eligible to purchase offsets. Due to the nature of the market it is predicted that not all eligible buyers will take up their allowance or join the exchange due to the costs involved exceeding the costs of purchasing carbon offsets, and thus they would be more willing to pay the full tax amount.

South African currently only has a small number of potential carbon offset sellers, but it is anticipated with the clarity provided on the carbon offset mechanism there will be a rapid rise in potential sellers, whether project developers or wholesalers. It is also anticipated that the majority of these will join the exchange to gain access to larger buyers. It is however anticipated that as the market matures there will be consolidation amongst sellers, and thus 150 represents the peak number of sellers.

Other key assumptions relate to the price of carbon offsets, it is assumed that a price of R80 will be realised due to the limited supply of offsets pushing up the price. The carbon offset market does however have a cap placed on the price of offsets which are related to the marginal tax rate of either R120 per tCO₂e (escalating at 10% per year), if used in year 1. It could be possible for the price to exceed the marginal tax rate in year 1, through buying and holding credits for future compliance, in this case the price of offsets will be capped by the marginal tax rate in 2020 of R176 tCO₂e, or in the year of use.

### 4.5 Determining the Financial Feasibility of a Carbon Offset Exchange

The financial feasibility of establishing a South African carbon offset exchange has been modelled utilising the assumptions presented in the sections above. Different business models have been applied to the modelled volume scenarios and cost assumptions to present potential options for a South African carbon offset exchange.

#### 4.5.1 The CTX Business Model Approach

The CTX business model promotes a low annual membership and other fixed fees, but higher transaction related fees due to the smaller volumes that pass through the exchange. The net present value (NPV) of the future cash flows of each scenario utilising this business model over a 10 year period is demonstrated in Table 4-7.

**Table 4-7: NPV for CTX business model approach**

<table>
<thead>
<tr>
<th>Volume Scenarios</th>
<th>Net Present Value (ZAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25% of supply volume traded on exchange</td>
<td>201,927,069</td>
</tr>
<tr>
<td>50% of supply volume traded on exchange</td>
<td>341,993,403</td>
</tr>
<tr>
<td>75% of supply volume traded on exchange</td>
<td>482,059,737</td>
</tr>
</tbody>
</table>

The positive NPV, at each volume scenario, demonstrates that utilising this business model will generate a return for the
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

The revenue stream responsible for the largest proportion relates to the transaction fee levied on sellers, while the membership fees (both buyers and sellers) maintain a fixed annual revenue stream regardless of trade volumes that would cover the annual exchange operating costs.

4.5.2 The ICEFE Business Model Approach

The ICEFE business model, in contrast to the CTX, is designed to maximise revenue from membership fees and while levying a smaller transaction based fee they aim to encourage trading and capitalise on the larger volumes that is passed through the exchange. Utilising this model in a South African context, the NPV over the 10 year period is represented in Table 4-8.

<table>
<thead>
<tr>
<th>Volume Scenarios</th>
<th>Net Present Value (ZAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25% of supply volume traded on exchange</td>
<td>117,198,317</td>
</tr>
<tr>
<td>50% of supply volume traded on exchange</td>
<td>118,169,827</td>
</tr>
<tr>
<td>75% of supply volume traded on exchange</td>
<td>119,141,336</td>
</tr>
</tbody>
</table>

This model also returns a positive NPV at each volume scenario which demonstrates that if this business model is utilised then the exchange operator will generate a return on their investment. At the low volume scenario the net cash flows under this model will be approximately R 14, 687,329 in 2016 rising to R 21, 280,597 in 2025.

As is consistent with the high membership fees and additional fixed costs utilised in this model they are responsible for the majority of revenue, while the reactively low number of transactions and the low transaction fees reduce this source of revenue in a South African situation.

4.6 Conclusions

The scenario-based modelling (and using fee structures consistent with existing platforms) demonstrates that a robust revenue stream can be generated in South Africa from the expected volumes transacted through the exchange. Under all scenarios, the level of membership fees and transaction costs when combined indicate that the offset platform will be financially sustainable. There is however a significant difference between the business models.

The ICEFE assumptions result in an NPV outcome that is only marginally related to volume. This is because the fixed membership fees and low transaction cost values drive the revenue. With very low transaction-based fees, the revenue profile of the ICEFE business model is dominated by membership fees. It is therefore largely unaffected by the level of transaction volumes. The ICEFE business model works in Europe because of the very high volumes that pass through the platform (which are unlikely in South Africa).

Alternatively, the CTX model has relatively low membership fees and higher transaction-based fees which produce a NPV which is higher. The membership fees are therefore utilised to ensure that the operating costs of the exchange are covered, but additional revenue generation is reliant on the activity being conducted via the exchange.

The South African market will be constrained by the supply side. Accordingly, for an exchange to be functional it will have to encourage the participation of the majority of potential suppliers of carbon credits, who are likely to be small, to satisfy the demand via the exchange. The buy-side of the exchange is likely to be dominated by large companies in South Africa due the nature of the GHG emissions profile through the economy. These large buyers are likely to crowd out smaller buyers due to the higher tax savings they can achieved through the purchase of carbon offsets. As such, the participation of these buyers in the exchange is important, but it is anticipated that they will participate if the sellers are present.

In the initial stages, the exchange therefore needs to be attractive to the sellers of carbon credits. Offset suppliers are likely to be, on average, smaller, with more limited cash reserves or funds to pay high membership fees. A mix of business models and fee structures may be required to maximise the reach of the platform, and the revenues that can be extracted from the different players in the market.

There is also a temporal consideration, with offset volumes likely to increase steadily over time to satisfy demand. In the short term, and with a shortage of supply, it will be a sellers’ market. To encourage sellers, it is likely that a South African exchange would look to combine diverse membership and transaction fees for buyers and sellers.
We would expect that a business model with the following characteristics would be most likely to achieve a strong level of participation from both sellers and buyers:

- Low seller membership fees (sellers are likely to be smaller and financially less able / willing to pay one-off fees) to encourage sellers to the exchange;
- High buyer membership fees (buyers are likely to be able to spread membership fees / costs over a larger number of trades);
- Low buyer transaction fees (this will encourage buyers to use the exchange to source offsets); and
- High seller transaction fees (smaller project developers may have less capability to develop bilateral relationships with buyers. With supply limited and prices on the exchange at or near the tax level of R120, sellers will be able to fund transaction fees from strong offset revenues).

As the development of an exchange is deemed to be strategically important (as noted in the NDP) there could also be the option to gain support for establishment of the exchange via international climate funds or through other support channels. It is expected that the operating costs would be covered by the annual revenues generated via the operation of the exchange.
5 Governance and Design

While the technical and financial components of an exchange are fundamental to determining its feasibility, it is also necessary to understand if there is demand for an exchange and how key stakeholders (i.e. infrastructure providers, buyers and sellers) would engage and participate. In turn, participation on any carbon exchange will be determined by the design and governance structure employed to manage participants, ensure fairness and promote integrity, ease of access, transparency and costs of joining and transacting via the exchange.

It is therefore imperative that the design and governance structure of a South African carbon offset exchange is aligned with the requirements of market participants, while ensuring compliance with and relevant regulation and supporting equitable access.

If the requirements for access or acceptance onto an exchange are too onerous, costly or complicated, then transactions will be channelled into the OTC markets, thus negatively affecting its viability. If the requirements are too weak, or lack the requisite oversight, the integrity and trust in the exchange will be compromised and in turn channel transactions into the OTC market.

A key consideration in designing the exchange is the governance and oversight structures to support integrity, trust, efficiency and equity. The ultimate design of the exchange and the governance structures are determined by a variety of stakeholders, including regulators, exchange developers and participants, who each have a distinctive role to play in the design and functioning of the exchange.

Promethium Carbon (2014) has previously proposed a possible market process that comprised of nine steps from carbon offset project development to trading, clearing, settlement and surrendering the offset for compliance purposes. This possible market structure also provided an outline of the roles of each project participant.

The Carbon Offsets Paper (2014) provided a greater indication of a potential governance structure of the carbon offset scheme and how the differing institutions would be involved in the oversight, management and implementation of the scheme.

This section of the report aims to investigate the potential market design further and outline the key governance and design considerations for a trading platform to support a market in South Africa. This section has been informed by stakeholder consultations with key representatives of potential market participants, including project developers and sellers, buyers, infrastructure providers, regulators and business representatives and an interpretation of the key policy documents that will establish the South African carbon offset market.

5.1 Roles of Carbon Offset Exchange Participants

There are many participants in the successful development and operation of a carbon offset trading exchange. Each has a different role to play. According to the Carbon Offset Paper (2014) and Promethium Carbon (2014), the South African carbon offset scheme using international standards, as proposed in Phase 1 of the carbon tax, will have the following participants: sellers, buyers, exchange operator, registry operator, South African Revenue Service (SARS), standard body, accredited auditors and the Designated National Authority of South Africa (DNA).

While each of these entities will play a role in the overall functioning of the South African carbon market, the carbon offset exchange will be but one component of an interconnected market [as illustrated in the Carbon Offset Paper, 2014]. There will be both direct and indirect participants in the exchange. Direct participants are classified as those that will directly participate in the exchange, develop requisite infrastructure or facilitate the process, while indirect stakeholder are those that play a role but do not have a direct bearing on the activities conduct via an exchange.

The roles of each of the identified direct and indirect participants in a South African carbon offset exchange are outlined in Section 5.1.1 and 5.1.2:

5.1.1 Roles of Direct Participants

- **Buyers**: The buyer of carbon credits is a key counterparty on the exchange. The buyer could take the form of a tax payer that intends to utilise the carbon credits to meet their compliance obligations, or it could be another party purchasing carbon credits for investment purposes.

- **Sellers**: A seller of carbon credits is the holder of carbon credits that have been issued and can be transferred to a respective buyer on receipt of payment. The sellers could take two predominant forms; either the project developer that implements and manages a carbon offset project and lists on the exchange, or a wholesaler which purchases carbon credits from project developers in the OTC market and sells them on the exchange.

- **Exchange Operator**: The exchange operator will provide the physical infrastructure that supports trading, including the trading platform, clearing support and settlement systems. The exchange operator, in compliance with any relevant
Registry: The development of a registry is a crucial complementary component of any carbon offset exchange, as the registry acts as warehouse storage for carbon credits. An effective registry allows project developers, sellers and buyers to safely store any carbon credits issued, while also ensuring market integrity through allowing for the detailed tracking and tracing of all carbon credits in the market. A registry therefore acts as the central system for storing and transferring carbon credits and thus minimising theft, fraud and side-selling.

Regulators: Key regulators of the carbon market and the exchange infrastructure include the National Treasury, the FSB, Department of Environmental Affairs (DEA) and the Department of Energy (DoE). Each of these regulatory bodies will have a different role to play in different segments of the market but are all vital in ensuring the creation and functioning of a carbon offset market and the exchange in South Africa.

5.1.2 Roles of Indirect Participants

- **Standard Body:** Each carbon standard is controlled and run by an overall standard body. In the case of the CDM, this is the CDM Executive Board. In the case of the VCS, this is the VCS Association. In the case of the Gold Standard, it is the Gold Standard Secretariat. These bodies have overall responsibility for managing the respective carbon standard programmes; through setting rules and procedures, approving projects, accepting methodologies and issuing carbon credits to projects. Project developers are required to meet all the requirements of the chosen standard and methodology, and obtain approval for the projects by the standard, in order to have a project recognised as contributing to reducing, avoiding or sequestering GHGs. All projects that fulfil the requirements are then issued with carbon credits, subject to continued operation and performance.

- **Accredited Auditors:** Accredited auditors are approved by the relevant standard and fulfil the role of providing an independent, unbiased assessment of whether a project will reduce, avoid or sequester emissions according to the standards rules, procedures and methodologies and if the project is implemented and operates according to the accepted parameters. The accreditation of auditors is set by the relevant standard body, but accredited auditors are generally confirmed either the CDM Executive Board or through registration under the ISO 14065 standard.

- **Designated National Authority of South Africa (DNA):** The DNA is currently tasked with overseeing the CDM process within South Africa, including reviewing prospective projects and acting as the custodian of the sustainable development criteria under the CDM. It is envisioned in the Carbon Offset Paper (2014) that the DNA would play a further role in a South African-specific carbon offset standard through acting as the standard body. In this the DNA would approve projects under a South Africa standard, accredit auditors, develop or approve methodologies, be the custodian of a South African carbon credit registry and ultimately issue carbon credits from projects.

Under Phase 1 of the Carbon Tax, it is anticipated that the DNA will continue to fulfil its role under the CDM, but be attributed with additional roles such as developing a South African registry, facilitating transfer of credits to the South African registry, and issuance of retirement certificates.

- **South African Revenue Service (SARS):** SARS will be responsible for recognising the use of carbon credits against a covered entities tax liability and reducing the liability accordingly. In this SARS will have to ensure that the carbon credits used do not exceed the allowance and that any credits used to meet compliance have been effectively removed from the system to avoid double counting of emissions reductions.

5.2 Institutional Arrangements

The possible market structure and an illustration of the role that each participant institution would play in a South African carbon offset exchange is provided in Error! Reference source not found.24.
5.2.1 Institutions Involved in the Carbon Credit Issuance Process

As can be seen, the indirect participants (marked in green in Figure 5-1) are primarily associated with the process to generate carbon credits from a carbon offset project for eventual sale. In particular these institutions are involved in the process of project development, registration, verification and issuance of carbon credits. In the use of international standards, it is envisioned that the process for project registration by project developers would follow the exact requirements and processes of the relevant standard body chosen by the project developer. If a project meets the set requirements it would then be issued with carbon credits into their registry account.

This process of project registration and issuance by a standard body aims to promote the environmental integrity of the credit issued. While this process will result in carbon credits that can be sold in international voluntary or compliance markets, it is envisioned in the Carbon Offsets Paper (2014) that additional scrutiny needs to be undertaken for projects to ensure that they comply with the specific South African requirements, or national appropriateness (Promethium Carbon, 2014), for example, eligible project types, location, and any other sustainable development criteria that could be applied.

It is envisioned in the Carbon Offsets Paper (2014) that the DNA of South Africa would fulfil the role of a standard body to set and assess projects against these additional requirements, and fulfil the role of carbon credits issuance and management of the registry. Promethium Carbon (2014) proposes that projects would be assessed against these rules by an accredited auditor approved by the DNA. If a project was deemed to meet the requirements of the South Africa carbon offset scheme, it could then be registered and issued with a national appropriateness tag by the DNA based on the verification reports.

While the South African “national appropriateness” tag or standard could be developed as a complimentary process under the VCS or the CDM and co-ordinated by the DNA, these would still be in conflict due to the different processes involved in registration, issuance and entry into the respective registries. This is also currently not possible under the Gold Standard and thus this route would introduce differences in the credits issued and complexity for market participants. This process could also cause confusion of for many compliance buyers due to the processes under the different standards.

To overcome these constraints, it is proposed in the Carbon Offsets Paper (2014) that a project proponent would seek evaluation against the national appropriateness criteria by the DNA prior to project development. This would follow a similar process under the CDM where a project is required to obtain a letter of approval from the country DNA against a set of sustainable development criteria. In this case all projects, regardless if they follow the CDM, VCS or GS, would be required to obtain the approval letter from the DNA, whether pre- or post-project registration.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

If a project is deemed to be compliant with the national appropriateness criteria and the project developer wants to sell these credits in the South African market, then it is suggested that a project would be required to undertake a conversion process for issuance under a South African system. To undertake this conversion process it is proposed that a project developer would submit all project documentation, including the letter of approval, project design documents, validation reports, monitoring reports, verification reports and issuance certificates to the DNA for consideration.

If a project is approved by the DNA, then the project developer would be required to cancel the issued credits in the relevant international registry, and submit the cancellation certificate to the DNA. Once these are received and approved, the DNA would then issue a corresponding amount of South African CERs (SACERs), with their own unique serial numbers, into a South African registry account of the project developer. This is required in order to avoid the double counting and selling of carbon credits.

The development of a country-specific standard, and the use of international standards as a base, is gaining traction globally for national, regional and local schemes. In particular, China has developed the Chinese Certified Emission Reduction (CCER) which borrows extensively from the CDM but requires local country approval and is the only eligible carbon offset standard that can be used in the Chinese pilot carbon markets (Environomist, 2014). To issue CCERs projects developed under the CDM can apply for conversion or be developed under specific CCER guidelines, the conversion process is still under discussion pending decision the UNFCCC EB (Environomist, 2014).

This trend is continuing in the California carbon offset scheme which has adopted the Air Resources Board Offset Credit (ARBOC) as the single standard for use to meet compliance (ARB, 2015). To obtain ARBOCs it is required that carbon offset projects are developed under existing, approved standards (e.g. the California Action Reserve (CAR) and the VCS) and then issued and retired under these standards before being converted through a central process into ARBOCs and stored in approved registries (ARB, 2012). Under the scheme, only ARBOCs are allowed to be used by covered entities to meet their compliance allowance (ARB, 2015). ARBOCs however face the risk of invalidation (or cancellation) and thus increase the risk to the buyer of these carbon offsets.

It is proposed that a similar system such as that in California and China is followed in the South African market. All credits issued by the approved carbon offset standard bodies would be converted through applying to a South African registration system, managed by the DNA and issued with SACERs. Once issued with SACERs, project developers could then sell these OTC or take them to the carbon offset exchange by a seller (either the project developer or other owner of credits, e.g. wholesaler) for sale to a buyer who could only use SACERs to reduce their tax liabilities.

This system would not, however, require that a project is cancelled in entirety under the international standard. Instead, only the issued credits are converted to SACERs. A project developer could therefore maintain the project with the relevant international standard body and undertake and comply with the chosen standards review and issuance process throughout the project lifetime. This would maintain the environmental integrity of the carbon credits issued, and simplify the market for all participants. Projects which remain registered with international standards could participate in any future global carbon offset scheme and could choose, at a point in future, not to undertake the SACER conversion process and hence sell their credits in other markets.

This conversion process does introduce some potential risks for project developers and the market in general. In particular, it introduces time risks for the project developer or seller of the carbon credits. If the conversion process is delayed by the DNA or other parties then it could cause the project proponent to lose out on the ability to sell the credits in another market. This risk could be overcome through ensuring the conversion process is efficient and conducted in the shortest time frame possible, this includes developing the capacity and process within the DNA and engaging with the relevant standard bodies and registries to ensure the process is conducted smoothly and with minimal delays.

The second risk relates to the market as a whole. By allowing projects developed in South Africa to be registered internationally means that the credits generated could be sold outside of South Africa in other markets. While this optionality is attractive to project developers, as it allows them flexibility and the potential to maximise revenues, it could limit the effectiveness of the carbon offsets allowance for covered entities in South Africa through reducing supply. In the short term, there is little need for limits to be placed on carbon credits being sold in other markets, due to the fact that the only viable market is a voluntary market. It is expected that prices in the South African mandatory market will be significantly greater than current voluntary markets. However, if it is longer term, global market developments that could attract the supply of carbon credits from South African projects away from the South African market. To ensure the sole use of carbon credits in South Africa, there could be a number of options implemented, including the development of a stand-alone South African carbon standard or through placing restriction on the carbon credits being sold out of the country.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

The development of a South African carbon standard would be expensive and time-consuming to develop. It is very unlikely that all the processes and infrastructure could be developed in time to support the registration of projects to be ready for the introduction of the carbon tax in 2016. In the longer term, projects registered under a South African carbon offset standard could also be excluded from global market, if the South African standard is deemed to be incompatible with international standards.

The second option involves placing trade restrictions on carbon credits and thus effectively banning them from being sold in external markets. If these bans are enacted, they could exclude a South African project from global markets in future and put the viability of some carbon offset projects into jeopardy.

It is not recommended that either of these approaches is pursued due to the need for flexibility to encourage the development of South African carbon offsets projects and support supply in the South African market. The proposed process for the conversion of issued credits into SACERs will avoid the need for a specific South African standard, while ensuring clear indications of South African projects. The risks of other markets can also be overcome by market participants through using standard market practices, such as future contracting, that ensure that supply from South African projects are used in South Africa. Placing restrictions on market activity and eligibility of projects could have negative consequences for investment in climate change mitigation projects in South Africa due to inability of these projects to access global markets in future.

5.2.2 Institutions Involved in Carbon Exchange Process

In the scenario outlined in Section 5.2.1, only SACERs would be allowed to be utilised for compliance purposes under a South African carbon tax. As a result, any South African carbon exchange would need to enable this process and take into account the unique South African situation. The direct participants involved in developing and ensuring the functioning of the exchange are highlighted in red.

Once the SACERs have been issued and registered in the South African registry, these could then be taken to the exchange platform by a seller (or owner of the credits), whether this is the project developer or another party. The exchange could therefore be used for either primary selling of credits (i.e. by the project developer) or secondary selling by other holders (e.g. wholesalers).

As with all exchanges, it is imperative that a set of rules and regulations are established by the exchange operator that provides access and governs the conduct of sellers and buyers on the exchange. The exchange operator will therefore develop and determine these rules to facilitate carbon trading by promoting good practice and compliance with applicable regulation. In order to buy or sell on a carbon offset exchange an interested party will have to apply to become a member of the exchange and commit to the rules.

To become a member, both buyers and sellers would follow the same process, including completing and signing a trading agreement, agreeing to a standard Emissions Reduction Purchase Agreement (ERPA) and paying all applicable fees. During this process the member would agree to all the rules of the exchange, identify authorised representatives and submit all required documentation.

It is envisioned that to register, all prospective members would be required to have a registry account with the South African registry. This would allow for sellers to post sales listing on the trading platform, and for buyers to post purchase orders and ensure successful completion of the trade. Other requirements could be for prospective members to prove VAT registration, company documents and banking details.

The submitted documents would then be reviewed by the exchange operator and if the requirements are met, the entity would be accepted as a member and allowed to participate in the exchange. While all members would be allowed to participate on the exchange, buyers and sellers would have different roles and processes for engaging on the exchange.

It is envisioned that to take a carbon credit to the exchange, a seller will have to access the trading platform and indicate their intention to post a sales listing through providing the following information:

- Vintage year of the carbon credits;
- Quantity of carbon credits available for sale;
- Intention to accept partial bids
- Price of units in South African Rand; and
- Project documentation

The provision of this information by a seller would provide a potential buyer with all the requisite information to determine if they are willing to purchase the carbon credits.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa should be possible for sellers to withdraw credits from the exchange, by providing appropriate notice, if unsold. For a buyer to post a purchase order, they could either place a bid on a sellers listing, or indicate their requirements for purchase. To do this, the buyer could provide information on:

- Vintage year;
- Quantity of credits required;
- Intention whether to accept a partial offer; and
- Price that they are willing to pay.

The provision of this information on the trading platform would enable efficient and transparent information for all parties and enable effective connection of buyers and sellers.

Once a trade has been agreed upon by both parties, the completion of the trade would be conducted via the approved clearing and settlement structures of the exchange platform. In the process of clearing, the clearing house of the exchange operator will approve the transaction and the transfer of the credits from the sellers registry account to the buyers account. To undertake this process automatically would require sending a signal to the South African registry account for transfer between accounts. This process is technically possible via a number of current registries, and should be incorporated as international best practice into any South African carbon offset registry.

In turn, during this settlement and clearing process, the relevant funds would be transferred from the buyer’s account and deposited in the seller’s designated bank account as payment for the credits. After the transaction via the exchange has been completed, the seller would be liable for any taxes incurred in the transaction.

It is envisioned in the Carbon Offsets Paper (2014) that the buyers or compliance entities, would have to obtain a certificate from the standard body (the DNA) relating to the carbon credits used. This certificated would then be transferred to SARS in order to receive recognition against their tax liability.

It is envisioned that this certificated would be similar to a retirement or cancellation certificate containing the details and unique serial numbers of the credits. Once confirmed the value, either GHG emissions or rand value) of the emissions (as compared to the marginal tax rate of the compliance year) represented by the cancellation credits would be deducted from the companies liability.

5.3 Oversight Mechanisms and Institutions

While the potential institutional arrangement of the participants and their role in a market are presented in Section 5.2, there is also the need for effective oversight of any carbon market to ensure functioning.

This trend of encouraging regulation of a carbon market, and by extension, the exchange, in South Africa has been promoted by various stakeholders to overcome many of the challenges highlighted in Section 2.2. There are two levels of regulation that need to applied, that of governance of the exchange and those that support the creation of the required market institutions.

5.3.1 Regulation at the Exchange Level

At the regulatory level a number of suggestions have been put forward by stakeholders, including:

- There is a need for regulation to govern the market to ensure integrity and protect participants, but this should not be additional to existing market regulation;
- Carbon credits should be viewed, or allowed to trade, as financial instruments to allow for easy integration into systems created under existing exchange licenses;
- Regulation should include significant penalties for lack of compliance with market rules for carbon offset suppliers to curb misrepresentation;
- The regulation should place a ban on using environmental instruments (carbon credits) in the derivative market (e.g. the selling of options); and
- The regulation should place limits on market speculation to keep the prices under control as it is designed to be a compliance market for use by covered entities.

It is clear that market participants require regulation to ensure market integrity and clear rules for all participants. It is also clear that there is a desire amongst potential participants, through the introduction or updating of regulation that recognises carbon credits as a financial instrument. It is however, not the desire of market participants to limit trading of carbon credits to the exchange only. Participants should be allowed to choose if they want to join the exchange and gain access to listed buyers or sellers, or conduct transactions in the unregulated OTC markets.
The classification of carbon credits as financial instruments will therefore allow both types of trades to be conducted, but allow for currently-licensed exchange operators to incorporate carbon credits relatively quickly and simply and allow the FSB to apply strict penalties to carbon credits to avoid issues surrounding potential disclosure, over estimation or fraud.

Some stakeholders argue that no derivative trading should be allowed on environmental instruments as it leads to market speculation and could increase the price of credits for compliance buyers. This argument is premised on the anticipation of limited supply of carbon credits being purchased by those that do not need them for compliance, thus increasing demand and the eventual price. As a result it has been suggested that the use of derivatives instruments, based on SACERs, should not be allowed into the market.

Derivative trading does play an important role in many markets and allows for the mitigation of price risk for both buyers and seller and reducing overall liquidity risk for market participants. It is anticipated that due to the predicted low liquidity of the South African carbon market, that price volatility would be relatively low and the need for derivative trading could therefore be diminished. It is however, not required for the trading of derivatives to be banned as any derivatives trading, e.g. futures, could still take place based on existing structures to support reducing the long term price risk and ensuring access to carbon credits, while freeing up capital for project developers to allow for continued investment in carbon offset projects. As demonstrated in Section 3.5 an exchange can be sustainable on a 1:1 offset issued to spot trade ratio, but it would be beneficial for the development of the market overall if futures were a feature of the traded market. In Europe the ability to forward sell volumes (and lock in a price) in the offset market enabled developers to secure the finance required to invest into the emission reduction projects.

Oversight at the regulatory level where the regulation of markets and licensing of exchanges is conducted falls under the ambit of the Financial Services Board (FSB). As indicated in Section 0, the key pieces of regulation in South Africa is the Financial Markets Act (FMA), 2012, which governs the licencing, functioning of exchanges, clearing houses and trade repositories. The FMA also sets out the offences and penalties for market abuse and prohibited trading practices. The FMA (2012) currently governs all aspects of trading that take place via a registered exchange and the associated infrastructure.

The overall regulation for securities exchanges in South Africa has been recognised as the best in the world by the World Economic Forum (2014). The JSE is currently the only licenced exchange in South Africa and complies fully with the requirements of the FSB and has developed comprehensive rules and regulations that are enforced to ensure compliance and market integrity. As a result, there is no need to introduce new regulations to specifically govern the establishment and governance of a South Africa carbon exchange. The adequate regulatory environment currently exists and can be utilised to govern the trading of carbon credits via an exchange and can be adequately managed by the FSB and existing licensees, such as the JSE. This process also does not exclude competition amongst exchanges as any new exchange would be required to apply for a licence to be allowed to operate an exchange platform in South Africa.

It is also not in the best interests of market participants to ensure that all trading is mandated to take place via a licenced exchange. Regulating against OTC transactions would diminish the options for participants and could serve as a barrier to some projects or compliance buyers who are willing to take the risks and participate in the unregulated OTC market. It is proposed that all projects available for OTC sale should be published via the South African registry to allow for potential buyers to identify projects and individual negotiations can be undertaken. The OTC market does however bring additional risks for unwitting retail consumers and clear guidance and labels should be required to be placed on the sale of carbon credits in the voluntary markets that issue a warning from investing in carbon credits.

5.3.2 Creation of Oversight and Market Institutions

As the carbon market in South Africa will be developed as a direct result of regulation, there is a need to ensure that the appropriate market oversight institutions are created and capacitated to support market functioning. The institutions that will be involved in the creation and management of the South Africa carbon market are the National Treasury, Department of Environmental Affairs, Department of Energy and the South African DNA.

It is envisioned in the Carbon Offsets Paper (2014), and as described in section 5.2.1, that the DNA would play a key role in setting and enforcing the rules, maintaining the South African registry and issuing SACERs. The DNA would therefore become the custodian, or standard body, of the SACER and maintain the enabling infrastructure. The current DNA was established and their mandate set by the publication of Notice 1478 on the 24 December 2004 under Section 25 of the National Environmental Management Act (No. 107 of 1998) by the Minister of Environmental Affairs. This notice established the DNA as the key focal point for the CDM in South Africa and is housed under the Minister of Energy. As a result, all of the current duties of the DNA are centered on the CDM, through approving projects, developing sustainable development criteria or supporting project registration.
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

If the DNA is to play the envisioned role of acting as the standard body and custodian of the SACER and South African registry, it will require a change in the current regulation and its mandate. To manage the process of reviewing projects effectively, issuing SACERS and maintain the South African registry the DNA would require additional resources and capacity. This would need to be done in combination between the Department of Environmental Affairs and the Department of Energy.

The other key government institutions involved in the process is the National Treasury, and SARS. National Treasury is the current custodian of the Carbon Tax, and Carbon Offsets, process. It has been announced by National Treasury that a Carbon Tax Bill will be published for public comment during 2015, to be finalised and ratified by Parliament in time for the stated start date in 2016. This process will include more detail and finalisation around the carbon offsets component of the tax and is imperative for the creation of a South African carbon offset market.

5.4 Key Considerations for Market Participants

A carbon offset exchange is only one component that could support the functioning of a carbon market. South Africa currently has a well-developed exchange (the JSE); with all requisite infrastructure and technical ability to develop a carbon offset exchange to support the market. This exchange would be ideally suited to host a South African carbon offset exchange, and has been identified as the optimal platform to do so by the NDP (2011) and Promethium Carbon (2014, 2015).

In order to invest in the establishment of the exchange, the operator and any participants will require policy certainty and clarity on the roles of oversight institutions and how they will interact. This clarity is currently not available and thus market participants have held off on investing resources into preparing for a South African carbon market. If a South African carbon market is to be established in 2016, then all market participants needed, as outlined in Section 5.1, to begin preparations through:

- Investment by an exchange operator in establishing the requisite technical infrastructure and designing the rules and regulations that will govern the exchange;
- Buyers to establish carbon offsetting strategies and competencies;
- Project developers to identify potential projects, design and implement project actions; raise funding and begin the carbon offset project registration process;
- The DEA and DoE to draft and pass legislation that provides the DNA with the relevant mandate to manage the components of the South African carbon market; and
- The DNA will need to develop the requisite competencies and skills to ensure that there are no delays in the approval of South African projects. This includes establishing the processes for application and review of projects, issuance of SACERS and establishing the technical infrastructure and processes for a South African registry, including linking with an exchange operator and SARS.

Uncertainty in the policy environment relating to the crucial aspects of the carbon offset market, or delays in creating oversight mechanisms and governance institutions, could result in the market functioning ineffectively. This would create knock-on effects for project developers, sellers and buyers who could not gain access to the market due delays in the project approval process, limited capacity in the standard body (the DNA) for issuance, gaining access to market counterparties and impact the price and ability of buyers to participate.

The overall governance and design of a carbon offset exchange is therefore dependent on the regulatory requirements and oversight institutions developed as a result of the introduction of Carbon Tax regulation. The effective functioning of a South African exchange, and market in general, is reliant on the role of the DNA as it is envisioned to apply the rules for participation, issue SACERS (the tradable instrument) and maintain the registry to ensure trades are recorded and ownership is changed.

It is imperative that the process of transforming the DNA into this institution, and clarifying the carbon offset framework and modalities, is undertaken during 2015 to allow all market participants and exchange infrastructure to develop concurrently and link with the DNA to make sure the market and exchange can function effectively on the start date of the carbon tax and carbon offsets mechanism.
6 Conclusions and Potential Policy Options

6.1 Conclusions

The aim of this report was to determine whether the establishment of a carbon offset exchange in South Africa is feasible, based on the guidance provided in the Carbon Offsets Paper (2014). Feasibility has been determined based on a set of technical, political, financial and social criteria which were selected to ensure that a viable carbon offset market is developed in South Africa.

This report finds that it is technically feasible to establish a carbon offset exchange in South Africa; a finding which is consistent with that of Promethium Carbon (2015). The technical feasibility of an exchange is a result of the technical capacity of existing exchanges and market infrastructure within South Africa, which are capable of handling carbon offset trades. Utilising existing infrastructure will both reduce the capital costs of establishing a market and also provide certainty and integrity to the system. This is widely recognised by stakeholders as being a key aspect to encourage participation in the exchange.

One of the largest concerns to covered entities is whether there will be sufficient supply to meet demand for carbon offsets in South Africa. This is a result of the limitations on project types allowed to participate in the South African market. In the first phase of the carbon tax, it is expected that demand for carbon offsets will significantly exceed supply, thus pushing prices higher. Supply will therefore be the limiting factor to the establishment of an exchange and will impact liquidity and participation of both buyers and sellers. It is expected that because of these liquidity constraints, some smaller emitters will not utilise their carbon offset allowances and will rather prefer to pay the tax directly due to the costs of participating in the exchange.

The carbon offset market, and liquidity via the exchange has the potential to be dominated by a number of large buyers, therefore rendering the carbon offset allowance allocation null and void for smaller buyers. This situation opens the market for smaller carbon offset project developers to participate in the market and find buyers at relatively higher prices that could support increased project development.

Support could be provided for these smaller projects as they face inherent barriers to development, including securing financing and technical skills to undertake the complex project registration processes. This could cause delays in project development and registration, leading to further supply constraints during the first years of the carbon tax implementation.

In spite of these restrictions on supply, it is not necessary to implement trade restrictions on South African carbon credits. This could both isolate South Africa from international carbon market discussions and limit the development of some project types. To increase supply in the market it is proposed that additional project types are listed as being eligible under the carbon offsets mechanism, in particular carbon credits generated from alternative electricity supplies (e.g. electricity generation for own use) for all entities in South Africa. There is currently no incentive for projects of this nature as they are not eligible for the energy efficiency tax incentives or other grid feed-in mechanisms. The inclusion of project types of this nature could support the roll-out of mitigation activities in South Africa and unlock large supplies of carbon credits to support the South African market.

While this report has demonstrated that it is financially feasible and attractive to develop a carbon offset exchange in South Africa (based on differing business model assumptions); this finding hinges on the ability of the exchange to attract the sellers or holders of carbon credits. As a result, the structure of the exchange should be such that it encourages sellers through offering low annual membership fees, complemented by higher membership fees for buyers. Transaction fees should however be reversed with the seller responsible for a higher transaction fee (percentage based) and buyers lower to encourage buyers to come to the exchange for their carbon offset transactions.

The current source of uncertainty in the establishment of the carbon offset exchange is the political environment and the influence of a lack of policy clarity on the structure of the market and the oversight institutions. While the Carbon Tax Policy Paper (2013) and the Carbon Offsets Paper (2014) provide an indication of the policy direction, they are not as yet policy documents and thus potential market participants are holding back investment and planning until certainty is provided. The major aspect where clarity is needed is the alignment between the DEROs process and the carbon tax, and which policy options will be followed or how they will interact.
While this policy uncertainty is delaying broader market readiness, a number of governance and policy requirements remain that need to be addressed to support the establishment of the institutions to support the carbon offset market (including a carbon offset exchange). The design of the South African carbon offset mechanism and the project registration process are critical to the feasibility of the exchange. This report recommends the creation of a South African carbon credit, the SACER, to support the market. This carbon credit would be based on international carbon standards, such as the CER, VCS and GS, but would serve as a conversion process to a single South African standard based on the eligibility criteria proposed in the Carbon Offsets Paper (2014). This would allow for normalisation across standards and provide covered entities with a clear signal on the carbon offsets that are eligible within a South African market.

To facilitate the market, the relevant supporting institutions, or standard body, and governance structures need to be developed and capacitated. It is proposed that the DNA’s mandate be extended to fulfil this function. The DNA would then be responsible for the management of the South African standard, the appointment of an appropriate registry(s) and issuance of SACERs into the registry account of a project proponent.

Other key regulatory arrangements include the need for the FSB to consider classifying carbon credits as a financial instrument to allow for them to be integrated into existing trading platforms by existing licensees, such as the JSE. This would allow for the rapid and cost effective development of a carbon offset exchange, based on existing infrastructure to support the market in 2016.

The development of a carbon offset exchange is both technically and financially feasible based on the provisions in the Carbon Offset Paper (2014) and as stakeholders would be willing to participate if it is developed. But as highlighted throughout this report, the current policy uncertainty is hampering the development of this market and the supporting infrastructure. This is restricting the crucial market readiness time and could result in an under-utilisation of the carbon offset allowance, and thus increase the cost of compliance, for many of the covered entities during the first phase of the carbon tax.

Timing is also imperative to allow for the relevant market participants and governance institutions to preparations for the market. This is particularly relevant to the DNA, the proposed standard body, which requires a change in its mandate and increased capacity to being putting the processes, structures and infrastructure in place to support the effective functioning of the market.

6.2 Recommendations and Potential Policy Options

As the final output of this study, and to fulfil the mandate of the South African Green Fund, there are a number of market-strengthening and policy options and recommendations arising from thus study that could be considered to support the establishment of a South African carbon offset exchange, and the functioning of the proposed carbon market in general. These policy options and recommendations relate to many aspects of the proposed carbon offset market and are designed to support the objectives of the Carbon Offset Paper (2014) and its role in the South African Carbon Tax regime.

These policy options can be divided into the areas addressed throughout this report including the policy, technical, financial and social and governance dimensions of the carbon offset market. A discussion of the key options and recommendations are presented in Section 6.2.1 to 6.2.4

6.2.1 Key Policy Options and Recommendations

The key recommendations and policy options relating to the development of the broader enabling policy environment to support the development of the carbon offset market, and exchange, are provided in Table 6-1.
### Table 6-1: Recommendations for the Enabling Policy Environment

<table>
<thead>
<tr>
<th>Key Challenge</th>
<th>Discussion</th>
<th>Recommendation</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td><strong>Alignment between Carbon Tax and DEROs</strong></td>
<td>The lack of clarity and alignment on the Carbon Tax implementation with the DEROs is causing delays for all potential participants, including buyers, sellers and support institutions.</td>
<td>It is imperative that this clarity is provided in the short term to allow for planning, readiness and development of market institutions before the start date in 2016.</td>
<td>National Treasury Department of Environmental Affairs</td>
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<tr>
<td><strong>Guidance on the classification of carbon offsets under existing financial market regulation</strong></td>
<td>To utilise existing exchange infrastructure in South Africa, carbon needs to be classified as a financial instrument to facilitate trading</td>
<td>The FSB needs to evaluate carbon credits and make a determination on their classification. It is recommended that they are classified as financial instruments, in line with international best practice, to enable integration with the existing exchange infrastructure. Guidance does however have to be provided on the requirements for licensed financial services providers in order to trade carbon offsets.</td>
<td>Financial Services Board</td>
</tr>
<tr>
<td><strong>Development of a South African specific carbon standard</strong></td>
<td>The utilisation of existing carbon standards provides the carbon offset mechanism with environmental integrity. Use of existing standards also introduces complexity and differences for regulatory bodies and market participants based on the different process for registration and compliance.</td>
<td>This study recommends that a South African standard is developed as part of the Carbon Offset scheme. Projects would still be registered and utilise the processes of international standards, but then convert issued credits into SACERs into a South African specific registry for use in the market. This would standardise the process and create clarity for participants.</td>
<td>National Treasury Department of Environmental Affairs Designated National Authority</td>
</tr>
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</table>

### 6.2.2 Market Characteristics and Recommendations

The establishment of the carbon offset exchange is directly related to the market dynamics in South Africa. The key challenges are presented in Table 6-2.

### Table 6-2: Market Challenges and Recommendations

<table>
<thead>
<tr>
<th>Key Challenge</th>
<th>Discussion</th>
<th>Recommendation</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td><strong>Low levels of supply will render the market unviable for many potential participants</strong></td>
<td>Due to the eligibility criteria imposed on carbon offset projects the market will be under-supplied, thus rendering the exchange ineffective for many participants. There is a need to support suppliers of eligible project types as suppliers will generally be small projects that face barriers to project development through access to</td>
<td>The sale of SACERs should be included into Section 12K of the Income Tax Act to support smaller projects. Alternative support mechanisms could be investigated, such as establishing a fund which provides low-cost loans and technical assistance to small project developers. Keep the eligibility list open for motivation for project inclusion over time. If a project type meets the</td>
<td>National Treasury Department of Environmental Affairs South African Green Fund Designated National Authority</td>
</tr>
</tbody>
</table>

**RESEARCH AND POLICY DEVELOPMENT TO ADVANCE A GREEN ECONOMY IN SOUTH AFRICA**
An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa

6.2.3 Financial Implications and Recommendations

The financial feasibility of establishing an exchange is directly linked to the exchange operator and the revenue model utilised to support the exchange. The potential challenges and the recommendations to overcome these are presented in Table 6-3.

<table>
<thead>
<tr>
<th>Key Challenge</th>
<th>Discussion</th>
<th>Recommendation</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td>Upfront costs could hinder establishment</td>
<td>The costs required to develop an exchange and the support structures required to maintain it would render it unfeasible</td>
<td>Existing exchange infrastructure (such as the JSE) should be utilised to reduce costs and time for establishment. It is envisioned that financial support could be raised to cover some initial capital costs as this is a strategic project for South Africa.</td>
<td>Financial Services Board Exchange Operator</td>
</tr>
<tr>
<td>High membership and transaction fees could deter market participants</td>
<td>If the joining and transaction fees for the exchange are high, it could discourage participation from smaller sellers and buyers.</td>
<td>Encouraging participation is a key determinant of the success of the exchange. It is proposed that membership fees are kept relatively low for both sellers, while transaction costs are kept low for buyers to encourage participation.</td>
<td>Exchange Operator</td>
</tr>
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</table>
### Market Governance and Institutional Recommendations

The development of the supporting market governance structures and institutions is essential to the market functioning. The recommendations contained in Table 6-4 directly relate to the establishment of these structures.

<table>
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<tr>
<th>Key Challenge</th>
<th>Discussion</th>
<th>Recommendation</th>
<th>Responsibility</th>
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<td>The DNA acting as the standard body</td>
<td>It is argued that if the DNA is acting as the standard body, they will have a conflict of interest as they will be both project reviewer under the CDM and issuer of carbon credits in a South African scheme.</td>
<td>The recommendation for the DNA to act as the SACER body overcomes these issues as the DNA will still play its role of project reviewer under the CDM during the initial stages. This is not in conflict with the issuance of SACERS as the environmental integrity still rests with the CDM EB and the project remains registered with the CDM for its duration and all checks are carried out in accordance with CDM rules.</td>
<td>DNA</td>
</tr>
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<td>Mandate of the DNA</td>
<td>The DNA is currently mandated to facilitate the CDM functions only. Thus they currently do not have the mandate or capacity to fulfill the role of a standard body.</td>
<td>The DNA’s mandate would have to be changed to the role of a standard body, including project review, credit issuance and linking with the registry. This would need to be done through an amendment to NEMA and approval by the relevant legislating bodies. If this route is envisioned then this process would need to begin in earnest to ensure readiness in 2016.</td>
<td>Department of Environmental Affairs, Department of Energy</td>
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<tr>
<td>Voluntary cancellation of issued credits removes them from future global markets</td>
<td>The suggested process to issue SACERS involves the requirement to retire all issued credits from the international standard, and re-issued in South Africa if they want to be used for compliance purposes. It is argued that this removes them from international markets and potentially harms the project developer.</td>
<td>The application for the issuance of SACERS would be a voluntary action if the seller deems they could achieve a higher price in South Africa. As projects will be registered and issued credits by the relevant international standard, a developer could choose at any point not to bring issued credits to South Africa and sell them in other markets. The SACER process would not require projects to be cancelled and then re-registered in South Africa; rather only issued credits to be converted into SACERS. If any global market was to develop this issuance process could be removed and the carbon offset scheme reworked to take this into account and allow participation of South African projects.</td>
<td>DNA, National Treasury, Department of Environmental Affairs</td>
</tr>
<tr>
<td>Key Challenge</td>
<td>Discussion</td>
<td>Recommendation</td>
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<td>Establishment of a South African Registry</td>
<td>The appointment of a registry to manage SACERs is imperative to ensure trust, transparency and efficiency. The registry is a vital component of any carbon offset scheme.</td>
<td>A registry provider should be appointed by the DNA to act as the official registry of the SACER. The registry would need to be able to provide a number of functions, including linking with an exchange operator and SARS to facilitate movement of credits and proof of retirement. It is recommended that a competitive bidding process is launched to provide this service and all major registries (e.g., market and APX) and South African entities (e.g., silocerts) are invited to submit bids to be the sole registry provider in South Africa.</td>
<td></td>
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<tr>
<td>Establishing National Appropriateness Criteria</td>
<td>To be issued with SACERs. The requirements will be that a project meets the national appropriateness criteria, as outlined in the Carbon Offset Paper (2014). Under the SACER, these would need to be accredited by an external auditor or pre-approved by the DNA.</td>
<td>Once the carbon offsets paper is finalised, these criteria need to be established for discussion and finalisation. It is recommended that all auditors accredited under existing standards or those that are ISO10464 compliant should be allowed to evaluated projects against these criteria.</td>
<td>DNA SANAS</td>
</tr>
</tbody>
</table>
References


An Assessment of the Feasibility of Establishing a Carbon Offsets Exchange in South Africa
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