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Country Study

Mitigation Actions in South Africa

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ABSTRACT

The country study aims to deepen our understanding of mitigation activity in South Africa, particularly with regard to how the country approaches, describes and defines mitigation actions. It considers three main areas of enquiry from a bottom-up methodological perspective: first, what is a South African Mitigation Action (SAMA)? Second, what are the barriers and challenges to their implementation, and third, how can these challenges be overcome through domestic measures and international support?

Four examples of South African activities to mitigate emissions are described and then analysed; Bus Rapid Transport in Cape Town, the South African Renewables Initiative, the carbon tax and the National Sustainable Settlements Facility. We find from these examples that defining a SAMA is an almost intractably difficult task. Possible new approaches are therefore considered, including SAMA 'continua', 'pyramids' and 'decision trees' to try to identify and deal with issues of attribution and causation of emission reductions. Generally, we find that South Africa is good at identifying, analysing and designing activities to mitigate emissions, but less good at implementation. However, identifying and rating the challenges that the four examples face is revealed as a challenge in itself. Because none of the examples have been successfully implemented, the analysis was necessarily subjective. Two main areas of implementation risk are suggested as those of counteracting vested interests, and availability of finance. Suggestions are made regarding how these implementation challenges might be overcome with appropriate support at the domestic and international levels.

Further work is required to verify these findings, and to expand on them. At this point it is hoped that they will catalyse discussion within the MAPS project, and beyond it, as mitigation action becomes an increasingly pressing issue.

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ACRONYMS

BRT	Bus Rapid Transit
DEA	Department of Environmental Affairs
DHS	Department of Human Settlements
DTI	Department of Trade and Industry
DoE	Department of Energy
DPE	Department of Public Enterprise
IPAP	Industrial Policy Action Plan
IRP	Integrated Resource Planning
IRT	Integrated Rapid Transit)
LTMS	Long Term Mitigation Scenarios
MA	Mitigation Action
MINMEC	informal forums between national-level Ministers (MIN) and provincial-level Members of Executive Councils (MEC) with common sectoral responsibilities
MRV	Measurement, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
NERSA	National Energy regulator of South Africa
NSSF	National Sustainable Settlements Facility
REFIT	Renewable Energy Feed In Tariff
SALGA	South African Local Government Association
SARi	South African Renewables Initiative
UNFCCC	United Nation Framework Convention on Climate Change

1. INTRODUCTION

This South African country study on mitigation actions forms one of a series of five country studies undertaken as part of the MAPS programme, the four other country studies are being undertaken in Peru, Chile, Brazil and Colombia. These five country studies will be used to prepare a comparative paper examining the different approaches towards identifying and implementing mitigation actions at a national level in these countries. The country studies were prepared for discussion at a MAPS Research Lab in Lima in September 2011, in order to further develop the understanding of how mitigation actions might best be implemented in the context of development. The country studies and follow up comparative work will be published by MAPS.

This South African country study aims to deepen our current understanding of mitigation activity in the country, particularly with regard to how South Africa approaches, describes and defines mitigation actions. The methodological approach is bottom-up, with an analysis of four examples of activities to mitigate emissions currently underway in South Africa forming the basis of the findings. The intention is to understand what is happening on the ground, without imposing definitions or conceptual constraints up front.

The three main areas of enquiry are:

1. What is a South African Mitigation Action (SAMA)?
2. What are the barriers and challenges to the implementation of SAMAs?
3. How can these challenges be overcome through domestic measures and international support?

A description of mitigation activity in South Africa provides a context in Section Two. In Section Three, four randomly chosen examples of activities to mitigate emissions are described: Bus Rapid Transport (BRT) in Cape Town, the South African Renewables Initiative (SARi), the carbon tax, and the National Sustainable Settlements Facility (NSSF). In Section Four, analytical criteria are derived to cover the three main areas of enquiry outlined above. In Section Five the four examples are analysed to see what can be discovered about mitigation activity in the country. Section Six discusses the findings, and Section Seven concludes.

2. SOUTH AFRICAN MITIGATION ACTIVITY: A BRIEF OVERVIEW

South Africa is a developing country of just under 50 million people with a population density of 40 people/km2 and a negative population growth of 0.05% largely due to the AIDS pandemic. In 2010 the economy grew by 2.7% in real terms, however, the level of inequality remains high with a GINI coefficient of 57.8 and 24.3% unemployment rate (South Africa at a Glance, 2011).

Since the first free election in 1994 South Africa has struggled to emerge from the institutional shadows of apartheid. These include an entrenched minerals-energy complex and a dependence on coal-based energy economy; coal provides about 77% of primary energy needs (Eskom, 2011) including 93% of electricity generation (IEA 2010). This reliance on coal produces a relatively high carbon intensity of the economy, 541.2t carbon dioxide equivalent/Million US$ for 2007, or 20th in the world (CAIT 2011).

South Africa is the largest single economy in Sub-Saharan Africa, comprising 36.6% of total Sub-Saharan African GDP (South Africa at a Glance, 2011). It is also has the highest CO_2 emissions on the African continent. Even though South Africa accounts for only 1.19% of total world CO_2 emissions, the high carbon intensity of the economy means it ranks 44th out of 185 countries for per capita emissions of CO_2 (CAIT, 2011).

South Africa has committed internationally under the Copenhagen Accord to 'take nationally appropriate mitigation action to enable a 34% deviation below the 'Business As Usual' emissions growth trajectory by 2020 and a 42% deviation below the 'Business As Usual' emissions growth trajectory by 2025... The extent to which this action will be implemented depends on the provision of financial resources, the transfer of technology and capacity building support by developed countries…" (DEA, 2010a).

The 2006-8 Long Term Mitigation Scenario (LTMS) process represented, amongst other things, the country's seminal endeavour to identify the suite of mitigation opportunities available to it. The LTMS used the Pakala-Socolow wedge methodology (2004), describing and quantifying ten large, thirteen medium and nine small technological and economic policy instrument wedges to reduce emissions between 2010 and 2050. The large wedges comprise four relating to renewables, an escalating CO_2 tax, electric vehicles with nuclear and renewables, two nuclear wedges, vehicle efficiency and industrial efficiency.

A number of initiatives are required to give affect to these and other emission reductions in South Africa, including policies, strategies, targets, voluntary agreements, regulation, standards, economic instruments, financial mechanisms, subsidies, programmes, projects, pilots, market initiatives, capacity development, information generation, innovation, institution-building, Centres of Excellence, partnerships, training, skills development and more. Appendix 8.2 attempts to capture many of these, broadly termed activities to mitigation (greenhouse gas) emissions, following from the United Nations Framework Convention on Climate Change (UNFCCC) text (UNFCCC, 1992: Art 4.1), as they are all directly and indirectly anticipated to lead to and be required for the implementation of emission reductions beyond 'Business as Usual'.

This set of activities to mitigate emissions is broad and diverse. In addition each is at a very different stage of development. Some are at the very early stages of conceptualisation, such as the carbon tax and SARi. Others are fully developed standards, policies or outputs, such as South African National Standard (SANS) 204, the Housing Code and the Carbon

Capture and Storage Atlas. Some have been partially implemented, like the Cape Town BRT system or the Gautrain, both of which will take many years to fully complete. Some constitute fully operational pilots, but with the ramp up in fairly early stages of design, such as the Kuyasa Housing Project and the NSSF. Certain technologies have just been invented, and others are nearing commercialisation (such as the Joule electric vehicle). Some have received committed funding, others still have to finalise their financing structure. It is not clear at this point whether the length of time taken to develop and implement a mitigation initiative is an indication of its strength, scale, mitigation potential or anything else in particular. Each one appears to have a unique and complex context. Some donor activity supporting activities to mitigate emissions is evident in the country, with a focus on pilots and capacity building.

The activities to mitigate emissions differ too in intention. Whilst most have mitigation as the main, or one of a few main objectives, some have a different primary objective, such as the latest Integrated Resource Plan (IRP 2010), the country's electricity planning tool. The list also includes policy that indicates 'support', or shows 'intent to improve', or 'build capacity' for mitigation.

When barriers to implementation of the activities to mitigate emissions are considered, again they appear to be very divergent. Some barriers cited in the literature include: the lack of testing facilities for clean technologies, low electricity prices, lack of skills, lack of research, the need for a certain market and demand, no institutional support in terms of industry associations, a culture of energy surplus, low awareness and understanding, a high upfront cost of energy efficient technologies, the inefficiency of local goods versus imports, the constraint of the Municipal Financial Management Act for municipalities in implementing the Clean Development Mechanism (CDM), or the use of consultants in government resulting in low development of internal capacity.

The attribution of emission reductions to the specific initiatives is not always easy. Some contribute directly, such as a wind farm, and others contribute indirectly but are essential for the emission reductions to have occurred, such as a Wind Atlas or the Renewable Energy Feed In Tariff (REFIT). It's not clear how a powerful mitigation tool like a carbon tax could be attributed for the emission reductions it achieves.

Policy discourse in South Africa has not yet settled on a definitive approach or understanding of mitigation action. The Climate Change Response Green Paper[1] suggests that mitigation actions should be urgent and decisive, and that those which significantly contribute to a peak, plateau and decline emission trajectory, and those that have potential positive job creation, poverty alleviation and /or general economic impacts should be prioritised. Provision is being made for a greenhouse gas emissions information management system that will provide 'measurable, reportable and verifiable information on all significant interventions' (DEA, 2010), and a climate change 'tracking facility' will report on actions. Separately, a 'register of climate actions that result in the mitigation of greenhouse gases' is anticipated to be used to track adherence to the peak, plateau and decline trajectory. A national climate change fund is proposed to assist with mitigation financing.

There is acknowledgement of the roles of all three spheres of government in co-ordinating and supporting activities to mitigate emissions, and too of the need to mainstream responsibility for planning and interventions into other departments. Industry and business are anticipated to define action plans, and companies are already undertaking and disclosing these through the Carbon Disclosure Project (CDP, 2010) and annual reports. There is no coordinated attempt by business to propose mitigation actions and to secure international funding for them. The notion of a 'roadshow' was

[1] A White Paper is pending at the time of writing.

mooted prior to Cancun but did not materialise. With the COP17 and CMP7 in Durban in December 2011, there is an important opportunity to attract a portion of fast-start funding of $30 billion from 2010-2012. Labour, civil society and faith communities are anticipated to support and encourage mitigation action.

The Green Paper indicates that mitigation actions will be 'guided' by the Inter-Ministerial Committee on Climate Change at the political level, through the Forum of South African Directors General (FOSAD) and the Intergovernmental Committee on Climate Change at the level of senior national government officials, with MINMEC and SALGA providing guidance on the provincial and local level.

The UNFCCC term 'Nationally Appropriate Mitigation Action' (NAMA) is not extensively used in climate mitigation policy dialogue in South Africa (it is not referred to at all in the Green Paper). However, South Africa is perceived as one of the most active countries on NAMAs in the international negotiations, having put forward suggestions on what NAMAs could look like, and how support for NAMAs could be organised through a registry linked to the UNFCCC mechanisms for finance and technology (WAB, 2010). There are only initial attempts to secure international support for activities to mitigate emissions, for example with SARi, but as yet no concerted effort by government, business or civil society.

3. SOUTH AFRICA'S MITIGATION ACTIVITIES

Four examples of South African activities to mitigate emissions are described in this section, with a focus on what constitutes the mitigation initiative and how it is anticipated to result in emission reductions, what are barriers and challenges to implementation, and how these can be overcome through domestic measures and international support.

The four examples were chosen, with an emphasis on their scale and emission reduction impact, but also to include diversity of actors, mitigation area and type of mitigation initiative. The use of examples through this bottom-up approach is primarily to deepen our understanding of South African mitigation activity. Whilst it is not possible to generalise any findings, it is intended that they will assist in better understanding mitigation activity in the country.

- **Mitigation Activity:** Reduced CO_2 emissions from improved public transport – energy efficiency and modal shift from single occupancy vehicles
- Not primarily a climate driven activity but a **public transport project**
- **Drivers:** World Cup and supportive allocation of national grants
- **Challenges:** Knowledge to operate & conflict of interests (taxi drivers)

3.1 Bus rapid transport in Cape Town

The City of Cape Town's Bus Rapid Transit (BRT) system, known as 'MyCiti', is part of the Integrated Rapid Transit system envisaged as part of a city wide improvement of the public transport system in Cape Town. The BRT consists of trunk and feeder bus routes that operate on dedicated bus lanes. The project comprises the physical infrastructure (roadways and stations) and the busses, as well as the centrally managed logistics control centre and tariff collection equipment (DME, 2009).

The MyCiti network will be rolled out over the next 15 to 25 years to serve the entire city. The implementation of the first phase 1a started in 2010 for the FIFA soccer world cup with an inner city loop service, and in May 2011 the west coast line was operationalised.

Although the BRT project is not specifically a climate driven initiative, it has potential to reduce emissions through encouraging a modal shift from single occupancy car usage to busses, thereby providing gains in energy efficiency and reduction in fuel combustion. A Project Identification Note (PIN) was prepared by the City of Cape Town as part of the initial stages of a CDM project, and identified that there is the potential to reduce 1.4MT C02/year (DME, 2009) and therefore has been considered as a mitigation action for this study. At this stage the CDM route has not progressed beyond the PIN.

The City of Cape Town has been responsible for planning, designing and implementing the BRT with some additional input from external consultants (ITDP & GSD+), as this is the first integrated transport system to be designed in South Africa. The operational aspects of running the BRT network such as vehicle operators, station management, a central control centre,

and fare management, will be contracted out. The vehicle operating companies will be designed in such a way to incorporate existing businesses currently operating on that route.

A component of the National Public Transport Strategy and Action Plan (DoT, 2007) includes implementing high quality, integrated, mass rapid public transport networks (IRPTNs). The MyCiti project is part of the National Department of Transports IRPTN programme and is funded primarily through the Public Transport Infrastructure and System Grant (PTISG) (CCT, 2011).

Furthermore the 2009 National Land Transport Act (RSA, 2009) supports cities in developing their own public transport needs from planning aspects to the administering of funds for capital expenditure and subsidies. The Integrated Development Plan for the City of Cape Town has identified eight strategic focus areas of which improving public transport is one (CCT, 2007). This has been taken forward through the City of Cape Town's Integrated Transport Plan (CCT,2007).

According to the Business Plan for MyCiti Phase 1a, the implementation costs are ZAR 4.6 billion. It is estimated that for Phase 1a the operating costs will have a deficit of ZAR 375 million between 2010 and 2014. The funding for this project comes from a variety of national and city level sources including the Public Transport Infrastructure Services Grant (PTISG), the City of Cape Town's Capital Replacement Reserve and the External Financing Fund, the Public Transport Operating Grant (PTOG), as well as local rates, a share of the fuel levy, advertising and parking revenue. The largest source of funding is from the PTISG, a national grant promoting the provision of appropriate Integrated Rapid Public Transport Network services in major South African cities.

When looking at enablers for this project, the 2010 FIFA soccer world cup was a key driver for implementing the project. Leading up to the world cup there was significant national funding made available for improving public transport in host cities. There is an inclusion in the PTISG grant framework: "to accelerate planning, construction and implementation of public and non-motorise transport networks in major cities in South Africa. This includes network related infrastructure and information systems as well as transitional measures such as the inclusion of directly affected public transport operators and workers and also once-off measures to ensure the availability of network vehicle fleet for the 2010 FIFA world Cup and for network Phase 1A services".

This project is a mitigation activity that has already begun implementation, largely due to available national funding and the world cup. There are however risks and challenges as the project progresses including how to address the financial deficit, strengthening institutional capacity to manage a centrally managed system, potential opposition from existing taxi & bus operators, and the complexity in managing fee collection and revenue distribution. Furthermore it is the first large scale integrated public transport system in South Africa and in this regard the City of Cape Town has to build capacity beyond planning and coordinating of a large infrastructure project but also the operational aspects.

3.2 South African Renewables initiative (SARi)

- **CO_2 Mitigation:** 1,2bn t by 2045 or 60Mt per annum at full ramp-up
- **Joint initiative** of the Department of Trade and Industry (DTI) and the Department of Public Enterprises (DPE) (with some input from civil society)
- **Stated aim:** secure both financial and institutional arrangements to facilitate critical mass of renewable development in SA
- **Co-benefits**: proposed scale up of renewables would produce 35,000 - 50,000 jobs
- In 2011 the Initiative moved into the **detailed design phase**

SARi was initiated in February 2010 as an inter-departmental initiative by the Departments of Trade and Industry (DTI) and Public Enterprises (DPE) to investigate ways to facilitate an accelerated scaling up of Renewable Energy production in South Africa (Zadek et al, 2010). It has an ambitious stated aim of defining "an industrial strategy for securing the economic gains from an ambitious program of renewables development, including financing and associated institutional arrangements that would not impose an unacceptable burden on South Africa's economy, public finances or citizens". (DTI 2010a, p.4)

SARi vies for prominence within a relatively crowded but largely uncoordinated energy policy space at national level. The policy-adjusted IRP[2], gazetted in May 2011, outlines a new build of 17.8 GW of renewable energy for electricity generation by 2030 which equates to 9% of the SA fuel mix for electricity in 2030 (RSA 2011, p18). Therefore as the National Energy Regulator of South Africa (NERSA) may only issue generating capacity licences within the framework prescribed by the IRP (Ecologic Institute 2010), without changes to the regulatory framework, the Initiative's ambitious scale-up target of between 10% and 15% renewable in the energy mix by 2013 is likely to be unattainable within the stricture of the existing 'new build' framework. 20GW by for 15% grid generation by 2020, or 23GW for 15% by 2025. (DTI 2010b, p.19)

In 2010 the South African cabinet approved the New Growth Path (NGP) which places job creation at the centre of government policy. SARi's modelling suggests that the proposed scale up of renewables would produce 35-50,000 jobs, thus it is aligned with at least one national priority. SARi is designated part of a scaled-up green economy programme according to the DTI's Industrial Policy Action Plan (IPAP 2010).

SARi illustrates the difficulties surrounding the attribution of emissions reductions. The initiative would primarily provide coordination of more ambitious action on renewable energy and a proposed financial framework to encourage investment. Any reductions which could be subject to Monitoring, Reporting and Verification (MRV) would not be produced directly by SARi as an 'entity', but by any renewable installations (wind farms etc) that were built as the consequence of the success of SARi. Emission reductions could therefore only be counted either for individual renewable energy projects, or for a programme like SARi as a whole, but not for both.

[2] This is the version of the IRP after 2 rounds of consultations: it will be recommended to cabinet for promulgation as the final IRP.

In 2011, the initiative moved into the detailed design phase, however, it is worth noting that the key risks and requirements mirror each other: a robust & transparent institutional design & consequent procurement process and the exercise of significant political will or "buy-in" will facilitate SARi. Conversely, without these, there is substantial risk of a lack of implementation.

- Exploring the carbon tax option as an economic policy instrument to achieve greenhouse gas mitigation in South Africa
- A proxy tax on fossil fuels is proposed, which will cover energy and some industrial process emissions
- The tax will enable South Africa to meet its Copenhagen Pledge (Treasury, 2011)
- The tax will generate revenue, but recycling of revenue will ensure that the tax is revenue-neutral to the fiscus.
- Treasury has been studying environmental fiscal reform since 2004, but more recently has issued a discussion document (December 2010) for comment and conducted analysis of the socio-economic implications of a tax

3.3 Carbon tax

National Treasury has signalled its intention to implement a carbon tax as an economic policy instrument to achieve greenhouse gas mitigation in South Africa. Treasury has long indicated its preference for economic instruments above regulation to effect environmental reform (National Treasury, 2006), and has steadily increased the number of mitigation related economic instruments in place over the past few years[3].

However, the carbon tax itself is at very early stage of development. In December 2010 Treasury released a discussion document that outlines the rationale for implementing a tax in South Africa, but gives very few design indications. Further, Treasury convened a stakeholder engagement after comments on the discussion document were submitted, where modelling of the impact of the tax on the economy was presented. A timeframe to regulation (and therefore implementation) of just over a year has been proposed, with legislation to be published for public comment in May 2012. It is not clear that this time-frame is achievable given the current level of instrument design. The discussion document calls for policy co-ordination for mitigation, and the tax will require supporting instruments in other policy areas to be developed.

A carbon tax in itself does not reduce emissions. However, the changes in relative prices and responses that this induces have resulted in very significant mitigation in countries that have implemented carbon taxes (Winkler & Marquard, 2009). Academic work on a possible carbon tax in South Africa suggests a similar effect (Goldblatt, 2010; Winkler & Marquard, 2011). Modelling for the LTMS analysed a carbon tax separately from other measures, in an energy model and also economy-wide modelling, and found that the carbon tax was the largest single mitigation intervention. Despite the indirect nature of its effects, a carbon tax is therefore a significant policy instrument for mitigation.

[3] These include: the 2.5c/kwh tax on electricity generated from non-renewable resources, tax on vehicle emissions, a charge on incandescent light-bulbs and income tax exemption for Certified Emission Reductions from CDM projects.

As proposed in Treasury's discussion document, the tax will have a broad base, covering a large number of South Africa's emissions sources, and thereby potentially inducing significant mitigation. Treasury's modelling suggests the tax will enable South Africa to meet its Copenhagen Pledge (National Treasury, 2011). As the tax is likely to be levied on fossil fuels, and as supporting policies take effect, it may be difficult to identify the number of tonnes of CO_2 equivalent (tCO_2e) mitigated in response to the tax. A projected baseline will be required to identify 'business as usual' emissions, but it will be difficult to specify attribution. The tax may have significantly positive knock-on effects as the price of carbon is anticipated to stimulate low carbon industries, products and processes. The discussion document proposes an escalating tax rate from R75 to R200 per tCO_2e. The tax itself as currently proposed (without any supporting incentives) will self-finance, and may actually generate revenue for mitigation.

The carbon tax appears to be aligned both with national mitigation policy objectives, and with the government priorities of growth and employment creation. Treasury's modelling suggests that GDP will be only slightly affected by the tax, the effect on employment will be neutral, and there will be a small reduction in inequality (National Treasury, 2011).

Whilst Treasury is an influential department, and determined to introduce the tax, it engages and potentially threatens incumbents in the minerals and energy sectors, and as such may face substantial opposition or lobbying from vested interests. The complexity of applying an economic instrument to an uncompetitive and regulated energy sector may also prove problematic. Institutionally, Treasury has capacity to administer the tax, but may require assistance from external consultants and experts to design the tax, particularly those with an understanding of energy economics. Whilst these are available domestically, international assistance is likely to be beneficial.

Therefore the tax is an ambitious policy instrument, and one that is central to the country's mitigation efforts. However, it requires careful design to ensure minimal negative impact on economic growth, and careful political and process management to navigate vested interests in South Africa's carbon intensive economy. Ensuring policy contextualisation, alignment and co-ordination with the Department of Environmental Affairs (DEA) led overarching mitigation policy will be important.

3.4 National Sustainable Settlements Facility

- Financing solar water heaters and thermal efficiency measures in 1 million new build low income houses in South Africa by 2020
- Programme delivers 3 $MtCO_2$ per annum reduction relative to baseline (30 $MtCO_2$ by 2020 and 95M tCO_2 by 2030)
- Costs:
    - Upfront programme and capacity development: €1m.
    - Programme capital costs: €2b by 2020 (undiscounted).
- Implementation tracked by number of new build houses including upgrades, and maintenance of the solar water heaters over time.
- Significant health, safety and energy service delivery co-benefits through the delivery of improved quality housing to poor households
- Currently in advanced design phase, led by the Development Bank of Southern Africa (DBSA).
- Education and awareness-raising around clean energy issues in a sector of the population anticipated to drive emissions growth into the future

The National Sustainable Settlements Facility (NSSF) will administer financing enabling the Department of Human Settlements (DHS) to increase the mandatory specifications of all new subsidized housing in South Africa to include solar water heaters and thermal performance improvements such as orientation, roof overhangs and insulating building materials[4]. It is a public facility, relying largely on a combination of international and domestic public funding. The NSSF is designed to earn income through an international carbon market mechanism such as the CDM.

The facility has substantial co-benefits in the form of improved health and reduced energy bills for home occupants, access to improved energy service for both urban and rural communities, employment generation, air quality improvements and reduced requirements for national electricity generation at peak times, and is therefore fully aligned with national priorities. It has knock-on mitigation benefits through the stimulation of demand for energy efficient interventions and through awareness of mitigation issues in the low-income sector.

The NSSF was conceived and developed by SouthSouthNorth Projects Africa (SSN), a Cape Town based NGO established to explore the implementation of the CDM. The SSN initiated Kuyasa Housing Project demonstrated the use of sustainable energy technologies in low income housing in South Africa, together with approaches for crediting emission reductions from these under the CDM (SSN, 2004), but did not consider financing for the project beyond the CDM. This becomes critical to achieve scale, hence the development of the NSSF. SSN has partnered with the Development Bank of Southern Africa (DBSA), which will host the facility, at least in the development phase. The Departments of Human Settlements,

[4] Whilst sustainable energy interventions are encouraged in the National Housing Code (2009), there is no corresponding budget allocated to finance these.

Energy, Environment and Science and Technology, together with the South African National Energy Research Institute, National Energy Efficiency Association and key metros have been involved in developing the concept and have given it their formal support.

The NSSF is in early design and planning stage, having been proven conceptually and subjected to extensive stakeholder engagement. Further development on MRV for the programme is being undertaken under the Gold Standard and the CDM[5], with local technical capacity. The NSSF is being piloted at large project scale in the housing development Cosmo City to develop and demonstrate a sustainable financial model.

The NSSF requires proving at scale, and detailed development of the mechanisms for implementation, including an institutional structure, disbursement mechanisms, MRV systems and access to the technologies and skills to install and maintain them. Proving a sustainable financing model, which effectively balances the interest and capabilities of all stakeholders, is the primary challenge of the NSSF. However, it also relies on many supportive measures that are not yet in place, including local skills to both install and MRV the technologies, acceptance of the interventions by the households, a supply of domestic manufacturing technologies, and maintenance capabilities at scale. The current delivery of low income housing is challenged by corruption and delivery issues on the ground, and overlaying a complex environmental mechanism on top of this may exacerbate these issues. However, it is also possible that these challenges could be overcome through design.

Emission reductions are achieved indirectly by the mechanism, through the housing projects which the NSSF financially enables. These are anticipated to be in the region of 25Mt over the first ten years of the project, at a cost of around ZAR370 per tonne. This figure excludes energy savings and co-benefits. Depending on the eventual MRV requirements, capacity to MRV may exist in the country, but is likely to require further development.

The NSSF needs to gain traction politically and momentum through confidence-building examples and pilots. As it spans the Housing, Energy and Environment sectors, some level of co-operation and co-ordination of these three departments on the NSSF would be advantageous.

[5] Including GS small scale PoA registration, and continued work on large scale methodologies which incorporate a 'suppressed demand' approach to crediting, and simplified monitoring requirements.

4. ANALYSIS CRITERIA

The objective of analysing the four examples is to arrive at a deeper understanding of mitigation activity in South Africa, particularly:

1. What is a South African Mitigation Action or SAMA?
2. What are the barriers and challenges to the implementation of SAMAs?
3. How can these can challenges be overcome through domestic measures and international support?

A set of criteria was established to assist in a consistent analysis of the four examples. These criteria were established through a process which involved firstly drawing from previous MAPS work on NAMAs as well as existing sources from international think-tanks like Ecofys, before posing ourselves a range of questions to broaden our understanding of how SAMAs are or might be defined, supported and potentially implemented.

This section organises the resultant criteria into three subsets for greater clarity: activity-specific information (usually descriptive), implementation issues, and NAMA specific elements with a view to addressing issues of international financing and reporting.

In looking for **activity-specific information** we began with the fundamentals:

- a description of the activity to mitigate emissions;
- its link to emission reductions (direct or indirect);
- a quantification of relative emission reductions, and
- the timing of the implementation or start of the activity.

We also considered whether the activity to mitigate emissions would have potential mitigation related "knock-on" effects in addition to their potential emissions reductions as well as whether co-benefits (non-mitigation related) were likely. This was particularly important when considering activities to mitigate emissions which might not primarily be driven by the objective of mitigation.

The second subset of criteria pertained to the possible risks to the **implementation** of the mitigation activities. First we considered the complex and multifaceted issue of capacity. We identified at least three discrete (but inter-related) areas in which capacity is potentially an issue: technical, institutional and ongoing capacity to monitor. The first two fall in this subset of implementation elements and the third one is dealt with later under MRV in the NAMA section. We posed the question of whether South Africa had both the *technical capacity* to design activities to mitigate emissions and the *institutional capacity* to see the activities to mitigate emissions through to implementation.

Two governance-related issues regarding implementation are the national policy context within which the activities to mitigate emissions are either driven, embedded or will have to function; and whether the activities to mitigate emissions are aligned with South Africa's national priorities.

Implementation also raises questions about agency in terms of the initiation, ownership or stewardship of the activity to mitigate emissions. In other words: who initiates the activity, who sees it through the implementation and maintenance (if any) phases and is this the same agent or different agents and if the latter, how would this be managed? The last two crucial elements we considered were whether there were plans for, or the existence of, a financial infrastructure for the activity to mitigate emissions and any other the potential risks to the implementation of the activity we had not already captured.

The third subset of criteria we grouped as they relate to information which we speculate would be needed to transform a national-level activity to mitigate emissions into a **NAMA** within the UNFCCC context in order to access international support. At the time of writing a NAMA has no clear definition or access criteria yet under the UNFCCC.

These are criteria which are anticipated to be essential to acquiring international financing and providing the information required for MRV of actions and support. Firstly, we asked whether the activity to mitigate emissions had been *designed* so as to be optimally positioned to apply for and receive international climate funding. Secondly, we asked whether the activity would require *financing of either the incremental costs* for implementing a mitigation action as opposed to business as usual investment, or fuller financial support if it was a preparatory activity (this disaggregation of international financing criteria stems from the international negotiations).

As a contentious topic at the international level, MRV is likely to remain an important issue as the mitigation activity/NAMA paradigm develops. We follow the understanding in the negotiating process, that what would be primarily required to be subject to MRV is the emission. Some level of domestic MRV may be required, but with this criteria we are assessing MRV as required internationally. The South African government is in the process of building its capacity to conduct the domestic MRV process (in the form of three staff members to be appointed in the DEA) and various organisations (including the Energy Research Centre (ERC) and the National Business Initiative (NBI)) are investigating options.

The actual resulting criteria are presented in the analysis section below.

5. ANALYSIS OF SOUTH AFRICA'S MITIGATION ACTIVITIES

Using the criteria identified above, the four mitigation initiative examples are analysed and discussed in this section. The analysis of each area of enquiry is summarised in tabular form, and then described. An excel table providing the full underlying data for the analysis can be found in Appendix 8.4.

5.1 Examples and Defining SAMA

TABLE1: DESCRIBING THE EXAMPLES

DESCRIPTION CRITERIA	TIMING: IS THIS A SHORT, MEDIUM OR LONG TERM MA? (WHEN WILL IMPLEMENTATION START?)	WHAT ARE THE RELATIVE CO_2E SAVINGS?	POTENTIAL MITIGATION KNOCK ON EFFECTS (SMALL, MEDIUM, LARGE)	CO-BENEFITS?
Tax	M	From Pledges? No figures given but could be deduced.	L (behaviour, price internalisation)	No direct.
NSSF	M	6m	L (education, manufacturing industries)	Skills, employment, health, energy poverty alleviation, avoided electricity generation.
SARi	M	1,2bn tonnes by 2045 or 60Mt per annum at full ramp-up	M (increasing of manufacturing base etc.)	Manufacturing, air quality, FDI attraction, skills development.
BRT	S	1.4m tonnes of CO_2e over first 10 years of implementation.	S (Awareness, increasing capacity at municipal level)	Improved air quality, reduction in transport costs, avoided fuel consumption, BoP benefits. Develop local construction skills base, formalise and grow taxi industry.

The four examples could be categorised as a local transport project; a national financing mechanism for renewable energy; a national mechanism for financing, aggregating and facilitating sustainable energy interventions in the low cost housing sector; and an economic policy instrument (the carbon tax). Therefore, whilst each covers different areas of mitigation, there is a strong weighting towards those that are focused on financing in the sample.

Of the four examples examined only the BRT has been implemented, and then only in its first phase. The other activities are likely to be implemented in the medium term. It is interesting that only the activity to mitigate emissions whose primary motivator was not climate mitigation has 'broken ground'.

All of the activities to mitigate emissions can be relatively easily modelled to understand their emissions reduction potential. However, this doesn't necessarily reveal much about the issue of attribution, particularly in the case of the

carbon tax and SARi. Once these activities are implemented, attribution may be even less clear, especially in the case of policy instruments and financing mechanisms, which are at least one step removed from the actual emission reductions.

The examples are considered for their ability to produce 'knock on mitigation effects', or mitigation beyond the individual activity's boundaries. This varied amongst the examples, pointing perhaps to the difference between local and national level activities to mitigate emissions, and also potentially to the difference in the number of people, economic actors, end users or sectors the activity reached. The type of activity may also play a role, with financial mechanisms having a greater potential for additional mitigation, although potentially for different reasons.

The discussion in this paper thus far has avoided defining the term SAMA, yet this is an objective of this paper. Appendix 8.2 lists activities which are anticipated to contribute to emission reductions, and these comprise policies, strategies, scenarios, targets, voluntary agreements, regulation, standards, economic instruments, financial mechanisms, subsidies, programmes, projects, pilots, market activities, capacity development, information generation, innovation, institution-building, Centres of Excellence, partnerships, training, skills development and more. These activities and statements are very diverse, and therefore it is clear that defining a mitigation activity as anything that contributes to emission reductions is far too broad a definition to be a useful in understanding South Africa's approach, barriers to implementation, or necessary support for mitigation action.

The term 'mitigation action' is still evolving in the climate negotiations and emergent in the literature on mitigation. To date, the definition of 'action' has largely been important in a negotiating context, with developing countries committing to take action under the 'nationally appropriate mitigation actions' (NAMA's) mechanism. The extent to which these commitments will be realised depends on support from Annex 1 countries to developing countries, established in Article 4.7 of the Convention and confirmed for NAMAs in paragraph 1b(ii) of the Bali Action Plan. There has been no attempt, as far as the authors are aware, to definitively establish the term outside of the UNFCCC context[6].

Whilst work to define a NAMA is certainly relevant to the definition of a SAMA, from a MAPS perspective it would seem clearest, simplest and most helpful to focus simply on 'mitigation actions' as core terminology rather than addressing the 'nationally appropriate' of NAMAs, which have assumed the connotation of internationally supported actions (e.g. para 56 of the Cancun decision 1/CP.16). This paper focuses on South Africa, and therefore 'SAMAs' as a sub-set of mitigation actions.

Given the dearth of literature describing or defining mitigation actions, the NAMA literature is briefly considered as a starting point. NAMAs are very broadly defined in this literature, and include data collection, studies, research, strategy development, plans, policies, projects, pilot projects, programmes the definition implementation and enforcement of regulation, capacity and institution building, provision of financial incentives and awareness raising or campaigns (Ecofys 2010b; Climate Strategies, 2009). The literature is unclear as to whether activities which indirectly cause emission reductions are NAMAs (Ecofys, 2010a; Ecofys, 2010b). NAMAs are also assumed to differ with regards to the timeframe to the realisation of emission reductions (Ecofys, 2010b).

NAMAs are understood to require supporting actions, and therefore can be said to have 'components' (Ecofys, 2010a). Climate Strategies (2009) finds that it is desirable to define one NAMA for any one transition in a sector or technology.

[6] Kim et al define the term mitigation action for the purposes of their 2009 OECD paper 'Matching mitigation actions with support: key issues for channelling public finance' (COM/ENV/EPOC/IEA/SLT(2009)8). The definition is very broad, including both climate-directed and climate-relevant actions and ones with both direct and indirect impacts on emissions.

Similarly, Ecofys (2010b) suggests that NAMAs could be either broadly defined as sectoral or national plans, or narrowly defined as a particular project, and states a preference for the broader definition as it avoids emission reduction attribution problems, and double counting. The closer to a specific project or programme the activity is, the easier it is to attribute emission reductions.

As discussed in the previous section, financial support for NAMAs is anticipated to be associated either with financing of the incremental costs for implementing 'regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol' (UNFCCC, 1992: Article 4 para 1b), or financial support for 'the development and enhancement of endogenous capacities and technologies' (UNFCCC, 1992: Article 4 para 5).

The Cancun text (UNFCCC, 2010) 'encourages developing countries to develop low-carbon development strategies or plans in the context of sustainable development' (para 65), suggesting that NAMAs are different to country strategies or plans. This approach is useful for our derivation of a SAMA definition in that it assists in narrowing the set of possible SAMAs. It is further supported in that the term NAMA emerged from the desire to scale up beyond the project-based CDM, and is therefore closely linked to actual emission reductions.

A SAMA must certainly result in emission reductions, and many argue that these must be measurable Winkler states that 'measurement is a fundamental starting point to any kind of mitigation action' (2008:539). Given that the BRT provides a strong example of mitigation action, it is concluded that a SAMA can cause emission reductions either directly or indirectly. Unpacking this causal relationship proves complex, and complicates the measurement of emission reductions and avoidance of double counting. Of the four examples, only the BRT could be said to directly reduce emissions as people switch from cars to buses. But can all these emission reductions really be proved to be a result of the presence of the BRT, or may some of them be the result of a carbon tax which is making petrol more expensive? The tax, SARi and NSSF are mechanisms or financing instruments which enable and incentivise mitigation projects and activities such as energy efficiency in industry, including solar water heaters on low income houses or developing a windfarm to occur. They are therefore one step away from the actual mitigation. However, their impact on mitigation has the potential to be highly significant, and for this reason are difficult to exclude from the definition.

A SAMA can be said to have two important components. The first is a name, or identification. Following directly from the NAMA literature, a SAMA is unlikely to be a plan, strategy or scenario, which suggests that implementation is a second important aspect of a SAMA. Both of these components are required, although each can be at various stages of development. The definition of a SAMA should preclude any judgement of whether the activity is likely to succeed, as this is a separate consideration of effectiveness, and not primarily one of definition. A SAMA need not be primarily motivated by the need to reduce emissions, as the BRT is a very good example of emissions reductions motivated by an entirely different objective.

The NAMA literature begins to suggest a continuum of activities which would lead to mitigation. The UNFCCC approach distinguishes between activities to mitigate and the development of endogenous capacities and technologies. Ecofys (2010a) speaks of supporting actions to NAMAs, and 'components' of NAMAs. The diagram below attempts to depict such a continuum, or set of components and / or supporting actions, referencing the SARi example.

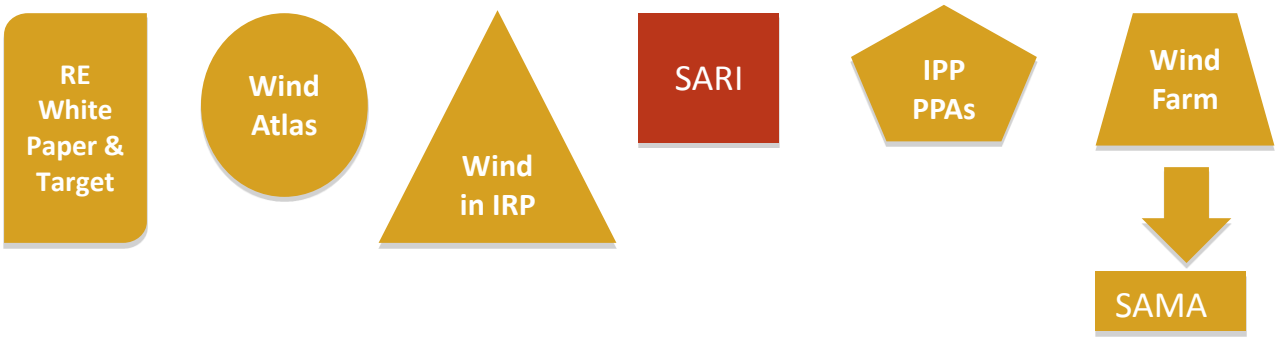

Figure 1: SARi SAMA Continuum

The diagram demonstrates some of the complexities in developing a SAMA definition which will automatically include or exclude distinct activities. Each of the shapes in the diagram contains an activity to mitigate emissions (SAMA, SAMA-component or supporting activity), in the form of a policy paper and target for renewable energy in South Africa, research, a plan for electricity generation build (the IRP), contracts (Independent Power Producer Power Purchase Agreements) within a regulatory environment, an aggregated financing mechanism (SARi), and a project involving technology. These can be separately identified and implemented, and each plays a part in emission reductions, although the wind farm is the closest to the reductions in terms of causation. The activities are mutually supportive, but it is unclear at what point along the continuum the activities change from those that support a SAMA, to a SAMA-component or SAMA itself. It can be argued that SARi, the IPP PPAs and the Wind Farm are all SAMAs as they most directly cause the emission reductions, whilst the activities to the left of the continuum are 'enablers' or supporting activities. But this argument is not watertight. It also involves double counting of emission reductions, if all three are equally considered SAMAs in their own right. Alternatively, only the wind farm could be identified as the SAMA, as it is to the far right of the continuum. But this definition is less practical as cautioned by the NAMA literature which proposes that a more encompassing and sector level definition is more useful in practice. Potentially the entire continuum could be termed the SAMA, with each activity to mitigate emissions a 'SAMA-component'. It is not clear what the implications of this definition would be for accessing international finance, and it is also unclear whether it would be particularly practical in application, given the diversity of actors involved.

In principle, this discussion suggests that the further to the right of the continuum an activity is, the more likely it is to be usefully defined as a SAMA. From this perspective SARi, the NSSF and the BRT are likely to be classified as SAMAs. However a carbon tax appears to be in a category of its own. Carbon prices are theoretically most usefully introduced upstream in an economy, and therefore may be a few steps away from where emissions are reduced (for example an increase in the price of coal leads to increased production costs for a coal-to-liquids plant, which both results in a potential switch to gas as a feedstock, and can be partially passed through to the petrol consumer through a regulated fuel price, causing the consumer to travel less or switch to an electric vehicle). However, the carbon tax could also be the direct cause of the emission reductions (a price increase leads to a reduction in the use of coal in industry).

An alternative way of considering SAMAs could be to identify them according to the type of activity they are. This approach is depicted in the diagram below.

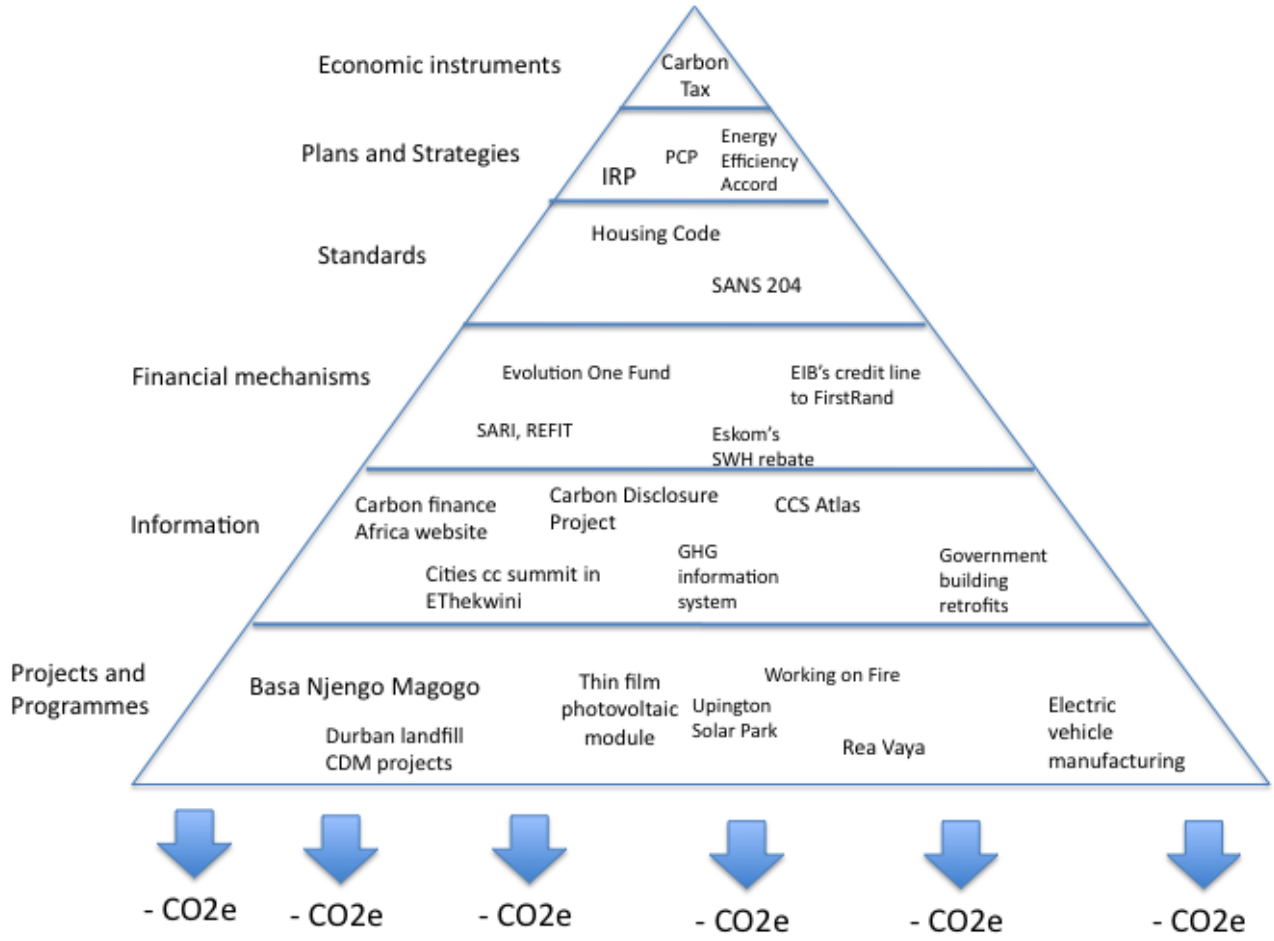

Figure 2: A SAMA pyramid

At the top of the pyramid are activities which impact almost all of the others, whilst at the bottom are those activities which are closest to the actual emission reductions. In the middle are activities which indirectly cause emission reductions, and which cause emission reductions from more than one 'bottom level' project or programme. For example, The Housing Code and the NSSF will contribute to emission reductions from the installation of insulated ceilings in low income housing, and in the inclusion of solar water heaters on high income housing. The example of the carbon tax has been discussed. The hierarchical nature of the diagram aims to convey the interventions which impact many others being closer to the top, and one gets closer to implementation of actual emission reductions the further down one goes. However this relationship is not unambiguous, as different types of activities to reduce emissions have different extents to their impact (for example a wind atlas only contributes to emission reductions from wind farms). This perspective captures the interconnectedness of many mitigation activities, and that the different 'SAMA continuums' in the country may overlap at many points. It does not shed any more light on the difference between supportive or enabling activities and SAMAs. Only the final activities in the bottom row can be unambiguously attributed to specific emission reductions.

A further approach, the decision tree depicted below, works off the principle that only those activities to mitigate emissions close to the right of a SAMA continuum are SAMAs. It then goes on to classify these as direct or indirect SAMAs according to whether they are at the far right of the continuum (and bottom of the pyramid), or close to the right. Direct SAMAs are assumed to require financing, either domestic or international. Indirect SAMAs, are divided into two categories, 'aggregating SAMAs' or 'pricing SAMAs'. Aggregating SAMAs may also require financing (some, such as the NSSF and SARi will have been expressly set up for this purpose). It is unlikely that economic policy instruments will require finance.

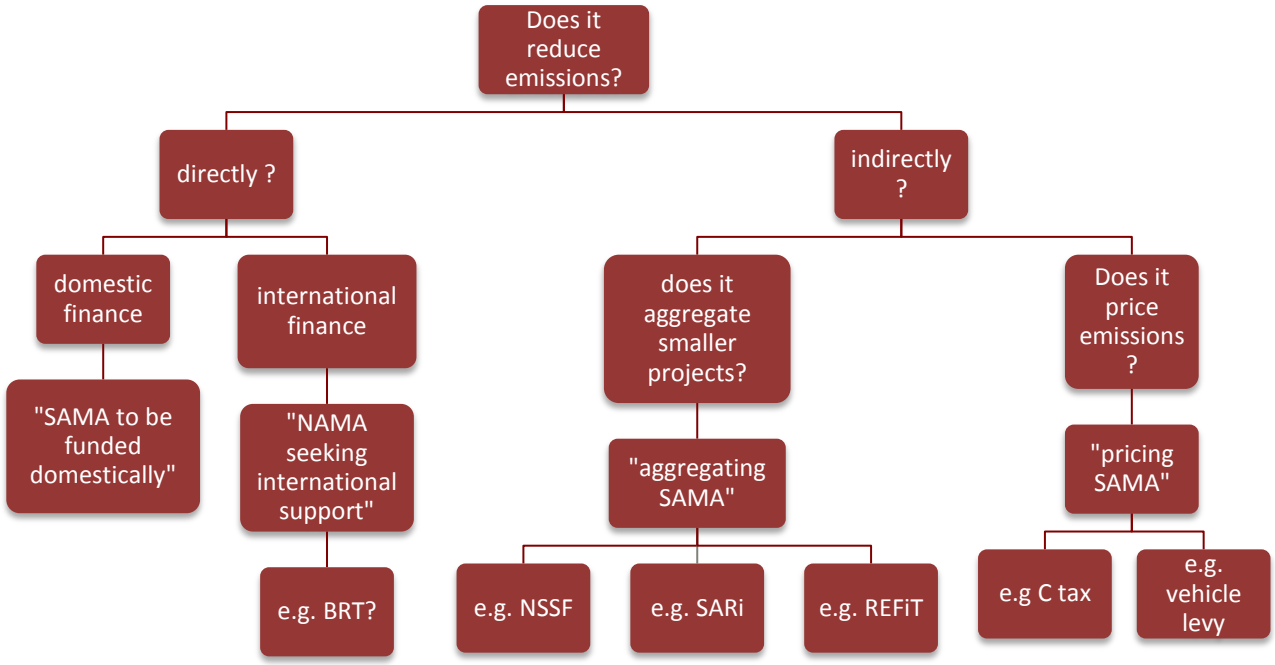

Figure 3: Decision tree to distinguish between four types of SAMAs

This discussion on SAMA definitions raises some important issues, which are not resolved in this paper:

- Is it useful to further define SAMAs (and by implication, 'mitigation actions') as a concept in itself?
- Is it important that work to define mitigation actions is aligned with ongoing work to define NAMAs? Which should inform which? How should mitigation actions and NAMAs (or other UNFCCC and international mechanisms) interact?
- The eventual SAMA definition is somewhat determined by the reason for which a definition is being created. If it is focused on accessing financial support, either domestic or international, then including all 'direct' and 'aggregating indirect' SAMAs is a useful direction to pursue. If it is for measurement purposes, then only including the 'bottom of the pyramid' activities may prove more useful. If the objective is to identify mitigation impact, then including both direct and indirect categories will be necessary, and perhaps the definition should be further expanded to certain activities to the right of the continuum.
- Importantly, due to the examples chosen, the discussion has nothing to add regarding activities to mitigate emissions in the realm of information, regulation, policy, institution and capacity building. This deserves further attention.

5.2 Enabling implementation: overcoming risks and barriers

The risks to implementation of the four example SAMAs were considered, and a green, amber and red system of depicting risk is used as an analysis tool (red indicates high risk, amber medium risk and green indicates low risk). The results are depicted in the diagram below. It should be noted that because the SAMAs are at different levels of maturity, this analysis focuses on areas which have been challenging to implementation, rather than current levels of implementation.

TABLE 2: RISKS TO IMPLEMENTATION

Description Criteria	Is there a problem with mandate?	Is there relevant existing institutional capacity to implement?	Is there a supportive planning, policy and regulatory context for the MA?	Is it aligned with national priorities?	Has a financial structure for the MA been developed?	Is there local technical capacity to design the MA?	Capacity to technically operationalise MA	Other, not-yet-captured risks to implementation
Tax								
NSSF								
SARi								
BRT								

The application of the risk criteria to the four SAMAs was a challenging and fundamentally subjective process, given that most of the SAMAs have not yet been implemented, and their risk profile depends on the perspective of the authors (some of whom have been involved in the development or analysis of some of the examples, and therefore bring particular experiences into the analysis process), or those who were interviewed (and who also bring particular experiences and perspectives). This may mean that some findings are overstated.

All of the SAMAs have very particular **'other'** risks to their implementation, and these specific risks tend to present the highest level of risk identified. These 'other' could be divided into two types. The first is that of vested interests, which the tax, BRT and SARi are likely to run up against, as existing systems are being changed by the mitigation activity. Finance is the second major 'other' risk identified; the NSSF, SARi and BRT all require substantial additional financing, with international climate finance largely being identified for this. Overall, the carbon tax comes out as the least risky SAMA, with only technical capacity as a potential risk of the standardised criteria. The NSSF appears the most risky, followed by SARi and then the BRT.

Risks arising from a **poor mandate** and weak or poorly defined ownership for the SAMA could occur when there is a disparity between what the owner typically does, and what the SAMA does (in the case of the NSSF), or when the SAMA cuts across government departments (e.g. SARi which appears to straddle DPE, DTI and Department of Energy (DoE), and the NSSF which straddles both DHS and the DoE). Clear, high-level and possibly legal mandates for mitigation actions would facilitate implementation.

The risk of **insufficient institutional capacity** to take the SAMA to implementation seems to diminish the closer the SAMA is aligned to successful mainstream and existing activities (for example the tax, which is a variant on the very well established policy tool of taxation, appears to have a lower implementation risk than the NSSF, which is a first of its kind from a variety of perspectives).

A **supportive policy, regulatory and planning context** is an important enabling factor for implementation, and the risks of this seemed to diminish where there is a non-climate change mitigation driver (such as the world cup driver for the BRT), or a strong owner (such as the Treasury for the tax). As noted when considering the risk of insufficient mandate and poorly defined ownership, SAMAs which need to cut across government departments may encounter greater challenges (e.g. SARi, NSSF). One way around this may be to situate a SAMA clearly in one area (e.g. the BRT in transport), with co-benefits in another (energy efficiency), but not attempt to require both to drive the SAMA.

Interestingly, all four examples are aligned to **national priorities**. This should help with implementation, and tends to suggest that they are nationally appropriate and that their mandate could be part of broader mandates or enhancements of existing mandates.

A **financial structure** was completed for the BRT (first phase) and SARi. The NSSF's financial structure is under development, and the issue of a financial structure is not particularly relevant for the tax which itself generates revenue and doesn't require much financing to implement. Importantly however, these are still at a modelling phase, and the only implemented SAMA, the BRT, is still in deficit. Importantly, this criteria also doesn't consider whether the SAMAs are financially viable (this is captured in the 'other' risk category).

Local capacity does exist to **design** the NSSF and SARi, but the BRT and the tax may well require external expertise. Interestingly, it appears that the SAMAs which are more unique to climate mitigation (SARi and the NSSF), and further from mainstream approaches (the BRT and tax), may struggle less with capacity issues, suggesting a high level of local innovation on the design of activities to mitigate emissions. These are also the SAMAs which are best developed as NAMAs.

Technical capacity to operationalise does present a risk to the BRT, but is not anticipated to be problematic for the remaining SAMAs. However, any new initiative (mitigation or other) inherently requires support. If the underlying area is well-functioning (e.g. taxation), then this may raise the likelihood of the SAMA being successfully implemented. In turn this suggests that South Africa should prioritise SAMAs which are well aligned to the country's strengths.

5.3 Support needed for SAMAs

Section Two on the South African context suggests that the country is good to at identifying, analysing and designing activities to mitigate emissions but hasn't yet really moved into the implementation of SAMAs, apart from at a pilot level. This could be caused by the country just not yet having prioritised this sufficiently, or (and) because real constraints and challenges to implementation exist.

Support to prioritise the implementation of SAMAs is therefore an important initial area for intervention. This could be undertaken through a domestic or internationally funded initiative. It would be important though for

the initiative to be owned by the country and its stakeholders, in order for the concept of SAMAs to gain traction.

Challenges arising from experience in SAMA development and implementation have been identified in the risk analysis of the previous section, and include:

- SAMAs struggle with typical project development blockages.
- Financing and vested interests are identified as large constraints to successful implementation.
- Technical capacity to design and operate SAMAs is required.
- A final constraint identified is the weakness of many state institutions which give effect to delivery.

Some of these challenges are likely to be best addressed domestically, whilst others will require international support. For example, financing and technological capacity is something that international support will be able to assist with, but countering vested interests is largely a domestic issue, and specific to each SAMA. Typical project development blockages, and the weakness of existing state institutions which give effect to delivery are more intractable issues, and it is less clear how the international community could assist in overcoming these.

The risk analysis also revealed aspects which are playing an important role in the development and implementation of some SAMAs, and may be able to be expanded to others. These include:

- Alignment of the SAMA with underlying areas of national strength in implementation and strong mandate, particularly to counteract the present bias against implementation overall
- Close alignment of the SAMA with the core business of the owner or implementer
- Exploiting the use of local development co-benefits which are likely to help achieve a mandate to implement. A tenuous finding is that SAMAs driven by non-climate factors may have a greater chance of implementation. This could possibly be translated as ‘where-ever possible drive through other avenues, or link closely to other motivators for the project’

The NAMA route appears to be one of the most likely mechanisms through which SAMAs could receive international assistance, and each SAMA example was considered against criteria which are considered important for NAMA suitability. The results are reflected in the table below (the red, amber, green analysis is utilised here again, but only in the non-descriptive categories).

Criteria Description	What is the level of incremental cost required to implement?	What is the full development cost?	Is this MA being designed to receive climate funding?	Can the emissions be MRV'd?	Do we have capacity to MRV emissions locally?
Tax	0	-	N		
NSSF	R5b	R10m	Y		
SARi	US$9.1 billion adjusted	?	Y		
BRT	Phase 1A- Implementation costs are ZAR 4.6 billion.	Operational ZAR 375 million between 2010 and 2014	N		

It would appear that both SARi and the NSSF are highly likely to be promoted as NAMAs, primarily due to the level of incremental financing required to implement them. In the case of the BRT, it is less easy to measure attributable emission reductions, and the City of Cape Town has decided not to propose a CDM project for this reason. It is not clear how the tax could be promoted as a NAMA, despite its anticipated significant contribution to South Africa meeting its Copenhagen Pledge.

The level of incremental costs is very difficult to determine for the BRT, and potentially for other areas where infrastructure is going to be delivered anyway. For the other three SAMAs, the incremental costs are likely to be available. The costs of developing the SAMAs up to the point of implementation is anticipated to be identified with ease in all cases.

SARi and the NSSF have been specifically designed in order to receive climate funding, whilst the tax and the BRT have not. This may be due to the underlying nature of the SAMAs themselves, or that the more mitigation specific and innovative the SAMA is, the more likely it will have mitigation financing as a focus.

All of the four examples will be able to provide information that would be needed for MRV of actions, although this may be difficult for the tax due to the way it is proposed to be levied (on fossil fuels as an indirect proxy). There does not appear to be a problem of capacity to MRV the SAMAs, but the nature of the MRV is very project specific, and it must be designed in a way which is appropriate and to enable the project to happen. The level of detail on financing suggests that these SAMAs would also be able to quantify the financial support required for implementation.

As a cautionary note, just because it may be easy to develop a NAMA in a particular area, this doesn't necessarily mean that it's the right thing for South Africa to do. It could be argued that the country has been

focusing too much on developing projects to fit with international mechanisms such as CDM or NAMAs to date, and not on what it is good at implementing domestically.

5.4 Findings

The analysis above is admittedly limited in that it considers only a very small and randomly chosen sub-set of South African activities to mitigate emissions, all but one of which have not yet been implemented. However, it raises a number of issues relating to the definition of SAMAs, barriers to implementation and how implementation can be supported going forward.

Encountering difficulties in deriving a definition of a SAMA, the paper offers a number of 'early stage' alternative approaches to considering SAMAs; as continua, categorised into types as part of a system pyramid, or as falling into four distinct categories relating to whether they result in emission reductions directly or indirectly. The analysis also questions why a definition is pursued, and whether further analytical work on this is helpful, or whether it may be more useful to focus understanding aspects such as how to measure and attribute whether an action reduces emissions, how different types of barriers can be overcome, and how mitigation actions in developing countries can be supported. This is especially pertinent in the light of the potential finding that aligning a SAMA closely to underlying development and delivery capabilities may strengthen its potential for implementation, and that SAMAs driven for non-climate reasons may also find greater implementation success.

Risks and barriers to implementation appear to be centred on issues of financing on the one hand, and those related to the domestic political economy and capacity realities, on the other. There is a clear role for international assistance in the former, but the latter presents a possibly more complex challenge, and one which must be initiated and championed domestically in the first instance.

Certain of the SAMAs considered appear to be better suited to development as NAMAs than others, particularly those which combine a clear need for capital financing with clear MRV characteristics.

Further work is required to verify these findings, and to expand on them. At this point it is hoped that they will catalyse discussion within the MAPS project and beyond, as mitigation action becomes an increasingly pressing issue.

6. CONCLUSION: A SOUTH AFRICAN APPROACH TO MITIGATION ACTIONS

South Africa has identified numerous SAMAs, or 'SAMA-components' to date. This despite no clear or co-ordinated approach to mitigation action in the country, either from the perspective of mitigation planning or for the purposes of accessing international finance through the NAMA route or others. South Africa has done less well on implementing these SAMAs. The only SAMA of the four examples considered in the paper which had been (partially) implemented at the time of writing, the BRT, was not driven by mitigation concerns at all, but rather by the availability of funding for the 2010 FIFA soccer world cup.

Four examples of activities to mitigate emissions were analysed according to a set of criteria established to address the following three questions:

1. What is a SAMA?
2. What are the barriers and challenges to SAMA implementation?
3. How can SAMA implementation be supported?

This approach, whilst limited in the extent to which its findings can be generalised and at times subjective in that only one of the SAMAs had been implemented, does assist in an understanding of mitigation action from a bottom-up South African perspective.

Probably most significantly, each SAMA considered was found to be very different, suggesting that the remaining SAMA population may be equally diverse. If this is confirmed, it would imply that caution should be exercised in seeking standardisation of SAMAs and by implication, NAMAs.

Arriving at a final definition of a SAMA proves difficult. Attempts to do this, however, offer different approaches to understanding SAMAs and their context, which may be worth taking forward in future work, particularly considering the interaction between SAMAs and low carbon development planning in South Africa. Whilst projects and programmes which directly reduce emissions are uncontroversial as SAMAs, aggregators of smaller projects and financial mechanisms are less clear cut. A carbon price is a strong lever for mitigation, but does not fall easily into any mitigation action category. It becomes clear that it is important to identify the reason behind pursing a definition in order to finally decide on an approach.

A number of factors appear to be constraining SAMA implementation, including the availability of financing, vested interests, and a weakness of state institutions. Some of these are able to be addressed through international support, whilst others are inherently domestic issues which could possibly be countered by aligning SAMAs with current areas of implementation strength within South Africa, focusing on non- climate drivers, and avoiding SAMAs which fall across more than one government department. A unified understanding of mitigation action, and plan or series of plans to implement SAMAs would clearly be beneficial, and all the more so if the mandates for action are linked to actual projects and programmes which directly deliver emission reductions.

Certain SAMAs appear more appropriate for development as NAMAs, because they clearly require significant financing and because they lend themselves to MRV. It is important that SAMAs drive the development of NAMAs, not the other way

round, as this may lead to problems with implementation if the NAMAs are not aligned with areas of implementation strength in the country.

The study also raised a number of areas for further research:

- Analysis of a broader set of SAMAs, particularly including a greater variety of types of SAMA could refine the SAMA definition, and expand on the various definitional approaches.
- Each criterion used in the analysis could be significantly further defined, most usefully in conjunction with an interrogation of a broader set of SAMAs.
- An analysis of additional implemented SAMAs, where available, would strengthen the findings.

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8. APPENDICES

8.1 TOR MAPS Mitigation Action Country Studies

MAPS has commissioned the development of five country studies to understand and explore the concept of a Mitigation Action (MA), and MA-related issues, in each of the four MAPS countries (Brazil, Chile, Colombia and Peru) plus South Africa, where the MAPS support team is based. These studies will then provide the basis for a second-phase comparative study across all five countries.

1. Each study will seek to understand how MA's are approached and conceptualised in that particular country. How does the country identify MA's and define them (if there is a definition)? Questions which the study will respond to include: What contextual framework does the country use to understood and define MA's? Have they been focused on to date, if so, by whom and in what context? Are any initiatives underway in the country to further define or structure approaches to MAs?
2. Each study will consider the suite of MAs identified in that country, perhaps with particular reference to an example or examples, against issues and characteristics of MAs, including:
    - stage of development of MAs (idea, concept note, business plan, implemented);
    - planning, policy and regulatory context (both of individual MAs and any broader plans or strategies);
    - institutional capacity to take MAs to implementation;
    - technical capacity to design and domestically MRV MA's;
    - financing;
    - ownership (who initiated and 'owns' the MA);
    - technical capacity to design MA's; and
    - any other issues which have arisen.

Approach: the studies wish to capture the particular sets of issues and characteristics relating to the MAs of a particular country. Therefore an emphasis should be placed on describing and understanding the country-specific approach in the first step, and then analysing some examples of MA's (one or more) against the items in the second step

8.2 List of Activities to Mitigate Emissions

See excel file (available on request)

8.3 Comparison of Four Example Activities to Mitigate Emissions

See excel file (available on request)

8.4 Full example analysis

See excel file (available on request)