

# Policy review and analysis: Energy efficiency strategy for the Republic of South Africa

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## **Abstract**

*This paper aims to draw attention to the complex landscape of translating policy into implementation actions. It underscores the disjuncture between a broad global response to climate change mitigation measures and the requirements for national action in this regard. Individual countries face this challenge of interpreting and translating the cross-cutting response measures into local action. Climate change mitigation and energy security are two themes that are growing in importance in terms of its contribution towards South Africa's developmental agenda, thereby requiring an understanding of how policies and strategies are geared towards supporting this developmental agenda, in a way that does not compromise existing or future growth and progress. An assessment of the implementation of the South African energy efficiency strategy, demonstrates that the translation of policy intent into implementation is not self evident and associated with a number of prerequisites. These do not merely relate to the competence or capacity of an institution to implement the policy, but to a complex interrelationship of a number of factors. This includes supporting legislation, institutional arrangements, sources of finance and the need for co-operative governance.*

*Keywords: Energy efficiency, energy security, climate change mitigation, South Africa.*

## **1. Introduction**

This paper aims to draw attention to the complex landscape of translating policy into implementation actions. This will be achieved through an analysis of the implementation of the energy efficiency strategy in South Africa. It further aims to underscore the gap between a global response to climate change mitigation measures that focuses on broad goals and policy measures and the more specific requirements for national action in this regard. Individual countries are required to interpret and translate the cross-cutting response measures required for climate mitigation activities into existing institutions, structures and strategies. This remains a challenge, specifically for developing countries.

In this regard South Africa's already complex and saturated social and economic developmental agenda reveals climate change mitigation as well as energy security as two themes that are growing in importance, specifically in terms of contributing towards South Africa's developmental agenda. Both of these issues require policy and institutional intervention in a manner that supports existing growth concerns as well as that of future generations.

Van Donk *et al.* (2008) point to the fact that in general, there has been a struggle by the South African government and other relevant stakeholders to integrate the issues of sustainable growth and progress into the pressing development concerns facing South Africa from the early 1990s to the present. These concerns are characterised by macro policy issues such as inequality, rising unemployment, as well as the difficulties of achieving programmatic co-ordination of sectoral services in a manner that achieves a return on investment as well as impact on an improvement in service delivery.

The present paper aims to reflect on the required support for implementation of the strategy and the extent to which it is possible to strategically use energy efficiency in order to respond to the issues of energy security as well as climate change mitigation in South Africa in a manner that is sustainable. This is based on the thesis of reducing the future and current need for electricity (energy), thereby reducing greenhouse gas emissions, and also providing benefits to the end user. The latter is supported by Clark & Mahvungu (2002) in their citation of international energy policy literature which illustrates numerous examples of how energy efficiency is often the least-cost way to provide energy services, while at the same time, reducing environmental impacts of energy use.

The analysis in this paper will contain an exploration of the global perspective on energy efficiency, followed by an examination of the South African energy efficiency strategy as well as a critical analysis of its implementation. In conclusion, recommendations will be put forward in support of implementation.

## **2. Energy efficiency – a global perspective**

Energy efficiency is an activity which generally contributes to greater efficiency in the use of energy sources. It is guided by a range of policy imperatives, as well as specific decision-making drivers across the globe. According to Sebitosi (2008), these drivers are mainly an aspiration toward energy security, environmental conservation and a contribution towards climate change mitigation.

This has been the case for most developed countries where policies to increase energy efficiency, have been introduced in the public sector, the residential sector, in industry, transport systems as well as in electricity generation and transmission. In the successful implementation of energy efficiency policy, it has been evident that legislation to enforce or guide these policies and strategies were always put in place. The latter was also guided by clear objectives and a focus on specific economic sectors (Sebitosi, 2008).

Important in guiding the nature of energy efficiency policy, as well as the nature of the strategy required for its implementation, is to clearly distinguish the type of the energy efficiency activities to be targeted. According to Pacudan (2002), a distinction can be made between two streams of energy efficiency activities. Firstly, business-based energy efficiency, whereby utilities may engage in energy efficiency services for corporate objectives such as to improve the profitability of existing business areas, improve market positioning, retain customers, improve public relations and increase profitability from new business areas. These are referred to as energy efficiency services. Secondly, public interest energy efficiency, whereby governments

may implement public interest energy efficiency for market failure reasons and several other objectives such as reduced environmental damage, increase overall system efficiency, as well as other macro-economic benefits and social aspects. In making this distinction, a targeted implementation strategy can be developed.

A World Energy Council Report (WEC, 2004), states that almost all OECD countries are implementing energy efficiency policies adapted to their national circumstances. What this implies is that the drivers for energy efficiency policy do not follow a homogenous format and would differ between countries, specifically between industrialised and developing countries. This report indicates that a reduction of greenhouse gas emissions and local pollution often have a lower priority for developing countries, where investments in energy supply infrastructure and more efficient use of existing capacities often come first.

Geller *et al.* (2006) in a summary of 30 years of energy efficiency policies in OECD countries, find that well-designed policies have resulted in substantial energy savings. It is further noted that energy efficiency policy in OECD nations has focused primarily on increasing the energy efficiency of buildings, appliances, vehicles, and industrial operations. Less attention has been devoted to changing consumer behaviour, e.g. encouraging people to drive less or buy fewer/smaller vehicles, appliances, or homes.

Notable examples in the implementation of energy efficiency policy include Japan, the USA, the European Union, as well as China and Brazil. Sebitosi (2008) highlights the fact that Japan has been a striking leader in this regard, with its emphasis on innovation and its concrete and well established regulatory environment. The latter refers to standards for energy consumption in industry, in buildings, and also in the transportation sector.

In the USA energy security, driven by the oil crisis in 1973, has been the main driver for the establishment of an energy efficiency policy. Geller *et al.* (2006) indicate that various policies and programs have played an important role in reducing energy use and energy intensity in the United States over the past 30 years. This includes a number of federal laws adopted during 1975–80 that established educational efforts, financial incentives, and authorized the setting of efficiency standards, as well as budgetary provisions for energy efficiency R&D and grants. More recent legislation established minimum efficiency standards on a wide range of household appliances and major types of equipment used in the commercial and industrial sectors. And many states have implemented building energy codes, utility-based energy efficiency programs, and other policies to complement these federal initiatives (Geller, 2006).

Geller (2006) further states that many state utility regulatory commissions or state legislatures require electric utilities to operate energy efficiency programs, also known as demand-side management (DSM) programs. Most of these programs are funded through a small surcharge on electricity sales. In some states, utilities are allowed to earn more profit on their energy efficiency programs than on building new power plants or other energy supply facilities. This removes the financial disincentive that utilities have to promoting energy savings by their customers. In a few states, these programs are implemented by independent entities or state agencies rather than utilities (Geller, 2006).

A significant program driven by states in the USA is the ENERGYSTAR labelling program. According to Gillingham *et al.* (2006) this program was initiated in response to a provision of the 1992 Energy Policy Act. It encompasses many voluntary programs designed to encourage consumers to buy energy-efficient models and encourages manufacturers to improve the energy efficiency of their products. The U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) now jointly run the program for more than 35 product categories (e.g., major appliances, office equipment, and home electronics) as well as new homes and commercial and industrial buildings. By 2001, ENERGY STAR had facilitated partnerships between the government and more than 7 000 public and private-sector organizations (Gillingham, 2006).

The Energy Independence and Security Act of 2007 established energy efficiency as a strategy to ensure energy security in the US. Specific provisions related to energy efficiency include the Vehicle Fuel Mandate, which specifies a national mandatory fuel economy standard thereby increasing the efficiency by 40%. The Act also advances lighting efficiency through the Lighting Efficiency Mandate. This will see to the phasing out of incandescent bulbs by 2014 and improve the general lighting efficiency by over 70% by 2020. Added to these is the Appliance Efficiency Mandate, which sets 45 new standards for appliances. Finally the Federal Government Operations Mandate will see to the reduction of energy consumption of Federal Government facilities of 30% by 2015 and subsequently forcing all government buildings to be carbon free by 2030 (Sissine, 2007).

This legislation has been complemented by the Energy Efficiency and Conservation Block Grants program initiated in 2009 and funded by the American Recovery and Reinvestment Act, which will provide grants for projects that reduce total energy use and fossil fuel emissions, and improve energy efficiency across the US.<sup>1</sup>

In the European Union, an important imperative for the EU Action Plan for energy efficiency (EU,

2006) is the reduction of energy consumption and the elimination of energy wastage, specifically in energy-intensive sectors such as buildings, manufacturing, energy conversion and transport. In this regard the EU Directive on Energy Performance of Buildings<sup>2</sup> aimed at a total reduction of energy consumption by 5-6% in 2020, is of specific relevance. This applies to all buildings constructed, rented, sold or accessible to the public. The aim thereof is to increase awareness of buyers and tenants about energy efficiency and to contribute to increasing consumer pressure for energy efficient buildings. These actions are considered to be decisive in ensuring competitiveness, security of energy supply for member states, as well as for meeting the commitments on climate change made under the Kyoto Protocol. Interestingly, the issue of cost reduction or potential savings has not been explicit in all of the instances above but has rather been of secondary importance as a policy driver. The reason for this could be that governments are not the direct recipient of such savings or able to put forward or secure the upfront investment required to ensure these future savings.

According to Richerzhagen *et al.* (2008) China has seen strong political support for energy efficiency policy, specifically regarding its benefits of combining economic growth with increased energy supply security and reduced local air pollution. This notwithstanding, implementation has been weak. Richerzhagen *et al.* (2008) identifies a number of reasons for this shortcoming and puts forward recommendations for improvement. A weak legislative and institutional environment was identified. In this instance, a single institution for the coordination of policy at national level, was recommended, along with the establishment of independent monitoring systems and stronger legal enforcement, stronger communication and cooperation between tiers of government, as well as improved competence of government officials. The funding of energy efficiency investment is identified as a crucial issue. In this regard, Richerzhagen *et al.* (2008) suggest the introduction of economic instruments such as tax cuts, subsidies and preferential loans for developers and households, as well as alternative funding sources such as energy service companies, the CDM or the voluntary market.

In a reflection on the impact of power sector reforms on energy efficiency in Brazil, Januzzi (2005) argues for an increased role of developing countries to provide solutions for meeting energy demand requirements in a manner more suitable to their internal markets. He also underscores the re-definition of the role of public agents and the need for the creation of new institutional structures.

In this global reflection, it is relevant to note the diverse nature of energy consumption and the application of energy efficiency in Africa, compared

to most other world regions, specifically in relation to global pressure on developing countries to follow a less energy intensive development path. This diversity is illustrated by Wolde-Rufael (2009) in a paper which re-examines the causal relationship between energy consumption and economic growth for seventeen African countries in a multi-variate framework which includes labour and capital as additional variables. The paper reflects divergent causality results for different countries and emphasises that the analysis does not exhaust all the possible reasons behind the divergent causality results. Wolde-Rufael (2009) states that there are considerable variations among African countries, this is in terms of their economic policies and structures, energy resources, as well as in their energy efficiency and energy policy.

Wolde-Rufael (2009) established a uni-directional causality between energy consumption and economic growth for countries such as Algeria, Benin and South Africa, and states that reducing energy consumption could lead to a fall in economic growth. Thus, any energy conservation measures undertaken should pay considerable attention to the adverse effects on economic growth. The paper however does not fully explore the economic significance of energy savings and the potential for job creation through the application of energy efficiency measures.

In Egypt, Ivory Coast, Morocco, Nigeria, Senegal, Sudan, Tunisia and Zambia Wolde-Rufael (2009) established a uni-directional causality running from economic growth to energy consumption, and deduces that reduced energy consumption may result in little or no adverse effect on economic growth. Wolde-Rufael (2009) cites the ECA (2008) which emphasises that in practice, any conservation measures taken to reduce energy consumption may not be a viable option for these countries particularly given the magnitude of their energy problems and the fact that the current energy infrastructure of these countries is still inadequate to support their quest for rapid economic growth and for eradicating poverty. These countries need to improve the detrimental consequences of energy consumption without reducing energy usage. Increasing the efficiency of current supply and efficient utilisation should be the top-most priority for power sector development for these countries (Wolde-Rufael, 2009).

The analysis by Wolde-Rufael (2009) found a bi-directional causality between energy consumption and economic growth in Gabon, Ghana, Togo and Zimbabwe. This implies that economic growth may demand more energy while more energy use may induce economic growth. In these countries energy consumption and economic growth complement each other and energy conservation measures may negatively affect economic growth. These

countries like many other African countries can further stimulate economic growth by investing more on energy and by reducing energy inefficiency in the supply and use of energy (Wolde-Rufael, 2009).

For Cameroon and Kenya, there was no causality running in any direction between energy consumption and income, thus reducing energy consumption may not affect income and energy conservation policies that may not affect economic growth. Theoretically, for these two countries energy conservation policies may be pursued without adversely affecting economic growth. Like many African countries, Cameroon and Kenya have to reduce inefficiency in the supply and use of energy

This analysis by Wolde-Rufael (2009) emphasises that there is no single mould solution toward a sustainable energy development path in Africa. It is also apparent that the issues of relevance differ significantly, from the developed world, with potential points of commonality with other developing world regions. However, Wolde-Rufael (2009) touches on a common thread with a citation from the UNDP (2005) which states that the lack of '...institutions, rules, financing mechanisms, and regulations needed to make markets work in support of energy for sustainable development...' inhibits the development of an efficient and accessible energy sector and unless fully addressed, energy supply will continue to be a major hurdle for the economic and social development of many African countries.

The following section investigates the nature and implementation of the current energy efficiency policy in South Africa in comparison to global initiatives.

### **3. South African energy efficiency strategy**

The energy efficiency strategy was published in 2005 by the South African Department of Minerals and Energy (DME) in support of the 1998 White Paper on Energy Policy, and set a national target for energy efficiency improvement of 12%, against the 2000 baseline year, by 2015.

In drafting the Energy Efficiency Strategy of South Africa (DME, 2005) the drivers as mentioned above, were considered and captured in the vision for the strategy, i.e.

To encourage sustainable energy sector development and energy use through efficient practices, thereby minimising the undesirable impacts of energy usage upon health and the environment, and contributing towards secure and affordable energy for all. (DME, 2005).

The strategy anticipated that energy efficiency improvements would strategically be achieved through enabling instruments and interventions including economic and legislative means, information activities, energy labels, energy performance

standards, energy audits, energy management and the promotion of efficient technologies. All economic sectors were to be covered by the strategy, through the proposal of sectoral programmes. Systems would be put in place to monitor and evaluate progress in energy efficiency improvements and a periodic strategic review of the implementation would be undertaken.

In the consideration of financial instruments geared toward the implementation of the strategy, self-finance was seen as paramount, as it was anticipated that the majority of energy efficiency improvements would materialise through the implementation of standards, regulation and management tools, which at the end of the day, would lead to short pay back periods for the individual enterprises, house owners and government. In the instance of less favourable payback periods, other options were put forward for consideration. These include the UNFCCC<sup>3</sup> Clean Development Mechanism (CDM) as well as a review of Public Building Sector budgeting.

The first periodic review of Energy Efficiency Strategy since its publication in 2005 occurred in 2008 (DME, 2008a). Two more reviews are scheduled in 3-yearly intervals up until 2015. The next review is scheduled for the first half of 2011. The current review reiterates the following:

- that energy efficiency improvements will be achieved largely via enabling instruments and interventions such as economic and legislative means, efficiency labels and performance standards, energy management activities and energy audits, along with the promotion of efficient practices.
- the national target for 2015 remains at 12%, against the 2000 baseline year. It is highlighted that this target is voluntary at present, but that sub-sectoral targets may become mandatory in due course.
- the establishment of a monitoring and verification system by the DME in compliance with the recently promulgated Energy Act (2008).
- taking full cognisance of governmental capacity to enforce implementation, the DME will prepare appropriate legislation and regulations for the governance and implementation of this strategy.
- the DME will ensure that the National Energy Efficiency Agency is appropriately funded to undertake its responsibilities.
- implementation of this strategy remains geared toward self-finance. However, budgetary provisions<sup>4</sup> were put in place to finance the Public Sector Implementation Plan.
- an inference is made towards the adoption of cost reflective energy pricing.
- sectoral implementation programmes, i.e. Industry and Mining, Commercial and Public Build-

ings, Residential and Transport remain the strategic focus.

The DME<sup>5</sup> has included the aims of the Energy Efficiency Strategy in the drafting of subsequent policy documents aimed at ensuring energy security. These policy documents include the following:

- *The Energy Security Master Plan – Electricity 2007 – 2025* (DME, 2007), which sets security of supply standards for generation and transmission (in terms of supply adequacy) along with proposed interventions necessary to achieve the respective adequacy measures, given projections about demand growth. The plan is premised on a number of assumptions. The most pertinent in relation to this paper, is the objectives that focus on the protection of the environment as embodied in the White Paper on Energy Policy, the White Paper on Renewable Energy Policy and the Energy Efficiency Policy and Strategy.

- *The National Response to South Africa's Electricity Shortage* drafted by the DME in January 2008 (DME, 2008b), maintained that the risk of load shedding will remain high until at least 2013 if no immediate actions are taken to ameliorate the demand for electricity, especially during times of high levels of planned maintenance. This document further states that specific and immediate interventions are needed to minimise the risk of load shedding until the new peaking plant and base load electricity generating capacity being built comes online.

- In terms of *The National Response to South Africa's Electricity Shortage* mentioned above, the DME has drafted a schedule of *Electricity Regulations for Compulsory Norms and Standards for Reticulation Services (2008c)*. This is for promulgation by the Minister of Minerals and Energy, under section 47(4) of the Electricity Regulation Act, 2006 (Act No 4 of 2006). These regulations are aimed at ensuring stability and security of electrical supply. It focuses on electrical lighting, water heating, space heating, ventilation and cooling, as well as the remote reduction or increase of supply in existing buildings. This draft regulation however, neglects critical issues such as the specification on how enforcement and monitoring will happen, as well as the regulation of energy consumption in new residential and commercial buildings.

- *National Energy Act (Act No 34 of 2008)*, (The Presidency, 2008). This is a first explicit legislative response to the issue of energy security, in a manner that addresses the issues of energy efficiency as well as renewable energy. In relation to the energy efficiency strategy, the act sets a significant platform for regulatory, legislative and institutional enablement. The act obligates and empowers the Minister

of Minerals and Energy to:

- establish mechanisms to ensure the provision of data, as well access to data sources required for energy planning.
- develop and annually, review and publish an Integrated Energy Plan.
- direct any state-owned entity to provide investment in and maintenance of energy infrastructure.
- issue regulations, in consultation with other cabinet ministers, on the publication and format of energy data, the minimum levels of energy efficiency in economic sectors as well as on the necessary procedures for the application of energy efficiency technologies, energy labelling, the prohibition of inefficient appliances, as well as the establishment of energy efficiency standards.

The act furthermore promulgates the establishment of the South African National Energy Development Institute (SANEDI). The functions of SANEDI broadly deal with energy efficiency as well energy research and development. The latter encompasses the functions currently performed by the South Africa's National Energy Research Institute (SANERI)<sup>6</sup> as well as the National Energy Efficiency Agency (NEEA).<sup>7</sup> It can therefore be assumed that the SANEDI would encapsulate both these existing entities, once it is fully established.

Policy to support the Energy Efficiency and Demand Side Management Program for the Electricity Sector through the Standard Offer Incentive Scheme. 20 May 2010 (DoE, 2010). This policy document emanates from section 19 of the National Energy Act (Act No 34 of 2008) and has the intent 'to stimulate energy efficiency through (i) enabling regulations and institutional governance structures and (ii) introducing targeted financial incentives.' (DoE, 2010). This document introduces an energy efficiency resource standard (EERS)<sup>8</sup> to be set by the Minister of Energy as well as the standard offer of purchase (SOP)<sup>9</sup> model.

This policy document appears to provide a regulative basis for the Eskom DSM Programme, without really addressing the issues which were predominant in historically curtailing this programme. Kellermann (2009) views energy service companies (ESCOs) as pivotal to the realisation of the DSM goals. Based on a survey of 114 ESCOs, Kellerman (2009) identified barriers intrinsic to the South African ESCO industry such as the ineffective management of the DSM programme by Eskom, a conflict of interest in Eskom's management of the DSM programme, the inappropriateness of the current DSM model to the South African context, specifically in terms of the lengthy duration of the approval process as well as the 'work at risk' principle for ESCOs, the lack of a single ESCO organisation supported by government, the lack of dedicat-

ed energy efficiency financing, the lack of a dedicated and uniform monitoring and verification process, as well as a lack of energy efficiency enforcement and regulation.

An analysis of the implementation of the energy efficiency strategy follows in the next section.

#### **4. Critical analysis of energy efficiency strategy implementation**

This section provides an analysis of the energy efficiency strategy from its initiation in 2005 to the present. This analysis will pertain to the following areas:

##### **4.1 Regulatory enforcement and monitoring**

The strong emphasis on mandatory measures and regulatory enforcement, as put forward in the strategy, has largely been neglected in the initial implementation phase, since 2006. Sebitosi (2008), states that despite the policy foresight, the strategy has failed to respond to the energy crises of the winters of 2007 and 2008. This is contrary to anticipated, initial outputs, i.e. enabling instruments and interventions as intended by the strategy. Sebitosi (2008) ascribes this failure to a lack of follow-up legislation since the publication of the strategy. This is because no process has been legally set in motion to guide, enforce and monitor these strategic outputs. There has furthermore also not been any publication of estimates in energy efficiency trends, in relation to prescribed targets. The majority of the anticipated outputs have not been achieved and consequently, there is no yardstick by which progress could be monitored (Sebitosi, 2008).

In relation to the energy efficiency strategy, the National Energy Act (Presidency, 2008) has set a significant platform for regulatory, legislative and institutional enablement (see section 3). This is specifically in terms of the establishment of regulations to effectively collect, collate and publish energy data and information, as well as the establishment of energy efficiency standards and the regulation of energy labelling. However, the implementation of this act is still dependent on institutional capacity as well as co-operative governance. Both still matters of concern, specifically with the separation of the DME into two distinct entities, i.e. the Department of Energy and the Department of Minerals. This has resulted in a period of institutional restructuring for the Department of Energy within the context of pre-existing capacity constraints.

##### **4.2 Implementation focus**

An analysis of the extent to which these policy intentions have been translated into practice reveals that the implementation has to a large extent rested on the implementation of the accelerated Demand Side Management (DSM) Programme, led by

Eskom, as well as the National Energy Accord.<sup>10</sup> The latter relates to an agreement between 44 large companies which have voluntarily joined the DME and Eskom by signing an energy-efficiency accord, committing themselves to targets contained in the DME's energy efficiency strategy.

In addition, in the drafting of subsequent policy documents by the DME aimed at ensuring energy security, it is also assumed that its targets and outcomes specifically in relation to energy efficiency, would be achieved through a focus on the Eskom (DSM) Programme.

This current focus is also reflected in the key objectives and initial focus of the National Energy Efficiency Agency (NEEA).<sup>11</sup> The latter was officially established in March 2006 through a directive issued by the Minister of Minerals and Energy. Currently the NEEA is under resourced and its authority is limited to oversight of the Eskom DSM Programme, the marketing and promotion of the efficient use of electricity, and to a lesser degree the exploration of efficiency in other sectors. In the first four years since its inception, the NEEA has been unable to obtain the funds for start up operations as was envisaged in the Ministerial Directive. Tyler (2010), states that this has been due to an ongoing dispute on roles and responsibilities between the NEEA and Eskom. As previously stated the SANE-DI as proposed by the National Energy Act, would encapsulate both the NEEA as well SANERI. Tyler (2010) however, stated the establishment of SANE-DI has been delayed due to confusion regarding the division of roles and responsibilities between the DoE, as well as the Department of Science and Technology.

When compared against the energy efficiency activities distinguished and put forward by Pacudan (2002), the implementation of the Energy Efficiency Strategy in South Africa to date displays a distinct neglect of public interest energy efficiency programmes. The motivation for this biased focus on DSM is varied and requires further investigation. However, possible reasons include the role and influence of major stakeholders such as Eskom in the drafting and implementation of the strategy.

This specifically relates to the period 1999 to 2005, when the country was in transition, with a shortage of skilled bureaucrats to fill key DME functions in order to meet its renewable energy and energy efficiency mandate as put forward by South Africa's first democratically elected government. Both of these functions were focused on for the first time in the country's history. The reason for this was that prior to 1999, the department's focus was on the exploration of minerals and the production of electricity from coal. In terms of political support, it also appears that the latter remained the focus of political support, even in the new democratically elected government. With the new function aimed

at the promotion of energy efficiency, the DME had to acquire institutional capacity to draft enabling legislation to support the implementation of strategic aims, as well as skilled technocrats to manage and monitor implementation. These skills were not abundantly available in the country, and staff from Eskom were seconded to the DME to provide assistance. The DME also benefited from capacity building initiatives from foreign donors like the Danish government, through its aid agency, Danida.

The drafting of the energy efficiency strategy with its balanced and progressive aims can to a large extent be ascribed to a capacity building initiative funded by Danida. This initiative was known as 'Capacity Building in DME in Energy Efficiency and Renewable Energy', (CABEERE). The project started 1 August 2001 and was completed in December 2005. The Project was aimed at enhancing the DME's capacity and performance. This was achieved through assistance in developing programmatic approaches, through strategies and actions plans for energy efficiency and renewable energy, through transparent co-operation with relevant stakeholders.<sup>12</sup>

The major influence that Eskom has had in the formulation of DME policy is due to its nature as a large and vested stakeholder, and sole energy generator, as well as the secondment of its staff to major DME functions, such as the new focus areas of energy efficiency and renewable energy. This has resulted in a focus on the Eskom DSM Programme as a means of implementing the energy efficiency strategy. For Eskom, the DSM Programme has historically, and still to a large degree at present, formed a minor role in its operations. Over the past few years, its importance has increased, due to nationwide power shortages.

In this regard, the role and relevance of vested interest groups in the development and implementation of the policy becomes a question for clarification. The extent, to which the internal capacity at the DME and other relevant departments has been built, as well as the availability of skilled professionals in the country, also needs to be established.

#### **4.3 The case for public interest energy efficiency programmes**

In a growing South African economy, coupled by population growth and rising aspirations these actions need to be complemented by public interest energy efficiency programmes. The latter are of importance as they contribute toward a reduction in the future demand for energy as well as toward macroeconomic and social benefits. In general, such programmes require market as well as legislative support. This specifically relates to efficiency measures (orientation, lighting, insulation and water heating) in low-income residential development, regulation of new medium to high income residen-

tial development as well as commercial development, focussed marketing of energy labelling (specifically as it pertains to electrical appliances) and the delivery of energy efficiency, as it pertains to other sectors, i.e. water, transport, waste and environmental management. All of the actions mentioned also have significant potential in contributing toward local economic development and job creation. In such a sectoral approach, co-operative governance becomes an imperative in the delivery of the aims of the energy efficiency strategy.

This potential of energy efficiency programmes is supported by Winkler (2007) in an analysis of the impact of different energy policies in South Africa, including alternative technologies, for both supply and demand up to 2025, towards making development more sustainable. The analysis was done using the Markal model. The paper acknowledges the urgent development challenges facing South Africa and looks at the current energy profile. Key results delivered by the study, were as follows: On the demand side, energy efficiency policies were found to be particularly important in that they delay the need for investment in new power stations. Three areas of significance were highlighted by the modelling, i.e.:

- Higher energy efficiency in industry.
- Efficient design standards for new commercial buildings.
- Standards for cleaner and more efficient use of energy in the residential sector

All of these programmes offer the opportunity for South Africa, to meet its current and future energy needs, and developmental commitments, in a manner that is sustainable. Winkler *et al.* (2007) define the latter as 'providing services for basic human needs, in a way that continue over time, resulting on less impact on the environment, and providing more social benefits and long-term economic development'. Nevertheless, there is no clear evidence of the incorporation of significant research undertaken by academic institutions in terms of policy implementation.

#### **4.4 Financial instruments**

In the consideration of financial instruments geared toward the implementation of the strategy, self-finance remains of paramount consideration in both the initial strategy, as well as in the current review. It is anticipated that the majority of energy efficiency improvements would materialise through the implementation of standards, regulation and management tools, which at the end of the day would lead to short pay back periods for the individual enterprises, house owners and government.

Where payback periods were less favourable, other options were put forward for consideration. This includes the UNFCCC CDM as well as a review

of Public Building Sector budgeting. These instruments were not forthcoming, due to of a lack of defined standards, regulation and management tools, as stated, as well as a failure of the market to support voluntary energy efficiency projects.

Preliminary indications show that CDM projects have failed to support the aims of the energy efficiency strategy, not for lack of a concerted effort in project development, but due to a direct correlation to factors debilitating the implementation of voluntary energy efficiency and renewable energy projects and initiatives in general. A review of current literature indicates that this failure of the CDM to support sustainable development is not unique to South Africa, but a global occurrence (Figueres, 2006; Holm Olsen, 2007; Sutter & Parreño, 2007 and Schneider, 2007). This highlights the need for legislative means to respond to this market failure. The latter however, still remains absent from the current review of the strategy.

#### **4.5 The need for co-operative governance**

A further complication in the implementation of the energy efficiency strategy has been that the delivery of its strategic outputs lies beyond the exclusive ambit of the DoE. This is due to the cross-sectoral nature of the outputs,<sup>13</sup> in terms of legislative competencies as well as in terms of powers and duties.<sup>14</sup>

According to du Plessis (2004), there is no specific mention of cooperative governance made in the energy efficiency strategy, but the list of output activities infers to the responsibility of government departments, other than the DME to ensure energy efficiency in their various sectors. This indicates that the energy efficiency strategy directly and indirectly affects and is affected by sectoral policies and legislation such as health, housing, building regulations, waste management, environmental management, transport, energy planning, urban development, economic development, poverty alleviation and climate change mitigation (see footnote 6). Currently, this aspect of the energy efficiency strategy has no implicit agreements on co-operative governance in this regard and there is limited coherence with these relevant sectoral policies and legislation in terms of its strategic implementation.

This need for co-operative governance in the energy sector has been recognised by a cabinet decision on 2<sup>nd</sup> December 2009 to establish the Inter-Ministerial Committee on Energy (IMCE).<sup>15</sup> The IMCE would be chaired by the Minister of Public Enterprises and co-led by the DoE and the National Treasury. Amongst the ten ministries represented on the committee are the Department of Environment, the Department of Economic Development and the National Planning Commission.<sup>16</sup>

It is possible to extract lessons on co-operative governance in policy implementation, in the follow-

ing instances.

South Africa's rapid electrification program from the late 1980s to the present, Bekker *et al.* (2008) provide some lessons in the value of co-operative governance. Key lessons are that the policy and institutional shifts in the sector were prioritised and streamlined during the governmental transformation of the early mid 1990s, the significance of appropriate cost driven technical innovations and standards were acknowledged, as well as the acknowledgement of the social function of electrification resulting in funding from the fiscus (rather than through cross-subsidies). Three main stakeholders were central in unfolding this programme, i.e. Eskom, local government and independent policy research capacity in the form of academic research institutions, as well as the DME. Some drawbacks were however, a lack of sustained political interest in developing the DMEs capacity to draft and implement an integrated household energy policy.

Further lessons toward greater policy coherence are put forward by Mackay and Ashton (2004). This refers to the models developed for the South African child protection policy, as well as the water policy. In the same manner as energy, these two areas of concern also cut across a number of sectors. A communication plan of the vision and programme interventions was put forward to all responsible and related sectors. This is particularly at the operational level and includes the design of an explicit sequence of co-ordinated implementation activities and clearly defined responsibilities. This explicit communication plan is of specific importance when one considers the DoE to be the responsible agent for policy formulation and other stakeholders and government departments responsible for the establishment of legislation and the implementation of strategies.

## 5. Conclusion

In the light of the global implementation of energy efficiency policy, it is evident that energy efficiency should be viewed broader than merely the management of electricity demand. In the efficient management of energy as a resource, the use and consumption of fossil fuels, nuclear power as well as renewable energy need to be considered.

It is also evident that energy efficiency policy does not follow a homogenous format and would differ between countries, specifically between industrialised and developing countries, based on the country context. Global best practices would therefore need to be tailored to national conditions to ensure successful implementation. In some instance, this might require a re-definition of the role of government as well as the creation of new institutional structures. It is also evident that governments enable investment in activities and pro-

grammes through the establishment of supportive policies and legislation.

This paper has attempted to illustrate that on its own a good policy document does not ensure implementation. An assessment of the implementation of the South African energy efficiency strategy shows that the translation of policy intent into implementation is not self evident. This assessment indicates that the failure to achieve specific strategic outputs does not merely relate to the competence or capacity of an institution to implement the policy, but to a complex interrelationship of a number of factors.

It highlights the need for a clearer understanding of the importance of supporting legislation with clearly defined policy instruments, institutional arrangements, regulatory enforcement and monitoring, sources of finance and the need for co-operative governance in the successful implementation of policy. This also highlights the disjuncture between the broad goals and policy measures set at a global level to ensure climate change mitigation and the complexities faced by especially developing countries in implementing these goals at national level through policy and legislation.

The following recommendations are geared toward providing support for the improved implementation of the energy efficiency strategy, as well as for consideration in the next review of the energy efficiency strategy:

### *Institutional arrangements: The need for co-operative governance and the case for public interest energy efficiency programmes*

Energy efficiency refers to the management of the use and consumption of fossil fuels, nuclear power as well as renewable energy. The DoE should therefore broaden the scope of the strategic focus of the energy efficiency strategy beyond the Eskom DSM programme, to the management of energy supply and demand at a national level.

This alludes to the explicit role of the DoE in the establishment and coordination of energy efficiency policy and implementation at a national level.

The strategic outputs, initially anticipated with the drafting of the strategy were not realised for a number of reasons. These range from a lack of capacity in the DME/DoE, through to dedicated policy instruments or regulation, as well as the implications of the cross sectoral nature of energy efficiency on existing governmental and institutional roles and responsibilities.

In this regard, it would be important to identify the relevant government departments constitutionally responsible for the establishment of legislation related to the strategic outputs as envisioned in the strategy. This is important in order to ensure the establishment of supportive legislation and the enforcement thereof. The need for co-operative

governance in the energy sector has been recognised by a cabinet decision on 2<sup>nd</sup> December 2009 to establish the Inter-Ministerial Committee on Energy (IMCE) which has as its main focus coherence in terms of long term energy planning. This is an important development, as lessons learnt from the importance of co-operative governance in successful policy implementation; indicate towards the value of a political champion in favour of implementation. This is specifically through the acknowledgement of the contribution of strategy implementation toward national imperatives.

Implementation relies strongly on other tiers of government as well as the private sector. This requires a well established and targeted communication plan between the DoE and these potential implementation agents.

Furthermore with the support of tertiary academic institutions, the shortage of specific skills within the DoE and other government departments should be identified and jointly addressed. SANEDI, once fully operational, would be ideally suited to co-ordinate and support such a venture.

The resourcing as well as the role and responsibilities of SANEDI should be clarified in conjunction with all relevant role-players, i.e. DoE, Department of Science and Technology as well as Eskom. According to Clarke & Mahvungu (2000), international experience supports a mandate for an energy agency, independent from prevailing interests, thereby ensuring unbiased budgetary allocations and strategic vision. This highlights the need for a reconsideration of the role of Eskom as manager of DSM and DSM funding. A foundation for the implementation of the DSM programme is the reliance on ESCOs. A survey by Kellermann (2009) indicates the current DSM model specifically relating to ESCOs as inappropriate to the South African context specifically in terms of the lengthy duration of the approval process as well as the 'work at risk' principle for ESCOs, the lack of a single ESCO organisation supported by government, the lack of dedicated energy efficiency financing, the lack of a dedicated and uniform monitoring and verification process, as well as a lack of energy efficiency enforcement and regulation. It is recommended that these issues be investigated in the next review of the strategy.

The current implementation focus of the energy efficiency strategy largely fails to consider public interest energy efficiency activities. The reason for this is the current DoE focus on the Eskom DSM program. In addition, there might be a perception that government investment in energy efficiency projects does not explicitly appear to have a direct return on investment. In this regard, it is recommended that SANEDI investigates the value of public interest energy efficiency investment in terms of achieving energy security as well as in supporting

economic growth. This specifically relates to efficiency measures (orientation, lighting, insulation and water heating) in low-income residential development, regulation of new medium to high income residential development as well as commercial development, focussed marketing of energy labelling (specifically as it pertains to electrical appliances) and the delivery of energy efficiency, as it pertains to other sectors, i.e. water, transport, waste and environmental management. In such a sectoral approach, co-operative governance becomes imperative in the delivery of the aims of the energy efficiency strategy, as well as in support of national development goals.

Voluntary agreements such as the national energy accord remain a valuable non-legislative instrument in support of the energy efficiency strategy. However, according to Krarup & Ramesohl (2002) voluntary agreements with industry can play a useful role in reducing energy intensity, if they are combined with substantial incentives for compliance through policy instruments. The current review of the strategy alludes toward the establishment of mandatory sectoral targets for energy efficiency; however, no firm commitment is given.

#### *Regulatory enforcement and monitoring*

As reflected in the overview of global implementation strategies, it is evident that the energy efficiency strategy for South Africa should be supported by explicit legal enforcement as well as appropriate and applicable policy instruments. This includes the consideration of efficiency standards and targets, voluntary agreements with industry, product labelling, DSM, financial incentives, as well as promoting a change in consumer behaviour. Furthermore, in order to ensure the effectiveness of implementation as well in support of policy review, an independent monitoring system should be established. The latter should be complemented with appropriate indicators and available and current data sources.

In relation to the energy efficiency strategy, the recent promulgation of the National Energy Act (Presidency, 2008) has set a significant platform for regulatory, legislative and institutional enablement. This is specifically through the proposed establishment of regulations to effectively collect, collate and publish energy data and information, as well as the establishment of energy efficiency standards and the regulation of energy labelling. However, the implementation of this act is still dependent on institutional capacity as well as co-operative governance. Both of these still are matters of concern, specifically with the separation of the DME into two distinct entities, i.e. the Department of Energy and the Department of Minerals. This has resulted in a period of institutional restructuring for the Department of Energy, within the context of pre-

existing capacity constraints.

In the current review of the strategy (DME, 2008a) budgetary provisions were put in place to finance the Public Sector Implementation Plan. It is recommended that this be supported through the legislation of proportional obligations with regard to energy efficiency for government departments, as well as agreements on efficient government procurement and the identification of alternative sources of funding for retrofitting government buildings.

These recommended policy instruments and monitoring system should be revised over specific periods in order to guard against policy redundancy.

#### *Financial instruments*

Due to the prevailing market barriers, such as the price of electricity as well as, a lack of mandatory energy efficiency regulation and standards as well the cost of energy efficient technologies which in most instances need to be imported, self financing of energy efficiency projects are currently not realistic within the South African context. In this regard closer engagement with the private sector is required in terms of the diffusion of energy efficient technologies, as well as the development of market transformation strategies.

Richerzhagen *et al.* (2008) put forward recommendations for the improvement of energy efficiency policy in China. They identified the funding of energy efficiency investment as a crucial issue. They suggest the introduction of economic instruments such as tax cuts, subsidies and preferential loans for developers and households, as well as alternative funding sources such as energy service companies, the CDM or the voluntary emissions reductions market. The evaluation of these recommendations for local application should be considered in the South African context.

Furthermore, the adoptions of specific instruments should be explicitly embedded in legislation and with negotiated co-operation and budgeting from relevant government line functions and departments.

#### **Notes**

1. [http://apps1.eere.energy.gov/news/progress\\_alerts.cfm/pa\\_id=154](http://apps1.eere.energy.gov/news/progress_alerts.cfm/pa_id=154)
2. [http://europa.eu/legislation\\_summaries/energy/energy\\_efficiency/l27042\\_en.htm](http://europa.eu/legislation_summaries/energy/energy_efficiency/l27042_en.htm)
3. United Nations Framework Convention on Climate Change
4. R20 million for the 2008/2009 financial year, with the anticipation of continued funding in the MTEF framework for the following three years. A similar delivery mode was anticipated for extension to all Provincial

and Local Government authorities and state owned entities funded by Parliamentary appropriations.

5. On 11 May 2009, the announcement of the incoming administration of President Zuma reflected a division of the DME into two separate departments, with Susan Shabangu appointed Minister of the Department of Mining and Dipuo Peters becoming Minister of the Department of Energy (DoE). On historical reflection, this paper will refer to the DME and in relation to legislation or policy established after 11 May 2010 and future recommendations; this paper will refer to the DoE.
6. SANERI: the public entity entrusted with the coordination and undertaking of public interest energy research, development and demonstration. SANERI is a relatively new body, established by the then Minister of Minerals and Energy in October 2004, as a subsidiary of CEF (Pty) Ltd, the state energy company in South Africa. The Department of Science and Technology, together with the Department of Minerals and Energy, are joint custodians of SANERI and assist in providing political and strategic focus for the company ([www.saneri.org.za/](http://www.saneri.org.za/)).
7. NEEA: officially established in March 2006 through a directive issued by the Minister of Minerals and Energy. Located within CEF (Pty) Ltd as a wholly incorporated division, the Agency commenced operations on 3 April 2006 and will be subject to review in three-year intervals, in line with the national Energy Efficiency Strategy. It is envisaged that the NEEA will initially oversee the implementation of DSM and Energy Efficiency projects undertaken by Eskom and other entities in the country. The DSM funds however, will in the interim remain with Eskom as the main implementing agency, who will continue to manage these funds with the oversight of the NEEA governance body. [www.cef.org.za](http://www.cef.org.za)
8. EERS: A quantitative, long-term energy savings target that is met by implementing energy efficiency programs to help customers save energy (DoE, 2010).
9. SOP: A mechanism to acquire demand-side resources (energy efficiency/load reduction) under which a utility purchases resources based on a predetermined rate. ESCOs, equipment suppliers or organisations able to deliver energy/demand savings at the agreed rate are eligible to submit projects and are paid on project implementation and the certification of savings by an authorised monitoring and verification organisation.
10. [www.nbi.org.za](http://www.nbi.org.za)
11. [www.cef.org.za](http://www.cef.org.za)
12. [www.energy.gov.za/EEE/Projects/Appliance\\_labelling/Information%20Campaign%20005/ANNEX%20D%20CaBEERE%20Backgrounder.pdf](http://www.energy.gov.za/EEE/Projects/Appliance_labelling/Information%20Campaign%20005/ANNEX%20D%20CaBEERE%20Backgrounder.pdf)
13. The cross sectoral nature of the energy efficiency strategy, specifically as it relates to public interest energy efficiency, is captured and highlighted in its vision (DME, 2005): To encourage sustainable energy sector development and energy use through efficient practices, thereby minimising the undesirable impacts of energy usage upon health and environment, and

contributing towards secure and affordable energy for all.

14. An example in this regard has been the effort put forward by the City of Cape Town to change the building regulations to put forward standards for energy efficiency, as well as the use of solar water heaters in new buildings. This process was halted midway, in 2008, when it was established that this task was beyond the jurisdiction of a local authority and that a change in building codes was the responsibility of the Department of Trade and Industry.
15. [www.gcis.gov.za/newsroom/releases/cabstate/2009/091203.htm](http://www.gcis.gov.za/newsroom/releases/cabstate/2009/091203.htm)
16. [www.engineeringnews.co.za/article/sa-outlines-consultation-process-for-20-year-energy-plan-2010-04-01](http://www.engineeringnews.co.za/article/sa-outlines-consultation-process-for-20-year-energy-plan-2010-04-01)

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