



Measuring, Reporting and Verifying mitigation actions at the municipal level

An exploratory study of capturing co-benefits from climate change mitigation actions in the City of Cape Town

MPhil specialising in Climate Change and Sustainable
Development

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ABSTRACT

With climate change argued to be one of the most significant challenges facing human kind currently, it is obvious that a coordinated effort is needed to mitigate the dangerous effects of climate change. Mitigation of emissions needs to occur at all levels- locally, regionally, nationally and globally. At the same time it is vital that local, regional and national economies continue to grow and develop, fostering principals of sustainable development, especially in the developing world. Monitoring processes should ideally capture the full range of benefits of a mitigation action, both the ability to decrease the amount of greenhouse gas in the atmosphere and the potential to promote sustainable development. This thesis examines the potential for a local government body, the City of Cape Town in South Africa to not only monitor mitigation actions with regard to emissions reductions but to also monitor processes that are encouraging sustainable development. It has used qualitative research methods to understand the processes within the city that are fostering effective monitoring and examines where there are challenges. It has found that whilst the monitoring of co-benefits has so far been limited there are structures and frameworks in place that can be drawn upon to increase the ability of this local government body to report on the full range of benefits different mitigation actions have

List of Abbreviations

CDM: Clean Development Mechanism

COP: Conference of the Parties

DOE: Department of Energy

DEA: Department of Environmental Affairs

ECAP: Energy and Climate Action Plan

EEDSM: Energy Efficiency and Demand Side Management

IDP: Integrated Development Plan

M&E: Monitoring and Evaluation

M&V: Monitoring and Verification or Measurement and Verification

MRV: Monitoring Reporting and Verifying

NAMAs: Nationally Appropriate Mitigation Actions

SDBIP: Service Delivery and Budget Implementation Plans

UNFCCC: United Nations Framework Convention on Climate Change

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1. Introduction

Climate change is a challenge that demands global collective action. It has been described as “the most intractable collective action challenge in human history, being inherently global, extremely long term, technologically demanding, and replete with distributional difficulties, among countries, people, and generations. It is little wonder that humanity is making such a mess of it..... It requires costly and concerted action by many countries to deal with a distant threat, on behalf of people as yet unborn, under unavoidable uncertainty about the costs of not acting.” (Wolf 2012:7, 12)

Whilst the challenge is a significant one, with a rapidly growing and urbanising world the onus is no longer only on the developed world to mitigate climate change, as the developing world, especially emerging economies, are generating a substantial amount of the global CO2 emissions (Wolf 2012). There is a huge variety of actors working in the climate change space, from international agencies and corporations down to small scale local NGO’s. Governments around the world are significant players in the climate change space. Commitments and targets made at the national level become possible when there is implementation on a local level in the form of mitigation projects and programmes. Local government bodies are the ones tasked with developing, managing and monitoring climate change mitigation plans and projects.

This thesis is drilling down to the workings of one such local government. The City of Cape Town in South Africa is doing cutting edge work in the climate mitigation field. This thesis is interested in how all of the climate mitigation projects within the City of Cape Town (The City) are being monitored, reported on and evaluated at the City level. As a local government in a developing emerging economy, there will be tensions and often trade-offs between climate mitigation and other developmental priorities. In some cases a mitigation project can meet both these climate and development needs through realising emissions reductions and other developmental co-benefits. This research is interested in investigating how, if at all, the City of Cape Town is capturing and monitoring the numerous co-benefits of the various mitigation projects it is currently implementing.

It will begin by presenting a conceptual framework of the research. In line with this conceptual framework follows a literature review examining the overlap between mitigation and sustainable development, the process for MRV at the international and national level, the development of indicators to monitor sustainable development and finally examining the potential for monitoring co-benefits of mitigation actions. Following this literature review, the context of the research will be provided giving an overview of the City of Cape Town’s mitigatory potential as well as briefly discussing relevant policies and programmes that relate to MRV within the City. In light of the literature review and contextual overview the aims and objectives of this thesis will then be presented. Following this a description of the methodology used to meet the aims and objectives will be presented. The findings of the research will then be presented followed by an analysis of key themes that have emerged through the research process. The thesis will then conclude by giving an overview of the findings in relation to literature and what the City may do to strengthen its MRV system in the future.

2. Literature Review: MRV of mitigation actions and co-benefits

2.1 Introduction

It is now scientifically undisputed that the earth's climate is warming and that a substantial percentage of this warming can be attributed to anthropogenic actions, most significantly the burning of fossil fuels (IPCC 2007a). It has further been argued that even if every effort is made to mitigate climate change, there will still need to be some degree of adaptation due to the inertia of the climate system and the lifespan of greenhouse gases that have already been emitted into the atmosphere (GNESD 2009-2010). Further, adaptation alone cannot be the sole focus as unmitigated climate change will bring about catastrophic change, the results of which will almost certainly be so drastic and damaging that they will exceed our ability to adapt. With this in mind it makes sense for nations and individuals to take actions that mitigate climate change, not only to decrease the amount of greenhouse gases emitted into the atmosphere, but to also make the country or society more resilient, more capable and able to adapt to future climate stresses and changes that may come their way.

As one of the emerging economies in the developing world South Africa is looking to develop and grow but at the same time is active in the internal climate change arena. Although South Africa and developing countries are not yet required to report on quantifiable mitigation targets to the United Nations Framework Convention on Climate Change (UNFCCC) (Boyd et al 2011) this may change in the future as a new climate deal is negotiated that is applicable to all countries (Dubash 2012). It is in South Africa's interests not only to take steps to mitigate climate change but also to have procedures in place to track the countries progress in this regard. This will be beneficial in order to be able to have a record of the progress being made towards domestic targets and goals set out in various policies and plans but then to also be prepared for future reporting requirements in the international realm.

This literature review provides evidence for the possibility that exists to exploit opportunities and actions that have mitigation and other benefits that ensure sustainable development and an increase in adaptive capacity. It is specifically interested in how progress to meeting mitigation goals, as well as the other benefits that are a result of a mitigation action, are monitored, reported and verified. This literature will review the links between sustainable development and climate change mitigation, exploring synergies between the two. It will then go on to examine how mitigation actions have been monitored reported and verified and further how the co-benefits of a mitigation action can be incorporated into this measuring, evaluating and recording process.

Throughout this research paper various words, terms and phrases are used. In some cases they are used specifically and other times interchangeably. The different terminology will be discussed to provide clarity. Throughout literature different terminology is used in relation to monitoring. For example Measurement and Verification (M&V) is often used in relation to

the carbon accounting or carbon financing schemes, such as REDD+, as well as the ESKOM DSM Programme in South Africa¹. Monitoring Reporting and Verification (MRV) is often closely aligned to the processes formalised in the international climate arena under the UNFCCC. Monitoring and Evaluation (M&E) is most often referred to in the context of the National Climate Change Response White Paper for South Africa which presents a M&E framework for the country. For the purpose of the literature review and in the research paper as a whole, the words or phrases monitoring and evaluation (M&E), monitoring/measuring and verification (M&V), monitoring, reporting and verifying (MRV) are used interchangeably. Firstly, it is acknowledged that the use of different words can indicate significantly different practices or processes. Where used by interviewees the same terminology has been used in the presentation of findings. For example an interviewee may use the term M&V but not be speaking of the exact M&V process used by ESKOM but rather using the term to describe the process of monitoring for a specific project. It is important to point out that the use of these terms does not always allude to the use of a rigid specific process, such as MRV under the UNFCCC or M&V under ESKOM but rather any structure, process, plan, strategy that is used to monitor, capture, keep track of or evaluate a mitigation action, project or programme.

2.2 MRV International and National

At the international level the Bali Action plan of 2007 set the scene for the monitoring, reporting and verification (MRV) of mitigative actions under the UNFCCC and the Kyoto Protocol (Ellis and Moarif 2009, Morgan 2011). The MRV process is vitally important for trust and accountability in commitments and cooperative effort in the international climate regime (Morgan 2011). It is a system that has been put in place to monitor and report on the progress of targets, and then have this information verified to ensure it is accurate and a fair representation of what has taken place. Whilst developed countries (Annex 1 countries) and developing countries (non-Annex 1 countries) both have a role to play in the global fight against climate change and each have a responsibility to mitigate, this responsibility is differentiated. Developed countries who have commitments under the convention have to comply with specified emissions reductions targets under the convention (UNFCCC 2007; Boyd et al 2011; Breidenich and Bodansky 2009; Niederberger and Kimble 2011). On the other hand, for developing countries, they are required to develop Nationally Appropriate Mitigation Actions (NAMAs), which should be in the context of sustainable development and enabled through support financially, technologically and in capacity building (Ellis and Moarif 2009, UNFCCC 2007). It is these NAMA's that developing countries, like South Africa, are required to MRV. However, international guidelines on how to carry out domestic MRV have not been finalised under the UNFCCC (Ellis and Moarif

¹ For more detailed information on the ESKOM Measurement and Verification process and REDD+ Monitoring see <http://www.eskom.co.za/c/102/measurement-verification/> and <http://www.un-redd.org/UNREDDProgramme/InternationalSupport/MeasurementReportingandVerification/tabid/1050/language/en-US/Default.aspx> respectively

2009, Boyd et al 2011). There has been some incremental progress made at COP18 in Doha. With regard to Annex 1 countries there is still little clarity on verification structures and no common reporting format tables were adopted (WRI 2012). However, the COP did agree to adopt voluntary domestic MRV guidelines within a year, allowing an opportunity for developing countries meet reporting requirements on the international and domestic level (WRI 2012).

Even though South Africa does not need to report emissions reductions targets in terms of compliance as do developed countries, there are reporting mechanisms in place which allow South Africa's mitigation efforts to be reported in the international arena. This is in the form of the National Communication to the UNFCCC which includes the Greenhouse Gas Inventory which has been compiled and submitted on three occasions since 1998 (RSA 2009, Ellis and Moarif 2009).

2.3 Mitigation and Sustainable Development

It has been argued that the model of economic growth and development pathways that were taken by the industrialised world and the pathways that some developing nations are on currently, are unsustainable (Mumtaz 2011). Although it may seem unsustainable, industrialisation can represent a viable development strategy in the context of climate change (Zhang 2012). In developing countries such as South Africa, there can often be a trade-off between development and climate change mitigation as development may seem to compromise mitigation through increasing carbon emissions as the economy grows and expands. However, there need not always be a trade-off where one 'trumps' the other, but the two can work synergistically. Not only is this synergistic element possible but it is in actual fact imperative. Sustainable development is necessary to ensure that mitigation actions or successes are not undermined by basic developmental vulnerabilities. Further it has been argued widely that it is imperative that mitigatory activities or policies support and promote development agendas (Klein et al 2005, Swart and Raes 2011, VijayaVenkataRaman et al 2012, IPCC 2007b Bizikova et al 2007). If mitigation processes are mainstreamed into existing developmental processes (Swart and Raes 2011), there will be what could be a 'win-win' situation.

In the international climate arena the link between climate change mitigation, sustainable development in the developing country context can be illustrated with the Nationally Appropriate Mitigation Action (NAMA) concept. The NAMA concept was introduced in the Bali Action Plan with the hope of fostering the participation of developing countries in climate mitigation and greenhouse gas reduction but at the same time promoting sustainable development, allowing technology transfer, access to finance and capacity building support (Cerqueira et al 2012). The development of sustainable development indicators can make the NAMA look attractive politically, providing both support from politicians and receiving buy-in from voters. Not only this but monitoring the sustainable development indicators can "lead to improved sustainable development outcomes and

stimulate replication of successful policies” (Cerqueira et al 2012:5). The Centre for Clean Air Policy provides a list metrics that are “specific, measurable, cost-effective to harvest, relevant, understandable and meaningful” to domestic policy-makers and officials working for government around the world (Cerqueira et al 2012:6).

Another example of where sustainable development indicators have been useful in ensuring climate mitigation is not only reducing greenhouse gases, but also ensuring growth and development, is in the CDM Gold Standard (GS). The GS is a standard that goes beyond what CDM requires and requires that operators complete a sustainable development matrix and the monitor for co-benefits (Wood 2011). Indicators are divided into 3 groups namely, environmental impacts, social sustainability and development and economic and technical deployment (Wood 2011). From the NAMA’s and the GS examples we can see that there are numerous sustainable development indicators that have been developed and used in climate mitigation projects. The aim of this research is to ascertain whether any of these or similar indicators are being used to monitor the co-benefits at the local government level in Cape Town, South Africa.

2.4 Co-benefits and Monitoring

Whilst South Africa is engaging in the international climate change space on a domestic level there are very real and urgent developmental and environmental priorities (Davis et al 2000). It is hard to incentivise the governments in developing countries to take often costly mitigation action when faced with these other real and urgent priorities. There is potential for some synergy between climate change mitigation and sustainable development. When mitigation costs are high, these costs can be offset by the often significant ancillary benefits (Krupnick et al 2000), benefits that are in line with development priorities like improvements in public health. If these so called co-benefits can be quantified and recorded then this could encourage the participation of developing countries in climate mitigation.

In order to assess the full benefit of a mitigation action there needs to be capacity to measure or quantify the climate benefits (emissions/GHG reductions), as well as the sustainable development benefits (which may differ between mitigation actions). The two ‘sets’ of benefits may be obvious but the challenge remains to standardise methods for estimation and valuation of these benefits. This presents a challenge as for each mitigation action the benefits are heterogeneous and they may affect the economy and country differently. This makes measuring them particularly complex (Davis et al 2000). The below flow diagram clearly depicts how a mitigation project or action at the onset can have both GHG mitigation objectives as well as Development, Equity and Sustainability (DES) objectives with the result being benefits that exist alongside each other.

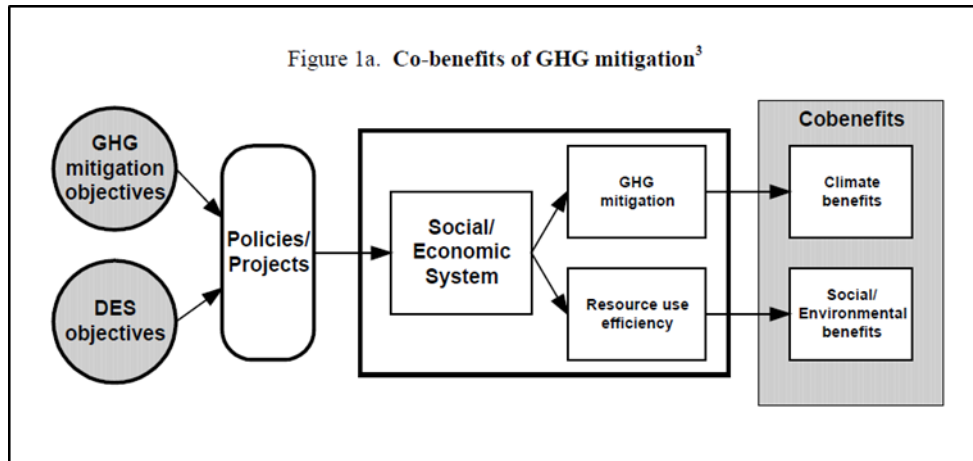


Figure taken from Davis et al 2000:11

There are many terms used to describe the non-emission benefits of mitigation actions. Jack and Kinney (2010:173) define them as described as “benefits through causal channels other than decreased radiative forcing”. Some distinguish between co-benefits and ancillary benefits. Jochem and Reinhard (2003:6) specifically differentiate between co-benefits and ancillary benefits:

- co-benefits: signalling (monetised) effects that are taken into consideration as an explicit (or intentional) part of the development of GHG mitigation policies, and
- ancillary benefits: indicating effects that are incidental to mitigation policies (i.e. not explicitly taken into account).

Davis et al (2000) further argue that co-benefits are intentional and ancillary benefits are incidental. This literature review and thesis are not concerned with the discrepancies between various definitions. This thesis will use the terms ‘sustainable development benefit, non-GHG benefits, co-benefits and ancillary benefits interchangeably. The discrepancies between these different definitions may be more pertinent when looking at the policy realm and investigating the development of climate policy and actions. However, the interest in this research is not whether the non-GHG benefits were incidental or explicit, but rather if they are being captured in the reporting or monitoring stage.

Until recently, co-benefits for mitigation projects have largely been measured and evaluated in a quantitative sense (Jack and Kinney 2010), with numerous studies using quantifiable indicators to measure air pollution and health related co-benefits, or those related to transport (Zhang and Wang 2011, Creutzig and He 2008, Davis et al 2000, Burtraw and Toman n.d). The monitoring and measurement of co-benefits is not an easy feat. The measurement of co-benefits is always challenging as mitigation actions and projects are often very context specific, perhaps necessitating different indicators and resulting in non-identical indicator sets (Parris and Kates, 2003; Pintér *et al.*, 2005). It can also be challenging as there needs to be some sort of system delineation in which to assess specific co-benefits,

for example the measurement of benefits within a specific sector, locality, population group or measuring the resultant economy or country wide impact (Wörten 2012). This does not mean to say that these benefits should be excluded in the evaluation process. There is a sense the incentivising power of co-benefits has not yet been utilised, that they have so far not been very well monitored and evaluated. Swart and Raes (2011) argue “in both cases [mitigation and adaptation] co-benefits may outweigh climate benefits, but this is often not yet recognised because of the lack of a fully comprehensive evaluation of cost and benefits over time and over different scales” (Swart and Raes 2011:292). Probably the most important finding of this literature review relating to MRV processes of mitigation actions, is that there is very little work that has been done with regard to MRV processes that use more qualitative methods and also those which look at MRV of sustainable development benefits of mitigation (Ellis and Moarif 2009). This thesis addresses the gap identified by Jack and Kinney (2010), that increasing work needs to be done examining sustainable development benefits of mitigation projects in developing countries, where population growth and urbanization are rapidly occurring. In the case of South Africa, it is argued by Boyd et al (2011) in their comprehensive study of South African approaches to MRV, that this area has been lacking so far and requires further research and development. This thesis aims to investigate the extent of and capacity to monitor and evaluate the sustainable development or co-benefits of mitigation projects at the local government level within the City of Cape Town.

2.5 Contextual Overview: City of Cape Town

In order for South Africa's approach to climate change and specifically mitigation to be strategic and aligned, it is necessary to have national level policy which ultimately drives the provincial and local operations and implementation. In the MRV context in South Africa the most pertinent example of such legislation is the National Climate Change Response White Paper ('the White Paper') published in October 2011. Chapter 12 of the White Paper deals specifically with Monitoring and Evaluation. This chapter in the White Paper highlights the need for both medium- and long-term climate projections to be available on which to plan and base responses. It further stipulates that South Africa will "within two years of publication of this policy, design and publish a draft Climate Change Response Monitoring and Evaluation System" (RSA 2011:47). More specifically South Africa's mitigation interventions will be monitored against the National Emissions Trajectory outlined in Section 6.4, detailing the 'peak, plateau and decline trajectory' that South Africa has committed to in the international climate change arena (RSA 2011:27). The monitoring process in South Africa is envisaged by the White Paper as sectoral implementation programmes and measures but a whole process that is overseen and coordinated by the Department of Environmental Affairs (DEA).

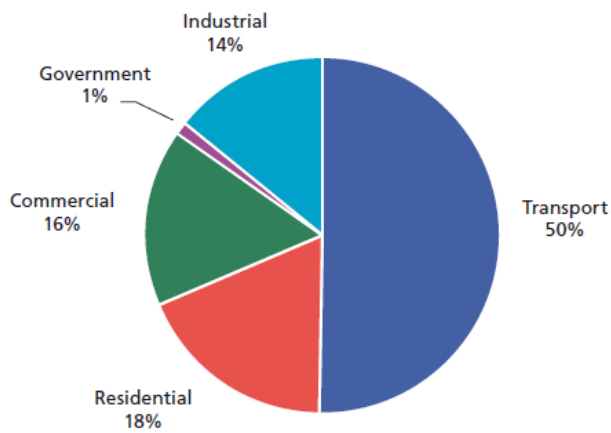
It is clear from an examination of the White Paper that South Africa has potential to mitigate climate change, and that is committed to doing so, and further to keeping a comprehensive record of this progress. This next section will examine the mitigation potential within the City of Cape Town as well as the various systems and processes that are in place to monitor and evaluate the City's mitigation response.

City of Cape Town Context

As described above local municipalities are the sites for implementation of climate projects. This next section draws on literature and publications that outline the mitigation need and potential in the City of Cape Town, as it is the local municipality on which this research project is based. It will outline the City's current energy consumption patterns and address areas where there is the greatest potential to mitigate emissions.

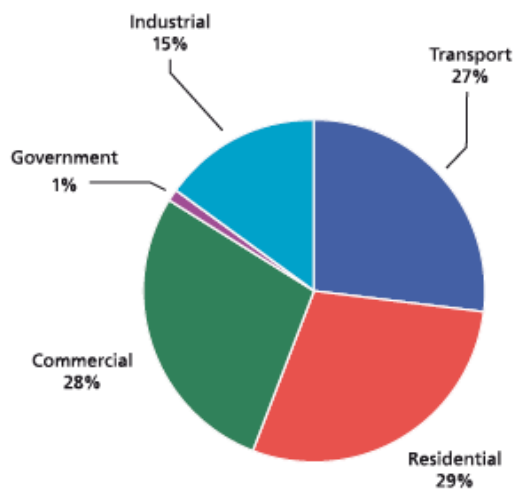
The City of Cape Town's State of Energy and Energy Futures Report uses energy consumption per sector and emissions per sector as two proxies for assessing the mitigation potential in different sectors within a local municipality like the City of Cape Town. Comparing the two pie charts highlights the need to look at both sectors that are using large amounts of energy, like the industrial and transport sectors, but then to also consider those sectors that may use proportionately less energy but have a very high emissions profile, such as the residential and commercial sectors. The high emissions in certain sectors with relatively low energy consumption can be attributed to the fact that a large percentage of the energy used in these sectors is electricity, generated from coal burning which is extremely emissions intensive (City of Cape Town 2011a).

Cape Town energy consumption by sector, 2007



Cape Town Energy Consumption by sector (Source: City of Cape Town State of Energy and Energy Futures Report:26)

Cape Town carbon emissions by sector, 2007



Cape Town carbon emissions by sector (Source: City of Cape Town State of Energy and Energy Futures Report:27)

How is the City of Cape Town responding?

The City of Cape Town is taking climate change seriously with a dedicated Energy and Climate Change Branch and political support in the form of an Energy Committee. It is, and continues to plan to respond to climate change in both policy and practice. In order to respond, data on current energy use and emissions scenarios needs to be available. The City released the State of Energy and Energy Futures Report on 2011 (City of Cape Town 2011a) which is a comprehensive assessment of the energy use in South Africa, the Western Cape, Cape Town and even in specific sectors. This is the most recent data that the City have available, and it, along with other data sets, have been used to inform policy from the broadest most strategic level down to a more practical implementation level. Policy formation is crucial for creating a mandate and strategic direction for the City's development.

A vital policy document, with a very strategic focus is the City of Cape Town's Integrated Development Plan (IDP). The IDP is a legal requirement mandated by national government and is the City of Cape Town's strategic plan for development over the next 5 years (from 2012-2017), based on 5 interrelated pillars- 'The Opportunity City, The Safe City, The Caring City, The Inclusive City and the Well-run City' (City of Cape Town 2012). Under each of these pillars are strategic focus areas and under strategic focus area specific objectives are listed. The most pertinent to climate change mitigation is Strategic Focus Area 1, The Opportunity City and Objective 1.3 to "Promote a sustainable environment through the efficient utilisation of resources" (City of Cape Town 2012:62). There are various programmes listed under this objective, some relating to biodiversity, water management and waste management. There is explicit mention of climate change mitigation where the City commits to improve its own energy use and reduce its carbon footprint. Explicit mention is made of the Energy and Climate Action Plan (ECAP) that will be used to monitor progress in mitigation across the city (City of Cape Town 2012).

The City's Energy and Climate Change Branch are managing the ECAP, a project-level project that is tracking the progress of key mitigation projects. The ECAP is a working plan that drills down all the way to project managers, project details and deadlines. This is a significant project that involves monitoring and evaluating the progress of various mitigation projects across the City. The ECAP does not limit the projects listed to those in and managed by the Energy and Climate Change Branch, or even by the Environmental Resource Management Department, but includes a wide range of projects run by different departments like the Traffic Department and the Electricity Department. This method of monitoring will be discussed in greater depth at a later stage.

Further, the City has done cutting edge research and have produced two key publications relating to the City's energy picture and future. These are the State of Energy and Energy Futures Report (City of Cape Town 2011a) and the Moving Mountains Report, Cape Town's Action Plan for Energy and Climate Change (City of Cape Town 2011b). The first report

provides up-to-date relevant statistics on the state of energy use and emissions in Cape Town and also provides details on Cape Town's optimum energy future. The Moving Mountains Report is linked to the State of Energy and Energy Futures Report but sets out 10 clear, directed and specific objectives that the City aim to complete or implement. These objectives are incorporated into service delivery implementation plans, with the ultimate goal being a city that is energy secure and competitive in a future that will in all likelihood be carbon constrained.

These plans and policies are in place to ensure that the future of the City is one which is climate compatible. With the task of implementation in front of the numerous City officials working in climate change related fields, the question that needs to be asked is what mechanisms and processes are in place to keep track of the progress towards these goals, from the broad strategic goals to the direct objectives. Further, in a developing country context are there mechanisms in place that ensure that projects and actions that are implemented at the local level are monitored in such a way to capture the full range of benefits from a climate mitigation project, not just the emissions reductions.

3. Research Approach.

3.1 Aims and Objectives

From the examination of literature and various policy documents, including their numerous targets, goals and objectives, there is strong evidence to suggest that there are both National and local goals and targets for climate change mitigation in South Africa and Cape Town. It follows that in order to track progress and deliverables it is helpful to report on these within the Cape Town, South African and International context.

The aim of this thesis is to examine the structures and projects within the local government body, the City of Cape Town, in order to explore the following research questions:

- 1) What mechanisms are currently in place to monitor, report on, evaluate, measure and verify projects, programmes, interventions or processes that are being implemented to mitigate climate change?
- 2) Does this monitoring, reporting, evaluating, measuring and verifying include the use of indicators and the assessment of benefits of a mitigation action other than the emissions reductions benefits (i.e. are co-benefits being considered?) and if this is the case how are these measured?

3.2 Methodology

3.2.1 Research design

This research aims to understand the action or process of undertaking MRV and further MRV of sustainable-development co-benefits in the context of the City of Cape Town. This thesis was a combination of qualitative research and a Grounded Theory. It involved qualitative methods of sampling, data-collection and analysis. The results can possibly be generalised to other municipalities within the Western Cape and South Africa. The research process was inductive, resulting in a new hypothesis, rather than testing an existing one (Babbie and Mouton 2005). This is the case as the MRV process of co-benefits in the City of Cape Town is largely undocumented, so no hypothesis was set before conducting the data collection. This inductive process relates very clearly to the Grounded Theory approach which seeks to build theory 'from the ground up', to make use of systematic procedures to develop theory about a given phenomenon (Babbie and Mouton 2005, Strauss and Corbin 1990, Charmaz 2006). Whilst this thesis has sought to follow this broad approach, it is not explicitly a Grounded Theory study as it has used literature in its initial stages to inform its objectives.

This research was undertaken in the context of a larger research project run by the Energy Research Center (ERC) at the University of Cape Town. This thesis has been developed as

part of a case study looking at the institutional arrangements for MRV at and between the local, provincial and national level in South Africa as part of a larger research project, MAPT²..

Practically the first step towards the aims and objectives mentioned above was a careful review of the literature on co-benefits of mitigation projects and specifically the processes to MRV these projects. This literature review was used to guide the formulation of questions for the interview process, rather than to build theory or a hypothesis.

3.2.2 Data collection

Sourcing interviewees

The snow ball sampling method (Babbie and Mouton 2005:167) was deemed appropriate in this case in order to access those who are relevant with regard to MRV of mitigation projects. The Environmental Resource Management Department at the City of Cape Town was the starting point for this snow ball sampling method. In particular the managers in the Energy and Climate Change Branch and Sustainable Livelihoods Branch were interviewed initially as they have previous involvement with the initiation and management of mitigation projects. This management may have involved some degree of monitoring.

The officials within the City of Cape Town who were interviewed include the following:

- Head of Energy and Climate Change Branch
- Senior Engineer, Energy and Climate Change Branch
- Project Manager of Energy Efficiency projects, Energy and Climate Change Branch
- Head of Sustainable Livelihoods Branch
- Professional Officer in Sustainable Livelihoods branch
- Transport Department: Engineer, Transport Planner, Sustainable Transport Branch

An interview was also conducted with the NGO Sustainable Energy Africa, a company based in Cape Town who have extensive experience both in the past and presently with MRV projects within government. In total 8 in-depth interviews were held and 1 workshop was attended.

² The ERC are extensively involved in a project called MAPT and have been co-funded through the MAPT project and the World Resources Institute (WRI) to undertake research on the domestic MRV system in South Africa. This project has been running for 2 years with the previous years' work culminating undertaking a scoping study and report of the MRV framework as it currently stands in South Africa (Boyd et al 2011).

Interview structure and design

The technique of intensive interviewing was utilised in the data collection, as the process of intensive interviewing allows for “in-depth exploration of a particular topic” (Charmaz 200:25), in the case of this research, exploration into the topic of monitoring. The interviews that were conducted were semi-structured and flexible allowing the interviewee to speak freely. The conversation was steered in a general direction by the interviewer, allowing specific topic to be pursued if necessary and pertinent (Babbie and Mouton 2005:289).

A dictaphone or voice recorder was used in certain instances to allow for accurate transcribing of interviews in the data analysis section. The ethics of the interview process as well as the use of the dicataphone are explained further in the section on ethical considerations.

The interview questions were structured into initial open-ended questions, intermediate questions and ending questions outlined in Charmaz (2006). A the following topics were used as talking points during the interviews:

- **Existing reporting processes** across the different tiers of government
- **Institutional context** & familiarity with the proposed DEA M&E framework
- **Drivers**, incentives & targets to capture & report data
- **Capacity** to collect & report on data
- **Challenges** of data collection: availability and accuracy

Source: Boyd et al (2012)

Workshop participation

During the period over which data collection was done a workshop was hosted by the Energy Research Centre in Johannesburg which brought together numerous role players within the MRV space in South Africa to work through challenges of reporting up through the three tiers of government. This workshop brought together numerous government officials from the a variety of different departments. The DoE and the DEA attended providing valuable insight on the national strategies and reporting structures, the Western Cape Provincial Government presented in their potential role in the MV space. Importantly for this research, various local government players attended including SALGA (the South African Local Governments Association), the City of Johannesburg, EThekweni Municipality and the City of Cape Town. This workshop was useful to contextualise the information gleaned from the interviews and to provide a holistic picture of the larger system. Notes taken during this workshop regarding the South African MV system, as well as specific municipal challenges highlighted by the City of Cape Town and other municipalities present, have been used to inform the findings and discussion sections of this thesis.

3.2.3 Data analysis

Once completed the interviews were transcribed using a combination of written notes and a dictaphone recording. Once the interviews were transcribed, a process of coding was used to analyse the data. Considering the inductive nature of the research, and the application of some of the principles of grounded theory, this coding process was used to analyse the data. While there are very technical methods and stages of coding such as Initial Open Coding and Focused Coding that are used to highlight significant and frequent categories in large data sets, and Axial Coding which can be used to compare these categories (Charmaz 2006, Strauss and Corbin 1990), this research adapted these techniques to suit the sample size and research aims. The transcribed interviews and notes were coded using a colour coding system where common themes and categories were manually highlighted. These themes, for example mandate or capacity, are discussed under the analysis section .

The complete process of data analysis, which draws heavily on analysis methods used in Grounded Theory, was to present an overview of the current mechanisms, practices, challenges and opportunities for MRV of sustainable development benefits of mitigation actions at the municipal level at the City of Cape Town.

4. Findings: MRV at the City of Cape Town

4.1 Energy and Climate Change Branch

The Energy and Climate Change Branch is located within the Environmental Resource Management Department and involved in numerous projects and policy development plans with regards to climate change mitigation. The interviews that were conducted with various officials in the Branch differed, as some dealt with the topic of monitoring and evaluation in project specific sense and others looked at the issue more broadly.

In the broadest sense, monitoring of all City work is done through the IDP targets and more specifically Service Delivery and Budget Implementation Plans (SDBIPs). The SDBIPs are detailed plans in the form of scorecards that are approved by the mayor for implementing the municipality's delivery of municipal services through utilising the annual budget. They should include, amongst other elements, operational and capital expenditure as well as service delivery targets and performance indicators for each quarter.³ The SDBIPs create an extremely strong mandate to monitor projects or targets that are listed on the various score cards. The monitoring of the performance of a branch or department is done by the auditor general who can give a city a qualified or non-qualified audit depending on the auditable progress made toward goals on all the SDBIPs. In a practical sense, this means that any target that is put onto a scorecard is one which must be reasonable, reachable and importantly, quantifiable or countable. For example if the City is to set a 10% energy reduction target for municipal infrastructure, then this target will need to sit on an SDBIP scorecard and be accounted for. The challenge for a target like this would be where to put it. It could easily sit with the Electricity Department or the Environmental Resource Management Department. This target could be quantified using the data collected during the monitoring of various projects, one example being an energy efficiency project.

One key project relating to MRV and managed by the Energy and Climate Change Branch is the Energy Efficiency and Demand Side Management Project (EEDSM). The EEDSM Project is administered by the Department of Energy (DoE) and funded through the Division of Revenue Act (DoRA). This project has now fallen within the Energy and Climate Change Branch's ambit, as the Electricity Department were issued with a non-compliance letter relating to poor performance with regard to M&V. There are currently 3 departments involved in this project, namely, Traffic Department (under Road and Storm Water Department) Electricity Department and Environmental Resource Management (Energy and Climate Change Branch). The project is an energy efficiency project which involves retrofitting of municipal buildings with energy efficient lights, as well as retrofitting traffic lights through the Metro. This project is unique in that it involves a national department working directly with a municipality.

³ (<http://www.capetown.gov.za/en/IDP/Pages/SDBIP20072011.aspx>).

The Energy and Climate Change Branch are doing the M&V for the whole project. The M&V of this project has been challenging for a number of reasons. Firstly, there is limited capacity within both the DoE and the Energy and Climate Change Branch to do M&V and associated reporting. This has meant that there are a handful of officials doing a large amount of work. The appointment of M&V specialists was a requirement of the DoE and these specialists have, as a result, been contracted by the City of assist with the M&V of the project. M&V specialists are certified, trained and registered service providers and individuals who undertake technical M&V work for ESKOM. These specialists are limited in number and are often very busy. In the case of the EEDSM Project, there have been numerous challenges associated with the use of the contracted M&V specialists. The specialist M&V practitioners have been a challenge to work with on the EEDSM Project, as they are said to work in a very linear, compartmentalised fashion. The reports they produce are often very technical, requiring a numerical aptitude to understand the results of the report. The template that the M&V specialists use is slightly different from the template they are accustomed to that is used for M&V related ESKOM work.

The second challenge relating to the M&V is the delivery of a report to DoE. The municipalities are unsure of the exact template required for M&V, so are unable to direct the M&V specialists, setting out clearly what is required. There will often be a requirement from the DoE that the M&V specialists have not been able to deliver, which then leaves the task with the Energy and Climate Change Branch, to undertake further work with the data to ensure the requirements are met.

Thirdly, the project has been very challenging to monitor and report with regard to the flow of raw and processed data. The Energy and Climate Change Branch need to collect and consolidate data from the three different departments. This data then moves from the Energy and Climate Change Branch to the M&V specialists, who work with the data to compile a report. The report is then sent back to the Energy and Climate Change Branch and edited if it does not meet the exact requirements of the DoE. This editing can involve making further calculations, or presenting the information in a more acceptable format. The process described above, which can practically involve the collection of and flow of information, can take time, for example assessing how many traffic lights there are, and extrapolating the savings. The simple flow of information between officials corresponding can take time and be a frustratingly slow process.

Fourthly, there are numerous challenges with regard to reporting on the spending of funding provided. In this project it is assumed that the DoE are collecting MV reports from the municipalities and using these to report to National Treasury on the money that they have given the municipalities. This reporting needs to prove that the money was well spent, that there have been quantifiable savings. The City's Finance Department also needs to report to National Treasury on the spending of City money. Accessing money for M&V and the Energy Efficiency project was cited as a significant challenge, as the budgeting time

frames for the City and the DoE are very different. Money that is awarded to and spent by the City needs to be placed on the City's budget at certain times during a yearly cycle, to accommodate budgeting and adjustment budgets. The difference between the budgeting periods of DoE and the City means that the City often struggles to access the funds that are available, and have to make appeals to the Council to make an exception to the budgeting system.

This interaction between a national department and a city or municipality could potentially be eased or facilitated by the provincial government. There however seems to be very little participation of the provincial government in this particular project. The involvement of provincial government could strengthen interaction between national and local governments but it may also simply add another reporting tier to an already under capacitated and fragile reporting structure.

There also seems to be very little overlap between the DEA and the DoE with regard to this project. As a mitigation project, reducing emissions through decreasing energy and electricity consumption, this project's M&V findings and reports should be available to both the DEA and the DoE. As far as officials are aware, this data or report sharing process is not happening and the two departments appear to be working in silos.

Co-benefits:

It seems that in the context of this particular project the officials working on the M&V of this project are struggling to meet the basic emissions M&V requirements, due to a lack of capacity and coherence between city departments and also between local and national government. A potential co-benefit of this project was that low skilled jobs could potentially be created to do the retrofitting. This ideal that the DoE suggested did not actually come to fruition. Instead, a more viable option would be to build capacity within the City of Cape Town, for example, to hire an intern to assist with the M&V.

There is potential to increase the scope of M&V through including the M&V aspect and co-benefits in the Energy and Climate Action Plan. If a detailed plan for MV, including indicators that have been identified, is put into a policy type document, it would be easier to justify and report through into the bigger City structure. Identifying what qualitative indicators to use was cited as a significant potential challenge in monitoring co-benefits of a mitigation project like this particular one.

4.2 Sustainable Livelihoods Branch

The Sustainable Livelihoods Branch is small, with limited staff and very little dedicated operational budget. They have, however, managed to plan and implement some very interesting projects within the environmental and climate change field. The project that was a good example of M&V challenges and opportunities was a ceilings retrofit that was carried out in Mamre, an area along the West Coast just outside Cape Town. This project involved

the scoping for an installation of approximately 236 insulated ceilings into RDP houses that were previously without ceilings. These ceilings have made a marked impact on the lives of the residents, as they have dramatically improved the thermal performance of the house. This thermal performance has had significant impact in lessening the health burden within the community as they previously suffered from many air-quality related diseases. From a climate change perspective, the residents previously spent substantial amounts of income on heating for the house during winter, and a large percentage of this heating was the burning of fossil fuels, such as paraffin. The ceilings have had a mitigatory effect as the insulated ceilings have decreased the amount of heat escaping and therefore the amount of fuel used, and so decreased associated carbon emissions.

This project is a very interesting case when looking at processes for monitoring as on the one hand there are emissions reductions which could be measured, but along with that the mitigation action of installing insulated ceilings has had numerous clear co-benefits, such as air quality and health improvements. There were also jobs, created as members of the community were trained in order to be sub-contracted to the contractor who was installing the ceilings. This project was also listed in the City's Energy and Climate Action Plan. The project managers explained that the monitoring of a project is hard without two things: Firstly mandate, and secondly budget. The project was funded using external grant funding from the Danish government. The condition of the funding was that the Sustainable Livelihoods Branch monitor and report on the physical installation and quality of the ceilings. The funders simply required that if the proposal was to install 'x' number of ceilings, that those were installed. This was relatively simple to do. The project managers tracked, surveyed and monitored the installation by doing numerous site visits and asked residents to sign what was called a 'happy letter' once their ceiling was installed and they were happy with the workmanship and quality. Further, there was no mandate from the funder to do any other monitoring. This seems strange as the project was funded under a theme of 'increasing resilience of at risk communities' yet they required no site specific details of how this had been done. The initial proposal describing the documented benefit of an insulated ceiling sufficed, but there was no monitoring required to measure to what degree the quality of life of a Mamre resident had improved as a result of the ceiling.

Due to the fact that there was no mandate from the funder to quantify or qualify benefits, there was no specific budget assigned to monitoring and evaluation. The Sustainable Livelihoods Branch took on this role internally, but they lacked capacity and assigned interns to the project. The interns were only on a short term contract, so would work for a certain period on the project only to be replaced by another person who had to pick up where the previous intern had left off. This resulted in data methods and collection that was patchy and inconsistent, resulting in data that was not of a very high quality. ICLEI- Local Governments for Sustainability came alongside the Sustainable Livelihoods Branch at one point to do some survey research in the community about the impact of the ceilings, and

this data has been useful but also limited as this was a once-off data collection process, not a baseline and resulting comparative study.

The mitigatory effects of the ceilings have not been quantified in terms of emissions reductions, nor is there concrete, quality data on the numerous co-benefits of the project, like a decrease in re-occurrence of TB and other respiratory illnesses. This is in part due to the lack of capacity within the Sustainable Livelihoods Branch, but also due to the fact that there is no mandate to collect it. The project managers agreed that a comprehensive study of the benefits, both emissions and other benefits, would have been very useful for reflection and to motivate for further funding. Motivation for further funding was an interesting topic with relation to monitoring. This is the case as the project managers agreed that the degree of success of a funding proposal is highly dependent on how much it meets the political 'flavour of the month', which is currently job creation. If a project can create jobs at the same time as mitigate climate change, it would be a win-win situation. This would mean having the capacity to monitor job creation, something that other projects have failed to do.

4.3 Transport Department

Numerous studies assessed and discussed the potential for transport mitigation projects, such as a public transport roll out, to have significant and quantifiable co-benefits, usually relating to air quality (Creutzig and He 2009, Proost 2000, Bollen et al 2009). There is such a transport project currently being rolled out in Cape Town. The MyCiti project is project managed and implemented by the City of Cape Town. There is a dedicated unit within the City's transport Department that is managing the roll out of this multiphase project. A selection of officials within this MyCiti branch were willing to shed light on the process of roll out, and what monitoring has been done and is envisaged. To give a broad overview, the MyCiti Project is part of the roll out of what is called Integrated Rapid Transport (IRT). The MyCiti project was initiated in 2007 by the Department of Transport (DoT) and has been implemented in a selection of municipalities across the country. The City of Cape Town have just completed the first pilot phase roll out along the West Coast corridor in order to see how the system works, identify challenges and opportunities as the bus service is rolled out across the metro. The aim of the MyCiti project is to provide a high quality, efficient and effective public transport system to commuters that will decrease traffic congestion, but more importantly, encourage a modal shift from private to public transport. The first phase of the project has not been without its challenges. The most significant challenge cited was the transformation of the taxi industry, a very unregulated informal industry that has thrived and grown in the city of Cape Town. This transition has been slow but has been carefully managed and the taxi industry has started to work well with officials. The MyCiti project has not created jobs in the transport industry as has been the case with other public transport systems, due to the fact that the jobs in the taxi industry were transferred across

to MyCiti as taxi owners and drivers have amalgamated into the MyCiti system as drivers, station managers and ticket officers, to name but a few roles.

The monitoring of this project has so far been focussed on the implementation and infrastructure related aspects of the project. These are generally management and engineering type examples, such as how many busses are operational, how they are performing, and the state of the road infrastructure. There is currently no system in place to monitor where people are traveling to, how far their travelling distances are or where their exact entry and exit points are. There has been a simple survey completed indicating the proportion of passengers using the service who have switched from private vehicle use. The focus of this first phase was to get the service up and running, to make sure there were no operational glitches, and that challenges like the taxi industry reform were running as smoothly as possible. The strong focus on implementation and infrastructure monitoring and management is linked to the current mandate for monitoring of transport projects. There is currently a government mandate for the City to submit an Integrated Transport Plan that will make its way through various government channels until it is gazetted by the DoT. For the City to be able to collect certain data, the mandate comes from the specific data being included in the ITP as a Key Performance Indicator (KPI). These KPI's are instrumental in determining indicators that are used. Using this information, it could be argued that if there was a strong enough KPI relating to the environmental and/or social impact of a transport project, there would then be mandate and drive to ensure that the necessary indicators are developed and that relevant data is collected.

The next phase of roll out into the Metro South East promises to perform in the sphere of monitoring and evaluation. It was explained that a tender document has been drawn up to appoint consultants for the next phase to assist with various aspects of the project, in particularly the environmental aspects and monitoring and evaluation. Included in the tender is an environmental assessment section, detailing the requirements that the consultants need to have relating to an environmental assessment of the project. The scope of work includes the requirement to quantify the environmental benefits and costs, to determine the environmental impact of the project. There was a strong feeling that the total benefit of the MyCiti project is not a case of direct cost versus direct revenue, but that included in this cost benefit analysis are other non-monetary, potentially qualitatively measured benefits.

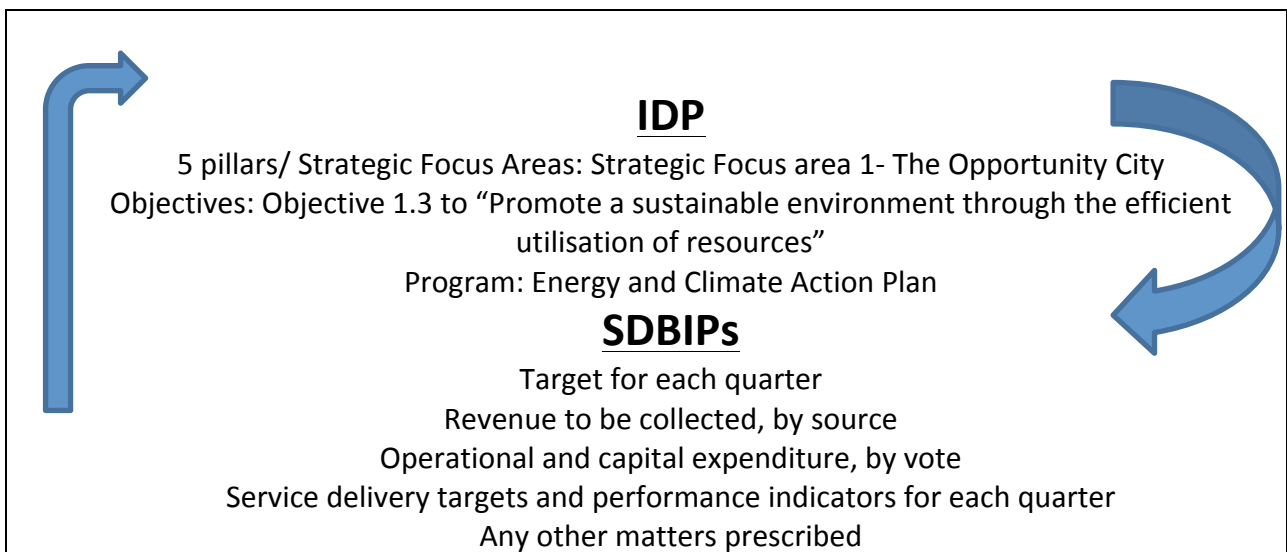
The IRT MyCiti project is not the only transport project that is mitigatory and related to climate change. There is also a small Sustainable Transport Branch within the Transport Department which is tasked with managing, coordinating and implementing greener transport projects. This department is small and has limited capacity, but has worked well in the past with other departments within and outside the Transport Department to encourage the greening of transport related activities. One of the project managers in the branch is part of the Vehicles Emissions Working Group, a working group under the Air

Quality Management Plan, specifically Objective 7 and Objective 8, to reduce and control vehicle emissions in the City, and to support sustainable transport planning initiatives, respectively. One of the main challenges associated with this particular project is the collection of emissions data from the transport sector within the City. There is only one modeller working on developing an emissions baseline and he is located in the IRT Branch.

Another project run by the Sustainable Transport Department is the Travel Smart project. This project is run by the City in collaboration with Provincial Government and five private companies. The overall aim of the project is to change the behaviour of employees with regard to travel, so that employees within these organisations travel more sustainably. Monitoring of this project is challenging, as each company has implemented different initiatives or actions so it would be difficult to do a cross company comparison. Behavioural change is also very challenging to monitor. Another behavioural change project overseen by the Sustainable Transport Branch was the Park and Ride project implemented around the 2010 FIFA World Cup. This project highlighted the challenges of monitoring a project when an external contractor is brought in to carry out the monitoring and evaluation using the City's tendering process. The City's procurement process is dictated by a National Standard that for larger projects (over R200 000), 80% of the decision/selection to award a contractor or service provider the tender is made on price, and 20% on other aspects such as proven ability to carry out the requirement of the tender. This results in some of the tenders which have the lowest price being successful, when they are not always completely competent to deliver on the requirements set out in the tender document. In the case of the Park and Ride Project the successful tenderer was not competent in fulfilling the monitoring and evaluation requirement set out in the tender.

4.4 IDP and SDBIPs

The IDP and SDBIPs, as explained in Section 4.2 of this thesis, seem to provide a good opportunity to strengthen and develop the monitoring processes at the municipal level. This is due to the fact that these processes are already in place in all municipalities. Presented below is a diagram showing the main elements of the IDP and the SDBIPs, the arrows highlighting that the activities under the SDBIPs should be aligned with the pillars, strategic focus areas and objectives of the IDP. The IDP informs the SDBIPs, and the SDBIPs realise the objectives under the 5 pillars or Strategic Focus Areas of the IDP.



*This diagram has been developed based on the authors findings and does not claim to be a comprehensive description of the IDP, SDBIP and other related monitoring systems.

With the IDP and the STDBIPs being two vehicles to monitor and report at the municipal level, the interviews revealed that there are often different processes and mechanisms used when monitoring specific mitigation projects. Presented on the following page is a table summarising the main projects discussed during the interview phase, and how these projects are being monitored. In line with the two aims of this research it presents MRV processes and then processes relating to the MRV of co-benefits

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5. Analysis

The following section will draw together key findings and themes that have emerged from the research process. These key themes are a selection of the most pertinent and reoccurring themes that have emerged through a careful examination of the findings. This discussion will deal with challenges relating to monitoring mitigation projects on the whole, as well as to the specific topic of the monitoring of co-benefits.

Firstly, local government reporting structures cannot be seen in isolation from the provincial and national structures into which they fit. Mandate, motivation, funding and support from other spheres all influence how the monitoring system at a local level works. This research project has focussed on the City of Cape Town and their capacity to report, monitor and evaluate mitigation projects. However, the mechanisms and processes that are put in place to do this seem to be determined by the reporting requirements from higher levels of government, most importantly national government. There are many plans and policies which inform and mandate MRV to some degree, but these are often vague and open-ended. At a national level the National Climate Change Response White Paper has only just been published, with the intention to draft a Climate Change Response Monitoring and Evaluation System by October 2013.

On the whole it appears that the monitoring and reporting on mitigation actions in the form of emissions inventories, is a national competency rather than a local one. Both the DoE and the DEA are involved in processes relating to monitoring of mitigation and energy projects. The respective departments are in the process of developing plans, templates and ideals for what they want to include in their monitoring and data management processes. These plans at a national level create a mandate for provinces and local government who are implementing mitigation projects to collect data and make this accessible to the appropriate national department. In order for a municipality to put in place systems to collect relevant information or data, there needs to be communication to the local municipality, firstly, about the overarching strategy and plan for M&V in the given national department and, secondly, be provided with clear directives about how data and information should be collected, recorded and verified. If local municipalities are given clear directives and even templates for M&V, it would be easier for them to plan for and deliver. When the instruction, vision, strategy and planning coming from national government is unclear and not coordinated, it is difficult to ensure the right mechanisms are in place when they are needed

These national strategies and requirements provide some degree of mandate to the City of Cape Town to report on various mitigation projects and actions. This mandate will become clearer as the M&E Framework set out in the National Climate Change Response White Paper becomes clearer. Mandate was one of the key issues that determined to what extent and what type of MRV was done for any given project. In many cases where a project has been externally funded, either by an external government department or by a funder

external to the government, the MRV requirements set out by the funder informs the mechanisms and processes set in motion to MRV the project. In cases where the expectation or requirement from the funder has been minimal, then the monitoring process need not be comprehensive or extensive. An example of this is the ceilings retrofit project run by the Sustainable Livelihoods Branch, where the monitoring requirement was simply to track and provide proof that the ceilings were installed in the community. There was no further requirement specified by the funder to further explain the benefits of the project, as these benefits, such as a decrease in amount of harmful fossil fuel burnt, had been described as an outcome in the proposal phase, so were assumed to be in place. In the case of the EEDSM project run by the Energy and Climate Change Branch, the strict reporting requirements set out by the DoE have moulded the M&V process into a very technical and quantitative one. If the mandate from the funder requires such limited M&V, or a specific indicator based approach, in this case electricity savings and resultant monetary savings, there is then very little incentive to monitor over and above this.

The IDP and SDBIP processes are critical in creating mandate for projects to be monitored and measured effectively at a municipal level. If a project is listed on any given SDBIP, which eventually feeds into the IDP process, it needs to be carefully, effectively and transparently monitored. Currently there seems to be a sense of apprehension to put climate mitigation projects and targets on the SDBIPs that require the use of indicators and measuring processes that are not quantifiable. This apprehension is largely due to the requirement to provide clear evidence of progress for the auditing process. It could be argued that this atmosphere of apprehension is one which is not conducive to allowing the development of mechanisms that can monitor and evaluate co-benefits, as part of a mitigation projects monitoring process. This is due to the fact that co-benefits may need to be monitored in a more qualitative way, a far cry from a more objective quantification process.

There also seems to be a lack of explicitly monitoring co-benefits of mitigation projects. One of the reasons for this is that the definition of a co-benefit can differ according to which department a project falls under. For example, if a project is in the Energy and Climate Change Branch, emissions reductions would be a benefit and jobs created or health improvements would be a co-benefit. However, it may be the opposite in a project run by the Transport Department, where emissions reductions may be a co-benefit to a public transport project like MyCiti. In order to ensure a co-benefit is monitored, it may have to be listed on the SDBIP of another department. This could be due to the fact that the co-benefit may not be the competency of the particular department who are implementing the project. This would in essence necessitate the same project to be listed many different SDBIPs. For example, the ceilings retrofit project could sit under a mitigation target, or a health related target. It would seem a daunting task for the Sustainable Livelihoods Branch to monitor health impacts as it would involve processes and mechanisms to be in place that they may be unfamiliar with. The answer would be to simply not put the potential for co-benefits onto the SDBIP in order to not be held accountable for measuring it.

This lack of mandate seems to be one of the most significant reasons why there is so little MRV of co-benefits. There is very little need to do over and above what is required, especially to monitor a benefit which is hard to develop indicators for, and is in some cases harder to measure quantitatively. A pertinent question to ask is what benefit is it for a municipality to monitor co-benefits? Is it simply a 'nice to have' but not that necessary? In many cases the co-benefits are obvious, for example an efficient, well designed public transport system will have air quality benefits, but what incentive is there for a local government to quantify or qualify this co-benefit when there are so many other challenges relating to monitoring to begin with, no requirement from the national government funder, and no immediate foreseen use for this type of data. The main focus seems to be on implementation and service delivery, the need to finish a project and move on to the next. There is little incentive to monitor co-benefits which will in all likelihood take time and capacity.

Even if there was a clear, funded mandate for MRV for projects implemented by the City of Cape Town, there then needs to be capacity within the City to carry out the MRV. It is often the case that project managers simply do not have the time or competency to undertake detailed MRV for a project. This has been clear from the Energy Efficiency Project, the Ceilings Retrofit Project and transport projects. Due to a lack of in-house capacity, the City of Cape Town often contract an external consultant to undertake the MRV. The process of appointing an outside contractor can in some cases be a slow and often challenging process. There are many facets of this system which can be detrimental to the MRV process, such as a tenderer with the lowest cost being chosen on this very basis and perhaps not on level of competency or experience, or in other cases very few consultants tender, leaving the project manager within the City with very little choice of who is appointed.

For successful MRV there firstly needs to be some degree of technical capacity within the City in order for the project manager to manage and work with the appointed consultants. In the case of emissions and energy savings M&V, there needs to be capacity developed within the City to understand and work with the M&V specialists who are contracted through the tender process. Secondly there needs to be a strong funded mandate for M&V within the project budget so that a competent consultant can be contracted to assist the City.

All of the project managers and City officials who were interviewed for this research cited a lack of capacity as a challenge to MRV. Often one project manager is tasked with planning for, developing, implementing and monitoring a project, along with a host of other deliverables in their everyday work life. Their capacity to do comprehensive, technical, time consuming M&V is obviously significantly low. It seems that many of them, through the appointment of external contractors, and identification of manageable quantifiable indicators, are able to produce data and do thorough M&V. The M&V that is done is what can be called the 'low hanging fruit', the indicators that are easiest to identify and

calculations that can most easily be translated into a usable report to send to funders. Almost none of the projects that were described by project managers in interviews were undertaking M&V of co-benefits. Many project managers said that co-benefits would be a great thing to monitor, but that the indicators used and processes for monitoring these benefits are often not as straight forward as monitoring a simply quantifiable unit such as kW hours, or number of ceilings installed, or number of km travelled by bus A. The findings of this research suggest that a project with strong developmental benefits is perhaps more likely to be implemented than a direct mitigation project focusing on emissions reductions. A 'non-climate' driven project, like the MyCiti Project discussed in the Findings and the broader IRT project discussed in Tyler et al (2011) has had significant political support and a relatively fast implementation. It has mitigation potential but also significant developmental potential.

This reflection by project managers is directly in line with what literature has to say about monitoring of co-benefits. It is always a challenge to identify indicators, and then develop processes to measure and monitor these. Depending on the indicators chosen there may be a need for inter-departmental interaction. For example, if the IRT monitoring processes identified the need to measure the improvement in air quality along the MyCiti routes, this would require extensive engagement with the Air Quality Management Department. It could also mean involving a department or official who has technical experience in converting other indicators into emissions reductions. With regard to an external contractor who is appointed through a tender process to do M&V, the probability of finding a contractor who is competent to measure and monitor numerous different indicators would be a challenge. For example, the M&V specialists appointed for the Energy Efficiency Project are technically trained as part of the Eskom M&V Professional Team, and would in all likelihood not have the skills or experience to undertake a qualitative study, or even monitor job creation.

Each project will have specific and perhaps unique co-benefits. In a reporting structure from local to national government it makes sense to simplify and consolidate reporting structures. Currently there are various different reporting channels, some reporting to government departments above them, others to external funders. In some cases this can or could cause reporting fatigue (Boyd et al 2011). The EEDSM project managed by the Energy and Climate Change Branch is producing data that would be useful not only to the DoE but also to the DEA with regard to climate mitigation. There can be reporting fatigue and lack of information sharing between departments at the national level and also between municipalities. This lack of information sharing seems to have led to a lack of consolidation and standardisation. There seem to be numerous different mechanisms, processes and ways to report on a mitigation project at the City level.

6. Conclusion

The challenge of climate change is a real and urgent one. It is largely agreed within the climate change field that mitigation of climate change is essential, but at the same time we need to adapt and prepare for the changes that will occur globally in the years to come.

A successful climate change response will require action at the international, national, regional and local level. This research has focussed on the local level in South Africa in the City of Cape Town. It is at this level where project implementation occurs, each project making a contribution to local, provincial and even national climate change mitigation targets. Whilst there is agreement that having robust climate mitigation monitoring is essential and useful, in reality it is very hard to achieve. This research may have been limited in the amount of departments that were interviewed. This limitation most likely due to the timeframe assigned to conduct research and interviews, and also to the busy schedules of many of the officials in the City being such that they were not able to be interviewed. An example of a few notable departments which would have been beneficial to the study are the IDP Department, the Electricity Department and perhaps a department whose mandate it is to monitor job creation. This aside, the interviews that were conducted have yielded interesting results. This research has established that at the local level there are numerous challenges to monitoring and evaluating a mitigation action. Some of these challenges include a lack of mandate, limited capacity, data availability, unconsolidated reporting structures and complicated institutional arrangements. There are however numerous mechanisms in place to ensure that monitoring is being done at the local level. With regard to climate change mitigation, the two most significant mechanisms are the IDP, through the SDBIPS, and the Energy and Climate Action Plan. These mechanisms are developing monitoring systems that are accountable and consolidated, regularly updated and audited. Moving forward, it would seem best to build on these existing channels and systems rather than develop new ones

This research was not only interested in simply monitoring mitigation actions and their emissions, but also examining the capacity of the City of Cape Town to capture the various co-benefits that these mitigation projects offer. These co-benefits are in many cases significant, and can be used to promote sustainable development within the developing country context. In this regard it seems that capacity and process for monitoring projects that have quantifiable indicators (such as kW Hours) is sometimes slow and challenging but is taking place. Indicators relating to other aspects of a project are largely not used in monitoring processes, due to the fact that they may be more suited to qualitative measurement, or due to the fact that they would need to be monitored by another department. For example, the public health benefits of insulated ceilings or solar water heaters are harder to capture and present in an auditable manner. The Health Department would be more suited to evaluating the impacts of a solar water heater that relate to health, compared perhaps to an engineer tasked with managing and monitoring a solar water

heater rollout. There does seem to be some incentive from national government to monitor the jobs created under the Expanded Public Works Programme (EPWP), which are co-benefits of a mitigation project

On the whole, at the municipal level there is a broader structure for MRV in the form of the IDP. Under the IDP sit the SDBIPs which provide detailed deliverables, which are clearly allocated to departments and individuals. This process seems to be thorough, well managed and accountable. On an individual project basis there are different mechanisms in place to monitor different projects. For example, the MRV for the EEDSM project and the MRV of the Ceilings Retrofit Project are very different, but are valuable for each specific project.

Thus far, both the broader mechanisms and the project-specific processes seem to be unable to capture the non-emissions or sustainable development co-benefits of mitigation. This could be due to a number of factors, but the main contributing factors appear to be a lack of mandate and limited capacity. With regard to mandate there seems to be a sense of caution when working in the broader IDP mechanism to commit to a monitoring process which is large and complex. Often the 'lowest hanging fruit' is what is put on the SDBIP scorecard, which will usually include simple quantitative MRV, and exclude complex qualitative co-benefits measuring. With regard to capacity, the officials working at the City of Cape Town are often very busy, struggling to meet the deliverables already on their scorecards. The expectation to embark on co-benefits monitoring possibly involving other departments and unfamiliar indicators seems a daunting and often unrealistic one.

Possibly in the future, through the IDP process and through the demands of external funders the mandate to MRV co-benefits of mitigations actions can be strengthened. This could be done by incorporating different M&V indicators into the IDP. This will be a complex process, as co-benefits differ from project to project, so may not lend themselves to a standardised monitoring framework which may be necessary on a broader scale. It is imperative that with a stronger mandate comes increased capacity perhaps through funding or staffing, in order for officials to engage in the demanding process of monitoring co-benefits.

The City of Cape Town has a strong base to build on with regard to MRV of climate change mitigation. There are very capable individuals, dynamic departments and a strong foundation on which to build a comprehensive MRV system. The City are also engaging with the partners with regards to MRV such as the DEA and the Energy Support Group. Whilst there are challenges, there is most definitely potential for mitigation actions to be monitored, evaluated and reported on in such a way that the full range of benefits are accounted for. The key will be to work and build on existing monitoring structures rather than creating new ones.

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1.1 Conceptual Framework

Overarching theme: Monitoring of co-benefits of mitigation projects

Research Activities

Section ref.

2

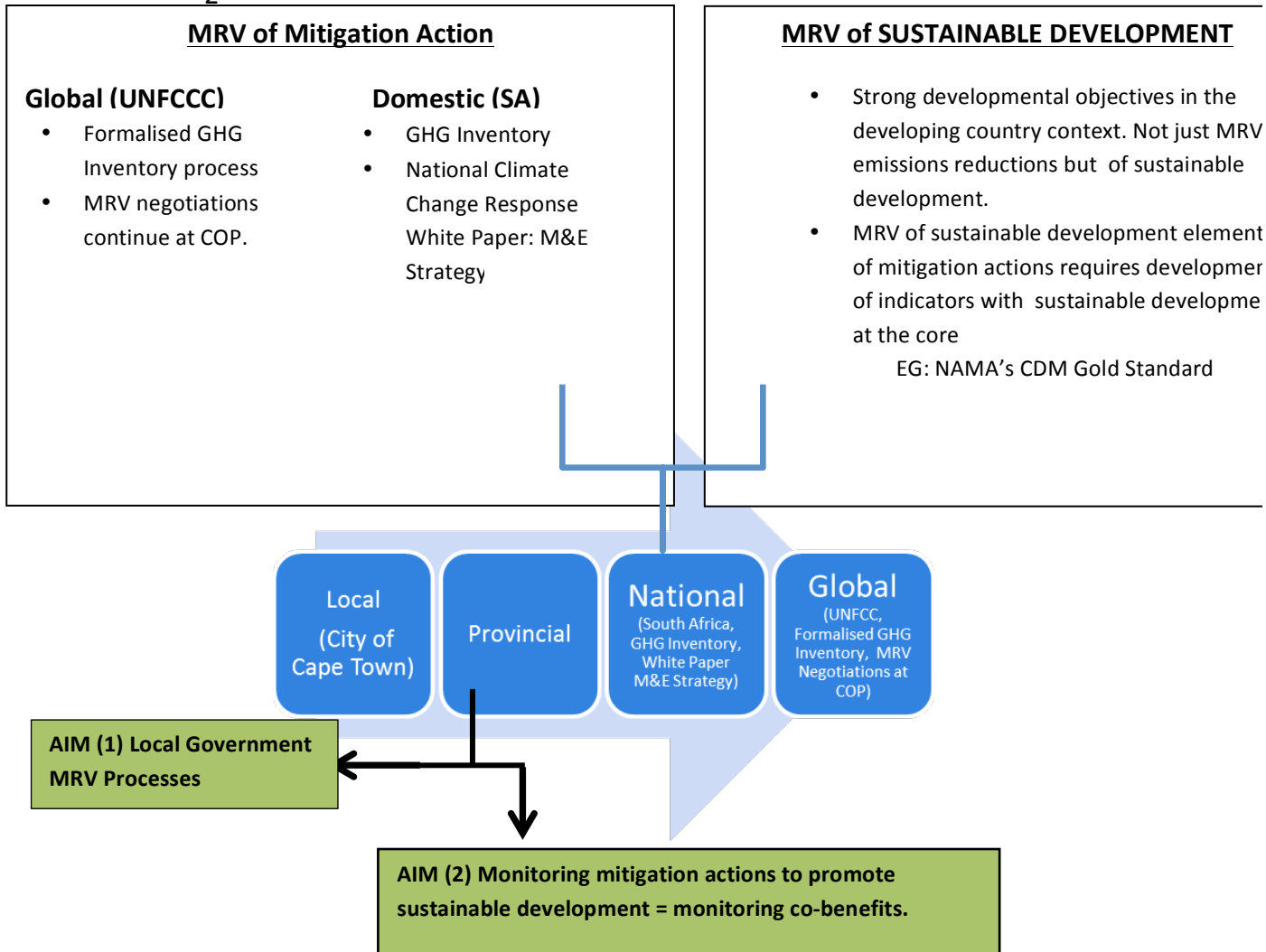


Table 1. Summary of project level MRV activities from interviews (Authors own compilation)

Project	Branch	Aim(1): MRV mechanism/process	Aim Co-b
EEDSM	Energy and Climate Change	<ul style="list-style-type: none"> • M&V specialist (trained according to Eskom standards) appointed through tender process • City collects data from various departments, sending data to M&V specialists. M&V specialists do necessary calculations and send report back to City. Report edited by City according to specifications set out by the funder (DoE) and finally sent to national government 	<ul style="list-style-type: none"> • •
Ceilings Retrofit	Sustainable Livelihoods	<ul style="list-style-type: none"> • Community surveys done by City staff, interns and ICLEI Africa but data produced not of the highest quality • Qualitative and quantitative indicators used eg experiences of weather events and seasons with and without an insulated ceiling and documenting types of heating used in homes. • Monitored project implementation as required by funders i.e. the number of ceilings installed 	<ul style="list-style-type: none"> • L h T w • T L o c
MyCiti (Phase 1)	Transport Department, MyCiti Branch	<ul style="list-style-type: none"> • Monitored infrastructure roll-out and maintenance • Focus has been on service delivery and dealing with significant challenges such as the taxi industry reform. 	<ul style="list-style-type: none"> • N • N T ti e s: ti • T n a