



Challenges associated with implementing climate change mitigation policy in South Africa

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List of Acronyms

AIDC - Alternative Information and Development Centre

BUSA - Business Unity South Africa

CAIA - Chemical and Allied Industries Association

COP - Conference of the Parties

DEA - Department of Environmental Affairs

DEAT - Department of Environmental Affairs and Tourism

DEROs - Desired emissions reduction outcomes

DG - Director General

DoE - Department of Energy

DTI - Department of Trade and Industry

EIUG - Energy Intensive Users Group

ERC - Energy Research Centre

GHG - Greenhouse gas

INDC - Intended Nationally Determined Contribution

IPCC - Intergovernmental Panel on Climate Change

IRP - Integrated Resource Plan

ITTCC - Industry Task Team on Climate Change

LTMS - Long Term Mitigation Scenarios

MPA - Mitigation Potential Analysis

MSA - Multiple Streams Analysis

NCCRGP - National Climate Change Response Green Paper

NCCRWP - National Climate Change Response White Paper

NDC - Nationally Determined Contribution

NEMA - National Environmental Management Act

NERA - National Electricity Regulation Act

PPD - Peak Plateau Decline

PPP - Pollution Prevention Plan

REIPPPP - Renewable Energy Independent Power Producer Procurement Programme

SBT - Scenario Building Team

UNFCCC - United Nations Framework Convention on Climate Change

USA - United States of America

Introduction

The aim of this paper is to explore challenges in implementation of greenhouse gas (GHG) emissions mitigation policy in South Africa using John Kingdon's Multiple Streams Analysis (MSA) Framework (Kingdon, 2014). The research does not focus on the technical content of the policies but on institutional, public administration, political and political economy issues involved in policy implementation. While it is impossible not to analyse at least some of the technical content, this is limited to what is needed to shed light on the more politically orientated analysis.

At the 2009 Conference of the Parties (COP15) of the United Nations Framework Convention on Climate Change (UNFCCC), South Africa pledged to limit its GHG emissions to a Peak Plateau Decline (PPD) trajectory (South Africa, 2010). The PPD specifies a quantitative maximum emissions range from 2010-2030. Complying with the limit would entail significant efforts by emitters of GHGs to invest in technologies and other measures as well as behaviour change (LTMS Technical report, 2007; MPA, 2014). The PPD has been further developed and refined since COP15, and the latest version is specified in absolute quantitative terms in the 2011 official National Climate Change Response White Paper (NCCRWP), and South Africa's Intended Nationally Determined Contribution (INDC), (now the Nationally Determined Contribution¹ (NDC), since its ratification on 1 November 2016), framed by the Paris Agreement reached at COP21 in 2015 (Department of Environmental Affairs (DEA), 2011; South Africa, 2015).

In addition to the specification of the PPD, the NCCRWP contains a mitigation policy framework, and the specifications, or at least names², of a set of mitigation policies within that framework. The policies include plans and regulatory and economic instruments intended to cause emitters to undertake GHG emissions mitigation measures.

A number of milestones for implementation of the mitigation policies were set out in the NCCRWP. These included the requirement for a 'foundation of the response', namely the GHG emissions reporting regulations and data system, to be operational by 2013 (DEA 2011:29) and the carbon budgets also by 2013 (DEA, 2011: 25). These milestones have not been achieved. An important finding of this research is that the mitigation policies specified in the NCCRWP are mostly³ not yet in operation and that significant challenges are being experienced in bringing them into operation.

Efforts to implement climate change mitigation policy in South Africa

South African climate mitigation policy has been under development for a number of years. South Africa acceded to the Kyoto Protocol in 2002, submitted its Initial National Communication to the UNFCCC in 2003, and in 2004 published a National Climate Change Response Strategy (DEAT, 2004). These initial efforts can be seen as steps in implementation of the emerging policy. Mitigation policy development took a significant step forward with the LTMS process (Winkler, 2010; Raubenheimer, 2011) which identified packages of mitigation measures 'wedges', bundled in scenarios, to formulate strategic options which indicated South Africa's mitigation potential (SBT, 2007). The LTMS involved a stakeholder process and a technical process. In addition to calculating the costs of emissions mitigation measures and exploring their potential combined contribution to reducing South African emissions from a 'growth without constraints' to a 'required by science' trajectory, the LTMS results included the conclusions that 'in the upcoming international negotiations there is increasing pressure on the larger developing country emitters to demonstrate their plans for achieving emissions

¹ South Africa ratified the Paris Agreement on 1 November and according to paragraph 22 of UNFCCC Decision 1/CP.21 from that date the INDC became the NDC.(UNFCCC, 2015)

² The level of detail of the specification of some of the policies is limited to naming the policy.

³ In terms of mitigation flagship programmes with the exception of the renewable energy and residential and commercial energy efficiency flagship programmes.

reductions. It is accordingly incumbent on South Africa not only to urgently develop such a plan, but also to prepare the path for its implementation', and that 'the economic challenges are huge because of the sheer scale of the mitigation solutions required' (SBT, 2007: 2).

Much research and analysis has been done on the technical content of South Africa's 'mitigation measures' (e.g. SBT, 2007; DEA, 2013; Altieri et al, 2015; DoE, 2011; National Treasury, 2013a) but little has been done on studying the institutional, public administration, political and political economy issues involved in implementing mitigation policy in South Africa. Initial work in this area includes Tyler and Gunfaus's (2015) review of the LTMS, Baker et al's (2015) study on the political economy of decarbonisation in South Africa, and Trollip et al (2015), which is a synthesis paper of implementation case studies in South Africa. This paper seeks to build on and further develop this emerging body of work.

Methodology, theoretical framework and key definitions

Research objective and methodology

Research objective

This paper explores institutional, public administration, political and political economy challenges involved with implementing mitigation policies specified in the NCCRWP. Kingdon's MSA is utilised as the theoretical framework as elaborated in *Agendas, Alternatives and Public Policies* (Kingdon, 2014: 2nd Edition).⁴

Methodology

The theoretical framework was chosen in parallel with the initial assessment of policy documents and associated documentation of the policy process. Within the theoretical framework and definitions (see below) three kinds of data were analysed: policy documents, documentary evidence related to the policy process, including stakeholder positions/inputs, and interviews.

Policy documents

Data compiled to support the interview research analysis was compiled from documents in two broad categories. Firstly, overarching legislation such as the National Environmental Management Act (NEMA) and National Electricity Regulation Act (NERA). Secondly, technical descriptions of the policies themselves, or design options such as in the NCCRWP, or Carbon Budget Design, or policy instruments such as the draft emissions reporting regulations (DEA, 2015) and draft Pollution Prevention Plan Regulations (DEA, 2015), Carbon Tax Policy Paper (2013), the Environmental Fiscal Reform Paper, Carbon Offsets Paper (2014) (National Treasury, 2015a) or presentations made by DEA on technicalities of policy options. The use of this technical information was limited to providing a general understanding of the planned overall operation of the mitigation policy system, because, as mentioned, the research intention was not a technical analysis. ERC (2015) provides a good technical overview of the mitigation system.

Documentary evidence related to the policy processes

The other category of documentary evidence was reports on policy development processes, submissions made to formal policy development/implementation processes and reports of and

⁴ All future references to Kingdon are to this work.

about these processes. Examples are presentations made by government on progress in implementation, stakeholder submissions to the Davis Tax Committee⁵, and newspaper reports.

Interviews

The research focuses on analysing information collected in interviews with actors who have been playing key roles in the mitigation policy implementation processes: senior government bureaucrats responsible for policy design and implementation, their counterpart business leaders who have had regular interactions with government in formal and informal processes, consultants supporting both the bureaucrats and the business leaders, academics, NGOs and a development aid organisation. Twelve interviews were conducted which covered most of the central figures intimately involved in climate change policy formulation and implementation processes since the NCCRWP.

Two hours were requested for the interviews, which centred around open-ended questions that essentially asked, firstly, what the interviewee thinks the main climate change mitigation policies are; secondly, what progress has been made in implementing the policies; and, thirdly, what challenges are being experienced in implementing the policies. Interviews were conducted in person and audio recordings documented them. The interview data is kept confidential and the anonymity of interviewees maintained.

After collecting and collating the documentary and interview data, first the challenges associated with a selection of policies were documented. This is in the section 'Challenges in implementing policies'. These challenges were then analysed in the context of the theoretical framework as interpreted in Kingdon and this analysis is presented in the 'Discussion' section. A first draft of the paper was circulated with interviewees for feedback and provisional findings of the research were presented in workshop format at a parliamentary colloquium on climate change with the intention of stimulating discussion and soliciting comments.

Theoretical framework – Kingdon's MSA

In conjunction with the initial analysis of documentation, a limited scan of the literature of public policy, public administration and policy implementation was conducted in order to choose a theoretical framework. Informal seminars were held at the Energy Research Centre to discuss theory that might be applicable to the study. Kingdon's MSA was selected as a useful theoretical framework for this paper. The use of this framework includes his highlighting of the importance of extra-governmental actors, theory and concepts related to interest groups, and his mention of 'iron triangles'. The MSA consists of three streams: the problem, policy⁶ and politics streams.

The problem (agenda) stream in the MSA

The problem stream is based on the notion that at any point in time there are a multitude of problems that government and those around government can focus on as issues for policy to address. The problem stream investigates how the problems are formulated, who they are formulated by, and how it comes to be that a specific problem makes it onto the policy agenda (to be 'solved' by policy) whilst other problems are ignored.

The policy (alternatives/solutions) stream in the MSA

The policy (solution) stream is concerned with the development and selection of alternative solutions. Sometimes these are developed to respond to problems on the agenda, and in other

⁵ The Davis Tax Committee was set up to assess South Africa's tax policy framework. The Committee conducted a review of the carbon tax to assess design issues, the timing of the introduction of the tax, its alignment with other policy, and its potential impacts.

⁶ Sometimes these 'policies' are also referred to as 'technical solutions', to the policy problems. In terms of our definitions presented below we will continue to refer to technical solutions such as carbon taxes, carbon budgets or efficiency standards and their supporting technical instruments such as reporting regulations and mitigation potential analyses as 'policies'.

cases they are developed independently of a problem, and wait for a problem to get onto the agenda to which they can be attached. Kingdon identifies a 'policy primeval soup' in which ideas and proposals generated by policy communities float around before some achieve sufficient support to be brought to life when the opening of a policy window provides the opportunity and the problem and policy streams get 'coupled'. Whilst solutions/policies change and can become prominent or fade, there appears to be a set of criteria that are common for them to gain traction and 'survive'. These include but are not limited to: technical feasibility, cost, acceptance from the public and policy community, and the anticipation of future constraints, and as a result an adapted proposal to address these constraints. Participants active in the policy stream continuously work on developing solutions, so that when the opportunity arises a proposal for their solution can move towards becoming a policy. Policy entrepreneurs can play a deliberate and influential role in working across the three streams, with the intention of attempting to create the conditions across the three streams that allow a policy (solution) to make it through a policy window should one emerge. Policy entrepreneurs are defined by their willingness to invest energy, time, reputation and resources to push a particular proposal.

The politics stream in the MSA

The politics stream incorporates the role of politics in the policy process and the influence of the different interests and interest groups. It consists of elements such as the public mood, pressure group campaigns, election results and changes in administration (Kingdon 2014:145). Main actors include the public, government, business and other interest groups.

Policy windows and stream coupling

Although for the most part streams operate independently, evidence suggests that significant policy changes occur when streams are 'coupled'. According to Kingdon, the coupling of all three streams has significant influence on determining the agenda and policy change, and policy windows provide opportunities for this coupling. Changes in the political stream, or the emergence of a new problem have the potential to lead to the opening of policy windows, which are opportunities for pushing certain solutions or proposals. As the conditions change so does the availability of a window.

In Kingdon's MSA the distinction between governmental and decisions agendas is defined as: 'the governmental agenda, is the list of subjects that are getting attention, and the decision agenda is the list of subjects within the governmental agenda that are up for an active decision' (Kingdon, 2014:4). The governmental agenda is mainly influenced by events in problem and political streams, whereas the decision agenda requires the availability of feasible alternatives (policies/solutions) that can be attached to a well-recognised problem that has sufficient political support. Thus, coupling of all three streams increases the probability of a problem arising on the decision agenda.

The process of specifying alternatives (policies/solutions) reduces the number of alternatives to be seriously considered by government, and those close to government. The agenda is predominantly influenced by developments in the problem and political streams, whereas alternatives are associated with the policy stream. Alternatives are present in the policy stream, with their proponents looking for problems to which to attach their solution, or looking to enhance the likelihood of adoption through utilising certain political events.

The emergence of pressing problems, or changes in the political stream, are the primary drivers for the opening of windows. On the other hand, the availability of alternatives (policies/solutions), although crucial for pushing a proposal through a policy window, are seldom responsible for creating a policy window. Given that it is the problem and political streams that have the greatest ability to create the openings of windows, windows can be categorised as problem and political windows, and these interact with the policy stream in different ways. If decision makers identify a particular problem as urgent they draw on the policy stream to pick out solutions for the problem. In cases where politicians align with specific issues, they will engage with the policy stream to identify proposals that align with their interests.

Importantly policy windows are typically only open for a short period of time. Thus utilising the opportunity of a policy window in the time it is open is crucial. Policy entrepreneurs play a key role in exploiting the opportunity of a policy window. Kingdon makes the analogy of policy entrepreneurs as ‘surfers waiting for the big wave’, illustrating that, although events and structures are out of the control of individuals, they can anticipate certain elements and can attempt to shape developments to align with their interests.

In order to utilise a policy window within its time constraints, proposals usually need to have been developed in advance so as not to miss the opportunity of the window, as explained by Kingdon (2014: 141): ‘When the time for action arrives, when the policy window ... opens, it is too late to develop a new proposal from scratch. It must have already gone through this long process of consideration, floating up, discussion, revision, and trying out again.’

Politics and Interest groups

The term ‘political’ often involves contestation, conflict, competing interests and controversy, so a definition is offered for its use in this paper. Our definition is based on Crick (1962) and firstly relies on accepting that there are different groups with different interests, that these interests are often competing or are in conflict and that this competition or conflict often cannot be resolved with a solution that equally satisfies all interests: thus it is inevitable that the interests of some will be impinged on by others and vice versa. In common terms, there is often not a win-win solution, or ‘common good’. There are often ‘winners’ and ‘losers’. According to Crick, what distinguishes politics from other forms of resolving these inevitable conflicts is that it is a process of deliberate conciliation by action in a free society. Crick states that ‘the political method of rule is to listen to these other groups so as to conciliate them as far as possible, and to give them a legal position, a sense of security, some clear and reasonably safe means of articulation, by which these other groups can and will speak freely’, as opposed to, for example, that of the oligarch which is ‘quite simply to clobber, coerce or overawe’ (Crick: 1968:14). Further, Crick defines politics as follows: ‘Politics, then, can be simply defined as the activity by which differing interests within a given unit of rule are conciliated by giving them a share in power in proportion to their importance to the welfare and the survival of the whole community.’ (Crick: 1968:21).

Given this definition of politics used in this paper, an ‘interest group’ in the context of MSA is understood as ‘an organization that attempts to influence public policy in a specific area of importance to its members’. In contrast to political parties, interest groups do not try to achieve their political objectives by electing their leaders to government office. Instead, they attempt to persuade elected leaders, administrative officials, judges, and others to make and implement laws and policies in line with their positions (Ethridge & Handelman 2010: 163-165). These groups with competing or conflicting interests operate in a political system where they legitimately pursue their interests, which will often be in conflict with others’ interests. Kingdon’s analysis of the actions of interests groups was an analysis of their activities in ‘politics’ in the relatively free democratic system in the USA and includes, in a chapter informatively titled ‘Outside of Government but not just looking in’, actions such as ‘lobbying’, ‘affecting the alternatives considered by policy makers’, ‘promoting’ and/or ‘blocking’ alternatives, and; trying to ‘ensure that their interests are protected in the legislation that emerges’. Thus these activities are viewed as intrinsic to a free democratic political system, and necessary and essential in the defence or promotion of their interests by various interest groups. They are thus also intrinsic and of essential interest in describing and analysing policy development and implementation in the context of the South African democratic dispensation.

While emphasising interest groups was not originally contemplated in the theoretical framework of this research, in the initial assessment of documentation, the importance of interest groups could not be escaped. Using the definition of interest group as ‘an organization that attempts to influence public policy in a specific area of importance to its members’ (Ethridge & Handelman 2010: 163), in analysing the documentary data and our interview records recognition was inevitable of the ongoing role of business groupings such as Business Unity South Africa (BUSA), Chemical and Allied Industries Association, the Industry Task Team on Climate Change (ITTCC), and public interest groups such as the World Wildlife Fund, Earthlife Africa,

the Alternative Information and Development Centre (AIDC), and the Southern African Faith Communities Environmental Network. This is not a comprehensive list and neither has it been possible to gather evidence on all groups and analyse this. However, as mentioned earlier, this research is an initial effort to address the situation that “little has been done on studying the institutional, public administration, political and political economy issues involved in implementing mitigation policy” and thus provides an example of the application of the MSA and interest-group concepts to some important actors in this area.

Further, in exploring the role of interest groups in climate change politics, it is apparent that the interests most likely to be severely impinged on by emissions, in the form of the impacts of climate change, are largely likely to be those that cannot adapt or cannot easily adapt – mainly the poor. In general, this large group of people is not as well organised or resourced to represent their interests or participate in the activities identified by Kingdon, as are energy intensive large industrial emitters and the fossil fuel industry that supplies much of their energy and the energy to the economy. There is a large literature that addresses issues involved in the disparate power and influence of various constituencies and their agents and representatives. The emissions mitigation problem appeared to have relevance to situations where small, concentrated economically and politically powerful interests were often responsible for a large proportion of emissions, and their support would be required in mitigating such emissions, whereas the interests which would be impinged on by the impacts of climate change were dispersed and relatively more poorly organised sets of people and interests, who would also be less able to adapt to climate change. Many of the most serious effects of climate change are displaced in time, as the most serious impacts of not addressing emissions would only be felt in decades, even though action to avoid this needed to be taken in the near term. It can be expected that interest groups aligned to current effects would be more organised than impacts only expected to emerge in many decades to come.

In this context, Kingdon’s emphasis on the role played by interest groups was noted, especially their relationships with ‘career bureaucrats’ (Kingdon 2014 :33), where he introduces the term ‘iron triangle’. These are special relationships between bureaucrats, congressional committees and interest groups, which are alleged to be impenetrable from the outside and uncontrollable by the executive and political appointees. In engaging with some of our interviewees on the text of this paper, it became clear that some viewed the idea of this kind of relationship between interest groups as being ‘inappropriate’. It must be emphasised that, as per the definition of politics used here, and the activities described by Kingdon, in this analysis these relationships are seen as legitimate and inevitable and essential in the politics of a free society: interests have to be free to attempt to influence government so long as in a free and democratic society this does not involve corruption.

Ethridge and Handelman (2010:163-188) provide a useful overview of interest groups, with some coverage of iron triangles, where they make clear that these are not a form of corruption and show that some political scientists argue that a close relationship between interest groups and government agencies is not necessarily a negative thing. They present information that is useful to our understanding about how interest groups form and operate, especially that it would be difficult to conceive of organised political activity in a free society without such groups. It would be equally difficult to conceive of such activity where some interest groups would not be better resourced and organised and thus be in a better position to establish and maintain relationships with government, and hence more effectively further their own interests. Their conclusion is as follows:

‘However interest groups are ultimately evaluated, it is clear that we cannot begin to understand how government works unless we appreciate their power. The growth of a modern society unleashes a wide range of competing interests, as new industries are developed and as people increasingly begin to affect the lives of others. One way or another, interest groups will form to advance many of these competing interests. How well the society manages those interests while maintaining some degree of democracy and fairness is one measure of the health of a modern political system’ (Ethridge & Handelman 2010:188).

Key definitions: ‘mitigation measure’, ‘mitigation policy’, and ‘implementation’

It is essential to define up-front our use of the terms ‘mitigation measure’, ‘mitigation policy’ and ‘implementation’, given that a key observation during our research has been that confusion is caused by imprecise uses of the concepts related to these terms. The aim of our definitions is not to provide definitive terminology for the area of study in general but to avoid confusion and to be precise and consistent about the use of these terms in this paper.

Within the context of climate change mitigation, the IPCC definitions of ‘measure’ and ‘policy’ are used, as follows (IPCC, 2016):

‘Mitigation measure’

‘In climate policy, measures are technologies, processes, and practices that contribute to mitigation, for example renewable energy technologies, waste minimization processes and public transport commuting practices.’ WGIII (IPCC, 2016).

‘Mitigation policy’

‘Policies are a course of action taken and/or mandated by a government, for example, to enhance mitigation. Examples of policies aimed at mitigation are support mechanisms for renewable energy, carbon or energy taxes, and fuel efficiency standards for automobiles.’ WGIII (IPCC, 2016). Using this definition within the MSA conception of policy, a ‘mitigation policy’ would be identified as being the result of an ‘authoritative decision’ being taken when a ‘solution’ (drawn or based on one or more solutions in the ‘solution stream’ or ‘policy stream’) gets coupled to a ‘problem’ (that is on the ‘agenda’) within favourable dynamics so it is coupled to the politics stream, these couplings creating a ‘policy window’.

The context can determine the application of these definitions in the MSA and in different timing contexts the ‘solution’ in one problem context could later be seen as establishing the ‘problem’, in the agenda stream in the later context. For example the PPD, in 2009 would be seen as the ‘policy’ (solution), to the ‘problem’ in the agenda stream which at that stage could have been phrased as: ‘What are the possible solutions to the problem of how a country should specify its climate change mitigation policy?’ Later, with government having taken a number of authoritative decisions to announce its policy (at Copenhagen) and specify it further (in the NCCRWP), the new ‘problem’ could be seen as the PPD: ‘What solutions are available to achieve the PPD) and the policies (solutions), policies such as the Carbon tax, carbon budgets, etc.

Examples of mitigation policies at different scales would be, firstly, an official commitment to an emissions trajectory target (for example the PPD) or, secondly, a data and reporting and quantitative analysis system to calculate the emissions trajectory and to set emissions limits and to measure impacts of policies to achieve it (which later became referred to as the mitigation potential analysis [MPA]) or, thirdly, individual policies such as regulatory standards or taxes to cause emitters or other actors to undertake ‘mitigation measures’ to reduce emissions. The South African climate change policy as per the NCCRWP is centred on these latter examples, and our analysis on the challenges in implementing them. These individual policies intend to respond to the objectives established by the PPD policy.

Building on the IPCC definitions above, this study differentiates between ‘mitigation policies’, which are authoritative decisions taken by government around actions, or regulations and systems put in place by government to enhance mitigation, and ‘mitigation measures’, which are actions to mitigate emissions taken by emitters or other actors in response to mitigation policy. These mitigation measures are actual investments in technology or behaviour change which materially reduce GHG emissions in the physical world. Examples of mitigation policies would include application and administration of a carbon budget set for an emitter and an information system required for operation of such a budget, such as a mandatory emissions reporting regulation and the related data system. An example of a corresponding mitigation measure would be an investment made by an emitter to comply with a carbon budget.

‘Implementation’

Using the above differentiation between ‘mitigation measure’ and ‘mitigation policy’, the relationship between implementation and policy is clarified by drawing on Pressman and Wildavsky (1984) as follows:

‘We can work neither with a definition of policy that excludes any implementation nor one that includes all implementation. There must be a starting point. If no action is begun, implementation cannot take place. There must be also an end point. Implementation cannot succeed or fail without a goal against which to judge it.’ (Pressman and Wildavsky, 1984 cited in Hill & Hupe, 2002: 4).

With the purpose of bounding our study, in this paper the starting point of implementation of South African climate change mitigation policies is defined as the specifications of the official mitigation policies in NCCRWP. It is thus the policies as specified in the NCCRWP that need to be ‘implemented’. The end point is defined as that the policy is considered as ‘implemented’ when the policy is in operation. In the case of primary policies such as carbon-taxes, carbon budgets and efficiency standards, it would be considered as ‘implemented’ when it is in operation to the extent that it is causing emitters or other actors to execute mitigation measures. The end point, in the case of supporting policies, such as the reporting regulations and related data system, and mitigation potential analysis for allocating carbon budgets, means that the policy is considered implemented when operating adequately to provide the necessary support for the primary policies it supports to operate. Note that this is the definition for the purposes of this paper; in reality, once policies achieve the state of ‘implemented’, as defined here, they then typically begin their operational phase, during which they may be adjusted, re-designed, or withdrawn, in the policy development processes that never cease.

Selected climate change mitigation policies

As mentioned earlier, for the purposes of this research, the ‘starting point of implementation’ was defined as the formal specifications of the policies when published in the NCCRWP and gazetted in October 2011. Many policies were specified in the NCCRWP, in what was called a ‘shotgun approach’ by one interviewee, referring to the lack of selection process for arriving at the given policies. Certain policies have been selected for the current research: those regarded as fundamental components in the mitigation system, or those that have achieved some progress and therefore warrant analysis of implementation, namely: reporting regulations and data-system, the mitigation potential analysis (MPA), DEROs, carbon budgets, the carbon tax and the renewable energy Flagship Programme. Table 1 provides a list of the selected policies, including a brief description, development progress and current status of each policy. Exploring these selected policies has allowed for the identification and analysis of interesting implementation challenges.

Table 1 – Overview of progress and status of selected policies

<i>Policy</i> ⁷	<i>Development progress</i>	<i>Current status</i>
Reporting regulations A national system of data collection involves both the regulations compelling emitters to supply necessary data and the ICT systems required to collect, store, analyse and report the data	March 2014 Notice of intention to declare GHG’s ‘priority pollutants’ May 2015 Draft reporting regulations circulated 8 January 2016 Notice of intention to declare GHG’s ‘priority pollutants’	<ul style="list-style-type: none"> • Declaration of priority pollutants • Reporting regulations Various reports: <ul style="list-style-type: none"> • Promulgation expected imminently • ‘Stuck with minister’ • Promulgation expected January 2017

⁷ Some of these are only as per the official policy document – owing to developments they might not necessarily still be planned for implementation. However, unless there is information that a policy has been officially withdrawn, it is included.

	<p>7 June 2016 New draft reporting regulations circulated for comment June 2016</p> <p>June 2016 Draft technical guidelines circulated</p>	
<p>Pollution Prevention Plans Mitigation plans for economic sectors, sub-sectors and/or companies</p>	<p>Pollution prevention plans regulations 8 January 2016 Draft regulations published</p>	<p>Interviewees</p> <ul style="list-style-type: none"> Status of PPPs in voluntary carbon budget scheme not clear. Approval criteria not clear
<p>Carbon budgets Company carbon budgets, 'cascaded down' (DEA, 2011a) from sector and/or sub-sector DEROs</p>	<p>Voluntary scheme 2016-20</p>	<p>No longer 'cascaded down'. Basis for allocation not clear. A version of grandfathering in voluntary scheme.</p> <ul style="list-style-type: none"> 5% carbon tax exemption offered for participation in voluntary carbon budgets scheme 18 companies were participating in November 2016. Now not clear number or which companies. learning by doing
<p>DEROs Desired emissions reduction outcomes (DEROs) for each sector and sub-sector.</p>	<p>March 2016 Explanatory note 4</p>	<p>The explanatory note is for Phase 1: 2016–20</p> <p>A group of companies have agreed to carbon budgets for the voluntary scheme. However they have no relationship with the DEROs.</p>
<p>Carbon tax Economic instruments to cause reductions in emissions.</p>	<p>Carbon Tax Policy Paper (2013) Environmental Fiscal Reform Paper, Carbon Offsets Paper (2014) Draft Carbon Tax Bill in November 2015</p>	<p>Currently at Draft Bill stage, stakeholder comments received</p> <p>January 2017 is the latest date proposed for the commencement of the carbon tax, however similar proposed start dates have been pushed back, year after year, since 2014.</p>
<p>MPA In-depth mitigation potential analysis in order to provide a basis for the development of policies contained within the NCCRWP</p>	<p>MPA full report December 2014 Approved by Cabinet</p>	<p>Agreed that it will be updated</p>
<p>PPD National GHG emissions trajectory range, against which the collective outcome of all mitigation actions will be measured</p>	<p>25 September 2015 INDC submitted to UNFCCC</p>	<p>PPD specified tightly in a number of policy documents notably NCCRWP, SA INDC</p> <p>Agreed that it is aspirational and that it will be revised</p>
<p>Renewable energy Flagship programme A scaled-up renewable energy programme as specified in the IRP 2010 Flagship programmes not covered here except for the renewable energy Flagship Programme. This policy was not directly driven by the DEA, so it is significantly different from the other policies in this table</p>		<p>Although the Integrated Resource Plan (IRP) / Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) was developed before the NCCRWP, it is the largest successful GHG mitigation measure implemented to date, and electricity remains the sector with largest potential. Also, the IRP/REIPPPP connection with Copenhagen PPD means it is closely connected with mitigation policy implementation and it provides the best example for analysis of implementation to date.</p>

		<p>However, the REIPPPP was implemented before the NCCRWP was gazetted, and thus, according to our definition, we do not include it in our analysis.</p> <p>It has extensively studied and documented see for e.g. Eberhard <i>et al</i> (2014), Baker (2014).</p>
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Challenges in implementing the selected policies

This section presents detailed results from documents and interview records for selected mitigation policies. These results are analysed in terms of the theoretical framework under themes of main findings in the subsequent Discussion section.

Emissions data from reporting regulations and mitigation potential analysis

This subsection gives information from the authors' analysis of documents and interview records about how the challenges related to the lack of data, validity and credibility of data, and acceptance of the results of quantitative analysis based on that data, continue to present a severe challenge to South African mitigation policy development and implementation. Sound data is a fundamental basis for sound policy. In addition, analysis of mitigation potential based on that data, is important. The following section therefore starts with the relevant policies related to data and quantitative analysis namely the reporting regulations and MPA.

Data is a prominent topic, as evidenced by interviewee remarks such as: 'Big business holds the power with voluntary reporting – Government has failed to break the stranglehold'; and 'Business is concerned with government keeping commercially sensitive data confidential'. One interviewee said: 'In 2008 many people said "just get the reporting regulations done", and yet we still don't have them'. The LTMS stakeholder process had to rely on voluntary stakeholder participation to source critical data and provide credibility to quantitative analysis. The need for data and quantitative mitigation potential analysis has continued to be a pressing requirement to inform the development and implementation of policy. Similarly, the questioning of the validity of data and quantitative analysis have played, and continue to play, a central role in mitigation policy implementation.

Credible data and quantitative analysis are necessities for effective policy formulation and implementation.

More than 40 countries have made GHG emissions reporting mandatory. These include facility-level reporting in, for example, the USA, EU countries, Canada and Australia. Facility level data in the US is publicly and easily accessible through the US Environmental Protection Agency website (2016) for significant South African emitters such as Sasol, BHP Billiton and Arcelor Mittal. Electricity generation GHG emissions data is similarly available. The aforementioned countries, which account for a significant proportion of South African trade and are also both consumption markets and production competition for South African energy-intensive industries, have decided that detailed, public domain, facility-level emissions data is appropriate and requisite.

This data is necessary to, *inter alia*, inform development of emissions mitigation policy, evaluate policy, and operate policy instruments such as carbon taxes, carbon budgets and emissions trading to operate in a transparent, credible manner.

When we say 'necessary', this is in the context of the focus of this study on institutional, public administration, political and political economy issues involved in policy implementation, not technical issues. The credibility of data and quantitative analysis based on that data plays a role in legitimising the policy. If questions around data and quantitative analysis can be sustained,

so can questions around legitimacy of the policy. If crucial data and quantitative analysis is not in the public domain, then it is easier to create and sustain questions related to that data and quantitative analysis. Our analysis thus views data as being the subject of and subject to political processes.

The challenge identified both in analysing documents and interviews is twofold. Firstly, to source data in a South African context where there is often almost crippling information and expertise asymmetry between nascent capacity in mitigation departments in government and big emitters. Secondly, to establish ICT systems and related highly specialised skills both in ICT and in emissions statistics and mitigation analysis (World Resources Institute (WRI) 2015:7).

In South Africa, currently available official emissions data in the public domain, and mitigation potential data and analysis, are limited to the national GHG inventory (DEA, 2014) and the Mitigation Potential Analysis (MPA) (DEA, 2013). However, data in the inventory was not sourced from mandatory reporting (and hence public domain source data, as for example facility level data would provide) and is inadequate or inappropriate for many of the crucial purposes that mandatory reporting data and analysis based on that data would support. The validity of the core quantitative analysis specified in the NCCRWP, namely the MPA has also been questioned by key participants in mitigation policy implementation (CAIA, 2015). This section gives information about how the lack of credible data, and hence challenges to the credibility of analysis based on that data, continues to present a challenge to South African mitigation policy development and implementation.

South African government policy on emissions data

The 2010 National Climate Change Response Green Paper (NCCRGP) proposed that a national GHG emissions monitoring and reporting system should be established by 2012 and should 'by 2013 require the mandatory submission of greenhouse gas emission data to the National Atmospheric Emission Inventory by all significant emitters' (DEA, 2010:35).

The 2011 NCCRWP states that 'accurate, complete and up-to-date data is the foundation of an effective response', that the DEA 'will prepare a GHG emissions inventory annually', and that 'reporting of emissions data will be made mandatory for entities (companies and installations) that emit more than 0.1 Mt of GHGs annually, or that consume electricity which results in more than 0.1 Mt of emissions from the electricity sector (DEA, 2011:29). The 'data system' to record and analyse this data and the 'impact of mitigation measures' is also specified as a key element of the overall approach to mitigation (DEA, 2011:6). Presumably this data system refers not just to the ICT-system but also to institutional capacity and the associated specialised skills.

The NCCRWP also specified in October 2011 that 'within two years an in-depth assessment of mitigation potential would be carried out to be available for allocating DEROs to sectors, sub-sectors and where appropriate, individual companies or entities' (DEA, 2011), i.e. carbon budgets. When finally approved by Cabinet in December 2014, this would become known as the MPA, and would unfortunately not be fit for one of its stated purposes, namely 'allocating DEROs to companies'.

Current status of emissions data and reporting regulations

The MPA was carried out and approved by Cabinet in December 2014, a year later than scheduled (DEA 2013a). It is not fit for supporting the PPD, given that the data and analysis made available did not serve such a function (CAIA, 2016).

Following the publication of draft reporting regulations in July 2015 (three years after they were scheduled to be in operation as a foundation of the mitigation system), and then a new draft in January 2016 and the notification that these are 'awaiting promulgation' (DEA 2016a:12), as at January 2017 the regulations have not been promulgated. South Africa thus remains without emissions data based on public domain data from mandatory reporting. Even though the MPA was developed through 'extensive consultation' (Interviewee) there have been challenges to its

current validity owing to changing conditions such as mitigation costs. It is slated for updating, this time in-house by the DEA (Interviews). However, it was not the intention of the department to use the MPA to allocate carbon budgets (Interviewee follow-up). The NCCRWP stated that they would be cascaded down from DEROs, but that is no longer the plan (Interviewee follow-up). It is not known how, beyond the grandfathering in the voluntary scheme, carbon budgets will be allocated. As a result, policy development and implementation reliant on resolving questions or political processes around quantitative analysis based on emissions data and mitigation analysis are unresolved and implementation of effective mitigation policy instruments is delayed.

The reporting regulations and data-system involve far more than designing, drafting and promulgating reporting regulations, which is just one element. The system involves both the ICT system and associated institutional and skills capacity, and based on comparisons with the staff capacity of other climate change emissions data systems such as Clean Energy Regulator of Australia which has 309 staff (Commonwealth of Australia, 2015), South Africa's capacity is woefully inadequate. A number of interviewees expressed the concern that the recent loss of just one staff member who had been employed at the technical level of collecting, compiling and analysing data, would significantly compromise the DEA's capability to collect and analyse emissions data.

In addition to challenges of getting regulations published and data-systems operating and appropriately staffed and skilled-up, there are possibly even greater challenges in getting intra-departmental systems operating. About 80% of emissions are energy emissions and until now emissions calculations have relied on Department of Energy (DoE) and Eskom statistics (DEA, 2014). DEA has gone ahead with implementing its reporting regulations and data system, while DoE is also developing regulations and systems to collect and analyse much of the same data. Interviewees informed us that business is understandably concerned at having to report similar data to different government departments. DEA was aware of the overlaps between energy data and emissions data but decided to go ahead with implementation after not being able to get necessary cooperation fast enough with DoE (Interviewee). Eskom is a crucial source of information and there are also concerns with Eskom cooperation linked to recent escalating problems with data and quantitative analysis issues with the Integrated Resource Plan (IRP), REIPPPP and Eskom supplying key information to National Treasury (Interviewee).

Struggles over emissions data and quantifying South Africa's mitigation potential

The LTMS project was South Africa's first national initiative to develop a national view on South African mitigation potential to inform South Africa's position on the contribution to global mitigation efforts at the UNFCCC negotiations and to inform domestic mitigation policy (DEAT 2006:4). The project, mandated and approved by Cabinet, used packages of emissions reduction measure 'wedges', bundled in scenarios to present strategic options which indicated South Africa's mitigation potential (SBT, 2007). The LTMS involved a stakeholder process and a technical process (Winkler et al, 2007; Winkler, 2010; Raubenheimer, 2011).

In 2015, eight years after completion of the LTMS, Tyler and Gunfaus (2015) interviewed many of the key LTMS participants and reported that 'in general, all interviewees felt that the LTMS achieved its objectives at the time' (Tyler & Gunfaus 2015: 15). According to Tyler and Gunfaus (17), data limitations had been acknowledged to be an issue throughout the LTMS process. Out-of-date data from the 1994 GHG inventory was used, and to address this Eskom generated much of the data and stakeholders helped fill data gaps, and the resulting analysis was accepted as being adequate for the kind of big-picture analysis for the scenarios.

A number of issues have been raised by some stakeholders in the period since the LTMS report was approved by Cabinet in 2008, many related to pushback from stakeholders that began in 2010, after the LTMS had been used as the basis for the South African Copenhagen Pledge in December 2009. Interviewees in the Tyler and Gunfaus study indicated that 'the pushback centred on the data issues in the LTMS analysis itself, and also on the lack of updating of the LTMS' (Tyler & Gunfaus, 2015:20). The challenges first centred on the validity of the PPD.

Key stakeholders began to say that they had participated in the LTMS and had gone along with the ‘quick and dirty’ and quite ‘coarse’ work on the basis that it would not be used for policy. When the LTMS results started being used in policy that could impact them materially, some interests began to criticise the official PPD benchmark range, raising questions about the validity of the LTMS (Tyler & Gunfaus, 2015).

The MPA (mandated by the NCCRWP) ‘with additional measures’ pathway achieved emissions reductions which fall within the PPD range up until 2040 (DEA, 2013a:111). Nevertheless, at the launch of the mitigation policy implementation consultations on 1 July 2014, stakeholders raised questions about the credibility of analysis of whether mitigation measures implemented in the ‘real world’ of competing priorities, and economic and institutional realities, could achieve the PPD. Some stakeholders in the NCCRWP policy implementation consultation process (the ‘DEROs consultation process’) claimed that this was not so, and took the position that their participation in the consultations was conditional on a revision of the PPD by the DEA (Interviewees).

Criticisms of the validity and credibility have been made in a number of fora (CAIA, 2016; Sasol, 2016). The MPA is to be updated (CAIA, 2016:4). However, in the absence of public domain emissions data and transparent quantitative analysis methodologies, including the calculation/estimation of mitigation potential, based on credible research, the results of the updating process could face some similar challenges to the first version.

One interviewee involved in the update said that key data is only available to certain stakeholders, peer review of the MPA is therefore not possible and therefore neither is peer review of key technical or policy analysis and in this context certain parts of stakeholder consultation processes ‘become a farce’ (Interviewee). Another interviewee was of the opinion that a strategically cynical game was being played where DEA was placed in a Catch-22 situation: some stakeholders challenged the validity of quantitative analysis that was the foundation of policy while at the same time denying public-domain access to the information required for the kind of peer-review that would resolve the question of validity of the analysis.

While from a technical point of view the pushback was expressed in terms of data issues and the credibility of related mitigation potential analysis, and the lack of economic impact assessment by DEA (CAIA, 2016), it is possible, taking a political view, that these issues could be chosen because they offer vulnerable points to question policy, which if effectively implemented, would probably have a significant negative material impact on a number of interests.

When the pushback against the LTMS started around 2010, and subsequently during the MPA process and during the DEROs consultation process, some of these interests, some big emitters, held the necessary data, but kept it confidential⁸, and at the same time challenged the validity of analysis, based on these data. Some of these same interests still exclusively own the data, mandatory reporting is still outstanding and they continue to question the validity of emissions analysis on the grounds of data and analysis being based on the lack of either access to, or peer-review of, data that only they can facilitate. Thus the DEA has continually been put in a logical bind: DEA cannot produce evidence that satisfies stakeholders because the data necessary for this evidence, in the form of emissions data and emissions mitigation analysis, is owned and held exclusively by those stakeholders. An additional challenge is that, even when reporting regulations are promulgated, if the level of detail is not sufficient, or the data is confidential, the necessary level of detail of analysis and/or corresponding transparent assessment will not be possible to resolve these issues.

The NCCRWP had stated that ‘reporting of emissions data will be made mandatory for entities (companies and *installations*)’ (emphasis added) and, as mentioned before, facility (equivalent

⁸ South Africa has a relatively small scientific/technology community involved in emissions mitigation. Data and personnel have to traverse institutional boundaries and much data, or sufficiently accurate estimates, or knowledge related to these, is present inside institutions including companies, the academy and consultancies. However, official, public domain data, at the required level of disaggregation, required for open peer-review and productive open debate (which is not undermined by attacks on data-quality or sources), or to operate regulatory systems where numbers can equate to financial obligations, is what is largely at issue.

to installation) reporting is common in many jurisdictions, and made available in the public domain. The ITTCC reports (ITTCC, 2015) that ‘at the meeting between business and the DEA on 24 April 2015, Business Unity South Africa (BUSA) agreed with the Director General (DG) that data will be collected at company rather than facility level.’ This is a decision with potentially severe negative implications for resolving the ongoing conflict over quantitative analysis related to mitigation policy implementation. The research for this paper has not been able to identify published policy analysis that such a crucial decision would necessarily need to be based on.

Will the reporting regulations overcome this challenge?

Submissions commenting on the draft regulations were invited but it is not known to what extent these comments have been addressed and if key issues related to reporting have been addressed. For example, formal submissions on the draft regulations (ERC 2016a: 3) mention that it is not clear that emissions will be reported for each facility and that this lack of clarity could lead to ‘data providers’ aggregating to the company level. In fact the data-table format supplied in the regulations does not provide for facility level reporting (DEA, 2016b: 21) and the reporting guidelines (DEA, 2016c) and therefore non-facility level reporting could be expected as default. Also, the ITTCC report (ITTCC, 2015) claims this has already been arranged between business and government. Whether or not to report at facility level is a key consideration. In a recent study of mandatory reporting, the WRI reports that of the nine entities studied in detail seven have facility-level reporting. Those with mandatory facility level reporting include Australia and Canada (with minerals-based, energy-intensive, high-emitting industries like South Africa’s), the European Union and United States, thus representing a significant proportion of South Africa’s trading partners and also countries that host facilities owned by some of the transnational corporations that own large emissions intensive facilities in South Africa, such as ArcelorMittal, Sasol and BHP Billiton. Electricity generation also has to report at facility level.

Countries with experience in operating mandatory reporting have opted for facility-level reporting and full transparency, including assisting access to data through public-domain web-access services (WRI: 2015). Also, it appears that in countries with similar market economies, and mature and stringent competition regimes, issues of commercial competitiveness, or associated competition legislation do not prevent this.

The WRI Guideline for designing mandatory GHG reporting programmes states that programme objectives should guide the design of the regulations and that these should be clearly articulated. However, in both versions of the draft reporting regulations (DEA, 2015, 2016) and the guideline (DEA, 2016b) there is an entirely inadequate section defining the programme objective – namely it just lists that the regulations are for: ‘Policy formulation, implementation and legislation; International reporting to the United Nations Framework Convention on Climate Change; and, Reporting to the National Inventory.’ This is all the information available to link the design of the reporting regulations and the specifications of the data they are designed to capture to the intended function and design of the policy instruments. There is no information or analysis provided on what data is required for this. Thus no links are made between a very high-level specification of what the data will be used for and what data would be needed, with proper policy analysis of options such as facility-compared to company-level and data transparency. How the data and related quantitative analysis would be used to serve design and operation of policies such as carbon budgets and the carbon tax is not mentioned.

Carbon budgets, DEROs and PPPs

Evolution of the technical design of the policy

The carbon budgets and DEROs were first mentioned in NCCRWP (DEA, 2011). Notably there was no mention of them in the NCCRGP or in the consultation process for the white paper,

which was one of the factors cited by interviewees as responsible for undermining the support for the carbon budgets and DEROs. The NCCRWP was thus significantly different from the white paper and had substantial policy components that were not subject to public or stakeholder comment (Interviewee follow-up). The NCCRWP stated that within two years of its publication in 2011 carbon budgets would be allocated and adopted. It also outlined the intention for sector-level DEROS to be cascaded to company or facility level, and that this would be based on an in-depth MPA (DEA, 2011). Since then a stakeholder process to develop the carbon budgets has been ongoing and the carbon budgets policy has not yet been implemented.⁹

In a context of a significant policy instrument (carbon budgets) being inserted in the NCCRWP without consultation and a context of lack of data provided by companies and quantitative analysis accepted by industry for the design or allocation of carbon budgets and legislation that can compel companies to implement carbon budgets, a voluntary carbon budget scheme is being undertaken over the 2016-2020 period (DEA, 2016d). The scheme involves the DEA and a number of (eighteen in October 2016) companies in a learning-by-doing exercise to inform the design of a mandatory scheme to be introduced in the 2021-2025 period. The timelines identified correspond with those laid out in South Africa's Nationally Determined Contribution (NDC).

To demonstrate how companies intend to achieve their voluntary budgets, companies are required to submit pollution prevention plans (PPPs). Interviewees from companies participating in the voluntary scheme, indicated that it is unclear about the criteria used to approve the PPPs. At present the PPPs under the NEMA, Air Quality Act, are still in draft form, and are therefore not yet mandatory.

A number of explanatory notes have been shared with participants of the process, the latest version being the DEROs Explanatory Note No. 4 (DEA, 2016d), which is the only one we have managed to access for this study. According to DEA all relevant documents are shared with the NCCC (Interviewee- post interview comment).

The progress of carbon budgets and DEROs

A number of interviewees raised the issue that the DEROs and carbon budgets are problematic in a number of ways, and in their current form inappropriate for implementation in South Africa. The commitments in the voluntary carbon budgets are broadly limited to the actions that business intend to take that make financial sense for a company without constraining GHG emissions (Interviewees), and include planned expansions (ITTCC, 2015).

The PPD and MPA are important elements of climate change mitigation policy in South Africa as they form the foundation of the policy. However both have been criticised by various stakeholders, leading to other elements of the policy such as the carbon budgets and DEROs being questioned (Interviewees). Addressing the issues with the PPD and MPA, especially their basis in publicly available official emissions statistics at facility level, and associated peer-reviewed quantitative analysis, could support further progress with the carbon budgets and DEROs.

The Integrated Resource Plan (IRP) for electricity developed by the DoE, is a key planning document for South Africa's electricity sector. Although the IRP 2010, published in March 2011, stated the need for the IRP to be a 'living document' to be updated every two years (DoE, 2011), in 2016 the official IRP in force is still IRP 2010. Given the significant changes and deviations from forecasts in the electricity sector since IRP 2010 was released, a prominent view held by numerous interviewees is that the IRP 2010 is outdated and inappropriate for the purpose of planning of the future of electricity. Thus, they indicated the release of an updated IRP is an essential prerequisite for the revision of the PPD and MPA. However, there is major uncertainty around the release of this document, with some evidence suggesting the highly political issue of the inclusion of nuclear in the updated of the IRP will continue to delay its

⁹ See definition of 'implemented' above in: 'Methodology, theoretical framework and key definitions'

release (Interviewee). It could also be that, as with the IRP 2010 process, even when it is released it will be highly contested, thus not resolving key issues relevant to the PPD and MPA.

Adding to the opposition to the current MPA are the divergent interpretations of its meaning, sometimes even by the same interest groups. DEA refers to the MPA as the technical and economic mitigation potential for South Africa (Interviewee). Interviewees from business indicate that the MPA represents maximum mitigation potential, but that, when taking into consideration national contexts and sector specificities, such as issues around competitiveness and jobs, the MPA could not be implemented without causing serious damage to the South African economy. Furthermore, they stated that, due to the slowdown in economic growth, and flat electricity demand growth, South Africa is currently below the upper level of the PPD. Based on this they expressed that further reductions are not needed. Contrastingly, the ITTCC indicated the position that 'the problem with the current PPD is that it is very strict and keeps industry to a specific number and range' (ITTCC, 2015: 4).

According to the presentation of a government official at a parliamentary colloquium on climate change (DEA, 2016c) carbon budgets lack a legal basis for mandatory compliance. Along with the PPPs, other forms of legislation could play a role in supporting the implementation of the mitigation system. Various interviewees raised the importance of a climate change act. This is currently being discussed in the DEA's *Towards a climate change response legal framework: Draft concept document 2016. To give legal effect to the national climate change response policy*. The intention of a climate change act would be to give legal basis for climate action. The lack of legislation supporting implementation of mitigation policy up until now, has been cited as a major problem (Interviewees). Whilst legislation undoubtedly has a role to play, some interviewees stated that the potential role as well as the limitations of a climate change act should be carefully assessed, including issues related to the alignment or contradiction with a broad raft of other existing legislation.

The importance of alignment is not confined to other legislation but is also necessary between the different instruments identified in the NCCRWP. The carbon tax is an economic instrument and carbon budgets are a regulatory instrument but both are intended to contribute to the mitigation response outlined in the NCCRWP (DEA, 2011). Numerous interviewees expressed serious concern about how the two instruments will be integrated and this is also a core concern expressed by CAIA in their 2016 submission (CAIA, 2016a) to DEA on the design of the draft report on integrating the carbon budgets and carbon tax. Tyler and Cloete (2015) also present an analysis of this concern in their 2015 paper 'Combining price and quantity instruments - insights from South Africa' stating that: 'It is found that combining sector level quantity targets with a broad-based carbon tax can provide emissions certainty, but at a cost of greatly complicated mitigation policy design.' The same paper says that the motivation for such joint instruments is the 'desire for specific emissions limits at sub-national level.' (Tyler & Cloete, 2015:1) The lack of adequate data and quantitative analysis, combined with the partially developed designs of the complicated policy instruments, makes the challenge of developing legislation more severe still.

Given the slow rate of progress achieved until now, a crucial question at this stage is: How will the involvement of stakeholders in the voluntary scheme shape the design of the carbon budgets, their implementation, and their effectiveness at reducing emissions?

CAIA states in its 2016 position paper on climate change that: 'Even though refuted by the DEA, there is concern that these policies as well as inappropriate targets that may be set for GHG emission reduction will result in deindustrialisation and companies leaving South Africa in order to be able to continue operating. Furthermore, opinion by the World Bank and the National Treasury that the risk of leakage is low, this is not clear' and; 'firms ... have mostly already mitigated direct process emissions to the extent that is feasible or available.'

A research supported resolution of these concerns would require mitigation potential analysis of quantitative targets for processes/facilities/installations that showed what the impacts of targets would be; for example the analysis would show whether achieving targets would entail curtailment of production or what level of investments would need to be made to improve emissions intensity. A research-supported resolution of the deindustrialization concern would

also require economic impact assessments in addition to the improved mitigation potential analysis. The current research has not identified either public domain data to support such analysis, nor public domain analysis: either of the mitigation potential of the individual processes/facilities, nor of economic impact. In the absence of such data or analysis, the struggle between big emitters and government attempting to implement the carbon budgets and carbon taxes remains largely influenced by political economy.

Big business is an important interest holder in the carbon budget discussion in South Africa, given that a functioning carbon budget scheme would in all likelihood require some businesses to make emissions reductions. Although businesses report GHG emissions for various purposes, they are not required by law to report for the purpose of mitigation policy, and the data that is being supplied to the DEA is confidential.

Reporting and quantitative analysis, at the required level of disaggregation, and making such data public, are important requirements for designing a carbon budget system that is able to achieve the goal of reducing emissions, for the credible and transparent operation of the system as well as to allow policy analysis of the impacts of carbon budgets. This is dealt with further in the Discussion below in the Information Asymmetry section.

South Africa's participation in the UNFCCC has influenced domestic climate change mitigation policy. Under the Paris agreement, South Africa's NDC specifies three five-year periods from 2016 to 2030 for implementation of mitigation policy. Carbon budgets and DEROs are identified in the NDC as policy instruments currently under development. One of the primary functions for the period 2016–2020 is 'developing and demonstrating' policy instruments (DEA, 2015b). The voluntary scheme for the carbon budgets aligns with this period of development and demonstration.

The carbon tax

Progress on paper

The option of a carbon tax was investigated in the 'Use the market' scenario in the LTMS, which modelled the impact on emissions reductions of different levels of carbon tax ranging from R100–R750 t CO_{2eq} (Scenario Building Team, 2007). Since the completion of the LTMS, National Treasury has published a number of documents to further develop the concept of the tax and investigate its feasibility. This has included the release of a discussion paper in December 2010, the Carbon Tax Policy Paper (2013), and the Environmental Fiscal Reform Paper, Carbon Offsets Paper (2014) (National Treasury, 2015a). Drawing on the inputs of the analytical work for the aforementioned documents, and the stakeholder process that provided comments in response to the carbon tax draft versions, Treasury has released draft Carbon Tax Bills for public comment. In the 2013 budget speech, 1 January 2015 was announced as the start date for the carbon tax (National Treasury, 2013a). The 2014 budget speech announced that implementation of a carbon tax would be delayed by a year to allow for more consultation with the new date being 1 January 2016 (National Treasury, 2014). The 2015 budget speech reiterated that the tax would be effective from 1 January 2016 (National Treasury, 2015b). However the 2016 budget speech made no mention of the carbon tax and as of 31 March 2017 a carbon tax has not been implemented.

Challenges encountered in implementation

The 'Use the market' scenario in the LTMS and the NCCRWP both identified economic instruments and market-based mechanisms to contribute to South Africa's mitigation response (Scenario Building Team, 2007; DEA, 2011a). One such tool is the carbon tax, being developed by Treasury.

The current draft bill identifies two options to implement carbon pricing which is accepted and implemented in many countries of the world as a primary emissions mitigation instrument: an emissions trading scheme or carbon tax. Given the complexity of an ETS and due to the

presence of a few big emitters, an ETS was deemed unsuitable for the South African context. A carbon tax was seen to be a more appropriate mechanism due to administrative feasibility and its ability to cover the majority of GHG emissions and to contribute to a long-term, smooth sustainable transition (National Treasury, 2015a). Core elements of the tax are the inclusion of tax-free allowances, a phased approach to avoid negative impacts on competitiveness of local industry, and protection of vulnerable households from price increases. A rate of R120 per ton CO_{2e} was proposed, to be increased by 10% per year until 2019. Given the tax-free thresholds, effective rates would be significantly lower (Davis Tax Committee, 2015). The carbon tax is intended to be revenue-neutral for the first five year implementation period (National Treasury, 2015a).

Despite commitments by the National Treasury to design and implement the carbon tax, various interviewees pointed out that Treasury are attempting to design and implement the tax but lack an overall mitigation strategy. The carbon tax has received major criticism. To investigate some of the concerns, the Davis Tax Committee was commissioned to conduct a review. A major criticism of the tax voiced by interviewees from business centre around questioning its scientific basis, particularly in terms of evidence on the potential impacts on behaviour change that the carbon tax proposes to address, and the potential socio-economic impacts, and the impact of the tax on the competitiveness of local industries. Interviewees from business expressed concern that, at the proposed levels, a carbon tax would bring about no shift in practices, and that, at a level high enough to stimulate behaviour change, it would significantly increase the cost of operation for industries that have significant lock-in and are unable to shift practices without stranding assets, therefore resulting in industries having to close down due to inability to compete, or being forced to reduce production. Modelling done by Treasury showed that, if introduced in a phased manner and coupled with revenue recycling, a carbon tax would have a small negative impact on economic growth in the short term, would reduce inequality slightly, and bring about a 1% increase in GDP by 2025. However the modelling does not analyse the timing of the different impacts on employment in different sectors and the issue lack of skills or transferability of skills across sectors (Davis Tax Committee, 2015). The tax design aims to provide relief for trade-exposed sectors through additional tax-free allowances. For phase 1, the tax identifies a maximum of a 95% tax-free threshold, with the intention of reducing the thresholds and eventually replacing them with absolute reductions after 2020 (Davis Tax Committee, 2015).

Another prominent issue highlighted by interviewees from business is addressing the emissions associated with electricity generation. Several stated that currently the design of the tax would ensure that industry would be penalised for induced electricity emissions while having little control over these emissions, apart from reducing the amount of electricity consumed, through increasing efficiency, or reducing production. They point out that this could be far more costly per emissions reduction than corresponding emissions reductions in the electricity sector and so, instead the tax should be directed at electricity generation, or at least be designed to cause mitigation investments in the most efficient manner.

The Davis Tax Committee highlights the importance of mandatory reporting requirements and the expectation of them to be effective from January 2016, which has not been achieved. In their recommendations, the Committee stresses the need for Treasury to reach an agreement with industry about Z-factors, for promoting carbon efficiency. More detailed analysis and up-to-date data and modelling are required for a better understanding of revenue recycling, distributional impacts, impacts on employment, as well as impacts beyond phase 1, in the medium term, as well as to come up with appropriate solutions to the problems (Davis Tax Committee, 2015). Without this detailed level of analysis, the information to address the concerns that have been voiced is not available.

The availability of appropriate quantitative analysis and hence associated data plays a fundamental role in the efficacy of a carbon tax. Facility level data is the most appropriate form of data required to implement a well-functioning carbon tax (Interviewee). National Treasury indicated that it had inputs it does not determine the design of the reporting regulations and that it would therefore utilise whatever data became available from the monitoring and reporting system developed by the DEA, which is still under development (National Treasury, 2015a;

Interviewees). As already discussed, however, the current draft reporting regulations stipulate company-level reporting as a requirement (DEA, 2015), and have yet to be promulgated, and the tax cannot be implemented until the reporting system is in operation. This analysis has not identified policy analysis or design documents linking the reporting regulations design to the tax design, so it is not known whether the reporting regulations will be fit for purpose when they are promulgated. We have mentioned before the absence of research or public domain documents on this topic, apart from submissions made to the draft reporting regulations, and that the reporting regulations were said to be with the minister (from mid-2016 – Interviewee). It appears to be a serious challenge to decide on what form the reporting regulations should take without the required analysis of their multiple functions and purposes and the compromises between level of reporting, administrative efficiency, costs, competition legislation issues to name a few. Resolution of these issues has to be viewed as one of the challenges facing implementation of the carbon tax, as well as many other policy development and implementation issues related to the availability of official, public domain emissions data.

Policy alignment plays an important role in making policy implementation possible, particularly climate change mitigation policy due to its cross-cutting nature. Part of this alignment is that between the different components of climate change mitigation policy identified in NCCRWP. The current design of the NCCRWP proposes a highly complex policy, with a number of partially developed elements which need to be aligned. The interaction between a carbon tax and carbon budgets is one such example. Interviewees from business, Treasury and DEA voiced concern about the lack of integration between the two instruments. Both DEA and National Treasury have acknowledged the need for the two mechanisms to be designed and implemented in an integrated manner¹⁰. They have agreed that companies that have agreed to voluntary carbon budgets will be awarded an additional 5% tax exemption from the carbon tax, representing an initial attempt to contribute to this alignment (Davis Tax Committee, 2015; Interviewees). However, this appears to have primarily been used to encourage participation of companies and cannot count as technical integration between the two instruments (Interviewees). Although there are technical challenges to achieving alignment, perhaps even more important are the political challenges. Given that the tax represents the risk of substantial additional costs to energy intensive users, there have been efforts by these interests to protect their current positions by raising their issues with other government departments such as the Department of Trade and Industry (DTI) and the others. Consequently the unaligned DTI policy poses barriers to the carbon tax. These challenges are political in nature and therefore require political solutions.

The World Bank's Partnership for Market Readiness has commissioned a project which National Treasury will be coordinating over the next five years, intended to further develop the current design, including issues related to the implementation of the carbon tax. Given the criticisms about how the carbon tax will address implementation issues, the project may help to address some of the concerns that have been raised.

Despite the concerns raised by business, interviewees from Treasury voiced confidence in the draft reporting regulations being finalised and the necessary systems being in place early in 2017. This is intended to align with the reporting that will begin as part of the commitment to the voluntary carbon budgets. Interviewees from Treasury recognise that facility-level reporting would be most suitable for the carbon tax, but that company-level could be adequate. The draft reporting regulations ensure that company-level reporting is accompanied by the declaration of facilities within a company and communication about changes in companies, but, as mentioned in the reporting regulations section above, it appears in the draft reporting regulations and guidelines, as well as the statements in the ITTCC report (ITTCC 2015) as though reporting will only be at company level.

¹⁰ This issue was also touched on in the carbon budgets section above, notably the formal CAIA position and the Tyler & Cloete paper.

Discussion – analysis in terms of theoretical framework

Understanding policy implementation progress using the MSA

Opportunities that the Paris agreement might create – analysed using insights from application of the MSA

The Paris Agreement may present future opportunities for South Africa to promote implementation of mitigation policy. Among the legal obligations to report are that Parties will be required to submit annual climate change reports, Biennial Update Reports, and GHG Inventories. Along with the obligation to report, Parties need to demonstrate ‘progression of NDC’ updates which are to be submitted every five years.

Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition, reflecting its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances. (UNFCCC, 2015: 22)

The technical expert review and facilitated multilateral dialogue represent significant milestones at which the domestic actions undertaken to achieve the NDCs will be independently assessed, so Parties need to make the necessary preparations in order to prove that acceptable progress is being achieved.

Information submitted by each Party under paragraphs 7 and 9 of this Article *shall* undergo a technical expert review... In addition, each Party *shall* participate in a facilitative, multilateral consideration of progress with respect to efforts under Article 9, and its respective implementation and achievement of its nationally determined contribution. (UNFCCC, 2015: 22) (authors' emphasis)

As South Africa has been able to utilise the windows provided by COP15 and COP17, it should look to utilise the windows provided by the Paris Agreement, as they become available.

Applying the MSA

The processes in which important milestones in climate change policy have been achieved in South Africa can be understood in terms of concepts provided by Kingdon's MSA. According to our usage of this MSA there are interactions between various activities which are assessed as being in either a ‘problem stream’ or ‘agenda stream’, a ‘policy or solutions stream’, and a ‘politics stream’. Additionally, ‘policy windows of opportunity’ and coupling of these streams are associated with significant points of policy progress.

In our application of MSA we choose as our first significant point of policy progress the announcement of South Africa's PPD pledge at COP15. In the lead up to COP15, the agenda stream had placed a ‘problem’ firmly on the agenda: this problem was that countries needed to come up with ‘solutions’ to what their contributions to the global GHG mitigation effort would be. In the ‘policy stream’ (also called the ‘solutions stream’) the LTMS was conducted and the LTMS scenario-based mitigation potential provided quantitative results, which informed a specific ‘solution’. COP15 provided an important event in the politics stream to give impetus, and a policy window, explained by the MSA as coupling of the ‘problem’, ‘policy’ and ‘politics streams’. The establishment of the problem in the problem stream combined with a technically and politically feasible solution combined further with the opportunity provided by the COP15 political event allowed for coupling of the streams (possibly worked for by policy entrepreneurs although we have not gathered specific evidence for this), a policy window opened, culminating in President Zuma making an ‘authoritative decision’ and announcing the Copenhagen Pledge, a quantitative peak-plateau decline emissions trajectory¹¹.

¹¹ We go into considerable detail in elaborating our usage of Kingdon's MSA here because of our experience through discussions with colleagues, feedback on this paper and actual research mentioning difficulties with applying MSA (Cairney and Jones, 2015)

In our application of MSA we choose as our second significant point of policy progress the publication of the NCCRWP¹². In this case, ‘how to achieve the PPD’ was the ‘problem’ that had been successfully placed on the ‘agenda’, the policies contained in the NCCRG and the authoritative decision to publish these policies in the NCCRWP processes were the ‘solutions’ developed for achieving the PPD, and South Africa’s hosting of COP17 in 2011 provided the necessary conditions in the ‘politics stream’ for the authoritative policy decision. COP17 itself provided the event in the politics stream and, as with COP15, the policy window and coupling of the three streams provided the impetus to publish the NCCRWP. The NCCRWP included a more tightly specified PPD and named a raft of policies to achieve the PPD, with specified timeframes for implementation, with core policies to be in operation by 2013.

The third milestone identified was COP21. The COP21 Paris Agreement and related NDCs can also be understood within the MSA framework as establishing defined problems on the agenda to drive action in the other streams and an associated policy windows of opportunity. With a set of ‘problems’ established in the problem (agenda) stream by the Paris Agreement, these dynamics are still unfolding and application of the MSA could assist with identifying opportunities for work in the ‘solutions stream’ and ‘politics stream’ and identifying policy windows and potential coupling of streams.

Some of the legally binding elements of the Paris Agreement (UNFCCC, 2015: 22) are that (authors’ emphasis):

Each Party *shall* prepare, communicate and maintain successive nationally determined contributions that it intends to achieve.

Parties *shall* pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

Each Party *shall* regularly provide the following information... Information necessary to track progress made in implementing and achieving its nationally determined contribution.’

In MSA terms, the obligations created by these “shall” statements establish ‘problems’ on the agenda, for which solutions can be formulated within country mitigation policy processes. In MSA terms, the formal events associated with reporting, the ‘facilitated dialogue’ (see later) and ‘stocktaking’ (see later) could create opportunities in the ‘political stream’ for authoritative decisions.

The Paris Agreement outlines explicit legal obligations for Parties to update their NDCs every five years, to pursue measures to achieve NDCs, to provide the necessary information for tracking the implementation progress of NDCs, and that information will undergo technical expert review. These requirements have placed the ‘problem’ of the need to report on implementation on the governmental ‘agenda’ of Parties.

The carbon budgets voluntary scheme could be viewed as a potential solution decided on in the Paris COP21 process to respond certain ‘problems’ as *per* the MSA. The voluntary scheme has been able to garner sufficient political support for a number (eighteen by late 2016) of companies to be now voluntarily participating. However, whether the voluntary nature will continue to meet technical and political feasibility criteria remains to be seen. Will a voluntary scheme that does not demonstrate mitigation below what emissions will have been anyway qualify in the unfolding implementation of the Paris Agreement as South Africa having ‘pursued a domestic mitigation measure’ sufficiently? Using Kingdon’s MSA allows provides a framework to extend analysis beyond techno-economic arguments to how techno-economic arguments operate in the context of streams of political, policy formulation and technical analysis activities, and the role of these in policy.

¹² The choice of these ‘significant points’ involved much discussion and analysis, sufficient for a paper on its own, but this is not our focus in this paper – our focus is to make the case by providing examples of extending policy analysis of climate change in South Africa away from a mainly technical-issue concentration to the political realm with the main purpose of this paper to identify implementation challenges. .

Although the COP15 and COP17 processes can be understood within the MSA to have driven progress, the raft of policies published in the NCCRWP has suffered significant implementation delays with none of the policies yet ‘implemented’ according to our definition. The quantitative bases of the policy, and technical issues have encountered significant and sustained criticism. However, MSA provides a framework to extend this analysis to these past processes and on the basis of this, to apply the framework to the unfolding policy development and implementation that COP21 might drive.

The MSA ‘policy stream’ and technical feasibility

One of the main reasons given by most interviewees for the delay in implementing the policies in the NCCRWP is that at the time of publishing the policies contained little detail in their specifications about what would be involved in implementation, and the supporting technical analysis was lacking. This was especially so for the ‘carbon budgets approach’, including the DEROs and carbon budgets.

Kingdon’s MSA speaks of the problem-, policy- and politics- streams. The list of policies in Table 1 is essentially a set of solutions to the problem of: ‘What government policies can lead to emitters limiting their collective emissions to the PPD range?’ Kingdon showed ‘the progress of ideas and policy proposals as a selection process in which a large number of possible policy initiatives is narrowed to a short list of proposals that are seriously considered’ (Kingdon, 2014:143). Each policy in this large list typically requires substantial time and effort to design and assess. Kingdon (2014:132) states that: ‘Feasibility, as policy specialists talk about it, is heavily involved with implementation’. Given the complicated policies (see reference to Tyler and Cloete 2015 earlier) chosen for inclusion in the NCCRWP, the dearth of research into, for example, carbon budgets and their late inclusion in the policy, without consultation, presents much to be concerned about. However, while the COP17 in Durban provided the political impetus, and in all likelihood contributed significantly to the creation of the window of opportunity and the coupling of the problem, policy and politics streams for the authoritative decisions required to publish the NCCRWP, it also placed huge time pressure on the ‘solutions development’ stream, that typically does not function well under such pressure (Kingdon, 2014:125). As Kingdon highlighted, when a policy window opens, solutions need to be available – it is too late to develop them from scratch. Thus the policies did not have the time necessary for them to be designed to an adequate level of detail, or assessed through effective policy analysis.

The short time period between the COP15 pledge and COP17 meant that, if South Africa was to announce a substantial climate change mitigation policy by the Durban COP17, little time was available for a process of developing a large number of policy proposals, selecting a short list for consideration and then being able to further develop the chosen ones for serious assessment for technical feasibility. Also, owing to the relative newness of climate change mitigation science and policy, especially in the developing country context, and in South Africa’s very specific and unusual context of being a high-emitting developing country, there were not the ‘usual’ set of solutions, that are typically under continuous development for perennial problems such as transport and health.

Competing solutions in such areas are often developed over decades, waiting for their time to come. Kingdon quotes an interviewee talking about a proposal about to be introduced for passage in the USA Senate as follows: ‘Then he said, “Let me tell you something. We’ll introduce this tomorrow, but it will take twenty to twenty-five years for it to be brought into being”’ (Kingdon, 2014:116). Climate change mitigation is an urgent problem, however, and the South African PPD is such that, assuming business as usual economic growth, immediate action would be required to stay within PPD limits. Therefore the challenge for policy development and implementation differed in two key ways from many other typical policy problems: the existence of solutions and the time-frame for implementation.

Kingdon’s first criterion for the ‘survival’ of a solution is ‘technical feasibility’ (Kingdon, 2014: 131) and he says that, according to the perspective of policy specialists, ‘feasibility is heavily involved with implementation.’ The relevant questions he mentions are: ‘Will it actually

accomplish what we want to accomplish?’ ‘Can it actually be administered?’ Before the publication of the South African NCCRWP in 2011, answers to these questions were not interrogated in any systematic policy analysis. The raft of un-designed or partially-specified policies in the CCRWP were thus accepted ‘voetstoots’ and are accordingly suffering huge implementation difficulties. Whether the ‘learning by doing approach’ being followed in, for example, the carbon budgets, will solve implementation issues, will unfold over the years to come. The Paris Agreement requires that parties ‘*shall* pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.’ It will also unfold over the Paris Agreement implementation processes whether due attention is expected to be applied to assessing the feasibility of mitigation instruments to show that the aim of these instruments is to effectively ‘achieve the objectives’ of the NDC. Without such an expectation, the short term international political ends of having national policies in place will have been met, but in the longer term, the credibility of a policy process which attempts to implement policies without due attention being paid to implementation-feasibility could become an issue.

Political and institutional challenges

Kingdon, the primary reference for the theoretical framework that informs the present analysis, devotes considerable attention to the roles of interest groups, and the interviews and documented empirical evidence indeed revealed the importance of interest groups in challenges to implementation of policy.

A number of overall patterns emerge from the section above detailing challenges being experienced in implementation of mitigation policy.

Firstly, a core element of the NCCRWP is the PPD has been ‘politically’ resisted by some interests and interest groups. Some state that South Africa’s emissions are currently below the PPD and thus South Africa should be credited with the remaining carbon space, and that the PPD is too strict. In other cases, the existing information asymmetry appears to be used politically to undermine the PPD, by not making fit-for-purpose quantitative analysis or underlying data for such analysis available or public, but using the lack quantitative analysis or underlying data for such analysis as the basis for declaring the PPD invalid. Further justification for the pushback against the PPD is its potential negative impact on the economy. This is used to substantiate arguments for the need for more in-depth policy analysis and a revision of the PPD and MPA.

It is difficult to imagine how the claims (repeated here for convenience) by interest groups that, for example, ‘Even though refuted by the DEA, there is concern that these policies as well as inappropriate targets that may be set for GHG emission reduction will result in deindustrialisation and companies leaving South Africa in order to be able to continue operating.’ (CAIA 2016:1) can be constructively explored without public access to quantitative analysis and underlying data to back this up. As detailed in the previous section, it is a norm in democratic market economies to make it mandatory for facility level data to be placed in the public domain. It would appear that mandatory reporting regulations are crucial for addressing the information asymmetry and the foundation for the implementation of all the policies. It is not plausible that a lack of technical capacity is the reason for the failure to introduce reporting regulations. South Africa has demonstrated that it does have the capacity to introduce similar regulations, and the delays appear to more a result of political challenges.

In spite of the existing information asymmetry and lack of reporting regulations, there have been efforts to proceed with the development of policies such as the carbon budgets and carbon tax. The result is that the carbon budgets have been watered down to a voluntary scheme with eighteen companies participating, and each company determining its budget. The carbon tax, on the other hand, has encountered significant opposition both within and outside government, with issues such as the linkages between instruments such as the carbon tax and carbon budgets still not resolved, and lack of intra-government coordination and alignment of policy.

It is noteworthy that the challenges experienced thus far in implementing South Africa's mitigation policy are common features of policy implementation processes in general.

Intra-governmental cooperation

Given the cross-cutting nature of the NCCRWP and the policies it contains, cross-department coordination within government is important for giving the policy effect. The NCCRWP specifies the requirement for mitigation plans to be developed by sectors and sub-sectors that detail how the mitigation action will be implemented (DEA, 2011). Government line departments in charge of sector and sub-sector policy are entrusted with the responsibility of assessing how the mitigation plans for these sectors and sub-sectors align with the national mitigation goal. The NCCRWP states:

Under the leadership of the relevant national sector government department, each significantly emitting economic sector or sub-sector will be required to formulate mitigation and lower-carbon development strategies. These strategies will specify a suite of mitigation programmes and measures appropriate to that sector or sub-sector. They will also provide measurable and verifiable indicators for each programme and measure to monitor their implementation and outcome. (DEA, 2011:28).

The Industrial Policy Action Plan (IPAP) is an example of the government policy for the industry sector. It most certainly does not come up with a plan as envisaged by the NCCRWP as specified above. Whilst the Plan does make mention of mitigation, it primarily speaks of the need to be cautious about balancing mitigation with protecting jobs and competitiveness of the sector. The policy outlines the need for improving inter-governmental coordination and policy coherence in order to accurately assess the impact of mitigation policy and legislation on employment, competitiveness and growth (DTI, 2014). Interviewees raised the issue that, despite the mention of the mitigation policy in the IPAP, the long-term planning and strategic decisions of industry, led by the DTI, are largely contradictory to mitigation. In addition it was raised that there is currently no vision for establishing more climate-compatible industry, which is crucial for supporting a transition of the sector.

In important ways this NCCRWP 'DEA policy' for the rest of government exemplifies much of the 'Rolls Royce', 'Shotgun' approach: relying much more on hope than credible consideration of implementation realities which would have to include thorough policy analysis, feasibility studies cost benefit studies, economic impact assessments and transparent selection of policies against objective criteria.

The MSA 'politics' stream and resolution of necessary political support

Policies had not only been under-developed from a technical point of view. In terms of the MSA framework, the politics stream had also not had sufficient time and process to resolve political support issues. A number of interviewees also mentioned the lack of intra-governmental consultation and support garnered before publication of the NCCRWP, which was still evident at the start of the DEROS implementation consultation process in July 2014 and is still evident in key departmental policy documents. Indeed, interviewees mentioned that intra-government political support is still problematic and a challenge for implementation.

While the international political pressure on national government to deliver at the COP17, especially as the host country, facilitated the opening of a policy window and contributed to creating favourable political conditions for the authoritative decisions involved in publishing the NCCRWP, the time necessary for resolving the politics surrounding intra-governmental policy issues was not made available, resulting in the politics represented in the conflicting policies and positions of different government departments. DEA capacity has been limited in resolving substantial inconsistencies between government departments at the time of publication of the NCCRWP, by the beginning of the DEROs carbon budgets implementation consultation process and until now.

The rushed NCCRWP had benefits of getting what Kingdon calls an 'authoritative decision', in terms of the authority of the DEA to issue a policy document, but a number of interviewees

questioned whether this reflected the policy position of the whole of government. The problems that have been experienced in implementation pose the question of whether the DEA had found solutions to its policy problems with solutions that were sufficiently supported by both the intra-governmental and extra-governmental politics streams so that the solutions would survive what Trollip et al (2015: 17) call the 'complex politics of implementation'.

Big emitters world-wide have opposed climate policy for decades and continue to do so, and given the potential huge negative impacts of the implementation of effective emissions mitigation policy for many of them this is to be expected. Obvious examples are fossil fuel companies and companies reliant on energy sourced from fossil fuels. However, this is not unusual in policy development in other policy domains too. As Kingdon points out:

Interest groups are among the most important' of non-governmental actors. Because they are often concerned with protecting current benefits and prerogatives, they affect the governmental agenda more by blocking potential items than by promoting them. Rather than structuring a governmental agenda, interest groups often try to insert their preferred alternatives into a discussion once the agenda is already set by some other process or participant. Groups with electoral clout, the ability to affect the economy, cohesion, and organization have better initial resources than those lacking in such respects. (Kingdon, 2014:68)

Information asymmetry, interests and interest groups

Access to quantitative analysis and underlying data and resultant information asymmetry has played, and continues to play, a central role in being an obstacle both to problem-identification and analysis, policy-formulation and implementation, and appears to play a large role in the political stream in terms of Kingdon's MSA. Even though there have been statements that reporting regulations are about to be promulgated, and even if they were to be promulgated, our analysis has highlighted a number of issues related to emissions data from reporting regulations, the data-system and quantitative analysis that both policy development and policy implementation rely on.

According to a report from the Industry Task Team on Climate Change (ITTCC) Projects Update (ITTCC, 2015) published in late 2015, 'the DEA ... have not decided how the next five years are going to work because they do not have the necessary information. The DEA advised that the reason for this is because they do not have a firm grip on the baseline for the emissions; government and business are aligned in this regard.' The same report notes that 'Business Unity South Africa (BUSA) agreed with the Director General (DG) that data will be collected at company rather than facility level.' Business opposed any direct link between PPD and company level carbon budgets, on the basis that in their view the limits of PPD were too tight and emissions were approaching upper limit, so additional space was needed.

In the context of severe problems with emissions data and quantitative analysis, the voluntary carbon budgets scheme is being pursued. Kingdon mentions that there is a stage where powerful interests 'attempt to insert their preferred alternatives into a discussion once the agenda is already set by some other process or participant' (Kingdon 2014:67). This could be the case with the carbon budgets. With the large degree of information asymmetry (and expertise and knowledge and skills asymmetries) between some large emitters and the DEA, the situation with the voluntary carbon budgets and non-resolution of the data issue could be an element in setting up what Kingdon and others refer to as the 'iron triangle'. These are special relationships between bureaucrats, committees and interest groups, which are alleged to be impenetrable from the outside and uncontrollable by the executive and political appointees. (Kingdon 2014:33). The impenetrability of such iron triangles makes their existence difficult to prove, so at this stage the circumstantial evidence indicating their possible existence and a potential challenge to mitigation policy implementation is noted. The South African Parliament invited the ERC research team to present preliminary results of the research for this paper to a paper Parliamentary Colloquium on the 28th October 2016. At the workshop, along with detailed listings of the many other challenges contained in this paper, the basics of Kingdon's iron triangle theory was presented, with a suggestion that it could be relevant to challenges with the

South African climate change mitigation policy implementation. Subsequent to the workshop strongly worded communications were received from the representative of one of the business interest groups objecting strongly to the suggestion that business interests were involved in the kind of relationships in iron triangles described at the parliamentary colloquium, noting that there was no evidence for this presented in the draft research paper. The specific arrangements of congress in USA law-making are quite different from those in South Africa, and indeed this research has no evidence of the kinds of relationships between interests and South African parliamentarians as one would find in a USA-type iron triangle. However, the relationships between interest groups and government has long been a central area of research and analysis in political science, and many configurations are possible, and these are an important and legitimate area for research.

The existence of Interest groups and iron triangles in well-functioning democracies is not contested in the literature, but their impacts on policy making is (Ethridge & Handelman, 2010:163). The 'iron triangle' is commonly called an 'image' in political science (ibid:180). In this paper the intention is not to prove the existence of an iron triangle in the case of the joint work being done on voluntary carbon budgets, but rather to use the image as an alert to potential relationships and processes, and possibly as an area for further research.

Kingdon describes the iron-triangle as being a set of relationships between career bureaucrats, congressional committees and interest groups (Kingdon 2014:33). Kingdon and Ethridge and Handelman (2014) provide examples from the USA in which the use of the iron triangle concept is in the context of the role congressional committees play in policy and law making. With these examples in mind, it was useful to observe the level of engagement of the South African Parliamentary Portfolio Committee on Environmental Affairs at the Parliamentary colloquium on climate change on the 28th of October 2016. At the colloquium the DEA bureaucrats made a presentation on progress in climate change mitigation policy. It appears that the equivalent of the USA congressional committee in the iron-triangle concept, namely the parliamentary portfolio committee, plays a far less active role than the role described in the USA iron triangle examples. The iron triangle concept in the USA examples involved congressional committees playing more of a leadership, or at least joint leadership role in policy and having tight relationships with both the bureaucrats and the interest groups, to the exclusion of others. Based both on documents from parliamentary portfolio committee hearings on climate change policy and the colloquium, the South African committee does not appear to have these tight relationships. Instead of a leading role in policy, it appears to provide arms-length oversight and gives a platform to and facilitates the engagement of a wide range of stakeholders. More in-depth research would be needed to explore the differences between South African structures and USA examples to assess the relevance of the iron triangle concept.

Kingdon mentions that Hugh Hecllo has argued that iron triangles in the USA 'are no longer as iron as they once were' (Kingdon 2014: 48). Ethridge and Handelman (2014) also question the relevance of iron triangles given that 'there has been an explosion of interest groups, especially public interest groups advocating broader interests' (Ethridge and Handelman 2014:181) that they have been 'breaking down the exclusive control enjoyed by some groups'. The colloquium and parliamentary committee records suggest that this might also be the case for climate change policy in South Africa. However, the extent to which the various interest groups influence policy, especially given issues of diverse and concentrated interests and resources and economic and political influence, remains an important research question. Also, it is not just the relationships between the parliamentary (congressional in USA) committee and bureaucrats at issue but also the relationships between bureaucrats and interest groups on the other side of the triangle.

A relevant question in the South African climate change policy implementation case is the extent to which what Ethridge and Handelman (2014:180) describe as the key impact of iron triangles operates in climate change policy in South Africa, namely: 'that policy decisions are dominated by relatively autonomous sets of governmental officials and interest groups, leaving very little role for broader public interests in shaping what government does.'

Our research suggests that the role of the parliamentary portfolio committee is relatively less influential than the congressional committees described in USA iron triangle examples. Most interviewees mentioned lack of technical capacity at the DEA as a key challenge and the inability of the DEA, so far, to recruit support from other government departments was clearly evident, in policy documents and reported in interviews. One interest group, the ITTCC reported (see quote above) that the DEA did not have key basic information either to design the work for the next five years or technical information on emissions. Thus economically powerful emitters are placed in the position of being potentially subject to policies such as carbon budgets that if applied without sufficient quantitative analysis and expertise could have significant negative impacts. However, adequate data and quantitative analysis and expertise at the DEA could equally lead to effective policies also leading to substantial curtailments of emissions which would also impact business's profits. The voluntary carbon budgets scheme solves one part of this challenge in its collaborative 'learning by doing' approach. However, should the lack of capacity and necessary foundational data and quantitative analysis persist or not be available for necessary public scrutiny, the challenge remains for a relatively weak DEA to effectively regulate comparatively powerful interests.

The 2015 Chemical and Allied Industries Association (CAIA) presentation to the Davis Tax Commission states that 'CAIA does not support South Africa's continued development of climate change policy, including that of the carbon tax (CAIA 2015:slide18). While this is in the context of a submission on the carbon tax, the rest of the presentation leaves little doubt that this statement does apply to climate change policy as a whole, as stated in the text of the slide. Among the main reasons given by CAIA for its lack of support for continued development of climate policy are that the climate change policy needs to be more clearly defined before it is implemented, that the 'socio-economic impacts need to be comprehensively investigated', that the chemicals industry which it represents has already made significant investments in mitigation, and that the economic slowdown has also led to significant mitigation. CAIA states directly, or implies, in these reasons that the MPA and PPD need to be updated, and thus that the quantitative basis for mitigation policy is challenged.

This research that this paper reports on does not seek to analyse technical issues in depth, and, while many of the reasons CAIA advances may have merit, one thing is clear: the *politically relevant issue* that is CAIA's unequivocal statement that it does 'not support South Africa's continued development of climate change policy' (CAIA, 2015: 18). CAIA also states in its presentation that it supports the Business Unity South Africa (BUSA) submission to the Davis Tax Commission, as an 'active member' of BUSA (BUSA, 2015). BUSA's submission states that: 'BUSA supports a holistic climate change policy' and that it 'continues to engage relevant government departments on the need' for this.

This is relevant to the interest group and iron triangle objects of analysis because CAIA has participated in climate change policy development on its own and by working with BUSA. There also a number of common members between CAIA, BUSA and the Energy Intensive Users Group. The ITTCC submission to the Davis Tax Commission is 'aligned with BUSA and has the support of the Energy Intensive Users Group of Southern Africa (EIUG)' (ITTCC, 2015). A consistent BUSA comment on climate change policy is reflected in its submission to the INDC parliamentary hearing (BUSA, 2015:slide11) that the 'PPD has not been updated since 2007', and that 'it is essential to keep the national benchmark trajectory up to date at all times and that the updating process which should have commenced by now be urgently implemented.' There are thus varying levels of challenge from members of the business interest groups, ranging from the unequivocal non-support South Africa's continued development of climate change policy of CAIA in 2015 to BUSA's problems with the fundamental quantitative mitigation limit, the PPD National Benchmark trajectory.

Although the names of the eighteen¹³ companies participating in the voluntary carbon budgets scheme are not known, it is most likely that most, if not all, would be either CAIA, BUSA, ITTCC or EIUG members. Referring to the process of developing the South African INDC for

¹³ There were 18 by late 2016: the exact number now is not known.

the Paris Agreement, CAIA stated in its 2016 position paper on climate change that: ‘CAIA participated in the process through Business Unity South Africa that resulted in a more flexible INDC being submitted to the UNFCCC than what could have been submitted.’ There is thus considerable cooperation on certain positions between interests and interest groups. We thus have a relatively weak DEA, that according to the ITTCC ‘have not decided how the next five years are going to work because they do not have the necessary information’ (ITTCC, 2015), being assisted by relatively powerful businesses, who exclusively own crucial emissions data and expertise necessary to conduct the mitigation potential analyses at the core of the carbon budgets, in bilateral engagements, in designing and implementation of prototype policy that, if the South African NDC undergoes substantial increases in ambition, as a combination of the COP21 agreement and assessments of Climate Action Tracker could suggest, might be required to significantly limit the operations of these businesses (Climate Action Tracker, 2016).

Ambitious ‘Rolls Royce’ policies

A view emerged in many interviews that South Africa is opting for a highly sophisticated, complex set of policies that would be challenging for a developed country to implement, and even more so for a carbon-intensive developing country. The term ‘Rolls Royce policies’ was used by two interviewees. Furthermore, there has not been a process to narrow down and select specific policies and discard others; instead the decision has been to attempt to move ahead with all policies, called a ‘shotgun approach’ by one interviewee. In order to support the implementation of such policies there would need to be substantial investments in technical capacity across the board, both inside government and in the companies and other entities participating in implementation of emissions mitigation. This would also be associated with substantial costs and as it is, much policy development to date has relied on international donor aid and technical assistance (Interviewees). It was mentioned by many interviewees that currently the technical capacity inside and outside government is inadequate to run the reporting system to support carbon budgets.

Revision of the MPA is crucial for allowing many aspects of policy implementation to progress. A barrier that needs to be resolved now, however, is how the MPA is seen differently by different actors. While the DEA refer to the MPA as the full mitigation potential for South Africa, business have expressed that, when balanced against other national priorities such as job creation and the competitiveness of an industry, the costs for implementing the full mitigation potential become too severe, and thus the mitigation action should be adjusted accordingly.

Lastly the link between ambition and implementation is crucial. Given that both have their own value, but that they often share antagonistic relationships, there is logic in these two streams of work progressing separately, so that one does not undermine the other. In terms of ambition it is noteworthy that the ambition outlined in the PPD is contested domestically in South Africa, with the view that it cannot be implemented without substantial negative socio-economic impacts; however the international community and analyses point out that the ambition contained in South Africa’s NDC is inadequate for making a fair contribution to the 2°C goal. Because the international community has a key role to play in driving ambition through the UNFCCC, it plays a unique role, in that it aims to drive ambition but is disconnected from the domestic implementation issues. Arguably this allows the international conversation to push the envelope on ambition. Conversely only pursuing maximum ambition for domestic implementation may significantly hinder implementation progress, and hence in terms of domestic implementation, frequently less ambitious options are decided on in order to build enough support to make progress with implementation.

Conclusions

In terms of the definition of ‘implementation’ and ‘implemented’ adopted in this research, none of the core mitigation policies in the NCCRWP have been implemented: these are the reporting regulations and associated data-system; the carbon budgets and associated pollution prevention plans, and; the carbon tax.

The empirical basis of quantitative emissions analysis, specifically the official PPD and the MPA have been continually challenged to the extent that it is problematic to use them in implementation of the core emissions reduction policies. It appears that resolution of these challenges would require adequate public domain quantitative analysis and availability of official underlying data and transparent peer-reviewed analysis utilising these public domain information sources.

A foundation of this resolution of these challenges would be the same ‘foundation of the mitigation response’ mentioned in both the NCCRG and NCCRWP, namely the GHG emissions reporting regulations and data system, that according to the NCCRWP was to be operational by 2013 (DEA, 2011). While draft reporting regulations have been published, regulations have not been promulgated. These regulations were reported as being identified in 2008 as the most important next step in implementation. Many other countries make mandatory the facility-level reporting and publication of emissions data, including those hosting emissions intensive facilities owned by major emitters who own large emitting facilities in South Africa. It is difficult to attribute purely technical obstacles as the cause of such a prolonged delay in establishing this acknowledged foundation. The draft regulations were reported as currently being with the Minister and it is not known how submissions on the draft regulations have been incorporated. Concerns remain that even when the regulations are promulgated the low level of disaggregation and the public domain status may continue to prevent them from playing their necessary role as the ‘foundation of the mitigation response’ and that challenges to the empirical basis of quantitative analysis may continue to undermine implementation of effective reductions to emissions.

The NCCRWP contains a raft of partially developed and complex policies with partially developed understanding and analysis of linkages and dependencies. This presents a significant technical implementation challenge to an under-capacitated Department of Environmental Affairs. This makes the policies vulnerable to pushback by interests that would be negatively impacted by effective implementation of policies, if these policies required substantial curtailment of emissions by these interests.

Implementation of climate policy needs to be acknowledged as involving both technical and political elements, and hence challenges in both these realms need to be addressed. Research into political elements around climate change policy is only emergent in South Africa. Although significant technical challenges exist, and lack of technical capacity is a key challenge, there are also important political challenges involved. The role of interests and interests groups is central to political science and the theoretical framework used in this research reveals that interests and interest groups have been found to play an important role in implementation of mitigation policy.

Some large decisions (such as adopting carbon budgets in the NCCRWP) and seemingly small (but potentially significant) policy decisions (e.g. company level reporting) are being made by bureaucrats alone, or in conjunction with interest groups without the benefit of (transparent, published) policy analysis, or in consultation with representatives of broader interests. Similarly there is an attempt to design and operationalise policies in conjunction with interests that these policies seek to regulate (e.g. carbon budgets) without adequate public domain policy analysis nor robust design.

What would appear to be obvious sequencing, such as feasibility analysis and design of policies before adopting them, assessing dependencies and linkages, prioritising the reporting regulations and data-system, which are necessary to inform other policy selection and design processes has not been happening. Policies are adopted before feasibility has been assessed and when their designs are far from complete, and attempts are made to implement the raft of under-

developed policies all at once, without the acknowledged foundation in place, and without policies which others depend on yet at a stage of development to facilitate implementation. It has been found impossible (so far) to implement the (acknowledged foundation) policy merely to report and record emissions, and to quantify mitigation potential adequately to support policy, which many other policies depend on and so the question arises about the capability and readiness to actually operate policies that would significantly reduce emissions.

Given the necessity for climate change policy to drive a transformation in energy systems especially, from being carbon intensive to being de-carbonised, expectedly powerful interest groups in the energy and emissions intensive South African economy respond strongly to climate change mitigation policy. The research has explored the issue of interest groups and iron triangles, which were identified as important in the primary reference for the research theoretical framework. The role of the portfolio committee on climate change appears different from examples of congressional committees in iron triangles to the extent that the concept does not appear to be applicable to the South African parliamentary committee and climate change policy. Interest groups, however, do play an important role, and there is very little existing research on this issue, and as such this paper both represents initial and emerging research of this kind and indicates that there is a need for more of this research.

Government departments other than the DEA are important in climate change policy, both in their role in implementing it (such as the DoE reporting regulations and data), as specified in the NCCRWP, in the alignment and impacts their own policies have on mitigation, and in political support for DEA policy. The National Treasury, Department of Economic Development, Department of Trade and Industry, Department of Energy, Department of Public Enterprises and Department of Science and Technology all have important roles to play. The research identified that currently the lack of coordination and alignment that exists between departments presents major challenges for the implementation of mitigation policy. Interviewees identified the DEA as often being a weak department in the political hierarchy in achieving the necessary engagement and support from other departments.

The issue of the technical capacity required to design, analyse and implement climate change policy is a recurring theme throughout the paper. Being the responsible department for climate change policy, and being a relatively small and modestly resourced department, the need for strengthening capacity in the DEA is crucial. Also, significant investment in enhancing capacity across the board, including government, business and civil society to support the implementation of climate change policy is necessary. The learning by doing approach now adopted by the DEA, may contribute to building capacity in various areas and identifying other areas that should be attended to. However, the learning by doing may also create a situation where, well-resourced and powerful parties may be assisting the comparatively much weaker DEA, design and develop policies that will be used to regulate these same powerful parties. If this regulation would need to constrain emissions and hence options, activities, and profits of these same parties, there is a concern that the effectiveness of regulation resulting from this collaborative approach may be compromised. Evidence for this concern has not yet been shown, but the conflicts of interest are self-evident.

With the failure, so far, to implement the core policies defined in the NCCRWP, it is clear that the two year time frames outlined in the NCCRWP to implement these policies was unrealistic. The experience up until now has demonstrated the complexity and difficulties associated with the implementation of climate change policy. Therefore the formulation and implementation of climate change mitigation policy should be approached as a long-term process, placing priority on putting in place the foundations timeously, such as the reporting regulations and data system. The 'shot-gun approach' of committing to a raft of complex policies without detailed cost-benefit and feasibility studies, and without a selection process properly looking into pros and cons, gave the initial appearance of significant progress, but, so far has not resulted in the core policies being implemented. Thus, for a while, the political pressure attached to the urgent need to curtail emissions is met, by being able to say that a policy exists, but ultimately effective action could be delayed if the policies cannot be effectively implemented.

Using the MSA framework has showed the importance of the ‘politics stream’ so far, namely the international climate negotiations, in creating useful windows of opportunity to catalyse authoritative decisions in domestic climate change policy in South Africa, as was demonstrated with COP15 and 17. COP21 and the Paris Agreement place legal obligations on Parties to report on implementation progress and to increase the ambition of policy. Given the emphasis the Paris Agreement places on implementation, South Africa should explore, anticipate and prepare for opportunities so that ‘solutions’ are developed to link to ‘problems’ within the favourable ‘politics stream’ opportunities that the Paris Agreement processes might create.

Specifically, in MSA terms, the legal obligations place achieving the objectives of NDCs firmly as an MSA ‘problem’ on the agenda and the reporting and facilitative dialogue and stock-taking processes will in all likelihood create opportunities in the ‘political stream’. It will be up to the technocrats, career bureaucrats and (willing) stakeholders to formulate feasible South African policy ‘solutions’ and (if one version of MSA is to be followed) the ingenuity of policy entrepreneurs and others to encourage MSA stream-coupling in the hope that when policy windows open, feasible solutions are ready to connect the solutions to the problems within the favourable political climate of the moment.

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