



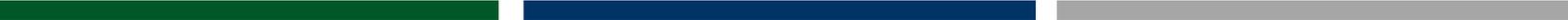
energy

Department:
Energy
REPUBLIC OF SOUTH AFRICA

SOUTH AFRICAN CARBON OFFSET ADMINISTRATIVE AND REPORTING SYSTEM

SYNTHESIS REPORT VERSION 3

JANUARY 2016



This report was prepared by **Promethium Carbon** as part of the execution of the work in terms of the ***establishment of South Africa's Carbon Offsets Administrative and Reporting System*** (SANEDI Bid Reference 0317)

EXECUTIVE SUMMARY

The Synthesis report was drafted within the context of the Project Inception Report as finalised in November 2015. The inception report specified that the synthesis report should include the following:

- *Update the existing database on information on international schemes with the most recent developments to provide a complete knowledge base of international experience and lessons learnt;*
- *Analyse and compare a diverse group of international examples. International schemes will be compared using the following broad categories: Policy context, institutional arrangements, resourcing, the establishment process and the implementation process. This analysis will highlight practical considerations and opportunities for further learning;*
- *Map the requirements of the Carbon Tax Policy Paper, Carbon Offset Paper, draft Carbon Tax Bill (if available), and proposed amendment to NEMA Regulation 721 (if available);*
- *Identify differences, similarities and linkages between international experiences and the South African requirements.*

ASSUMPTIONS MADE IN COMPILING THE SYNTHESIS REPORT

The Synthesis Report has been drafted on the assumptions that the following issues have been addressed and are taken as being pre-determined:

- The Offset Scheme will operate in the context of the proposed South African carbon tax.
- The Offset Scheme will be managed by an Administrator, as contemplated in the Carbon Offset Paper.
- The Administrator will be the unit currently operating as the Designated National Authority (DNA) in terms of South Africa's commitments under the Kyoto Protocol, which is housed in the Department of Energy.
- The Administrator will be supported by an Independent Expert Committee, as contemplated in the Carbon Offset Paper.
- The Administrator will be in full control of the process of issuance and retirement of the credits in the South African system.

In the event that some of these assumptions change, the impact of such changes on the work done on the project will have to be assessed with respect to the completion and the implementation of the project.

OBJECTIVE OF THE SYNTHESIS REPORT

The objective of Synthesis Report is to create a knowledge base for further use throughout the various phases of the project. As a result the Synthesis Report provides an in-depth analysis of current trends and leading research, as well as an overview of the South African Carbon Offset system components in the context of this research. This report provides an extraction of relevant information to guide the development of the Standard Operating Procedures (SOP), the development of the IT system as well as the development of the Organisation Development Plan (ODP).

The Synthesis Report is therefore a culmination of various research streams. The report is structured in two specific sections: the first section pertains specifically to the various considerations of the South African Carbon Offset System, linked to international learning where relevant. The second section consists of a number of annexures that provide a detailed assessment of selected international case studies.

The design of the proposed South African carbon offset administrative system will build on both international learning and local experience and perspective. This synthesis report documented the international learning from the current portfolio of World Bank Partnership for Market Readiness studies as well as from dedicated country and carbon trading schemes in Denmark, China, California, Australia and the EU.

The South African tax and offset system is unique but can use features of various international systems. Examples of the unique attributes are that there is no free allocation, allowances or auctions in the SA system. There is therefore no need for retirement, expiry, banking or borrowing in the administration system.

The local experiences in CDM project approvals, commodity trading and various government department mandates can be brought together to provide the essential basis for a cost-effective, appropriate and well-functioning carbon administration system.

Based on research and experience synthesised in this report there are key aspects which are vital to take cognisance of. These include the relevance of international experience, the components of an IT administrative system to support the carbon offset system and project eligibility criteria.

The Synthesis Report has to inform specific decisions pertaining to the design and functioning of the eventual South African Carbon Offset System. These decisions will inform the further development of aspects such as an Organisational Development Plan and the Registry / IT System infrastructure.

In this regard the following sub-sections provide a brief overview of each of these key aspects as detailed in the Synthesis Report, culminating in a summary of the key decisions that need to be taken.

RELEVANCE OF INTERNATIONAL EXPERIENCE AND RECOMMENDATIONS

The development of this report coincided with a number of existing international carbon trading systems which documented their respective lessons learned, as well as the studies undertaken by the WorldBank Partnership for Market Readiness. This varied body of research assists to understand the current issues in the international carbon markets, identify the risks and reduce these risks in developing the South African administration system.

The collection of workshop background papers developed by the WorldBank Partnership for Market Readiness and published during 2015 is of specific relevance. These documents list common recommendations on the development of institutional frameworks for carbon offset administration systems based on international best practice and learning. The following table provides an overview of the key aspects to consider in developing the South African carbon offset administration system:

TABLE A: PMR WORKSHOP BACKGROUND PAPERS - COMMON RECOMMENDATIONS

PMR WORKSHOP BACKGROUND PAPER RECOMMENDATION	RELEVANCE TO THE SOUTH AFRICAN SYSTEM
<i>Build the Register/Registry in a manner commensurate with the nature, scope and scale of the proposed Market Mechanism.</i>	<p>The South African context in terms of the proposed Carbon Offset Administration system is unique. On the one hand, a functional carbon offset trading is in its infancy. On the other hand, the South African carbon market, taking into consideration the Carbon Tax and the South African industrial mix provides significant opportunities in terms of carbon trading. As such, the South African carbon administration system must allow for flexibility in design to grow the system. Current market appetite, specifically considering the Carbon Tax, must be integrated in the system design. This will ensure that the system allows for maximum market penetration.</p>
<i>Identify what is required to establish the immediate legal framework necessary to support the role of the Register/Registry in the context of the Market Mechanism and the timeframe required to achieve that.</i>	<p>Both the Carbon Tax Policy Paper and the Carbon Offset Paper refer to South Africa’s Designated National Authority (DNA) as the administrator of the carbon offset system. To achieve this, we propose that the following be implemented:</p> <ol style="list-style-type: none"> a) That the unit currently residing in the Department of Energy and fulfilling the functions of the DNA be expanded to make provision for the functions of the Carbon Offset Administrator. b) A sub-unit inside the Carbon Offset Administrator acts as the DNA in terms of South Africa’s commitments under Article 12 of the Kyoto Protocol. It is important to note that the functions of the DNA need to stay intact as South Africa plans to continue making use of the CDM of the UNFCCC to generate Certified Emission Reduction (CER) credits for the domestic offset scheme. We, therefore, recommend that the new unit, the Carbon Offset Administrator, becomes the home for the DNA, which will now reside inside the Department of Energy. <p>Should Government decide to implement the structure as proposed above, then there will be no need to revise Regulation 721, which defines the role of the DNA in relation to the requirements of the Kyoto Protocol.</p>
<i>Identify the other areas of laws likely to be impacted by the intended market mechanism and identify the necessary responsible entity to address those laws (e.g. ministry of environment, ministry of finance, ministry of trade etc.).</i>	<p>Carbon offsets in the South African context will require effective integration amongst a number of Government departments. These include the Department of Environmental Affairs, National Treasury, the Department of Energy and the Department of Trade and Industry. Throughout the course of this project key consideration will be highlighted that require authoritative discussions on inter-departmental cooperation.</p>
<i>Establish a plan to coordinate and consult on issues, obstacles to achieving the necessary changes (e.g. delay, lack of expertise, authority of budget). The changes determined need to be consistent</i>	<p>Due to the diverse parties involved in the proposed South African carbon offset administration system, this project specifically has an embedded stakeholder engagement strategy. This strategy ensures that all relevant parties are updated and communicated with to achieve buy-in and feedback. Stakeholder engagement is critical to ensure buy-in from the</p>

and not conflict with each other with a view to implementing the policy objectives of the Market Mechanism.

various departments involved. This will facilitate ultimate implementation and operation.

Recognise limitations – seek expertise and support where required (including from other government agencies) and do so in a timely manner.

The South African carbon offset administration system will rely on inter-departmental support to ensure its functionality. In this regard it has been proposed that this project be used as a platform to commence these discussions between the various role-players. In addition, the structure of the proposed South African carbon offset administration system require different fields of expertise and different skill sets. Therefore, it will be critical to ensure that the eventual IT system and organisational development plan takes cognisance of existing skills in relation to skills that will be required.

Do not avoid the hard issues (e.g. what is the legal nature of the carbon credit) as, sooner or later, the issue will get highlighted via a market incident where the fallout will be far more difficult to manage.

The South African carbon offset administration system must be cognisant of hard issues to ensure that the proposed infrastructure effectively address these. The PMR workshop documentation highlights a number of important lessons learnt in international carbon offset systems. These include issues such as VAT fraud, cyber theft and the management of market data to name a few. In addition to these, key considerations in terms of platform selection include purpose, scope scale and potential for growth. Taking the above into consideration, the South African carbon offset administration system must consider varied factors to ensure its market integrity and viability.

Ensure the allocation of responsibility, roles of regulators or administrators are clear and unambiguous. It is important that along with the allocation of roles and responsibilities, sufficient budgets are provided to enable their discharge.

An Organisational Development Plan forms part of the South African carbon offset administration system project. This Plan will be developed based on *inter alia* the business processes designed in the standard operating procedures. As mentioned previously, the carbon offset administration system must allow for a specific range of skills to ensure functionality.

If the scope of the Market Mechanism is to create a tradable carbon asset, recognise the success of a market product is dependent on the market participant's confidence in it and provide what is necessary to achieve that confidence.

Market confidence, especially in ensuring the South African system achieves momentum, is of absolute critical importance. Therefore, the design of the system should take potential users, existing offset project developers and current international market learning into consideration. This will ensure that the South African system can provide for user confidence.

THE IT SYSTEM, TRANSACTION LOG AND OWNERSHIP REPOSITORY REQUIREMENTS

The analysis of the international systems reviewed in this Synthesis Report has highlighted that the IT System and Ownership Repository should be treated as two distinct units with distinct requirements.

In addition to this, a Transaction Log, in which all transactions involving carbon offset credits are recorded, must be set up.

The Synthesis Report analysis has identified that the Carbon Offset Administration System should be supported by the following components:

Administrative IT System: This system should have the following major functions:

Database: The system should store all information, data and documents submitted to and generated by the management of the South African Carbon Offset Scheme.

Workflow: The system should provide workflow assistance to the Carbon Offset Administrator on the execution of the tasks required to operate the system smoothly.

Access: The system should provide access to the correct users at the correct levels of security.

Reporting: The system should provide for reporting to the users at different functionality and access levels.

Transaction Log: The transaction log should maintain an accurate log of the issuance, change of ownership and retirement of all credits in the system.

Ownership Repository (Registry):

The ownership repository must provide an accurate and auditable record of ownership of carbon offset credits and all transfers of ownership.

The Transaction Log and Ownership Repository are functions of the Carbon Offset Administration System. However, due to the specific role of these elements within the carbon offset administration context, these have to be discussed as individual components of the system.

The relationship between the components of the administration system described are shown in the figure below:

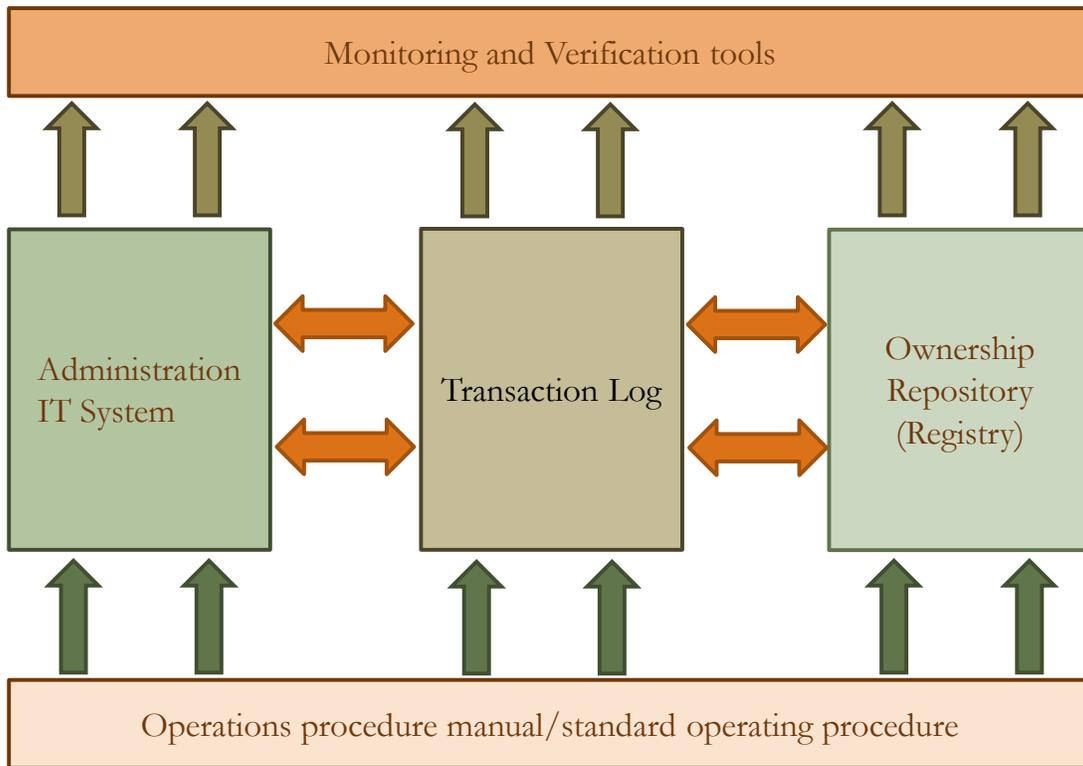


FIGURE A:PROJECT COMPONENTS IN RELATION TO EACH OTHER

The following table provides an overview of the relationship between the various components.

TABLE B: RELATIONSHIP BETWEEN THE IT SYSTEM, TRANSACTION LOG AND THE OWNERSHIP REPOSITORY (REGISTRY)

	IT System	Transaction Log	Ownership Repository (Registry)
Purpose	To facilitate the smooth administration of the system: <ul style="list-style-type: none"> • Ensure environmental integrity • Ensure National Appropriateness through the project eligibility criteria 	To maintain an accurate and auditable record of all transactions involving the issuance, change of ownership and retirement of carbon offset credits in the system	To facilitate the transfer of ownership of credits in the private sector between generators and taxpayers. The ownership repository must: <ul style="list-style-type: none"> • Record of ownership • Ensure commercial and financial integrity

IT System	Transaction Log	Ownership Repository (Registry)
Requirements	<ul style="list-style-type: none"> Workflow of project registration and issuance Accurate record of project documents Access to specified users for inputs and reports 	<ul style="list-style-type: none"> Failsafe communication with IT System and Registry Accurate database of all transactions Secure transaction platform for transfer of ownership of credits. Accurate transaction history. Access to specified users for inputs and reports.
Content	<ul style="list-style-type: none"> Project approval history. Project details and history Project Design Documents Validation reports Verification reports Issuance history 	<ul style="list-style-type: none"> An accurate record of all transactions. Commercial details and history Ownership records Transfer of ownership records Retirement details
Linkage	IT System, transaction log and ownership repository are linked through <ul style="list-style-type: none"> Project registration number Credit serial numbers 	

THE ADMINISTRATIVE IT SYSTEM REQUIREMENTS

The Administrative IT System forms the backbone of the carbon offset administration system. This analysis is based on the following high-level system requirement specifications:

- Control:** That the administration will be under the control of the Carbon Offset Administrator, which will be the unit in the Department of Energy currently performing the function of the DNA. The Carbon Offset Administrator will be supported by an Independent Expert Committee.
- Applicable Standards:** The system must be able to handle offset credits from the UNFCCC’s Clean Development Mechanism (CDM), the Verified Carbon Standard (VCS), the Gold Standard (GS) and the Climate, Community and Biodiversity Alliance Standard (CCBS).
- Project eligibility:** The system must be able to handle the assessment of the National Appropriateness of offset projects as specified in the project eligibility criteria to be published in the forthcoming carbon tax legislation and regulations.
- Record keeping:** The system must keep all records related to project registration, national appropriateness (project eligibility in terms of the carbon tax), issuance and retirement of credits. This will require an extensive database in which all relevant data is recorded and kept.

Linkages:	The system must link with both the Transaction Log and with the Registry.
Access:	The system must be accessible to the following users: <ul style="list-style-type: none"> • Carbon Offset Administrator. • Technical Support. • Carbon offset project owners. • Independent verifiers. • Other Government departments that may require access to specific reports, such as SARS, Department of Environment, etc.; • Members of the public with respect to specific reports.
Reporting:	The system must provide for a variety of fixed and configurable reports for various users.
Security:	The system must have the required level of security.
Timeframes:	The system must be operational in time for the implementation of the carbon tax in January 2017.

Based on the analysis done in this report, the recommendations with respect to the Administrative IT System are:

TABLE C: OPTIONS FOR ADMIN IT SYSTEM

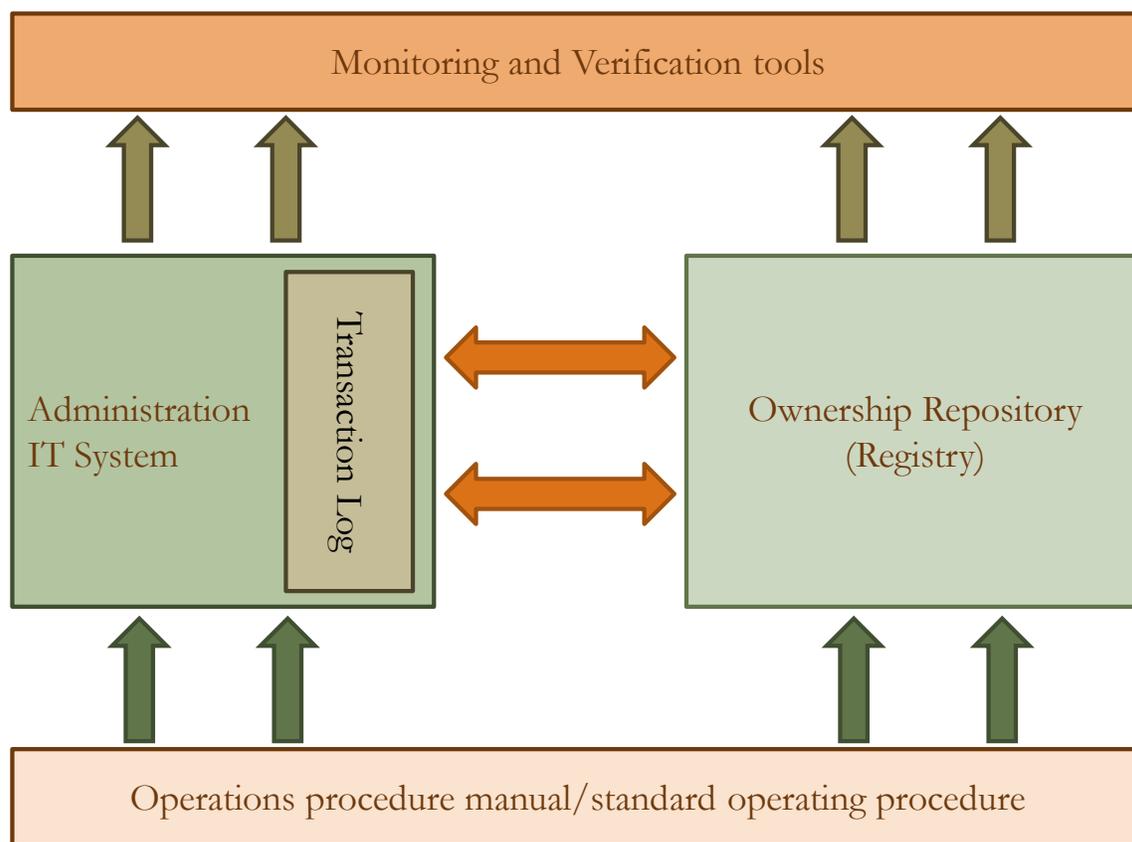
Options	Comments	Analysis
Build new system	The benefits of building a new system for the Carbon Offset Administrator is that the IT System can be custom made to address the unique characteristics of the South African System.	<p><i>The South African Carbon Offset Administration system should be a custom designed IT System built purposely for the Carbon Offset Administrator, housed inside the Department of Energy.</i></p>
Use existing DNA system	The current DNA system is based on providing host country approval for the CDM projects. Certain critical components that will be required in the new carbon offset administration system that are not covered in the current DNA system are: <ul style="list-style-type: none"> • The ability to handle VCS projects. • The ability to handle GS projects. • The ability to handle CCBS projects. • The ability to handle full project registration details. • The ability to link to carbon offset credit registries. 	
Use system developed by SANEDI for Section 12L energy efficiency incentives	Whereas the Section 12L IT system managed by Sanedi is similar in nature to the required carbon offset IT System, the processes differ on many points. Retrofitting this database to accommodate the carbon offset requirements would be costly and time intensive. However, elements of the 12L IT system can be replicated in the offset IT system.	

TRANSACTION LOG REQUIREMENTS

The purpose of the Transaction Log is to provide a full record of all transactions related to ownership of carbon offset credits in the South African scheme. The transactions include issuance, transfer of ownership and retirement.

Even though the existing rules of the UNFCCC do not allow non-Annex I countries to participate in the UNFCCC registry/transaction log system, it will be prudent to ensure that the South African system is aligned with the international architecture for possible future linkage.

Based on the analysis presented in this Synthesis Report, we recommend that the South African Transaction Log be housed in the Administrative IT System, as shown in the figure below:

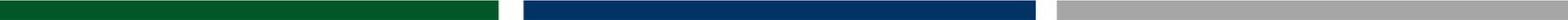


FIGUREB: PROPOSED HOUSING OF THE SOUTH AFRICAN TRANSACTION LOG

OWNERSHIP REPOSITORY REQUIREMENTS

The environment within which the Ownership Repository operates, and, therefore, the requirements for the Ownership Repository, differ fundamentally from that of the Transaction Log and the IT System. Whereas the IT System is designed to ensure the environmental integrity of the system, the ownership repository is designed to ensure the financial integrity of the system. The Transaction Log acts as “check and balance” between the two systems.

In general, carbon offset registries need to:

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- i. Record ownership and facilitate transfers of ownership in an accurate and auditable way;
 - ii. Ensure administrative efficiency;
 - iii. Provide access to specified users in the required way, such as via the internet;
 - iv. Keep transaction costs low;
 - v. Ensure timeous execution of transfers;
 - vi. Ensure very low risk of fraud; and
 - vii. Provide adequate administrative support.

In relation to the above the Synthesis Report show that the requirements for structuring, managing and hosting a registry include the following:

**TABLE D: REQUIREMENTS FOR STRUCTURING, MANAGING
AND HOSTING THE CARBON OFFSET REGISTRY**

Issue	Requirements	Implications for structuring, managing and hosting of the registry
Property	An entry into the registry must act as a legal claim to a property right.	The registry must be structured in a way that can guarantee the property rights of the holders of the carbon offset credits. The entity managing and hosting the registry must have the training, background and skillset to manage a registry of property rights.
Insolvency	The registry must provide for the treatment of property rights in cases of insolvency that is consistent with the laws of the country.	The entity managing and hosting the registry must have the training, background and skillset to manage a registry of property rights.
Market abuse	The registry must provide protection against market abuse.	The registry must be set up in an environment where the organisation is trained and skilled in the provision of protection against market abuse, and the necessary checks and balances are in place. Such an environment exists in South Africa in the existing commodities exchange on the JSE. Managing market abuse is <u>not</u> a traditional skillset of the DNA.
Criminal / white collar crime prevention	The registry must provide protection against criminal activities and white collar crime.	The registry must be set up in an environment where the organisation is skilled in the provision of protection against criminal activities and white collar crime. Such an environment exists in South Africa in the existing commodities exchange on the JSE. Criminal/white collar crime prevention is not a traditional skillset of the DNA.
Financial regulation	The registry must comply with the required financial regulation.	The DBA is not structured to accommodate compliance with financial regulations. The environment within which all of the required regulations are met does, however, exist in the existing commodities market and the accompanying trading platform for derivatives and futures on the JSE.
Cybersecurity	The registry must have the necessary levels of security to provide protection against cyber fraud attacks such as phishing scams and hacking.	The platform on which the registry is built must have proven track record of security measures to prevent cyber-attacks. Such a track record does exist in the existing South African commodities registry and the online trading platforms used by the JSE.

Whereas we believe that the South African system should be built to accommodate more than one registry when the system matures, the initial phases will, however, most probably only allow for one registry to operate in the system. We have identified some options for the first registry in the system. The options are:

TABLE E: OPTIONS FOR CREDIT TRANSFER REGISTRY

Options	Details	Comments
Build new system to be housed in (managed and hosted by) the Carbon Offset Administrator	The design and construction of a new registry system will have to address the concerns on the functionality of the system reliability with respect to structuring, managing and hosting the registry.	As illustrated in Table 8, the required skill set to address DNA the commercial and financial issues listed as well as manage and host the registry with the degree of security required, differs from the conventional skillset required by the DoE and the DNA
Use an existing international system	<p>The available systems are:</p> <ul style="list-style-type: none"> • Markit • APX • CCX <p>We have engaged with both Markit and APX and both organisations have indicated a willingness to set up operations in South Africa to provide the necessary registry services required.</p>	<p>An existing international system could be a viable option to move toward implementation. The issues that need to be addressed are:</p> <ul style="list-style-type: none"> • The registry structures of Markit and APX are not set up to handle the additional requirements that are imposed by South African law. These requirements will have to be built into those systems. • Where comparative alternatives exist for South African organisations to offer equivalent services, the South African organisations should be given the opportunity to offer their services.
Use existing South African system	<p>The available systems are:</p> <ul style="list-style-type: none"> • Silocerts • STRATE <p>We have engaged with both Silocerts and STRATE to discuss the possible hosting of a South African carbon offset registry. STRATE have indicated that they do not believe that their platform is ideal for the carbon offset registry, but Silocerts have indicated that they could host the carbon offset credits.</p>	The JSE performed a pilot trade through the Silocerts registry in January 2015. This pilot involved a number of trades of both CERs from the CDM and VCU from the VCS by voluntary participants. The trades were executed OTC and mirrored in the tests environments of both Silocerts and the JSE.

Based on the analysis provided above, the registry for the South African Carbon Offset Scheme can be hosted on the existing South African commodities market platform that consists of the registry in Silocerts and the JSE.

SA CARBON OFFSET ADMINISTRATION SYSTEM: ELIGIBILITY CRITERIA

The Carbon Offset Paper provided a starting point from which to determine and refine project eligibility criteria. This Paper indicated the following elements to be considered in terms of project eligibility:

- **Location:** *Only South African-based credits will be eligible for use within the carbon offsets scheme, to encourage the development of locally based projects and GHG-mitigation in South Africa.*

- **Position in tax net:** *Projects that generate carbon offset credits must occur outside the scope of activities that are subject to the carbon tax. This is to prevent double counting of the carbon reduction benefit should an offset project be implemented on an activity that is liable to the carbon tax.*
- **Eligible projects:** *In keeping with desired carbon offset principles a list of eligible projects will be introduced as a starting point to provide certainty and stimulate investment decisions and project development in the carbon offsets market. Lists of both eligible and ineligible projects should be introduced, based on the value added to the low-carbon transition. An eligible projects list would include project areas that, in addition to carbon mitigation, also have sustainable development benefits and contribute to meeting South Africa's developmental priorities.*
- **Timing:** *Projects registered or implemented prior to the introduction of the carbon tax regime will have to fulfil specified conditions to be accepted to the scheme.*

In addition to the above, the project team suggests that the following criteria also be considered:

- **Host Country Approval:** The CDM currently requires that all projects must get approval from the host country DNA with respect to the eligibility of the project in terms of the sustainability criteria of the host country. This is not currently a requirement in either the VCS or the GS. It is recommended that VCS and GS must get approval in the same way as the CDM with respect to the sustainable development criteria before these credits can be eligible to trade in South Africa.
- **Forestry Credits:** Afforestation or reforestation projects registered under the CDM are recommended to be excluded from carbon offset trading, as ICERs and tCERs do not address permanence issues. The purpose of this exclusion is to ensure that project permanency risk should not be transferred to the State but should lie with the project owner. Projects utilizing VCS methodologies (which address permanence through risk assessments and buffer accounts on a program level) should be eligible for carbon offset trading. These permanence requirements are applied across the entire program and do not vary methodology by methodology thereby reducing uncertainty and costs for project developers.
- **Registration date:** It is recommended that projects registered prior to the date of introduction be eligible irrespective of the other eligibility criteria. The motivation for this lies in two areas with specific reference to the registration date. The first is that these projects will supply the initial volume into the market that is required to give liquidity to the trading system. Secondly, any CER or VCU that is eligible to be used as an offset elsewhere in the world and which was generated from a project registered when there was no carbon pricing mechanism implemented in SA, should be eligible to be used in SA as well.
- **Additionality:** Projects registered under the CDM and for which the E-policy argument was used in the additionality should prove that the project will still be additional if the E-policy argument is not used.
- **Positive list:** Both the CDM and VCS allow for positive lists which both identify project types that have been deemed to be additional through a series of analysis. Projects on the positive list are automatically additional. In the supply and demand section, the impact of supply of a positive list is assessed. The proposed positive list includes all projects in the residential

sector, as well as projects developed under the RE IPP Programme up to a penetration rate of 5% for each technology.

DECISIONS FOR MOVING FORWARD

The Synthesis Report has to inform the further development of aspects such as an Organisational Development Plan and the Registry / IT System infrastructure. This report provides a culmination of information which highlighted key considerations in terms of international lessons learnt, the IT administration system and eligibility criteria. These considerations impact on the project going forward in various ways. The main decisions that need to be taken in relation to these aspects are listed in the table below:

TABLE F: LIST OF PROJECT DECISIONS TO BE TAKEN IN THE DEVELOPMENT OF THE CARBON OFFSETS ADMINISTRATION SYSTEM

Topic	Working question	Considerations
Organisational design	What should the Administrator look like?	The organisational design of the Administrator will impact on the capacity and skills of the Administrator. The design will impact on the definition of tasks to be performed in-house or outsourced. Responsibilities that may fall, as an example, under the regulation of the Financial Services Board, may have to be outsourced. These could typically include the administering and regulation of trades on the selected market platform.
Project eligibility rules	What projects can be allowed into the offset trading scheme?	The criteria for National Appropriateness must be considered. The rules should probably be informed by policy decisions to be taken by the Independent Expert Committee. The relevant government department must be the decision point.
Administration of the IT System	Who should be in control of the administration of the carbon offset scheme?	This report is based on the assumption that this decision has been taken and that the unit in the Department of Energy that currently acts as South Africa's DNA will be the Administrator
Structure of the Administrative IT System	What information should be contained in the administrative IT system?	The structure of the IT system will be informed by the responsibilities and actions of the Administrator. As a minimum, information that allows for full tracking and auditing of all aspects of the issuance and retirement of the credits in the system should be covered. Additional information may be required for National Government reporting.
Administrative IT System hosting	Where should the IT System be hosted?	Note that the decision of where to host is informed by issues such as security and disaster recovery and not by the controls of the system and the database. From this perspective, it may be prudent to host the IT system at a reputable third party service provider.

Topic	Working question	Considerations
Administration of the Transaction Log	Who should be in control of the Transaction Log?	The purpose of the Transaction Log is to act as a control measure on the issuance, transfer of ownership and retirement of carbon offset credits. As such we believe that the Carbon Offset Administrator, as the final custodian of the carbon offset system, should be in control of the Transaction Log.
Structure of the Transaction Log	What information should be contained in the Transaction Log?	The Transaction Log should contain a full record of all transactions related to the issuance, transfer of ownership and retirement of credits in the system. The Transaction Log should further be structured that communication with other international Transaction Logs will be possible if required in future.
Transaction Log hosting	Where should the Transaction Log be hosted?	It would be best if the Transaction Log is hosted with the Administrative IT System.
Administration of the Ownership Repository (Registry)	Who should handle the administration of the ownership repository?	The administration of the ownership repository will require unique skills and responsibilities that may fall outside of the conventional skill-set of the Department of Energy. The most important element of the administration of the ownership repository is the responsibility for the commercial and financial integrity of the ownership database and transfer-of-ownership database for the carbon offset credits.
Ownership Repository (Registry) structure	What information should be contained in the ownership repository?	The ownership repository must contain all information required to manage the ownership records and transfer-of-ownership records of the carbon offsets credits in an auditable environment.
Ownership Repository (Registry) hosting	Where should the ownership repository be hosted?	Note that the decision of where to host is informed by issues such as security and disaster recovery and not by the controls of the ownership repository. From this perspective, it will be prudent to host the ownership repository at a reputable third party service provider. The government will retain oversight of the system through the Transaction Log.

CONCLUSION

This synthesis report provides the project team and the project steering committee an understanding of the current issues in trading carbon and form a basis for decision-making and the development of a practical SA appropriate administrative system. The objective of the report is to provide a structured reference to key issues related to the development of a carbon offset administration system.

Therefore, this synthesis report can be used in drafting the Standard Operating Procedures and the Organisational Development Plan as per the project terms of reference.

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GLOSSARY

TERM	ABBREVIATION	DESCRIPTION
Carbon Offset Administrator	COA	The administrative units as defined by the Carbon Tax Act (to be published) and the Carbon Offset Regulations (to be published)
Carbon Offset Administrative System	COAS	The system described in this document that enable the COA to perform its duties as specified in the Carbon Tax Act (to be published) and the Carbon Offset Regulations (to be published)
CDM executive Board	CDM EB, EB	The Executive Board of the CDM as defined in Article 12 of the Kyoto Protocol. The function of the Board, whose members are elected by the CMP, is to supervise the CDM in accordance with paragraph 5 of the annex to decision 3/CMP.1.
CDM Programme of Activities Design Document	CDM-PoA-DD	The document prepared by the CME of a PoA, which sets out in detail, in accordance with the CDM rules and requirements, the PoA which is to be undertaken. The form of PoA-DD and guidelines on preparing the PoA-DD are publicly available on the UNFCCC CDM website.
Certified Emission Reductions	CER	CERs are emission reductions equivalent to one metric tonne of carbon dioxide. They may be used by countries towards meeting their commitments under the Kyoto Protocol, or by voluntary offsetters. CERs must come from projects that have been approved by the CDM.
Clean Development Mechanism	CDM	<p>The CDM is an arrangement under the Kyoto Protocol allowing industrialised countries with a greenhouse gas reduction commitment (so-called Annex 1 countries) to invest in emission reducing projects in developing countries as an alternative to what are generally considered as more costly emission reductions in their own countries.</p> <p>The CDM is supervised by the CDM Executive Board (CDM EB) and is under the guidance of the Conference of the Parties (COP/MOP) of the United Nations Framework Convention on Climate Change (UNFCCC).</p>
Climate, Community & Biodiversity Alliance	CCBA	The CCBA is a partnership of international NGOs that was founded in 2003 with a mission to stimulate and promote land management activities that credibly mitigate global climate change, improve the well-being and reduce the poverty of local communities, and conserve biodiversity.
Climate, Community & Biodiversity Standard	CCBS	Carbon offset standards developed by the CCBA
Economic Integrity		Economic integrity means that the credits and money handled in the system must be secure from theft, fraud and other undesirable events.

TERM	ABBREVIATION	DESCRIPTION
Eligibility criteria		A set of criteria published under the South African carbon tax regime that defines what projects can be used as providers of carbon offsets in the carbon tax system.
Environmental Integrity		Delivering real, permanent, additional and verified mitigation outcomes, avoid double counting of effort, and achieve a net decrease and/or avoidance of greenhouse gas emissions. Environmental integrity refers to the requirement that each ton of CO ₂ traded as an offset must represent an actual emission reduction of one ton. This can be achieved through the utilisation of existing offset standards like the Clean Development Mechanism (CDM), the Verified Carbon Standard (VCS) or the Gold Standard.
Gold Standard	GS	Gold The Gold Standard is an independently audited, globally applicable best practice methodology for project development. The Gold Standard is a non-profit foundation, based in Basel, Switzerland. The Gold Standard project method requires the use of renewable energy and energy efficiency technologies that promise sustainable development for local communities. All Gold Standard projects are rigorously tested for environmental quality by registered third parties. The Gold Standard carbon credit label is awarded after third party validation and verification of the offset project.
Kyoto Protocol	KP	An international agreement, reached in 1997 in Kyoto, Japan. The agreement came into force on 16th February 2005. The Protocol set targets for future emission reductions by each developed country up to 2012. Agreements were made to limit their greenhouse gas emissions, relative to the levels emitted in 1990.
National Appropriateness		Ensuring mitigation and adaptation which is will facilitate environmental sustainability whilst acknowledging pro-poor, pro-growth and pro-employment strategies. This relates to nationally appropriate action on the basis of equity and in accordance with common but differentiated responsibilities and respective capabilities
United Nations Framework Convention on Climate Change	UNFCCC	The UNFCCC is the Convention signed at the Earth Summit in Rio De Janiero in 1992. This stipulated that industrialised countries listed in Annex 1 were required to stabilise their emissions at 1990 levels by 2000. The Kyoto Protocol was later drawn up as the initial agreement was not sufficient.
Validation/Verification body	VVB	Auditors known as validation/verification bodies (VVBs) are tasked under VCS, with validating project descriptions and verifying actual emission reductions. All projects under the VCS Program must be independently audited to ensure compliance with rigorous VCS requirements for environmental integrity. Each VVB must meet key requirements before being eligible to audit a project in any given scope, though VVBs can be authorized to work on multiple sectoral scopes.

TERM	ABBREVIATION	DESCRIPTION
Verified Carbon Standard	VCS	The Verified Carbon Standard (VCS) has been developed by the International Emission Trading Association, the Climate Change Group and the World Economic Forum. The VCS has been designed to be a global benchmark standard for project-based voluntary emission reductions. It creates a voluntary emission reduction credit, the VCU that can be traded.
Verified carbon Unit	VCU	Under VCS, projects are issued unique carbon credits known as Verified Carbon Units or VCUs. Each VCU represents a reduction or removal of one ton of carbon dioxide equivalent (CO ₂ e), which can be generated by reducing or removing any of the listed greenhouse gases (GHGs).

1. INTRODUCTION

1.1 PROJECT BACKGROUND

This synthesis report was prepared to provide background information and a platform for decision making related to the development of the carbon offset administration system project. The report analyses information from a number of countries and international organisations with respect to their carbon systems. The carbon offset systems largely include cap-and-trade programmes as these are the most common schemes worldwide. A cap and trade scheme trades emissions allowances whereas an offset trades emissions reductions. This report considers the lessons learned from these systems and looked for applicability in the South African context.

The main areas considered are:

- European Union Emission Trading Scheme (EU-ETS)
- California's Emission Reduction Initiatives
- Australia's Greenhouse Gas Reduction Initiative
- China's Emission Trading Scheme
- Danish Emission Reduction Initiatives

In addition, information from the following schemes are considered:

- The Clean Development Mechanism (CDM) of the United National Framework Convention on Climate Change (UNFCCC)
- The Verified Carbon Standard (VCS) which includes the Climate Community and Biodiversity Alliance (CCBA)
- The Gold Standard (GS)

Some reference is also made to schemes such as the Chicago Climate Exchange and the Regional Greenhouse Gas Initiative (RGGI). The project also draws on work done in South Africa over the last three years. The selection of the schemes is based on identifying varied developmental and operational aspects relevant to the South African conditions. These schemes provide a number of different scenarios and aspects to be taken into consideration when developing a carbon offset system.

Reference is made in the Annexures to the successful pilot trade of carbon offset credits that were done in January 2015 on the JSE, using the existing South African commodities ownership repository as registry.

The report considers the following aspects of the schemes investigated:

- Policy context;
- Institutional arrangements;
- Resourcing regarding teams and organisational structure;
- Establishment and implementation processes; and
- IT Systems, Transaction Logs and Registries.

The report concludes with analysis and recommendations on the directions to be taken in the development of the South African carbon offset scheme.

1.2 STRUCTURE OF THE SYNTHESIS REPORT

The Synthesis Report is structured in the following way:

- The main body of the report provides an analysis of the information presented in the annexures. This analysis distils the issues relevant to the design of the proposed South African Carbon Offset Administration System.
- Detailed information and analysis of the South African context and international schemes are presented in the annexures. This covers the following:
 - South African Context;
 - Offset schemes in North America;
 - European Union Emission Trading Scheme;
 - Australia’s Greenhouse Gas Reduction Schemes;
 - China’s Emission Trading Schemes; and
 - Danish Emission Reduction Initiatives.

1.3 PURPOSE AND CONTEXT OF THE SYNTHESIS REPORT

The project inception report gave context to the Synthesis report, and specified that the synthesis report should include:

- *Update the existing database on information on international schemes with the most recent developments to provide a complete knowledge base of international experience and lessons learnt;*
- *Analyse and compare a diverse group of international examples. International schemes will be compared using the following broad categories: Policy context, institutional arrangements, resourcing, the establishment process and the implementation process. This analysis will highlight practical considerations and opportunities for further learning;*
- *Map the requirements of the Carbon Tax Policy Paper, Carbon Offset Paper, draft Carbon Tax Bill (if available), and proposed amendment to NEMA Regulation 721 (if available);*
- *Identify differences, similarities and linkages between international experiences and the South African requirements; and*

The Synthesis report is structured to address these issues.

1.4 RELEVANCE OF THE SYNTHESIS REPORT TO DECISIONS THAT NEED TO BE TAKEN

The relevance of the Synthesis Report to design and implement a carbon offset administration system for South Africa is shown in the figure below:

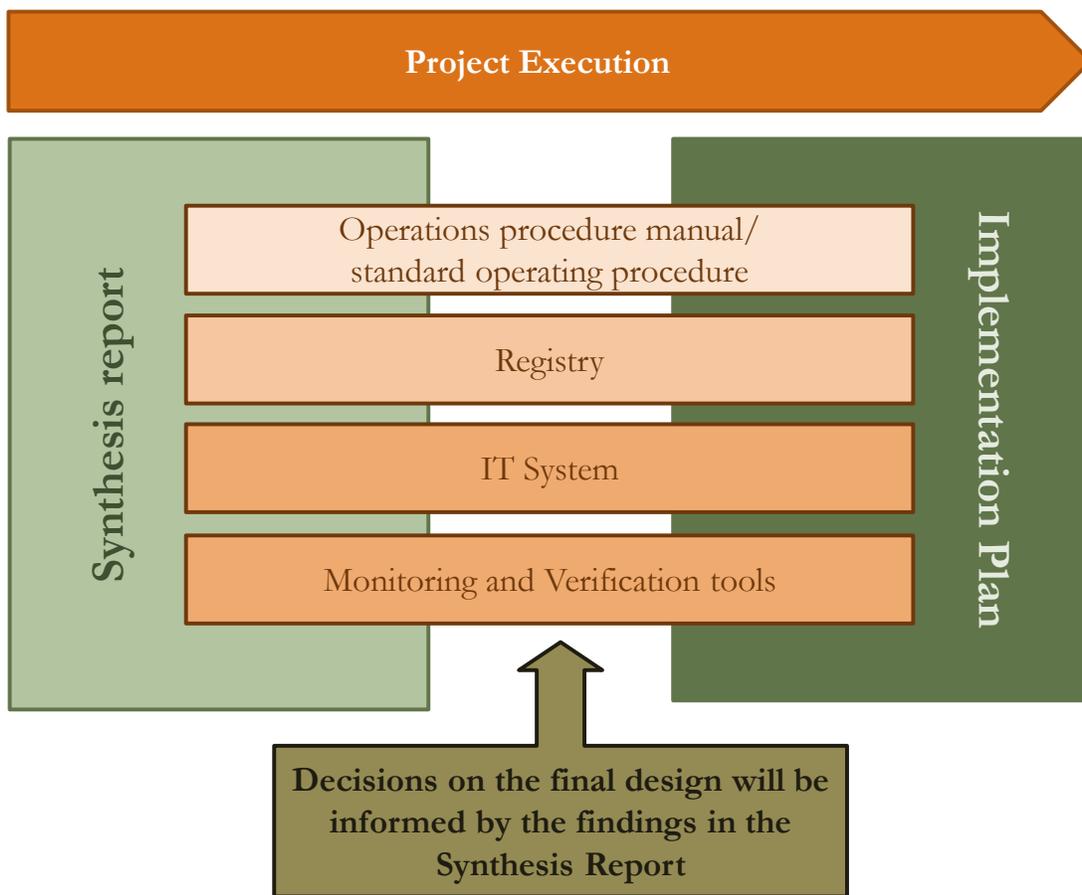


FIGURE 1: SYNTHESIS REPORT IN RELATION TO THE DEVELOPMENT OF THE ADMINISTRATION SYSTEM FOR THE SOUTH AFRICAN CARBON OFFSET SCHEME

The Synthesis Report has been drafted on the assumptions that the following issues are addressed and are taken as being pre-determined:

- The Offset Scheme will operate in the context of the proposed South African carbon tax.
- The Offset Scheme will be managed by an Administrator, as contemplated in the Carbon Offset Paper.
- The Administrator will be the unit currently operating as the Designated National Authority (DNA) in terms of South Africa's commitments under the Kyoto Protocol, which is housed in the Department of Energy.
- The Administrator will be supported by an Independent Expert Committee, as contemplated in the Carbon Offset Paper.
- The Administrator will be in full control of the process of issuance and retirement of the credits in the South African system.

The Synthesis Report has to inform the choices to be made at the decision points indicated in the figure above. These decisions will inform the further development of aspects such as an Organisational Development Plan and the Registry / IT System infrastructure. The main decisions are listed in the table below:

**TABLE 1: LIST OF PROJECT DECISIONS TO BE TAKEN IN THE DEVELOPMENT OF THE
CARBON OFFSETS ADMINISTRATION SYSTEM**

Topic	Working question	Timing of the decisions	Considerations	Documents to be considered in taking the decisions
Organisational design	What should the Administrator look like?	Decision towards the end of the project	The organisational design of the Administrator will impact on the capacity and skills of the Administrator. The design will impact on the definition of tasks to be performed in-house or outsourced. Responsibilities that may fall, as an example, under the regulation of the Financial Services Board, may have to be outsourced. These could typically include the administering and regulation of trades on the selected market platform.	The organisational design will be informed by the functional design of the offset system as specified in the Standard Operating Procedures.
Project eligibility rules	What projects can be allowed into the offset trading scheme?	Principles and a first draft have been provided in the Carbon Offset paper. Can be refined later.	The criteria for National Appropriateness must be considered. The rules should probably be informed by policy decisions to be taken by the Independent Expert Committee. The relevant government department must be the decision point.	This document presents comments on the principles contained in the Carbon Offset Paper.
Administration of the IT System	Who should be in control of the administration of the carbon offset scheme?	Indication by December 2015. This can be changed later.	This report is based on the assumption that this decision has been taken and that the unit in the Department of Energy that currently acts as South Africa's DNA will be the Administrator	This will be informed by the draft regulations for the carbon offset system expected in January 2016.

Topic	Working question	Timing of the decisions	Considerations	Documents to be considered in taking the decisions
Structure of the Administrative IT System	What information should be contained in the administrative IT system?	Will be developed in an iterative process during the execution of the project..	The structure of the IT system will be informed by the responsibilities and actions of the Administrator. As a minimum, information that allows for full tracking and auditing of all aspects of the issuance and retirement of the credits in the system should be covered. Additional information may be required for National Government reporting.	The structure of the administrative IT system will be informed by the Synthesis Report.
Administrative IT System hosting	Where should the IT System be hosted?	December 2015. Can be changed later.	Note that the decision of where to host is informed by issues such as security and disaster recovery and not by the controls of the system and the database. From this perspective, it may be prudent to host the IT system at a reputable third party service provider.	The Carbon Offset Paper proposed that the unit in the Department of Energy currently fulfilling the functions of the Designated National Authority in terms of the Kyoto Protocol acts as Carbon Offset Administrator. This report is written on the premise that the Carbon Offset Administrator will host the Administrative IT System.
Administration of the Transaction Log	Who should be in control of the Transaction Log?	December 2015. Can be changed later.	The purpose of the Transaction Log is to act as a control measure on the issuance, transfer of ownership and retirement of carbon offset credits. As such we believe that the Carbon Offset Administrator, as the final custodian of the carbon offset system, should be in control of the Transaction Log.	This decision will be informed by the Synthesis Report as well as the draft carbon offset regulations expected in January 2016.
Structure of the Transaction Log	What information should be contained in the Transaction Log?	December 2015. Can be refined later.	The Transaction Log should contain a full record of all transactions related to the issuance, transfer of ownership and retirement of credits in the system. The Transaction Log should further be structured that communication with other international Transaction Logs will be possible if required in future.	This decision will be informed by the Standard Operating Procedure.

Topic	Working question	Timing of the decisions	Considerations	Documents to be considered in taking the decisions
Transaction Log hosting	Where should the Transaction Log be hosted?	November 2015.	It would be best if the Transaction Log is hosted with the Administrative IT System.	This decision will be informed by the Standard Operating Procedure.
Administration of the Ownership Repository (Registry)	Who should handle the administration of the ownership repository?	December 2015. This can be changed later	The administration of the ownership repository will require unique skills and responsibilities that may fall outside of the conventional skill-set of the Department of Energy. The most important element of the administration of the ownership repository is the responsibility for the commercial and financial integrity of the ownership database and transfer-of-ownership database for the carbon offset credits.	This decision will be informed by the Synthesis Report; the draft carbon offset regulations expected in January 2016 as well as through consultation with National Treasury.
Ownership Repository (Registry) structure	What information should be contained in the ownership repository?	December 2015.	The ownership repository must contain all information required to manage the ownership records and transfer-of-ownership records of the carbon offsets credits in an auditable environment.	This decision will be informed by the Standard Operating Procedure.
Ownership Repository (Registry) hosting	Where should the ownership repository be hosted?	November 2015.	Note that the decision of where to host is informed by issues such as security and disaster recovery and not by the controls of the ownership repository. From this perspective, it will be prudent to host the ownership repository at a reputable third party service provider. The government will retain oversight of the system through the Transaction Log.	This decision will be informed by the Synthesis Report, the draft carbon offset regulations expected in January 2016 as well as through consultation with National Treasury.

2 ANALYSIS

The following sections outline the investigations into the recent experience gained in carbon offset schemes in other countries and regions that could potentially inform the proposed South African carbon offset administration system. It also lists insights regarding the national operational parameters compared to established trading schemes operating internationally.

2.1 POLICY CONTEXT

An analysis of the international schemes shows that the South African policy context is unique. South Africa is the only region where carbon offsets will be used for carbon tax obligations. A summary of the policy context of the international schemes considered is shown in the table below:

TABLE 2: SUMMARY OF POLICY CONTEXT ON GREENHOUSE GAS EMISSION OFFSETS

Country/region	Purpose of the carbon offset scheme			Comments
	Cap and trade	Tax	Emission abatement	
South Africa		✓	✓	The National Climate Change Response White Paper states that offsets in South Africa could potentially be used against both the planned carbon tax as well as the planned carbon budgeting system.
European Union	✓			Many European countries have carbon taxes in addition to the cap-and-trade scheme imposed by the European Union. The use of offsets is however only linked to the cap-and-trade scheme.
California	✓		✓	Californian companies can use offsets against their obligations under both the California Environmental Quality Act and the California Global Warming Solutions Act.
Regional Greenhouse Gas Initiative (RGGI)	✓			Utilities operating in the USA states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont are required to participate in the RGGI cap-and-trade scheme.
China	✓			Pilot cap-and-trade schemes are running in 7 provinces/cities with a nationwide cap-and-trade scheme announced for 2017.
Australia – Carbon Pricing Mechanism	✓			This was a cap-and-trade scheme that was abandoned by the current government.

Country/region	Purpose of the carbon offset scheme			Comments
	Cap and trade	Tax	Emission abatement	
Australia – Direct Action Plan			✓	The Direct Action Plan aims at reducing Australia’s emissions through two mechanisms. The first is the Emission Reduction Fund that will purchase certified emission reduction credits from approved projects. The second is the Stabilization Mechanism in which companies can offset excess emissions through the purchase of Australian Carbon Credit Units (ACCUs).

2.2 RELEVANCE OF INTERNATIONAL EXPERIENCE TO OPERATION OF THE SOUTH AFRICAN OFFSET SYSTEM

The following section highlights the different ways in which some of the major cap-and-trade and related emission trading schemes operate.

One of the biggest challenges in approaching this project is to clearly articulate the issues that need to be addressed, and those that do not. There are many issues that are relevant to carbon offset trade within a cap-and-trade scheme that are not directly relevant to offset trade within the proposed South African tax-and-trade scheme. This is due to fundamental design and institutional differences between the two schemes.



FIGURE 2: ELEMENTS OF A CONVENTIONAL ETS

The different parts of a traditional carbon trading scheme is illustrated in Figure 2. The issues associated with the various parts and their inclusion or not in this project are summarized in Table 3 below.

The largest carbon trading and offset scheme in the world is the European Union Emission Trading Scheme (EU ETS). This scheme is significantly more complicated than the proposed South African carbon offset scheme in that it is a fully fledged cap-and-trade scheme where both the emission allowances and the offsets are handled in the same scheme. With regards to cap and trade schemes – it is important to understand how the offset scheme is implemented as part of carbon pricing policies. This will inform the development of the South African carbon offset scheme.

The roles of the following participants are outlined in Figure 3 below:

- **Operator:** The company that has an emission reduction obligation;
- **Authorities:** The governments of the individual countries in the EU; and
- **Verifier:** Independent verification bodies.

The figure below shows the mechanics of the system starting with the monitoring plan at the top and ending with the enforcement stage.

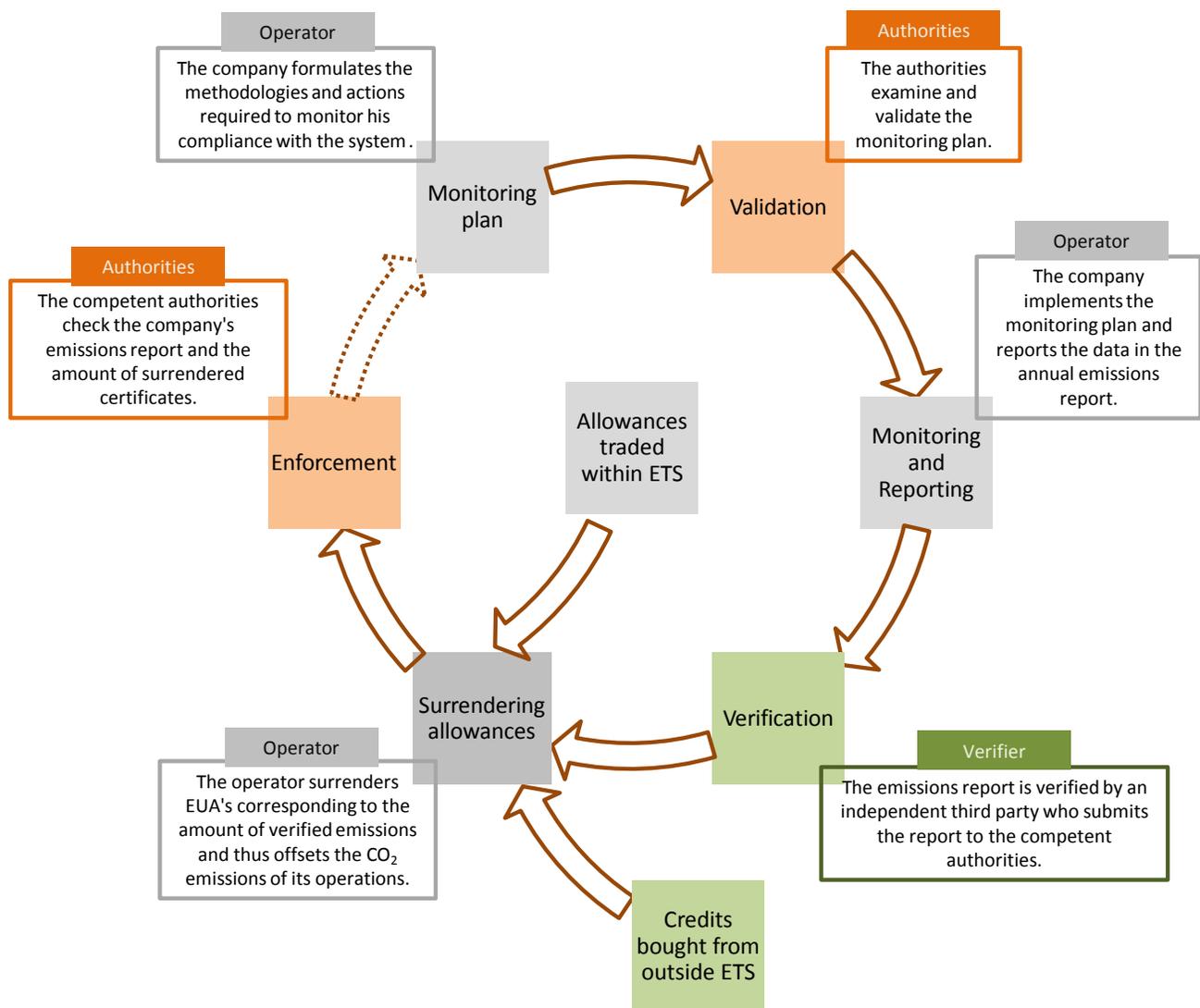


FIGURE 3: OPERATION OF THE EU ETS

The administration system of the EU ETS is defined by the laws of the European Union. Directive 2003/87/EC of the European Parliament and of the Council dated 3 October 2003 forms the foundation of the system. The administration is done on a number of levels:

- The Central Administrator of the EU ETS controls the following:
 - Maintain an International Transaction Log recording the issue, transfer and cancellation of allowances;
 - Conduct an automated check on each transaction in registries through the International Transaction Log to ensure there are no irregularities in the issue, transfer and cancellation of allowances; and
 - If irregularities are identified through the automated check, the Central Administrator shall inform the Member States concerned who shall not register the transactions in question or any further transactions relating to the allowances concerned until the irregularities have been resolved.
- Each member state must establish and maintain a registry for the management of ownership rights and transactions in its jurisdiction.

The Californian cap-and-trade scheme illustrated below covers eligible electric utilities, industrial facilities and natural gas distributors. While following similar project cycles and regulations to those

developed by international frameworks such as the EU ETS, the Californian scheme is administered and enforcement by the Californian Air Resources Board (ARB). The figure below outlines the high-level framework in this regard.

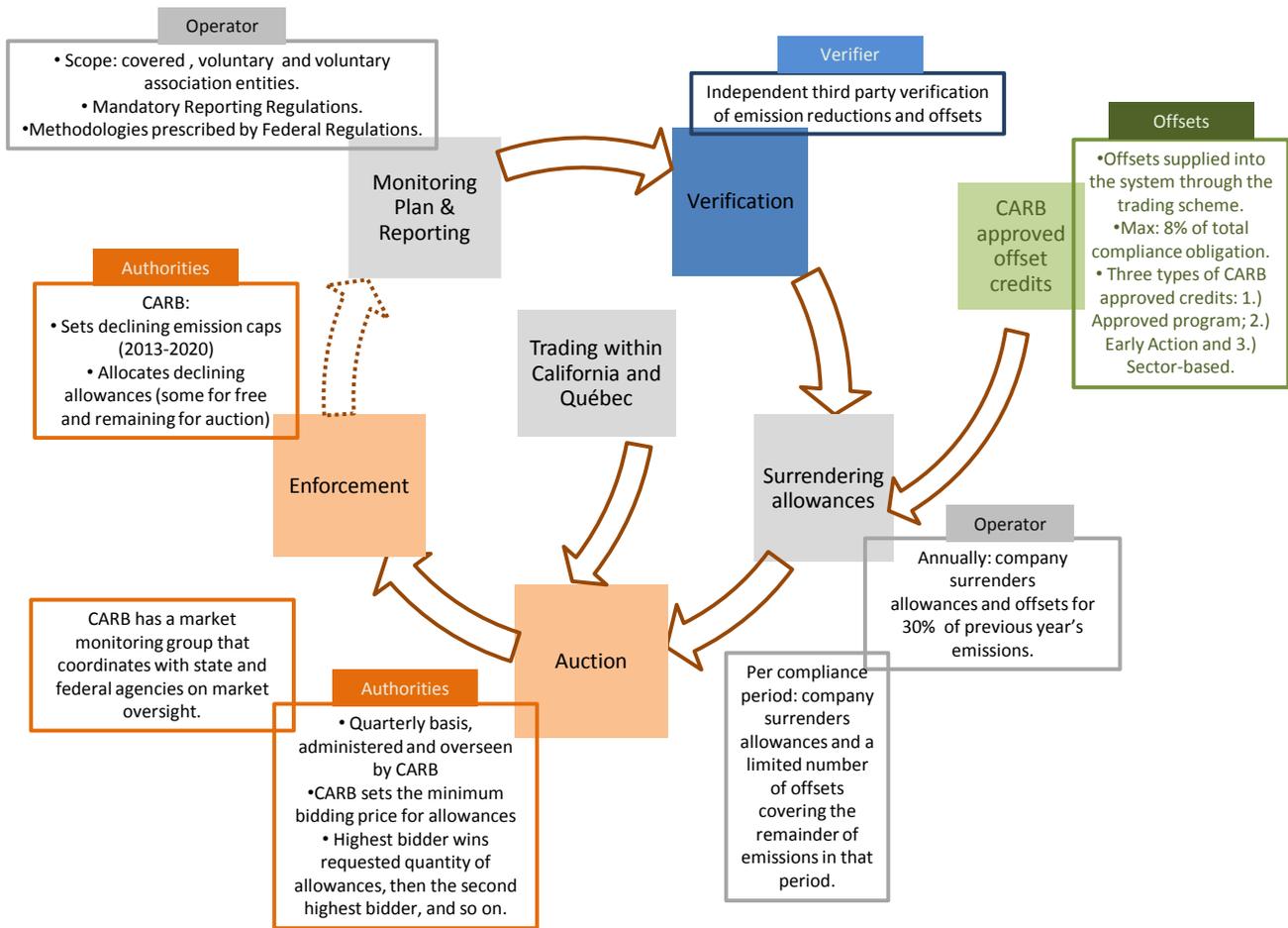


FIGURE 4: CALIFORNIAN CAP-AND-TRADE PROGRAMME

The ARB is mandated to perform the actions required to implement the California Global Warming Solutions Act. The ARB is supported by the Climate Action Team.

The proposed South African scheme is shown in the figure below. This analysis shows that there are significant differences from the European and Californian schemes.

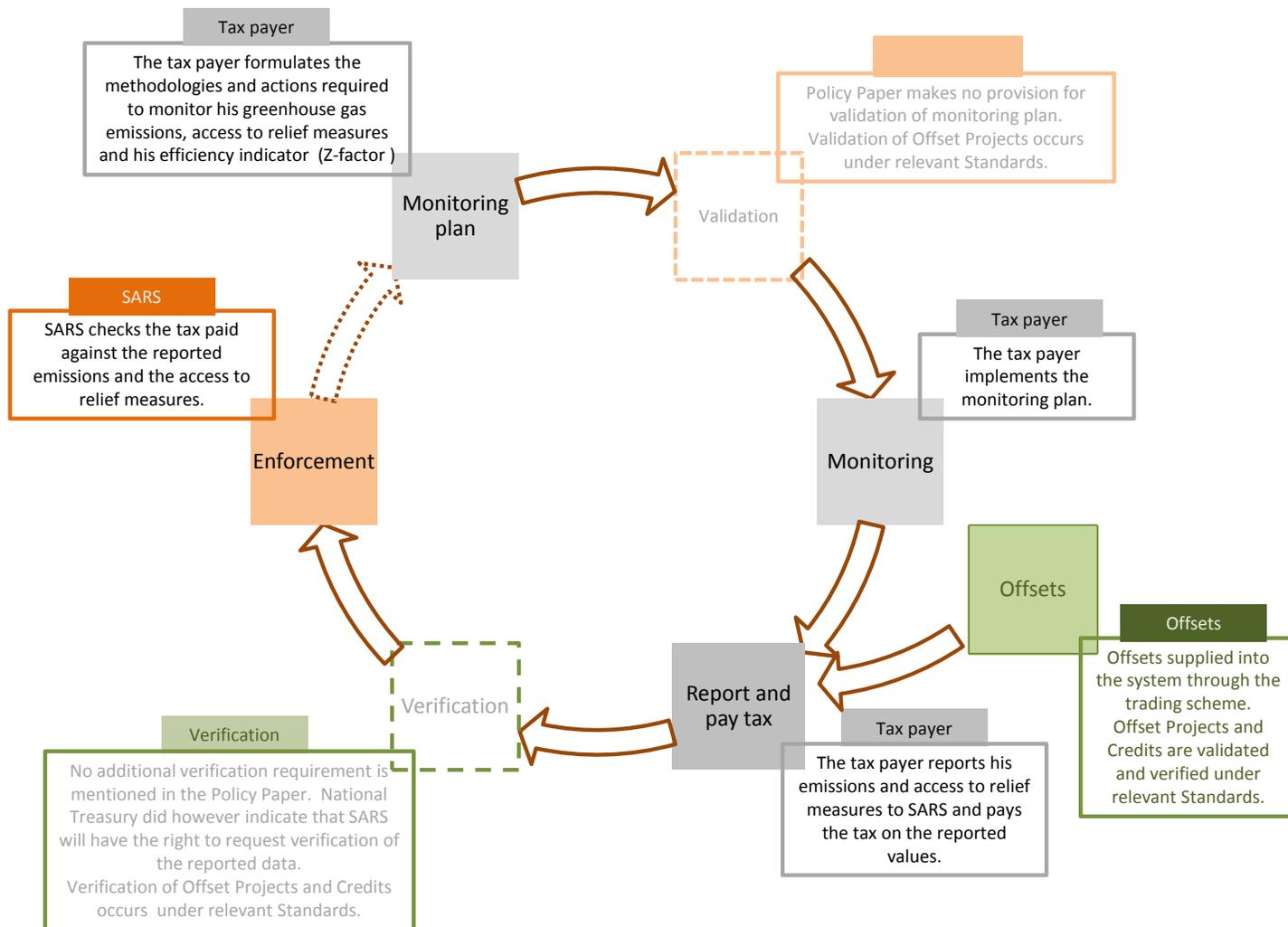


FIGURE 5: OPERATION OF THE PROPOSED SOUTH AFRICAN CARBON TAX SYSTEM

The South African system is significantly simpler than the EU ETS and the Californian system as it does not have to deal with the allocation of allowances, auctioning, banking or borrowing. Therefore, it does not need to address the same amount of wide-ranging issues in its design.

The South African carbon offset scheme is fundamentally different from the current cap-and-trade schemes that operate in Europe and North America, as well as from those being established in developing countries such as China and South Korea. The main elements of such cap-and-trade schemes and their relevance to the South African scheme are shown in the table below:

TABLE 3: ELEMENTS ASSOCIATED WITH TRADITIONAL EMISSION TRADING SCHEMES AND THEIR RELEVANCE TO THE PROPOSED SA SCHEME

Part of ETS	Issues that need to be addressed in traditional ETSs	Relevance to the proposed South African Scheme
Allocation of Allowances	<p><i>How should allowances be allocated?</i> Allowance allocation is usually decided formally within the allocation system of a carbon scheme. Baseline setting and allocation by industry and specific installation are issues that frequently require attention.</p>	<p>This is not relevant to the South African scheme as there will be no allocation of allowances. Companies will simply pay tax on their emissions. The proposed system allows for a maximum number of offsets to be used as indicated in the policy paper.</p>
Auctions	<p><i>Who should participate in auctions?</i> One of the major questions in an emission trading scheme is to decide which institutions should be required to buy their allowances on auctions and which institutions should get free allowances. Differences exist, for example, between the RGGI where institutions are required to buy around 90% of their credits on auctions and the EU emission trading scheme where market participants exposed to potential carbon leakage are expected to participate in auctions in a limited manner.</p> <p><i>What volumes should be auctioned?</i> The decision on some allowances to be auctioned is an important one in emission trading schemes. As an example, Europe hard-coded the volumes into their ETS legislation, and when economic circumstances changed, the market prices dropped to levels lower than what is required to achieve the objective of carbon pricing – to stimulate investment in low carbon technologies.</p>	<p>This issue is not relevant in the South African scheme. In practice, the proposed carbon tax is functionally similar to a cap and trade scheme where no allowances are issued (either free or via auction), and all participants are required to pay the “penalty” associated with emissions not covered by allowances.</p> <p>Auctioning is not relevant to the South African scheme as the thresholds at which companies will become liable for tax and limits to which a company may use offsets are determined in the design of the tax structure.</p>
Free Issuance	<p><i>What volume should be issued?</i> Free issuance of allowances in an ETS is the main tool to manage the risk of carbon leakage. Examples are the free issuance in the EU ETS and the Chinese pilot emission trading schemes being implemented in seven regions. In some of the Chinese schemes, participants are issued with 100% of their business as usual credits.</p>	<p>The risk of carbon leakage in the proposed South African carbon tax system is managed through the implementation of the relief measures. This is achieved by reducing the effective, average price of carbon in the system down to a level comparable with the country’s international trading partners. These measures include allowances for trade exposure and process emissions. As the leakage risk is addressed outside of the offset trading scheme, the question of free issuance is irrelevant to the implementation of the South African carbon offset scheme.</p>

Part of ETS	Issues that need to be addressed in traditional ETSs	Relevance to the proposed South African Scheme
	<p><i>What benchmarks should be used?</i></p> <p>Free issuance allocations are often based on industry benchmarks. The purpose of this is to ensure that more efficient firms are rewarded through the issue of sufficient allocations to run their operations, and inefficient firms are penalised as the higher emissions associated with their operations will force them to buy more credits in the market.</p>	<p>Even though the concept and use of benchmarks are used in the tax scheme as a relief measure (the efficiency based Z-factor), it is not relevant to the offset scheme and is therefore not covered in this analysis.</p>
Banking	<p><i>Should banking be allowed?</i></p> <p>The question about banking relates to the transfer of the value of credits between phases or commitment periods. It is relevant to emission trading schemes where allowances are distributed without associated costs because free issuance during one phase can impact on the cost of emissions in the subsequent phase.</p>	<p>In cases where there is no free issuance of allowances the generation of all credits is always associated with the economic cost to the owner. As will be the case in the South African system, the question of the limitation of banking over time is irrelevant. The approach taken in this analysis is therefore that offsets will retain their value over time. This is an essential element if the scheme must stimulate investment in low carbon technologies.</p>
Borrowing	<p><i>Should borrowing be allowed?</i></p> <p>Borrowing in ETSs takes place when companies are allowed to use the allocations expected in future phases in earlier phases of compliance.</p>	<p>This is not relevant in the South African scheme as there are no free allowances, and the carryover of free allowances between phases is not relevant.</p>

The design of the South African carbon offset administration system should take the issues identified in the figures and table above into consideration, and care should be taken if elements from international schemes are being used out of context in the South African system.

2.3 CARBON OFFSET TRADE CLASSIFICATION

Emission allowances are generally traded as commodities in existing trading systems. Certain challenges in Europe have however led to efforts to reclassify them as financial instruments. The following actions have been taken in this regard:

- The EU proposed in October of 2011 to classify spot trades in carbon credits as financial instruments¹ in terms of the *Markets in Financial Instruments Directive* ("MiFID II"). This proposal created a separate category for marketable securities, derivatives and financial contracts. This inclusion in the MiFID II Directive will reclassify emission allowances as financial instruments.

¹ EU MEMO/11/719 Brussels, 20 October 2011, Review of the Markets in Financial Instruments Directive (MiFID) and Proposals for a Regulation on Market Abuse and for a Directive on Criminal Sanctions for Market Abuse: Frequently Asked Questions on Emission Allowances, http://europa.eu/rapid/press-release_MEMO-11-719_en.htm

The legislation was passed in the European Parliament and Council on 14 January 2014 and will be written into national law for the European countries by January 2016.

- France transferred the responsibility to oversee carbon trading from the French Energy Regulation Commission to French Financial Markets Authority in October 2010² in terms of the French Banking and Finance Regulation Act (Loi de Régulation Bancaire et Financière). This effectively classifies emission allowances as financial instruments in France.
- Romania classified European Union Allowance (EUA) carbon credits as a financial instrument in February 2012³ in a move to combat VAT fraud.

It appears that the reclassification of carbon in Europe does not result from challenges associated with the commodity nature of carbon allowances and offsets but rather from the chain of custody in European trans-border transactions, and the regulatory requirements to avoid issues such as VAT fraud. In areas where similar risks associated with trans-border transactions do not exist, it may not be required to classify carbon offsets as financial instruments.

Australia classified carbon credits as financial instruments under the Carbon Credits (Consequential Amendments) Bill 2011 (the Carbon Credits Bill)⁴. This includes all eligible international emissions units under the Australian National Registry of Emissions Units Act 2011 (eligible international emissions units) which would include Assigned Amount Units (AAUs), Certified Emission Reductions (CERs) and Emission Reduction Units (ERUs) as well as other future units such as those potentially from REDD+ projects or units from other schemes like New Zealand Units (NZUs) and voluntary units such as under the Voluntary Carbon Standard (VCS). Emissions units are regulated as financial instruments under the Corporations Act (2001) and Australian Securities and Investments Commission Act (2001).

In Brazil, carbon credits are not classified as securities, both because they do not have the nature of a derivative instrument and do not fit under the concept of a collective investment agreement, the two categories of securities with which financial instruments are commonly identified.⁵

California classified emission reduction credits as commodities and requires that anybody trading in offsets must be *a derivatives clearing organization as defined in the Commodities Exchange Act that is registered with the U.S. Commodity Futures Trading Commission pursuant to the Commodities Exchange Act*⁶.

² Climate Brief No16 · May 2012, Applying MiFID to the EU ETS: what are the implications?
http://www.cdcclimat.com/IMG/pdf/12-06_point_climat_no16_-_applying_mifid_to_the_eu_ets.pdf

³ Reuters, <http://www.reuters.com/article/2010/02/24/us-romania-carbon-idUSTRE61N1PF20100224>

⁴ Baker McKenzie, Financial Services and Climate Change Australia, Carbon Credits (Consequential Amendments) Bill 2011, <http://auslt01.bakernet.com/reaction/images/Legal%20Alert%20-%20Carbon%20Credits%20Bill.pdf>

⁵ Ronald Herscovici and Mauricio Teixeira dos Santos, IFLR1000, Brazil - Carbon credits are not securities,
<http://www.iflr1000.com/ViewLegislationGuide.aspx?LegislationGuideId=170&IsPrint=true>

⁶ California Air Resources Board, Final Regulation Order: Article 5: California Cap On Greenhouse Gas Emissions And Market-Based Compliance Mechanisms To Allow For The Use Of Compliance Instruments Issues By Linked Jurisdictions

Even though the property right to carbon offsets such as the CDM is not explicitly described in South African law⁷, the ownership thereof is provided for through South Africa’s ratification of the Kyoto Protocol and the issuance thereof in terms of Host Country Approvals granted as per the requirements of the Kyoto protocol. This analysis is based on the validity of ownership of carbon offset credits as intangible assets in South African law⁸.

The South African market has a good analogue for carbon trading. Grain that is produced and used in the country is stored in silos country-wide. Each tonne of maize is represented by a silo certificate. The silo certificates are traded either on the over-the-counter (OTC) market or on the futures and derivatives markets on the JSE. The table below shows how the commodities are classified and how this same philosophy can be used for carbon offset credits:

TABLE 4: CLASSIFICATION OF COMMODITIES IN SOUTH AFRICA AND POSSIBLE CLASSIFICATION OF CARBON OFFSETS

Item	Grain	Carbon Offsets	Classification
Product	The product is defined as tonnes of grain of a specific type and specific grade, present in a specific silo at a specific point in time.	Greenhouse gases removed or sequestered expressed in tonnes of CO ₂ e on a specific site, using a specific approved methodology, under specific approved standards, for a specified period.	Products, such as grain are classified as commodities. Carbon offsets can be treated in the same manner as grain.
Certificate/proof of ownership	The legal owner of the grain is issued with a “silo certificate”. This document states the grade of the product, the amount of product and in which silo the product is stored. The silo certificate has traditionally been a paper document, but can now be issued as an electronic certificate.	The legal owner of the carbon offset credit is issued with an electronic certificate that states the volume of offsets in tonnes of CO ₂ e, and all other relevant information.	The certificates of ownership are proxies for the underlying commodities and should be treated as such. If the certificates are traded, they simply represent the underlying commodity and should, therefore, be classified in the same way as the underlying commodities.

⁷ Personal communication with Andrew Gilder of ENSafrica

⁸ Note that this is different from the situation in California where it is explicitly stated that a carbon offset does not constitute property or a property right.

Item	Grain	Carbon Offsets	Classification
Derivatives and Futures Markets	The owner of a silo certificate for grain can offer the certificate on the futures or derivative markets of the JSE. The JSE currently offers futures and options for white maize, yellow maize, wheat, soya beans and sorghum. The futures are typically contracts for physical delivery on specific dates.	Carbon offset futures and derivatives can be traded in exactly the same manner as other commodities. As an example, a carbon offset contract can stipulate the physical delivery of a certain volume of offsets on the last day before the carbon tax payment is due.	The futures and derivatives are classified as financial instruments. They are regulated by the Financial Services Board and can be traded on the Johannesburg Stock Exchange (JSE) provided the JSE has included the products in their license in terms of the requirements of the Financial Services Board.

Based on the analysis provided above, carbon offsets can be classified in line with the existing legal and commercial infrastructure in the country:

- The emission reduction, and the certificate of ownership representing the reduction as a commodity; and
- Any derivatives based on the commodity as a financial instrument.

This classification system as mentioned above will enable the trading of carbon on the existing commercial and financial infrastructure in South Africa. However, bilateral discussions between the Department of Energy and National Treasury will further refine and finalise the required definitions and their resultant implications.

2.4 LINKING TO INTERNATIONAL REGISTRIES

The proposed South African system will allow credits from the Clean Development Mechanism (CDM), Verified Carbon Standard (VCS), Gold Standard (GS) and Climate, Community and Biodiversity Standards to be used during the initial phases. The system must therefore make provisions to either link the South African system to the international systems generating credits under these standards, or to transfer credits from the international systems (where these credits are generated) to the South African system.

The UNFCCC does not currently allow non-Annex I Parties to link national registries directly to the registries of the UNFCCC.

It is important to remember that credits allowed into the South African carbon offset system will have to comply with more requirements than that of the standards in which they originated. The additional requirements include the criteria for National Appropriateness, as specified in the eligibility criteria contemplated in the Carbon Offset Paper.

A thorough analysis of international linking of credit systems has shown that the most appropriate example is the linking of the (now abandoned) Australian Carbon Pricing Mechanism with the EU ETS. Under this arrangement the transfer of Australian-Issued International Units to the EU's Union Registry would have been done according to the following process:

- Step 1: Check the validity of the transfer request.

- ii. Step 2: Send information to the EU Transaction Log (EUTL) about the number of Australian-Issued International Units to be cancelled and the account in the Union Registry into which the corresponding number of EUAs must be issued.
- iii. Step 3: If the transfer is validated by EUTL, then cancel the Australian-Issued International Units in the Registry by removing the transferred amount from the account in which it was held.
- iv. Step 4: Advise the EUTL that the units have been cancelled.
- v. Step 5: Arrange for an equivalent number of EUAs units to be transferred from the Commonwealth foreign registry account in the Union Registry to the nominated account in the Union Registry.

Transferring credits in the opposite direction would work in exactly the same way.

The Australian/European approach could be used in South Africa if the following approach is followed:

- i. A project is validated and verified by an accredited auditor in either of the standards eligible for use in the South African carbon offset system.
- ii. The credits generated by the project are issued into the international registry in terms of the scheme under which the project was developed. In the case of the CDM, this will be the CDM registry, or other registries in the European Union to which the credits may have been transferred and in the case of the VCS or GS, this could be in either of the independent registries catering for the VCS and GS; Markit or APX.
- iii. The owner of the credits must ensure that the project is eligible in terms of the requirements of the South African carbon tax rules. (Note that the rules of process for this step must still be defined.)
- iv. The owner of the credits must apply for the voluntary cancellation of the credits in the registry of origin.
- v. The credits are issued in the South African registry into the account of the offset provider against delivery of the confirmation of eligibility (point iii. above) and attestation of cancellation from the registry of origin.
- vi. Once the credits arrive in the account of the offset provider, they can be used as offsets against the carbon tax, or traded on either an OTC market or on the JSE.



United Nations
Climate Change Secretariat

Nations Unies
Secrétariat sur les changements climatiques

Date: 20/02/2015
Reference: VC0008/2015

ATTESTATION OF VOLUNTARY CANCELLATION

In accordance with the provisions to provide voluntary cancellation services in the CDM Registry, this attestation hereby certifies completion of the following voluntary cancellation transaction:

Transaction reference: CDM33175
CDM project activity reference number: 0795
CDM project activity name: Tugela Mill Fuel Switching Project
Number and type of cancelled units: 240 CERs
Start serial number: ZA-5-7337392-1-1-0-795
End serial number: ZA-5-7337631-1-1-0-795
Purpose / beneficiary of the cancellation: We are offering Backsberg Wine Estate 50 tons of CER's who need to cover a shortfall from their tree planting initiative in order to remain a carbon neutral wine estate. This is an initiative by Promethium to demonstrate carbon trading on the Johannesburg Stock Exchange Platform.
Date of cancellation transaction: 19/02/2015

The above information is also published on the CDM website at the following link:
https://cdm.unfccc.int/Registry/vc_attest/index.html

CDM Registry Administrator
UNFCCC Secretariat
Bonn

Martin-Luther-King-Strasse 8 · 53175 Bonn · Germany · Telephone +49 228 815 -1000 · Fax -1999 · secretariat@unfccc.int

FIGURE 6: EXAMPLE OF ATTESTATION OF VOLUNTARY CANCELLATION OF CERS

Further discussions with regards to linking the registry to existing international structures should pro-actively continue between the Department of Energy and the UNFCCC.

2.5 FASTER PRINCIPLES OF CARBON PRICING

The World Bank published a guideline for carbon pricing, *The FASTER Principles for Successful Carbon Pricing*⁹ in September 2015. An analysis of the proposed South African carbon offset system against these principles is presented in the table below:

⁹ The FASTER Principles for Successful Carbon Pricing: An approach based on initial experience, September 2015, Organisation for Economic Cooperation and Development (OECD) and the World Bank Group (WBG)



TABLE 5: THE FASTER PRINCIPLES FOR SUCCESSFUL CARBON PRICING

Principle	Description	Analysis of South African proposed system
F	Fairness Successful carbon pricing policies reflect the “polluter pays” principle and contribute to distributing costs and benefits equitably, avoiding disproportionate burdens on vulnerable groups	<p>The proposed South African carbon tax design is based on the polluter pays principle and it makes provision for revenue recycling to alleviate the economic pressures on poor communities.</p> <p>The carbon offset system assists these principles in that it allows for the direct expenditure of resources on emission reduction projects. Polluting companies can, under this scheme, make direct investments to offset their emissions and thereby mitigate the impact they have on the planet, the environment and society.</p>
A	Alignment of Policies and Objectives Successful carbon pricing policies are part of a suite of measures that facilitate competition and openness, ensure equal opportunities for low-carbon alternatives, and interact with a broader set of climate and non-climate policies.	<p>The proposed carbon offset scheme is aligned with the National Climate Change Response Strategy.</p> <p>The Alignment Principle requires that the offset scheme be designed to be able to integrate with both the envisaged policy measures to manage GHG mitigation – the carbon tax and the carbon budgets. This will be kept in mind during the execution of the project.</p>
S	Stability and Predictability Successful carbon prices are part of a stable policy framework that gives a consistent, credible, and strong investment signal, the intensity of which should increase over time.	<p>The principle of stability and predictability impacts on the following aspect of the design of the system:</p> <ul style="list-style-type: none"> • Longevity of credits: It is proposed that credits do not expire once they are listed in the South African system. This is necessary to ensure that companies will be prepared to make the investments required to generate credits. Note that this is a different arrangement from systems where allowances are issued for free and expires at the end of the commitment periods (example: EU ETS). • National Treasury have propose to fix the rules of the carbon tax up to 2020. It is however important that the rules for the offsets must be fixed for a longer period. Carbon offset projects have a minimum life of 10 years and the offset project implementer must be ensured that the credits will be eligible for this period of time in order to ensure that the investment can be repaid. This means that the design of the carbon budget system must also take cognisance of the details of the carbon offset system.

T	Transparency	Successful carbon pricing policies are clear in design and implementation	<p>This principle requires that the following be incorporated in the carbon offset administration system design:</p> <ul style="list-style-type: none"> • Transparent management and administration of the system with respect to: <ul style="list-style-type: none"> ○ Administrative structures ○ Public access to necessary information ○ Transparency with respect to the eligibility criteria as future changes in the eligibility criteria. • Transparent reporting of the operation of the system with respect to: <ul style="list-style-type: none"> ○ Projects listed in the system ○ Credits listed in the system ○ Retirement of credits • Transparency with respect to the impacts of the carbon offset system with respect to its impacts: <ul style="list-style-type: none"> ○ Emission reduction achieved by the system ○ Socio-economic benefits achieved by the system
E	Efficiency and Cost-Effectiveness	Successful carbon pricing improves economic efficiency and reduces the costs of emission reduction.	<p>The principle of efficiency is addressed in the process through:</p> <ul style="list-style-type: none"> • Maximum use of existing infrastructure to achieve the objectives of setting up the carbon offset system at a reasonable cost and within the timeframe as dictated by the implementation of the carbon tax. This includes the following: <ul style="list-style-type: none"> ○ Use of the personnel structures in the Department of Energy and the Designated National Authority to achieve a rapid deployment of personnel within established structures. ○ The use of existing carbon offset standards of proven integrity (CDM, VCS, GS) to achieve the required environmental integrity. ○ The optimal use of existing commercial infrastructure to achieve rapid deployment of trading systems of excellent economic integrity. • Revision of the project eligibility criteria to ensure national appropriateness of the offset projects while contributing to the objectives of GHG mitigation and the stimulation of green economic growth.
R	Reliability and Environmental Integrity	Successful carbon pricing schemes result in a measurable reduction in environmentally harmful behaviour.	<p>This principle requires that the environmental integrity of the system is guaranteed. The proposed structure addresses this issue through:</p> <ul style="list-style-type: none"> • Utilisation of existing GHG mitigation and carbon offset standards that have proven track records and international acceptance. • The direct linkage of GHG mitigation and carbon tax liability provides for a measurable impact of the carbon tax on environmental impact.

3 ROLE OF THE DESIGNATED NATIONAL AUTHORITY

Both the Carbon Tax Policy Paper and the Carbon Offset Paper refer to South Africa's Designated National Authority (DNA) as the administrator of the carbon offset system. To achieve this, we propose that the following be implemented:

- c) That the unit currently residing in the Department of Energy and fulfilling the functions of the DNA be expanded to make provision for the functions of the Carbon Offset Administrator.
- d) A sub-unit inside the Carbon Offset Administrator acts as the DNA in terms of South Africa's commitments under Article 12 of the Kyoto Protocol. It is important to note that the functions of the DNA need to stay intact as South Africa plans to continue making use of the CDM of the UNFCCC to generate Certified Emission Reduction (CER) credits for the domestic offset scheme. We, therefore, recommend that the new unit, the Carbon Offset Administrator, becomes the home for the DNA, which will now reside inside the Department of Energy.

Should Government decide to implement the structure as proposed above, then there is no need to revise Regulation 721.

4 IT SYSTEM, TRANSACTION LOG AND REGISTRY REQUIREMENTS

4.1 PROJECT COMPONENTS

The analysis of the international systems reviewed in this Synthesis Report has highlighted that the IT System and Registry should be treated as two distinct units with distinct requirements and treatment. In addition to this, a Transaction Log, in which all transactions involving carbon offset credits are recorded, must be set up.

The first example of the interrelationship between the Administrative IT System, the Transaction Log and the Registry is in the CDM. In this case, the IT System acts as a database for project registration and issuance. This is shown in the figure below:

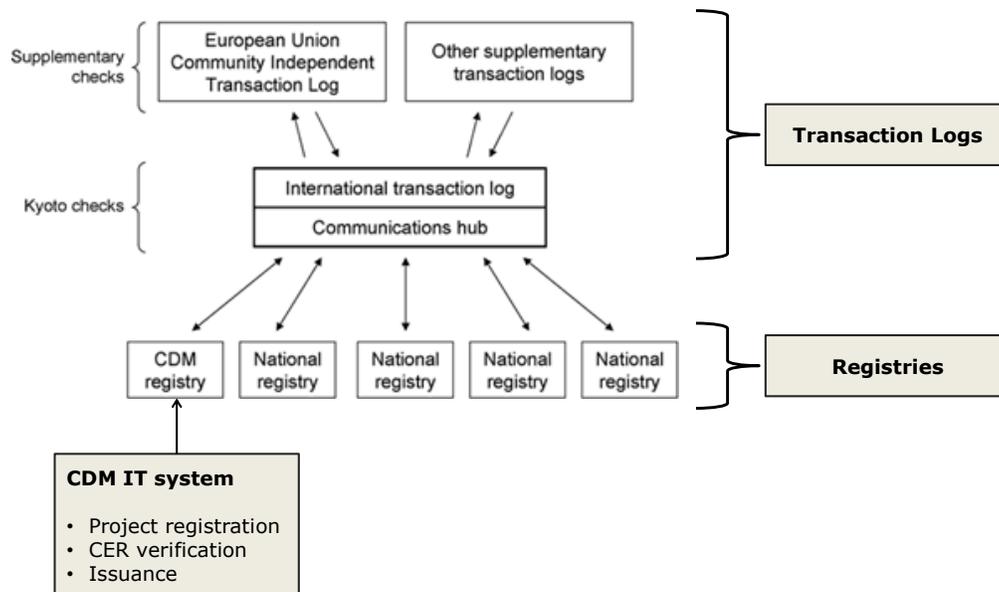


FIGURE 7: CDM IT SYSTEM, TRANSACTION LOGS AND REGISTRY

In the case of the VCS, the relationship between the Administrative IT System and the Registry is shown below:

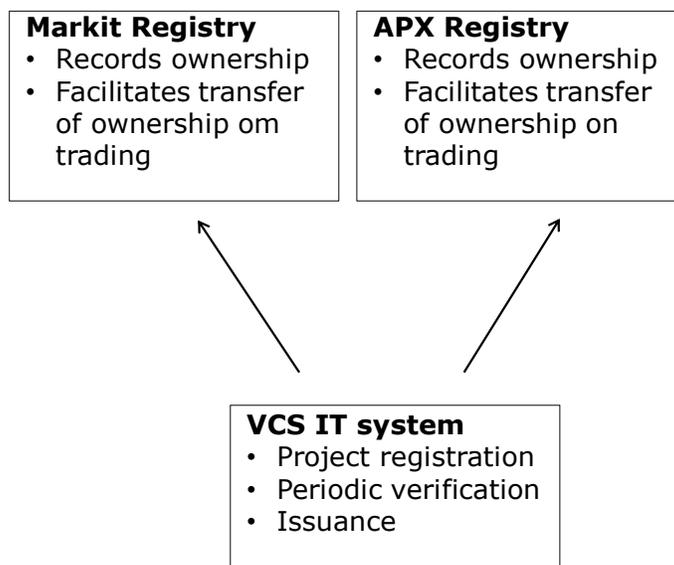


FIGURE 8: RELATIONSHIP BETWEEN ADMINISTRATIVE IT SYSTEM AND REGISTRIES IN THE VCS

Some of the salient points related to the relationships between the Administrative IT Systems and the ownership registry are listed in the table below:

TABLE 6: RELATIONSHIP BETWEEN IT SYSTEM AND OWNERSHIP REPOSITORY (REGISTRY)

	IT System	Transaction Log	Ownership Repository (Registry)
Purpose	To facilitate the smooth administration of the system: <ul style="list-style-type: none"> • Ensure environmental integrity • Ensure National Appropriateness through the project eligibility criteria 	To maintain an accurate and auditable record of all transactions involving the issuance, change of ownership and retirement of carbon offset credits in the system	To facilitate the transfer of ownership of credits between generators and taxpayers: <ul style="list-style-type: none"> • Record of ownership • Ensure commercial and financial integrity
Requirements	<ul style="list-style-type: none"> • Workflow of project registration and issuance • Accurate record of project documents • Access to specified users for inputs and reports 	<ul style="list-style-type: none"> • Failsafe communication with IT System and Registry • Accurate database of all transactions 	<ul style="list-style-type: none"> • Secure transaction platform for transfer of ownership • Accurate transaction history • Access to specified users for inputs and reports
Content	Project details and history <ul style="list-style-type: none"> • Project Design Documents • Validation reports • Verification reports • Issuance history 	An accurate record of all transactions.	Commercial details and history <ul style="list-style-type: none"> • Ownership records • Transfer of ownership records • Retirement details
Linkage	IT System and Registry linked through <ul style="list-style-type: none"> • Project registration number • Credit serial numbers 		

The results of this analysis have identified that the administration system should be supported by the following components:

Administrative IT System: This system should have the following major functions:

Database: The system should store all information, data and documents submitted to and generated by the management of the South African Carbon Offset Scheme.

Workflow: The system should provide workflow assistance to the Carbon Offset Administrator on the execution of the tasks required to operate the system smoothly.

Access: The system should provide access to the correct users at the correct levels of security.

Reporting: The system should provide for reporting to the users at different functionality and access levels.

Transaction Log: The transaction log should maintain an accurate log of the issuance, change of ownership and retirement of all credits in the system.

Ownership Repository (Registry): The registry must provide an accurate and auditable record of ownership of carbon offset credits and all transfers of ownership.

The Transaction Log and Ownership Repository are functions of the overall administrative IT system. However, due to the specific role of these elements within the carbon offset administration context, these have to be discussed as individual components of the system.

The components of the administration system are shown in the figure below:

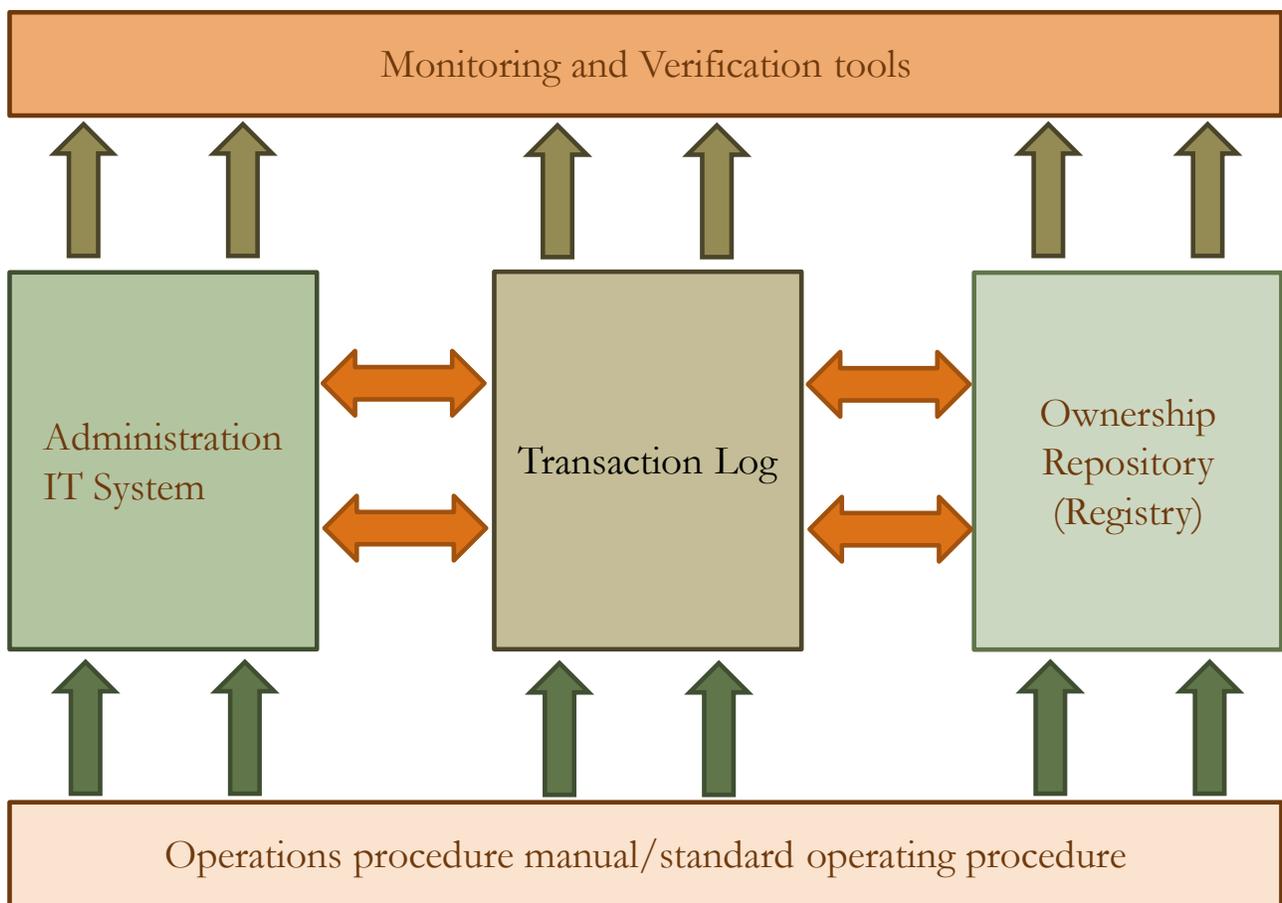


FIGURE 9: PROJECT COMPONENTS IN RELATION TO EACH OTHER

4.2 ADMINISTRATIVE IT SYSTEM REQUIREMENTS

The Administrative IT System forms the backbone of the carbon offset system. This analysis is based on the following high-level system requirement specifications:

Control:	That the administration will be under the control of the Carbon Offset Administrator, which will be the unit in the Department of Energy currently performing the function of the DNA. The Carbon Offset Administrator will be supported by an Independent Expert Committee.
Applicable Standards:	The system must be able to handle offset credits from the UNFCCC's Clean Development Mechanism (CDM), the Verified Carbon Standard (VCS), the Gold Standard (GS) and the Climate, Community and Biodiversity Alliance Standard (CCBS).
Project eligibility:	The system must be able to handle the assessment of the National Appropriateness of offset projects as specified in the project eligibility criteria to be published in the forthcoming carbon tax legislation and regulations.
Record keeping:	The system must keep all records related to project registration, national appropriateness (project eligibility in terms of the carbon tax), issuance and retirement of credits. This will require an extensive database in which all relevant data is recorded and kept.
Linkages:	The system must link with both the Transaction Log and with the Registry.
Access:	The system must be accessible to the following users: <ul style="list-style-type: none"> • Carbon Offset Administrator. • Technical Support. • Carbon offset project owners. • Independent verifiers. • Other Government departments that may require access to specific reports, such as SARS, Department of Environment, etc.; • Members of the public with respect to specific reports.
Reporting:	The system must provide for a variety of fixed and configurable reports for various users.
Security:	The system must have the required level of security.
Timeframes:	The system must be operational by 1 July 2016.

Based on the analysis done in this report, the recommendations with respect to the Administrative IT System are:

TABLE 7: OPTIONS FOR ADMIN IT SYSTEM

Options	Comments	Analysis
Build new system	The benefits of building a new system for the Carbon Offset Administrator is that the IT System can be custom made to address the unique characteristics of the South African System.	<p><i>The South African Carbon Offset Administration system can be based on a custom designed IT System built purposely for the Carbon Offset Administrator, housed inside the Department of Energy.</i></p>
Use existing DNA system	<p>The current DNA system is based on providing host country approval for the CDM projects. Certain critical components that will be required in the new carbon offset administration system that are not covered in the current DNA system are:</p> <ul style="list-style-type: none"> • The ability to handle VCS projects. • The ability to handle GS projects. • The ability to handle CCBS projects. • The ability to handle full project registration details. • The ability to link to carbon offset credit registries. 	
Use system developed by SANEDI for Section 12L energy efficiency incentives	Whereas the Section 12L IT system managed by Sanedi is similar in nature to the required carbon offset IT System, the processes differ on so many points. Retrofitting this database to accommodate the carbon offset requirements would be costly and time intensive. However, elements of the 12L IT system can be replicated in the offset IT system.	

4.3 TRANSACTION LOG REQUIREMENTS

The purpose of the Transaction Log is to provide a full record of all transactions related to ownership of carbon offset credits in the South African scheme. The transactions include issuance, transfer of ownership and retirement.

Even though the existing rules of the UNFCCC do not allow non-Annex I countries to participate in the UNFCCC registry/transaction log system, it will be prudent to ensure that the South African system is aligned with the international architecture for possible future linkage. The International Transaction Log (ITL) of the UNFCCC is shown in the figure below. The data exchange in the architecture shown below must be done according to the specification of ***Data Exchange Standards for Registry Systems under the Kyoto Protocol: Technical Specifications.***

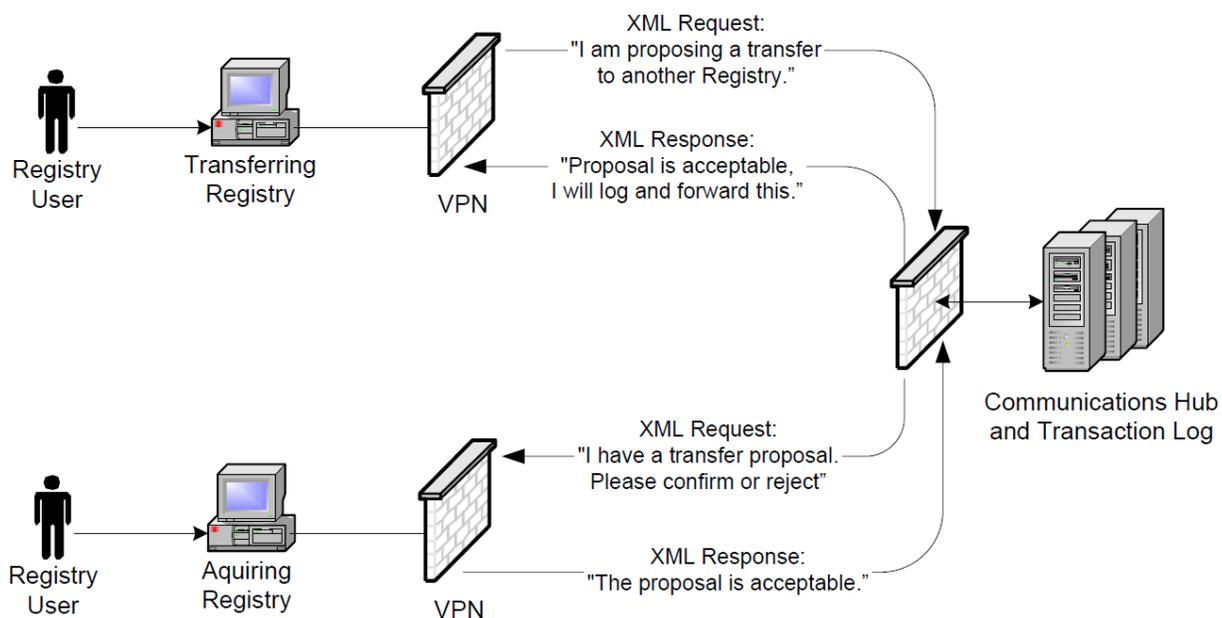


FIGURE 10: OPERATION OF THE INTERNATIONAL TRANSACTION LOG (ITL)¹⁰

The proposed relationship between the South African Transaction Log and the other components of the administration system is shown in Figure 9 above. However, based on the analysis presented in this Synthesis Report, we recommend that the South African Transaction Log be housed in the Administrative IT System, as shown in the figure below:

¹⁰ UNFCCC, Data Exchange Standards for Registry Systems Under the Kyoto Protocol Technical Specifications (Version 1.1.10), 24 April 2013

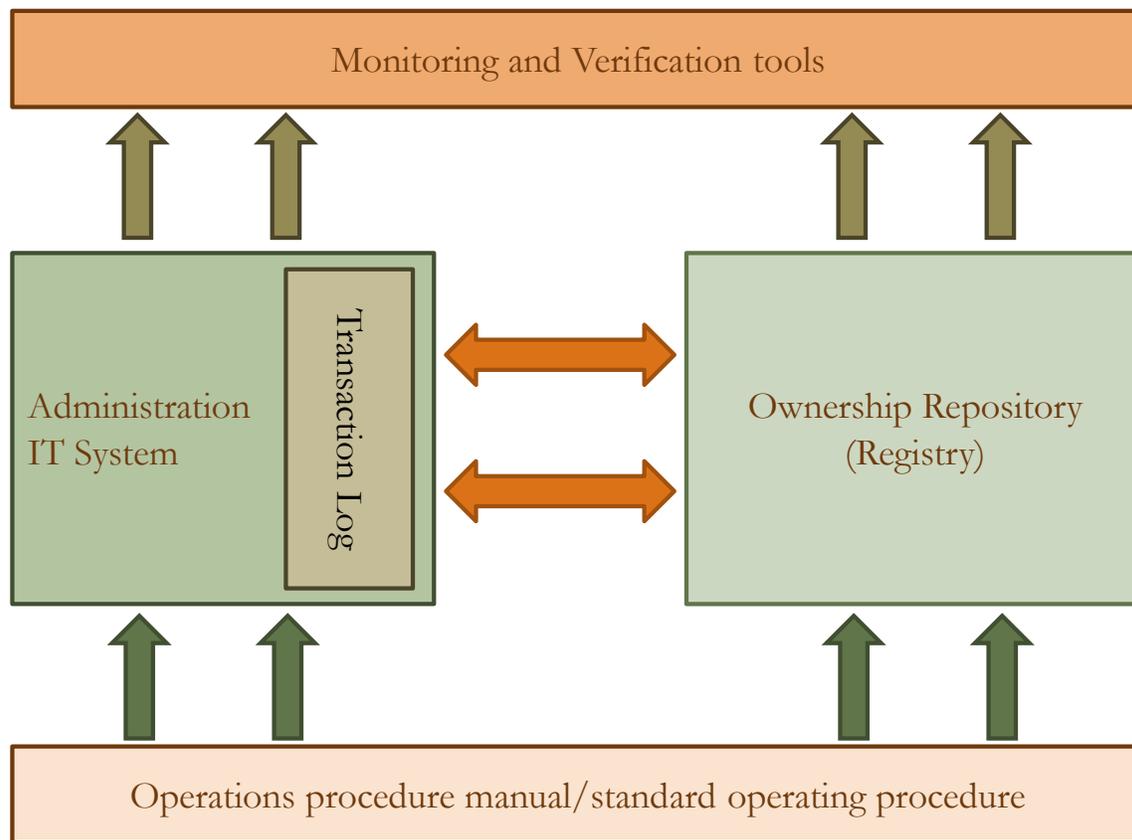


FIGURE 11: PROPOSED HOUSING OF THE SOUTH AFRICAN TRANSACTION LOG

The Transaction Log will provide the Carbon Offset Administrator with full oversight of all market activity on the ownership and transfer of ownership of carbon offset credits in the system.

4.4 REGISTRY/OWNERSHIP REPOSITORY REQUIREMENTS

The environment within which the ownership repository operates, and, therefore, the requirements for the ownership repository, differs fundamentally from that of the Transaction Log and the Administrative IT System. Whereas the Administrative IT System is designed to ensure the environmental integrity of the system, the ownership repository is designed to ensure the financial integrity of the system. The Transaction Log acts as “check and balance” between the two systems.

In general, carbon offset registries need to:

- viii. Record ownership and facilitate transfers of ownership in an accurate and auditable way;
- ix. Ensure administrative efficiency;
- x. Provide access to specified users in the required way, such as via the internet;
- xi. Keep transaction costs low;
- xii. Ensure timeous execution of transfers;
- xiii. Ensure very low risk of fraud; and
- xiv. Provide adequate administrative support.

The Partnership for Market Readiness lists the following registry (ownership repository) requirements:

TABLE 8: PMR REGISTRY REQUIREMENTS

PMR listed requirement	Relevance to South African Carbon Offset Scheme	Comments
Access	The system must give access to: <ul style="list-style-type: none"> • Carbon Offset Administrator. • Owners of carbon offset credits. • A market platform for operation. • Regulators. • Public for specified public access reports. 	This access can be achieved through web-access with the appropriate security levels.
Content	The registry must have a complete and accurate dataset of the ownership of carbon offset credits and the ownership history.	This can be achieved through a database that holds the required information.
Actions	The registry must process transactions with respect to: <ul style="list-style-type: none"> • Listing of credits. • Transfer of ownership. • The retirement of credits. 	This can be achieved through a database that holds the required information.
Linkages	Linkages with the following required: <ul style="list-style-type: none"> • Administrator – linkage with the Administrative IT System and the South African Transaction Log. • Financial Sector – information related to the financing of transactions. • Market – linkages with JSE to facilitate trading between carbon taxpayers (buyers of offsets) and offset owners (non-carbon tax paying companies). 	The linkages with the financial sector and the market (JSE) are complex and building them can be a very onerous task. Maximum use of existing infrastructure such as the existing commodities exchange can aid in setting up these linkages in the time available to implement the South African carbon offset scheme.
Skills required	The following skills are required of the operator of the registry: <ul style="list-style-type: none"> • Financial sector skills. • Market operation skills. 	The skills to operate the registry do not form part of the conventional skill set of the DNA. These skills are available in the existing South African commodities market. The commodities market is accessible to the project through work done on the pilot trading of carbon on the JSE during January 2015.

Most carbon trading systems operating in the world today rely on multiple registries. See Figure 7 above as an example for the registries associated with the trade of CERs from the CDM. Multiple registries imply that there needs to be a set of minimum standards that will allow a registry to operate in the system. This set of standards will have to be established when the carbon trading system is set up, but a starting point could include the aspects listed in the table below:

TABLE 9: PROPOSED MINIMUM REQUIREMENTS FOR REGISTRIES TO PARTICIPATE IN THE CARBON OFFSET SYSTEM

Issue	Requirements
Quality and validity of credits in the system	The registry must have the systems in place to ensure that credits are only listed when a valid claim for a credit exists.
Security	<p>A registry needs to be secure in ensuring that:</p> <ul style="list-style-type: none"> • Ownership of credits are secure, and credits cannot be transferred in a fraudulent manner; • There must be mechanisms in place to ensure that fraud is detected in the unlikely event that it does occur; • Procedures should be in place to ensure the correct actions are taken if fraud is discovered and that trading is not affected by such events.
Administration	The registry must be able to prove that it has the required governance and administration in place.
Accessibility	The registry must be accessible to account holders and market participants.
Technical capacity	The registry must be able to prove that it has the technical capability to manage the functions of the registry in an efficient and professional way.

The World Bank’s Partnership for Market Readiness provided guidance on the legal building blocks required for the effective operation of carbon offset registries. This is shown in the figure below:

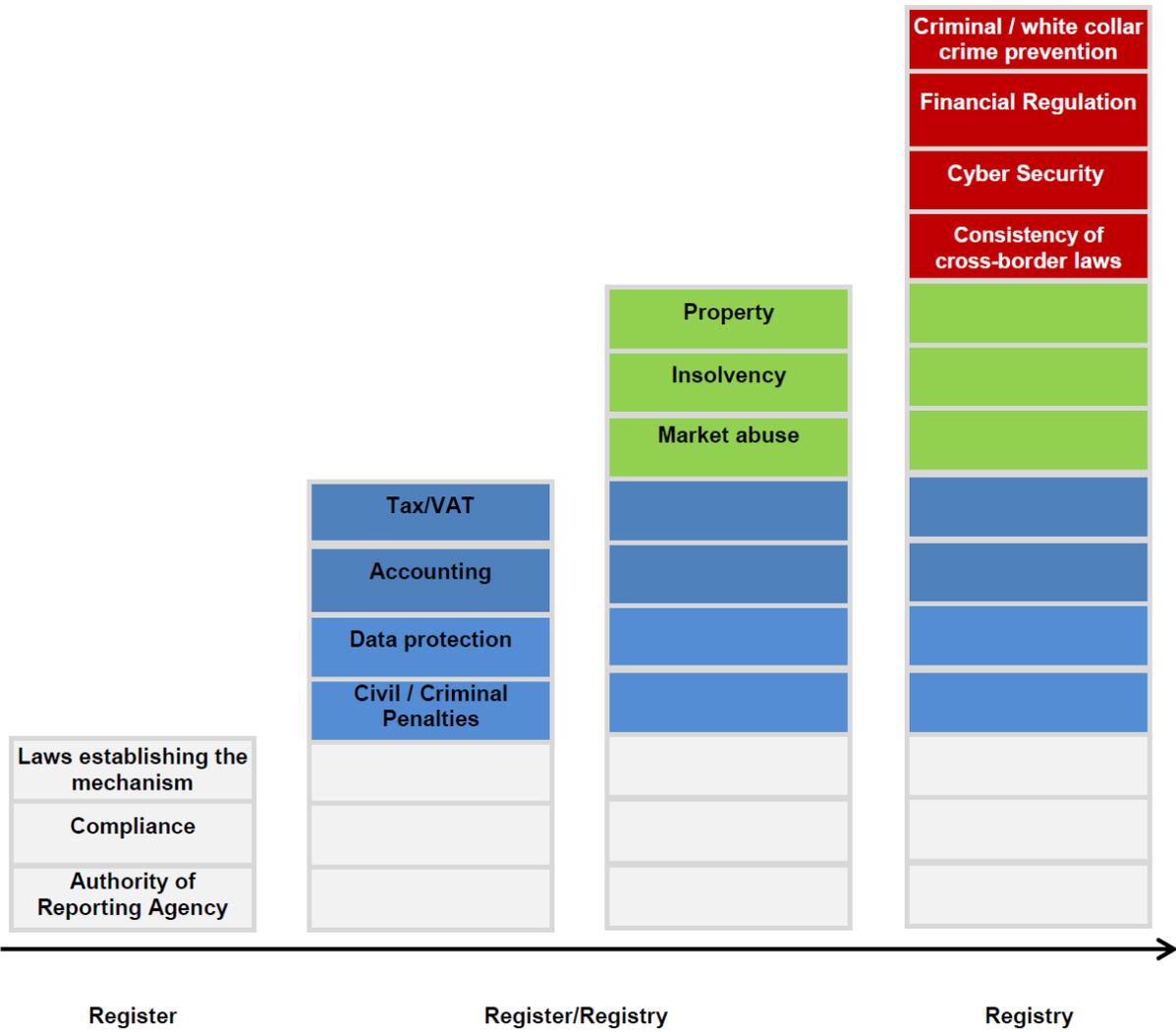


FIGURE 12: PARTNERSHIP FOR MARKET READINESS REGISTRY REQUIREMENTS

A detailed analysis of the figure above shows that the requirements for structuring, managing and hosting a registry include the following:

TABLE 10: REQUIREMENTS FOR STRUCTURING, MANAGING AND HOSTING THE CARBON OFFSET REGISTRY

Issue	Requirements	Implications for structuring, managing and hosting of the registry
Property	An entry into the registry must act as a legal claim to a property right.	The registry must be structured in a way that can guarantee the property rights of the holders of the carbon offset credits. The entity managing and hosting the registry must have the training, background and skillset to manage a registry of property rights.
Insolvency	The registry must provide for the treatment of property rights in cases of insolvency that is consistent with the laws of the country.	The entity managing and hosting the registry must have the training, background and skillset to manage a registry of property rights.
Market abuse	The registry must provide protection against market abuse.	The registry must be set up in an environment where the organisation is trained and skilled in the provision of protection against market abuse, and the necessary checks and balances are in place. Such an environment exists in South Africa in the existing commodities exchange on the JSE. Managing market abuse is <u>not</u> a traditional skillset of the DNA.
Criminal / white collar crime prevention	The registry must provide protection against criminal activities and white collar crime.	The registry must be set up in an environment where the organisation is skilled in the provision of protection against criminal activities and white collar crime. Such an environment exists in South Africa in the existing commodities exchange on the JSE. Criminal/white collar crime prevention is not a traditional skillset of the DNA.
Financial regulation	The registry must comply with the required financial regulation.	The DBA is not structured to accommodate compliance with financial regulations. The environment within which all of the required regulations are met does, however, exist in the existing commodities market and the accompanying trading platform for derivatives and futures on the JSE.
Cybersecurity	The registry must have the necessary levels of security to provide protection against cyber fraud attacks such as phishing scams and hacking.	The platform on which the registry is built must have proven track record of security measures to prevent cyber-attacks. Such a track record does exist in the existing South African commodities registry and the online trading platforms used by the JSE.

Whereas we believe that the South African system should be built to accommodate more than one registry when the system matures, the initial phases will, however, most probably only allow for one registry to operate in the system. We have identified some options for the first registry in the system. The options are:

TABLE 11: OPTIONS FOR CREDIT TRANSFER REGISTRY

Options	Details	Comments
Build new system to be housed in (managed and hosted by) the Carbon Offset Administrator	The design and construction of a new registry system will have to address the concerns on the functionality of the system reliability with respect to the issues raised in Table 10 above.	As illustrated in Table 8, the required skill set to address DNA the commercial and financial issues listed as well as manage and host the registry with the degree of security required, differs from the conventional skillset required by the DoE and the DNA
Use an existing international system	<p>The available systems are:</p> <ul style="list-style-type: none"> • Markit • APX • CCX <p>We have engaged with both Markit and APX and both organisations are prepared to set up operations in South Africa to provide the necessary registry services required.</p>	<p>An existing international system could be a viable option to move toward implementation. The issues that need to be addressed are:</p> <ul style="list-style-type: none"> • The registry structures of Markit and APX are not set up to handle the additional requirements that are imposed by South African law. The process to be followed to retrofit these registries with the South African requirements may be costly and time-consuming. • Where comparative alternatives exist for South African organisations to offer equivalent services, the South African organisations should be given the opportunity to offer their services.
Use existing South African system	<p>The available systems are:</p> <ul style="list-style-type: none"> • Silocerts • STRATE <p>We have engaged with both Silocerts and STRATE to discuss the possible hosting of a South African carbon offset registry. STRATE have indicated that they do not believe that their platform is ideal for the carbon offset registry, but Silocerts have indicated that they could host the carbon offset credits.</p>	The JSE performed a pilot trade through the Silocerts registry in January 2015. This pilot involved a number of trades of both CERs from the CDM and VCUs from the VCS by voluntary participants. The trades were executed OTC and mirrored in the tests environments of both Silocerts and the JSE.

Based on the analysis provided above, the registry for the South African Carbon Offset Scheme can be hosted on the existing South African commodities market platform that consists of the registry in Silocerts and the JSE.

5 PROJECT ELIGIBILITY CRITERIA

The Carbon Tax Policy Paper states that certain projects will be allowed to be used to generate offsets for the carbon tax system while other project will be excluded. The Carbon Offset Paper provided a starting point for project eligibility criteria. The following list indicates the criteria in bold and the definition of the criteria as per the Carbon Offset Paper in italic print:

Location

Only South African-based credits will be eligible for use within the carbon offsets scheme, to encourage the development of locally based projects and GHG-mitigation in South Africa.

Position in tax net:

Projects that generate carbon offset credits must occur outside the scope of activities that are subject to the carbon tax¹¹. This is to prevent double counting of the carbon reduction benefit should an offset project be implemented on an activity that is liable to the carbon tax.

Eligible projects

In keeping with desired carbon offset principles a list of eligible projects will be introduced as a starting point to provide certainty and stimulate investment decisions and project development in the carbon offsets market. However, this standardised approach will be sufficiently flexible in accepting additional methodologies, so as not to limit the variety of projects that can be added once the offset programme has been launched. The list will therefore be expanded as the programme matures to allow new project types to be included should they meet the required criteria.

Lists of both eligible and ineligible projects should be introduced, based on the value added to the low-carbon transition. An eligible projects list would include project areas that, in addition to carbon mitigation, also have sustainable development benefits and contribute to meeting South Africa's developmental priorities. An ineligible projects list would include projects that would be implemented within the scope of taxable activities following the introduction of the carbon tax. Projects that have little co-benefits and low value, such as the mitigation of industrial gasses, should also be excluded.

Timing

Projects registered or implemented prior to the introduction of the carbon tax regime will have to fulfil specified conditions¹² to be accepted to the scheme.

¹¹ Note that the statement “*occur outside the scope of activities that are subject to the carbon tax*” is inconsistent with words used elsewhere in the Carbon Offset Paper that states “*activities that are owned or controlled by companies that are covered by the carbon tax*”. We have used the first of these two different phrases as being representative as it aligns closer with the intent of the carbon offset system, which is to allow companies to make investments outside of their taxable activities in order to expand the potential positive impact of the carbon tax.

¹² There was a concern around existing programmes that would flood the domestic carbon market. As a result the initial design of the Carbon Offset Paper suggested to limit supply by restricting CDM projects. However the CDM process of validation and annual verification will by definition prevent flooding of the domestic market. Therefore existing CDM projects could be allowed in the future design of the carbon tax system. Not all project concepts that were validated and registered were implemented, preserving the first mover advantage of CDM project developers. This supports the on-going promotion of mitigation through international tradable and credible mechanisms.

In addition to the above-mentioned criteria from the Carbon Offset Paper, and taking into consideration the potential carbon offset market, we recommend that the following criteria also be considered:

Host Country Approval:

The CDM currently requires that all projects must get approval from the host country DNA with respect to the eligibility of the project in terms of the sustainability criteria of the host country. This is not currently a requirement in either the VCS or the GS. It is recommended that VCS and GS must get approval in the same way as the CDM with respect to the sustainable development criteria before these credits can be eligible to trade in South Africa.

In addition to the sustainable development criteria, it is recommended that each project must get an extension of its Letter of Approval to confirm that it complies with the project eligibility criteria as set out in this section.

Forestry credits

Afforestation or reforestation projects registered under the CDM are recommended to be excluded from carbon offset trading, as ICERs and tCERs do not address permanence issues. The risk of non-permanence in international programmes is dealt in five main ways: buffers for unintentional reversals (VCS, GS, CAR), reserve accounts (VCS, CDM for CCS), compensatory measures by project developers (VCS and CAR), temporary carbon credits (CDM) or consideration in the host country's inventory (Joint implementation)¹³.

The purpose of this exclusion related to the South African carbon offset administration system aims to ensure that project permanency risk not be transferred to the State but rather lie with the project owner.

Projects utilizing VCS methodologies (which address permanence through risk assessments and buffer accounts on a program level) should be eligible for carbon offset trading. These permanence requirements are applied across the entire program and do not vary methodology by methodology thereby reducing uncertainty and costs for project developers.

Though currently no such methodology or standard exist, it is recommended that credits generated under a ton-year accounting method^{14,15} for biologically sequestered carbon be included in the system. This approach shifts risk related to the permanence of forestry credits from the issuance phase to the financing phase.

Registration Date:

It is recommended that projects registered prior to the date of introduction be eligible irrespective of the other eligibility criteria. The motivation for this lies in two areas with specific reference to the registration date. The first is that these projects will supply the initial volume into the market that is required to give liquidity to the trading system. Secondly, any CER or

¹³ World Bank. 2015. "Options to Use Existing International Offset Programs in a Domestic Context." PMR Technical Note 10. Partnership for Market Readiness, World Bank, Washington, DC. License: Creative Commons Attribution CC BY 3.0 IGO

¹⁴ McLaren & Ford-Robertson, Carbon accounting methodologies, Forest Research, Private Bag 3020, Rotorua, New Zealand.

¹⁵ IPCC Special Report on Land Use, Land-Use Change, and Forestry, 2000

VCU that is eligible to be used as an offset elsewhere in the world and which was generated from a project registered when there was no carbon pricing mechanism implemented in SA, should be eligible to be used in SA as well.

Additionality:

Projects registered under the CDM and for which the E-policy¹⁶ argument was used in the additionality should prove that the project will still be additional if the E-policy argument is not used.

Type E-policies: National and/or sectoral policies or regulations that give comparative advantages to less emissions-intensive technologies over more emissions-intensive technologies (e.g. subsidies to promote the diffusion of renewable energy) (EB 22, Annex 3, paragraph 6). Policies or regulations classified as an E- policy can be excluded from the baseline scenario and additionality analysis. A reason for this is that governments should be encouraged to create such incentives without being restrained in their access to the international carbon credit market.

The South African Demand Side Management and REIPPP incentives are classified as E- policies and therefore don't form part of the financial additionality arguments of projects applying for registration with the CDM or VCS.

Though policy incentives should be excluded from CDM or VCS additionality analysis to prevent discouraging governments to support emission reduction projects, it is recommended that for additional South African benefits (i.e. to be classified as an offset project); all national incentives should be included in the financial additionality of a project.

This rule will prevent projects to obtain multiple benefits from the South African Government without needing it to overcome the barriers to implementation. By imposing this rule, it is believed that funds can be preserved and therefore more projects will be allowed to obtain financial support.

Projects registered under the CDM or VCS, which used barrier analysis to prove additionality will be automatically allowed as offsets.

Positive List:

Both the CDM and VCS allow for positive lists which both identify project types that have been deemed to be additional through a series of analysis. Projects on the positive list are automatically additional.

In the supply and demand section, the impact of supply of a positive list is assessed. The proposed positive list includes all projects in the residential sector, as well as projects developed under the RE IPP Programme up to a penetration rate of 5% for each technology.

¹⁶ One of the key design elements of the international carbon credits was promoting improvements in terms of climate change mitigation by countries. An approach that the CDM took in dealing with the evaluation of improving climate change mitigation was to evaluate changes in national and/or sectoral policies and regulations over time. The CDM Executive Board agreed to differentiate the following 2 types of national and/or sectoral policies that are to be taken into account when establishing baseline scenarios: Type E+ That give comparative advantages to more emissions intensive technologies or fuels and / or Type E- That give comparative advantages to less emissions intensive technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs). The progressive South African legislation quantifies in a large number of cases as E-policy and projects could get carbon credits under the CDM regime. (CDM in Charts, Ver. 26.0 Nov 2014, IGES).

6 CONCLUSION

There is a great deal of local and international learning and experience that can be used in the developing a new generation carbon offset administrative system. The timing of this project benefits from the existing international carbon trading systems that are documenting their respective lessons learned, as well as the studies undertaken by the World Bank Partnership for Market Readiness that have recently concluded and are available in the public domain. These assist to understand the current issues in the international carbon markets, identify the risks and reduce these risks in developing the South African administration system.

The focus of research that underlay this report, are the following four aspects:

- Identifying the important aspects for drafting the operating procedures.
- Alternative options for the registries, and ownership log.
- High-lighting the key elements of a suitable IT systems, including lessons learned from 12L system administered by SANEDI.
- Monitoring, Reporting and Review, through a transaction log.

Key recommendations that have been compiled by the WorldBank Partnership for Market Readiness and that should be kept in mind in developing the South African Carbon Offset Administration System include the following¹⁷:

- *Build the Register/Registry in a manner commensurate with the nature, scope and scale of the proposed Market Mechanism.*
- *Identify what is required to establish the immediate legal framework necessary to support the role of the Register/Registry in the context of the Market Mechanism and the timeframe required to achieve that.*
- *Identify the other areas of laws likely to be impacted by the intended market mechanism and identify the necessary responsible entity to address those laws (e.g. ministry of environment, ministry of finance, ministry of trade etc.).*
- *Establish a plan to coordinate and consult on issues, obstacles to achieving the necessary changes (e.g. delay, lack of expertise, authority of budget). The changes determined need to be consistent and not conflict with each other with a view to implementing the policy objectives of the Market Mechanism.*
- *Recognise limitations – seek expertise and support where required (including from other government agencies) and do so in a timely manner.*
- *Do not avoid the hard issues (e.g. what is the legal nature of the carbon credit) as, sooner or later, the issue will get highlighted via a market incident where the fallout will be far more difficult to manage.*
- *Ensure the allocation of responsibility, roles of regulators or administrators are clear and unambiguous. It is important that along with the allocation of roles and responsibilities, sufficient budgets are provided to enable their discharge.*
- *If the scope of the Market Mechanism is to create a tradable carbon asset, recognise the success of a market product is dependent on the market participant's confidence in it and provide what is necessary to achieve that confidence.*

There are a few critical lessons to take forward with regards to the South African Carbon Offset system. In the first place the current extent, context and future potential of the South African carbon market must be considered when developing the required administrative system. The proposed administration system should allow for flexibility in design in order to allow sustainable scalability. Secondly, existing infrastructure provide a unique opportunity to ease initial implementation

¹⁷ Zaman, P; 2015; PMR Workshop Background Paper no 1: Setting the Legal Framework for Transaction Registries.

challenges. Optimising existing infrastructure will allow the carbon offset administration system to gradually build the necessary capacity and ensure system integrity. Finally, market integrity is absolutely vital. The development of the carbon offset administration system must consider participant confidence. As a result, development decisions must be taken in the best interest of the long-term viability of the carbon offset system.

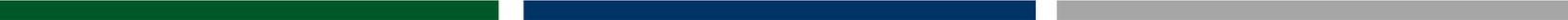
In addition to the above, the PMR distinguishes between three levels of registry administration. These are as follows¹⁸:

- Level 1: Few users and transactions; no interaction with any other IT system (e.g. MRV database); only the administrator can access the registry system (i.e. users have no online access to their accounts). The registry can be paper-based, or supported by an excel spreadsheet or other basic accounting tools; reports (e.g. on account holdings and transactions) are issued, published and audited periodically. The financial value of the units and related market and/or fraud risks are low.
- Level 2: Communication with other systems is possible but exchanges are limited; the registry is computerized with little automation; user interfaces are provided and accessible through the internet (e.g. check on account balances and related reporting). The execution of operations requires the involvement of the administrator – at least to validate them. The value of account holdings and related risks are moderate.
- Level 3: The registry is automated and exchanges a large volume of information with a number of other systems and databases – and potentially other registries. It supports a large market with frequent and numerous transactions; users perform operations directly on-line, with no intervention by the registry administrator. A range of users exists, including non-compliance participants (e.g. banks) or foreign entities – which complicates registry administration procedures, operations, and allocated resources.

South Africa will in all likelihood be classified as a Level 3 registry administration system due to the nature of the South African carbon market and the various stakeholder involved. In this regard issues such as expertise, the level of service to ensure system integrity, effective and all-encompassing risk management and finally costs and resources will have to be considered. It is therefore suggested that the South African system, in order to effectively gain system momentum and ensure market confidence, start off by the Department of Energy playing a gatekeeper role initially. This implies that the Department plays a critical front-end role in terms of applying project eligibility and reporting, however the ownership repository and market functions could potentially fall within the ambit of specific discipline professions within the IT and/or financial markets.

The South African offset scheme would be built around actual emission reductions from projects registered under three main schemes, CDM, Gold Standard and VCS (which now controls and includes the CCB). As only actual verified and issued carbon credits will be eligible for offsetting, there is no need for borrowing, banking or expiry procedures. The elements of the South African system would be extending the Letter of Approvals from the DNA, transferring credits from the various international standards after issuance, listing of eligible credits as offsets, the transfer of ownership, and the transfer of credits to SARS

¹⁸ World Bank. 2015. “Setting the institutional framework for transaction registry administration” PMR Workshop Background Paper No.2. Partnership for Market Readiness, World Bank, Washington, DC.



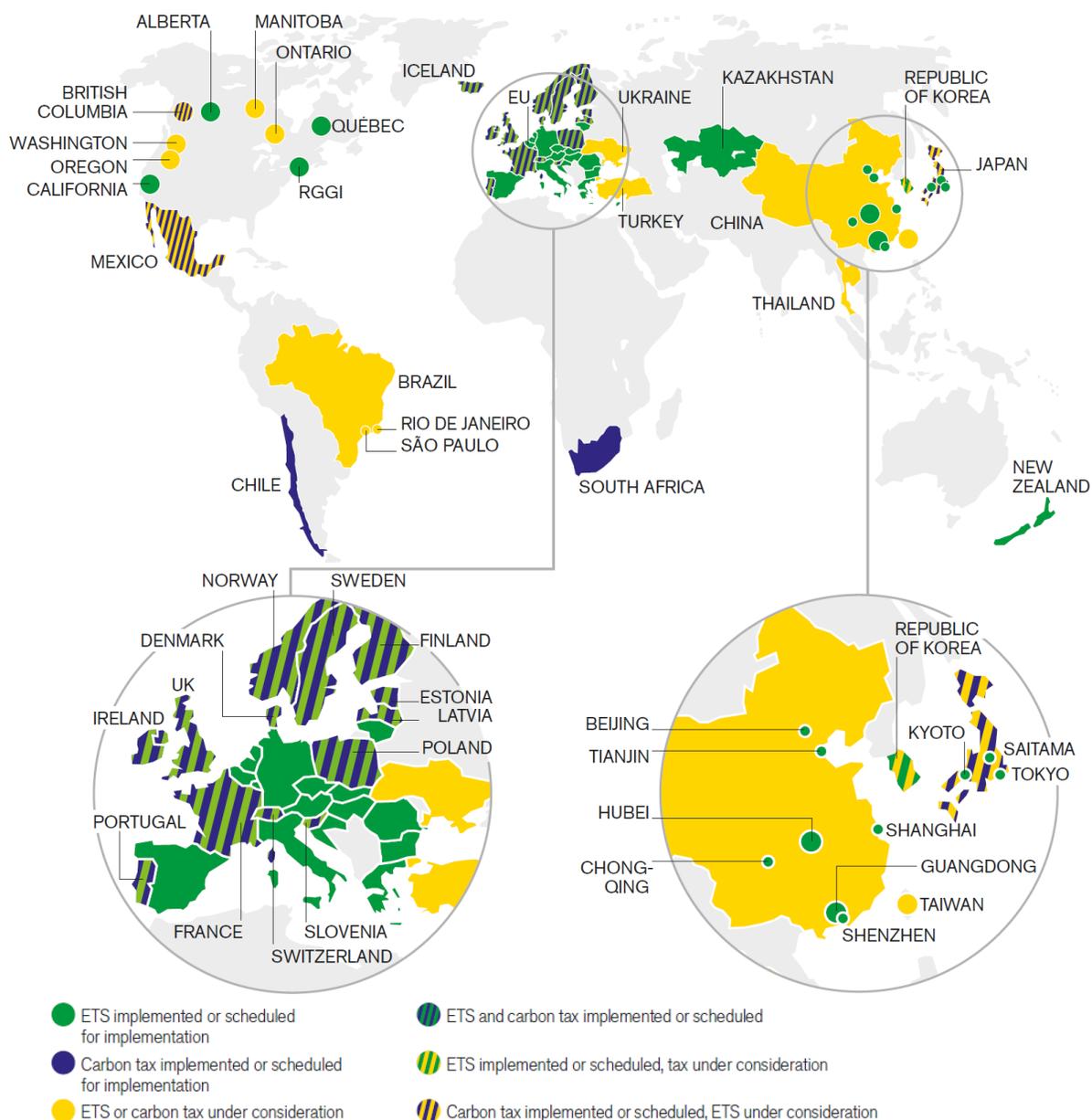
The input from this synthesis report will be used in drafting the Standard Operating Procedures and the Organisational Development Plan as per the project terms of reference.

Annexures

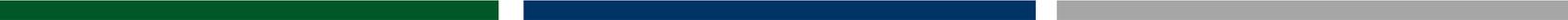
OVERVIEW OF SELECT INTERNATIONAL CARBON OFFSET SCHEMES

The world has seen significant development in the carbon offset space in the last couple of years. A graphic summary of the current status of carbon regulation development is shown below:

FIGURE 13: EXISTING AND EMERGING CARBON SCHEMES IN 2015¹⁹



¹⁹ State and Trends of Carbon Pricing, World Bank Group, September 2 015



Summaries of the important aspects of the reviewed schemes are given below.

1. SOUTH AFRICAN CONTEXT

The development of the South African carbon offset scheme is occurring within the context of the National Climate Change Response White Paper (NCCRWP), the Carbon Tax Policy Paper, and the Carbon Offset Paper. To get insights from carbon schemes in other countries, it is important to understand the policy contexts within which these schemes were developed.

1.1 NATIONAL CLIMATE CHANGE RESPONSE WHITE PAPER

The NCCRWP stipulates that South Africa's approach to greenhouse gas mitigation should balance its contribution to international efforts to curb global emissions with its developmental priorities. Therefore, a key element of South Africa's approach to mitigation will include the following:

*"The deployment of a range of economic instruments to support the system of desired emissions reduction outcomes, including the appropriate pricing of carbon and economic incentives, as well as the possible use of **emissions offset** or **emission reduction trading mechanisms** for those relevant sectors, sub-sectors, companies or entities where a carbon budget approach has been selected."*

The NCCRWP provides the framework and context for the implementation of the proposed carbon tax and the related carbon offsetting possibilities.

1.2 CARBON TAX POLICY PAPER

The Policy Paper makes the following provision for offsets:

- A carbon offset is defined as "... an (external) investment through which a firm can access GHG mitigation options that are cheaper than what can be achieved by investment in its own operations."
- Carbon offsets are generated in projects that "... are developed and evaluated under specific methodologies and standards, which enable the issuance of carbon credits" and "...can be categorised by a set of characteristic, including the technology employed or type of GHG reduction, as well as specific methodology selected to develop the project."
- "Offsets can be used by firms to reduce their carbon tax liability up to a limit. Variable offset limits are proposed based on the mitigation potential of the sector."
- The proposed offset limits are listed in the Policy Paper and range from 5% for certain sectors to 10% for other sectors.
- The purpose of the offsets is to: " allow greater flexibility to reduce emissions on the margin via investments outside a specific sector."
- On the standards to be used, "It is proposed that initially firms could use verified offsets developed under internationally recognised carbon offsetting standards (e.g. Clean Development Mechanism (CDM) and Verified Carbon Standard (VCS)) to reduce their carbon tax liability".
- As per the Policy Paper, carbon offset projects must comply with the following principles:
 - **Real** - develop or use available methodologies that ensure that carbon emissions are measurable and quantifiable and take into account adjustments for uncertainty and leakage.
 - **Reliable** - an independent, third party, to audit a project. This includes both a validation of a project's design before it is implemented, and then a constant verification process at set intervals following the generation of emission reductions.

- **Additional** - its intent is to prove that a carbon offsetting project is being implemented above what would have happened under a 'business as usual' scenario. The project needs to demonstrate that its main aim is to reduce emissions, in a manner that would not have occurred under a business as usual situation.
- **Permanent** - relates to the long-term removal, reduction or avoidance of carbon (or carbon dioxide equivalent) emissions. This applies to projects with the risk of reversibility, especially in the case of land-based projects, which face risks such as fire and disease.
- **Sustainable Development** - within a carbon offset projects relates to the incentivising of co-benefits (positive externalities) from the development of projects.
- On project eligibility:
 - **Eligible projects** could include: Agriculture, forestry and other land uses (AFOLU), waste, community-based and municipal energy efficiency and renewable energy, electricity transmission and distribution efficiency, small-scale renewable energy (up to 15 MW) and transport projects.
 - **Ineligible projects** could include industrial gas destruction projects, e.g. HFC-23 and Nitrous Oxide destruction projects. In addition projects that could potentially result in a double incentive will not be allowed; energy efficiency in company owned or controlled operations that are covered by the carbon tax; embedded or cogeneration of renewable energy for company owned or controlled operations that are covered by the carbon tax. This includes parasitic electricity usage by fossil fuel based power stations; fuel switch projects in company owned or controlled operations that are covered by the carbon tax; and energy-efficient coal-fired power stations.

1.3 CARBON OFFSET PAPER

The Offset Paper makes the following provision:

- The motivation for the offset scheme is: “Carbon offsets will enable firms to cost-effectively lower their carbon tax liability. They will also incentivise investment in least-cost mitigation options in the country, driving investment in GHG-mitigation projects that deliver carbon emissions reduction at a cost lower than the carbon tax.”
- Carbon offset projects will have to comply with a set of eligibility criteria. The eligibility criteria are specified regarding the following:
 - Geographical location – the projects must be located in South Africa.
 - Carbon tax coverage – only projects outside the carbon tax net will be eligible. This is shown in the figure below:

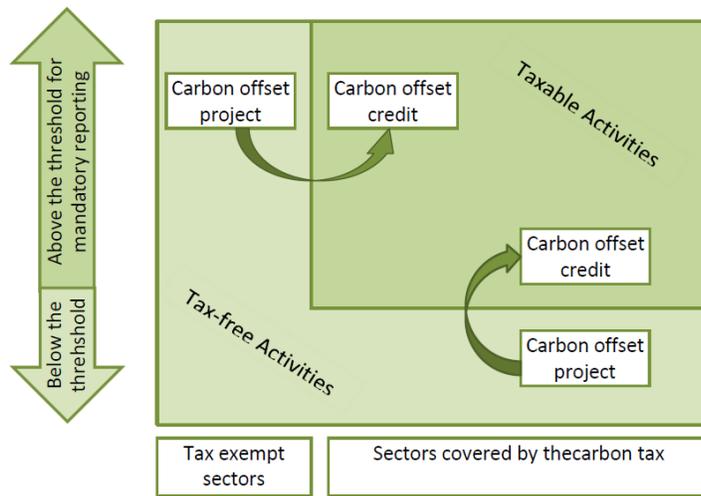


FIGURE 14: PROJECT ELIGIBILITY WITH RESPECT TO THE CARBON TAX NET

- Technical infrastructure: The Offset Paper proposes a technical infrastructure as shown below:

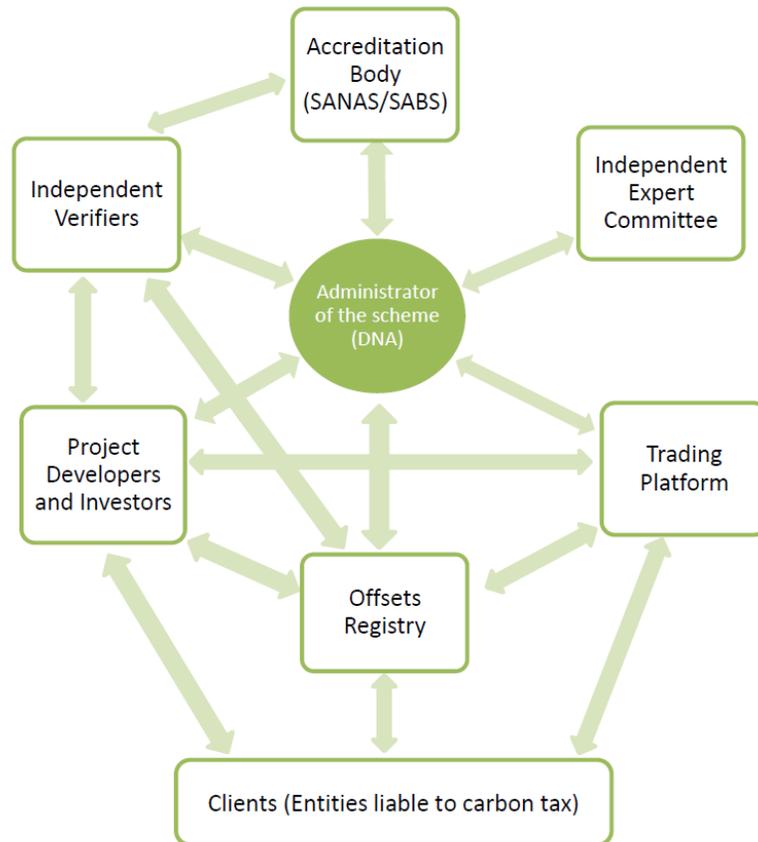


FIGURE 15: TECHNICAL INFRASTRUCTURE PROPOSED IN THE OFFSET PAPER

- The following comments are made with respect to the administration of the scheme:
 - *An administrator of the scheme, which is proposed to be the DNA, will have extensive responsibilities. Among its roles would be to pre-screen projects for their eligibility, evaluate independent verification reports and issue carbon credits. Additionally, an*

administrator or an appointed independent expert committee would be responsible for development and evaluation of methodologies and, when appropriate, also an endorsement of international methodologies for use in South Africa.

- *Firstly, an administrating entity should have the capacity to register carbon-offset project developers, to pre-screen project ideas to ensure they comply with eligibility criteria prior to their implementation. Secondly, it should be able to evaluate offset project verification reports prior to credits being issued and subsequently approve issuance of the specified amount of carbon credits.*
 - *Additionally, with the expansion of the scheme, an administrating entity and its affiliate, which is proposed to be an independent expert committee described below, would be responsible for the design and approval of methodologies and project types to be included within the scheme. This approach would lead to creation of a 'positive list' of approved methodologies. The administrator would then be responsible for providing guidance on approved methodologies and regular updating of the positive list.*
 - *The DNA has developed the capacity to assess CDM projects for eligibility and its institutional capacity will be used to administer the domestic carbon-offset scheme. The DNA already fulfils a part of the first responsibility of the administrator as it conducts pre-screening and tracking of projects for eligibility in the CDM, which is considered as the most robust global carbon offset standard.*
 - *To ensure sufficient capacity in this regard, expanding the DNA's technical capacity must be considered. The DNA must be further capacitated and provided with additional training, financial and human resources to carry out all proposed functions.*
- The Offset Paper also provides for the possible appointment of an Independent Expert Committee. This committee could handle issues such as the development and maintenance of a positive list and the approval of proposed new methodologies.
 - Reference is made to the creation of a system of checks and balances that would rely on Independent Verification Bodies.
 - The carbon offset registry must facilitate the effective management of carbon-offset credit records. The registry must ensure that credits surrendered for compliance are retired, thus eliminating double trading and double counting of credits either locally or internationally.
 - The Offset Paper stipulates that the registry should consist of an electronic database allowing for the storing of carbon credits. The registry should explain the ownership of offsets by providing and assigning a serial number for each verified offset.
 - The retirement of carbon credits is regarded as fundamental to ensure the integrity of the carbon offset.
 - Key features of the carbon registry as per the Offset Paper includes the following:

- *A registry with publicly available information to uniquely identify offset projects.*
- *A serial number for each offset credit generated by each project.*
- *A system to transparently track ownership of offsets which makes it possible to track each offset to the project from which it originated.*
- *A system to easily check on the status of an offset (e.g. whether an offset has been retired).*
- *Contractual or legal standards that clearly identify the original “owner” of the emission reductions as well as further owners of this offset.*
- *Contractual or legal standards that spell out who bears the risk in case of project failure or partial project failure (e.g. who is responsible for replacing the offsets that should have been produced by the failed project).*

1.4 PILOT TRADE OF CARBON CREDITS ON THE JSE IN JANUARY 2015

Promethium Carbon executed a project to investigate the viability of carbon trading in South Africa during 2013, 2014 and 2015. The project was funded by the British High Commission in Pretoria.

Policy documents published by the South African Government up to 2013 mentioned the potential use of carbon offsets in two applications. The first was to allow companies to mitigate its financial liability in terms of the proposed carbon tax. The second was to be used against a potential carbon budgeting system. The project focussed mainly on the first application.

The project investigated the question of whether it will be possible to implement a carbon offset trading scheme within the same time horizon as the announced schedule for the implementation of the South African carbon tax. It concluded that this would be possible provided maximum use can be made of existing infrastructure. This infrastructure is required to ensure both the environmental integrity and the economic integrity of the system.

The environmental integrity of the system can be assured through the utilisation of existing offset standards like the CDM, VCS or Gold Standard. Economic integrity can be assured by using the JSE as trading platform and combining it with either a local registry such as Strate or ESC or an international registry such as Markit or APX. Over time elements such as additional standard, new national offset standards or derivative trading could be added to the proposed basic offset trading framework.

The research found that the introduction of credits into a South African system should be done in a process that checks the appropriateness of the project to be traded into the South African system. The project proposed a set of National Appropriateness Tagging Rules. In the current context these are referred to as the Project Eligibility Criteria, and will be specified as part of the carbon tax regulatory infrastructure. The project found that the eligibility criteria could be placed under the custodianship of the Independent Technical Committee as envisaged in the Carbon Offset Paper.

The project covered a high level analysis of the potential market supply and demand and found that there is sufficient potential volume at a marginal cost of R120 per ton CO_{2e} to create a viable market.

The overall conclusion of the project was that the necessary infrastructure as well as potential supply and demand exists to create a carbon offset trading scheme within the same timeframes as the proposed South African carbon tax.

1.4.1 DESIGN CONSIDERATIONS

The project found that, to design the basic carbon trading system with actual verified emission reductions, suitable for the South African Carbon Tax System and with a minimized risk of fraud, the following three process steps should be addressed (also depicted in Figure 16):

Step 1: Ensure environmental integrity by utilising existing standard

A large amount of effort has gone into the design of offset systems over the last decade and a half. The proposal made in this report is that the existing infrastructure with respect to offset credits be utilised. This is in line with the Carbon Tax Policy Paper that states that credits from the CDM, VCS and GS could potentially be used.

Step 2: Ensure National Appropriateness by applying tagging rules (project eligibility criteria)

The critical issue in using offsets from existing schemes within the proposed SA carbon tax system is that none of these schemes takes the system-specific requirements of the tax scheme into consideration. It is important that a step be included where the appropriateness of the emission offsets can be tested and verified before the offsets are introduced into the system for use in the SA carbon tax scheme.

Step 3: Ensure economic integrity by utilising existing markets and market infrastructure

The next step is to introduce the offsets as commodities into the existing South African commodity trading system. Here, we recommend that the infrastructure of the existing commodity trading market be utilised.

Additional elements could be added to this basic carbon trading scheme in future development to reduce the costs of participation or expand the market. In addition optimisation over time of each of these three process steps can be expected.

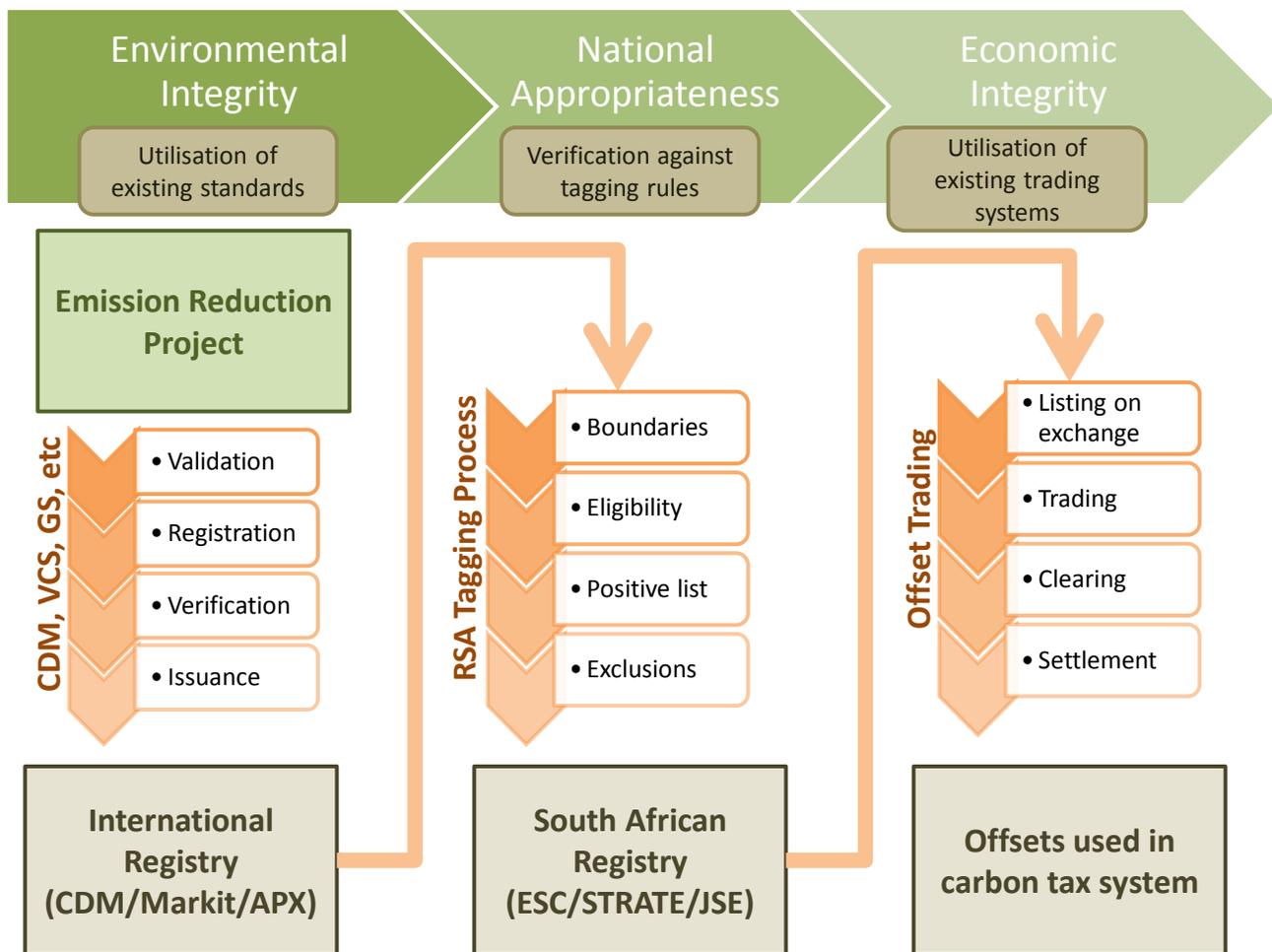


FIGURE 16: PROPOSED PROCESS FOR INCLUDING CARBON OFFSETS IN THE SOUTH AFRICAN SYSTEM

The following sub-sections will address each of the three process steps in more detail.

1.4.2 ENVIRONMENTAL INTEGRITY

Traditionally, environmental integrity in the context of producing and delivering emission reduction offsets is taken as meaning “*delivering real, permanent, additional and verified mitigation outcomes, avoid double counting of effort, and achieve a net decrease and/or avoidance of greenhouse gas emissions*”²⁰. There is, however, a challenge in this that has been overlooked in the structure of many of the international schemes. Many schemes place a burden on the environmental integrity requirements of offsets that is significantly higher than the burden placed on the accounting for the emissions that the offsets will be used against. This asymmetry in the validation and verification burden is detrimental to the development of a robust system and can prohibit the development of projects that adhere to the highest standards of environmental integrity.

One example of the above is the asymmetry between the EU ETS and the CDM. This is illustrated in Table 12 below:

²⁰ UNFCCC Decision 2/CP.17

TABLE 12: ASYMMETRY IN ENVIRONMENTAL INTEGRITY BETWEEN THE EU ETS AND THE CDM

	EU ETS	CDM	Comments
Validation	The monitoring plan of the installation operating under the EU ETS is checked and approved by the competent authority. No validation by external auditors is required ²¹ .	The Monitoring Plan and other elements of the project design, as contained in the PDD is validated by a Designated Operational Entity (DOE) prior to checking and approval by the Executive Board.	The validation process is one of the biggest barriers to the implementation of CDM projects. CDM projects undergo checking by both the DOE and the authority (Executive Board), while the emissions offset by the credits generated is only checked by the authority.
Data Accuracy	Operators must supply accurate data. They are required to balance the benefit of greater accuracy with the additional cost of achieving the accuracy. Data must be of the “highest achievable” quality. This means that operators must do what is “technically feasible and without incurring unreasonable costs” ²² . The competent authority is only required to use conservative assumptions when no verification report is produced. ²³	The CDM project Standard requires that “Project Participants shall apply conservative assumptions or discount factors to the calculations” ²⁴ . This means that where uncertainties exist the developer of a CDM project cannot use the most accurate data available, but must use the most conservative data.	The accuracy requirement in the CDM is higher than that in the EU ETS. The implication of this is that if the same intervention is applied in a facility operating under the EU ETS and one implementing the CDM, then the CDM project could earn significantly less credits than what is deemed saved in the EU ETS operation.

²¹ European Commission: Directorate-General Climate Action, MRR Guidance document No. 1, Version of 16 July 2012,

http://ec.europa.eu/clima/policies/ets/monitoring/docs/gd1_guidance_installations_en.pdf

²² Commission Regulation (EU) No. 601/2012 of 21 June 2012, Article 7

²³ Commission Regulation (EU) No. 601/2012 of 21 June 2012, Article 70

²⁴ CDM Project Standard, EB 65, http://cdm.unfccc.int/filestorage/e/x/t/extfile-20131011143951951-reg_stand01.pdf/reg_stand01.pdf?t=dGx8bXV3bnJlfDDmPXWWmowSeLF7OJ59WfbE

	EU ETS	CDM	Comments
Integrity of the monitoring methodology	The monitoring methodology is required to achieve reasonable assurance, meaning a <i>“high but not absolute level of assurance, expressed positively in the verification opinion”</i> ²⁵	The CDM validation and verification process requires absolute resolution of all issues. DOEs often refuse to finalise project validation and verifications until ALL of the issues, no matter how minor, are addressed.	The level of assurance required by the CDM is significantly higher than what is required by reasonable assurance. This places a significantly higher administrative burden on the generation of the offsets than on the emissions that is being offset.
Liability of participants	In the event that the authorities become aware of errors in verification reports, they will inform the verifier, who must then correct the verification report.	In the event that there is excess issuance of credits, the DOE must transfer the equivalent amount of emission reduction units to the account of the Executive Board ²⁶ . This means that the DOE must buy the credits in the market at his own expense.	The need to check the underlying fundamental of each project and the liability placed on DOE’s in the CDM is the biggest contributor to delays and costs in the CDM validation and verification process.

The design of the South African system must aim at achieving symmetry in the requirements of the accounting of actual emissions and the accounting for offsets used against those emissions. It is therefore proposed that a central environmental integrity standard be developed and that this requirement be applied to both the accounting for actual emissions and for the projects used to offset those emissions. This is illustrated in Figure 17 below.

²⁵ Commission Regulation (EU) No. 601/2012 of 21 June 2012, Article 7

²⁶ FCCC/KP/CMP/2005/8/Add.1, Para 22

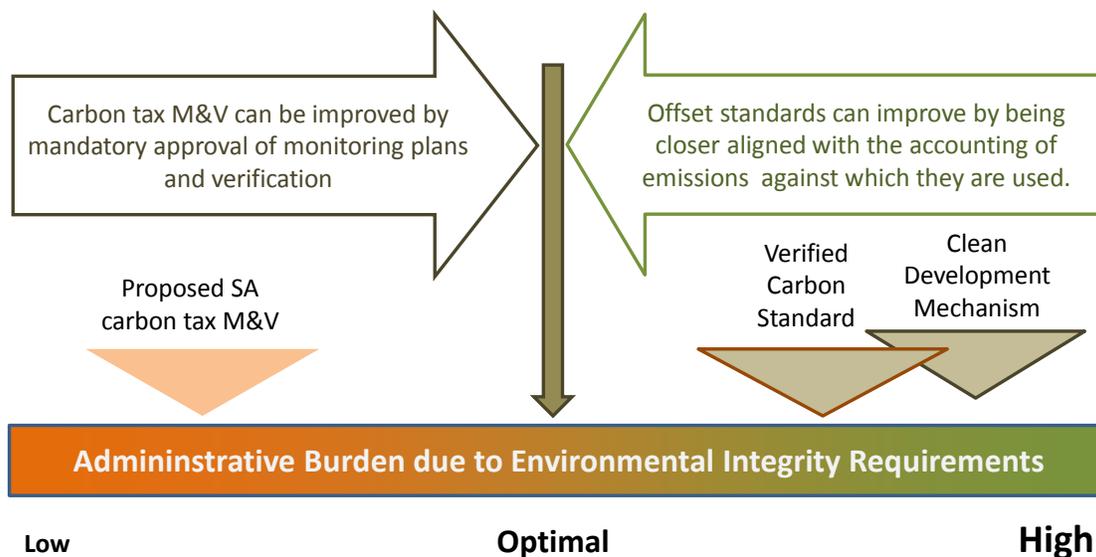


FIGURE 17: CONCEPT OF A CENTRAL ENVIRONMENTAL STANDARD TO BE USED FOR BOTH EMISSIONS ACCOUNTING AND OFFSET VERIFICATION

There is increasing consensus regarding the level of scrutiny that offset projects need to adhere to with reviews of issued credits and registered projects being built in such as the VCS program update dated October 2013

1.4.3 OFFSET STANDARDS

The Carbon Tax Policy Paper states that existing standards such as the CDM, VCS and Gold Standard should be allowed into the proposed system. The benefits of using the existing international standards lie in a number of areas:

Time to market:

One of the biggest advantages in using existing standards is the relatively short time to market that can be achieved with these systems. The introduction of the SA system will not have to be delayed by the design of a custom built standard.

Infrastructure:

The existing standards all have well proven methodologies, auditors, registries etc. The use of these standards gives direct access to this infrastructure.

Environmental Integrity:

The standards mentioned have all been accepted on an international level as having sufficient environmental integrity. This issue is described in more detail below.

Scope of supply:

Regions that have opted to design their own standards (RGGI, California and Australia) have limited scope for the implementation of offset projects based on the slow rate of development of the methodologies.

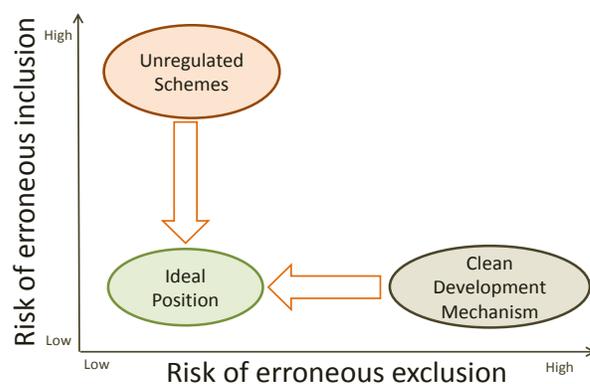


FIGURE 18: RISKS ASSOCIATED WITH THE

Early supply:

The use of existing schemes will allow for a fast start-up of the SA scheme with a potentially significant volume of existing credits.

Provision must be made for inclusion of other standards into the system at a later stage. This could include the design of a South African standard or for example any of the standards approved by ICROA. A list of criteria to which standards must comply before forming part of the SA system is essential and must be developed in cooperation with the stakeholders. An example of what could be included as criteria is presented below:

TABLE 13: CRITERIA FOR SELECTION OF OFFSET STANDARDS

Criteria	Questions to be answered for each standard	Comments
Environmental integrity	Are emission reductions real?	The CDM, VCS and GS all comply with this criterion as the principle of emission reduction calculation is very well established. Projects can reduce emissions in any of the Kyoto gasses
	Are emission reductions permanent?	Proving permanence is a difficult point for some types of projects, such as land-based and forestry projects. Emission reductions achieved by standard CDM projects are permanent, but not those achieved by afforestation/reforestation CDM projects. The VCS addresses the permanence issue in a realistic way through risk assessments and provisions for the risks, like buffer accounts.
	Can the emission reduction be verified?	This issue is addressed in the verification requirements of each standard. Some of these requirements can, however, present a disproportionate burden.
	Are emission reductions additional?	Most standards will comply with this criterion as additionality arguments are well developed and matured. As with the verification criterion above, some standards tend to over-emphasise the additionality argument to the detriment of the provision of offsets. Progress achieved by the VCS in the development of positive lists goes a long way towards overcoming the onerous additionality requirements imposed by other standards.
	Does the standard provide for the avoidance of double counting?	The risk of double counting is reduced where only one standard is used in a region. The risk can, however, be increased if more than one standard is used. The CDM does not require checks that a project has not been registered under another scheme, whereas this provision is made in the VCS.
	What is the risk of erroneous exclusion and erroneous inclusion of emission reduction projects?	The CDM has a very low risk of erroneous inclusion but a very high risk of erroneous exclusion. This situation is detrimental to the aims of the offset scheme and development in general. The VCS is more balanced in this respect. Figure 17 above illustrates this issue.

Criteria	Questions to be answered for each standard	Comments
Economic factors	What is the cost of validation and registration?	The costs of validation and verification in the CDM are very high. This is in part caused by the high degree of asymmetry between the offset scheme and the verification of the emissions actually being offset. The high costs combined with the high risk of erroneous exclusion makes the CDM unattractive to many potential offset providers, especially those developing projects with smaller emission reduction potential. Standardized methodologies such as positive lists or performance benchmark approaches can reduce transaction costs considerably, especially in respect of project validation.
	What degree of localisation is possible by using local auditors and registry structures?	One of the objectives of the domestic offset scheme is the generation of green jobs. Localisation of the validation and verification services can create a significant amount of high quality green jobs. The accreditation of designated operational entities under the UNFCCC is an onerous task, and only one SA company has achieved this accreditation. Entities that are accredited against ISO 14065 by an accreditation body recognized by IAF can act as validation/verification bodies under the VCS. As of 2013, the local IAF recognised entity SANAS can accredit organisations against ISO14065, and two entities have indicated that they are applying for this international accreditation through this local accreditation body.
Regulatory factors	What are the regulatory delays associated with validation and registration?	Validation of CDM projects can take up to three years to be completed, with the average time in the order of one year. These long development timeframes put a large burden on the developers of offset projects.

1.4.4 NATIONAL APPROPRIATENESS AND PROJECT ELIGIBILITY

Traditionally the emphasis in the design of carbon trading schemes lies on how to ensure the economic and environmental integrity of the system. In these two areas, sufficient infrastructure is available that can be utilised in the design of a South African system.

There is however another step that does not normally get the same amount of attention in the design of systems. This step involves the introduction of the credits into the national emission trading scheme. Examples of this additional step can be seen in the EU, USA, Australia, New Zealand and Thailand.

EU ETS: There is a limitation on the trade of certain types of credits in the EU ETS. The introduction of Kyoto offsets into the EU ETS is made possible by the 2004 Linking Directive (2004/101/EC). The requirements of the Linking Directive were later

modified in Article 11(a) of Directive 2009/29/EC²⁷, which spells out under which conditions CER's and ERU's can be used in the ETS during Phase 3 of the ETS. The implementation of the measures listed in these directives is enforced through Article 48(5) of Commission Regulation (EU) No 920/2010 which states: "*The Union registry shall reject any request to surrender CERs or ERUs that are prohibited from being used in the ETS in accordance with Article 11a of Directive 2003/87/EC.*" In Commission Regulation (EU) No 389/2013 of 2 May 2013²⁸ it states: "*The central administrator shall ensure that CERs and ERUs relating to projects hosted in Member States are only held in ETS accounts in the Union Registry if their issuance was not prohibited by Article 11b of Directive 2003/87/EC.*" This effectively makes the administrator of the registry the gatekeeper with respect to the introduction of credits into the EU ETS.

- Australia:** Similar provisions exist in the Australian regulation that allows the use of EUA's in the Australian system, (Clean Energy Legislation Amendment (International Linking) Regulation 2013, Select Legislative Instrument No. 78, 2013.²⁹) Liable entities under the Australian scheme may surrender 12.5 % of their liability from Kyoto units (CERs) and 37.5 % from EUAs.
- California:** The Final Regulation Order³⁰ of the California Cap On Greenhouse Gas Emissions And Market-Based Compliance Mechanisms outlines the requirements for offsets to be used in the Californian Scheme in § 95973 - *Requirements for Offset Projects Using ARB Compliance Offset Protocols*. These provisions are up for review in Senate Bill 605³¹ of 2013 which seeks to limit the use of offsets in California to offsets generated in the state of California.
- RGGI:** The rules of RGGI states that only offsets from the approved categories and generated inside the borders of RGGI states may be used in the system, unless the carbon price exceeds \$10, in which case CERs may be used. These requirements are legislated by the individual states. One example of such state specific legislation is the Connecticut regulations for abatement of air pollution, Section 22a-174-31a - Greenhouse Gas Emission Offset Projects³².
- New Zealand:** The NZ ETS allows for the unlimited use of international credits in the NZ ETS in Article 19 of the Climate Change Response (Emissions Trading) Amendment Act 2008³³.
- Thailand:** The Crown Standard provides a tag to Thai CDM or VCS projects that meet specific criteria of sustainable development. This is done according to a Thai scoring system evaluating environmental aspects, stakeholder consultation in the form of public participation process (not just to inform the public), and social aspects such as supporting social activities, culture and self-sufficient economy or improving the health and sanitation of workers and nearby communities. The project developer must furthermore demonstrate that it either shares the benefit from carbon credit income

²⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0063:0087:en:PDF>

²⁸ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:122:0001:0059:EN:PDF>

²⁹ <http://www.comlaw.gov.au/Details/F2013L00778>

³⁰ <http://www.arb.ca.gov/regact/2010/capandtrade10/finalrevfro.pdf>

³¹ http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB605

³² <http://www.ct.gov/deep/lib/deep/air/regulations/mainregs/22a-174-31a.pdf>

³³ <http://www.legislation.govt.nz/act/public/2008/0085/latest/DLM1130932.html>

with local communities, or that the project contributes to Corporate Social Responsibility.

The provisions that regulate what credits can be introduced into a national emission trading scheme is best described as “National Appropriateness” measures or Project eligibility Criteria.

Infrastructure to determine the National Appropriateness of carbon credits is the only part of the offset trading system that needs to be built in South Africa. This will require the following aspects to be addressed:

- The rules for establishing the Eligibility Criteria need to be formulated. This must be the outcome of a process in which all stakeholders are involved.
- The custodianship of the Project Eligibility rules for needs to be established. A custodian committee made up of both government and private sector representatives is suggested.

CUSTODIANSHIP OF PROJECT ELIGIBILITY CRITERIA

If a project is successfully registered under a recognized offset standard and complies with the project eligibility criteria, it will be eligible to be traded as an offset under the South African Carbon Tax system.

It is suggested that custodianship of the Project eligibility Criteria sits with the Independent Technical Committee, as envisaged by the Carbon Offset Paper. This committee can be chaired by the Designated National Authority (DNA). Other members of the committee should include representatives from National Treasury, Department of Environmental Affairs, Department of Energy, Department of Trade and Industry, Industry (i.e. BUSA), civil society and Labour. The committee will deal with requests to updating and changing tagging rules, interpretation questions or objections.

1.4.5 ECONOMIC INTEGRITY

Economic integrity is related to the offset trading component of the carbon offset trading scheme. By using existing trading infrastructure, carbon trading can take place with minimum additional costs and risks related to new infrastructure.

TRADING SYSTEM

The trading system required for a carbon trading scheme has to provide the platform on which the trading can take place. The most important functions of the trading system are:

- **Price discovery:** The trading platform must provide the means for buyers and sellers to communicate with each other in a transparent way. The main items of information that needs to be communicated are the volume and price of credits offered by sellers, the volume and price of offers made by buyers and the volume and price of transactions concluded.
- **Clearing and Settlement:** The trading platform must provide a secure way of ensuring proper clearing, where the credit is transferred from the seller to the buyer, and settlement, where the money is paid by the buyer to the seller for the transaction.

Promethium Carbon had a number of meetings with the JSE and are of the opinion that the JSE can offer the services required in a practical and cost effective way.

REGISTRY

The registry is the electronic database in which a carbon credit is stored. No carbon credit can exist outside of a registry, and a credit can only exist in one account at a time. The full life cycle of the carbon credit trading occurs inside the registry. This includes its issuance, trading and retirement.

The purpose of the registry is to keep an accurate record of the credits and ownership of the credits in the system. A registry records the holdings of credits, and any transactions involving those credits, through a structure of accounts. This is similar to the way that banks record balances and movements in money using accounts allocated to individuals or other entities. Process steps that are being addressed in a registry include issuance (bringing new credits into the registry), trade (transfer of credits from one owner to another) and cancellation (when a credit ceases to be valid to be used as offset). Other functions include the mechanism of transfer of credits between registries.

In general, registries need to:

- i. Ensure administrative efficiency;
- ii. Provide access in the required way, such as via the internet;
- iii. Keep transaction costs low;
- iv. Ensure timeous execution of transfers;
- v. Ensure very low risk of fraud; and
- vi. Provide adequate administrative support.

The transfer of credits from one registry to the next requires special processes. An example of a transfer of credits process is the transfer of Australian-Issued International Units (AIUs) to the EU's Union Registry. The process is as follows¹:

- i. check the validity of the transfer request
- ii. send information to the European Union Transaction Log (EUTL) about the number of AIUs to be cancelled and the account in the Union Registry into which the corresponding number of EUAs must be issued
- iii. if the transfer is validated by EUTL, then cancel the AIUs in the Registry by removing the transferred amount from the account in which it was held
- iv. advise the EUTL that the units have been cancelled
- v. arrange for an equivalent number of EUAs units to be transferred from the Commonwealth foreign registry account in the Union Registry to the nominated account in the Union Registry

As the registry forms a central part of the trading system, it is important that its design and functioning is aligned with both the domestic SA market and the international registries from which credits will be introduced into the SA system, and to which credits may eventually be transferred if international linking is established in the future.

The carbon registries in the international arena include:

CDM Registry³⁴: The CDM registry is defined in the decisions of the UNFCCC Conferences of Parties. It forms the basis on which many registries are based as all registries that accept CERs must link to the CDM registry.

³⁴ UNFCCC 3/CMP.1, Annex, Appendix D

Union registry: The Union Registry is the registry of the EU and has been in operation since 20 August 2012. It was created by consolidating all the individual country registries in the EU.

The Australian National Registry of Emissions Units: is the registry of the Australian trading system.

APX: APX is an infrastructure provider for environmental markets in greenhouse gases including carbon commodities. These commodities include emissions allowances and carbon offsets. APX has provided carbon trading registries for the 'Climate Action Reserve', 'American Carbon Registry' and the 'Verified Carbon Standard'.

Promethium Carbon discussed the registry infrastructure requirements of South African carbon trade with APX Environmental Markets. APX indicated that using its existing systems would put APX in a position to provide a competitive rate for the development of a registry for South African offset trading. In terms of timing, APX indicated that it could operationalise a registry system within South Africa in about 2-3 weeks from the point in time that all government requirements are formalised.

Markit: The Markit Registry provides a tool for managing global carbon, water and biodiversity credits. Amongst others, Markit has established registries for the 'UK Woodland Carbon Code', 'Gold Standard' and the 'Verified Carbon Standard'.

Promethium Carbon had a discussion regarding registry infrastructure requirements to allow for carbon offset trading within South Africa with Markit. Markit indicated that they are in a position to offer a cost effective solution to South Africa to host a carbon registry, should it be required. Such a registry could be "white labelled" and operated from South Africa. They highlighted the fact that a number of South African companies and financial institutions already have carbon accounts at Markit and are trading credits through the Markit registry.

Within South Africa, the following registries are used by the Johannesburg Stock Exchange:

Strate: South Africa's Central Securities Depository, trading under the name Strate, provides electronic settlement for securities and tracker funds for the Johannesburg Stock Exchange (JSE).

Promethium Carbon had discussions with Strate about the possibility of housing a carbon registry on the Strate platform. Whereas it will be technically possible, such a move will have some challenges due to regulatory uncertainty. Firstly the credits will have to be classified as a financial instrument (while the current recommendation is for the carbon credits to be treated as a commodity) and be subject to all the regulatory aspects associated with financial instruments, and secondly it will be much more costly than to trade carbon through registries where it can be treated as a commodity.

ESC Electronic Silo Certificates (ESC) is the registry through which commodities such as maize is traded on the JSE. The ESC register is administered by the Exordia Division of PricewaterhouseCoopers, independently of any industry player. The system is capable of taking on carbon as another commodity and trading can be done with minimal setup time required.

The cost of trading through the ESC is in the order of R1 per ton of maize for issuance and R2 per ton to trade. This price range is compared to international

carbon related admin costs very low and will support the development of medium sized projects, which are traditionally not viable under the CDM and VCS.

CRITERIA FOR REGISTRIES

During the analysis of the registries available to house carbon credits for trade in South Africa, we found that the registries interviewed (Strate, ESC, Markit and APX) can all accommodate South African credits with minimal additional effort. There are however differences in the registries that relate to their structure and regulatory frameworks, and these differences will translate into operational impacts on issues such as accessibility and costs.

Whereas we believe that a carbon trading system should not be built on allowing a single registry to establish a monopoly, there needs to be a set of minimum standards that will allow a registry to operate in the system. This set of standards will have to be established when the carbon trading system is set up, but a starting point could include the following aspects:

Quality and Validity:

The registry must have the systems in place to ensure that credits are only listed when a valid claim for a credit exists.

Security:

A registry needs to be secure in ensuring that:

- Ownership of credits are secure and credits cannot be transferred in a fraudulent manner;
- There must be mechanisms in place to ensure that fraud is detected in the unlikely event that it does occur;
- Procedures should be in place to ensure the correct actions are taken in the event that fraud is discovered and that trading is not affected by such events.

Administration:

The registry must be able to prove that it has the required governance and administration in place.

Accessibility:

The registry must be accessible to account holders and market participants.

Technical capacity:

The registry must be able to prove that it has the technical capability to manage the functions of the registry in an efficient and professional way.

1.5 FUNCTIONING OF THE MARKET

A possible market structure is shown in Figure 19 below with a nine step process from project implementation to the utilisation of the tax offset.

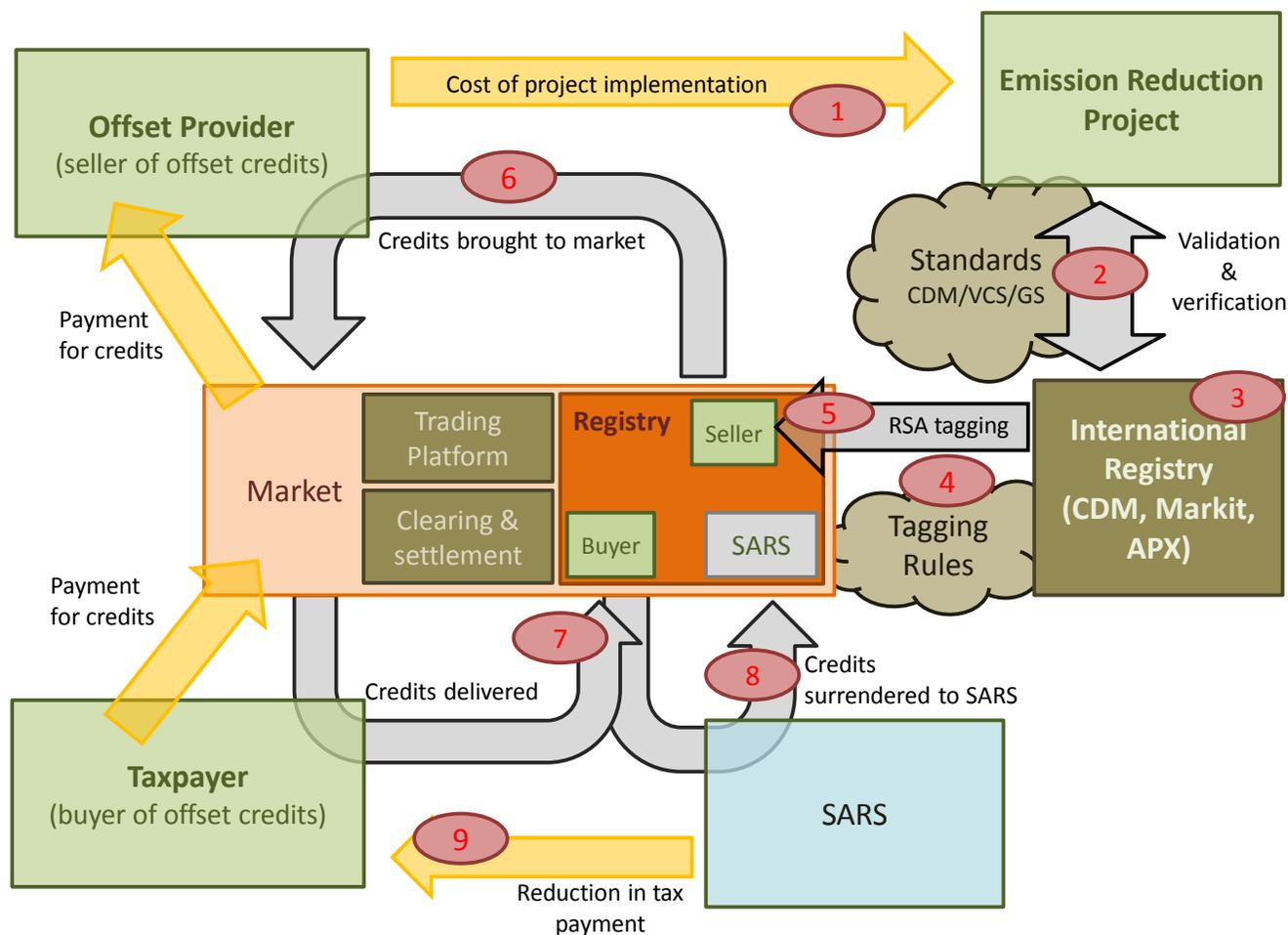


FIGURE 19: ENVISAGED MARKET STRUCTURE

The process steps are indicated by numbers in the diagram. The nine steps are explained below:

- 1) The offset provider invests in an offset project. This project can be either inside the business of the offset provider or outside. Note that the forward buying of credits, as is typically done in the CDM to finance projects, is not covered by the scope of the scheme proposed in this report. However trading can be done on an over the counter (OTC) basis.
- 2) The project is validated and verified by an accredited auditor of the standard used (CDM, VCS, GS). This process guarantees the environmental integrity of the system.
- 3) The credits generated by the project are issued into the international registry in terms of the scheme under which the project was developed. In the case of the CDM this will be the CDM registry and in the case of the VCS or GS, this could be either Markit or APX. Even though APX and Markit run the registries, these really are part of either the VCS or GS registry systems. In both cases APX/Markit are accountable to VCS/GS through a contractual agreement. APX and Markit are effectively registry service providers or administrators.
- 4) The owner of the credits can now apply for the credits to be transferred to the South African Scheme. This is done by auditing the credits for National Appropriateness according to the RSA Tagging Rules. This audit could be done by the project auditor.
- 5) The credits are issued into the account of the offset provider in the RSA registry against delivery of the Tagging Audit report and cancellation certificate from the registry of origin. See **Error! eference source not found.** above for an example of a cancellation certificate.

- 6) Once the credits arrive in the account of the offset provider, he can bring the credits to the market to be traded.
- 7) The tax payer buys the credits on the market. The credits are transferred to the registry account of the buyer.
- 8) The tax payer surrenders the credits into the cancellation account of the South African revenue Service (SARS).
- 9) The tax payer receives a reduction in his tax liability that is equal to the CO₂ value of the surrendered credits.

1.5.1 ROLES OF PROJECT PARTICIPANTS

The project reported in 2014 that the following project participants and their subsequent roles could be distinguished:

- **Offset provider:** the offset provider implements a project from which the carbon offsets will be generated for use either internally or sold on the market;
- **Accredited auditor:** an accredited auditor is required during the project validation phase in order to ensure environmental integrity of the carbon offset. Each standard prescribes the competencies required of the validators and verifiers. Currently this competency is either confirmed by the UNFCCC or under the ISO14065 standard. The ISO14065 accreditation can be obtained internationally but since 2013 also locally through SANAS. SANAS is the South African Accreditation services under the Department of Trade and Industry. Local accreditation could bring the cost of auditing down while creating jobs and building capacity in the green economy.
- **Designated National Authority (DNA):** it is proposed in this report to make the DNA the chair of the custodian committee of the SA tagging rules. Furthermore, the DNA must give Host Country Approval to every offset project. In the case of CDM projects such approval is granted before project registration. For standards such as the VCS where host country approval is not granted before project registration, such approval must be given by the DNA prior to the credits being listed on the RSA registry. It is further recommended that the DNA gets actively involved in the development of standardised baselines, as provided for in the rules of the CDM, so-as to help reducing the cost of carbon offset project registration.
- **Tax payer:** once the offset provider has brought its offsets to the market, the tax payer can purchase these offsets and surrender them into the cancellation account of SARS.
- **South African Revenue Service (SARS):** upon receiving the offset credits from the tax payer, SARS deduct these offsets from the total carbon tax liability of the tax payer. Note that the proposed system does not require any carbon offset knowledge or actions from SARS. The Tagging Rules Custodian Committee and the accredited auditors guard over the introduction of credits into the system. Cancellation of the used credits happens automatically when credits are transferred to the SARS account in the registry by virtue of the fact that the account will be set up as a cancellation account. SARS simply has to allow for a relief of the carbon tax equivalent to the amount of credits transferred into the account by a specific tax payer.

1.6 PILOT TRADE ON THE JSE

The project culminated in a pilot trade of CERs in January 2015. This demonstration took place within the context of the provision for carbon offsets to be used in both the announced South African carbon tax system and the announced carbon budgeting system.

The demonstration of market readiness was the culmination of a three year research project executed by Promethium Carbon in close cooperation with the JSE (trading platform), Silocerts (commodities registry) and Done Technologies (technology provider to the registry).

The objective of the project was to investigate the applicability of existing South African commercial and financial infrastructure for use as a carbon trading platform.

The demonstration consisted of performing actual trades of carbon credits from a wide variety of standards (CDM, VCS, GS) on an over-the-counter (OTC) basis. These trades were then mirrored in a test environment on the electronic platforms of the JSE and Silocerts.

The execution of the demonstration showed that full commoditisation of carbon from a variety of international standards is possible, and that the commoditised credits can be traded on a common platform. This means that carbon offset credits, as contemplated by the South African Government, can be traded in the country's existing infrastructure.

The demonstration of market readiness was presented on 29 January 2015 at an event held at the JSE in Johannesburg. The demonstration can be seen in the context of the potential carbon tax and carbon budget as shown below:

TABLE 14: CONTEXT OF THE MARKET READINESS DEMONSTRATION

	Proposed carbon offset trading system	Demonstration on 29 January
Commodity traded	Carbon offset as defined in the carbon tax or carbon budget system	Voluntary offsets used by SA businesses
Institutional arrangements	ISO accredited auditors, listing entity, registry (Silocerts) and trading platform (the JSE)	Registry (Silocerts) and trading platform (the JSE)
Market participants	Companies owning SA generated credits, traders and companies with carbon obligations under either the carbon tax or the carbon budget system	Companies owning SA generated credits, traders and companies

The demonstration mirrored actual trades for two reasons. The first reason was that the value of the carbon offset credits in South Africa will be created when the carbon tax and/or the carbon budget legislation are promulgated. Until such time, the commodities have no value in the regulatory sphere. The credits do however have a real value in the voluntary market where the demonstration took place. The second reason was that only offsets from specific project types will be eligible to be traded in the South African compliance regime. As the rule stipulating the eligibility criteria is still unknown, the commodities that would be eligible as offsets could not be created.

In order to overcome these two barriers, the following approach was followed:

- 1) A number of prominent South African companies were asked to trade credits on a voluntary basis.
 - a. The sellers offered credits generated by projects inside South Africa that could potentially comply with the national eligibility criteria.

- b. The buyers bought the credits to use as offsets in voluntary offset initiatives for a variety of corporate activities.
- 2) The market participants agreed to provide the demonstration project team with information about the trades. The demonstration project team then performed the trades on the infrastructure platform, described in this report, in a test environment.
- 3) The results of testing the trades on the actual Silocerts and JSE platforms were then presented to illustrate the readiness of the platforms to trade carbon offset credits for compliance purposes in SA.

The demonstration of market readiness was the culmination of three years of work conducted by Promethium Carbon in cooperation with the JSE, Silocerts and Done Technologies. The programme was funded by the British High Commission in Pretoria, through the Prosperity Fund. The work done in this programme is summarised in the following reports³⁵:

- Initial Framework for Carbon Offset Opportunities and Verification Options - April 2013;
- Interim Report Carbon Trading in South Africa: Trading Offsets Against the Proposed Carbon Tax - October 2013;
- Carbon Trading in South Africa: Trading Offsets Against the Proposed Carbon Tax - March 2014;
- Potential Alignment between the Proposed South African Carbon Offset Trading Scheme and the Carbon Budget Approach - September 2014;
- Supply and Demand Modelling in the Proposed South African Carbon Offset Scheme - September 2014

In addition to the above reports, the system was demonstrated to both National Treasury and the DNA during sessions held in November 2014.

The outcomes of this research are confirmation that the commercial and regulatory infrastructure exists to allow carbon to be traded in South Africa, as well as for the trading system to be made operational within the same timeframe as the proposed carbon tax. The available infrastructure is sufficient to:

- Guarantee the environmental integrity of the offset system;
- Guarantee the national appropriateness of the offsets within the context of the proposed South African carbon tax system; and
- Guarantee the financial integrity of the trading system.

1.6.1 PROPOSED MECHANISM FOR CARBON OFFSET TRADING

The proposed mechanism described below was the outcome of three years' worth of investigation by Promethium Carbon, the JSE and Done Technologies (the Silocerts technology provider). It covers the listing of credits, trading of credits, change of ownership and cancellation of credits after a trade has taken place.

LISTING OF CARBON OFFSETS IN THE SOUTH AFRICAN REGISTRY

The project proposed that the listing of carbon offset credits be done as shown below:

³⁵ The reports were compiled by Promethium Carbon and are available for download at http://promethium.co.za/knowledge-center/?category_ids%5B%5D=6

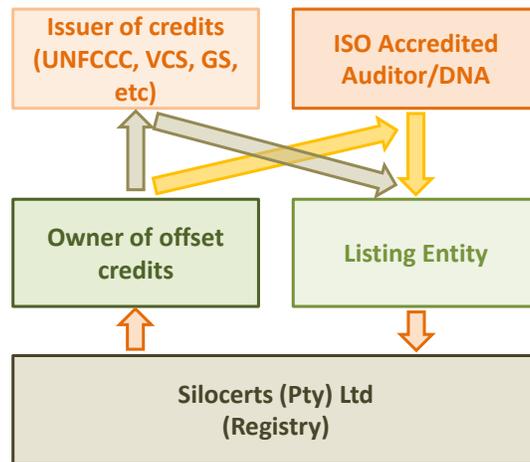


FIGURE 20: MECHANISM OF PROPOSED TRADING SYSTEM

The proposed mechanism of listing was modelled on the mechanism developed for the linkage of the Australian and European carbon markets. It relies on the cancellation of a credit in the one registry and subsequent issuance of the credit in the other registry. The South African system includes an additional step to ensure the national appropriateness of the credits for the South African carbon tax or carbon budgeting system:

- 1) **Step 1 - Cancellation of credits in the registry of origin:** The owner of the offset credits gives instruction to the registry of origin (such as the CDM or VCS) to cancel the credits. The proof of cancellation is then supplied to the listing entity.
- 2) **Step 2 – National Appropriateness:** The owner of the offset credits supplies information about the project from which the credits were generated to the ISO 14065 accredited auditor or the DNA, who in turn supplies a letter confirming that the criteria for eligibility of the credits have been met. This letter is then provided to the listing entity.
- 3) **Step 3 – Listing in the registry:** The listing entity lists the offset credits in the registry based on the proof of cancellation in the registry of origin and the letter of proof of compliance with the national eligibility criteria. The owner of the offset credits can now trade with the credits.

The integrity of the proposed system rests on the three steps listed above. It is important to understand that the registry does not assume responsibility for the integrity of the credits. This is guaranteed by the administrative process preceding the listing, in which the environmental integrity and national appropriateness is checked.

TRADING

The project proposed that once the carbon offsets are listed in the registry, there are a number of options available to the owner:

- a) The credits can be kept and used against the owner’s carbon tax or carbon budget obligations;
- b) The credits can be traded in an over-the-counter (OTC) trade; or
- c) The credits can be traded on the JSE.

The systems for each of these options are well established and available for use by market participants if they choose to do so.

CHANGE OF OWNERSHIP IN THE REGISTRY

The project proposed that the process to change ownership of the carbon credits in the registry is as follows:

- a) Both the buyer and the seller must have an account in the registry;
- b) The seller logs into their account and offers the credits being transferred to the buyer on an offer-out basis;
- c) The buyer logs into their account and accepts the offer on an offer-in basis within the specified period of time.
- d) The credits are then transferred from the seller's account to the buyer's account.

CANCELATION OF THE CREDITS

The ultimate purpose of the carbon offset trading system is for the credits to be cancelled. This can simply be done by issuing a request for cancellation to the registry. In practice this will probably only be done by Government agencies such as SARS in the case of the carbon tax or the Department of Environmental Affairs in the case of carbon the carbon budgets

1.6.2 DESCRIPTION OF THE MARKET READINESS DEMONSTRATION

The demonstration of market readiness took place within the context of a number of restrictions:

- **Restrictions on carbon offsets:** The demonstration was aimed at showing that carbon credits can be traded in South Africa should the regulatory environment with respect to the carbon tax and the carbon budgeting system develop to require it. The fact that the legislative actions required to allocate value to carbon as an offset instrument in South Africa have not yet been promulgated, means that the offsets traded in this demonstration, do not have any value in the compliance offset market. However, the participants in the demonstration felt that the value of the carbon credits in the voluntary offset space was sufficient to justify the trades. The demonstration trades were therefore real commercial transactions, but with the value created in the voluntary market.
- **Restrictions of the registry:** The accounts for the participants (buyers, sellers and administrator) were opened in a test environment on the registry. This means that these accounts cannot be used to trade carbon credits for any other purpose than for this demonstration of market readiness.
- **Restrictions on the trading platform:** The restrictions of carbon offsets with respect to fact that the legislative framework for the creation of a carbon offset instrument for the compliance market described above apply to the JSE as well. In the case of the JSE all products traded on the market must be approved by the JSE's regulator, the Financial Services Board. This approval could not be obtained due to the lack of legislative framework.

Within the context of the above restrictions, the demonstration took place as follows:

- **Commodity traded:** Carbon offset credits that were already issued by one of the standards mentioned by the National Treasury in the Carbon Offset Paper (CDM, VCS, Gold Standard, etc.), and came from projects implemented inside South Africa, were traded. The credits were used for the voluntary offset of certain corporate activities in the normal course of business of the buyers.
- **Nature of the trades:** The trades were executed on an over-the-counter (OTC) basis.

Demonstration of market readiness: All trades were mirrored in a test environment in both Silocerts and the JSE, to show how these trades would have looked in the event that they were performed live on these two platforms.

1.6.3 DEMONSTRATION MARKET PARTICIPANTS

The participants in the demonstration of market readiness on 29 January 2015 were:

Table 15: Summary of trades executed on 29 January 2015

Seller	Buyer	Standard	Volume	Price
Climate Neutral Group	Sanlam & Sanlam Cape Town Marathon	CDM, VCS & GS	Total volume of 873 tonnes	Average price of R110 per ton
Statkraft (credits from Corobrik Lawley)	Harmony Gold	CDM	20	Price not disclosed
Sibanye Gold	Nedbank	VCS	9 643	Price not disclosed
Sappi	Backsberg	CDM	240	R50 per ton

The selection of market participants for the demonstration covered:

- Carbon credits generated by using a range of standards including CDM, VCS and GS. The aim was to indicate that the variety of standards mentioned in the Carbon Offset Paper can be accommodated on a single platform;
- Carbon credits from a range of project types, to indicate that different project types can be accommodated on a single platform; and
- A range of participants including project owners, banks and carbon traders, to indicate that the different players can be accommodated on a single platform.

A number of other companies ranging from project owners to large emitters also expressed their wish to participate in the demonstration.

1.6.4 TRADING PLATFORM

The JSE has been active in trading commodities in South Africa for two decades. The JSE's historical timeline is highlighted below:

- The commodity derivatives market was established in 1995 due to the deregulation of the grains market by South African Government. The creation of the market introduced a number of physically settled agricultural products;
- Physical delivery of commodities is facilitated via a system of warehouse receipts;
- The commodities exchange established its own clearing house to guarantee all transactions;
- The commodities exchange was bought out by the Johannesburg Stock Exchange (JSE) in 2001;
- The JSE established a currency derivatives market trading major currency pairs in 2007;
- In 2009, cash settled commodity products traded under license from the CME Group (corn, soybean complex, SRW, HRW, crude oil and metals), were introduced;

- The following commodity products are currently being traded by the JSE:
 - Physically deliverable agricultural products (white and yellow maize, wheat, soya beans, sunflower seeds and sorghum)
 - Cash settled commodity products (crude oil, gold, platinum, copper, silver, corn, soybeans, sugar, cotton, coffee, cocoa and natural gas)
- In 2014, all product areas were consolidated under a single business unit called Capital Markets to further enable cross market evolution.

The structure of the JSE commodities market is shown in the figure below. This market structure is 100% applicable to the trade of carbon offset credits.

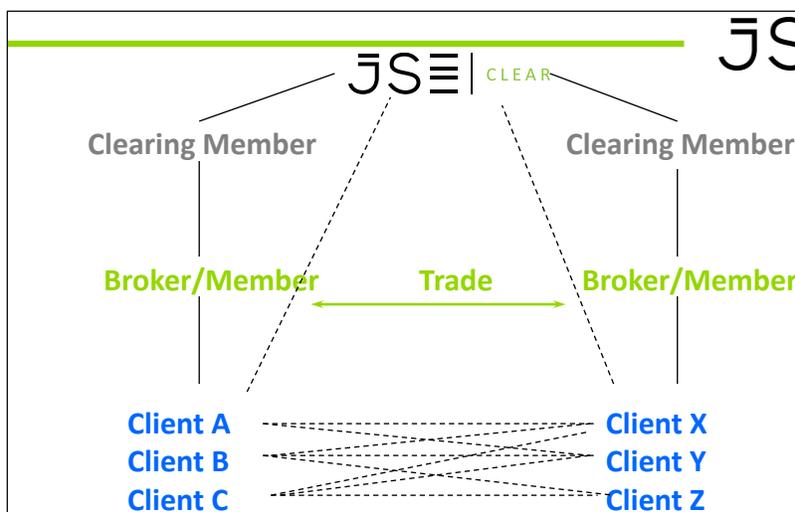


FIGURE 21: THE STRUCTURE OF THE JSE COMMODITIES MARKET

The proposed platform to trade carbon offset credits, relying on existing technology and market structure, can be integrated with the JSE’s existing systems. This has been done in the demonstration of market readiness in the following ways:

- Silocerts provided the carbon registry;
- JSE Commodities introduced a standard carbon credit contract (in a test environment) where 1 contract = 1 ton of CO₂ equivalent. This contract was referenced as CRBN, a shortened version for carbon;
- JSE derivatives trading and clearing platform performed the trading and settlement of the transactions in a test environment.

The demonstration of market readiness showed that detailed trading rules and contract specifications will be required in order to support the live trading of carbon offset credits.

The mechanics of the trade on the JSE are:

- Following a willing buyer-willing seller agreement to trade, the trade is submitted for settlement;
- “Delivery Notice” generated to determine the settlement amount due to the seller;
- “Assignment Notice” generated to provide the buyer with an invoice to confirm the amount due;
- Messages generated to send instructions to Silocerts to transfer ownership of the carbon credit as represented by the receipt.

A number of screen shots from the mirroring of the OTC trades in the JSE test environment are shown below:

Instrument	QtyB	Bid / Offer	QtyO	Change	Last	Time	High	Low	Volume	OpenInt
27 FEB15 CRBN	9	81.00 / 83.00	9	1.00	81.00	10:13	81.00	81.00	1	1

Memb	QtyB	Bid / Offer	QtyO	Memb
X	9	81.00 / 83.00	9	NEDM
X	10	79.00 / 84.00	9	SAFM
	0	0 / 0	0	
	0	0 / 0	0	
	0	0 / 0	0	
	0	0 / 0	0	
	0	0 / 0	0	
	0	0 / 0	0	

FIGURE 22: SCREEN SHOTS FROM THE JSE TEST ENVIRONMENT

The outcome of the work done on the JSE highlighted the following requirements:

- The JSE will require clarification around how carbon credits will be classified and if the credits will fall within the ambit of a “security” as referenced in the Financial Markets Act before proceeding to list such; and

It was confirmed that the integrity of the entire system relies on the validity of the carbon credits listed in the registry.

1.6.5 REGISTRY

Silocerts is the registry for all commodity trades on the JSE. The Silocerts registry is administered by the Exordia Division of PricewaterhouseCoopers, independently of any industry player. The registry provides for the full life cycle of the electronic certificates representing a carbon credit. This includes listing, transfer of ownership and cancellation.

The screen shots below shows the mirroring of the listing and transfer of ownership of the carbon credits that were traded in the demonstration:

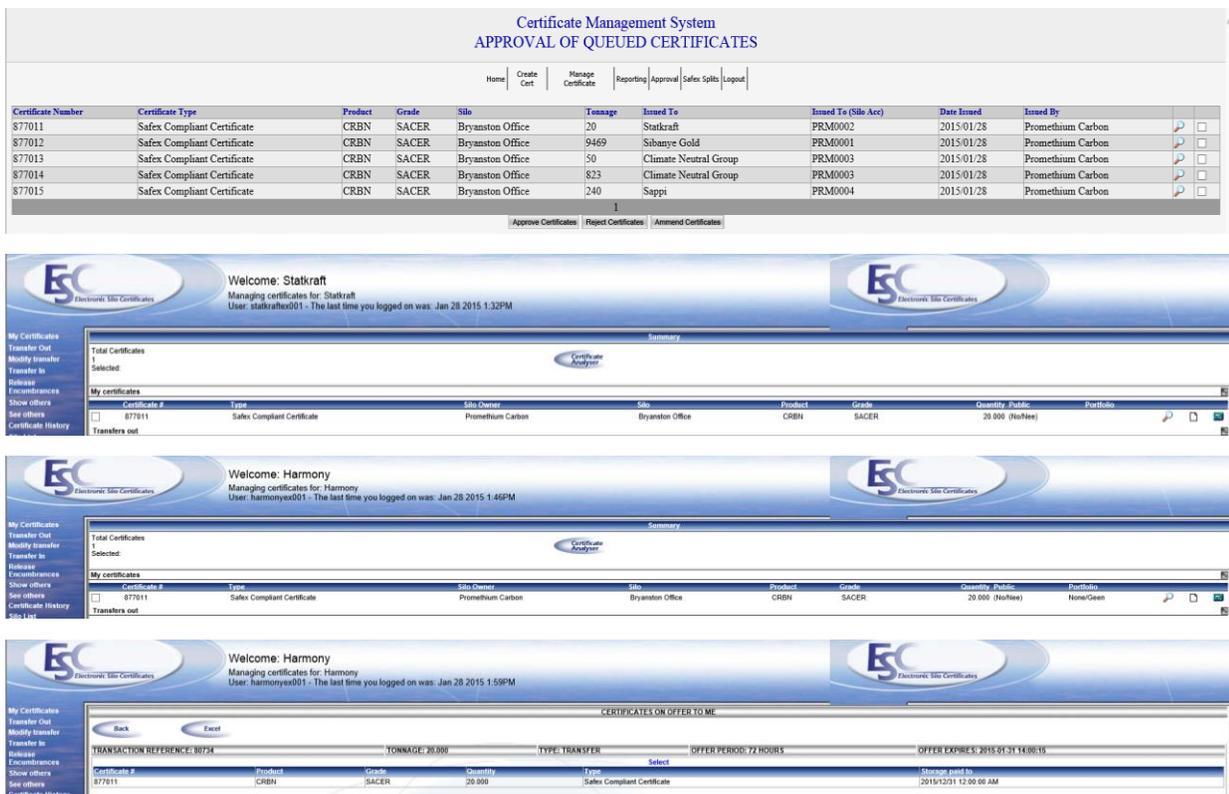


FIGURE 23: EXAMPLES OF SCREEN SHOTS FROM TEST ENVIRONMENT

1.6.6 CONCLUSION OF THE PILOT TRADE

The following outcomes have been achieved by carrying out the demonstration of market readiness:

- 1) Full commoditisation of carbon offsets is possible, irrespective of the international standard on which it was registered or the nature of the project in which it was created. This demonstration of market readiness has shown that credits, from both the CDM and the VCS, ranging from community based to industrial projects can be commoditised and traded on a single platform;
- 2) South Africa's private sector commodities registry, Silocerts, can successfully host carbon offset credits as a new commodity;
- 3) The JSE can successfully trade carbon offset credits as a new commodity under the condition that, the regulatory environment of the compliance criteria is in place;

The South African market participants, buyers and sellers, are eager to participate in the market.

2. NORTH AMERICA

North America has implemented various emission reduction initiatives, and the following sections outline some key examples that can be viewed in relation to the proposed South African carbon offset system.

2.1 CALIFORNIA'S EMISSION REDUCTION INITIATIVES

The State of California is arguably at the forefront of carbon emission reduction policies and initiatives within the United States (US). Carbon offsets schemes run under two sets of legislation in California: the California Environmental Quality Act (CEQA) and the California Global Warming Solutions Act (also known as AB32).

2.1.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA calls for the states and the US Environmental Protection Agency to solve multiple air pollution problems through programmes based on the latest science and technology information. California has a greenhouse gas emission reductions scheme under CEQA that requires public works projects, industrial facilities, etc. to produce an Environmental Impact Report before they can be permitted under the CEQA. In terms of this report, the following steps need to be taken:

- Assessment of the project's greenhouse gas emissions
- Assessing the effect of climate change on the project and the project's impacts
- Determine if the project's impacts are significant
- Evaluate alternatives
- Adopt feasible mitigation measures
- Offset greenhouse gas emissions that cannot be mitigated

The requirements on offsets are summarised as: *"...offsite mitigation and offsets should be pursued only after all feasible onsite actions have been undertaken to maximally avoid and reduce the project's greenhouse gas emissions. Furthermore, any offsite mitigation should give the highest priority to offsets within California in order to contribute to state-wide greenhouse gas emissions reductions and to help ensure that the offsets comply with California environmental laws and emissions standards."*³⁶

2.1.2 THE CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

AB 32 was the first programme in the US to take a comprehensive, long-term approach to addressing climate change and realising a sustainable, low-carbon future. The Act mandates a sharp reduction of greenhouse gas emissions with the aim of limiting these to 1990 levels, by the year 2020. California set the stage for its transition to a sustainable, low-carbon future. The Act aims to balance the dual requirements of improving the environment and natural resources while maintaining and encouraging a robust economy, and it does so through a number of mechanisms. The cap-and-trade programme is one of the larger programmes under the Act and prioritised for discussion under this summary.

³⁶ Center for Biological Diversity, The California Environmental Quality Act, On the Front Lines of California's Fight Against Global Warming September 2007.

CALIFORNIA'S CAP-AND-TRADE SCHEME

California's greenhouse gas cap-and-trade scheme was promulgated through the California Global Warming Solutions Act of 2006 and came into effect in 2012. The scheme is a market-based mechanism that aims to reduce or limit greenhouse gas emissions to 1990 levels by the year 2020, as per AB32's mandate. The cap and trade's ultimate goal is to achieve an 80% reduction from 1990 levels by 2050. The mechanism to achieve this goal is an overall limit/cap on greenhouse gas emissions from applicable sectors. The eligible emitting organisations (owners or operators of facilities located in California) can trade permits (allowances) to emit greenhouse gases.

The following figure presents California's greenhouse gas emission cap compared to business-as-usual projections (MMtCO₂e)³⁷.

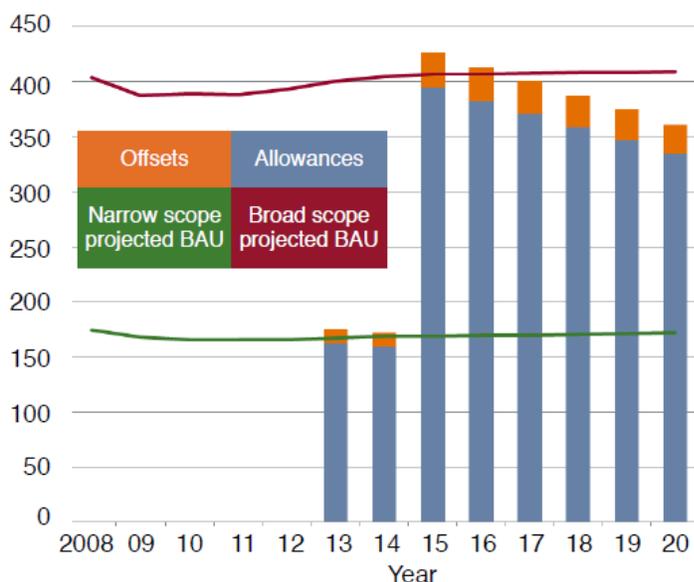


FIGURE 24: CALIFORNIA'S GREENHOUSE GAS EMISSION CAP COMPARED TO BUSINESS-AS-USUAL PROJECTIONS (MMTCO₂E)

To date the scheme covers approximately 450 entities which include electricity generators and large industrial facilities that emit more than 25,000 tonnes of CO₂e per year. Based on the amount of emissions covered, California's programme is, therefore, second in size only to the EU ETS³⁸. As of 2014, the scheme has been linked to the Québec programme that allows the trading of credits and allowances across the jurisdictions.

The scope of the programme was expanded in early 2015 to include transport fuels and natural gas suppliers, effectively doubling the market and increasing revenues. Recent forecasts predict that by

³⁷ Source: Californiacarbon.info. 2014. State of the California Cap-and-Trade Market 2013-14.

³⁸ <http://www.c2es.org/us-states-regions/key-legislation/california-cap-trade>

mid-2016 the programme could bring in \$3.3 billion - \$7.7 billion, with the most likely scenario generating \$3.7 billion for the state³⁹.

Covered entities (i.e. operators) comply with the programme by surrendering the equivalent of one emissions allowance per each metric tonne of CO₂e that the organisation emits. The California Air Resources Board (CARB) allocates the majority of the allowances for free during the initial years of the program, with a decreasing sliding scale over time. In 2014, over 54.3 million allowances were allocated to 156 entities. Refineries were the major beneficiaries with over 52% of these allowances while operators in the oil, gas exploration and cement manufacturing sectors also benefited⁴⁰.

2.1.3 INSTITUTIONAL ARRANGEMENTS

Institutional arrangements are the policies, systems, and processes that organisations use to legislate, plan and manage their activities efficiently and to effectively coordinate with others to fulfil their mandate. The following sections outline the institutional arrangements with regards to the CEQA and AB32.

2.1.3.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA mandates actions that all state and local agencies must take to advance environmental policies. The California Resources Agency promulgates the CEQA Guidelines, which detail the protocol by which state and local agencies comply with CEQA requirements. CEQA's jurisdiction includes virtually all projects within California, including those undertaken by private businesses and individuals, specifically when a government permit or another entitlement for use is necessary.

AB 32's CAP-AND-TRADE SCHEME

The Californian cap-and-trade programme was fully designed by and continues to be run by the state. The CARB is the state entity responsible for monitoring and regulating sources of emissions of greenhouse gas that cause global warming to reduce said emissions in the state. The CARB is, therefore, responsible for the review and approval of projects, the issuance of credits and the oversight and enforcement of the cap-and-trade programme.

The following compliance instruments may be used to meet compliance obligations under the scheme:

- California Greenhouse Gas Emissions Allowances issued by a programme approved by CARB;
- Offset credits issued by a programme approved by CARB;
- CARB early action offset credits; and
- Sector-based offset credits.

Each unit of the compliance instruments represents a limited authorization to emit up to one metric tonne in CO₂e of any of the specified greenhouse gases covered under the programme (see below). Only a registered entity or entity registered with an approved external programme can hold a compliance instrument.

³⁹ <http://californiacarbon.info/2015/05/27/revised-state-budget-increases-investment-cap-trade-revenues/>

⁴⁰ Californiacarbon.info. 2014. State of the California Cap-and-Trade Market, 2013-14. P. 24

Emissions allowances and credits are tracked and overseen by the CARB through the registration and housing of project and company information in the Compliance Instrument Tracking System Service (CITSS).

6.1.1.1 SCOPE: APPLICABLE ENTITIES AND GASES

Eligible emitting entities (operators) in the jurisdiction of the Californian state fall under the following scopes: electric utilities (not generators), industrial facilities and natural gas distributors. Section 95811 of the “Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms to Allow for the Use of Compliance Instruments Issues by Linked Jurisdictions” provides a definitive list of the entities that are mandated to report their emissions and the various conditions and requirements to do so. All covered entities must register with the CARB.

The scheme also allows for the voluntary participation of various entities. Opt-in entities are those operators covered under the applicable sectors that do not exceed the inclusion thresholds. The opt-in covered entity is subject to all reporting, verification, enforcement and compliance obligations that apply to covered entities. Voluntarily associated entities refer to those entities that have a primary residence in the United States but are not identified as covered entities or opt-in covered entities that intend to hold California compliance instruments. An example would be an entity operating an offset project or early action offset project that is registered with the CARB.

The gases covered include the six Kyoto Protocol gases (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆) as well as NF₃ and other fluorinated greenhouse gases⁴¹.

Thresholds are specified under section 95812 of the cap-and-trade regulations. For most industrial sectors, the mandatory reporting regulation specifies a reporting threshold of 25 000 metric tonnes of CO₂e. There are also reporting thresholds by fuel type. Similarly, reporting is required if the facility can generate more than 1 MW of electricity and emits at least 2 500 metric tonnes of CO₂ from generating activities. Electricity retail providers and marketers are also required to report.

In addition to the cap-and-trade regulations, the federal regulations also require mandatory reporting of greenhouse gases by owners and operators of facilities located in the United States. Eligible entities are required to develop Monitoring Plans as per the methodologies outlined in the federal regulations. All emissions reductions are subject to verification by independent third parties.

Entities covered under the cap-and-trade scheme must report emissions and required data on an annual basis. Emissions reporting must be verified by an independent third-party, accredited by the CARB.

6.1.1.2 THE CAP

The cap or emission targets are prescribed by the “Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms to Allow for the Use of Compliance Instruments Issues by Linked Jurisdictions”. The 2013 cap was set at approximately 2% below the emissions level forecast for 2012 and was set to decline a further 2% in 2014. Additional reductions of 3 %, year on year, have been set for the years between 2015 and 2020⁴².

⁴¹ As per section 95810 of the Regulations.

⁴² 162.8 MMT in 2013 (electricity and industry); 394.5 MMT in 2015 (includes all covered sectors) and 334.2 MMT in 2020 (15% reduction between 2015 and 2020)

By setting a state-wide cap instead of the company or sector-specific levels, the programme provides a measure of flexibility for regulated entities that have the freedom to choose how they will comply. Companies can purchase additional allowances beyond those they receive for free or invest in emissions reduction projects that leave them with extra allowances that can be sold to other businesses.

6.1.1.3 THE TRADING: ALLOWANCES, AUCTIONS AND OFFSETS

The total reductions or limits are translated into tradable emission allowances that are then auctioned or allocated (for free) to regulated emitting organisations on a regular basis. The California Carbon Allowances, therefore, represent the right to emit or discharge a specific volume of greenhouse gases during the specified period. Capped entities must register with CARB to participate in the allowance trading market.

The Californian scheme is linked with Québec's programme, meaning that offsets and allowances can be traded across these jurisdictions.

6.1.1.4 ALLOWANCES

Allowances are distributed through three methods: direct distribution to covered entities as industrial assistance⁴³, direct allocation to electrical distribution utilities, and quarterly auction of allowances.

The state makes free allocations available to the various eligible entities. Free allocations vary per sector (i.e. electric utilities, industrial facilities and natural gas distributors) but are typically initially provided for 90% of a business' emissions, based on benchmarks that reward efficient facilities. Every year, the total number of available allowances (either allocated or auctioned) decreases, driving emissions down over time.

With regards to large industrial facilities, the distribution of allowances is typically updated annually, according to the production at each facility. CARB provides free allowances to electrical distribution utilities to protect electricity ratepayers from price spikes in their electricity bills. The state does require however that the value of these allowances must be used to benefit ratepayers and achieve greenhouse gas emissions reductions. Transport fuels distributors do not qualify for free allowances under the industrial assistance program.

Organisations that need to increase their volume of emissions must buy allowances at auction or via trade from those who have reduced their emissions below the amount of allowances held.

6.1.1.5 AUCTIONS

Auctions occur on a quarterly basis, administered and overseen by CARB. Eligible allowances are those that have been neither allocated for free nor consigned by regulated utilities. The auctions use a single-round, sealed-bid, uniform-price format. Confidential bids are submitted by participants for specific amounts of allowances at specific prices (also known as a bid schedule). The CARB sets the minimum bidding price for allowances. The highest bidder wins the requested quantity of allowances, then the second highest bidder, and so on until there are no more allowances.

⁴³ Allowance allocations are made under the Industrial Assistance Programme to prevent leakage and assist in transitioning to a low emissions economy.

The minimum price per allowance (each representing one metric tonne of carbon dioxide) in 2012 was \$10 and is estimated to be rising 5% annually over inflation. Since these prices are not subject to market forces, the CARB places certain percentages of allowances, at different pricing tiers, in a strategic reserve (rising 5% annually over inflation). This removal process allows the CARB to constrain compliance costs while also reducing the risks of oversupply and negative impacts on prices. As of 2014, 40.611 million allowances had been placed in reserve⁴⁴.

The state is required to invest cap-and-trade revenue into local projects, specifically those in economically disadvantaged communities that tend to suffer disproportionately from air pollution.

Companies can 'bank' excess allowances for use in another period – however various limits apply. 'Borrowing' from future years is not permitted.

6.1.1.6 OFFSET CREDITS

Offset project emission reductions are eligible from sectors outside of the cap-and-trade scope. Furthermore, offset credits must be approved by the CARB before they are eligible for use in the Californian programme. There is a quantitative usage limit however on the use of offsets. Organisations can therefore only use offset allowances or credits equating to a maximum of 8% of their *total* compliance obligation as opposed to 8% of the reduction amount required by the business. Therefore, offsets could account for more than 8% of the scheme's total reductions.

There are three types of eligible offset credits: 1.) those issued by a programme approved by CARB; 2.) early action offset credits; and 3.) Sector-based offset credits. The eligible offset credits must originate from projects that fall under the following categories, within the US boundaries:

- US Forest and Urban Forest Project Resources;
- Livestock Projects;
- Ozone Depleting Substances Projects;
- Urban Forest Projects

All eligible credits must be independently verified by CARB accredited entities. Once successfully verified, offset credits can be registered, issued and subsequently auctioned. The CARB oversees the tracking of credits in the CITSS and conducts desk reviews before officially issuing CARB offset credits to participating offset projects.

The CARB⁴⁵ also allows for the use of offset credits from voluntary reductions under the cap-and-trade scheme. Known as early action offset credits, these credits must not have been retired or used to meet other obligations. Only credits that are registered and verified under the Climate Action Reserve (CAR) and Verified Carbon Standard (VCS) are eligible for early action offset credits under the Californian cap-and-trade scheme. Verified credits must, however, be transferred to the CARB, which is ultimately responsible for their approval based on compliance with the relevant CARB Offset Protocols.

Sector-based offset credits are an additional category of credits allowed under the Californian cap-and-trade scheme. Currently, sector-based credits may only be generated from Reducing Emissions from Deforestation and Forest Degradation Plans. Sector-based offset credits can only account for a maximum of 25% of the quantitative usage limit on compliance instruments in the first compliance

⁴⁴ Californiacarbon.info. 2014. State of the California Cap-and-Trade-Market, 2013-14. P. 25

⁴⁵ As per Section 95990 of the Regulations.

and second compliance period, and a maximum of 50% of the quantitative usage limit on compliance instruments in subsequent compliance periods.

Offset credits can be owned by the registered Offset Project Operator, Authorized Project Designee or another third party as requested by the Offset Project Operator. These entities are entitled to sell, trade or transfer the CARB offset credits.

6.1.1.7 ISSUANCE OF CREDITS

To date, the American Carbon Registry and Climate Action Reserve are the only two approved registries that handle the issuance of registry credits. At the time of issuance, the registries create unique serial numbers for each registry offset credit and transfer the CARB offset credits to the designated holding account.

6.1.1.8 COMPLIANCE AND ENFORCEMENT

Entities covered under the cap-and-trade scheme have a compliance obligation for every metric tonne of CO₂e emitted from their associated activities. Compliance obligations vary depending on the source e.g. fuel combustion, process emissions, etc. Eligible entities are those organisations whose annual emissions are equal to or exceed 25 000 metric tons CO₂e during the applicable compliance periods.

The Regulations provide timelines for three compliance periods:

- First compliance period: January 1, 2013 - December 31, 2014
- Second compliance period: January 1, 2015- December 31, 2017
- Third compliance period: January 1, 2018 - December 31, 2020

At the end of every compliance period, emitters under the Californian scheme are required to surrender enough allowances to cover their actual emissions during the period. Emitters also have annual obligations and must provide allowances and/or offsets for 30% of their previous year's emissions.

If the compliance deadline is missed or there is a shortfall, four allowances must be provided for every tonne of emissions that was not covered in time. The programme includes mechanisms to prevent market manipulation, and the CARB has a market monitoring group that coordinates with state and federal agencies on market oversight.

The compliance obligation for covered entities remains in place until greenhouse gas emissions fall to less than 25 000 metric tons of CO₂e per year during one full compliance period, or if the entity shuts down.

2.1.4 ESTABLISHMENT PROCESS

California has established a number of frameworks and policies to drive emission reductions in the state. The following sections briefly describe the establishment processes with regards to the CEQA and the cap-and-trade scheme under AB32.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Congress established much of the basic structure of the Clean Air Act in 1970 and made major revisions in 1977 and 1990. The drive behind the development of the Act related to the visible and

tangible risks of air pollution (such as “killer fogs”⁴⁶) which became evident around the middle of the 20th century.

Several state laws were passed in the US, including the Clean Air Act of 1963, but there was little comprehensive federal response until the Clean Air Act was passed in 1970. This Act is a federal law covering the entire country, where states and local governments are mandated to meet the Act’s requirements.

AB 32’s CAP-AND-TRADE SCHEME

The Californian cap-and-trade scheme was preceded by the Northeast Regional Greenhouse Gas Initiative (RGGI) and the EU-ETS, from which the state drew on lessons learnt to create its domestic program.

The Californian scheme was authorized by the California Global Warming Solutions Act of 2006, also known as Assembly Bill 32 (AB32), which was passed by the Legislature and signed into law by the then governor of California, Arnold Schwarzenegger. The Act aims to reduce greenhouse gas emissions to 1990 levels by 2020 and mandates the CARB with the responsibility of managing the process.

The CARB subsequently developed a Scoping Plan to this effect, which resulted in the development of relevant regulations and ultimately the cap-and-trade programme – the main market mechanism to facilitate the required emission reductions. The Scoping Plan is revised regular in five-year intervals, ensuring that it remains current and practicable.

Expert advisory groups such as the Emissions Market Assessment Committee and the Economic and Allocation Advisory Committee also assisted in the development of the regulations. The CARB subsequently adopted the regulations in 2011, which were amended following a variety of minor adjustments, and finally adopted the following year in 2012.

The cap-and-trade programme was not implemented in a vacuum, however, and it is argued that its success lies in part with complimentary policies, regulations and programmes that arose from AB32. Of note are the Low-carbon Fuel Standard and the Renewable Portfolio Standard.

The Low-carbon Fuel Standard is the combination of command-and-control regulation and an emissions trading mechanism. It mandates declining emission caps in the transport sector over time while allowing covered entities to purchase offset credits from other parties that introduce low-carbon solutions into the transportation industry. The Renewable Portfolio Standard further mandates the increasing proportion of renewable energy in California’s total energy mix, further stimulating the sector in this regard.

The cap-and-trade scheme was implemented in a staggered approach. The first phase applied to large electric power plants and industrial facilities which covered approximately 35% of California’s total greenhouse gas emissions⁴⁷. The first auction under the cap-and-trade scheme took place in November 2012, and the compliance obligations followed in January 2013. The sector scope was extended in

⁴⁶ <http://www2.epa.gov/sites/production/files/2015-08/documents/peg.pdf>

⁴⁷ Approximately 160 MMT

2015 to include fuel distributors and which covers approximately 85% of California’s total greenhouse gas emissions⁴⁸.

Figure 4 below describes milestones regarding the establishment, implementation and future goals of the cap-and-trade scheme.

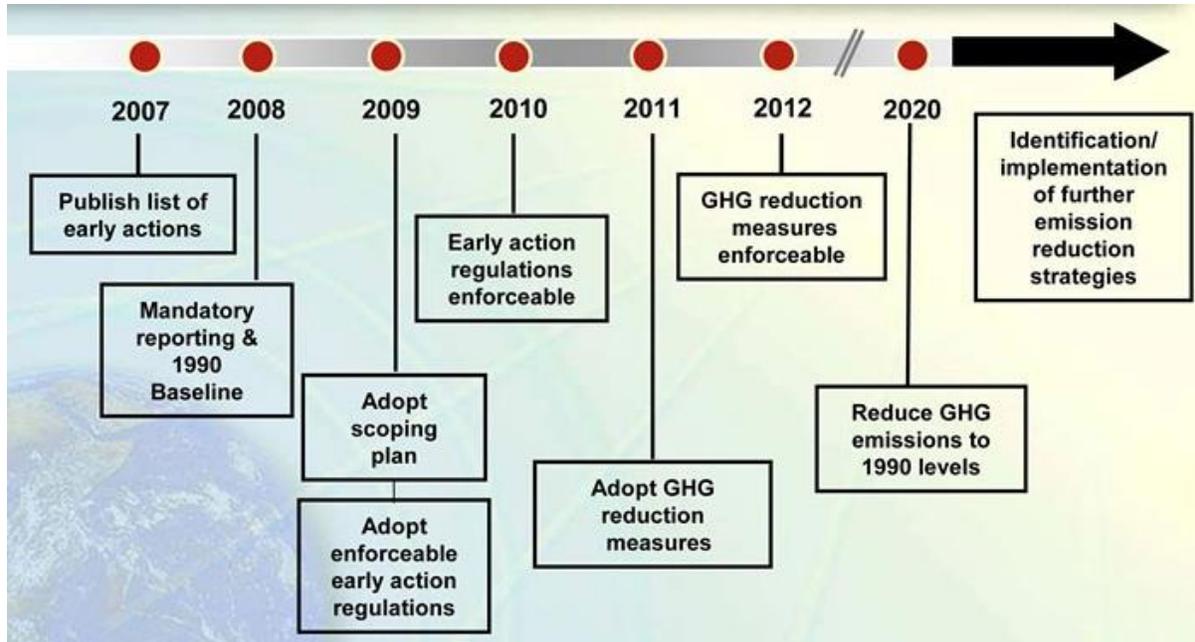


FIGURE 25: CALIFORNIA GLOBAL WARMING SOLUTIONS ACT IMPLEMENTATION TIMELINE

The Californian scheme is administrated by the Air Resources Board, which has the mandate to do the following:

- *Prepare and approve a Scoping Plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions from sources or categories of sources of GHGs by 2020, and update the Scoping Plan every five years.*
- *Maintain and continue reductions in emissions of GHG beyond 2020.*
- *Identify the state-wide level of GHG emissions in 1990 to serve as the emissions limit to be achieved by 2020.*
- *Identify and adopt regulations for discrete early actions that could be enforceable on or before January 1, 2010.*
- *Adopt a regulation that establishes a system of market-based declining annual aggregate emission limits for sources or categories of sources that emit GHG emissions.*
- *Convene an Environmental Justice Advisory Committee to advise the Board in developing and updating the Scoping Plan and any other pertinent matter in implementing AB 32.*
- *Appoint an Economic and Technology Advancement Advisory Committee to provide recommendations for technologies, research and GHG emission reduction measures.*

⁴⁸ Approximately 395 MMT

The ARB is supported by the Climate Action Team (CAT), which is charged with helping direct state efforts on the reduction of GHG emissions and engaging state agencies. The CAT consists of the following:

- California Environmental Protection Agency
- Governor's Office of Planning and Research
- California Air Resources Board
- Business, Consumer Services, and Housing Agency
- Government Operations Agency
- California Natural Resources Agency
- California Department of Public Health
- Office of Emergency Services
- California Transportation Agency
- California Energy Commission
- California Public Utilities Commission
- California Department of Food and Agriculture
- Department of Forestry and Fire Protection
- Department of Fish and Wildlife
- Department of Transportation
- Department of Water Resources
- Department of Resources Recycling and Recovery
- State Water Resources Control Board

6.1.1.9 LEGAL CHALLENGES

Various lawsuits have been lodged against the State of California challenging the legality of the cap-and-trade program.

The Association of Irrigated Residents brought a legal application against CARB, claiming cap and trade was not fully justified as a policy decision relative to a carbon tax or direct emission limits. In 2012, the court found in CARB's favour and dismissed the application⁴⁹.

Another example of civil action against the programme occurred following the first auction in November 2012 where the California Chamber of Commerce filed a lawsuit alleging that AB 32 did not give CARB the authority to raise revenue from allowance auctions and that all allowances must, therefore, be freely allocated. In an additional lawsuit, the California Chamber of Commerce argued that the auctioning off allowances constitute an unauthorized, unconstitutional tax. Both lawsuits were dismissed in late 2013.

2.1.5 IT SYSTEM AND REGISTRY

Sophisticated electronic systems and registries are required to record, monitor and oversee the various emission reduction initiatives in the state of California. The following sections outline some of the major IT systems and registries in this regard.

⁴⁹ <https://elr.info/litigation/42/20127/association-irritated-residents-v-california-air-resources-board>

IT SYSTEMS

6.1.1.10 AB 32's CAP-AND-TRADE SCHEME

All qualifying entities must register with the CARB's tracking system known as the Compliance Instrument Tracking Service (CITSS). Qualifying organisations include covered entities, opt-in covered entities and voluntarily associated entities and other registered participants.

6.1.1.11 COMPLIANCE INSTRUMENT TRACKING SYSTEM SERVICE

The CITSS is a market tracking system that supports the implementation of greenhouse gas cap-and-trade programs for California. The CITSS is a registry that provides accounts for market participants to hold and retire compliance instruments and to participate in transactions of compliance instruments with other account holders.

The CITSS is used to:

- Register entities participating in the California Cap-and-Trade Program;
- Track the ownership of compliance instruments⁵⁰;
- Enable and record compliance instrument transfers;
- Facilitate emissions compliance; and
- Support market oversight.

The CARB Regulations stipulate that all qualifying entities can only apply for one registration on the tracking system. Furthermore, any entity wishing to hold a compliance instrument can only do so once the Executive Officer approves the entity's registration with the CARB and the relevant account in the tracking system.

The Final Regulation Order for California's cap-and-trade programme stipulates that the following information must be reported to the accounts administrator as part of a transfer request before any transfer of allowances can be recorded on the tracking system:

- a) Holding account number and authorized account representative of seller;
- b) Holding account number and authorized account representative of purchaser;
- c) Serial number of the compliance instruments;
- d) Date of the transaction agreement;
- e) Settlement date, if not the same as date of transaction agreement;
- f) The price of the compliance instruments in U.S. dollars. If California links to Canadian provinces, the price of the compliance instrument may be reported in Canadian dollars; and

Holding account number and authorized representative of an entity for whom the compliance instrument is to be held in benefit.

The tracking of compliance instruments is particularly relevant under the scope of this report, and further details are provided in the following section.

⁵⁰ Specifically California Greenhouse Gas Emissions Allowances issued by a programme approved by CARB; offset credits issued by a program approved by CARB; CARB early action offset credits; and sector-based offset credits.

6.1.1.12 HOLDING, DECLARING AND SURRENDERING COMPLIANCE INSTRUMENTS

To obtain compliance instrument accounts in CITSS, an individual must first register on the system. Following approval, the user may then apply for compliance instrument accounts for themselves or on behalf of an entity that has authorized them to do so.

There are two broad account categories under the CITSS: entity accounts and jurisdiction accounts. There are four types of entity accounts:

- General (Holding) Account: applicable to all entities except exchange clearing service providers. All exchanges occur between these accounts
- Compliance Account: limited to covered and opt-in entities. Used for surrendering allowances and meeting compliance obligations. Allowances cannot be transferred out
- Limited Use Holding Account: limited to electrical distribution utilities; allowances can only be consigned to auction account
- Exchange Clearing Holding Account: limited to exchange clearing service providers

No entity can hold all four accounts simultaneously.

Jurisdiction accounts are maintained by the CARB and are used to administer CITSS. There are three types of jurisdiction accounts:

- Allocation Account: CARB distributes allowances to entities from this account
- Auction Account: holds allowances related to auctions but also used for surrendering allowances and meeting obligations. Following an auction, winning bidders receive allowances from this account. Allowances cannot be transferred out
- Retirement Account: allowances transferred to this account do not meet any obligations

The figure below describes the flow of compliance instruments⁵¹:

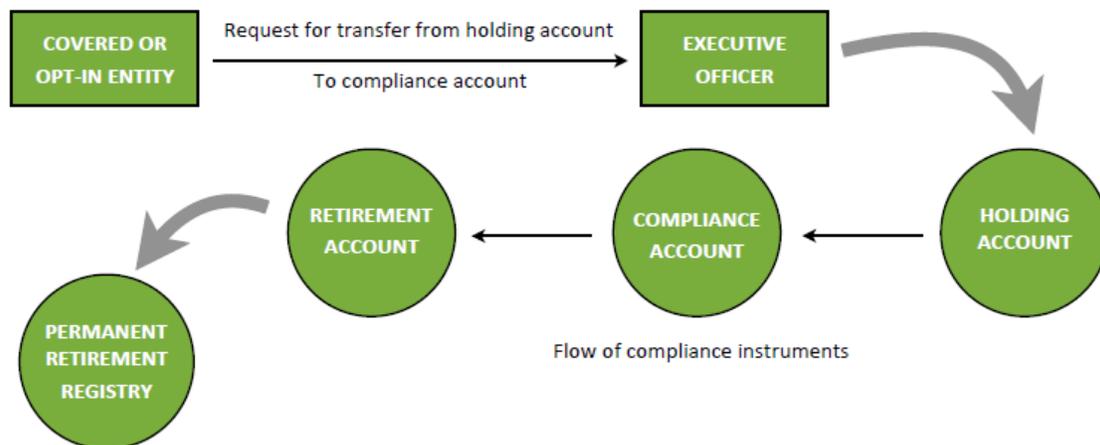


FIGURE 26: RETIREMENT OF COMPLIANCE INSTRUMENTS

The retirement of instruments must be undertaken on a First-in, first-out basis.

6.1.1.13 CAL E-GGRT REPORTING SYSTEM

The California Global Warming Solutions Act also encompasses the Mandatory Reporting Regulation, which applies to industrial facilities, fuel suppliers, and electricity importers. The emissions data reports must comply with the various regulatory requirements and must be submitted via the electronic Cal e-GGRT reporting system that is administered by the CARB. The Act defines the

⁵¹ Californiacarbon.info. 2014. State of the California Cap-and-Trade Market, 2013-14. P. 28

applicable entities (see Tables A-3 and A-4) which are also subject to the cap-and-trade emissions threshold, i.e. entities are only required to report if they emit 25,000 metric tons CO₂e or more per year in combined emissions.

REGISTRIES

The registries in the state of California are web-based applications that record the details of projects and operators relating to CO₂ allowances and offset units, including the movement of these allowances and units between accounts (e.g. allocations, transfers, surrender and cancellations).

6.1.1.14 THE CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006



While the California Global Warming Solutions Act does not restrict the use of specific registries, the American Carbon Registry and the Climate Action Reserve are the only approved registries thus far for early action offset credits (both for compliance and voluntary markets).

- **American Carbon Registry:** The American Carbon Registry is a non-profit US carbon market registry that was founded by Environmental Defence Fund and Environmental Resources Trust in 1997 and is now an enterprise of Winrock International. The American Carbon Registry provides the following:

- An electronic registry system designed to serialize and transparently track offset credits from projects around the globe.
- Publishes standards, methodologies, protocols and tools for greenhouse gas accounting, which are all based on International Standards Organization (ISO) 14064.
- The American Carbon Registry only registers project-based carbon offset tons that are real, additional, permanent and verifiable and comply with American Carbon Registry Standards. These standards outline requirements for registration of project-based carbon offsets.
- The American Carbon Registry allows project developers to use methodologies and tools for greenhouse gas measurement from the Clean Development Mechanism (CDM), EPA Climate Leaders and Verified Carbon Standard to the extent that they comply with the Registry's published standards.
- The American Carbon Registry has published a Forest Carbon Project Standard, which includes requirements for afforestation, reforestation, improved forest management and reduced emissions from deforestation and degradation projects.
- All projects must be third-party verified by an accredited American Carbon Registry verifier or by an accredited verifier from the standards listed above.

- **Climate Action Reserve:** The Climate Action Reserve was developed by the California Climate Action Registry, a state-developed voluntary greenhouse gas registry designed to track and report institutional greenhouse gas emissions. The Climate Action Reserve registers and tracks carbon offset projects throughout the US. Projects that are registered in the Climate Action Reserve have been third-party verified against the Climate Action Reserve project protocols. These protocols call for projects that produce additional, real and permanent emission reductions. Climate Action Reserve projects include livestock methane management, forestry and landfill gas collection, and reduction.



6.1.1.15 CALIFORNIA ENVIRONMENTAL QUALITY ACT

Offset programmes can be traded on the following registries⁵²:

- **California Air Pollution Control Officers Association** – the association set up a registry system, the Greenhouse Gas Reduction Exchange in 2013. This registry is for California greenhouse gas reduction projects only.
- **Climate Action Reserve** - created by the State of California in 2001 to address climate change through voluntary calculation and public reporting of emissions.
- **American Carbon Registry** - founded in 1996. The registry has over 150 projects currently listed, mostly in the US, but some in Brazil and Mexico. They have a wider range of protocols available than the California Air Pollution Control Officers Association.
- **Western Climate Initiative** - is a collaboration of jurisdictions working together to identify, evaluate, and implement emission-trading programs to mitigate the impacts of climate change at a sub-national level. Current members are British Columbia, California and Quebec. The Western Climate Initiative manages the Compliance Instrument Tracking Service System, administers allowance auctions, conducts independent market monitoring of allowance auctions, and certifies allowance and offset certificate trade transactions.
- **Gold Standard** - The Gold Standard is a primarily international market for greenhouse gas offsets.

6.1.1.16 REGIONAL GREENHOUSE GAS INITIATIVE

Under Regional Greenhouse Gas Initiative Model Rules 12/31/08 (XX-7.2 Recordation) the Regulatory Agency of the RGGI (or its agent) records a CO₂ allowance transfer by moving each CO₂ allowance from the transferor account to the transferee account within 5 business days of receiving a CO₂ allowance transfer. The prerequisites for recordation are that the transfer is correctly submitted under established rules and that the transferor account includes each CO₂ allowance identified by serial number in the transfer.

Furthermore, under the point XX-7.3 of the said Model Rules the Regulatory Agency of the RGGI (or its agent) notifies each party to the transfer within five business days of recordation of a CO₂ allowance transfer.

2.2 CHICAGO CLIMATE EXCHANGE



The Chicago Climate Exchange was the world's first voluntary greenhouse gas trading system. It operated from October 2003 to February 2010. The system traded greenhouse gas emission allowances in a voluntary cap-and-trade scheme

in which companies committed to reducing their emissions by 6% by 2010. The scheme had an aggregate baseline of 680 million tonnes of CO₂e.

The Chicago Climate Exchange did not operate in any government policy context. Members joined voluntarily and committed to reducing their emissions in a legally binding agreement. The scheme had

⁵² Greenhouse Gas Mitigation and CEQA, A Review of Mitigation Strategies for Projects Subject to the California Environmental Quality Act, Santa Barbara County Air Pollution Control District, April 2015

more than 400 members that included companies (like Ford, DuPont and Motorola), US states and municipalities (such as Oakland and Chicago), and educational institutions (such as University of California, San Diego, Tufts University, Michigan State University and University of Minnesota).



The Chicago Climate Exchange was acquired by the Intercontinental Exchange (ICE) in 2010. The market was closed down shortly after the acquisition due to low trading volumes. After the market closed in 2010, the organisation launched the Chicago Climate Exchange Offsets Registry Programme. This programme platform to register verified emission reductions based on a certain approved protocols (methodologies).

2.2.1 INSTITUTIONAL ARRANGEMENTS

The Chicago Climate Exchange was operated by a public company Climate Exchange PLC, which also owned the European Climate Exchange.

The exchange currently operates the Chicago Climate Exchange Offsets Registry Programme, which consists of the following components:

1. **Trading Platform:** This was a marketplace for executing trades among Registry Account Holders.
2. **Clearing and Settlement Platform:** This section processed all transaction information and facilitated the clearing and settlement of the trades.
3. **Registry:** This was the official database for Carbon Financial Instruments owned by Registry Account Holders.

Members joined the Chicago Climate Exchange by signing a Participant Agreement. The main aspects covered by this agreement are:

- Access to the registry
 - Terms of access
 - Representations and warranties
 - User IDs and passwords
- Offset registration
- Registry transfers
- Fees
- Confidentiality

2.2.2 ORGANISATIONAL STRUCTURE

- The Chicago Climate Exchange administrative structure consisted of Senior Management and staff responsible for the day-to-day administration of the CCX and its operations;
- A 12-member Committee on Offsets comprised of members of the exchange responsible for reviewing and approving proposed offset projects.
- A Committee on Forestry comprised of members of the exchange responsible for the review of proposed forestry projects.
- A Regulatory Services Provider is responsible for auditing the baseline and annual emissions reports of members, monitoring trading activity and reviewing verifiers' reports for offset projects.

- Independent auditors called CCX Verifiers responsible for verifying a project’s annual greenhouse gas sequestration or destruction.
- Technical Advisory Committees comprised of external experts, established at the request of the Committee on Offsets or on an ad-hoc basis by CCX administrators to assist in the development of rules for each offset type.

2.2.3 PARTICIPATING IN THE CHICAGO CLIMATE EXCHANGE

The process to participate in the Chicago Climate Exchange includes the following steps:

- **Step 1: Eligibility**
- **Step 2: Verification**
- **Step 3: Registration**

The public access parts of the registry look as follows:

Chicago Climate Exchange Registry

[Please Login](#) PUBLIC REPORTS

CCX Offset Project Public Registry Homepage

[PRINT](#) [EXPORT CSV](#)

Project ID	CCX Member	Project Name	Project Type	State/Province	Country	View
1	Premium Standard Farms	WF1 and S5 Sites Methane Capture Project	Agricultural Methane Offset	TX	United States	View
21	Waste Management, Inc.	Jay County Landfill Gas Project	Landfill Methane Offset	IN	United States	View
41	Iowa Farm Bureau	Continuous Conservation Tillage and Grassland Conversion- Pool 1	Agricultural Soil Carbon Offset	IA	United States	View
81	Environmental Credit Corp	Haubenschild Dairy Methane Capture Project	Agricultural Methane Offset	MN	United States	View
82	Environmental Credit Corp	Vander Haak Methane Capture Project	Agricultural Methane Offset	WA	United States	View
83	Iowa Farm Bureau	Continuous Conservation Tillage and Grassland Conversion - Pool 2	Agricultural Soil Carbon Offset	KS , IA , NE , SD	United States	View
86	Environmental Credit Corp, Environmental Carbon Credit Pool LLC	Hilarides Dairy Methane Capture Project	Agricultural Methane Offset	CA	United States	View
107	Precious Woods Holding Ltd	Precious Woods Managed Forest Offset Project	Forestry Offset	Guanacaste	Costa Rica	View
126	Waste Management, Inc.	Tontitown Landfill Gas Project	Landfill Methane Offset	AR	United States	View
146	Environmental Carbon Credit Pool LLC, Environmental Credit Corp	Koetsier Dairy Methane Capture Project	Agricultural Methane Offset	CA	United States	View
147	Environmental Carbon Credit Pool LLC, Environmental Credit Corp	Patterson Farms Methane Capture Project	Agricultural Methane Offset	NY	United States	View
149	Waste Management, Inc.	Crossroads Landfill Gas Project	Landfill Methane Offset	ME	United States	View
150	Environmental Carbon Credit Pool LLC, Environmental	Pine Hurst Acres Swine Methane Capture Project	Agricultural Methane Offset	PA	United States	View

© 2011 Chicago Climate Exchange, Inc. CCX Registry v3.6.1

FIGURE 27: CCX REGISTRY PUBLIC ACCESS PLATFORM

Chicago Climate Exchange Registry

[Please Login](#) PUBLIC REPORTS

[Return to all Projects](#)

WF1 and S5 Sites Methane Capture Project

[PRINT](#) [EXPORT CSV](#)

Project ID	1
Assigned Name	Texas Agricultural Methane #001
Project Name	WF1 and S5 Sites Methane Capture Project
Project Type	Agricultural Methane Offset
Facility	WF-1, WF-1 & S-5
CCX Member	Premium Standard Farms
Project Owner	Premium Standard Farms
Project Description	Manure from hogs at Premium Standard Farms' WF1 and S5 Sites near Dalhart, Texas is treated by two anaerobic digester systems. Methane biogas is collected and combusted for process heat.
State/Province	TX
Country	United States
Validation	CCX Offset Committee Approval
Approval Date	12/02/2004
Methodology	CCX Rulebook Chapter 09 Offsets and Early Action Credits 08-01-2003
Project Verifier(s)	SES Inc.

Issuance Summary

Vintage	2003	2004	2005	2006	2007	2008	2009	2010	2011
Net Total Issued (mt) VIEW HISTORY	4,400	11,000	20,400	19,600	0	0	0	0	0

Project Documents

Title	Type	Date	Action
-------	------	------	--------

FIGURE 28: CCX OFFSET PROJECT PUBLIC ACCESS

3. EUROPEAN UNION

3.1 STRUCTURE OF THE EUROPEAN UNION EMISSION TRADING SCHEME

The EU Emissions Trading System (EU ETS) is a ‘cap and trade’ system⁵³. It caps the total volume of GHG emissions from installations and aircraft operators responsible for around 50% of EU GHG emissions. The system allows trading of emission allowances so that the total emissions of the installations and aircraft operators stay within the cap, and the least-cost measures can be taken up to reduce emissions (see Benefits of cap-and-trade). The EU ETS is a major tool of the European Union in its efforts to meet emissions reductions targets now and into the future. The trading approach helps to combat climate change in a cost-effective and economically efficient manner. As the first and largest emissions trading system for reducing GHG emissions, the EU ETS covers more than 11,000 power stations and industrial plants in 31 countries, and flights between airports in participating countries.

The system was first introduced in 2005 and has undergone several changes since then. The implementation of the system has been divided up into distinct trading periods over time, known as phases. The current phase of the EU ETS began in 2013 and will last until 2020.



FIGURE 29: TIMELINE OF THE EUROPEAN UNION EMISSION TRADING SCHEME (EU ETS)

The EU ETS places a ‘cap’ or limit set on the total greenhouse gas emissions allowed by all participants covered by the System, and this cap is converted into tradable emission allowances.

Tradable emission allowances are allocated to participants in the market; in the EU ETS this is done via a mixture of free allocation and auctions. One allowance gives the holder the right to emit one tonne of CO₂ (or its equivalent). Participants covered by the EU ETS must monitor and report their emissions each year and surrender enough emission allowances to cover their annual emissions.

Participants who are likely to emit more than their allocation have a choice between taking measures to reduce their emissions or buying additional allowances; either from the secondary market – e.g. companies who hold allowances they do not need – or from Member State held auctions.

It does not matter where (regarding physical location) emission reductions are made because emissions savings have the same environmental effect wherever they are made.

The rationale behind emissions trading is that it enables emission reductions to take place where the cost of the reduction is lowest, lessening the overall cost of tackling climate change.

The trading volumes in the EU ETS have constantly been growing since its inception. The graph below shows how the volumes have grown in the three major trading mechanisms – exchange-based trading, over-the-counter (OTC) trades and auctions:

⁵³ EU ETS Handbook, European Commission.

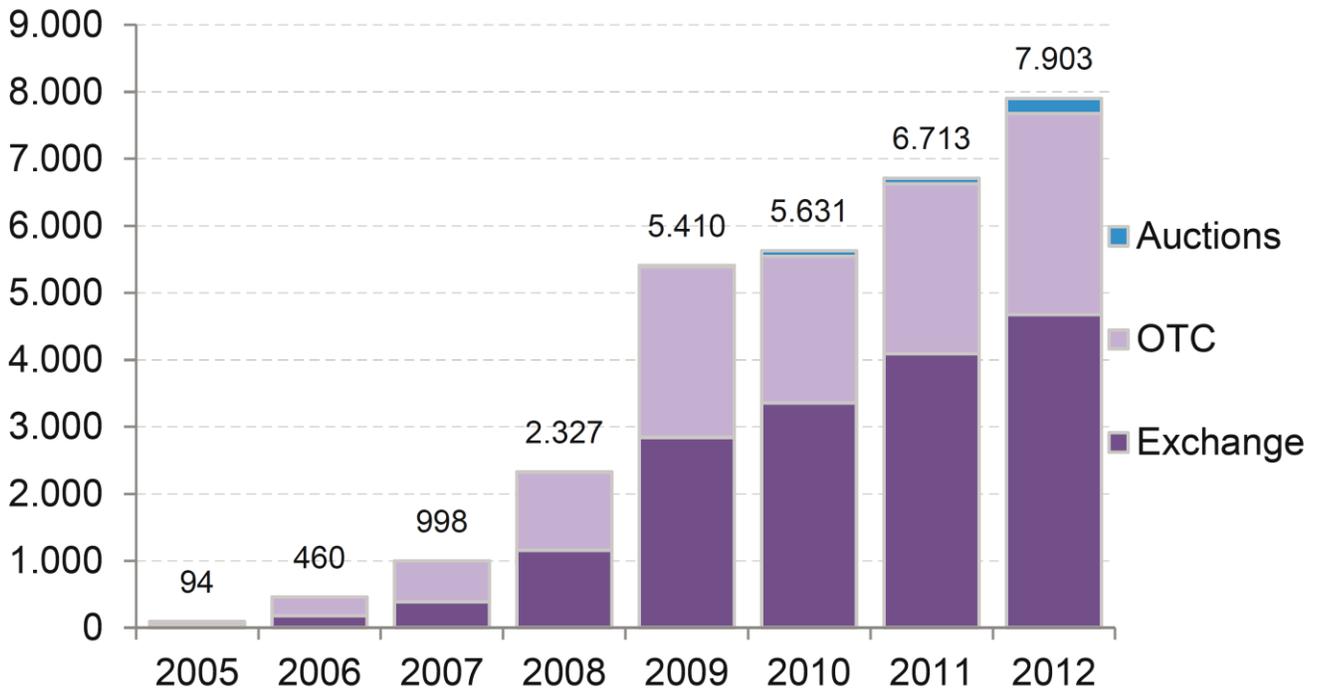


FIGURE 30: GROWTH OF CARBON ALLOWANCE TRADING VOLUMES IN THE EU ETS

3.2 IT SYSTEM AND REGISTRIES

Instead of only individual member states 15 member states joint IT efforts to cope with the structural changes in the EU ETS system.

The EU passed the Registries Regulation in 2004. All member states were bound by this regulation and had to run registries in their countries. Transfers between institutions in different EU countries were recorded in the Community Independent Transaction Log (CITL). The reform of the EU ETS in 2009 led to the formation of a single EU registry, the Union Registry⁵⁴. The regulations also require the formation of an independent transaction log, the European Union Transaction Log (EUTL). The regulations were updated in 2013⁵⁵.

The Union Registry is an online database that records the following:

- A list of installations covered by the ETS Directive in of each Member State;
- All free allocations to each of the installations for the period 2013-202;
- Accounts of companies or physical persons holding free allocation allowances;
- Transfers and transactions of allowances by the account holders;
- Annual verified CO2 emissions from installations;
- An annual reconciliation of allowances and verified emissions, where each company must have surrendered enough allowances to cover all its verified emissions.

⁵⁴ Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009

⁵⁵ Commission Regulation (EU) No 389/2013 of 2 May 2013

It can be seen from the list above that the Union Registry is very much structured to address all the requirements of the complex EU ETS. The points relevant to the SA system will relate to offsets rather than free allowances.

The operation of the Union registry is shown below:

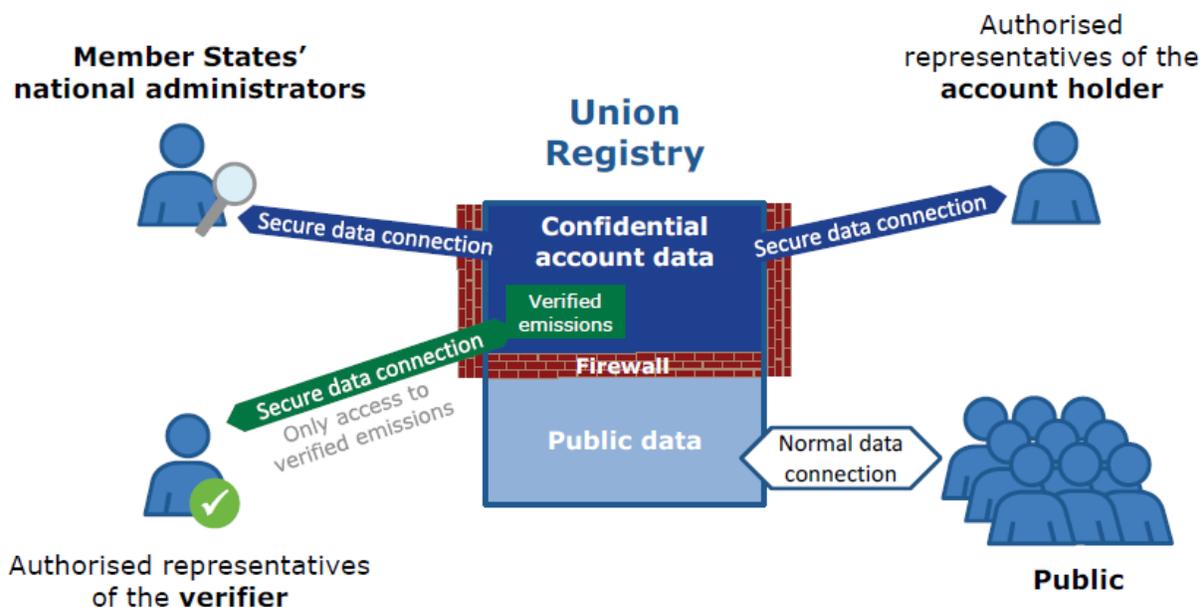


FIGURE 31: OPERATION OF THE UNION REGISTRY⁵⁶

The EUTL has the responsibility to record all information relating to the holdings and transfers of Kyoto units such as CER's that are used inside the EU ETS.

The Union Registry and EUTL has a central administrator with the following responsibilities:

- to provide, operate and maintain the Union Registry and the EUTL,
- to manage central accounts and
- Emissions Reduction Funding operations that are carried out centrally;

In addition to the central administrator, national administrators' main responsibilities are:

- to be the contact point with their respective account holders in the Union Registry; and
- Emissions Reduction Fund all operations involving direct contact with them, including the opening, suspension and closure of accounts.

The EUTL is required to perform automated checks on all processes in the registries system concerning allowances, verified emissions, accounts, annual emission allocation units, the credit entitlement and Kyoto units. Processes that fail these checks should be terminated to ensure that transactions in the Union Registry system comply with the requirements of the system.

The EUTL and its connection are shown below:

⁵⁶ EU ETS Handbook, European Union, http://ec.europa.eu/clima/publications/docs/ets_handbook_en.pdf

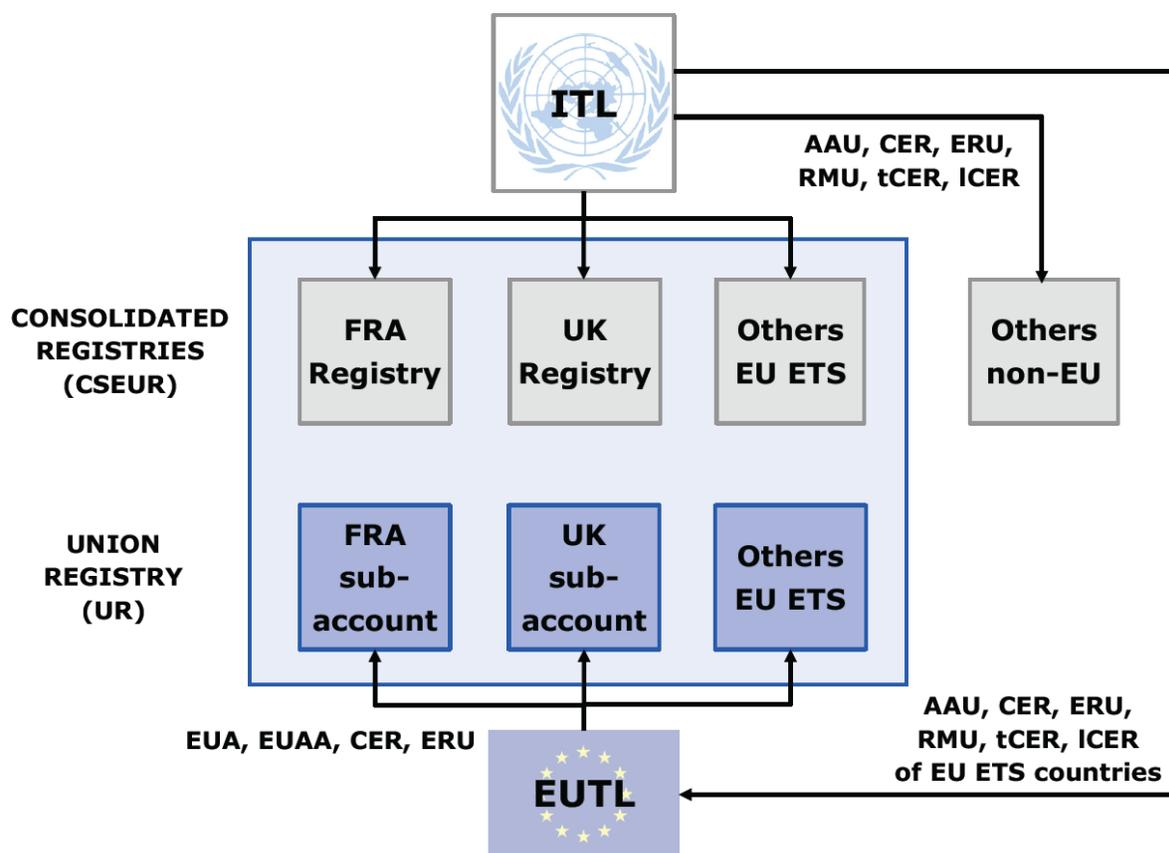


FIGURE 32: EUROPEAN UNION TRANSACTION LOG⁵⁷

The Union Registry makes provision for external trading platforms. Such platforms can be any multilateral exchange that brings together facilitates multiple third-party buying and selling interests to transfer the ownership of allowance listed in the registry. Two auction platforms are currently in place: the European Energy Exchange (EEX) in Leipzig and the ICE Futures Europe (ICE) in London.

The central administrator has an obligation to ensure that communication links are maintained between the Union Registry, the EUTL and the ITL.

The registries in the European Union are:

TABLE 16: CDM REGISTRIES IN THE EUROPEAN UNION AND OTHER COUNTRIES

Registry	Organization managing the registry	Public/private sector
CDM Registry		
Australia	Department of the Environment	
Austria	Umweltbundesamt GmbH	
Belarus		
Belgium	Federal Public Service of Public Health, Food Chain Safety and Environment, DG Environment, Climate Change Division	
Bulgaria	Environmental Executive Agency	
Canada		

⁵⁷ EU ETS Handbook, European Union, http://ec.europa.eu/clima/publications/docs/ets_handbook_en.pdf

Registry	Organization managing the registry	Public/private sector
Croatia	Croatia Environment Agency	
Czech Republic	O TE, a.s.	
Denmark	The Danish Business Authority	
Estonia	Keskkonnaministeerium	
European Community	European Commission	
Finland	Energy Authority	
France	Caisse des dépôts et consignations	
Germany	Federal Environment Agency	
Greece	Ministry of Environment Energy and Climate Change	
Hungary	Hungarian National Inspectorate for Environment and Nature	
Iceland	Environment Agency of Iceland	
Ireland	Environmental Protection Agency	
Italy	ISPRA – Istituto Nazionale per la Protezione e la Ricerca Ambientale	
Japan	Ministry of the Environment Ministry of Economy, Trade and Industry	
Latvia	Latvian Environment, Geology and Meteorology Centre	
Liechtenstein	Office of Environment	
Lithuania	Lithuanian Environmental Investment Fund	
Luxembourg	Administration de l'environnement	
Monaco	Direction de l'Environnement	
Netherlands	National Institute for Public Health and the Environment (RIVM)	
New Zealand	The Environmental Protection Authority	
Norway	The Norwegian Environment Agency	
Poland	Institute of Environmental Protection - National Research Institute	
Portugal	APA – Agência Portuguesa de Ambiente, I. P.	
Romania	Ministry of Environment and Climate Change	
Russian Federation	Federal Centre of Geoecological Systems	
Slovakia	ICZ Slovakia a. s.	
Slovenia	Slovenian Environment Agency	
Spain	Spanish Climate Change Office	
Sweden	Swedish Energy Agency	
Switzerland	Federal Office for the Environment (FOEN), Swiss Emissions Trading Registry, Climate Division	
Ukraine	State Environmental Investment Agency of Ukraine	
United Kingdom of Great Britain and Northern Ireland	European Commission Environment Agency	

3.2.1 MONITORING AND VERIFICATION

The European Union’s Monitoring and Reporting Regulation (MRR) uses different tiers to define accuracy levels in which installations of different sizes need to report their emissions. The larger the installation, the higher tier level it needs to apply:

- **Category A:** average annual emissions are equal to or less than 50,000 tCO₂(e)
- **Category B:** average annual emissions are equal to or less than 500,000 tCO₂(e)
- **Category C:** average annual emissions are more than 500,000 tCO₂(e).

The compliance cycle in the EU ETS is shown in the figure below:

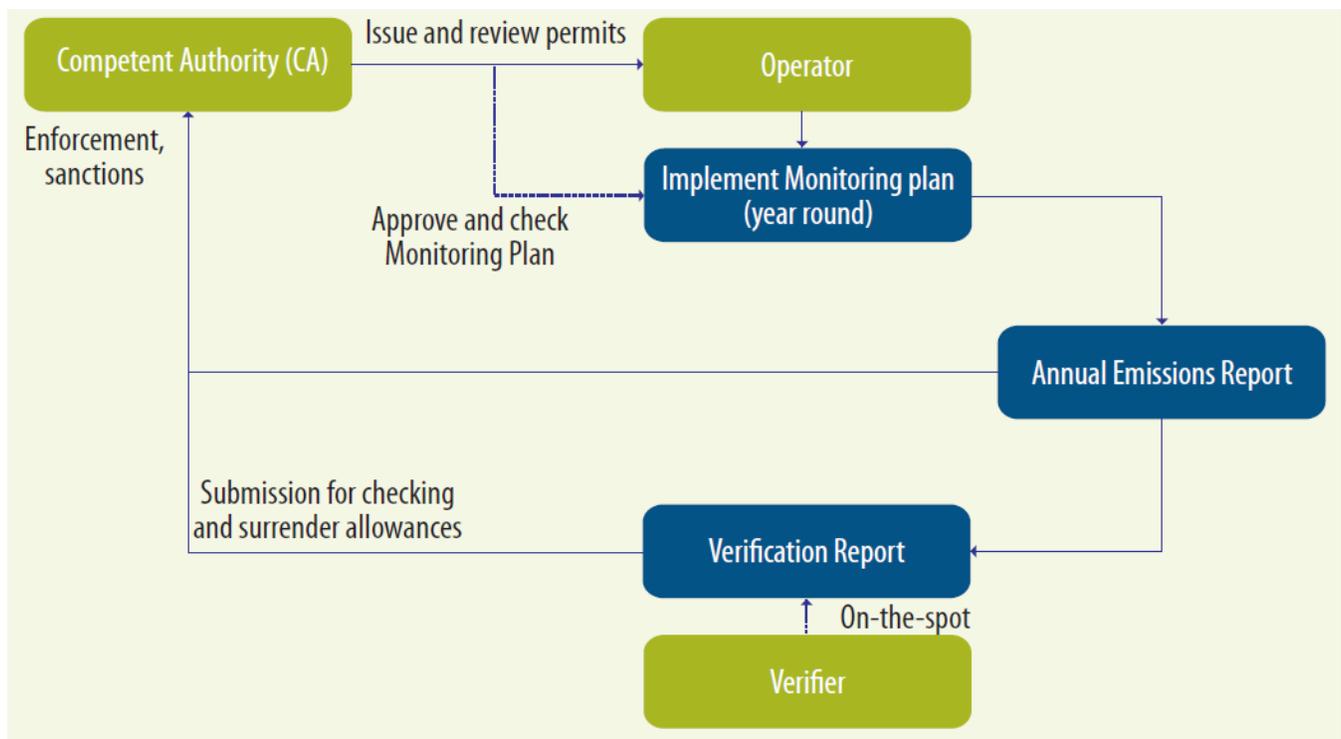


FIGURE 33: COMPLIANCE CYCLE IN EU ETS⁵⁸

The items described in the figure above are defined as follows:

Competent Authority:

Member States assign one or more (i.e. regional) Competent Authorities responsible for the implementation of the EU ETS directive.

Permit and monitoring plan:

in conformity with the ETS directive and the monitoring and reporting guidelines issued by the Commission, the Competent Authority adopts GHG emissions permits for the operators’ installations which include a monitoring plan describing the technical details

⁵⁸ Special Report The integrity and implementation of the EU ETS, European Court of Auditors, Publications Office of the European Union, 2015

of the installation and how emissions will be monitored (i.e. by applying calculations and/or measurements) and reported.

Annual emissions report and verification report:

based on the monitoring performed during the year; operators prepare an annual emissions report that is verified by an independent verifier contracted by them. The verifier checks the annual emissions report and issues a verification report inclusive of a verification opinion. These documents are sent to the Competent Authority before 31 March of the following year. The verifier also establishes a more detailed internal verification report that may be sent to the operator and/or the Competent Authority.

Surrendering of allowances:

based on the figures in the verified annual emissions reports, the correct number of allowances is surrendered from the operator's account in the Registry before 30 April of the following year.

4. AUSTRALIA'S GREENHOUSE GAS REDUCTION SCHEME



Australian Government
Department of the Environment

The introduction of a carbon offset system in Australia has its origins in the legislation that was introduced by several States before 2007. After that time, the Rudd Labor Government insisted on national responsibility for climate change. All States had legislated for mitigation

programmes in some form or other which at minimum established carbon emissions as a potential carbon 'right.' For instance, the Western Australian (WA) Government introduced the Carbon Rights Bill to Parliament in 2003. This legislation – the Carbon Rights Act – defined the covenanting to secure carbon sequestration on Crown or private land.

The Carbon Rights Act enabled the WA Government to limit greenhouse gas emissions on new resource projects by requiring certain levels of emissions to be offset. Several large resource companies engaged with carbon sequestration companies to secure carbon credits from plantations of trees, grown on dryland agricultural farmland in the WA wheat belt.

Concerning other State action in Australia, the following passage is taken from the NSW Independent Pricing and Regulatory Tribunal report on the legacy of GGAS (Greenhouse Gas Abatement Scheme) in 2013:

The NSW GGAS commenced on 1 January 2003 and was the first mandatory greenhouse gas emissions trading scheme in the world. The Scheme imposed obligations on all NSW electricity retailers, known as Benchmark Participants, to reduce a portion of the greenhouse gas emissions attributable to their sales/consumption of electricity in NSW. The Scheme also included certain other parties, including large electricity users who elected to manage their own benchmark, and required them to reduce their greenhouse gas emissions by meeting a target. They did this by purchasing and acquitting NSW Greenhouse Abatement Certificates (also known as NGACs) created by accredited Abatement Certificate Providers (ACPs) who undertook activities that:

- *reduced emissions from existing generators*
- *generated electricity using low emission technologies*
- *improved energy efficiency*
- *sequestered carbon in forests*
- *reduced emissions from industrial processes in large energy consuming industries.*

The Australian government closed the GGAS on 30 June 2012 on the basis that the scheme a duplication of Commonwealth Carbon Tax that was scheduled to be implemented. The level of compliance by both Benchmark Participants and ACPs during the life of GGAS was high. Over 144 million abatement certificates were created, representing a similar number of tCO₂e of greenhouse gas abatement achieved⁵⁹.

The following figure provides an overview of the GGAS operational framework.

⁵⁹ <http://shapingsustainablemarkets.iied.org/new-south-wales-greenhouse-gas-reduction-scheme-closed>

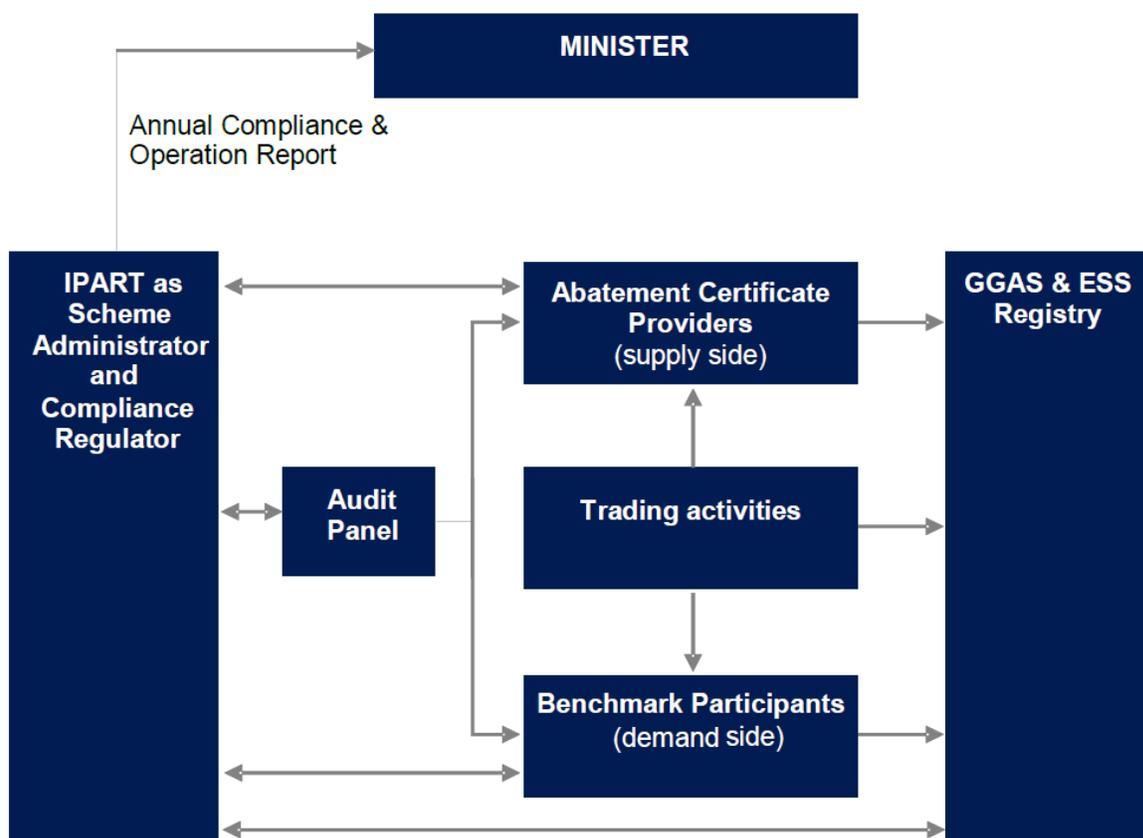


FIGURE 34: OPERATIONAL FRAMEWORK OF THE GGAS⁶⁰

It is clear that there was considerable experience in carbon emissions management at the State level, but also a readiness to pass the task from the States to the Commonwealth when the time was right. This time came with the election of the Rudd Labour Government at the federal level in late 2007 with strong commitment to tackling climate change. The Carbon Farming Initiative (CFI) is a testament to the Labour Government and its proposals to join more wholeheartedly with the global effort and implement industry-wide market mechanisms to reduce carbon emissions. The CFI was a legislated process for the creation of carbon offsets from the agricultural sector.

4.1 THE CARBON FARMING INITIATIVE AND THE EMISSIONS REDUCTION FUND

The Carbon Farming Initiative (CFI) is part of the Commonwealth Government's response to climate change. It is a national, voluntary scheme that provides incentives for activities that reduce or avoid greenhouse gas emissions.

The CFI, introduced in 2011, was originally intended to provide offsets for businesses with liabilities under the carbon pricing mechanism (also known as the carbon tax). The carbon pricing mechanism was subsequently repealed in July 2014. The government is expanding and streamlining the CFI to form the Emissions Reduction Fund, the central element of its Direct Action Plan to reduce Australia's greenhouse gas emissions.

⁶⁰ NSW Greenhouse Reduction Scheme - Strengths, weaknesses and lessons learned, Greenhouse Gas Reduction Scheme, July 2013

Right up to the abolition of the Carbon Pricing Mechanism in 2013 – an emissions trading scheme established by the Commonwealth – the generation of offsets through the Carbon Farming Initiative was restricted to land-based activities. This approach was based on the rationale that offsets could only be generated in sectors that were not subject to reporting or emissions limits. The approach was further articulated in the Carbon Pollution Reduction Scheme– an earlier, unimplemented Commonwealth initiative – which had a specific structure of covered sectors and non-covered sectors. The structure is similar in character to the UNFCCC structure of developed countries and the developing world, where the latter does not have emission reduction obligations or targets. Under this arrangement, offsets can be generated from projects in the developing countries for use in the developed world to meet targets. In the context of the domestic situation in Australia, agriculture did not have reporting obligations or mandatory targets to meet.

Generation of Australian Carbon Credit Units under the most recent scheme, the Emission Reduction Fund, which builds on the CFI, is not limited to this separate treatment of industry and agriculture as neither sector has mandated targets to meet.

With the introduction of the Emissions Reductions Fund and auction process, the generation of carbon credits has been extended to include a range of other activities including energy efficiency.

The Carbon Farming Initiative was reviewed by the Climate Change Authority in late 2014, and it made important observations as follows:

The Authority found that Carbon Farming Initiative achieved emissions reductions, but participation has been lower than it might have been. The scheme has reduced emissions by approximately 10 million tonnes, and environmental integrity has been reasonably high. However, policy uncertainty led to low price expectations for credits and a lack of confidence in longer-term returns, which deterred participation. Participation was also affected by gaps in coverage and relatively high transaction costs.

The Emissions Reduction Fund makes some important improvements on the Carbon Farming Initiative, and these should reduce costs and increase participation. Fixed price contracts are likely to be more attractive to project proponents. Also, the new approach to method development and approval appears to be an improvement, and streamlining is likely to result in lower transaction costs.

The expansion and streamlining of the Emissions Reduction Fund also introduces some new or expanded risks. Rapidly expanding the scale and scope of the Emissions Reduction Fund brings significant risks, especially to ‘additionality’. Good governance arrangements will be critical. The Authority recommended that enhanced additionality tests be considered for individual projects that generate a large volume of credits; and that the ongoing appropriateness of the Emissions Reduction Fund for achieving emissions reductions in particular situations be subject to independent and periodic review.

One issue that has been highlighted in the proposed South African offsets scheme is the significance of “co-benefits” that accompany projects and will be encouraged in the proposed scheme. The Carbon Farming Initiative, particularly in association with the Emissions Reduction Fund, has opted to emphasise the “least cost” approach and not to directly reward proponents for the value of their associated co-benefits.

The Carbon Farming Initiative assumes a degree of associated benefits from the offsets created by land-based projects. The approved Carbon Farming Initiative methodologies ensure that potential “disbenefits” or environmental damage and limitations are addressed in the context of the scale of the project and its location. Also, the regional land care authorities have been charged with the development of regional strategies and subsequently resourced to undertake this task. The proponents must acknowledge the strategies and address the issues raised. However, under the Emissions Reduction Fund, this requirement has been removed.

The Emissions Reduction Fund approach of purchasing least cost abatement and not rewarding co-benefits of Carbon Farming Initiative activities does not necessarily mean the co-benefits cannot be potentially on-sold in the voluntary market. This is particularly relevant in the context of recent low prices achieved in the Emission Reduction Fund auction. It could become common for proponents to require additional funds to undertake activities that cannot be fully financed through the auction. It is proposed by some project developers that the project is co-funded by an industry partner willing to secure the co-benefits. In this context, the industry partner can sponsor the proponent's project and claim to have partially supported the abatement activity. Alternatively, a proponent can seek further funding from a sponsor for a project that has already received funding from the auction process to leverage additional funds.

The policy and political context related to the question of appropriate land-based projects, particularly afforestation, has resulted in the introduction of planning regulations by local and State governments. This aims to limit the impact of large-scale planting across landscapes. There was considerable concern about inappropriate use of otherwise good agricultural land from farmers, local government and the WA State Government. Claims that carbon projects are only grown on land unsuitable or unprofitable for cropping or grazing did not provide any assurance that inappropriate and opportunistic land use practices would not emerge. Following an extensive review of planning regulations on agricultural land, large projects are required to seek approval. On the other hand, integrated projects where there is only partial use of the agricultural land do not require such approval. The integration is usually expressed in the form of belts of trees across cropping land occupying less than 10% of the property or paddock.

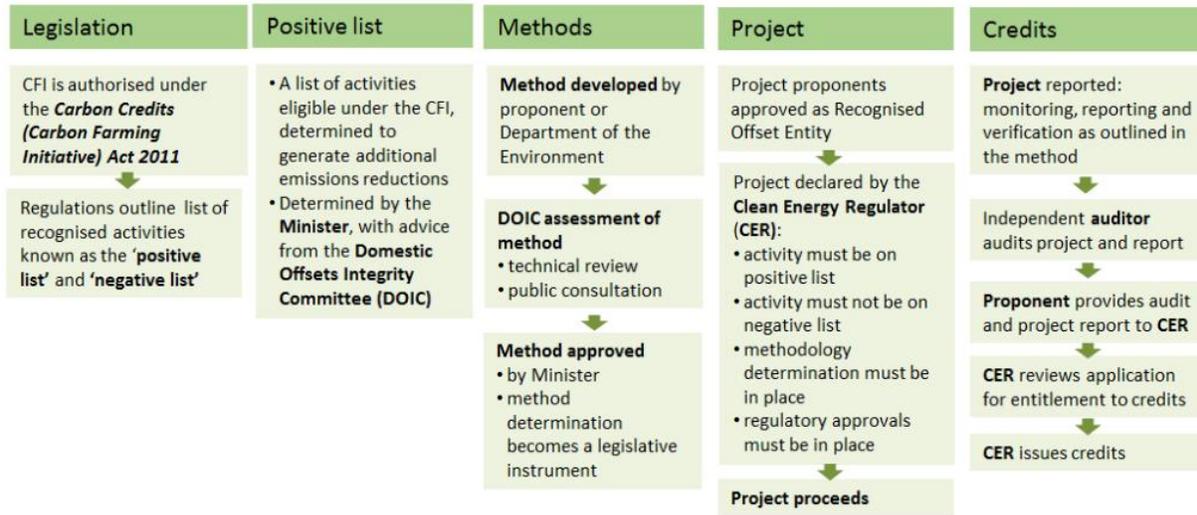
This question of land use and carbon sequestration remains a concern and many methodologies reflect this concern by placing constraints on the size of the project or its location in a particular rainfall zone. Initially, the Carbon Farming Initiative contained both positive and negative lists. The negative list was created to identify projects with potential social and environmental risks but has not been retained over time. There is a real possibility that some methodologies are too protective, and other planning laws at a more local level should be used to control and moderate bad practice. The overly restrictive rules in the methodologies can limit the application or increase the cost of Carbon Farming Initiative projects.

Several additional changes have been made to the operation of the Carbon Farming Initiative as it was incorporated into the Emissions Reductions Fund policy framework. These methodologies have been simplified and reviewed. Several additional streams of activity have been added to the range of potential methodologies. Now that the CFI is the means through which to generate Australian Carbon Credit Units for purchase by the Commonwealth government, there is no further need to differentiate "covered" and "uncovered" sectors.

4.2 INSTITUTIONAL ARRANGEMENTS

The Carbon Farming Initiative has been incorporated into the framework of the Emission Reduction Fund policy approach to emissions abatement. As such it does not have associated mandates for the reduction of emissions by emitters. This component of the Emissions Reduction Fund, the Safeguard Mechanism, is still in development and could involve a commitment by emitters to meet levels of emissions determined by an average of historic emissions. The penalties for transgressions of this limitation are expected to attract a "civil penalty" as opposed to a fine or another form of monetary charge that may be confused with the imposition of a carbon tax that, given recent history, would be politically unacceptable. However, the discipline necessary to maintain a level of emissions under a period of growth may need a greater level of attention.

The diagram below provides an overview of the carbon Farming Initiative process and below that a representation of the emissions Reduction Fund process. Below both of these Tables is a summary of the governance arrangements associated with the Carbon Farming Initiative and the Emissions Reduction Fund.



Source: Climate Change Authority based on DCCEE (2012)

FIGURE 35: OVERVIEW OF THE CARBON FARMING INITIATIVE PROCESS

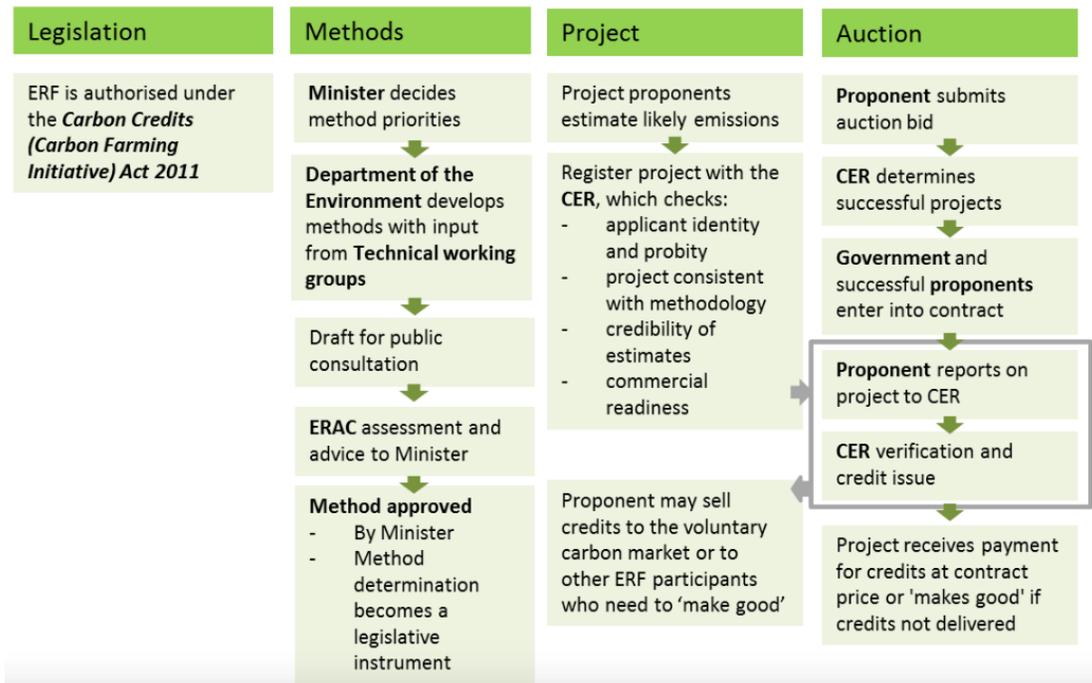


FIGURE 36: OVERVIEW OF THE EMISSIONS REDUCTION FUND PROCESS

CFI ARRANGEMENTS					
Parliament	Minister	Department of the Environment	Proponent/technical working groups	Domestic Offsets Integrity Committee	Clean Energy Regulator
Ultimate control of legislation	Approves methods, positive list and other regulations	Advises Minister on CFI, develops methods and supports method developers	Develops method with Department of the Environment	Assesses draft methods; DOIC endorsement is a prerequisite for method approval	Implements CFI, regulates, enforces compliance; approves proponents and projects; verifies emissions and issues credits

ERF ARRANGEMENTS					
Parliament	Minister	Department of the Environment	Technical working groups	Emissions Reduction Advisory Committee	Clean Energy Regulator
Ultimate control of legislation	Sets priorities for method development; approves methods and other legislative rules	Advises Minister on CFI, develops methods and supports technical working groups	Provides advice to Department of the Environment on design and practical application of methods	Assesses draft methods; advises Minister on whether ERF requirements are met; can veto proposed methods; can suspend methods	Implements CFI, regulates, enforces compliance; approves proponents and registers projects; runs auctions; enters into contracts; verifies emissions; issues credits and pays contract price for units issued

Source: Climate Change Authority

FIGURE 37: OVERVIEW OF GOVERNANCE ARRANGEMENTS IN CARBON FARMING INITIATIVE AND EMISSIONS REDUCTION FUND

Before the election of the current Coalition Government, the CFI was associated with the Carbon Pricing Mechanism, which determined the agreed emissions reductions required of larger companies in Australia. The Carbon Pricing Mechanism was abolished by the subsequent Liberal and National Party Coalition, soon after their election to government.

Under the auction system of the Emissions Reduction Fund, there are reporting requirements imposed on projects that are successful at the auction and coincides with the request to be issued with credits for transfer to the Government for retirement.

The annual National Greenhouse and Energy Reporting System still imposes reporting requirements on companies with emissions of more than 25,000 Mt, but is currently not linked to any mandatory abatement action.

4.3 COST EFFECTIVENESS OF THE CARBON FARMING INITIATIVE

The three tables above provide a guide to the institutional arrangements and connections that operationalize the Carbon Farming Initiative. Regarding cost-effectiveness of operation, the Climate Change Authority’s review of the Carbon Farming Initiative stated the following about the history thereof.

The number of credits generated under schemes such as the Carbon Farming Initiative does not necessarily equate to the emissions reductions brought about by the scheme. The number of credits may exceed ‘real’ emissions reductions because:

- the emissions reductions that were measured or estimated did not in fact occur or occurred to a lesser extent (measurement risk)

- the emissions reductions occurred, but would have happened even without the scheme (additionality risk)
- the emissions reductions relate to sequestration that did not persist for the required period (permanence risk)
- the project triggered an increase in emissions outside the project (leakage risk).

In the Authority's view the Carbon Farming Initiative appears to have achieved a reasonably high level of environmental integrity (i.e. it has brought about real reductions in emissions that would not otherwise have occurred). The main area of possible concern, as is usual for schemes of this type, is with additionality. The problem is that it can be virtually impossible for governments, regulators or indeed anyone outside the firm concerned, to quantify what would have otherwise happened (Climate Change Authority: Review of the Carbon Farming Initiative, p 2)

...

Some emissions reduction policies in Australia have been criticised for being uncoordinated and high cost. The Carbon Farming Initiative is not in this category; abatement costs were capped by expected carbon prices.

This does not mean, however, that there was no scope for reductions in costs. The government invested heavily in method development, sometimes in areas that have, at least to date, failed to attract projects. While it would be unrealistic to expect the level of interest in running projects of different types to always be accurately predicted, more might have been done to better prioritise method development. Some private expenditure on method development also has been less cost-effective than it might have been, because proponents had an incentive to develop narrow methods that were not suitable for use by other firms.

At the same time, some costs associated with measurement, verification and reporting appear to have been higher than necessary, with costs not aligned with the risks being managed.

The Climate Change Authority report also indicates that some improvements have been made in the operation of the Carbon Farming Initiative after its incorporation with the Emissions Reduction Fund:

Perhaps the most important improvement under the Emissions Reduction Fund is that project proponents will have the certainty of a fixed-price contract, typically over seven years, and in some cases, possibly up to 10 years. This is likely to provide an attractive investment proposition for activities that generate a high proportion of their emissions reductions within the contract period.

The Emissions Reduction Fund also adopts a new approach to method development, which entails:

- Prioritizing method development;
- Developing methods that have broader applicability and are potentially more consistent in their approach to managing risks;
- Introducing facility-based methods (for multiple activities at the one facility);
- Allowing baselines based on emissions intensity (so that reductions in emissions per unit of production can be credited).

The report continued:

Some problems identified with the Carbon Farming Initiative cannot be fixed under the Emissions Reduction Fund because they are inherent in crediting-below-a-baseline approaches. Even if the additionality risk is appropriately managed some non-additional emissions reductions will inevitably be credited, and some genuine abatement opportunities excluded—for fear they are non-additional, or

because they do not lend themselves to an activity- or facility-based method. In the process, considerable resources could be devoted to managing the additionality risk given the complex nature of the task.

Uncertainty has plagued Australian policy on climate change for many years. While the passage of the Emissions Reduction Fund amendments and the availability of methods and contracts will bring a degree of certainty for some activities over the next few years, the role and budget allocation for the Emissions Reduction Fund after 2020 is unclear. Expectations of longer-term policy stability and predictability will be important in supporting investments required to help Australia meet its long-term emissions reduction goals.

In relation to the cost of the Carbon Farming Initiative, the Climate Change Authority Review summarises this issue quite effectively:

Method development is likely to be the largest transaction cost incurred by the Department of the Environment; however, the direct costs incurred by the Department are not publicly available. Government grants for method development give some indication of government expenditure, however other significant costs (for example, staffing) would have been incurred. The Methodology Development Grants programme provided grants ranging from \$110,000 to \$214,000 for four method development projects, and the Indigenous Carbon Farming Fund allocated \$2.7 million in five grants to develop methods and supporting tools—these grants ranged from \$60,000 to \$1.2 million.

Direct scheme administration costs incurred by the CER in the 2013–14 financial year amounted to approximately \$6.1 million. This corresponds to over \$40,000 for each project that was in the scheme by the end of 2013–14; or around \$1.40 for every credit issued that year. The bulk of scheme administration costs (almost \$3 million) were incurred in developing and conducting assessment processes (for example, assessing projects for approval). Education and engagement accounted for over \$1.5 million.

While transaction costs are necessary to ensure the environmental integrity of schemes such as the carbon Farming Initiative, it is likely that costs have been unnecessarily high in some areas. In particular, the approach to developing methods under Carbon Farming Initiative —whereby anyone could propose a method—resulted in a number of methods that were very narrowly defined. For example, there are three reforestation and afforestation methods that relate to very similar activities, differing in their specific measurement requirements. The need to develop a new method where there was a very similar method available is likely to have increased transaction costs for some proponents, and discouraged other potential proponents from participating.”

4.4 ESTABLISHING THE CARBON FARMING INITIATIVE

The progress towards actually establishing a market-based mitigation programme was stimulated by the proposed emissions trading scheme (ETS) being taken to the election by the Coalition and the announcement in June 2007. The election of the Rudd Labor Government at that election brought with it a commitment to implement an emissions trading scheme. However, this final step in the adoption of an emissions trading scheme followed many years of preparation and research.

Four discussion papers on a national emissions trading scheme were developed by the Australian Greenhouse Office with the involvement of the State Governments in 1999 and 2000. These publications remain as a valuable resource but are unavailable online. These papers were followed some years later by an important contribution by all State Governments on the development of a national approach to emissions trading.

At the same time, in the context of a “no regrets” approach to developing a climate change policy framework by the federal Howard Coalition Government, the Commonwealth instigated many

regulatory and voluntary participation schemes to engage with industry and provide guidance to the community on the potential policy options for future management of emissions. Included in the range of measures was the National Greenhouse Energy Reporting Scheme that required large companies to provide an annual report of their emissions. This measure also provided the context for the Greenhouse Challenge program, which encouraged participation in energy and carbon emissions reduction, and the Greenhouse Friendly labelling and marketing program.

Notably the then Commonwealth Government did not ratify the Kyoto Accord and defended its position as a major trading nation with significant exports arriving in destination countries without the burden of reduced emissions being shared with the purchasing country. Nevertheless, the standard of research and quality of regulation and voluntary schemes was acknowledged and appreciated by most nations at many UNFCCC conferences. The advocacy by Australia for modest international measures and targets throughout this period was well presented and enthusiastically promoted with a general appreciation of the professional delegations to many Conferences of the Parties.

The election of the Labor Government in late 2007 provided a marked increase in rhetoric and action. The Government ratified Kyoto and made an early announcement of an increased effort at the UNFCCC Bali Conference.

The incoming Labor Government created a dedicated Department of Climate Change. This Department was later combined with other responsibilities and then abolished by the Coalition Government and folded into the Department of the Environment. The relationship between the Department of Climate Change and other key agencies was often strained and complex for outsiders to navigate. Whether the integration of this department into the Department of Environment will ease this sense of complexity and interdepartmental interplay is yet to be seen.

The establishment of the foundations for the operation of an offsets scheme followed an earlier attempt to establish an emissions trading scheme, the Carbon Pollution Reduction Scheme (CPRS), in 2008. The Carbon Pollution Reduction Scheme was voted down by the Senate two years later and never came into force.

However, the principles established during the design process are very similar to the proposed South African carbon tax structure, and the carbon offset scheme, in particular, the exclusion of the agricultural sector for any liability for emissions and the particular focus of the offsets scheme in this sector.

As part of the emerging structure of the offsets scheme, the Domestic Offsets Integrity Committee (DOIC) was initially proposed to oversee the determination of offset methodologies for inclusion in the Carbon Pollution Reduction Scheme. The Domestic Offsets Integrity Committee was later integrated into the Carbon Pricing Mechanism through the Carbon Farming Initiative, which remains a robust element of the Emissions Reduction Fund. The Emissions Reduction Fund was renamed the Emission Reduction Advisory Committee (ERAC).

Regarding establishment of climate change response policies, it is important to acknowledge the polarisation of the debate that ensued when the Labor Government attempted to introduce carbon policies. Below is a poll conducted by the Climate Institute over the period just before and after the election of the Labor Government with a policy agenda to introduce an economy-wide response to climate change. What is noticeable is the increase in the “don’t know” response. While this period under examination was during the Global Financial Crisis (GFC), there may have been other factors at play that influenced the strength of public opinion.

Various commentators have proposed that the very alarmist tone of the announcements associated with the delivery of the Carbon Pollution Reduction Scheme, in particular, seemed to operate in a way that increased the opportunity for climate sceptics to enter into the debate and confuse the issue so much that people responded in a very non-committal way. Given that the climate change issue was

very political, this undermined the Government’s attempt to get the legislation through both houses of Parliament.

Furthermore, if the global financial crisis was even partially responsible for some increase in negative opinion or non-commitment, this represents a salutary warning that adverse economic conditions can disrupt sensible and necessary legislation.

Also attached is an attempt to match the key changes in policy development with the slide in public support for leadership on Climate Change. The reversion to greater support for leadership is difficult to analyse but seems to coincide with the increasing strength of alarmism by the Opposition Liberal and National Parties as the election came closer. This trend in support then increased after the election of the new government and the abolition of the Carbon Pricing Mechanism, after a key election proposal to “axe the tax” by the Coalition partners.

The policies of the Coalition Government including the Emissions Reduction Fund have been reasonably well received and the post-2020 targets being taken to the Paris meeting of the UNFCCC are within the range of other developed nations taking reasonable action. With the level of support for leadership on climate change nearly reaching the level of 2007, it is likely that the current government will perceive it as policy it must treat with a serious intent.

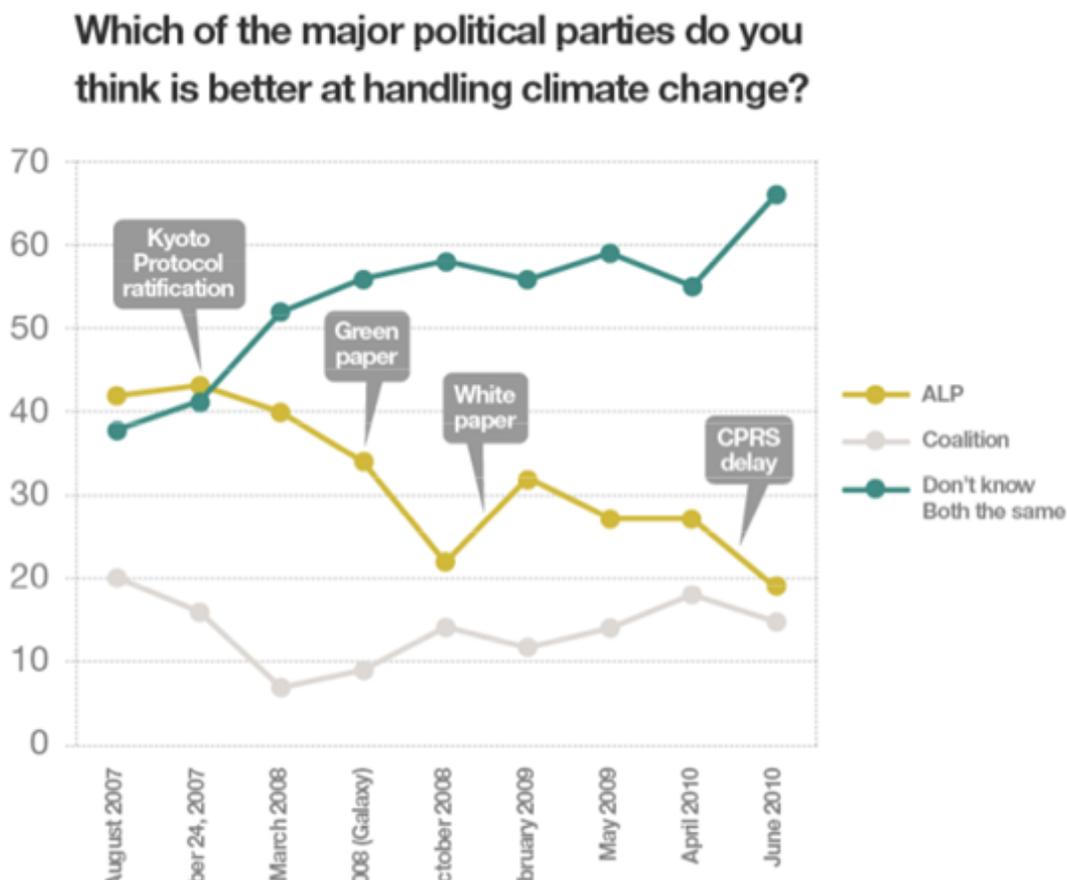


FIGURE 38: AUSTRALIA SUPPORT FOR CLIMATE CHANGE POLICIES

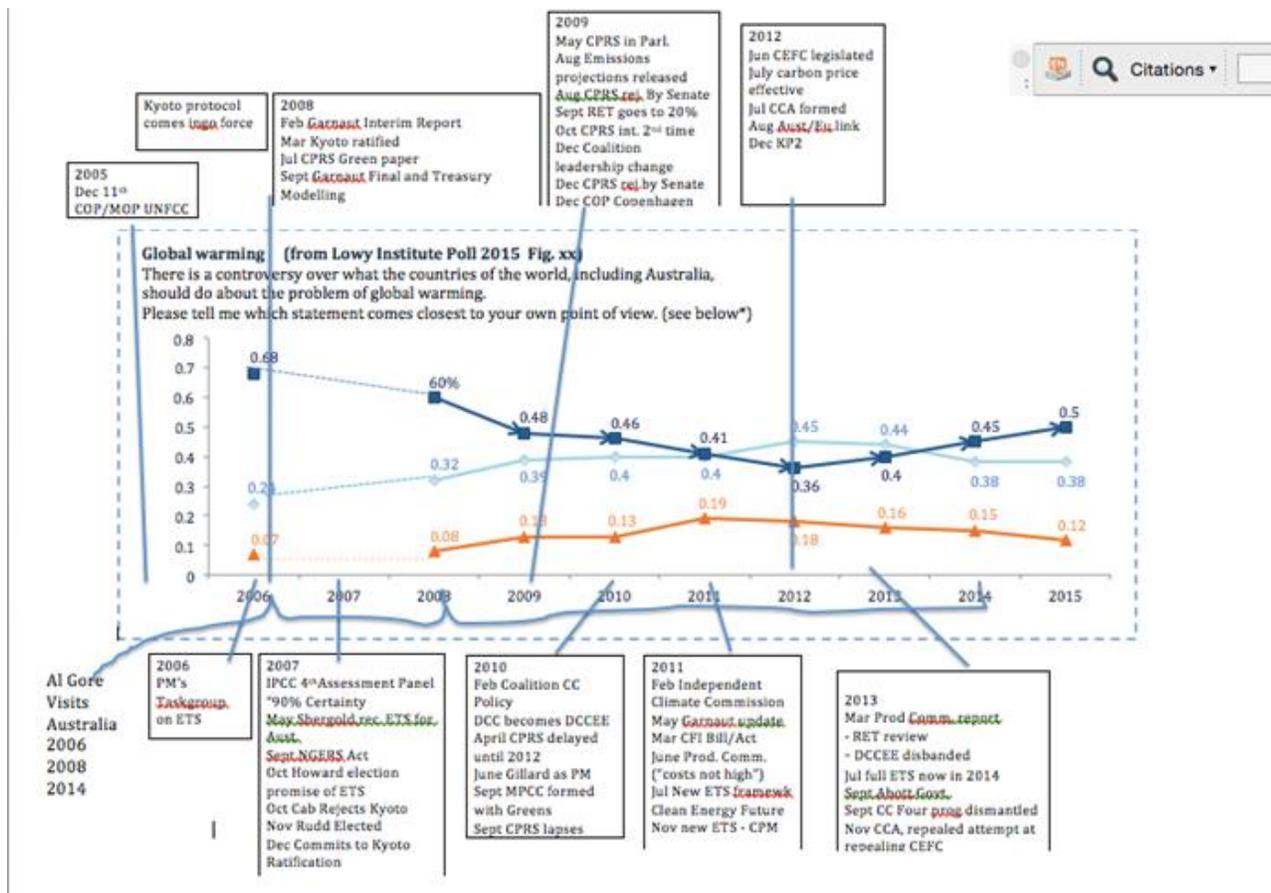


FIGURE 39: THE LOWEY INSTITUTE POLL (MODIFIED)

4.5 THE DEVELOPMENT OF CARBON OFFSET SCHEME POLICY AND LEGISLATION

Australia has experienced a volatile policy journey in the area of market-based abatement systems including emissions trading, carbon offsets and auctioning. This journey provides rich material for interpretation of the successes and failures of the various attempts to create an efficient mitigation program. Several commentators have attempted to analyse the development and implementation processes adopted and have provided explanations as to why support for climate change policies have become unpopular and have subsequently failed.

Some of these commentators have pointed to the inevitable failure of policies delivered “top down” by experts in government without sufficient consultation. It has been said that the design of the Carbon Pollution Reduction Scheme by former Treasury officials was a cause for disappointment. This perception of a failure to listen and consult and adequately explain the benefits led eventually to a significant lack of confidence and a failure to negotiate its path through the Senate.

Others have commented on the alarmist tone of the motivation for the proposed legislation that was often presented as “carbon pollution” with dramatic, seemingly immediate catastrophic consequences if the action was not taken. Commentators (including former United States Vice President Al Gore) propose that overly dramatic language tends to disempower people, and they become “don’t know” observers as the conversation between proponents and climate change deniers becomes more and more strident.

Furthermore, it is likely that ramping up the need for climate change action for political purposes can backfire in that it creates a vacuum for confusing, anti-action opinions to infiltrate the dialogue. The

experience in Australia as outlined in the graphics trends, identified earlier, eventually created the circumstances for a radical reversal of the policies implemented by the Government of the day, despite the growing interest in the Commonwealth taking action.

Another aspect of this period was the adoption of a dominant policy position by the Commonwealth and the winding back of the legislative action, policy and commitments by the State Governments. While this makes sense in the circumstances, the Commonwealth had little or no support from State Governments. This form of multi-jurisdictional engagement would probably have been helpful. Other experience in Australia of such Commonwealth dominance in policy and funding, for example in tertiary education, has resulted in a volatile scenario with little competition for ideas or direction.

As an extension of this lack of more diverse sources of political support, the Australian Greens unexpectedly did not support the Carbon Pollution Reduction Scheme in crucial votes in the Senate, effectively spoiling its chances of ever being adopted. Without outlining the particular reasons for opposition, it is probably fair to state that in this case “the good was the enemy of the best”. In other words, the Greens wanted the laws to be tougher and the key emitters to be pushed harder to reduce emissions. It is probable that the planned modest start to national mitigation policies via the Carbon Pollution Reduction Scheme was a practical and potentially enduring strategy. However, the difference between the tough rhetoric and the soft action did not read well with opinion polls and other political forces.

Other players in the consultation process at this stage and later for the Carbon Pricing Mechanism that did take place included dedicated environmental groups and industry bodies established to liaise on this topic with the government. Before the Carbon Pollution Reduction Scheme legislation going to parliament, larger emitters accommodated the inherent constraints imposed by the legislation and put in place programs and budgets to conform to the intent of the policy when implemented. At the same time, other smaller industry players were less certain of the policy and were more concerned about the economic impact of the policy, even though the direct impact did not necessitate their participation.

For example, the larger resource companies which belonged to the WA Chamber of Commerce and Industry were well represented on the Climate Change Committee of that body. A positive message was drafted by the committee in support of the Carbon Pollution Reduction Scheme but ignored by the State Council and then subsequently by the national body in favour of a much more opposed position.

The actual offsets instrument, the Carbon Farming Initiative, had its origins in the Carbon Pollution Reduction Scheme but was not developed as separate entity until the lead up to the Carbon Pricing Mechanism. Development of Carbon Farming Initiative methodologies by specialist groups was encouraged and, when approved by an independent panel of experts, legislated so that there was less likely of modification by the Minister and possibly by future governments.

Indeed, the Carbon Farming Initiative has been adopted as part of the Emissions Reduction Fund with few substantial modifications made to the overall program. While the review of the Carbon Farming Initiative by the CCA has commented on the potential for financial waste in this methodology development process, the fact that the methodologies are legislated provides some certainty to the Carbon Farming Initiative for investors and associated parties.

A key principle of the development of the Carbon Farming Initiative and linked to the veracity of the carbon credits created on agricultural land was ownership of the credits; they were “attached the land”. In other words, the credits were listed on the land title as an encumbrance and subsequent owners needed to be aware of this and the obligations attached to registration. This process necessitated a complex set of arrangements that differed in each State based on the land management system in force but was manageable.

The Emissions Reduction Fund has streamlined and simplified this aspect of registration, and no such formal registration is required. There is some uncertainty as to how this will play out in future, but

bilateral agreements are required between the landowner providing consent and the project proponent undertaking the carbon sequestration project. As the carbon contracts are awarded after the auction on seven years contracts, and the credits issued only when realised, there may be adequate scrutiny of the projects and ample ability to ensure the “make good” provisions implemented, whoever owns the property at that stage.

It is worth outlining that the experience of a long lead up to, and a short period of, an actual emissions trading resulted in substantial activity, particularly in the land sector.

Many thousands of hectares have been planted in WA and New South Wales (NSW) with 100-year covenants on their maintenance. Some of these covenants have subsequently been converted to 25 years following the reduction in the permanence requirement of new methodologies associated with the Emissions Reduction Fund. This adoption or conversion to a 25 year period is accompanied by a discount on carbon credits generated of 20%.

The actual form of registration of carbon rights in some Australian States (NSW, South Australia and, at one point, Queensland) are linked to common law rights that do not need to be registered on title and parties to the agreement sort out the details of maintenance and access. In other States (WA, Victoria and more recently Queensland) the rights are treated as a de novo statutory interest and “are not aligned with any common law form of real property” (Zahar 2012). The carbon right is a separate interest in the land.

The Carbon Farming Initiative, when legislated in 2011, required that one must hold the applicable carbon sequestration right. About sequestration projects, the project proponent must hold the carbon sequestration right created under State and Territory legislation for all the relevant project areas.

The owner of the land usually holds the carbon right unless it has been registered and sold to someone else. Leaseholders of pastoral land may have the carbon right depending on the conditions of their lease.

In 2014, the Carbon Farming Initiative Act was amended to remove the requirement that carbon sequestration rights must be registered on the title of the land on which the project is located. The carbon permanence obligation remains applicable and is attached to the land even when the property is sold to a new owner. In other words, the onus for compliance with the permanence obligation passes to the new owner. If this non-registered encumbrance on the land is not revealed at the time of sale, complications can arise. The project also has to demonstrate eligible landholder consent.

4.6 CURRENT STATE OF CARBON MARKET IN AUSTRALIA

The current state of the carbon market in Australia is defined in the regulations summarised in the table below:

TABLE 17: REGULATORY FRAMEWORK FOR AUSTRALIA'S DIRECT ACTION PLAN⁶¹

Regulation	Details
RG 236.1	<i>From 2015, financial services provided in relation to emissions units in Australia are expected to predominantly relate to the activity of the Emissions Reduction Fund (ERF), through which the Australian Government purchases Australian Carbon Credit Units (ACCUs), usually under multi-year contracts. The sellers of ACCUs under these contracts are people who carry out ERF projects that generate ACCUs, but they may also deal in ACCUs with other parties (e.g. to balance their actual ACCU position with their contract sale obligations to the Australian Government).</i>
RG 236.2	<i>An ERF project is a project carried out in accordance with the Carbon Credits (Carbon Farming Initiative) Act 2011 (CFI Act) which allows a person (the 'project proponent') to generate Australian Carbon Credit Units (ACCUs) through domestic emissions offset projects that avoid or sequester greenhouse gas emissions. The CFI Act refers to the avoidance of emissions or removal from the atmosphere (i.e. sequestration) of one or more greenhouse gases as 'carbon abatement' of the CFI Act.</i>
RG 236.3	<i>The Clean Energy Regulator is responsible for administering the ERF, this includes:</i> <ol style="list-style-type: none"> <i>a. Registering projects;</i> <i>b. Issuing Australian Carbon Credit Units (ACCUs) for carbon abatement achieved by registered projects;</i> <i>c. Conducting auctions of offers to sell ACCUs to the Clean Energy Regulator; and</i> <i>d. Accepting offers and entering into contracts for the purchase of ACCUs by the Clean Energy Regulator on behalf of the Australian Government.</i>
RG 236.4	<i>In November 2014, the National Greenhouse and Energy Reporting Act 2007 (NGER Act) was amended to establish the 'emissions reduction safeguard mechanism' (safeguard mechanism), to commence on 1 July 2016. Under the safeguard mechanism, certain designated large facilities must ensure that their net emissions number does not exceed their baseline emissions number at the end of each monitoring period. A facility may reduce its net emissions number by acquiring and surrendering ACCUs and, if specified in the 'safeguard rules', other types of emissions units.</i>
RG 236.5	<i>There are also markets through which participants voluntarily offset carbon emissions ('voluntary carbon markets'). Voluntary carbon markets operate in Australia and overseas and trade a variety of emissions units, some of which are financial products in Australia, and some of which are not.</i>
RG 236.8	<i>Australian Carbon Credit Units (ACCUs) and certain other emissions units are classified as financial products under the Corporations Act. This means that any person wishing to offer services related to ACCUs may require an Australian Financial Services (AFS) licence.</i>
RG 236.9	<i>Other emissions-related financial products include, for example, derivatives over emissions units and interests in managed investment schemes involving carbon abatement activities or emissions units. People wishing to offer services involving these product may require an AFS licence to carry on a financial services business in relation to these financial products.</i>

The Australian Government is in the process of legislating a compliance process using the Safeguard Mechanism of the Direct Action Plan. The mechanics of this mechanism is shown in the figure below:

⁶¹ Regulatory Guide 236, Do I need an AFS license to participate in carbon markets? Australian Securities and Investment Commission, May 2015.

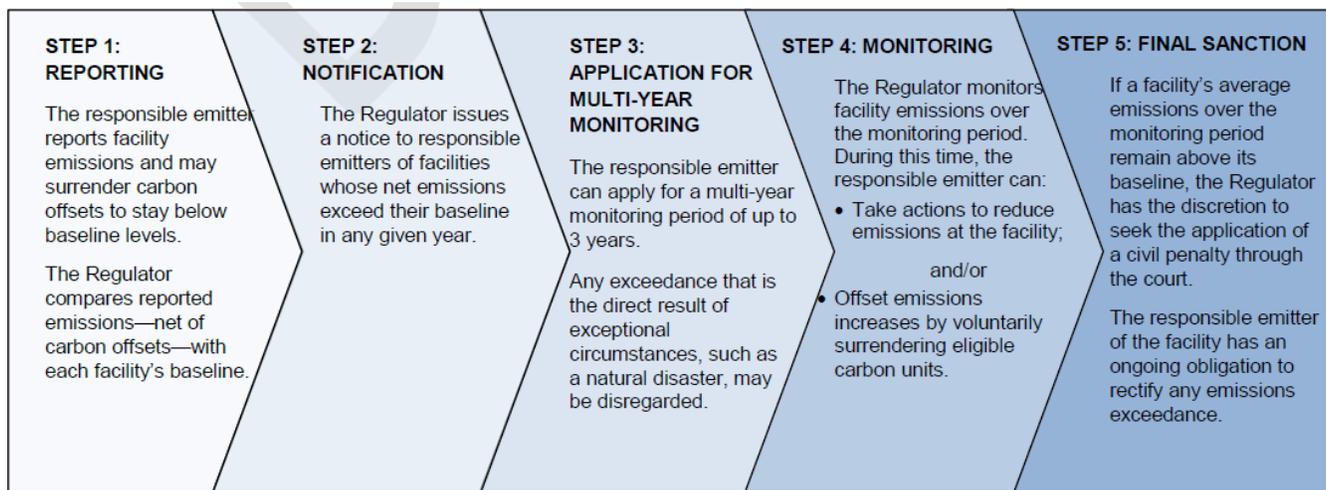


FIGURE 40: COMPLIANCE PROCESS OF THE STABILIZATION MECHANISM OF THE DIRECT ACTION PLAN⁶²

⁶² National Greenhouse And Energy Reporting (Safeguard Mechanism) Rule 2015, Draft Explanatory Statement, Issued by the authority of the Minister for the Environment of Australia

5. CHINA'S EMISSION TRADING SCHEME

After the success of CDM projects in China, the Chinese Government instructed the National Development and Reform Commission (NDRC) to develop a Chinese Emission Trading Scheme to (or “intending to”) implement this in 2017. The many Chinese CDM projects generated millions of CERs under the Kyoto Protocol. The Chinese government subsequently taxed the CER sales by Chinese companies abroad and received approximately 1,5 billion USD (10 billion RMB) income. As a result, a fund was developed to manage the tax income from the CER sales. This fund is referred to as the CDM Fund and has the following specific financial targets:

- Low-carbon research.
- Equity investments.
- Renewables project finance via cheap loans.

Further to the sale of CERs, the climate change division of the National Development and Reform Commission on 14 January 2015 announced the launch of a national registry for Chinese Certified Emission Reductions (CCERs). The national registry would enable traders of the offsets to easily complete and record their transactions in a centralised repository⁶³.

5.1 INTRODUCING REGIONAL PILOT TRADING SCHEMES

The Chinese Certified Emission Reduction (CCER) scheme provides offsets for the Chinese markets, which is currently composed of seven operational pilot Emission Trading Schemes. The objective is to test these schemes on a regional level before national implementation. Each pilot has its own rules with regards offset eligibility based on national criteria (quantitative limits as well as qualitative restrictions on, e.g., the implementation date, the location of the project, the project types) (World Bank, Partnership for Market Readiness, 2015).

The seven operational pilot emission trading schemes are:

- Beijing
- Chongqing
- Guangdong
- Hubei
- Shanghai
- Shenzhen
- Tianjin

These schemes make use of Chinese Certified Emission Reduction units (CCERs) that is equivalent to a tonne of carbon dioxide abatement per unit. The Chinese Certified Emission Reduction unit has been selected because the Chinese emission trading scheme will only allow for trading in China.

The National Development and Reform Commission manages the national scheme, CCERs issuance and related controls as well as the Beijing-based registry.

5.2 CCER PROJECTS CONTEXT AND PROJECT CYCLE

The Chinese Certified Emission Reduction scheme is largely based on the CDM. Key differences were introduced to reduce transaction costs while maintaining the quality of the projects and the credits. They include no request for review stage, no charge for the project developers and different

⁶³ <http://chinacarbon.net.cn/china-launches-ccer-registry-issues-offsets-16-projects/>

requirements for validation and verification entities (World Bank, Partnership for Market Readiness, 2015).

Eligible projects include (World Bank, Partnership for Market Readiness, 2015):

- New projects.
- Projects that passed the host country’s CDM approval by the National Development and Reform Committee but not registered by the CDM Executive Board.
- Chinese CDM projects with pre-registration emission reductions.
- Chinese CDM-registered projects with planned reductions but not issued. To avoid double counting, these projects first need to be deregistered from the CDM. This is possible now that the deregistration procedure is in place.

All projects must have started construction after 16 February 2005. As of October 2014, 369 Chinese Certified Emission Reduction projects had started the registration process, and 90 projects had been registered.

The figure below provides an overview of the Chinese Certified Emissions Reduction projects cycle.

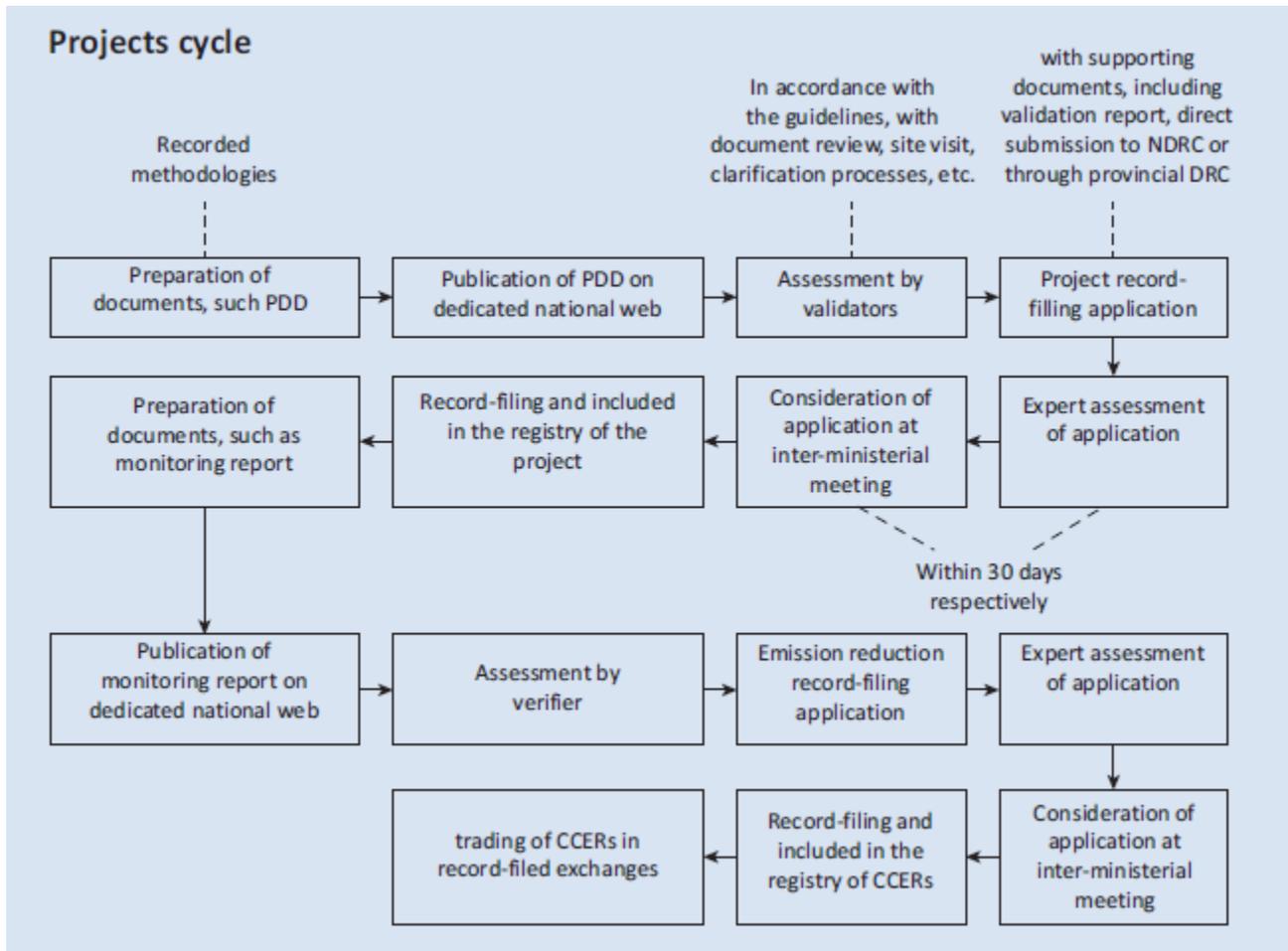


FIGURE 41: CHINESE CCER PROJECT CYCLE

CCERs are only eligible in the seven above-mentioned pilot emission trading schemes. Interestingly, CDM project linked CERs are not recognised as a tradeable carbon reduction under the Chinese

system. The pilot schemes will terminate in December 2015, and new regulations will be developed for the Chinese emission trading scheme.

The figure on the next page provides a detailed overview of the Chinese Certified Emission Reduction recording and offsetting process.

5.3 ISSUING CARBON CREDITS

The issuance of offset linked carbon credits is done via the National Development and Reform Commission and registered in the National Chinese Certified Emission Reduction registry. However, all pilot schemes have the opportunity to decide, together with the local supervisor the Development and Reform Commission, which Chinese Certified Emission Reduction units are eligible for compliance under the various pilot scheme.

Shanghai, for example, started the pilot emission trading scheme with exempting CCERs for compliance. Other pilot schemes specify that offsets within the region may only be used to generate eligible CCERs for compliance in that specific pilot scheme.

Over the past three years very few CCERS have been issued by the National Development and Reform Commission due to a conservative approach to safeguarding the market and various pilot schemes. However, there has been CCER trading in Hubei, Shanghai and Guangdong.

The very large experience with project – registration and verification in the CDM market makes China any deal place for the new type of offsets that will be used in China as offset and as a trading vehicle.

In the Shenzhen pilot, there are actually over 82 verifiers active and thanks to stricter rules and controls the Shenzhen pilot was 97 % compliant in 2014 with as absolute leader the Shanghai pilot that was 100% compliant.

Very important in China is the non-compliance of existing CDM projects to be used as offsets for compliance

Some large State Owned Enterprises are still trying to sell CER s in the market, but buying interest is fading away.

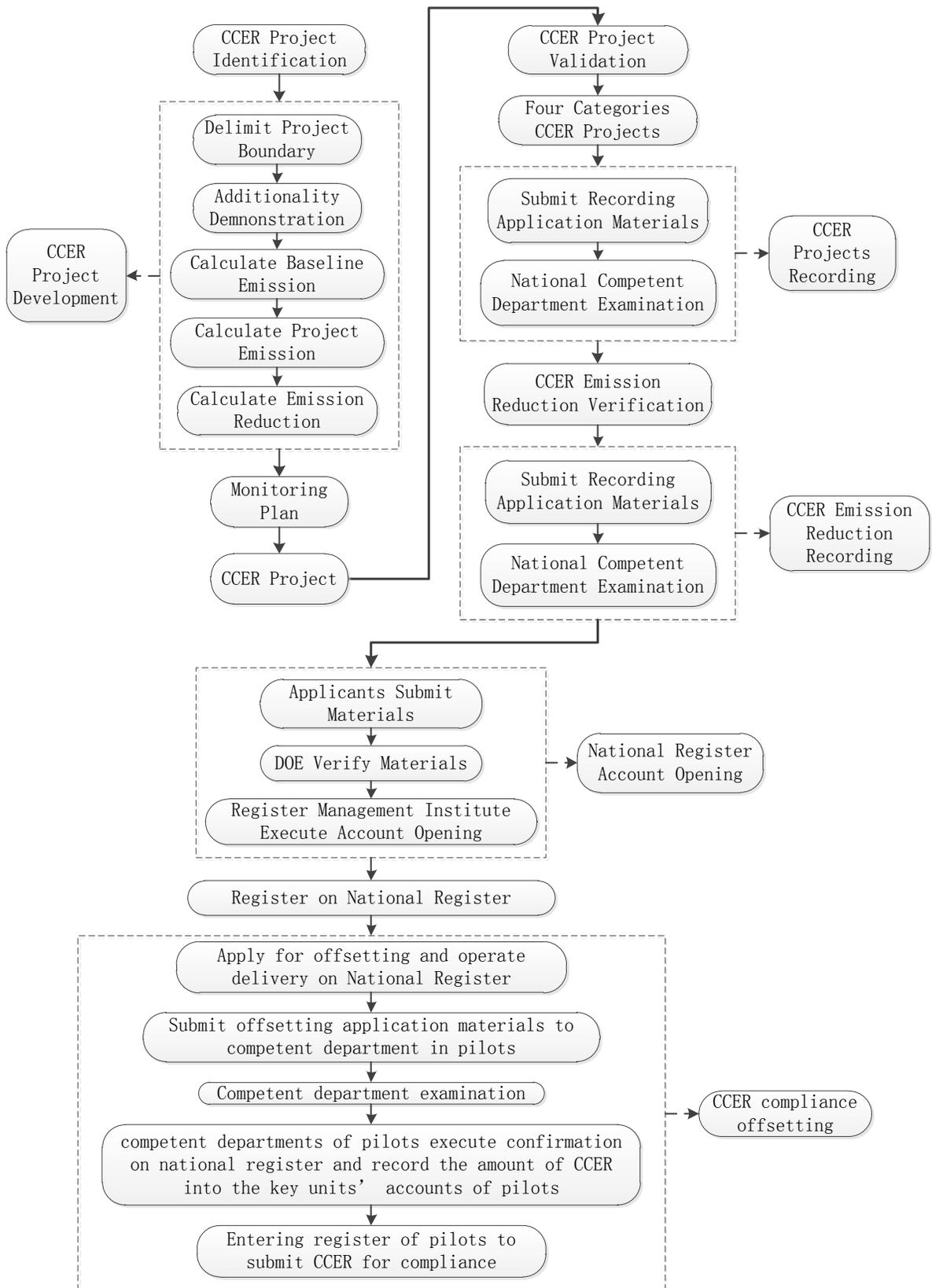


FIGURE 42: CCER RECORDING AND OFFSETTING PROCESS

6. DANISH EMISSION REDUCTION INITIATIVES

Denmark has a long history of energy taxes on electricity and oil and in 1992 a carbon tax was introduced. The main reason for the taxes is the promotion of energy savings and CO2 reductions. Fuels for electricity production are exempted from the taxes, as taxes on these fuels would have a negative influence on Denmark’s large import and export of electricity. Instead, an energy tax is put on electricity produced.

Denmark’s further efforts and initiatives to reduce the nation’s greenhouse gas emissions can be viewed mainly from the context of the country’s international commitments. Denmark signed the Kyoto Protocol in 1998 together with the EU and other member states, and through this committed to reducing their greenhouse gas emissions by a total of 8 % for the period 2008-2012 compared with 1990 levels. As part of the EU Burden Sharing Agreement, Denmark further committed to reducing national greenhouse gas emissions by 21 % during the period 2008-2012 compared with 1990 levels. When this commitment was pledged it was estimated that the required reductions per year for Denmark was around 20 million tons of CO₂e.

In 2003, the Danish State issued the so-called “Cost-effective Climate Strategy” which laid out the government’s plan on how to comply with the nation’s obligations of reducing greenhouse gas emissions. The title indicates a specific focus on identifying means that regarding emission reductions should be as cost-effective as possible. Through the initial analyses of cost of technologies, prices of EU allowances and credits from the Kyoto Protocol’s flexible mechanisms, it became evident that domestic interventions were costly and had to be supplemented with less costly interventions at an international level.

The strategy document concluded that this could either be achieved through investments in eligible greenhouse gas reduction projects or through schemes facilitating the purchase of offset credits. There is, however, a limit on the quantity of credits that could be used to offset total emission reduction obligations, as the Kyoto Protocol states that the use of climate credits may only be a supplement to national reduction initiatives. Denmark has ratified the EU directive on greenhouse gas emission allowance trading and made it law. The government regards the emission allowance trading scheme as a vital element in the Danish climatic strategy.

The Danish JI/CDM programme 2008-12 has been involved in approximately 80 projects in Eastern European countries as well as in some developing countries, primarily in Southeast Asia. It has been estimated that approximately 16 million tons CO₂e will be purchased under the programme. In an evaluation of the programme in 2010, it was found that when comparing the market price in the same year, the average price paid for 1 tonne CO₂e was lower than the market price and hence proved the cost-effectiveness of the programme.

Table 18 below summarises the roles of entities involved in the various Danish emission reduction initiatives.

TABLE 18: ROLE PLAYERS IN THE DANISH EMISSION REDUCTION INITIATIVES

Entity / Organisation	Role, mandate and responsibility
Ministry of Finance	<ul style="list-style-type: none"> Developing and issuing national strategies and policies such as the “Cost-effective Climate Strategy”, among others

Ministry of Energy, Utilities and Climate	<ul style="list-style-type: none"> • Developing and issuing policies, strategies and plans related to Danish Climate Action
Dansk Energy Agency	<ul style="list-style-type: none"> • Providing expert reviews and performing analyses • Assessment of reporting from entities covered by the national allocation plan and allowance system • Competent Authority for EU ETS in Denmark. <ul style="list-style-type: none"> • Permissions for CO2 emissions to installations under EU ETS. • Approval of CO2 Monitoring Plans and CO2 Reporting for installations under EU ETS. •
Danish Business Authority	<ul style="list-style-type: none"> • Administrates the Danish Emission Trading Registry

The following sections provide more information on key initiatives being undertaken in Denmark to reduce greenhouse gas emissions.

6.1 THE DANISH NATIONAL ALLOCATION PLAN AND THE EU ETS

The Danish National Allocation Plan is a central element in Denmark’s commitments to reducing its greenhouse gas emissions. A National Allocation Plan can be considered as a detailed description of the status of a country’s climate efforts. The plan sets out the distribution of allowances for the period 2008-2012 and describes how Denmark will reduce its emissions of greenhouse gases by 21% relative to 1990.

In continuation of the commitments following from the Kyoto Protocol, the EU ETS was developed as a common emission trading system. The ETS was the first international trading system for carbon emission allowances. The EU ETS applies to all 27 EU Member States. The EU ETS covers more than 10,000 companies, which together accounts for 40% of the EU’s total CO2 emissions. Around 380 Danish installations are covered by this emission regulation. For the period 2008-2012, the emission trading system includes a cap on the number of emission allowances. Within this cap, allowances and credits may be traded. Each EU Member State must prepare a National Allocation Plan, which is subject to approval by the European Commission. The plans describe the country’s general climate efforts and allowance allocation. Furthermore, EU Member States are subject to a number of reporting obligations in relation to the EU.

6.1.1 ACTIVITIES THAT ARE COVERED BY THE EU ETS ALLOWANCE SYSTEM

Activities covered by EU ETS includes Any type of activity / combustion installations with a rated thermal input exceeding 20 MW, production and processing of ferrous metal, mineral industry as well as other industry like paper and pulp fuel combustion that leads to CO2 emissions is covered by the allowance system.

Any activity / installation with fuel combustion that leads to CO2 emissions is covered by the allowance system. This means that in addition to electricity and heat production, direct fuel combustion in industrial processes is also covered by the legislation. For instance, fuels used for melting stone in the production of stone wool. All emissions from energy generating installations are covered, including emissions from space heating of administration buildings.

The following sectors are now included in the EU ETS Allowance System: agriculture, transport, waste and residential. These sectors contribute a large share of the total national greenhouse gas emissions. The Danish state has therefore decided, based on principles of solidarity and the need to stimulate economically sustainable development, which aim to ensure emission reductions in these sectors must be prioritised.

6.2 ADDITIONAL CLIMATE CHANGE INITIATIVES

In 2010, the Danish Government initiated a pilot programme on domestic actions to facilitate greenhouse gas emission reductions. This pilot was in addition to the international purchase scheme (EU ETS) and hence the ultimate goal was to contribute to Denmark's international commitment. The main driving force was to find undiscovered reduction potentials by making the private sector responsible for the initiative. The sub-objectives were also included implementing and testing new innovative solutions and technologies that reduce greenhouse gas emissions, in addition to giving the Danish JI/CDM programme an extra dimension by increasing the scope to include the development of climate projects inside Denmark's boundaries.

In June 2014, the Danish Climate Change Act was adopted in Parliament. The Climate Change Act establishes an overall strategic framework for national climate policy to convert to a low-carbon society by 2050. The new strategic framework aims to ensure transparency and openness on the status, direction and momentum for climate change policy.

The legal content of the Climate Change Act contains:

- 1) Establishment of an independent, academically based Climate Council.
- 2) An Annual Climate Policy Report.
- 3) Process for establishing new national climate targets.

In January 2015, a new independent Climate Council was established to promote transparency and an academically coherent approach for decisions on national climate policy. The Climate Council is mandated to make annual recommendations to the government on climate action so that this move can be geared to the most cost-efficient manner regarding growth, competitiveness and employment.

6.3 REGISTRY AND IT SYSTEM

While the EU ETS Registry and the Danish Emission Trading Registry are two separate legal entities, the Danish Registry operates as part of the EU ETS Registry. These registries contain allowances and offset credits, which are electronic units giving certain companies the right to equivalent tonnes of greenhouse gases during a specified period. The various emission registries are linked in an electronic network, which makes it possible to exchange allowances and credits between the registries' accounts.

6.3.1 THE EU ETS REGISTRY

The EU ETS came into effect on 1 January 2005. In October 2008, the European system was linked to the UN emission trading system, which is why there is now a world-wide system for the trading of allowances and credits. Because emission allowances and credits exist only as electronic units, electronic registries are needed in which to store these allowances and credits and register to whom the allowances and credits belong.

6.3.2 THE DANISH EMISSION TRADING REGISTRY

The Danish Business Authority, under the Ministry of Business & Growth, administers and oversees the Danish Emission Trading Registry. Danish operators that are covered by the allowance system prepare monitoring reports that must be verified by accredited auditors before being sent to the Danish Energy Agency for final evaluation and approval. The notice of approval is then forwarded to the Danish Business Authority.

6.3.3 IT SYSTEM

The Danish Registry is a carbon trading and exchange system which, therefore, requires an IT system where security has the highest priority to avoid fraud and market manipulation. There are strict administrative procedures in place at the Danish Business Authority and any company or individual who applies to open an account in the registry needs to provide confidential information and records that will undergo a comprehensive background check.

It took the IT team over a year to develop the IT system that was developed from scratch and required EU and UN approvals. An IT system development company was hired to assist in this process.

The registry is staffed with six full-time officers who are involved in all the administrative tasks of operating the Danish Registry. The staff is however also involved in providing recommendations and advice to Danish Governmental delegations attending international climate negotiations and conferences. The staff from the Business Authority were also involved in the development and setting up of the Registry in the United Kingdom.

7. REGISTRY AND IT SYSTEM - PMR, UNFCCC AND EU

The World Bank’s Partnership for Market Readiness (PMR) defines a registry as a transaction platform rather than a “register”, which is a data and reporting management tool⁶⁴. In addition to this distinction, this report views the IT System described in the Scope of Work for this project as a management tool that will contain information not contained in the registry – and, therefore, similar to the PMR’s definition of a register.

The PMR defines a registry on a sliding scale of functionality. In terms of this the requirement for the administration of offset schemes falls on the border between a “register” and a “registry”. The focus of this analysis is to develop a system with the full capability of a registry in terms of this sliding scale.

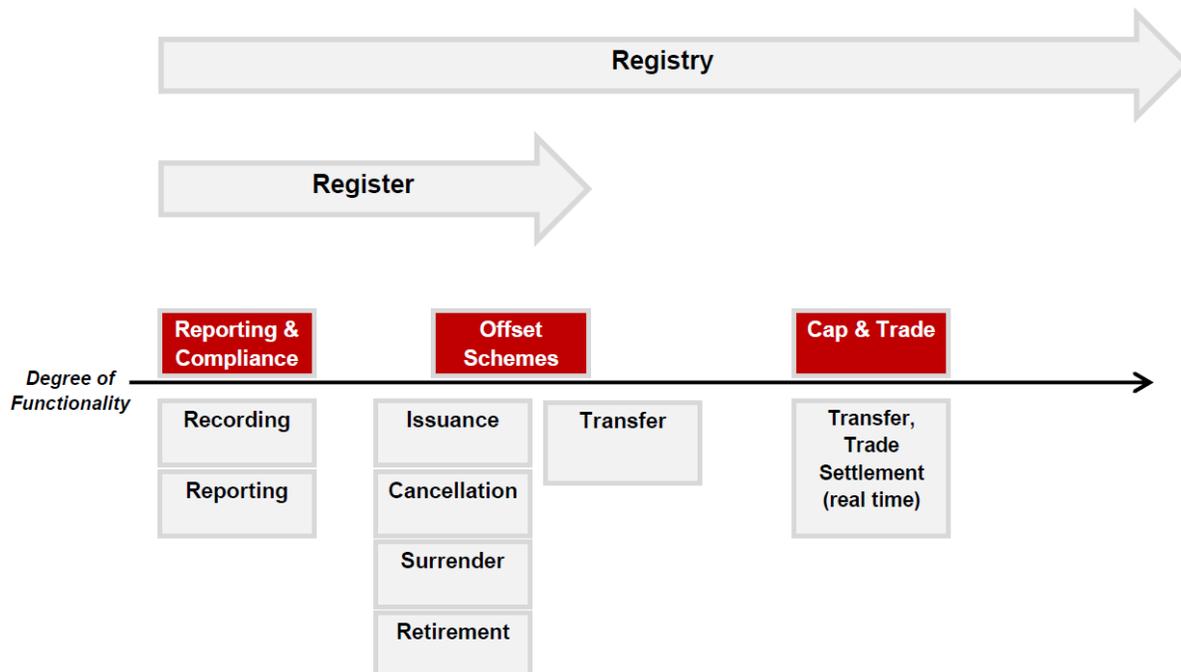


FIGURE 43: PMR SLIDING-SCALE OF PLATFORM FUNCTIONALITY

The PMR⁶⁵ analysed a number of factors influencing the choice of a registry platform. These include:

Purpose of the policy-based Market Mechanism: The PMR states that: *...for example a ‘cap and trade’ mechanism, where the ability to trade and establish a successful market for such trading will be key to its success, is likely to require a greater degree of sophistication than an offset scheme. An offset scheme that is simply aiming at registering offsets, recording purchases, sale and retirement of such offsets will require less sophistication.* Within this context, it is important to see that the level of sophistication of the South African system does not have to match that of

⁶⁴ Zaman, P, Partner Reed Smith LLP, Workshop Background Paper No.1, Setting The Legal Framework for Transaction Registries, September 2015

⁶⁵ Zaman, P, Partner Reed Smith LLP, Workshop Background Paper No.1, Setting The Legal Framework for Transaction Registries, September 2015

the European Union (as an example), which has to cater for the management of the full cap-and-trade scheme.

Scope of the Market Mechanism: The PMR states that: *a Market Mechanism that covers a larger number of sectors (e.g. energy generation, forestry, transportation (road, aviation, shipping), manufacturing, medium and large industrial operations, etc.) will attract a greater number of participants, potentially more transactions and therefore, by necessity, more automation.* The South African system will cover most of the sectors in the economy. The sectors that will be able to generate offsets will be those that are excluded from the carbon tax. The level of sophistication of the South African system must be able to handle the sectors covered.

Scale of the Market Mechanism: The PMR states: *The larger the size of the proposed trading marketed, the more likely that automated (as opposed to manual) processes will be required to capture, manage and record transactions.* The analysis in this report is based on the premise that the South African system will be large enough to warrant automated (as opposed to manual) processes that will be required to capture, manage and record transactions.

Potential for growth (international or domestic): This analysis is based on the assumption that the South African system will not be linked to international markets in a reciprocal way.

This analysis is further conducted on that basis of the legal frameworks required:

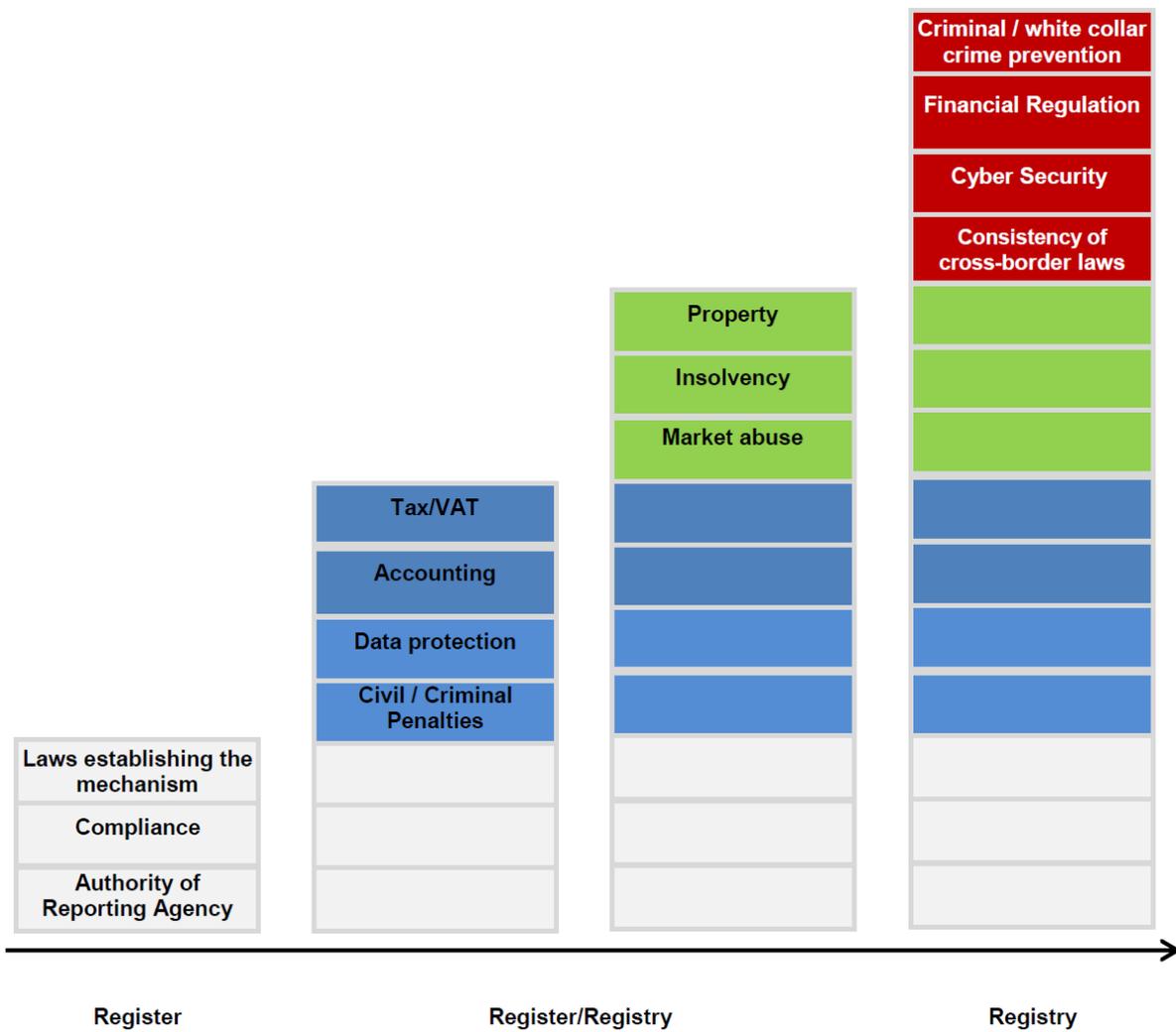
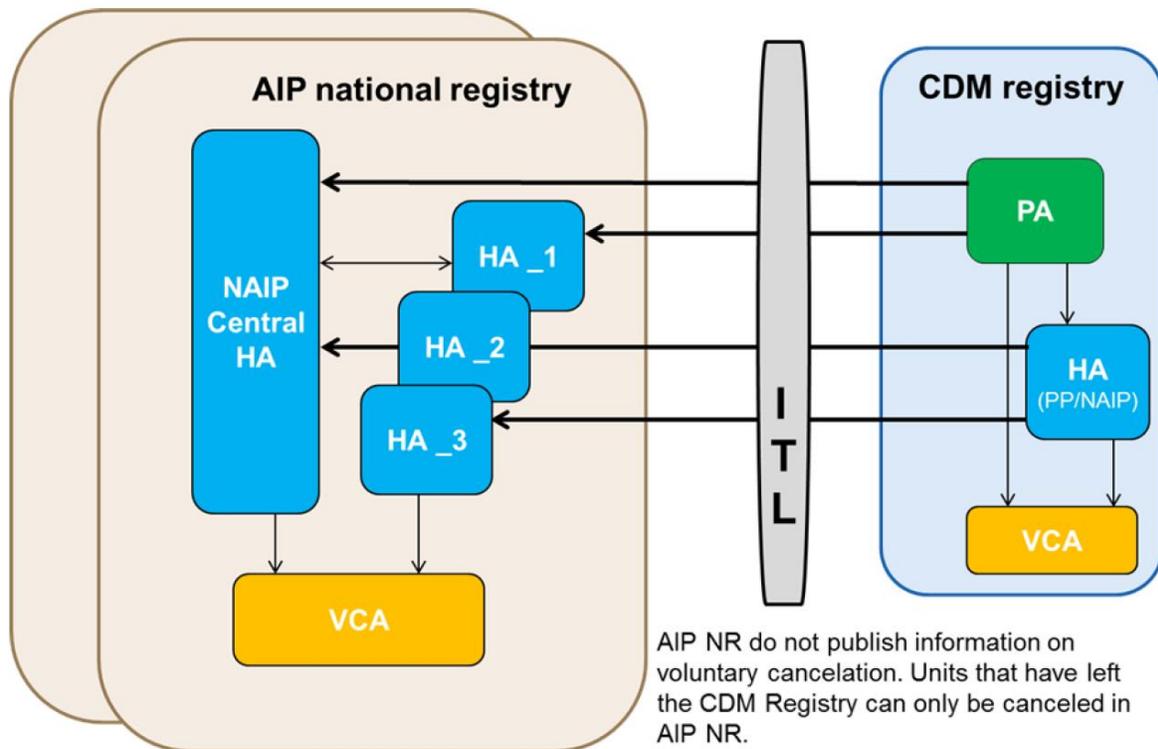


FIGURE 44: PMR BUILDING BLOCKS OF THE LEGAL FRAMEWORK

7.1 UNFCCC

The United National Framework Convention on Climate Change (UNFCCC) operates the CDM registry and the International Transaction Log (ITL).



Notes: PA=Project Activity; PP_HA= Project Participant Holding Account; NAIP_HA= a Party account operated by an entity authorised by the NAIP; NAIP_Central HA= the Party account operated by the NAIP; VCA= the voluntary cancellation account in the CDM registry for administrative and other purposes

FIGURE 45: TRACKING AND CANCELLING CERs THROUGH AN ANNEX I PARTY REGISTRY⁶⁶

⁶⁶ PMR Technical Brief: Voluntary Cancellation of CERs for Domestic Offset Schemes

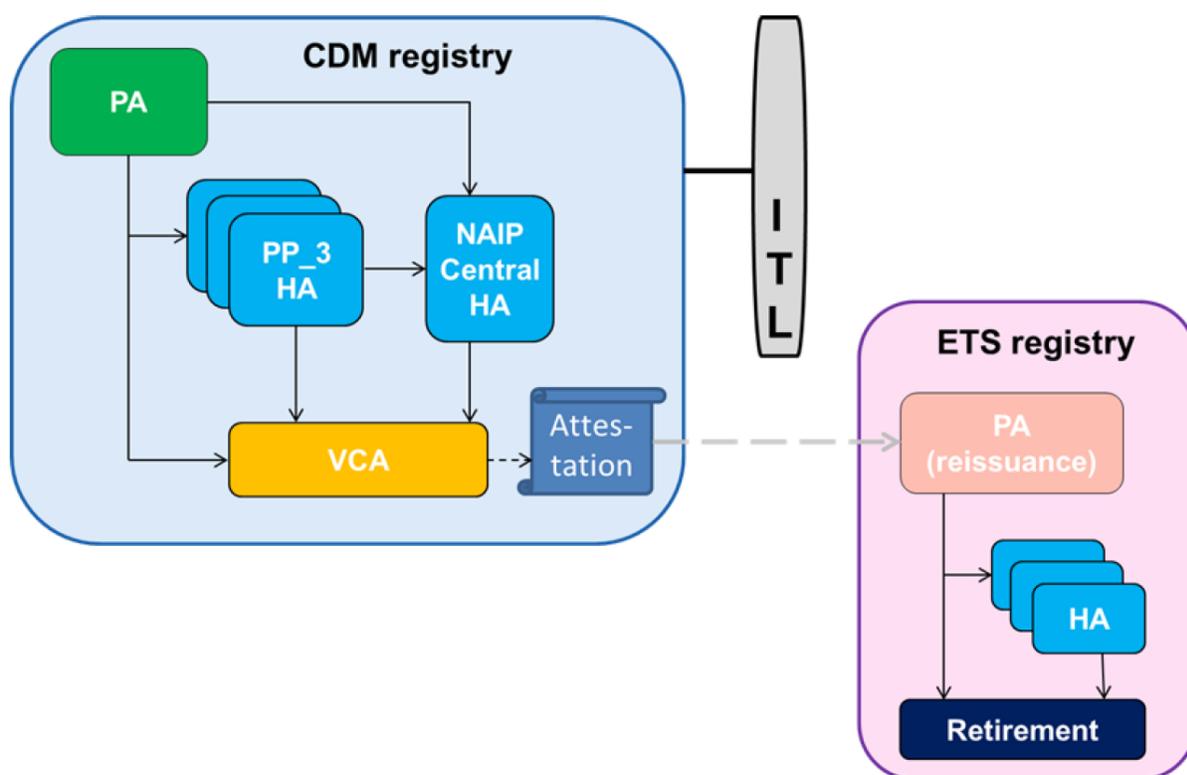


FIGURE 46: RE-ISSUANCE OF NATIONAL LEVEL COMPLIANCE UNITS BY VOLUNTARY CANCELLATION⁶⁷

The ITL operates on the following basis:

The content of the CDM database includes the following publicly available information:

TABLE 19: PUBLICLY AVAILABLE INFORMATION IN THE CDM IT SYSTEM DATABASE

Data field	Comments
Registered	The date on which the project was registered
Title	The project title
Host Parties	The country in which the project is implemented
Other Parties	Other countries involved in the implementation of the project or purchase of the credits
Methodology	The approved methodology and version of the methodology used
Reductions	The amount of emission reduction the project aims to achieve estimated <i>ex-ante</i>
Reference	The project registration number
Project	A list of project documents including the Project Design Documents (PDD) as well as all project documents uploaded by the project participants
VVS Version	The version of the Validation and Verification Standard used in the project registration

⁶⁷ PMR Technical Brief: Voluntary Cancellation of CERs for Domestic Offset Schemes

Data field	Comments
Standardised baselines used	Information of any Standardised Baselines used in the registration of the project
Validation Opinion	Links to the validation documents uploaded by the Designated Operational Entity (DOE)
Renewal Date	Dates of renewal from crediting periods in the event that a project as selected the use of renewable crediting periods
Requests for Issuance and related documentation	Full history of all issuance requests and documents associated with the issuance

Whereas the primary reference point in the CDM Administrative IT System is the project registration number, the primary reference point in the CDM registry is the name of the account holder. The CDM registry makes provision for the following type of accounts:

- a) *One pending account for the Executive Board, into which CERs are issued before being transferred to other accounts.*
- b) *At least one holding account for each Party not included in Annex I hosting a CDM project activity or requesting an account*
- c) *At least one account for the purpose of cancelling ERUs, CERs, AAUs and RMUs equal to excess CERs issued, as determined by the Executive Board, where the accreditation of a designated operational entity has been withdrawn or suspended*
- d) *At least one account for the purpose of holding and transferring CERs corresponding to the share of proceeds to cover administrative expenses and to assist in meeting costs of adaptation in accordance with Article 12, paragraph 8. Such an account may not otherwise acquire CERs*

In addition to this, the registry is structured to allow each CER issued to have a unique serial number that complies with the following requirements:

- a) *Commitment period: the commitment period for which the CER is issued*
- b) *Party of origin: the Party which hosted the CDM project activity, using the two-letter country code defined by ISO 3166*
- c) *Type: this shall identify the unit as a CER*
- d) *Unit: a number unique to the CER for the identified commitment period and Party of origin*
- e) *Project identifier: a number unique to the CDM project activity for the Party of origin*

Note that the CDM database structures for standalone projects and Programmes of Activity (PoAs) are different. In the case of the CDM, the PoAs have been added later. We suggest that the South African system is built from the beginning to accommodate both standalone projects and PoAs.