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ASSESSMENT AND EVALUATION OF MARKET-BASED ENERGY EFFICIENCY POLICIES AND INCENTIVES

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List of Abbreviations

Btu	British thermal units
CEF	Central Energy Fund
CFL	Compact Fluorescent Lamps
CO_2	Carbon Dioxide
CO_2-E	carbon dioxide equivalent, the accepted unit of measurement for greenhouse gases
DEA	Department of Environmental Affairs
DME	Department of Minerals and Energy
DoE	Department of Energy
DoT	Department of Transport
DPW	Department of Public Works
DSM	Demand Side Management
DST	Department of Science and Technology
DTI	Department of Trade and Industry
EBRD	European Bank for Reconstruction and Development
EE	Energy Efficiency
EEDSM	Energy Efficiency Demand Side Management
EPC	Energy Performance Certificate
ESCO	Energy Service Company
EU	European Union
G77	A coalition of developing nations, designed to promote its members' collective economic interests and create an enhanced joint negotiating capacity in the United Nations.
GHG	Green House Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IDM	Integrated Demand Management
IEA	International Energy Agency
INDC	Intended Nationally Determined Contribution
JICA	Japan International Cooperation Agency
LTMS	Long-Term Mitigation Scenario
MCEP	Manufacturing Competitiveness Enhancement Programme
MEPS	Minimum Energy Performance Standards

MRO	Mass Roll-Out
MTOE	Mega Tons of Oil Equivalent
$MTCO_2$	Metric tons of carbon dioxide equivalent
MW	Megawatt
M&V	Monitoring & Verification
NAS	National Climate Change Adaptation Strategy
NECC	National Energy Conservation Centre
NEEA	National Energy Efficiency Agency
NEES	National Energy Efficiency Strategy
NERSA	The National Energy Regulator of South Africa
NRCS	National Regulator for Compulsory Specifications
OECD	Organisation for Economic Co-operation and Development
Post-2015 NEES	Post-2015 National Energy Efficiency Strategy
S&L	Standards and Labelling
SA	South Africa
SABS	South African Bureau of Standards
SAEE	Southern African Association for Energy Efficiency
SANEDI	South African National Energy Development Institute
SANS	South African National Standard
SWH	Solar Water Heating
TPES	Total Primary Energy Supply
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

1.1. Context of the Study

South Africa's electricity crisis in 2008 prompted government to take drastic measures to implement energy saving initiatives, as detailed in the National Energy Efficiency Strategy (NEES) of 2005. The objective of this strategy was to reduce residential energy demand by 10% by 2015. Initially, during the electricity supply crisis, various policies and incentive programmes were developed to improve energy efficiency (EE) and reduce electricity demand. These gained momentum and markets for EE products, appliances and equipment were developed. In subsequent years, the energy landscape in South Africa changed from an under to an oversupply of electricity, leading to a decline in the emphasis placed on EE and further EE policy development. Internationally, EE continues to gain attention as a means to environmentally sustainable economic and inclusive social development. Given the multiple benefits that EE provides (such as environmentally sustainable economic and employment growth, decarbonisation, improved trade, technological innovation, energy security, and inclusive energy access), it is essential that the Department of Energy (DoE) and the South African Government consider policies and incentive programmes that can progress and scale up EE to contribute to sustainable energy supply and consumption (NEES, 2015).

1.2. Problem Statement

EE is a measure of how efficiently an appliance, building, organisation or country utilise its energy resources (UNIDO, 2016), whereas EE incentive programmes are intended to encourage, or motivate customers to reduce the total amount of energy they consume for a given level of energy service provided, without compromising the quality or level of service. Resulting EE actions could include investments in EE technologies and practices and/or changes in customer behaviour (Prindle, 2010).

Despite numerous advances in EE policy development and incentive programme implementation, enactment of new EE policy measures has slowed down; nearly all the increase in coverage were a result of existing policy amendments and over two-thirds of global energy use are still not included in any EE policy frameworks (IEA & OECD, 2017). The International Energy Association's (IEA) Efficiency Policy Progress Index indicates that the impact of policies increased at their slowest rate in recent years and rates of progress vary significantly across countries (ECEEE, 2017).

South Africa took an early lead in developing national guidelines for energy production and consumption with the promulgation of the White Paper on Energy in 1998, which was further built upon by the NEES (2005).

Significant gains were made in EE during and directly after the 2008 electricity supply crisis. Furthermore, the Standards and Labelling (S&L) Programme has been successful in improving EE uptake after 2010 (Tholen, et al., 2016). Nevertheless, since the initial expansion of EE programme development, advances in South Africa's EE regulatory environment have stalled, considering that most of the Energy Efficiency Demand Side Management (EEDSM) programmes that were being championed by Eskom have been placed on hold: The policy arena pays less attention to EE, with much of government's focus shifting to supply side generation capacity investment.

To scale up energy security, economic growth and environmental sustainability, the EE policy incentive environment must be reformulated and improved in line with South Africa's national policy

objectives; employment creation, low carbon economic growth, Greenhouse Gas (GHG) reduction, and a socially inclusive and affordable energy supply.

It is concerning that South Africa faces several barriers that hinders the uptake of EE measures. The uptake of EE measures remains muted and some incentive programmes have not managed to achieve their desired outcomes, such as the widespread adoption of EE manufacturing processes and the proliferation of EE appliances and equipment throughout the economy (especially within the residential and commercial sectors).

The EE regulatory framework must be reformulated to create a policy incentive environment that will improve the uptake of EE measures, specifically regarding the residential and commercial[1] markets. EE policies must be evaluated according to their value for money and their ability to realise national development goals (Duffy, et al., 2015).

1.3. South Africa's Commitment to the Paris Climate Accord

Emanating from the 2015 Paris Climate Accord, South Africa's Nationally Determined Contribution[2] (NDC) was formulated within the context of the environmental rights set out in section 24 of the Constitution and the National Development Plan, 2030 (National Planning Commission, 2012). According to its NDC, South Africa is committed to limit GHG emissions to below 398 $MtCO_2$ and 614 $MtCO_2$ per year by 2025 and 2030 respectively. This is the benchmark against which the efficacy of mitigation actions will be measured (DEA, 2015).

South Africa's abundant coal reserves have led to a historical dependence on coal as a source of electricity, resulting in a highly carbon-intensive economy, with the electricity sector alone accounting for almost half of GHG emissions (National Planning Commission, 2012). The IEA suggest that 50% of emission reductions can be met through the implementation of EE instruments (IEA, 2016). EE is thus explicitly linked to investment in and policy support for the generation of environmentally sustainable and renewable energy as well as reducing the country's harmful emissions. Towards this end, the NDP seeks to reduce emissions through an appropriate mix of carbon pricing mechanisms and policy instruments (National Planning Commission, 2012). The proposed Carbon Tax, for example, is seen as a key mitigation strategy to scale up EE in South Africa as well as an indirect investment incentive that may stimulate growth in the renewable energy sector.

While these EE mitigations are commendable, South Africa remains a highly carbon-intensive economy. As noted previously, the development, promulgation and implementation of EE policies and incentive programmes have slowed significantly in South Africa since Eskom placed the EEDSM programmes on hold. Government's policy and incentive support for investment in renewable energy have also dwindled over the past three years while Eskom had to raise the price of electricity due to a declining sales base. The building of two new coal-fired power stations, Medupi and Kusile, will commit the country into significant CO_2 emissions over their projected lifespan. This will limit the available carbon space for the rest of the industry, the economy and

[1] The commercial sector covers energy used for air condition, water heating, ventilation and other miscellaneous such as office equipment and lighting.
[2] South Africa ratified the Paris Agreement on 1 November and according to paragraph 22 of UNFCCC Decision 1/CP.21 from that date the INDC became the NDC. (UNFCCC, 2015).

society as a whole (National Planning Commission, 2012). It is unclear if the country would be able to meet its socio-economic and climate targets as advocated in the NDP and the 2015 Paris Climate Accord without significant EE policy and incentive programme implementation.

2. Energy Efficiency Policies and Strategies in South Africa

2.1. The National Development Plan, 2030

The vision for 2030 adopted by the NDP sees South Africa transition into an environmentally sustainable, climate-change resilient, low-carbon economy and just society (National Planning Commission, 2012). The policy theory, including all the assumptions on how policy makers and executors thought that the NDP should reach the targeted effect, is included in Figure 11 in Appendix B on page 85.

In accordance with the purpose of this study, the NDP highlights the following:

- Introducing more energy-efficient and less carbon-intensive industrial processes.
- The development of environmentally sustainable green products and services, including renewable energy technologies, which will contribute towards the creation of jobs in niche markets.
- EE mitigation measures that take account of environmental pressures, provide South Africans with access to affordable and safe energy and making communities less socioeconomically vulnerable.
- South Africa must leverage price competitive renewable energy to extract its mineral wealth as a means to economic diversification and employment creation.
- Carbon-pricing mechanisms that target specific mitigation opportunities must be implemented.
- Investment in skills, technology and institutional capacity is critical to support the development of a more sustainable society and the transition to a low-carbon economy.

The NDP states that emissions by the residential sector will be reduced through greater household energy efficiency, implementing new building design standards (including solar water heaters) and reducing domestic use of fossil fuels through universal electrification (National Planning Commission, 2012).

2.2. The New Growth Path (2011)

The New Growth Path (NGP) focuses on seizing the potential of new economies and the opportunity to create jobs on scale; it aims to address concerns about climate change through partnerships and processes that promote a green economy.

Included in its strategy for seizing the potential for new economies, the NGP advocates comprehensive support for EE and renewable energy as required by the second Integrated Resource Plan (IRP), including appropriate pricing policies, combined with programmes to encourage the local production of inputs, starting with solar water heaters. The targets for renewable energy open major new opportunities for investment and employment in manufacturing new energy technologies as well as in construction. The policy theory, including all the assumptions on how policy makers and executors thought that the NGP should achieve its mandate is shown in Figure 12 in Appendix B on page 90.

2.3. The White Paper on Energy (1998)

The White Paper on Energy Policy of 1998 was developed to clarify government policy regarding the supply and consumption of energy in South Africa.

The White Paper acknowledges that EE in the residential, industry and commercial sectors has not been adequately addressed by the policy framework and that energy savings would free resources and delay the need for further investment. The Paper states that government will facilitate the sustainable production and management of solar power and non-grid electrification systems, such as solar cookers, solar pump water supply systems, solar systems for schools and clinics, solar heating systems for homes and hybrid electrification systems. The policy theory, including all the assumptions on how policy makers and executors thought that the White paper on energy 1998 should reach the targeted effect, is included in Figure 13 in Appendix B on page 96.

The White Paper states that Government will establish EE norms and standards for commercial buildings and industrial equipment, and voluntary guidelines for the thermal performance of housing. A domestic appliance-labelling programme may also be introduced. Publicity campaigns will be undertaken to ensure that appliance purchasers are aware of the purpose of appliance labels (DME, 1998).

2.4. The National Energy Efficiency Strategy (2005 and Post-2015)

The NEES was approved by Cabinet in 2005 to explore the potential for improved energy utilisation by reducing the nation's energy intensity, and separate economic growth from energy demand (DoE, 2015). The NEES received its mandate from the 1998 White Paper on Energy Policy and set a voluntary national target for EE improvement of 12% by 2015. Since 2005, several revised iterations of the NEES were published but not ratified by Cabinet.

In 2016, Government published the Draft Post-2015 NEES for comments as a replacement of the NEES adopted in 2005 (DoE, 2016). The focus of the latest iteration is on:

- Improving household EE (reducing residential energy demand) - especially after the blackouts of 2008.
- Providing support to the Appliance and Equipment Efficiency Standards and Labelling Programme; the focus of the programme is to replace all energy inefficient appliances and to halt the introduction of such appliances to the market.

This strategy aims to build on the achievements of the first NEES, which witnessed higher than targeted improvements in energy intensity, by stimulating further EE improvements through a combination of financial incentives, enabling measures, legal and regulatory frameworks. In addition, the Draft Strategy aligns with the DoE's vision that seeks to promote EE as the 'first fuel' in driving balanced, socially inclusive and environmentally sustainable economic growth, boosting job creation and leading technological innovation across the region.

The strategy aims to contribute towards reducing South Africa's overall energy consumption by 29% by 2030 through the implementation of the suggested EE measures. Specific targets to be achieved by 2030 have also been suggested for each of the sectors. These are a reduction of 15% in energy consumption within the industry and mining sectors; 37% in the commercial and public sectors; 33% in the residential sector; 39% in transport; 30% in agriculture; and a reduction of 29% for the economy as a whole by 2030.

The strategy has been framed to complement the policies and strategies of the Department of Environmental Affairs (DEA), the Department of Public Works (DPW), the Department of Science and Technology (DST), the Department of Trade and Industry (dti), the Department of Transport (DoT) and the National Treasury (DoE, 2016).

The draft document identifies three energy savings opportunities within the residential sector namely, appliances, lighting and buildings. It emphasises the fact that energy savings are possible with the continued implementation of Solar Water Heating (SWH) and Mass Roll-Out (MRO) programmes in the residential sector. Although the draft Post-2015 NEES concedes that mandatory labelling is already implemented, it suggests that mandatory labelling and the Minimum Energy Performance Standards (MEPS) programme should have a broader scope to include appliances that are commonly used in the public sector, such as large-scale cooking and heating appliances. It therefore recommends the tightening of MEPS and its expansion to other sectors.

Within the residential sector, transforming the market for household appliances in favour of more energy efficient models is explicitly stated as one of the Draft Strategy's goals. The draft policy document proposes the following salient measures regarding the residential appliances market, including:

- The feasibility of introducing an energy endorsement label
- Successive tightening of appliance MEPS will ensure that the market is continually pushed in the direction of improved EE for the duration of the strategy period
- A scrappage scheme for old energy-inefficient appliances
- Successive tightening of building standards
- The issuing of mandatory Energy Performance Certificates (EPCs) for new construction

The policy theories, including all the assumptions on how policy makers and executors thought that the NEES 2005 and Draft Post-2015 NEES should reach the targeted effects, are included in Figure 14 and Figure 15 on pages 103 and 112 respectively.

Figure 15

2.5. The Proposed Carbon Tax (2015)

The NDP acknowledges that South Africa needs to reduce GHG emissions and improve EE. The prime purpose of the proposed carbon tax is to reduce the growth of South Africa's GHG emissions in an economically efficient manner that also contends with the commitments of South Africa's NDC to the Paris agreement. On 14 December 2017, the South African National Treasury published a Draft Carbon Tax Bill for public comment, with the comment period commencing immediately and continuing until 9 March 2018.

The following high-level points are important to note in relation to the Bill:

- The actual date of implementation of the carbon tax will be determined through a separate process by the Minister of Finance and will be announced either during the course of 2018 or at the National Budget 2019, taking into account the state of the economy.
- The announcement of the carbon tax implementation date will be complemented by a package of tax incentives and revenue recycling measures to minimise the impact in the first phase of the policy (up to 2022) on the price of electricity and energy-intensive sectors such as mining, iron and steel.

2.6. The National Energy Efficiency Action Plan (2013)

The National Energy Efficiency Action Plan (NEEAP) does not supersede or replace the NEES, which remains the overall guiding document on EE policy; rather, the NEEAP is intended to support NEES by capturing recent changes in the policy and programme landscape, and to describe the measures and activities intended to create an enabling environment for the implementation of these policies and programmes (including overcoming the barriers to EE).

The NEEAP has listed priority activities to be implemented annually including the energy efficiency trend analysis (part of the monitoring system), adjustments of sector/sub-sector baselines, and determination of post-2015 NEES targets and programmes (DoE, 2013).

Other key deliverables of the NEEAP are the finalisation of the energy efficiency monitoring system, reporting mechanism, energy management, measurement and verification of energy savings, functional energy efficiency incentive scheme.

2.7. Commercial Building Standards concerned with EE

2.7.1 SANS (204:2011)

This standard specifies the design requirements for EE in buildings and of services in buildings with natural environmental control and artificial ventilation, or air conditioning systems.

2.7.2 SANS (10400: XA)

This standard sets minimum EE requirements in buildings and is applicable to residential (subsidised and non-subsidised) and non-residential building sector segments.

2.7.3 SANS (941:2014)

The standard covers EE requirements, measurement methods and EE labelling for various residential and electronic appliances.

2.7.4 SANS (1544:2014)

SANS1544 outlines the requirements for producing Energy Performance Certificates (EPC) for public buildings.

2.8. Compulsory Specifications concerned with EE

2.8.1 VC 9006

This compulsory specification covers electric geysers and references SANS 151.

2.8.2 VC9008

This compulsory specification covers EE requirements and EE labelling for electrical and electronic apparatus and references SANS 941.

3. Energy Efficiency Incentive Programmes in South Africa

3.1. The Manufacturing Competitive Enhancement Programme (MCEP)

The Manufacturing Competitive Enhancement Programme (MCEP) is a dti incentive programme that supports manufacturing enterprises through competitiveness improvement interventions, financial assistance to clusters and partnerships of companies in the manufacturing industry that enhances productivity and international competitiveness. The MCEP was introduced in 2012 with a budget allocation of R5.8bn with an objective to increase competitiveness and help companies retain jobs. It was introduced to support the manufacturing sector in response to the global financial crisis and it has been very successful resulting in the incentive scheme being oversubscribed. The programme can be a useful catalyst to scale up EE initiatives and to achieve the national development goals of the country.

3.2. The Integrated Demand Management Programme (IDM)

Eskom's IDM programme has been instrumental in stabilising the national power network through demand management and EE programmes that have significantly reduced supply constraints, while assisting customers to contain their energy costs. Eskom is the main administrator and implementer of the NERSA-funded demand-management programme and has set up an entire division, Integrated Demand Management (IDM), dedicated to EEDSM implementation.

The IDM scheme aimed to promote and implement more energy efficient technology, processes and behaviour by all electricity consumers. In addition, the programme focused on both short-term and long-term security of electricity supply and delivery of the national EE policy objectives. For example, by the end of the 2012 financial year, the IDM programme reported verified cumulative savings of 3,072 MW (Covary & Urich, 2013).

Due to financial constraints, a number of the Eskom IDM programmes have been placed on hold.

3.3. The 12L Tax incentive

The 12L Tax incentive is administered by the South African Energy Development Institute (SANEDI). This incentive scheme was promulgated in 2013 and the main objective is to promote EE in the manufacturing environment. The programme aims to combat greenhouse gasses and for manufacturers to become more energy efficient, as well as safeguarding the security of energy supply. It allows taxpayers to claim deductions of 95 cents per kilowatt hour, or kilowatt hour equivalent, of EE savings made against a baseline measured at the start of each year of assessment.

Despite the objective of promoting EE, the 12L tax incentive has implications for business which entail:

- An additional cost burden implied by the Measurement & Verification (M&V) body which can be as high as 10% of the project costs.
- The Act does not stipulate how charges are set and therefore are left at the discretion of the specific M&V body.
- The financial viability of registering a project under the 12L or against another state-led incentive such as the MCEP is an obstacle, as the 12L regulations do not make provisions for concurrent consumption or any related benefits.

3.4. The Green Energy Efficiency Fund (GEEF)

The Industrial Development Corporation (IDC) partnered with the German Development Bank (KfW) to launch the Green Energy Efficiency Fund (GEEF), which is a R500 million fund that supports the introduction of EE and self-use renewable energy technologies through inexpensive loans. The aim is to encourage investments in EE and renewable energy projects to support the transition towards a low-carbon economy. The GEEF loan requires eligible applicants to submit a detailed and viable EE business plan that provides significant energy or emission savings, a financial model and past and projected cash flows. The fund aims to ensure that there are no out of pocket expenses for the applicant and loan repayments are aligned as far as possible with savings in operational expenses from reduced electricity consumption.

3.5. The Green Fund

The Department of Environmental Affairs (DEA) initiated the Green Fund that provides catalytic finance for green initiatives that support South Africa's transition towards a green economy and the overall NDP mandate of poverty reduction and job creation. The Fund is managed and implemented by the Development Bank of Southern Africa (DBSA) which requires three funding areas that reflect national policy priorities and sectors with high potential. These funding areas include; Green Cities and Towns, Low Carbon Economy and Environmental and Natural Resource management. The Fund seeks to unlock barriers and bridge gaps, wherever they exist along the innovation value chain and is expected to respond to market weaknesses currently hampering South Africa's transition to a green economy by:

- Promoting innovative and high impact green programmes and projects
- Reinforcing climate policy objectives through green interventions
- Building an evidence base for the expansion of the green economy
- Attracting additional resources to support South Africa's green economy development

4. Lessons Learnt from International Case Studies

This section summaries the lessons learnt from International Case Studies on policies and incentive programmes used to scale up EE for the respective countries. These lessons can be utilised to inform the South African EE regulatory environment on the most prudent course of action going forward by indicating a benchmark of similar realities in the selected case study countries.

4.1. Turkey

A policy case study analysis for Turkey is included in Appendix A on page 34. Key lessons learnt from this case study include:

- Regulation for supporting EE in SMMEs together with training and auditing consultancy services were successful as this contributed to the achievement of wider policy objectives, including the reduction of GHG emissions. This also led towards the development of the "Improving Energy Efficiency in Industry" incentive project in Turkey. South Africa could similarly benefit from such a regulation in the SMME sector to achieve better uptake of EE measures and increase SMME profitability and competitiveness. Improving EE in SMMEs contributes to wider policy objectives, such as boosting employment, reducing GHG emissions and air pollution, and deferring investments in additional power generation.
- The Law Regulating and Promoting Energy Efficiency No. 5627 of 2007, as shown in Table 5 on page 35, resulted in an increase of the average EE of manufacturers' product lines and

a real-world energy saving of 25.4 Mtoe. This policy resulted in the development of the Clean Technology Fund. **South Africa's similar regulations in the Post-2015 NEES are not as comprehensive as Turkey's.**

- The Energy Efficiency Strategy (2012) is a comprehensive policy document. It centralises the monitoring of EE sectors using a database known as the Energy Efficiency Portal that provides effective information flow, produces reliable projections, educates the public and creates awareness. **South Africa lacks a centralised EE portal and comprehensive EE sector data for detailed Monitoring and Evaluation.** The only local body similar to Turkey's is the Energy Efficiency Target Monitoring System, established in 2014 to monitor the progress made towards meeting the original targets of the NEES.
- Turkey adopted the Law on Energy Efficiency in February 2007 and has since established an Efficiency Coordination Board. Similar EE bodies in South Africa are The Southern African Energy Efficiency Confederation (SAEEC) and SANEDI (although SANEDI's mandate extends beyond EE to incorporate broader measures to promote the uptake of Green Energy). **GIZ suggests that the government considers employing SANEDI as an independent body to drive efficiency programmes and measures.** Globally, the use of independent bodies (often semi-governmental) to deliver EE programmes has proven successful (GIZ & Unlimited Energy, 2014).
- The Law Regulating the Promoting of Energy Efficiency No. 5627 of 2007 resulted in awareness campaigns including, a training bus, free publications, technical manuals for energy managers, national and international conferences, seminars, workshops, etc. This awareness programme informed the public about the advantages of EE. **South Africa lacks a broad public awareness of EE that will require large campaign roll-outs to educate the public on improved energy efficiency** by employing, for example, EE champions and celebrities, showing the practical steps that consumers can take to utilise EE.
- An energy audit guide and check list were designed and finalised in terms of ISO 50002. An energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprint. In South Africa, the private sector energy efficiency (PSEE) programme offered discounted energy audits to businesses, but **more initiatives in terms of energy auditing is needed**, as this was a limited initiative. An independent Professional Body was established in the form of the Measurement and Verification Council of South Africa (MVCSA) (a chapter of SAEE) to assist consumers to engineer and invest in energy efficiency projects, or to utilise the 12L Tax incentive.

4.2. Thailand

A policy case study analysis for Thailand is included in Appendix A on page 44. Key lessons learnt from this case study include:

- The creation of public awareness and subsequent behavioural change in consumers ensured an early buy-in from various stakeholders. Thailand's 20-year Energy Efficiency Development Plan 2011-2030 (EEDP) enabled the establishment of a close relationship between government and the private sector that resulted in the stimulation and adoption of EE. **In South Africa such a relationship is limited, primarily due to a lack of proper stakeholder engagement and to a lesser extent, the cross-sectoral nature of EE, involving a number of different departments.** The implementation of the NEES revealed a neglect of public interest energy efficiency programmes. **Mechanisms that provide for ongoing stakeholder engagement are particularly useful.** Engaging stakeholders should

be part of every policy process. However, ensuring that stakeholder involvement is part of all EE policy development can lead to improved policy design and implementation.

- Thailand adopted a Climate Change Master Plan that places considerable focus on mitigation actions to reduce emissions. South Africa's current draft National Adaptation Strategy (NAS) is intended to be the cornerstone for climate change adaptation in the country. **The challenge with this Strategy is that the white paper provides policy direction, but does not contain any binding obligations to conduct, for example, climate change impact assessments.**
- The Energy Efficiency Revolving Fund (EERF) in Thailand, as shown in Table 8 on page 49 provided appropriate schemes to incentivise banks to provide soft loans with longer payback periods. This incentive resulted in banks streamlining procedures for appraising and financing EE projects. The ENCON Act (1992/2007) and Thailand's 20-year Energy Efficiency Development Plan 2011-2030 (EEDP) were the policy instruments supporting the EERF. **South Africa could benefit from the development of appropriate schemes to incentivise banks to provide loans to EE projects.**
- The ENCON Act (1992/2007) and Thailand's 20-year Energy Efficiency Development Plan 2011-2030 (EEDP) also piloted the highly successful Technology Development and Innovation Programme, where technology hubs for EE resulted in more cost-effective and energy efficient products in the market. This programme was a key instrument for EE information dissemination. An overview of this incentive is summarised in Table 8 on page 49. **South Africa's Technology Innovation Agency (TIA) is a similar public entity that supports the development of a sustainable energy industry; however, the scope of TIA's EE programmes is very small.**
- The Human Resources and Institutional Capability Development Programme is instrumental towards the development of institutional capability, agencies or organisations in both public and private sectors, responsible for the planning, supervision, promotion and implementation of energy conservation measures. The programme resulted in energy conservation measures being implemented in a timeous manner, according to national strategies. South Africa's NEA (2008) and other energy policies depend on a high level of institutional capacity to function. **South Africa still suffers from institutional capacity constraints to implement EE policy in the public sector** and relies significantly on private capacity.
- The Government of Thailand established the Energy Conservation Promotion Fund in 1992 to foster investment in EE. The fund is financed from a tax on all petroleum sold in the country. **South Africa can similarly use proceeds from taxation, such as the proposed Carbon Tax, to finance EE initiatives or to offset the rebates offered by incentives like the 12L Tax Incentive.**

4.3. Australia

A policy case study analysis for Australia is included in Appendix A on page 55. Key lessons learnt from this case study include:

- The National Strategy on Energy Efficiency (NSEE) 2009, makes EE a national priority in Australia. The Australian government works in close partnership with the private sector to reduce EE adoption barriers. **Such functional partnerships are still limited in South Africa**. Improving EE is a strategic priority in both the NDP 2030 and South Africa's Intended Nationally Determined Contribution (INDC). It is anticipated that the ratification and implementation of the Post-2015 NEES will improve these relationships towards increased

adoption of EE measures. This, together with good governance and public buy-in, will be key to improved uptake of EE measures and GHG emission reductions.

- The Commercial Building Disclosure Programme in Table 10, on page 59, addresses the barrier of split incentives - particularly common in the commercial property market.[3] Such incentives may lead to the unintended consequence of landlords under-investing in EE measures. The programme requires sellers and lessors of large commercial office spaces to provide energy efficiency information to prospective buyers and tenants. It improves communication and information about EE in the property market. **South Africa will benefit from a programme that assists sellers, lessors and landlords to make more informed decisions regarding energy use in the commercial property market, thereby encouraging the construction of more energy efficient buildings.** The Draft Post-2015 NEES proposes mandatory Energy Performance Certificates (EPCs) to be considered for the rental sector.
- The Star Energy Rating label contributed to EE by creating awareness and appliance preference among consumers. The Star Rating label encourages manufacturers to keep improving the energy efficiency of appliances. **In South Africa, this label can only be found on certain imported products (mainly computers). The Draft Post-2015 NEES suggests a broadening of MEPS to include appliances that are commonly used in the public sector (such as large-scale cooking and heating appliances). To further prevent the introduction of energy inefficient appliances it is further recommended that the marketing of such appliances be prohibited.**

4.4. India

A policy case study analysis for India is included in Appendix A on page 64. Key lessons learnt from this case study include:

- In India, the National Action Plan on Climate Change (2008) and the Energy Conservation Act (2001) lead to the adoption of the Strengthening Institutional Capacity Programme, which was essential to the implementation of various EE initiatives (Table 12). **South Africa will benefit from a similar programme since institutional capacity among key role players remain limited.** The **development of financial and human resource capacity within key institutions** responsible for EE (such as the DOE, SANEDI and SABS) is important. According to Götz, the **filling of relevant vacancies and appropriate training** of public officials is of crucial importance (Götz, et al., 2016).
- The National Action Plan on Climate Change (2008) also lead to various other EE programmes in India. These programmes included the Market Transformation Energy Efficiency Programme, as shown in Table 12 on page 68. The programme improved the uptake of EE measures in India by **bridging the financing gap in partnership with commercial banks**. The banks provided soft loans with a longer payback period to enable the implementation of EE measures among companies in India. The programme also made EE products more affordable through the development of Bachat Lamp Yojana (BLY) and

[3] Split incentives occur when those responsible for paying energy bills (the tenant) are not the same entity as those making the capital investment decisions (the landlord or building owner).

Super-Efficient Equipment (SEEP) initiatives that lead to a price reduction of about USD$7 to USD$3 for 7-Watt LED lightbulbs.

- The Energy Efficiency Financing Platform (EEFP) programme (also the result of the National Action Plan on Climate Change (2008) and the Energy Conservation Act, 2001)), led to MoUs being signed with financial institutions to work together to develop EE markets and to identify issues related to private sector uptake. **Collaboration between government and the private sector is essential in the development of energy markets, especially in addressing barriers to scaling up EE adoption. As noted in this and previous case studies, such collaboration is limited in South Africa.** Table 12 on page 68 provides more information on the EEFP programme in India.
- India also developed a Framework for Energy Efficient Economic Development (FEEED) from the National Action Plan on Climate Change (2008). This programme was broadly seen a success, as it **provided commercial banks with partial risk coverage regarding the provision of loans for EE projects and investment in the development of new EE technologies**. Furthermore, this programme facilitated **credit services to be extended to ESCOs** for EE projects. In addition, the India Energy Efficiency Services Limited (EESL) business model was based on high-volume purchases through **competitive bidding** that significantly lowered the price of super-efficient energy equipment (Table 12 on page 68).
- The Energy Conservation Act (2001), presented in Table 12 facilitated the development of the Procurement of Energy Efficient Appliances Programme for Government. This programme resulted in the **increased procurement of EE appliances among all ministries/ departments and attached subordinate offices.** The initiatives and examples set by government paved the way for companies and end-users to also increase their adoption of EE appliances. In South Africa, the Department of Public Works is also developing a similar programme, namely the “Leading by Example” brand that supports programmes aimed at building retrofits, raising awareness and the greening of procurement.
- India also introduced a Deemed Savings Approach, which saw the upfront implementation of EE street lighting. Because implementation occurred upfront, the challenges and costs associated with M&V was reduced. In South Africa, the Standard Product Programme offered pre-approved rebates for deemed energy savings achieved through specified technologies as part of the EEDSM programme (point-of-sale rebates would be impractical without using deemed savings as substitutes for actual measurement). However, due to the estimating nature of deemed savings, it should be used for M&V only when necessary, and government should employ more rigorous M&V approaches wherever possible.

4.5. Algeria

A policy case study analysis for Algeria is included in Appendix A on page 77. Key lessons learnt from this case study include:

- **When compared to South Africa, Algeria reflects better continuity between government policies and implementation** (Table 13 on page 78). Implementation is mainly dependent on institutional capacity and good governance.
- Subsidies in the energy sector may result in a rebound effect in relation to energy efficiency measures whereby EE improvements decrease the marginal cost of energy services, thereby increasing demand and inducing less-than-proportional reductions in energy use. **Energy subsidies present a challenge to EE measures as end-user prices do not naturally provide consumers with sufficient incentives to adopt EE appliances.**

- Public awareness and information campaigns in Algeria were mainly aimed at decision makers, both at national and local level. The National Energy Efficiency Programme was tightened with the ban on the marketing of inefficient appliances to increase the rate of EE Policy compliance. Similar tightening of regulations should be considered in South Africa.

5. A Review of the Energy Efficiency Policy & Incentive Programme Framework in South Africa

5.1. Policy Review

Table 1: Policy Review

Name	Policy Description (Goals)	Policy Theory Approach				Cause-Impact Relationship	Barriers to Adopting EE Policy Measures	Success & Failure Factors
		Assumptions	**Strategies**	**Acts**	**Regulations**			
NDP 2030	• Transition to a low carbon economy: reducing carbon emissions to the baselines of 34% in 2020 and 42% by 2025.	• Support for carbon budgeting. • Introduction of the Carbon Tax. • Building standards that promote EE.	• Draft Post-2015 National Energy Efficiency Strategy.	• National Energy Act of 2008.	• National Green House Gas Emissions Reporting.	• Sector Tax exemptions/ Allowance. • Draft Carbon Tax Bill. • Public awareness campaigns. • Internalising CO_2 cost • Solar Water Heater EE impacts. • Assumed reductions of 26–33% by 2035 compared with Business-as-usual.	**Insufficient public-private sector engagement** Limited public commitment and prioritisation of policy and regulations to enforce EE. Limited delivery and implementation capacity among the public and private sectors implies a need to create dedicated public and private entities towards scaling up energy efficiency.	• Significant inroads in ensuring the adoption of policy measures that will reduce GHG emissions, i.e. new building specifications (SANS 204), which resulted in eco-refurbishment of buildings built before 2015. • There has been little progress w.r.t. GHG emission reductions as the Carbon Tax has, to date, not been promulgated. • Its objectives concerning EE (residential and commercial sectors), are ambitious in certain instances. • Should the Carbon Tax be implemented, it will assist in reaching the 42% reduction target by 2025.
New Growth Path 2010	• To link the creation and growth of jobs with the development of the "green economy": Expansions in construction and the production of technologies for solar, wind and biofuels.	• A target of 5 million solar water heaters by 2030. • Increasing investments in the green economy • Promoting energy efficiency across the economy. • Developing an Energy Efficiency Campaign to build public awareness. • The local manufacture (or assembly) and installation of Solar Water Heaters, including collectors, metal frames, glass, geysers and piping. • Retrofitting buildings with EE equipment and replacing incandescent	• IPAP (2017/18-2019/2020).	• National Energy Act of 2008.	• Compulsory specification for energy efficiency and labelling for electronic apparatus.	• Benchmarks for sector EE and company Energy-Management Plans. • Decrease in reliance on coal and paraffin. • Job creation potential while contributing to energy savings. • Rollout of Solar Water Heaters. • Investment in the Green Economy. • Promotion of localisation, youth employment, cooperatives and skills development. • Encourage domestic production of EE inputs.	**Limited access to appropriate finance for EE adoption** • Limited availability of appropriate financial incentives to accelerate the implementation of programmes such as the Solar Water Heaters initiative. • Unfavourable or un-incentivised loan interest rates to facilitate investment in EE measures, appliances, equipment and technologies, hinders EE adoption. • Lack of local procurement due to a lack of skilled.	• The roll-out of solar water heaters resulted in 400,000 SWH installed up to 2016. • Some success achieved in the IDC Green Industries SBU, as well as incentives such as Eskom's SWH and CFL programmes. • The introduction of the NDP resulted in a halt to the attempt to forge an alignment of the macroeconomic policies, in particular the monetary policy with the industrial policy and job creation as proposed in the NGP. • The halting of Eskom's IDM programmes has significantly reduced the prospect for job creation in the EE sector.

Name	Policy Description (Goals)	Policy Theory Approach				Cause-Impact Relationship	Barriers to Adopting EE Policy Measures	Success & Failure Factors
		Assumptions	**Strategies**	**Acts**	**Regulations**			
		lamps with CFL or LEDs.					expertise and adherence to international standards.	• A lack of skilled expertise and adherence to international standards further hampers local procurement in EE.
Energy White Paper 1998	• Provides the overall policy direction for developing South Africa's energy sector.	• Government commitment to facilitate energy efficiency. • Promotion of an EE awareness amongst industrial and commercial energy consumers. • Establishment of EE norms and standards for commercial buildings. • Establishment of EE standards for industrial equipment. • Implementation of an EE programme to reduce consumption. • Promotion of EE awareness in households. • Promotion of a domestic appliance labelling programme. • Promotion of audits, demonstrations, information dissemination, sectoral analyses and training programmes.	• National Energy Efficiency Strategy (Post, 2015).	• National Energy Act of 2008.	• Regulations on the mandatory provision of energy data (2012).	• Adequate energy conservation regulations, EE standards and norms. • Improving Energy Efficiency Governance. • Appliance Standards and Labelling to produce more efficient appliances. • Raising public awareness. • Skills development and training in EE.	**Asymmetric Information & Lack of awareness** • Lack of consumer awareness and understanding or llimited information on the knowledge and benefits of energy efficiency. • A lack of skills in the energy efficiency market remains a challenge that will require further attention. • Insufficient data collection and management. • Lack of implementation and enforcement.	• Although in need of an update, the White Paper sets clear expectations for EE policy in terms of norms and standards for commercial buildings • The S&L Programme has been successful resulting in improved EE after 2010. • Little effect pertaining public awareness campaigns • EE programmes have not realised the initially-set targets as outlined in the Paper. • Governance in EE is hampered by overlap, as the DTI, DoE and Eskom are driving EE programmes resulting in strategic outputs lying beyond the exclusive ambit of the DoE. • The necessary policies to adopt EE for appliances are in place, however, thus far, the country has been lacking in implementation and enforcement. • MEPS have had moderate success. • The more comprehensive S&L programme will offer new opportunities for successful transition of appliances market. • Public awareness of the significance of EE is still lacking. • By 2025, estimated 462,000 additional jobs created by "going green". • EE managers and technicians' occupations in high demand by the DHET.

Name	Policy Description (Goals)	Policy Theory Approach				Cause-Impact Relationship	Barriers to Adopting EE Policy Measures	Success & Failure Factors
		Assumptions	**Strategies**	**Acts**	**Regulations**			
								• A lack of skills in EE market remains a challenge that will require further attention.
NEES 2005	• Strategy sets out the intention to implement a variety of regulatory measures, demonstration and awareness raising measures by Government, as well as voluntary agreements. • Explore the potential for improved energy utilisation through reducing the nation's energy intensity and decoupling economic growth from energy demand. • Strategy is divided into 4 sector programmes: Industry and Mining; Commercial and Public Buildings; Residential; and Transport. • Target of 12% reduction in overall primary energy consumption by 2015.	• Energy intensity reduction target of 12% by 2015. • Sectoral Energy Efficiency improvement targets: Industry and Mining (15%), Commercial and Public buildings (15%), Residential (10%) and Transport (9%). **Residential EE measures:** • Final demand reduction of 10% by 2015 • Appliance labelling. • Awareness campaign • Mandatory EE standards for housing and appliances.	• IPAP (2017/18-2019/2020).	• National Energy Act of 2008.	• Draft Regulations Regarding Registration, Reporting on Energy Management and Submission of Energy Management Plans (2015).	• National target of a 12% reduction in final energy demand by 2015. • Strengthening of the Energy Efficiency Accord. • Extension of labelling for the energy efficiency status of appliances and implementation of a labelling scheme for the fuel consumption of new vehicles. • Improvements in EE via "enabling instruments and interventions" • Implementation via Sector Programmes which would include systems to monitor and evaluate progress in energy efficiency improvements and review implementation.	**Institutional Capacity & Enabling Framework** • Lack of integrated planning results in ineffective regulations that may impede the fostering of energy efficiency. • Lack of regulatory guides to enforce and monitor strategic outputs. • Technology and institutional change means that EE policies must be kept up-to-date with contemporary technologies, or else risk becoming irrelevant.	• Decomposition analysis by the EETMS: reduction of almost 24% in economy-wide energy consumption relative to a baseline. • Structural effects had a positive impact while efficiency improvements. (technology/substitute) reduced demand over the period from 1994-2006. • Significant EE gains took place despite falling electricity prices. • R5.4bn investment in IDM initiatives in a bid to reduce electricity demand. • Several support mechanisms for the implementation of the Strategy have not been developed. • Several measures to implement the NEES 2005 targets have not taken place.

Name	Policy Description (Goals)	Policy Theory Approach				Cause-Impact Relationship	Barriers to Adopting EE Policy Measures	Success & Failure Factors
		Assumptions	**Strategies**	**Acts**	**Regulations**			
Draft Post-2015 NEES	• The Post-2015 NEES aims to build on the achievements of the original NEES 2005. • Improving household EE (reducing residential energy demand). • Providing support to the Appliance & Equipment Efficiency Standards & Labelling Programme.	• To promote energy efficiency as the 'first fuel'. • Streamlining the 12L Tax incentive. • Promulgation of Carbon Tax. • A review of the IRP on a regular basis. • Closer engagement with the Private Sector • A follow-up on regulations & enforcement of legislation. • Introducing an energy endorsement label. • Successive tightening of appliance MEPS. • Successive tightening of building standards. • Mandatory EPCs for new construction.	• IPAP (2017/18-2019/2020).	• National Energy Act of 2008.	• Draft Regulations Regarding Registration, Reporting on Energy Management and Submission of Energy Management Plans (2015).	• 12L Tax Incentive. • EPC mandatory certificates. • Public sector awareness programs. • Draft Carbon Tax (2015) • Successive tightening of building standards. • Financing schemes for energy efficiency.	**Lack of co-ordination on the energy transmission mechanism, limited capacity and policy coherence** • Lack of effective regulation and coordination between the public and the private sector resulting in the low priority of energy efficiency. • Limited capacity within key governance structures. • Limited coherence with relevant sectoral policies and legislation in terms of strategic implementation. • Split incentives: The advantages of the incentive might not benefit the party making the investment in EE, particularly evident in building regulations.	• Amendments to the 12L Act now include co-generation. • Interest in 12L has increased since the suspension of Eskom IDM programme. • EPC regulations will be extended to the commercial sector by 2020. • EPC addresses two critical market failures in the building sector: incomplete information and the split incentive problem. • According to estimates, the tax would lead to an estimated decrease in greenhouse gas emissions of 13% to 14.5% by 2025, and 26% to 33% by 2035. • A shift in financing priorities, coupled with strong economic incentives (via taxes, charges and subsidy reform) can promote behavioural change. • Establishing an 'ESCO Incubator' as a public-sector body, to create conducive environment for ESCOs.
Proposed Carbon Tax	• Carbon Tax aims to reduce greenhouse gas emissions of 34% by 2020 and 42% by 2025 against a business as usual curve.	• Transition to a more sustainable low carbon economy and green jobs.	• National Climate Change Response 2011.	• National Environmental Management: Air Quality Act No.39 of 2004.	• National Green House Gas Emission Reporting Regulations (2016) • Draft Regulations Carbon Offsets (2016).	• Internalising CO_2 cost. • Tax Allowance / exemption. • The Green Fund.	**Ineffective Market Structures to Support EE** • Procedures to enforce and prioritise EE requirements have not been put in place • Not considering non-energy or co-benefits of an end-use energy efficiency project weakens the business case	• Carbon Tax is still in its draft form. It has not been promulgated.

5.2. Incentive Schemes and Programmes Review

Table 2: Incentive Schemes and Programmes Review

Name	Incentive Description	Accompanying Policy	Cause-Impact Relationship	Barriers to Adopting EE Incentive Measures	Success & Failure Factors
MCEP	• In relation to the green economy the objective of the incentive is to promote enterprise competitiveness and job retention through Green Technology and Resource Efficiency Improvement.	• IPAP (2017/18-19/2020).	• Capital Investment. • Green Technology & Resource efficiency improvement. • Enterprise-level Competitiveness improvement. • Feasibility studies & Cluster Competitiveness improvement. • Industrial Financing loan facilities. • Pre- and post-dispatch working capital facility. • Industrial policy niche projects fund.	**Ineffective market structures and access to Finance** • Lack of access to capital: companies often have limited capital available for end-use efficiency projects and frequently require payback periods that are not favourable. • Gap for supporting new projects. • Lack of support for smaller initiatives.	• The MCEP has been very successful resulting in the incentive scheme being oversubscribed. • The MCEP covers expansions only, which means that there is a gap in support for new projects. • There is support involving new and expansion projects for black industrialists, but only for investments. exceeding R30-million. Consequently, the industrywide tax incentive, 12I, is only available for projects of R30-million and above. • There was a lack of communication between the department and applicants when MCEP was running.
IDM	• The programme coordinates and consolidates a variety of initiatives aimed towards promoting EE and demand reduction for sectors that include (industry and mining, commercial, residential and agriculture.	• New Growth Path (2010). • IPAP (2017/18-2019/20).	• Solar Water Heating Programme. • Energy Service Company. (ESCO Model). • Standard Offer & Standard Product. • CFL Rollout Programme.	**Lack of Prioritisation of Energy Efficiency** • Lack of effective market structures and finance to proceed with programmes such as the SWH programme.	• IDM has been instrumental in stabilising the national power network through demand management and EE programmes that has significantly reduced supply constraints, while assisting customers to contain their energy costs. • The programme has since been placed on hold. The suspension of the IDM programme has had a negative impact on SMME's efforts to implement EE. • The reduction in Eskom's IDM incentives has caused a large growth in the number of enquiries and applications received for the 12L tax incentive.
12L Tax Incentive	• The incentive seeks to promote energy efficiency in the manufacturing environment. • Provides an allowance for businesses to implement energy efficiency savings. The savings allow for tax deduction of 95c/kwh saved on energy consumption.	• IPAP (2017/18-2019/20) • New Growth Path 2010 (Green Economy Accord 4).	• Simplified and streamlined Measurement & Verification (M&V) procedures. • Tax allowances. • Institute a regular review of design and effectiveness.	**Cost Burden; Cooperative Governance; Rebound Effect** • Tax structure that is not streamlined to other sectors. In addition, high transaction cost including; project preparation facilities and investment are also challenges towards the uptake of energy efficiency projects. There is lack of cohesion of current incentives towards scaling up EE. • Subsidies in the energy sector may result in a rebound effect in relation to energy efficiency measures whereby EE improvements decrease the marginal cost of energy services, thereby increasing demand and inducing less-than-proportional reductions in energy use.	• There is an additional cost burden implied by the M&V body which can be as high as 10% of the project costs. • The Act does not stipulate how charges are set and therefore are left at the discretion of the specific Measurement &Verification (M&V) body. • The financial viability of registering a project under the 12L or against another state-led incentive such as the MCEP is an obstacle, as the 12L regulations do not make provisions for concurrent consumption or any related benefits.

Name	Incentive Description	Accompanying Policy	Cause-Impact Relationship	Barriers to Adopting EE Incentive Measures	Success & Failure Factors
The Green Energy Efficiency Fund	• Launched by the IDC in partnership with the German Development Bank (KfW). To encourage investments in EE and RE projects to support the transition towards a low-carbon economy.	• Draft Carbon Tax (2015) • IPAP (2017/18 - 2019/20). • New Growth Path 2010 (Green Economy Accord 4).	• Project Investment support on energy efficiency. • Public awareness campaigns • Energy assessments & audits to propose sustainable energy solutions.	**Information & Awareness** • Lack of knowledge of available incentives for end-use efficiency measures can lead to missed opportunities.	• This is an opportunity for energy start-ups to access finance from the IDC which is offered at a low-cost debt. • The Fund has been well-subscribed but not enough projects have benefited. • There is an opportunity for energy start-ups to access finance from the IDC which is offered at a reduced interest loan (prime -2%), which eases the financial burden on SMMEs. • The Fund offers a long payback term of up to 15 years, thereby easing the debt burden of companies. • The GEEF supports the introduction of self-use renewable energy technologies and will ultimately continue contributing to global climate protection.
The Green Fund	• The DEA initiated the Green Fund which aims to promote the development of the green economy.	• National Development Plan, 2030. • New Growth Path 2010 (Green Economy Accord 4). • Draft Carbon Tax (2015).	• Internalising carbon emissions. • Project Investment on the Green Economy. • Public awareness campaigns.	**Varying access to capital; Fast Tech change; Cooperative Governance** • The fast turnover of new EE technology risks firms' EE measures quickly becoming obsolete. • The ability to access capital with ease can hinder adoption of EE measures by firms. • Insufficient local capacities for identifying, developing, implementing and maintaining EE investments. • Insufficient partnering with key stakeholders lead to a lack of cooperative governance that is essential for co-ordinated implementation of activities and clearly defined responsibilities.	• The strength of the Fund has been its willingness to fund new and emerging green technologies. • The significant demand for green finance is illustrated by the overwhelming response to the public calls for proposals. • Strategic partnerships with key stakeholders have been critical to the success of the funded initiatives.

6. Study Outcomes and Recommendations

6.1. Financial Incentives & Instruments Outcomes

Table 3: Financial Incentives and Instruments

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
EEDSM Standard Offer	• Due to financial constraints, many of the Eskom IDM programmes have been placed on hold.	• New Growth Path (2010) • IPAP (2017/18-2019/20)	• A resolution to the current impasse in the EEDSM programme should be sought by recapitalising and restructuring the programme. • Should IDM be re-established, consider transferring the IDM programme to SANEDI. • Further simplification and streamlining of the approval process, should the programme continue.	• Community-scale DSM: Managing energy, peak demand and bills on community level may be more feasible, because of the collective purchasing & bargaining power, and more options in energy efficiency or storage.
Tax Incentives	• The 12L tax Incentive provides an allowance for businesses to implement energy efficiency savings.	• Draft Post-2015 NEES • Section 12L of the Income Tax Act	• The 12L tax structure should be streamlined with other sectors. • Transaction costs should be lowered. • Provisions should be made for concurrent consumption or related benefits. • Consider restructuring the incentive to include smaller EE projects. • To stimulate uptake of EE, proceeds from taxation, such as the proposed Carbon Tax, can be used to finance EE initiatives or to offset the rebates offered by incentives like the 12L Tax Incentive.	• ESCO-specific tax incentives for implementation of EE projects. • Allow tax-deductible investments for certain projects; companies gain a tax shield. • Reduce customs and excise duties to decrease the cost of EE technology and equipment.
Regulations for supporting SMMEs	• South Africa does not currently have EE	• Draft Post-2015 NEES	• Consider restructuring the 12L incentive to include smaller EE projects. • Provide preferential loans to SMMEs	• Support leasing through a National EE Financing Mechanism/ Investment Fund. Energy service

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
	regulations in the SMME Sector. • The South African Renewable Energy Business Incubator (SAREBI) supports viable small enterprises who manufacture or provide services to the renewable, clean and EE sectors.	• New Growth Path (Green Economy Accord 4)	• Low value term loan products for SMMEs • Develop a system to ensure that energy audits are widely promoted and easily accessible for all SMMEs.	companies can acquire loans for equipment, which they then lease to SMMEs. • Energy Savings Insurance (ESI) is a formal insurance contract between an insurer and either the building owner, or third-party provider of energy services. In exchange for a premium, the insurer agrees to pay any shortfall in energy savings below a pre-agreed baseline, less a deductible.
Support leasing through a National EE Financing Mechanism/ Investment Fund	• SA currently has a scarcity of funding for large-scale EE investments requiring significant capital.	• Draft Post-2015 NEES	• Establishment of a National EE Financing Mechanism/ Investment Fund that can offer seed capital, takeout financing and low-interest loans to EE projects.	
Soft Loans	• SA does not have appropriate schemes to incentivise banks to provide soft loans with longer payback periods. • Low uptake of EE projects	• Draft Post-2015 NEES	• Develop appropriate/innovative financing schemes to incentivise banks to provide loans to EE projects with longer payback periods. • MoUs can be drafted and signed by financial institutions and government to work together towards the development of EE markets and the identification of issues related to this market development.	• Establishment of National EE Financing Mechanism/ Investment Fund that can offer seed capital, takeout financing and low-interest loans to EE projects.

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
Provision of Partial Risk Guarantee	• SA does not offer sufficient cover for companies to take on the risk of developing EE projects that insures the borrower against the risks posed by government's actions or inactions that may impact its ability to repay the debt.		• Consider offering investors in EE Partial Risk Guarantees (PRGs), also known as political risk guarantees, to cover them against the risk of the government (or a government owned agency) failing to perform its obligations regarding a private EE undertaking.	
Deemed Savings Approach	• Eskom's Standard Product Programme offered pre-approved rebates for deemed energy savings achieved through specified technologies as part of the EEDSM programme.		• DSA can be used to ease the burden of M&V that can be strenuous on some programmes. • Deemed Saving should be used only when necessary considering its estimating nature, and government should employ more rigorous M&V approaches wherever possible.	
MCEP	• The MCEP was introduced in 2012 with a budget allocation of R5.8bn with an objective to increase competitiveness and help companies retain jobs.	• IPAP2 • IPAP (2017/18-2019/2020)	• Extend the timeline of incentives offered in MCEP for the foreseeable future, focussing in particular on EE projects.	• Establishment of a Revolving EE Fund (see below)

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
	• The R1-billion loan component of MCEP has been reopened			
Revolving EE Fund	• The MCEP offers working capital loans, including revolving credit facility, but these are not exclusive to EE projects.	• IPAP2 • IPAP (2017/18-2019/2020)	• With a revolving EE fund, loans are provided to municipalities (with lower cost financing, longer repayment schedules and reduced security requirements) to cover the initial investment costs of EE projects. • The savings are then used to repay the Fund until the original investment is recovered, plus interest and any fees or service charges. • Repayments can be utilized to finance additional investments.	
Green Fund	• The Green Fund offers catalytic finance for green initiatives that support South Africa's transition towards a green economy and the overall NDP mandate of poverty reduction and job creation.	• NDP 2030	• Investigate the possibility for the Green Fund to contribute financially to support a EE Financing Mechanism/ Investment Fund. • The fund should broaden its scope to gain traction in provinces such as the Northern Cape and Mpumalanga.	
Green Energy Efficiency Fund	• The fund has been well subscribed, but not enough projects have been identified.	• IPAP • NGP	• Broader public campaigns & enhanced marketing are needed to inform stakeholders about GEEF's opportunities. • Investigate the possibility for the GEEF to contribute financially to support a EE Financing Mechanism/ Investment Fund.	• Consider obtaining more EE grants or loans from bilateral donors such as USAID, the German Technical Cooperation (GTZ), GEF (Global Environmental Facility) & UNDP.

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
			• The possibility to scale up the fund should be considered.	
Private investment in energy efficiency **Public Private Partnerships (PPP)**	• In relation to EE, there is limited engagement between the public and private sector.	• NDP 2030 • Draft Post-2015 NEES	• Collaboration between government and the private sector is essential in the development of energy markets, especially in addressing barriers to scaling up EE adoption. • Consider expanding PPPs, which are voluntary efforts in which government and the private sector agree to work together to analyse public policy problems and jointly implement solutions. • Expand SA's current voluntary EE agreements (VEEAs), e.g. the EE Accord with the NBI. • Promote the accreditation, categorisation and registration of ESCOs.	• Consider the development of a Super ESCO under the auspices of the DoE to serve as an overarching ESCO for the public sector that supports capacity development and other, smaller ESCOs with access to project financing.

6.2. Non-Financial Incentives & Instruments Outcomes

Table 4: Non-Financial Incentives and Instruments

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
Mandatory Legislation	• SA's EE policy framework is not legislated. • The scope of EE policy is extensive, but not cohesive.	• Draft Post-2015 NEES • National Energy Act	• Investigate the trade-off between comprehensive long-term laws (with broad impact) versus quick, incremental laws with limited impact. • Target high-impact consuming sectors with legislation that includes a mix of reinforcing policy measures. • Consider implementing "hard" EE legislation that offers a statutory basis for funding and implementation. • Utilise a phased approach to ensure role-players are prepared for legally binding commitments and the implementation of mandatory standards. • Revise and amend current EE policy where necessary to ensure flexibility, should mandated legislation be implemented. • Provide a statutory basis for EE strategy development and updates.	• The development of a National Energy Efficiency Act to provide a statutory foundation for rules and regulations, give guidance to energy efficiency policies and stipulate funding needs and mechanisms.
Government Coordination & Cooperative Governance	• The NEES has no implicit agreements on co-operative governance. • Due to the cross-sectorial nature of EE outputs, delivery of EE strategic outputs is not the exclusive domain of the DoE.	• NEES 2005 • Draft Post-2015 NEES • White Paper on Energy Policy of 1998	• The need for intra-governmental co-ordination can be drastically reduced by a centralised EE agency, or single government body, as policy development and implementation are focused under a single banner. • Where responsibility is shared among several departments, a formal type of inter-agency agreement can guide coordination.	• Development of a Centralised EE Agency • Targeted EE Communications Plan • Political Champion of EE Implementation

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
	• SA, with its multiple national-level agencies (e.g. energy, transport, buildings) involved in EE policy implementation requires more co-ordination.		• Develop a targeted EE Communication Plan, as implementation relies strongly on multiple tiers of government and the private sector. • The identification of a political champion in favour of EE implementation can be of great value.	
Need for revisions and amendments	• SA aims to review its NEES every five years. The latest iteration is still in draft form. • Due to a lack of capacity, many EE programmes are not reviewed on a timely basis, resulting in certain programmes becoming obsolete.	• NEES 2005 • Draft Post-2015 NEES	• Revision and amendment of existing EE policy is crucial as technologies and mechanisms change, and certain policies become ineffective. • EE policies need to anticipate the requirement for revisions and amendments. • Providing for amendments or refinements minimises concerns about unanticipated results and may ease establishing an initial political consensus on passing EE laws.	• All EE policies and future laws need to include a means to regularly evaluate effectiveness in order to identify areas for improvement.
Skills Improvement	• There is a need in the South African EE market for skills development and accreditation of professionals to bridge the skills gap and provide for growth in the industry. • At present, Eskom provides some technical skills training and workshops, but further organised and systematic training is needed.	• NDP 2030 • NGP • IPAP • EPWP • Skills Development Act of 1998 – amended • National Skills Development Strategy III	• The shortage of specific skills within the DoE and other government departments should be identified and jointly addressed. • SANEDI's Working for Energy Programme may be ideally suited to co-ordinate and support a skills development initiative specifically for EE. • Skills shortages in the private sector should be addressed via dedicated sector programmes by capacitating tertiary institutions, SETAs and research institutes. • Government subsidies and assistance via the skills development levy and other assistance programmes should be put in place to develop EE skills.	• Development of an EE Skills Capacity Training Initiative

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
	• The implementation of EE requires a skill set commensurate with the technology being developed.			
The exemplary role of the public sector	• The Department of Public Works is developing a the "Leading by Example" brand that supports programmes aimed at building retrofits, raising awareness and the greening of procurement.	• Draft Post-2015 NEES	• The exemplary role of the public sector can marshal a significant amount of energy savings, especially if broadened to include provincial and local authorities. • There are two ways for government to lead by example: rollout of EE improvements within owned and managed government buildings and integrating EE into local procurement (see below).	
Localisation of procurement	• EE technologies and/or parts thereof are largely still imported, instead of locally manufactured.	• NDP 2030 • NGP • Local Procurement Accord	• Develop a prescribed minimum for locally developed or manufactured EE components to be included in public procurement processes. • Employ local EE technologies within existing initiatives and programmes. • Consider the inclusion of EE in technical tender specifications and use of lifecycle costing in public tender specifications. • Develop clear, practical guidelines on how to apply EE criteria in public procurement procedures.	• Consider adapting public procurement laws to facilitate the evaluation of EE service providers.
Taking cognisance of the rebound effect in developing EE policy	• The "rebound effect" refers to the propensity of consumers to increase use of energy services in response to efficiency measures that have reduced their energy costs.	• NEES 2005 • Post-2015 NEES • MEPS • S&L Programme	• Consider that unless the rebound effect has severe external costs, it will be a benefit, rather than a cost, of an EE policy, as implementers should not merely focus on minimising energy use, but rather maximising economic growth. • Policymakers need to consider the health, economic and other non-energy benefits that often result from	• The value of EE policies should be measured not just by their efficacy in lowering energy consumption, but by their overall social, economic, and environmental benefits.

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
	Therefore, policies often result in lower energy savings than estimates predicted.		the increase in energy services represented by positive user "rebound effects". • Legislators should analyse these trade-offs to choose EE measures that will increase SA's overall welfare.	
Stakeholder Engagement	• The most important stakeholders in EE are government, private companies, inter-governmental organisations and NGOs. • SA lacks a broader awareness campaign that will require large EE campaign roll-outs to educate the public on improved energy.	• Draft Post-2015 NEES	• SA requires more mechanisms that provide for ongoing stakeholder engagement, as a crucial component of an overall EE governance system. • Stakeholder engagement helps build political consensus and ensures broad buy-in to policy implementation. • Political will and commitment from various Government departments are essential if EE is to become a national priority. • Engagement in EE policy development should be open to all interested stakeholders. • Stakeholder diversity should be a goal of engagement, as stakeholders have different interests and concerns.	• Consider making stakeholder engagement mandatory within EE legislative frameworks (as in New Zealand).
Promotional and market transformation mechanisms	• SA still lacks comprehensive promotional campaigns to raise public awareness of EE. • SA lacks a strategic intervention to achieve a long-term, significant share of EE products and services in its targeted market.	• Draft Post-2015 NEES • White Paper on Energy Policy of 1998	• Develop consistent political messages and effective public communication (crucial to obtain public support for energy reforms). • Develop policies that can be easily presented and are effective in convincing consumers to make energy efficient decisions to have high market transformation rates.	

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
			• Develop policies that demonstrate a competitive advantage that can become a key market transformation tool. • Develop comprehensive public information campaigns and promotions to extoll the virtues of EE. • Include EE in school curricula. • Introduce organised EE exhibits at conferences and trade fairs.	
Data collection, monitoring and indicators	• The DoE has developed EE target monitoring system (EETMS). • SA has good, third-party M&V assessments; however, they are not performed in a uniform fashion for all EE policies and programmes.	• NEA 2008 • Draft Post-2015 NEES	• The mandatory collection, analysis and verification of energy data should be prioritised. • Develop a database(s) containing information on building certification and systems inspections as an information source on the energy performance of buildings. • Develop a database of manufacturing energy efficient equipment. • Invest in customised information, e.g. online products databases allowing customers to compare products.	• Consider developing an evaluation protocol that reflects SA's context and establishes broad guidance and standard usage that can be followed consistently by all EE programmes.
Project Development Assistance	• Many individuals or businesses lack the necessary capacity to set up, implement, and finance EE projects		• Develop Project Development Assistance (PDA) via different instruments such as dedicated PDA facilities, or "one-stop-shops". • Stakeholders in PDA can include local and authorities, ESCOs, banks, energy agencies or utilities.	• Set up a "one-stop-shop" for EE that deals with communication and information campaigns, training and skills, financing mechanisms, and energy performance tracking.
Energy Audit Guide	• The Private sector energy efficiency (PSEE) programme offered	• Draft Post-2015 NEES	• Develop an Energy Audit Guide with updated guidance and tools for energy consulting engineers, professionals, real estate professionals, building owners and building managers.	

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
	discounted energy audits to businesses.			
Energy Performance Certificates	• There is limited information between the lessors and landlords on EE uptake in buildings • Split incentives in the rental sector remain a concern.	• Draft Post-2015 NEES	• Design more user-friendly EPCs • Compile EPC data via databases for easy access	• Consider the development of a regulatory framework with mandatory EE targets that can create demand for energy audits and EE investments that will raise awareness, thereby lowering EE investment risks.
Technology Development and Innovation	• In SA, little has been done in terms of EE Technology Development and Innovation. • South Africa's Technology Innovation Agency (TIA) supports the development of a sustainable energy industry; however, the scope of TIA's EE programmes is small.	• Draft Post-2015 NEES	• Expand the scope of TIA's EE programmes. • Introduce tax credits for R&D • Offer incentives for early market adoption. • Create a portfolio of technologies best suited to meet national priorities, taking cognisance of SA' energy infrastructure and resources. • Foster a national system of technology innovation in EE.	
Institutional Capacity	• South Africa still suffers from institutional capacity constraints to implement EE policy in the public sector and relies significantly on private capacity**.**	• NDP 2030 • NGP • Draft Post-2015 NEES	• Capacity building is a prerequisite to effective co-ordination, especially when institutional partners are unaccustomed or unfamiliar with EE programmes or technologies. • Build the capacity within partner institutions commensurate with the implementation role expected of them.	• Consider identifying and designating a dedicated implementing department for EE.

Instruments	Current State in SA	Main SA Policy	Recommendation(s)	Possible new Policy or Incentive where applicable
			• Increase the financial and human resource capacity of key institutions participating in EE, such as the DoE, SANEDI and SABS. • Develop clear and appropriate institutional mandates for EE.	
Mandatory MEPS **Standards and labelling for appliances and equipment**	• The MEPS programme has been performing well, although further tightening is required. • The 2015 MEPS level was already mostly obsolete in 2014.	• NEES 2005 • Draft Post-2015 NEES • White Paper on Energy Policy of 1998	• MEPS should be broadened to include appliances that are commonly used in the public sector (such as large-scale cooking and heating appliances). • Energy inefficient appliances and their marketing should be prohibited via the tightening of MEPS. • EE labels and MEPS should be frequently revised to ensure that the best EE category is only available for the “best not yet available technology”. • Ensure reliable data and analysis to set S&L programme priorities. • Link S&L with complementary energy efficiency programmes (i.e. tax incentives and rebates, building energy codes). • Develop a comprehensive S&L M&V Framework. • Develop consumer information and education campaigns.	• Consider endorsement of highest efficiency appliances via a high energy performance label. • Consider the design and implementation of new mandatory MEPS and S&L requirements.
Align SA EE policy with International Best Practice	• The utilisation of international policies as models of best practice for the local EE milieu is currently limited.	• Post-2015 NEES • NEA 2008 • White Paper on Energy Policy 1998	• Align local EE policies with international best practice in EE, based on collective learning and shared efforts to develop effective policy as done by, *inter alia*, the IEA, World Bank and WEC. • Develop a structured framework on which to identify a taxonomy of best practice EE policies and measures suitable for adaptation and adoption in South Africa.	• Development of a national energy benchmarking tool to guide possible gaps in policies and implementation.

6.3. Analysis and Recommendation for Policy & Regulatory Adjustment

Table 5: Policy and Regulatory Adjustments

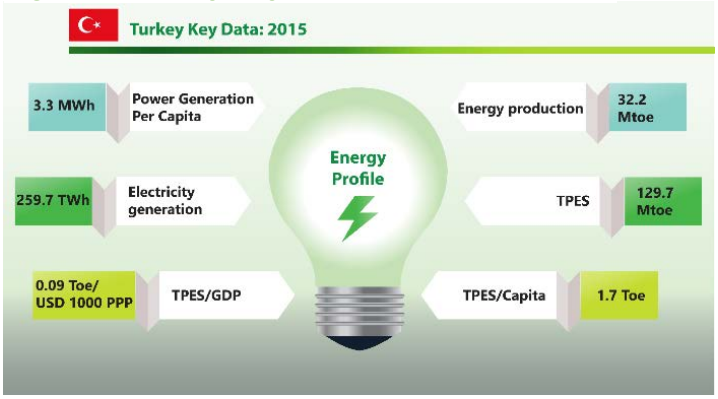
#	Area of Intervention	Implementing Agency	Main Stakeholder	Priority Focus
1.	National Government should improve the uptake of EE measures in the SMME sector through the promulgation of specific regulations towards this end. Restructuring of the 12L tax incentive to include smaller EE projects, preferential loans and low value term-loans to SMME and Energy Saving Insurance should also be considered.	• DOE	• Department of Small Business Development • SANEDI	• Immediate
2.	The development and promulgation of a National EE Act. The purpose of the Act is to drive EE regulations is all sectors of the economy, provide a statutory foundation for rules and regulations, give guidance to EE policies, stipulate funding mechanisms and specify penalties for non-compliance.	• DOE	• National Treasury • SANEDI	• Immediate
3.	The White Paper on Energy 1998 must be revised – it was intended to guide government's energy related policies until 2008. The review should assess what has been achieved and determine appropriate short and medium-term EE priorities.	• DOE	• National government • Provincial government • Local government authorities	• Immediate
4.	Legislation and regulations governing public procurement must be expanded to include EE requirements. Service providers to government must comply with a set of minimum-prescribed EE standards. In the short term, government entities should include EE considerations within their tender specifications.	• National Treasury • DOE	• National government • Provincial government • Local government authorities	• Immediate
5.	Government should consider fast-tracking the implementation of the Draft Carbon Tax. Proceeds from the Tax can be used to finance EE initiatives while reducing South Africa's GHG emissions in accordance with the Paris Agreement.	• DEA	• DOE • National Treasury	• Immediate

#	Area of Intervention	Implementing Agency	Main Stakeholder	Priority Focus
6.	Government should reduce or remove the import duties and tariffs that currently apply to EE technologies and equipment. Allowing tax-deductible investments for EE projects (or projects that include EE measures/components) would improve the adoption and scale EE initiatives.	• SARS	• DOE • SANEDI • National Treasury	• Short to medium term
7.	Government should consider transferring the IDM programme to SANEDI.	• Eskom	• DOE • SANEDI • National Treasury	• Short to medium term
8.	The MCEP covers expansions only, which means that there is a gap in support for new projects considering that there is only support involving new and expansion projects for black industrialists, specifically only for investments exceeding R30-million. Government should consider expanding the scope of MCEP programme to support new projects.	• DOE	• National Treasury • SANEDI	• Short to medium term

7. Appendices A – International Case Studies

7.1. Turkey Case Study

Figure 1: Turkey Key Data, 2015



SOURCE: IEA

*TPES or Total primary energy supply
*Toe: Tons of Oil Equivalent

Map 1: Map of Turkey

SOURCE: GOOGLE MAPS

Country Profile

The Turkish Republic is a Eurasian country located in the Southeast European region and the Middle East. Approximately 97% of its territory (called Anatolia) is in Asia and the rest (Eastern Thrace or Rumelia) is in Europe.

Turkey is of key strategic importance, given its proximity to the world's largest proven oil and gas reserves. It has the desire to become a major hub for the energy trade between Central Asia, Russia, the Middle East and Europe.

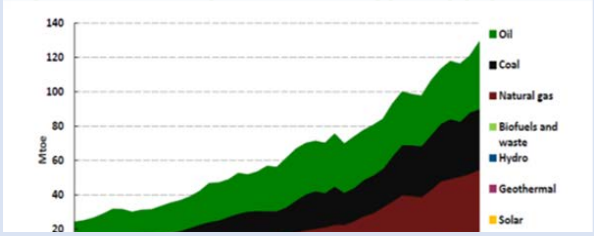
Energy Profile

- The energy mix in Turkey primarily comprises fossil fuels which represented 87.6% of TPES in 2015.
- Turkey's energy intensity has increased from 2005 to 2015 by 7% in contrast to other European IEA countries that have seen a decline.
- Turkey ranks eighth-highest with regard to its share of fossil fuels in TPES among all IEA countries (IEA & OECD, 2016).
- The IEA estimates that Turkey will see the fastest medium- to long-term growth in energy demand among its member countries. According to Turkey's own projections, it is estimated that total final consumption will more than double and could reach an estimated 170.3 MTOE by 2020 (Ibid., 25.).

Economy

- The economy is increasingly driven by the manufacturing and the service sectors.
- GDP per capita is equal to USD$10,80 (World Bank, 2016).
- The largest export sector by value is textiles and clothing, although the agriculture sector accounts for about 25% of employment.
- The availability of more and better paid jobs has been the driving force behind poverty reduction.

Figure 2: Turkey Total Energy Supply 1973-2015



Turkey 2016 International EE Scorecard

- Ranks 15th, with 46.5 points, above Australia and Russia but below Poland and Taiwan (Kallakuri, et al., 2016).
- Ranks the highest in the buildings sector at 10th place. The country received an average score or above on most buildings metrics, scoring 15 of the possible 25 points.

The IEA's 2016 country review of Turkey indicates that energy from renewable sources represented 12.1% of TPES.

Table 6: Energy Policies in Turkey

Turkish Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
National EE Action Plan (NEEAP)	Current	• To establish a framework of measures for the promotion of EE within Turkey. The action plan addresses the need to balance economic growth with environmental concerns.	• The policy is intended to show real outcomes and sets the country on course to implement a reduction of 14% of primary energy consumption by 2023. In addition, government has committed to invest almost USD$ 11 billion in energy efficiency measures set out by the plan.	• The plan envisages the development of a national EE financing mechanism and a regulatory framework for the creation of a heating and cooling market.	• SA's NEEAP (2013) proposes an annual EE trend analysis and adjustments of sector/sub-sector baselines and determination of post-2015 NEES targets. • SA's post draft NEES 2015 and NEEAP do not currently address barriers to EE adoption.
MENR Strategic Plan 2015-19	2015	• To make energy savings and efficiency a key focus area of Turkish policy.	• The development of Turkey's first NREAP and NEEAP.	• Strategic national policy documents, placing EE and RE at the centre of energy policy are essential in outlining national EE targets and detailing actions to ensure EE in all economic sectors.	• Similar to Turkey's Strategic Plan, SA's NDP 2030 emphasises transition to lower Carbon Economy via a EE culture, zero emission building standards, by 2030.
National Renewable Energy Action Plan (NREAP)	2014	• A roadmap for planning and efficient development of renewable energy until 2023.	• The Policy is too new to show real-world outcomes regarding Turkey's EE agenda. • The share of renewable energy in total electricity generation will be increased to 30% by 2023.	• The policy is too new to assess its impact; however, it is hampered by contrary policy measures due to the division of EE across a range of government portfolios.	• SA's Integrated Energy Plan deals with Renewable Energy as well as its White Paper on RE (2003), which has set a target of 10 000GWh of energy to be produced from RE sources.
Regulation on the energy performance of buildings (as amended in 2013)	2013	• To turn a quarter of building sustainable by 2023.	• Since 2016, the number of buildings with an EPC totalled 350,018. • 485 cases of industrial EE applications with annual total	• Turkey strengthened EE legislation, notably with MEPS and EPCs.	• SA's post draft NEES 2015 needs to be comprehensive as Turkey's Efficiency Strategy.

Turkish Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
		• Mandatory building labelling policies for all buildings. • MEPS for new buildings and those subject to major renovation. • An energy performance certificate (EPC) that gives information on primary energy demand and CO_2 emissions.	energy saving of 111,722 Toe, or a reduction of 645,474 tons of CO_2 from the industrial sector. • Turkey ranks 9th on the LEED list, with a 258% increase in the amount of year over year gross m^2 of LEED-certified space from 2013 to 2014. • Financial incentives are being developed by GDRE for buildings.	• Sustainable buildings are given special attention by the government. • Financing is made available based on an evaluation of audits and EPCs.	Comprehensive building targets: - 20% Improvement in energy performance of residential buildings by 2030 relative to 2015 baseline. - 37% Reduction in energy consumption by 2030. - 16% Reduction in energy consumption in manufacturing by 2030. - SANS 204 deals with EE in buildings and specifies the design requirements.
EE Strategy	2012	• Reduce energy intensity and losses in the industry and services sectors by 10%. • Decrease energy demand and CO_2 emissions of buildings. • Market transformation of EE products. • Increase efficiency in production, transmission and distribution of electricity. • EE in the public sector. • Strengthen institutional capacities and collaboration.	• Implementation of the ISO 50001 Energy Management Standard. • In 2016, 100 out of 1 200 large industrial installations apply ISO 50001. • 25 voluntary agreements to reduce energy intensity of industrial production. • Turkey's cement industry has numerous waste heat recovery (WHR) systems. • Energy management units in Organised Industrial Zones are promoting energy management systems (ISO 50001).	• Industry mainly uses coal, therefore the GHG reduction potential is high. • Owners of outdated equipment is a target group due to the need for GHG savings and investment in new and more efficient equipment. • Energy intensive industries provide a suitable target group for EE investments. • Centralised heat/electricity producers contain high GHG savings potential. • Manufacturers, utilities, ESCOs, etc, are using ISO	SA's National Energy Efficiency Strategy (2012) aimed to: - Improve household EE. - To support the Appliance & EE S&L Programme. - To implement regulatory & awareness raising measures by Government, as well as voluntary agreements. - The development of appropriate schemes to incentivise the introduction of EnMS. ISO 50001 certification is key.

Turkish Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
		• Train 5,000 certified energy managers & create up to 50 EE consultancy companies in industry.		50001 to reduce costs and CO_2 emissions.	
Regulation amending the Regulation on increasing the efficient use of energy resources and energy	2014	• Specifies the roles and responsibilities of General Directorate of Renewable Energy. • Specifies subsector targets for industry and buildings. • Mandates energy audits in industrial plants, buildings in the public and services sectors.	• Amount of savings potential for industrial sector estimated at 5.7 million Toe. • Up to January 2017, audits of 270 business enterprises and 220 commercial/service buildings have been done.	• An energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprints. • EE targets for industry are key in increasing energy savings.	• SA's post draft 2015 NEES aims to build on the achievements of the original NEES 2005, stimulating further EE improvements through a combination of fiscal and financial incentives, robust, legal and an enabling regulatory framework.
Regulation for supporting EE in SMEs	2010	• Training, audit and consultancy services through the KOSGEB.	• The Turkish Sustainable Energy Financing Facility, TurSEFF, is a credit line for SMEs to be used on their EE and RE investment. • Mid-size Sustainable Energy Financing Facility (MidSEFF) offers on-lending to private sector for financing mid-size. investments in RE, waste to energy and industrial EE. • The World Bank Project "SME Energy Efficiency Project".	• Improving SMEs' EE is key to increase their profitability and competitiveness. • Energy price volatility & uncertainties hamper SME growth. • Improving EE among SMEs contributes to wider policy objectives, such as boosting employment, reducing GHG emissions, air pollution, and deferring investments in additional power generation.	• SA has no similar regulatory environment for local SMMEs. • Such regulatory support could greatly enhance local EE efforts, (such as IDM, MCEP, the Green Fund etc.).

Turkish Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
Law Regulating and Promoting Energy Efficiency No. 5627 of 2007	2007	• Increase & support EE via investments subsidies. • Set up EE consulting companies. • Form energy management systems (EnMS). • Promote EE investments (Productivity. Enhancement Project & Voluntary Agreements). • Increasing EE in transportation & buildings. • Increase awareness.	• Total energy savings of 25.4 Mtoe. • Saving of 6.4 Mtoe in the manufacturing industry. • Saving of 10.7 Mtoe in the transportation. • Saving of 8.3 Mtoe in the residential sector.	• Effective EE regulations lead to real-world energy savings. • Increased EE awareness is key in engaging the public. • Voluntary programmes encourage manufacturers to increase the average efficiency of their product lines.	• SA's similar regulations are espoused in the post draft NEES 2015 but are not as comprehensive as Turkey's. • The post draft NEES 2015 wishes to ensure broad introduction of EnMS.
Monitoring Energy Efficiency in Sectors	2007	• To monitor EE, according to the EE law, certain energy users are obliged to report on their energy consumption to the General Directorate of Renewable Energy (GDRE). • Industrial plants and OIZs consuming over 50 000 Toe must establish energy management units and report energy consumption and management activities to GDRE.	• GDRE has set up an energy use database known as the EE Portal, which provides effective information flow, produces reliable projections, provides education and creates awareness.	• Monitoring is essential for target setting & tracking policy design and implementation including efficiency of public budget spending, reporting and transparency. • It is key for policy makers to understand sector energy saving potential when conducting policy evaluation, reporting and forecasting.	• SA's Energy Efficiency Target Monitoring System 2014 analysed EE in terms of the NEES. • SA lacks a centralised EE portal and comprehensive EE sector data for detailed M&E.

Turkish Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
Energy Labels for Household Appliances	2002	• Manufacturers or suppliers must provide information regarding the energy consumption of the appliances in the form of an energy label, as well as technical documentation for verification.	• By end of 2015, Turkey completed a five-year project for the market transformation of EE household appliances with the financial support of the GEF.	• Labels increase the average efficiency of the market, increasing the market share of efficient models at the expense of inefficient ones. • Labelling acts as an incentive for manufacturers to differentiate themselves from their competitors. • Standards and voluntary programmes encourage manufacturers to increase their average efficiency. • Standards remove the less efficient appliances from the market.	• In SA, mandatory labelling is already in place, and MEPS have been introduced or are proposed for most of the major categories of appliance. • The post draft 2015 NEES is proposing an Energy endorsement label with a simple yes/no indication that an endorsed appliance is among the most efficient in its class. • Successive tightening of appliance MEPS will ensure that the market is continually pushed in the direction of improved EE.

Table 7: Energy Incentives in Turkey

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
Market Transformation of Energy Efficient Appliances in Turkey	2008-2013	• National Energy Efficiency Strategy (2012). • Energy labels for Household appliances (2013).	• Transposition of EU eco-design and energy labelling regulations. • Implemented ten product-related energy labels and 16 eco-design communications. • Training on enforcement of eco-design and energy labelling regulations. • Public awareness campaign reached more than 9 million people. • Provided a GHG reduction of 2.8 million $MtCO_2$.	• Standards must be regularly revised to avoid stagnation in EE improvements and to encourage manufacturers to continually seek to improve their product's efficiency. • Lead Turkey to adopt MEPS more rapidly and ensured completion of transformation of products within 1.5 or 2 years and is expected to achieve full market transformation in 10 years.	• SA has a similar project funded by UNDP that runs until Sept 2017. • The delayed implementation of SA's own S&L Programme for EE appliances meant a loss of innovation potential and cost disadvantages. • Improvements in appliance efficiency classes would have gained socio-economic benefits and GHG emissions reductions which have been lost. • SA now has a much more comprehensive S&L programme development and revision cycle, but requires rigorous market monitoring and surveillance, as well as public awareness.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
Clean Technology Fund (CTF)	Ongoing	• Law Regulating and Promoting energy efficiency No5627. • Monitoring Energy Efficiency in Sectors (2007).	• CTF financing is expected to leverage an additional USD$2.25 billion for investments in EE, renewable energy, and smart grid upgrades to facilitate greater integration of renewable energy. • GHG emissions savings and reductions for CTF financed projects are estimated at 87 $MtCO_2$.	• Enables the replacement of old and inefficient equipment and appliances with new and more efficient substitutes. This provides opportunities for equipment suppliers and leasing providers. • Opportunities for the recycling of old products.	• SA's Green Fund is a national fund established in 2012 and aimed at supporting South Africa's transition to a green economy. The DBSA manages the fund on behalf of the DEA.
Improving Energy Efficiency in Industry UNDP Project	2010-2017	• Regulation for supporting EE in SMEs (2010). • Law Regulating the Promoting Energy Efficiency No5627 of 2007. • Monitoring Energy Efficiency in Sectors (2007).	• An Energy Auditing Guide and a comprehensive checklist were designed. Both the Guide and the checklist were finalized in light of ISO 50002. The energy service companies (ESCOs or EVD companies) were trained within the scope of the Guide and Checklist. • 400 people were trained within the scope of ISO 50001 & Energy Management Systems. • 59 investment projects initiated.	• Increasing EE in all processes, preventing waste and reducing energy intensity at the sectoral and macro level should be among the most important items in any energy sector. • In order to reduce not only the energy consumption but also the greenhouse gas emissions in manufacturing industry the concept of EE is of crucial importance.	• SA's Industrial Energy Efficiency (IEE) programme facilitates the implementation of the new South African Energy Management Standard under the framework of the international energy management standard ISO50001; it builds the capacity to introduce a systems optimization approach for industry in SA. • SA could benefit from an Energy Audit Guide and a comprehensive check list.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
Awareness Campaigns	Ongoing	• Law Regulating the Promoting Energy Efficiency No5627 of 2007.	• A training bus, free publications, technical manuals for energy managers, national and international conferences, seminars and workshops, and granting energy conservation awards to companies.	• Consumer awareness is key when drafting an EE framework. • In Turkey, awareness campaigns directed the attention of consumers to more EE products.	• NEES provides for EE regulatory awareness campaigns. • The DoE's energy efficiency campaign aims to raise and enhance awareness amongst all South Africans on EE. • SA requires broader public awareness of EE with larger campaign roll-outs.
Private Sector Renewable Energy and Energy Efficiency Project	2009 - 2016	• Regulation amending the Regulation on increasing the efficient use of energy (2014). • Monitoring Energy Efficiency in Sectors (2007).	• Project financed 969 MW of renewable energy and energy-efficiency. investments, which resulted in energy savings of 1,840 tera calories (TCal). • GHG emissions reduction of 3.3 million tons per annum.	• Private sector EE drives innovation and productivity, supports a cleaner environment and enhances energy security and reliability.	• SA's Private Sector Energy Efficiency Programme (PSEE) (2013-2015) identified close to 6 000 energy saving opportunities with more than 4,000 SMMEs. • The PSEE is on hold due to challenges in funding.
Voluntary Energy Efficiency Agreement Scheme & Productivity Enhancement Project	Ongoing	• Regulation for Supporting EE in SMEs (2010). • Regulation amending the Regulation on increasing the efficient use of energy resources and energy (2014).	• Between 2009 to 2013, 24 voluntary agreements were signed with industrial establishments to reduce their energy intensity by 10% on average for three years.	• Voluntary Schemes facilitate the adoption of cost-effective EE technologies that achieved low rates of market adoption prior to program implementation. • The programme can lead to improvements in the technical use of EE and effective resource allocation.	• SA has various voluntary incentives such as IDM, DSM, peak shaving, load shifting and the energy conservation scheme.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
EE Tax Incentives	Ongoing	• Renewable energy Law No 5346. • Law Regarding the support of Research and Development activities (No 5746). • Monitoring Energy Efficiency in Sectors (2007).	• Tax reductions for investments in EE projects which are to be carried out at existing manufacturing industry facilities with minimum 500 TEP.	• Financial incentives are important for spurring investment in EE technologies & services. It makes EE investments more alluring by lowering inhibitive upfront costs. • Financial incentives complement efficiency policies such as appliance standards & energy codes, overcoming market barriers for cost-effective technologies.	• SA's 12L Tax incentive provides an allowance for businesses to implement EE savings, with a tax deduction of 45c/kwh saved on energy consumption. • It is considered low by some, and insufficient to motivate companies to adopt EE. • The regulations exclude the claiming of concurrent benefits from other programmes.

7.2. Thailand Case Study

Map 2: Map of Thailand

SOURCE: GOOGLE MAPS

The Kingdom of Thailand is a country at the centre of the Indochinese peninsula in Southeast Asia. Thailand is bordered to the north by Myanmar and Laos, to the east by Laos and Cambodia, to the south by the Gulf of Thailand and Malaysia, and to the west by the Andaman Sea and the southern extremity of Myanmar.

Energy Profile

- The energy mix in Thailand primarily comprises oil and natural gas which represented 39.3% and 28.2% of TPES in 2015, respectively.
- Thailand's TPES grew at an annual rate of 4.17% between 2003 and 2013, amounting to a total increase of more than 50%. This number reached a record high of 134.1 Mtoe in 2013, a 6.24% increase compared to the previous year (OECD/IEA 2016).
- Thailand's energy intensity has increased between 2007 and 2013, but then declined to 5.5626 (MJ/$2011 PPP GDP) in 2014, according to the World Bank.
- Energy demand has increased rapidly over the past decade, with peak load experiencing a growth of nearly 50% while consumption increased by an average of 5% per year. According to Thailand's own projections, demand is forecasted to double over the next period from 2015-2036.
- While its share of coal increased only marginally in relation to the energy mix, it is expected to exceed more than double its current volume from approximately 2,400 megawatts (MW) to nearly 7,400 MW (OECD/IEA 2016).

Figure 4: Thailand Total Energy Supply 1973-2015

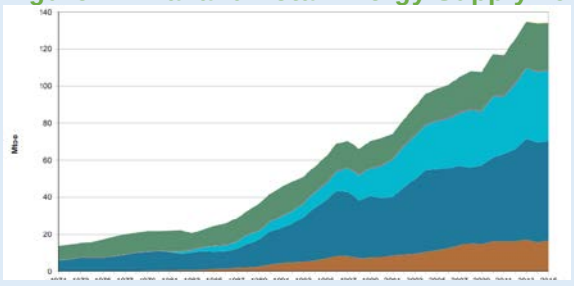
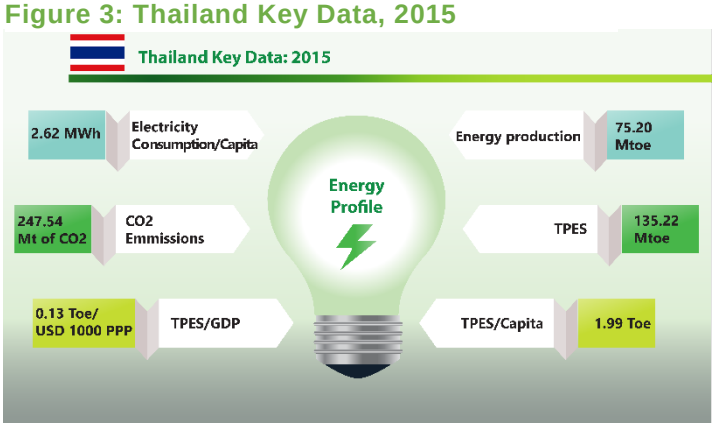


Figure 3: Thailand Key Data, 2015



SOURCE: IEA

*TPES or Total primary energy supply
*Toe: Tons of Oil Equivalent
*MTOE Million Tons of Oil Equivalent

As a newly industrialised country and middle power in the region and globally, Thailand can contribute significantly to the global energy sphere. Thailand is the second largest importer of oil in SE Asia, as well as a large producer of natural gas.

Economy

- Thailand's economy is largely export-dependent, with exports accounting for over two thirds of the country's GDP.
- GDP per capita equal to USD$ 5,90 (World Bank, 2017).
- Major exports include vehicles, computers, electrical appliances, rice, textiles and footwear, fishery products, rubber, and jewellery.
- Slightly over 40% of the population is employed in the services sector, followed by agriculture.

Thailand 2016 International EE Scorecard

- Ranks 20th - fourth from the last with 36.5 points, but above other developing countries such as South Africa and Brazil (Kallakuri, et al., 2016).
- Ranks the highest in the industry sector at 16th place, while ranking the lowest in the buildings sector.
- Thailand only has two appliance categories with minimum energy performance standards (MEPS) and labelling of appliances are not mandatory but voluntary.

THE IEA/OECD country statistics of Thailand indicate that energy from renewable sources represented 19.3% of TPES.

Table 8: Energy Policies in Thailand

Thailand Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
Thailand Power Development Plan (PDP 2015 – 2036)	Current	• The PDP was developed in response to changes in economic and infrastructure development.	Renewed focus on: - Energy Security: coping with increasing power demand to correspond to National Economic and Social Development Plan while considering fuel diversification. - Economy: maintaining an appropriate cost of power generation for long-term economic competitiveness. - Ecology: lessening carbon dioxide intensity of power generation.	• A thorough public participation and stakeholder input contributed to a robust and complete PDP and secured buy-in from all stakeholders.	• For the Post Draft NEES, 2015 to be implementable, a buy in and partnership from the government with the private sector is essential as this will ensure that energy goals and objectives are achieved.
Thailand Energy Efficiency Development Plan (PDP 2011 – 2030)	2011	• To provide the national policy framework and guidelines on energy conservation implementation in the long term. • To set the energy conservation targets both at the national level and by energy-intensive economic sectors. • To lay down strategies and guidelines promoting energy conservation to achieve EE targets.	Major mandatory measures include: - Enforcement of the Energy Conservation Promotion Act, B.E. 2535 (1992), as amended up to No. 2, B.E. 2550 (2007). - Establishment of Minimum Energy Performance Standards (MEPS). - EE labelling. - Supportive and promotional measures include the Standard Offer Program (SOP), or funding for	• Distribution of responsibilities across all spheres in the Thailand economy will encourage the private sector to become an important partner to government.	• In SA, a close relationship between the government and the private sector needs to be encouraged to scale up EE. • In a bid to scale up EE agreements with manufacturers of high EE equipment should be made subsequently with the government supporting through campaigns and PR activities which aim to change consumer behaviour.

Thailand Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
			energy saving achieved, which can be proven or assessed. - Emphasis on measures to bring about market transformation and consumers' behavioural change by enforcing EE labelling for appliances, buildings and vehicles so as to provide options for consumers. - Mandatory (instead of voluntary) implementation of energy conservation promotion measures for large-scale energy businesses, to encourage their customers to reduce energy use by a specified minimum standard (Energy Efficiency Resource Standards: EERS). - Financial and technical assistance and support for small operators (SMEs).		
20-year Energy Efficiency Development Plan 2015-2036 (EEDP)	2015	• Aimed at setting specific energy-intensity reduction targets of 30% by 2036 compared 2010 as a base year.	• Establishment of energy conservation targets (heat and electricity) over the short and long term.	• Strategic approaches and measures which encompassed financial incentives, technical assistance and public	• In SA, strategic programmes and measures that have been successful and resulted in energy savings such as the IDM

Thailand Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
			• Adoption strategies and guidelines for energy conservation and promotion among role players to achieve the targets. • Formulation of operation plans for relevant organisations.	awareness campaigns to create EE awareness among the general public, were successfully implemented. • Money from the Energy Conservation Fund was used to extend credit lines, strengthen ESCO, and support greater expansion of ESCO business. • Public agencies should take a lead role and should set a good example in the implementation of policy. • Cooperation between Public organisations and the business sector to promote land and implement initiatives leading to EE and a low carbon economy.	programme, which reported verified cumulative savings of 3,072 in the year 2012 should be revived. • In South Africa the Green Fund and the Green Energy Efficiency Fund from the IDC provide an opportunity to provide funding EE projects.
Climate Change Master Plan (CCMP) (2012-2050)	2012	• Support climate change initiatives in line with Thailand's economic and socio-cultural contexts as well as the country's development and economic philosophy.	• Development of work plans/action plans on climate change for every sector and level over the short, medium and long term. • Places focus on mitigation as the rate of voluntary greenhouse gas emission reduction of all sectors by 2050.	• More local research and studies must be undertaken to identify areas of improvement as data on climate change is not always available or accessible (UNFCCC 2015). • Increase in financial support is required to maintain the	• SA has a National Climate Change policy that has been promulgated and a National Climate Change Adaptation strategy in its draft form. • It would be essential for South Africa to adopt National Climate Change Mitigation Strategy to

Thailand Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
			• Development of three climate change management. strategies for managing the effects of climate change.	momentum of the CCMP's actions and initiatives (UNFCCC 2015).	provide guidance towards GHG emissions in all sectors of the economy.
Energy Conservation Promotion Act (ENCON Act) (1992)	2007 (amended)	• To supervise, promote and support entities in the energy consuming sectors (including industry and buildings) in conducting energy conservation measures. • To promote and support the production and utilization of high EE equipment. • To promote and support energy conservation by providing financial assistance to entities.	• Energy Management System. • Third Party Energy Auditor. • Building Energy Code. • Creation of the Energy Conservation Promotion Fund to finance projects and research related to the issue of energy conservation. • Establishment of the Energy Conservation Promotion Program (ENCON Program) to implement the ENCON Act.	• Effective EE regulations lead to real-world energy savings. • Increased EE awareness is key in engaging the public. • Severe penalties for non-compliance to the ENCON Act ensures compliance from entities. • Comprehensive review and updates to the legal and regulatory framework for renewables will help to avoid conflicts among state agencies (Pornovalai 2017). • The government of Thailand established the Energy Conservation Promotion Fund in 1992 to foster investment in EE.	• In SA, more EE regulation aimed at the SME sector is needed as this will lead to real world energy savings. • In SA, the Integrated Resource Plan (IRP) and the Integrated Energy Plan (IEP) are considered to be a living plans. • Fast tracking the promulgation of the IRP and the IEP would be essential as it will provide a roadmap for the future energy landscape of South Africa. • South Africa can use proceeds from EE initiatives such as the carbon Tax to finance EE projects.

Table 9: Energy Incentives in Thailand

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
Market Transformation of Energy Efficient Appliances in Thailand	Ongoing	• ENCON Act (1992/2007). • 20-year Energy Efficiency Development Plan 2011-2030 (EEDP).	• Enforcement of energy conservation standards in designated factories and buildings. • Building Energy Code (BEC) compliance for new buildings. • Energy labelling for equipment/ appliances (Minimum and High energy performance standards, MEPS & HEPS). • Enforcing of EE Resource Standard (EERS). • The Efficiency Standards and Labelling (ES&L) program in Thailand has been successful in reducing electricity demand, conserving energy and reducing GHG emissions.	• Implementing energy efficiency programmes should be market oriented and must involve the private sector. • Government intervention is essential in accelerating market transformation. • Agencies play an important role in the implementation of Energy Standards and Labelling.	• Public agencies should take the lead role and set a good example for engaging with the private sector, as this will help with the implementation of the post draft NEES 2015.
Energy Efficiency Revolving Fund	2003	• ENCON Act (1992/2007). • 20-year Energy Efficiency Development Plan 2011-2030 (EEDP).	• Facilitate investment in EE by partnering with commercial banks. • Exemption of import duties for EE equipment. • Reduction of the corporate income tax rate for companies that improve their EE. • Pre- and post-audits are required to evaluate the performance of energy saving projects.	• Capacity building initiative has promoted EE among commercial banks to unlock financing and EE development. • Access to finance for EE projects was at low interest rates. • Tax incentives and soft loans in Thailand resulted in commercial banks developing and	• In SA, the 12L Tax incentive could unlock greater EE if the incentive is expanded to include other sectors of the economy. • The development of appropriate or innovative financing support schemes to incentivise banks towards providing soft loans with longer pay back periods, could scale up the uptake

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			• Providing a dedicated credit line to commercial banks to fund EE projects at low interest rates. • A reduction in a total amount of energy subsidies.	streamlining procedures for appraising and financing EE projects. • The Fund was financed by tax incentives for EE projects and fiscal support.	and adoption of energy efficiency projects. • The post draft NEES 2015 states that innovative financing models will be explored such as encouraging partnerships between local and international energy service companies.
Public Awareness Creation and Behavioural Change	Ongoing	• ENCON Act (1992/2007). • 20-year Energy Efficiency Development Plan 2011-2030 (EEDP).	• Good public relations and the distribution of information about energy conservation to the general public, via educational institutions, youth awareness campaigns, and other marketing initiatives. • Setting energy prices to reflect the actual costs of energy. energy conservation. • Application of tax measures as an important tool to promote EE. • Adoption of a “voluntary agreement” to save energy between the public and private sectors.	• Cooperation between public and private sectors in the planning and implementation of activities leads to a reduction of GHG emissions and efficient use of energy. • Transparency and communication of tax measures to the public is essential to creating awareness.	• In SA the government must implement regulatory and awareness raising measures to educate and inform the public about benefits of EE. • SA requires broader public awareness of EE campaigns.
Technology Development and Innovation	Ongoing	• ENCON Act (1992/2007). • 20-year Energy Efficiency	• Promotion of research and development to improve EE and reduce technological costs.	• Investment and innovation in EE technologies can assist in creating more cost-	• The Post Draft NEES 2015 highlights the adoption of technology/ learning hubs for EE.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
		Development Plan 2011-2030 (EEDP).	• Promotion of EE technologies that have been proven but have not been commercialised in the domestic market. • Support for necessary preparation to implement wide commercial deployment of such technologies. • Adoption of new or developing existing technologies, with support for SMMEs.	effective and EE products in the market. • Adoption and development of new and existing technologies, with SMMEs is key towards scaling up EE. • Information dissemination is important to ensure consumers understand the benefits of EE. • More than 50 R&D projects for energy technology development and conservation that have been undertaken by various government agencies and academic institutions have been supported.	• The establishment of a similar programme in South Africa such as a technology hub that researches, tests and showcases technologies that are EE is essential to scale up EE adoption and address key energy intensive activities in the sector. • Having technology hubs for EE would also serve as an instrument for information dissemination about EE.
Human Resources and Institutional Capability Development	Ongoing	• ENCON Act (1992/2007). • 20-year Energy Efficiency Development Plan 2011-2030 (EEDP).	• Assignment and training of professionals in the energy conservation field. • Development of the institutional capability of agencies/ organisations in both the public and private sectors responsible for the planning, supervision and promotion of implementation EE.	• Employment of professionals and agencies in the energy conservation sector ensures that energy conservation measures are implemented in a timeous manner, as well as according to the national strategies.	• In SA, this is a programme that would benefit the private and the public sector thereby ensuring that professionals are conscious about EE measures at the work place. In addition, this would result in the public and the private sector being aware of EE.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
Thai Green Label	1994	• Thailand Environment Institute (TEI) in association with the Ministry of Industry.	• Signing of bilateral mutual recognition agreements with eco labelling programmes from six countries; the Environment Development Foundation (EDF) of Taiwan in 2001, Japan Environment Association (JEA) in 2004, Korea Environmental Industry and Technology Institute (KEITI) in 2002, The New Zealand Eco Labelling Trust (NZET) in 2004, Good Environmental Choice Australia (GECA) in 2005 and China Environment United Certification Centre Co. Ltd (CEC) in 2007.	• Targeting schemes of high political priority assists in meeting the government's national and international EE goals.	• The post draft NEES 2015 states that broadening the scope of MEPS will facilitate the implementation of green procurement. International agreements must also include mandated eco labelling.
Energy Conservation Promotion Program (ENCON Program)	1992 (ongoing)	• ENCON Act (1992/2007).	• A rolling five-year programme of energy management and related activities, which is continuously updated to reflect the latest developments in government strategies, policies and priorities. • Taxes and levies raised from fuel sales must be channelled to EE and environmental sustainability initiatives. • Support for the operation of ESCOs who aim to alleviate the technical and financial risks for SMMEs regarding EE operations.	• The risk that the collected funds are not allocated to intended EE or environmental initiatives. • Establishment of the ENCON Fund ensured that government had a reliable source of funding for EE projects without having to rely on international funding. • Imperative to a successful EE fund is assessing the	• Financial incentives are important mechanisms that must be scaled up. • Energy performance contracts with a private sector can serve as an alternative finance mechanism that can be used to reduce the investment burden on the government, however such commitments have been mentioned in the post draft NEES 2015 which is still in its draft form.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			• Successful financing of EE and use of initiatives increased renewable energy share in the total energy mix. • Raised approximately USD$50 million per year between 1992 and 2012. • Disbursements through several different economic and financial mechanisms, including: grants, subsidies, tax incentives, a feed-in premium for renewable energy, the Energy Efficiency Revolving Fund (EERF) and the ESCO Fund. • EERF, established in 2002, financed projects worth a total investment of USD$453 million, resulting in energy cost savings in the region of USD$154 million each year by 2010.	effectiveness of the strategy/program implementation on a regular basis and revising the strategy/program as needed. • Financial incentives aimed at banks combined with awareness initiatives were key towards the success of the EERF.	• Making EE a national priority is essential to allocating sufficient public funds.
Demand Side Management (DSM)	1992	• ENCON Act (1992/2007).	• Development of public awareness campaigns. • Setting EE standards for buildings and appliances. • Implementation of demand-side planning to better manage the timing of consumer energy use. • 15,700 gigawatt hours of energy savings by 2012, exceeding the	• Close collaboration with the private sector is imperative in ensuring wide-scale buy-in and implementation of DSM schemes. • The Plan was carefully tailored to the Thailand economy and therefore	• In terms with the banking sector, SA needs to engage in a broader public awareness for EE with larger campaign initiatives to ensure that end users understand EE. • In SA, there is insufficient engagement with the private

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			plan's own energy-savings targets.	implementation was successful. • Public awareness campaigns resulted in strong support from industry and the public. • Considerable staff expansion and training is key to building government's capacity to effectively implement the plan. • Local banks lacked understanding of EE projects, causing barriers to access financing for DSM projects.	sector to ensure an early buy in when it comes to implementation of EE incentive programs or policy.

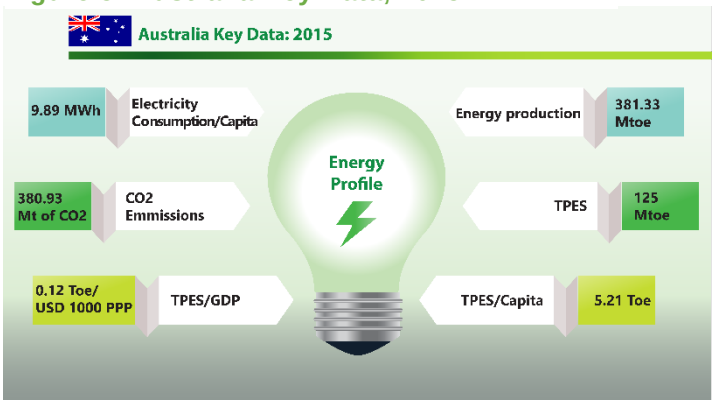
7.3. Australia Case Study

Map 2: Map of Australia

SOURCE: GOOGLE MAPS

The Commonwealth of Australia comprises the mainland of the Australian continent, the island of Tasmania and numerous smaller islands. It is the largest country in Oceania and the world's sixth-largest country by total area.

Figure 5: Australia Key Data, 2015



SOURCE: IEA

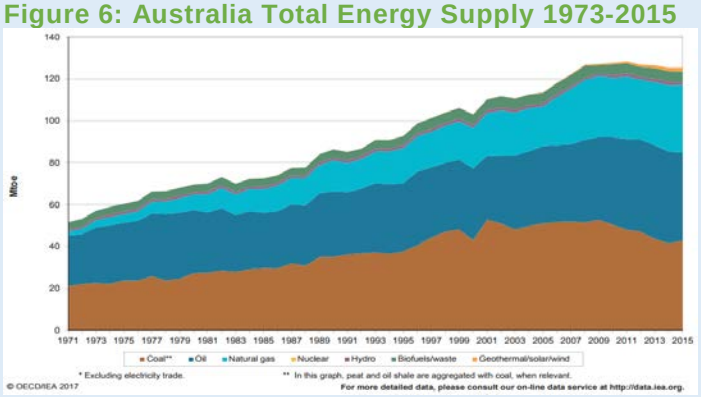
*TPES or Total primary energy supply
*Toe: Tons of Oil Equivalent
*MTOE Million Tons of Oil Equivalent

Australia represents the world's 12th largest economy and has the 6th highest per capita GDP (World Bank 2017). As a first world country, member of the United Nations, G20, Commonwealth of Nations, ANZUS, Organisation for Economic Co-operation and Development (OECD), World Trade Organization, Asia-Pacific Economic Cooperation, and the Pacific Islands Forum, Australia is in a spotlight position regarding its energy sphere.

Energy Profile

- Australia's energy mix is dominated by fossil fuels, in particular coal, which accounted for 34.2% of TPES in 2015, followed by oil (33.4%) and natural gas (25.7%).
- Energy intensity in the country has gradually decreased by 1% per annum from 1980 to 2013.
- Australia is the world's eighth largest energy producer, accounting for 2.4% of world energy production (Morris, 2016).
- Energy consumption in Australia increased by 1% during 2014-2015, along with a 1% increase in energy productivity. (AEU 2016).

Figure 6: Australia Total Energy Supply 1973-2015



SOURCE: OECD/IEA 2017

Economy

- Mining-related exports, telecommunications, banking and manufacturing drive Australia's economy.
- GDP per capita was USD$ 49,927 in 2015/16 (World Bank, 2016).
- The Australian economy is dominated by its service sector, comprising 61.1% of GDP and employed 79.2% of the labour force in 2016 (Australian Industry Report 2016.

Australia 2016 International EE Scorecard

- Ranks 16th, with 41 points, above Russia and Indonesia, but below India and Turkey (Kallakuri, et al., 2016).
- Ranks the highest in the buildings sector at 9th place. The country was awarded top scores for residential and commercial buildings codes on most building metrics, scoring 15.5 of the possible 25 points.
- Ranks 13th for national efforts, 21st for industry and 22nd for the transportation sector.

According to the IEA, energy from renewable sources represented 6.6% of TPES in Australia.

Table 10: Energy Policies in Australia

Australian Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
National Strategy on Energy Efficiency (NSEE)	2009	• To accelerate improvements in energy and deliver cost - EE gains across all sectors of the Australian economy.	• Assisting households and businesses to transit into a low carbon economy. • Reducing impediments on the uptake of EE. • Making buildings more EE. • Government working in partnership and leading the way.	• Assist business and industry to ensure they have adequate knowledge, skills and capacity to meet the challenges of operating in a low carbon economy. • Assist the transition to a low carbon economy by encouraging a smarter and more EE network. • Improving the EE of appliances and products has reduced the running costs of appliances and products for households and businesses. • Provide support to businesses to assist them in improving their E and to make informed choices regarding EE by addressing barriers.	• In Australia the government working in partnership with other sectors addressed barriers to scale up EE initiatives. • The post draft NEES 2015 cuts across many government departments in South Africa. In order for the NEES to reduce the barriers of scaling up EE. The DOE must facilitate cooperative governance between departments.

Australian Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
Greenhouse and Energy Minimum Standards (GEMS) Act	2012	• Implements the commitments of COAG to establish national legislation to regulate EE and energy labelling standards for appliances and other products (Data build Research, 2015).	• GEMS is one of the biggest drivers of energy efficiency in Australia, annually delivering around USD$1 billion in avoided energy costs and cutting emissions by over 1.5%. • GEMS saved the average consumer around $300 per year, and the estimated benefit-cost ratio is between 1.7 and 5.2 (Energy Efficiency Council, 2016).	• The GEMS Act created a regulatory environment specifically targeting the EE.	• The Australian Government commits to EE through the GEMS Act which has resulted in Efficiency improvements. Emissions was reduced by over 1.5%. • The post draft NEES 2015 aims to build on the achievements of the NEES 2005 and it is the main policy paper on EE. More work and commitments are needed to have the Bill promulgated.
National Energy Productivity Plan (NEPP)	2015-2030	• To provide a framework and an economy-wide work plan of new and existing measures designed to coordinate efforts and accelerate a 40% improvement in Australia's energy productivity.	• Introduction of a Clean Energy Innovation Fund and its commitment to expand the role of the Australian Renewable Energy Agency will support more innovative approaches towards improving energy productivity.	• While the Plan is still relatively new, the outcomes indicate that the NEPP is making an important contribution to Australia's climate goals.	• In Australia the NEEPP (2015-2030) shows commitment of the government towards energy support. • EE should be made a national priority in SA as this will help to improve the uptake of EE.

Australian Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
			• Expansion of the Commercial Building Disclosure program. • Implementation of the Energy Council's new prioritisation plan to accelerate the impact of the successful Equipment Energy Efficiency program. • Provision of more than $10 million in funding across a range of activities. • The Council of Australia Governments (COAG) Energy Council has also committed a further $8 million to support collaborative work (Commonwealth of Australia 2016).		
Energy White Paper	2015	• The White Paper's focus is on increasing competition, energy productivity and investment to deliver reliable and cost competitive energy to households and business.	• Expression of the need to develop a National Energy Productivity Plan, which was subsequently done in the same year.	• The Australian government has taken steps to put in place the right mechanisms to maintain investment attractiveness and the ability to adopt new technologies.	• Australia implemented the Energy White Paper in 2015 and in that same year the National Energy Productivity Plan.

Australian Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
					• In SA the White Paper on Energy was introduced in 1998.

Table 11: Energy Incentives in Australia

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
Market Transformation of Energy Efficient Appliances in Australia	Ongoing	• National Strategy on Energy Efficiency 2009. • National Energy Productivity Plan (NEPP) 2015-2030.	• Establishment of an Energy Rating Label – allows consumers to compare the EE and running costs of appliances before they are purchased. • Development of Energy Rating and Light Bulb Saver apps comparison of appliances and energy efficiency products. • Development of an energy rating calculator.	• Improving the EE of appliances and products has significant economic and environmental benefit reducing the running costs of appliances and products for households and businesses. • EE certificate schemes are an effective way of dealing with market distortions.	• The post draft NEES 2015 provides for regulatory awareness campaigns. SA requires broader public awareness of EE with larger campaign roll-out programmes.
Equipment Energy Efficiency Program (E3)	Ongoing	• GEMS Act 2012. • National Strategy on Energy Efficiency 2009.	• Execution of an EE standards and labelling programme that applies performance standards. • E3 mandatory labelling for the following appliances such as: - Air Conditioners (single phase, non-ducted) - Clothes washers - Clothes dryers - Dishwashers - Televisions - Refrigerators	• Introduction of a stricter standard for calculating star ratings prevents clustering and encourages manufacturers to keep improving the EE of appliances. • Star ratings of appliances should be reviewed on a continuous basis and changed / updated if necessary.	• Tightening of the S&L programme will contribute towards improvement in EE.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			- Freezers - Computer Monitors • Continuous improvement in appliance performance over time forced E3 to incorporate a 10-star rating instead of a 6-star rating.	• Evolving expansion of E3 under separate state and territory laws resulted in inconsistencies which increased the regulatory burden for businesses and government agencies. <u>These included:</u> - A lack of coordination of the implementation date for agreed regulations - Some jurisdictions implementing more stringent requirements than nationally agreed MEPS levels. - Differences in how registrations, compliance and enforcement were dealt with between jurisdictions (Databuild Research, 2015).	
6 Star NatHERS Rating for Buildings	2006	• Building Code of Australia.	• Establishment of a new residential building EE standard and accredited under the Nationwide House Energy Rating Scheme (NatHERS). • The 5-star standard has produced significant savings in heating energy use.	• EE standards can make a meaningful contribution to lowering the energy costs of buildings (especially heating costs).	• Eco refurbishment buildings built before 2015 resulted in an energy consumption reduction of 35%. Further tightening according to trajectories of should result in cost savings.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
Carbon Neutral Program	2010	• National Energy Efficiency Strategy NEES 2009.	• Certification of organisations, products/services and events as carbon neutral against the National Carbon Offset Standard. • Currently over 40 organisations, products/services and events that are certified carbon neutral including 5 local councils and a registered charity.	• Carbon neutral certification demonstrates a commitment from these organisations to take action on climate change (Department of Environment and Energy 2017). • Energy efficiency certificate schemes are an effective way of dealing with market distortions which could take years to correct.	• Australia recognises that EE is key to reducing GHG emissions and the cost of transitioning to low carbon economy. • In SA the post draft NEES, 2015 proposes the introduction of a carbon tax that will further reduce GHG emission. However, to date the carbon tax bill is still in its draft from and has not been implemented.
Commercial Building Disclosure Program	2011 (10 November)	• Building Energy Efficiency Disclosure Act,2010. • National Energy Productivity Plan 2015-2030.	• Requires sellers and lessors of large commercial office spaces to provide EE information to prospective buyers and tenants. • While the program originally mandated the disclosure of EE information for commercial office spaces of 2000 square metres or more, the scope of the program was expanded to cover commercial office space of 1000 square metres or more from July 2017. • Reduction in end-use energy consumption of 10,020 TJ, abatement of 2 million tonnes of	• Builders and residential landlords often have little to no incentive to ensure that buildings are energy remedied by this program. • Increased communication and information surrounding EE in the building sector creates a more informed commercial property market and towards more sustainable decision making.	• The Commercial Building Disclosure programme addressed the barrier of split incentives which can be seen in the rental sector. • SA could benefit by having a similar programme which would improve EE in the rental sector.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			greenhouse gases and delivery of $15 million in benefits ($44 million including GHG reductions) between 2010 – 2014 (Department of Environment and Energy 2017).		
Clean Technology Investment Program	2012 (discontinued)	• National Energy Productivity Plan 2015-2030. • Clean Energy Legislative Package.	• 7.4% reduction in emissions in the National Electricity Market. • Growth in real GDP at an annualised rate of 2.5% since the carbon price scheme started. • Creation of over 150,000 new jobs. • Management of inflation. • Millions of households have been assisted through tax cuts, increases in Family Tax Benefits and higher growing pensions and allowances. • Lower than expected impact on the cost of living (Combet 2013).	• Reducing the emissions intensity of the economy is essential to Australia's future competitiveness and foreign trade positions.	• The Clean Technology Investment Programme supports manufacturing businesses to invest in energy efficient equipment, technologies, processes and products. • In SA a number of initiatives such as MCEP have the potential to provide significant support to the implementation of energy efficiency projects in the manufacturing sector. The major barrier towards the progression of some of the programmes has been financial constraints.
Energy Efficiency Exchange (EEX)	2012	• National Energy Efficiency Strategy (NSEE) 2009	• Maintaining a website that provides medium and large energy consuming companies with access to a consolidated source of high quality national	• Providing a platform of information and support for all players in the energy industry is key in ensuring that stakeholders are	• In SA, the DOE have a website on EE provides information on support programs. However, SA must do a lot more to

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
		• National Energy Productivity Plan 2015-2030	and international resources on EE information. • Supports the development and implementation of energy management and energy efficiency strategies by companies.	equipped to meet the national EE goals and GHG emission goals.	promote EE and to disseminate information to small, medium and large commercial and residential energy consumers.

7.4. India Case Study

Map 2: Map of India

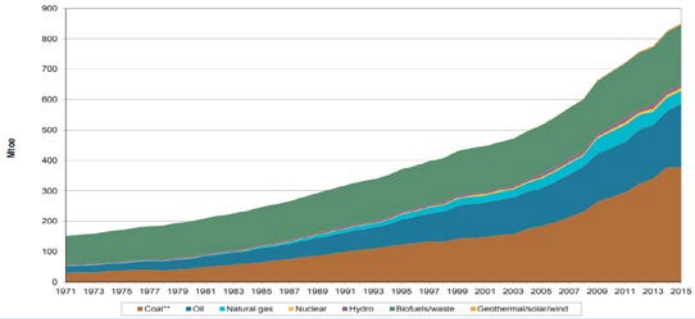
SOURCE: GOOGLE MAPS

The Indian Republic is the seventh largest country by area and located in South Asia. India shares borders with Pakistan, China, Nepal, Bhutan, Myanmar, and Bangladesh, and is bounded by the Indian Ocean on the south.

Energy Profile

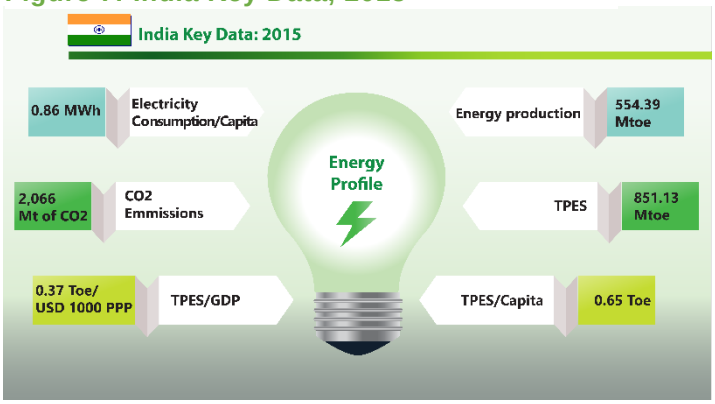
- The energy mix in India primarily comprises fossil fuels which represented 73% of TPES in 2013 (IEA 2016).
- India's energy intensity has decreased from 0.58 in 1993 to 0.32 in 2013.
- India was the second largest coal producer and importer in the world during 2016.
- India's primary energy demand has more than doubled since 1990, while GDP increased more than fourfold, indicating that economic growth is decoupling from energy consumption (IEA 2016).
- The Indian government has recognised the fast growing energy demand in the country and is focused on improving India's energy efficiency while sustaining economic growth.

Figure 8: India Total Energy Supply 1973-2015



SOURCE: OECD/IEA 2017

Figure 7: India Key Data, 2015



SOURCE: IEA

*TPES or Total primary energy supply
*Toe: Tons of Oil Equivalent
*MTOE Million Tons of Oil Equivalent

India is the world's third largest and one of the fastest growing economies globally. The country is also expected to be the world's most populous country in the near future, thereby recognising the importance of energy as a central component of meeting its development needs.

Economy

- The Indian economy is mainly driven by its commercial and private service sectors, contributing almost 60% of its GDP in recent years, followed by the industrial and agriculture sectors.
- GDP per capita was USD$ 1,70 in 2015 (World Bank, 2016).
- Largest export sector is petroleum products, textiles and jewellery
- The services sector employs roughly 25% of the labour force, while the agriculture sector accounts for approximately 50% of employment (OECD/IEA 2016).

Table 12: Energy Policies in India

Indian Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
National Energy Policy (NEP: Version as on 27.06.2017)	2017 (Draft)	• To set the framework for India's National Energy objectives and strategies to meet EE objectives. • The NEP builds on the achievements of the Integrated Energy Policy (IEP) and sets a new agenda consistent with the redefined role of emerging developments in the energy world.	• Not yet implemented.	• Not yet implemented.	• The NEP makes EE a priority through creating awareness and establishing a focused financing initiative such as, offering a line of credit to EESL or other agencies. • In SA, EE still needs to be made a national priority, starting with the promulgation of the post draft NEES 2015 and the carbon Tax Bill.
Integrated Energy Policy	2006	• Addresses all aspects of energy, including energy security, access availability, affordability, pricing efficiency and the environment.	• Over 2000 energy projects have been launched under the Clean Development Mechanism (CDM). • The Central Electricity Regulation Commission (CERC) has passed regulations to promote growth in the energy sector.	• The Integrated Energy Policy took a few years to obtain Cabinet approval since its release in 2006. • Development and adoption of detailed energy policies to improve economic growth have been witnessed, while potential environmental effects have been placed on the background. • A balance should thus be struck between economic growth and environmental protection (Environmental Law Institute 2010).	• SA has an Integrated Energy Plan which provides a roadmap for the future energy landscape, infrastructure investment and policy development for the country. • The IEP & IRP must be updated and reviewed on an annual basis to incorporate the shifts in the energy landscape. • The IEP needs to address further policy and incentive development on how to scale up EE in SA.

Indian Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
Twelfth Five Year Plan (2012–2017): Faster, More Inclusive and Sustainable Growth	2013	• To achieve faster, sustainable and more inclusive growth. • The plan recognises the need for adopting a low carbon strategy for inclusive growth and carbon mitigation.	• Targets for the 'mega' and 'ultra mega' power sector in India were comfortably met after missing the targets by wide margins in the previous two five-year plans.	• Implementation of cost-effective EE policy solutions. • Strengthening the national and state designated agencies tasked with improving EE. • The strong institutions will ensure that proper cost-benefit analysis is applied when promoting energy efficient technologies and that emission norms for power sector is strictly applied within specified timelines (IAP 2017).	• One of the key elements that can make the post draft NEES 2015 in SA scale up EE is coordination/ cooperative governance by government departments. • Agencies tasked with improving EE need to be strengthened and a proper cost benefit analysis needs to be applied when promoting EE technologies.
National Action Plan on Climate Change	2008	• The NAPCC is a significant formulation of India's response to climate change, and it includes eight National Missions, which identify sector-specific measures to be implemented either in conjunction with or in addition to ongoing government initiatives in public provisioning and regulation.	• The National Mission for Enhanced Energy Efficiency (NMEEE) launched many innovative national programs to encourage EE.	• Building public awareness was key to the implementation of the NAPCC. • Banks and financial institutions should increase information sharing through networking and initiate capacity building activities within the financial community.	• SA needs to adopt a National Climate Change Mitigation Strategy which will support the implementation of the post draft NEES 2015.
Energy Conservation Act	2001	• To reduce energy intensity of the Indian economy.	• Standards & labelling of equipment and appliances. • ECBCs for commercial buildings.	• Establishment of the Bureau of Energy Efficiency (BEE) as the statutory body to	• The Energy Conservation Act makes mention of Certification of Energy Managers and Accreditation

Indian Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
			• Energy consumption norms for energy intensive industries. • Steps to facilitate and promote EE in the economy. • Direct states to designate agencies for the implementation of the Act and promotion of EE.	facilitate the implementation of the Act. • Central Energy Conservation Fund provides a thrust to Research and Development (R&D) and demonstration in order to boost market penetration of efficient equipment and appliances. • The Central Energy Conservation Fund supports the creation of facilities for testing and development and the promotion of consumer awareness. • Bureau of Energy Efficiency was supported by Government in the form of grants.	of Energy Auditing firms with qualified energy managers and auditors, with expertise in policy analysis and project management of which implementation of energy efficiency projects would be developed through certification and accreditation programme. • In SA, there is need for a development of the successor scheme for the Private Sector Energy Efficiency Programme which focused on providing a comprehensive service of targeted advice, information, assistance and subsidised energy audits, particularly on the needs of small and medium-sized enterprises (SMEs).

Table 13: Energy Incentives in India

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
National Standards and Energy Labelling Programme	2006	• Energy Conservation Act, 2001.	• A cumulative savings of 29771 MW during 2006 - 2014 recorded in the Draft National Energy Plan 2016. • High penetration of labelled appliances among consumers as reflected by the high level of consumer awareness for labelled products. • Better understanding on energy conservation-built consumers' trust in labels and awareness of the need to save electricity. • Manufacturers' view – the program has brought commitment to produce high quality products (IEPPEC 2017).	• The cost of appliances and lack of incentives or replacement programmes focused on increasing the uptake of higher star rated appliances continue to hinder market transformation. • Consumers' lack of willingness to pay for additional cost of more efficient products limits their penetration in the market. • Need for a robust market surveillance, compliance and verification mechanism (IEPPEC 2017).	• The S&L programme in SA has been doing well; however, more can be done with the further tightening of MEPS and the concurrent development/ of an energy label which is essential to stimulate EE.
Energy Conservation Building Codes (ECBCs)	2007	• Twelfth Five Year Plan (2012–2017).	• Building codes reduces electricity consumption by 25% - 30%. • The ECBC was revised and relaunched in June 2017.	• Energy performance is regulated through prescriptive requirements and performance requirements. • Allows a prescriptive path or simulated (baseline building) calculation to show compliance.	• SA requires broader public awareness of EE with larger campaign roll-outs to essentially scale up energy efficiency.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
				• No recognized 'levels beyond minimum standard' strategy within the ECBC. • BEE introduced star labelling programme for existing commercial buildings, which provided labels to buildings based on their actual energy performance. • Bulk procurement of LED bulbs by EESL has led to a price reduction of 7W LED from about USD 7 per bulb to USD 3 per bulb. • The EESL's business model is based on high-volume purchases through competitive bidding that significantly lowers the price of super-efficient equipment.	
Demand Side Management Scheme	2009	• Energy Conservation Act, 2001.	<u>Agriculture (during XI plan):</u> - 11 Detailed Project Reports (DPRs) have been prepared in 8 states for 11 DISCOMs covering 20,750 pump sets connected on 87 feeders. Average 40% (96 MU) energy saving potential assessed.	<u>Agriculture:</u> - Massive successes and remaining significant energy saving potential called for extension of the plan. - An increase in regulatory measures, monitoring and verification protocol, technical assistance and	• The South African energy efficiency demand side management (EEDSM) programme has been noted by its success. The re-establishment or the development of other successful related energy efficiency programmes would scale up EE.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			Municipal (during XI plan): - Bankable DPRs were prepared after taking up Investment Grade Energy Audit (IGEA). Overall potential saving of 120 MW is estimated. - A web portal was developed under the programme, consisting of DPRs and knowledge materials.	capacity development are required to maintain the momentum. Municipal: - Market transformation can only be achieved if the project is implemented at ground level. DISCOMs: - Capacity building in DISCOMs create programmes and action plans to reduce peak electricity demand without adding supply.	
Strengthening Institutional Capacity of States	Ongoing	• National Action Plan on Climate Change (2008). • Energy Conservation Act,2001.	SDAs: - SDAs have been set up in 32 states by designating one of the existing organisations. - LED Village Campaign implemented by 28 states. - Investment grade energy audit completed. - SECF: - To date, an amount of Rs 82 crores disbursed to 26 states. 15 of these have	• Provision of financial assistance to SDAs is essential in strengthening institutional capacities and capabilities, while state matching contributions create buy-in and commitment from SDAs.	• State designated agencies (SDAs) play an essential role in terms of carrying forward various EE initiatives at the state level. This type of program scales up EE initiatives.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			provided matching contributions.		
School Education Program	Ongoing	• Energy Conservation Act, 2001.	• Implementation of Students Capacity Building Programme under Energy Conservation awareness scheme. • Preparation of the text/material on EE and Conservation. • National certification examinations for energy Managers and Auditors. • National Energy Awards.	• Creating awareness among students is essential in creating a next generation of consumers who will be more aware of efficient use of energy resources. • Promotion of EE across all sectors is key when drafting an EE framework. • Recognition of EE efforts enhances public buy-in into government efforts and strengthens government commitment to climate change.	• The post draft NEES 2015 highlights the introduction of energy awareness in the national school curriculum, the display of notices in hospitals and clinics. • SA needs a broader public awareness of EE and the adoption of a similar School Education Program in India would be a good initiative to scale up EE.
National Mission for Enhanced Energy Efficiency (NMEEE)	2009	• National Action Plan on Climate Change (2008).	Innovative national programs were identified to enhance EE included: - Perform Achieve and Trade Scheme (PAT). - Demand Side Management. - Energy-saving certificate scheme. - Financing of EE.	• Consultations need to be conducted regularly post-notification to inform designated consumers about PAT implementation process, and to seek their views and experiences. • Capacity of stakeholders – Need for building of Capacity of AEAs/SDAs/ BEE desired.	• The NMEE has been noted by the success of the PAT scheme in India; though the programme requires specific interventions, such as raw material management, process improvement, installation of new systems such as waste heat recovery, reducing output wastages

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			- Power Sector Technology Strategy. - Market Transformation for Energy Efficiency (MTEE). - Set up of Energy Efficiency Services Ltd. - Strengthening of State Designated Services.	• Removal of rules related to early issuance of ESCerts – since no DCs applied for early issuance, a rolling cycle was proposed for applications • Consultations need to be conducted regularly post-notification to inform designated consumers about PAT implementation process, and to seek their views and experiences.	through better quality control, etc. • The post draft NEES 2015 makes provision for mandatory display of energy performance certificates (EPCs) in government owned properties. This is expected to be supported by green leases that will become a standard requirement.
Market Transformation for Energy Efficiency (MTEE)	Ongoing	• National Action Plan on Climate Change (2009)	• Development of Bachat Lamp Yojana (BLY) and Super-Efficient Equipment Programme (SEEP). BLY: - Under this program, over 29 million incandescent bulbs have been replaced by CFLs. - SEEP: - Designed to bring accelerated market transformation for super-efficient (SE) appliances by providing financial stimulus.	• Consistent efforts should be taken to stimulate the uptake of EE. BLY: - Notable a reduction in GHG emissions and other harmful emissions as well as conservation of energy resources. - Increase in EE technology among rural households, reduction in peak load and reduction in government and household energy expenditure.	• The MTEE program in India aims to make efficient products more affordable thereby scaling up EE. • Bringing the banks into the MTTE program is a key aspect towards stimulating EE. • The MCEP in SA has the potential to leap frog and encourage manufactures produce more EE products. • However, the provision of financial incentives enables Banks to give out loans with a reduced payback period, thereby increasing

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			- Goal is to support introduction and deployment of SE 35W ceiling fans, opposed to current average ceiling fan sold in market with about 70W rating.	SEEP: - Technological upgrades and innovation is stimulated through an incentive mechanism for manufacturers to avoid inefficiency in the market.	the attractiveness of investments in EE appliances.
Energy Efficiency Financing Platform (EEFP)	Ongoing	• National Action Plan on Climate Change (2009). • Energy Conservation Act, 2001.	• MoUs have been signed with financial institutions to work together for the development of energy efficiency market and for the identification of issues related to this market development.	• Collaboration between the Govt. and private sector is essential in the development of the energy market, especially in addressing barriers to growth in the market relating to financing. • Training and engagement with financial institutions and banks can result in agreements being signed with several financers.	• The stimulation of energy efficiency requires the collaboration and cooperation between the government and the private sector. • Innovative financial schemes from local or the international financial institutions or donor organisations need to be developed to support banks to take up EE projects.
Framework for Energy Efficient Economic Development (FEEED)	Ongoing	• National Action Plan on Climate Change (2009). • Energy Conservation Act, 2001.	• Two funds have been created: Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) and	PRGFEE: - Risk management for players in the EE market is crucial to their involvement	• The (FEEED) programme has two main funds of which the PRGFE provides a risk sharing mechanism

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			Venture Capital Fund for Energy Efficiency (VCFEE) PRGFEE: - A risk sharing mechanism to provide commercial banks with a partial coverage of risk involved in extending loans for EE projects. - VCFEE: - Provide equity capital for EE projects.	and further development of financial support to investors and consumers. VCFEE: - Support is limited to government buildings and municipalities.	to provide commercial banks with a partial coverage of risk involved in extending loans for EE projects, whereas the VCFEE is a risk fund that supports EE in investment and new technology in goods and services. This has resulted in credit facilities being extended to ESCOs for EE projects and an ideal volume growth of EE opportunities and projects. Such type of a facility would be beneficial towards stimulating the uptake of EE in South Africa.
Ujwal Bharat	2016	• Integrated Energy Policy (2006).	• 13,511 villages electrified out of 18,452 villages as on 19th May 2017. • First ever power surplus year with no shortage of electricity and coal. • India's rank increases to 26 in 2017 from 99 in 2015 on World Bank's Ease of Getting Electricity Index.	• Collaboration of the Ministry of Power, Ministry of Coal and Ministry of New and Renewable Energy has demonstrated successes since 2014. • Creating the most comprehensive power sector reform ever through Ujwal Discom Assurance Yojana (UDAY) – turnaround	• The Ujwal Bharat programme was a success due to the collaboration and an early buy-in from the public and private sector, in the form of awareness campaigns that helped with the implementation. • In SA, creating awareness at an early stage is

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			• Amount of coal required to generate per unit of electricity has reduced by 8% in the last three years. • Over 56 cr. LED bulbs distributed. • New mobile apps launched for transparency, accountability and public convenience.	DISCOMs through financial and operational efficiency improvements.	essential towards enhancing a next generation of consumers who will be more aware on the efficient use of energy resources.
Purchase of Star Rated appliances in Haryana	2013	• Energy Conservation Act, (2001).	• 36% improvement in energy efficiency noted in 2014.	• The Bureau of Energy Efficiency (BEE) needs to increase the efficiency of appliance models. • More regulation is required in the market to ensure that consumers and manufacturers have access to the most energy efficient technology (DTE 2014).	• The S&L programme has been doing well, however the further tightening of MEPS will halt the introduction of inefficient appliances into the market.
Procurement of energy efficient appliances for Government Undertakings	2013	• Energy Conservation Act, 2001.	• Memorandum for promoting procurement of EE appliances in all ministries/ departments and attached subordinate offices.	• Clear initiatives and examples set by government are essential in paving the way for companies and end-users to also increase their use of energy efficient appliances.	• This is one way to harness and influence the stimulation of EE and simultaneously achieving policy objectives. South Africa could benefit from having such an initiative.
Bachat Lamp Yojana (BLY) Lighting Programme	2009	• Integrated Energy Policy (2006).	• Under this programme, over 29 million incandescent	• BLY entered validation for the UNFCCC CDM Programme of Activity - the largest PoA	• In SA, Eskom's Efficient Lighting Roll Out Program led to Energy savings at

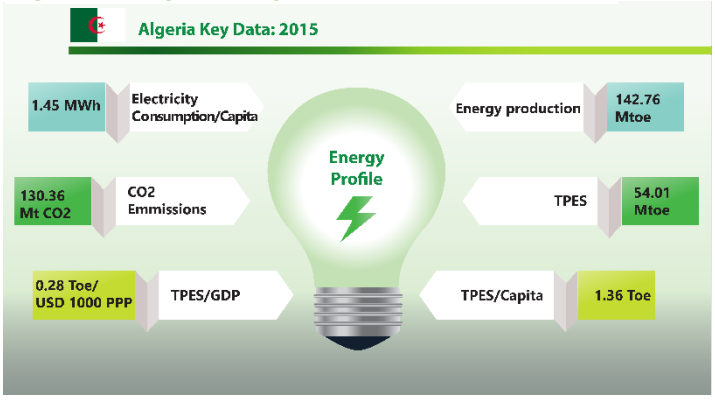
Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			bulbs have been replaced by CFLs. • A secondary phase of BLY has been rolled out, in which BEE will provide support to Rural Electrification Corporation (REC) for framing technical specification and monitoring and verification of the energy savings from the LED bulbs distributed under RGVVY scheme to BPL households. In addition, BEE will undertake outreach activities to promote large scale adoption of LEDs. • Deemed savings approach will stress on service delivery – street lighting.	(Programme of Activities) being implemented in India and the largest PoA registered with CDM executive Board in May 2010. • Reduction in CO_2, GHG and other harmful emissions as well as conservation of energy resources. • Increase in EE technology among rural households, reduction in peak load and a reduction in government and household expenditure on energy. • India introduced deemed savings approach to ease the challenges of monitoring and verification and achieve energy savings.	both individual homes and national levels, job creation and reduction of GHG emissions. Re-establishing such programmes on a larger scale that were a success would contribute massively towards stimulating energy efficiency. • SA could implement a deemed savings approach to ease the burden of monitoring and verification that is strenuous on some programmes.

7.5. Algeria Case Study

Map 3: Map of Algeria

SOURCE: GOOGLE MAPS

Figure 9: Algeria Key Data, 2015



SOURCE: IEA

*TPES or Total primary energy supply
*Toe: Tons of Oil Equivalent
*MTOE Million Tons of Oil Equivalent

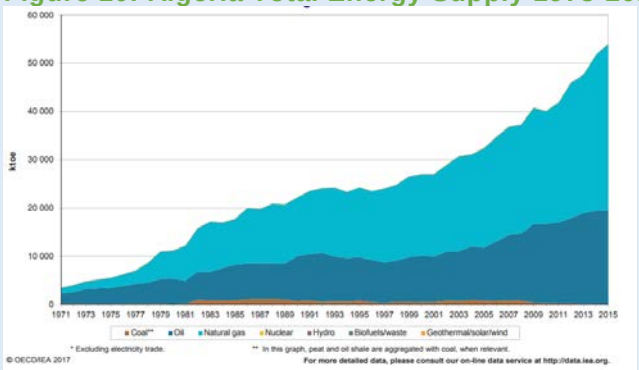
The People's Democratic Republic of Algeria, is a sovereign state in North Africa on the Mediterranean coast. Algeria is bordered by the Mediterranean Sea to the North and the Western Saharan territory to the southwest, and also shares borders with Libya, Morocco, and Tunisia.

Algeria's significance lies in its position as a regional and middle-power, supplying large volumes of natural gas to Europe. The country has the potential to be a key player within its energy sphere, as it is home to the 16th largest oil reserves in the world - also the second highest reserves in Africa.

Energy Profile

- The energy mix in Algeria primarily comprises fossil fuels (crude oil and natural gas) which accounts for almost all current domestic consumption.
- Algeria's energy intensity has increased by about 30% between 2004 and 2011 (Open Data for Africa 2014).
- Algeria's TPES was 54.01 Mtoe in 2015, more than double than in 2000 (IEA 2015).
- Energy demand and consumption has increased rapidly in recent years due to the heavily subsidised nature of the energy sector. Energy consumption was 31,500 ktoe in 2010 and increased by 22% to 38,543 ktoe in 2013 (IEA 2012). Energy consumpion is estimated to increase to 63 Mtoe in 2030 (Menani 2012).

Figure 10: Algeria Total Energy Supply 1971-2015



SOURCE: OECD/IEA 2016

Economy

- The economy is increasingly driven by the industry and service sectors.
- GDP per capita was US$ 3,84 in 2015 (World Bank, 2016).
- Algerian exports are either mined or manufactured, although the government sector still accounts for about 32% of employment.

Algeria Energy Efficiency

- Algeria is not included in the 2016 International Energy Efficiency Scorecard.
- In February 2015, the Algerian government announced a new national programme on EE for the years 2015 to 2030, mainly targeting three sectors: the building sector, transport and industry.
- The National Agency for the Promotion and Rationalization of Energy Use (APRUE) is responsible for promoting EE, developing NEEAP, and implementing national EE policies.

The non-oil and gas industry contributed a mere 5% of GDP in 2016, significantly lower than the 35% contribution at the end of the 1980s. As such, the authorities are working towards the re-industrialisation of the country.

Table 14: Energy Policies in Algeria

Algerian Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
Renewable Energy and Energy Efficiency Development Plan 2015-2030	2015	• An updated version of the 2011 plan focused on expanding usage of renewable energies, increasing energy efficiency and diversifying the country's energy mix.	• Improvement of heat insulation of buildings. • Development of solar water heating; promotion of co-generation. • Developing a solar cooling system. • Substituting all mercury lamps with sodium lamps and promoting the use of low-energy lamps.	• Strategic national policy documents, placing EE and RE at the centre of energy policy, are essential in transforming the country's energy sector.	• In SA, there is need for greater involvement and consultation with the private sector and consumers to ensure that the regulatory framework effectively works to achieve the intended goal of improving EE.
National Plan of Action and Adaptation to Climate Change (PNA-ACC)	2003 - 2013	• Developed in response to the Kyoto Protocol (KP) and to honour the KP commitments. It provides measures to limit climate change through CO_2 sequestration, promotion of clean energy, reduction of the carbon footprint of industry and households, and increasing energy efficiency of processes.	• Establishment of measures to limit climate change through CO_2 sequestration, promotion of clean energy, reduction of the carbon footprint of industry and households, and increasing EE processes. • Adoption of infrastructure to combat global warming by improving the water system.	• Commitment to provide in the energy mix and providing a clear set of goals that are incorporated into national policies and action plans. • Public awareness and information campaigns in Algeria were mainly targeting decision makers both at national and local level, thus including parliamentarians, private sector, investors and bankers.	• In order to change the consumer behaviour in SA towards the purchase of more efficient products or appliances, public awareness and information campaigns should be targeted at key stakeholders such as (decision makers, private sector and bankers etc).

Algerian Policy	Year	Goal	Outcomes	Lessons Learnt	Implications for SA Policy
Law 99-09 on the Management of Energy	1999	• The law defines the conditions, framework and application processes of Algeria's national policy to manage energy.	• Establishing a general framework for national use of energy. • Developing energy conservation and EE techniques. • Developing environment protection through the reduction of carbon dioxide and monoxide emissions.	• An all-encompassing law on the management of energy is key in the development and regulation of the energy sector in Algeria.	• In SA an all-encompassing law on EE is essential. The Draft Regulations Regarding Registration, Reporting on Energy Management and Submission of Energy Management Plans (2015) that promote audits and the adoption of the ISO/SANS 50001 energy management system - in line with NEES is still in its draft form.

Table 15: Energy Incentives in Algeria

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
National Energy Efficiency Program	2011	• Renewable Energy and Energy Efficiency Development Plan 2015-2030.	• Programme is focused on the scaling up EE. • Standards and labelling of energy efficient products (mandatory labelling of refrigerators, freezers, air conditioners and lamps). • Improving heat insulation of buildings. • Developing solar water heating. • Spreading the use of low energy consumption lamps.	• The programme is multi-sectoral, aiming to improve EE across the entire economy. • Standards and labelling should be revised and communicated regularly to all parties involved. • Increase in consumer awareness and information regarding energy efficiency is essential in enabling market transformation of energy efficient products.	• The post draft NEES (2015) states the further tightening of MEPS to restrict the entry of inefficient appliances into the market. As a further step, installing a ban on the marketing of inefficient appliances can be a good measure which helps to tighten the MEPS programme thereby increasing the rate of compliance.

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			• Substituting all mercury lamps with sodium lamps. • Developing solar cooling systems. •	• A restriction on the marketing of inefficient appliance so as to increase the rate of energy efficiency compliance. •	
ECO-BAT program	2011	• Thermal regulations for new buildings No. 2000-90.	• By 2012, 500,000 Compact Fluorescent Lamps (CFLs) have been distributed as a part of APRUE's ECO-Lumiere program. • National Fund for Energy Management (FNME) was established in 2000 for financing EE projects.	• There is a lack of continuity between government policies and implementation. • Stakeholders – especially the private sector actors and consumers need to be consulted to ensure that the regulatory framework responds to their needs. • A well-defined regulatory framework is required to be put in place appropriate incentives to change consumer behaviour to more efficient appliances.	• In SA, there is lack of continuity between government policies and implementation. This is noted by regulation and policy's that are key to scaling up energy efficiency which are still in its draft form.
Subsidies in the Energy Sector		• Established based on all energy laws within Algeria. • Reinforced and expanded within "Renewable Energy and Energy Efficiency Development Plan 2011-2030" and other eligible renewable projects.	• Increase in domestic demand and consumption of energy. • The calls for subsidy reform have increased rapidly since 2015 and the government has increased energy prices	• Heavy subsidisation of the energy sector covers the additional costs on the national electricity system as well as on the cost of providing drinking water. • Subsidies in the energy sector are associated with	• The current incentive programmes in SA do not effectively change consumer behaviour to more efficient products. A thorough understanding of the market and identification of the most

Incentive	Year	Policy Environment Created	Outcomes	Lessons Learnt	Implications for SA Incentives and/or Policy
			in 2016 as a first step in the direction of subsidy reform.	distortions in the social sphere and harmful effects on the environment. • Implementing EE measures reduces the need for energy subsidies by government, and thereby alleviates the fiscal budget. • Energy subsidies present a particular challenge to EE measures as end-user prices do not naturally provide consumers with sufficient incentives to choose EE equipment.	important local obstacles is key towards the implementation and the design of appropriate EE measures.

8. Appendices B: Ex-post Evaluations of Energy Efficiency Policy and Incentive Programme Analysis

8.1. Ex-post Evaluation of the National Development Plan

8.1.1 Policy Description/Characterisation

The NDP (2030) is the cornerstone and blueprint for a future economic and socio-economic development strategy for the country. It also makes a commitment towards a transition to a low carbon economy with an undertaking of reducing carbon emissions to the baselines of 34% in 2020 and 42% by 2025 (National Planning Commission, 2012).

- Improving energy efficiency is a strategic priority in both the National Development Plan 2030 and South Africa's Intended Nationally Determined Contribution (INDC) ((Government Gazette no. 39604, 2016).
- Chapter 5: Environmental Sustainability emphasises the need for a transition to a low carbon economy.
- Stresses the need to link job creation and growth with the development of the "green economy".
- MTSF 2014-2019: Outcome 10- Protect and enhance our environmental assets and natural resources:
- Achieve the peak, plateau and decline trajectory for GHG emissions, with the peak being reached around 2025.
- Zero emission building standards by 2030.
- By 2030, an economy-wide carbon price should be entrenched
- All new buildings to meet the EE criteria set out in SANS 204.

8.1.2 Policy Theory

The policy theory, including all the assumptions on how policy makers and executors thought that the NDP should reach the targeted effect, is included in Figure 11.

8.1.2.1 Initiation of the NDP

President Zuma formally introduced the NDP in his state of the nation address (SoNA) in February 2013. The NDP stresses the need to break the links between economic activity, environmental degradation and carbon-intensive energy consumption (National Planning Commission, 2012). The country must invest in the skills, technology and institutional capacity required to support competitive EE and RE sectors.

8.1.2.2 Assumptions

It was assumed by policy makers that the NDP would lead to the implementation of EE in the following ways:

8.1.2.2.1 Implicit

- Support for carbon budgeting, i.e. a 'peak, plateau and decline trajectory', which intends to limit emissions to peak between 2020 and 2025, then remain stable for 10 years, and gradually reduce emissions year on year until the budget is exhausted by 2050.
- Building standards that promote energy efficiency.

8.1.2.2.2 Explicit

- A target of 5 million solar water heaters by 2030.
- Economy-wide carbon tax with sector exemptions.

8.1.3 The role of the NDP in the general energy / climate policy:

All government policies are to be realigned to the NDP. Concerning energy policy, the NDP envisions the following pertaining to achieving national EE uptake:

- South Africa needs to reduce its carbon emissions, in line with its international commitments, while maintaining its competitiveness in the global economy.
- SA needs to introduce more energy-efficient and less carbon-intensive industrial processes.
- A competitive advantage can be gained through becoming an early adopter of mitigation technologies and finance mechanisms rather than competing for carbon space tied to obsolete fossil-fuel technologies that may gradually be subject to trade barriers (National Planning Commission, 2012).

8.1.4 Political support for the NDP

All political parties represented in Parliament articulated support for the NDP. However, the NDP is a controversial document within the tripartite alliance. The differences are due, in part, to the unresolved tensions between proponents of the RDP initiative and GEAR respectively, in the 1990s. Nevertheless, this mainly pertains to macroeconomics and projections on job growth and not Energy Efficiency (Helen Suzman Foundation, 2013).

8.1.5 Cause-impact relationships

This subsection evaluates whether the cause-impact relationships assumed by policy makers for the NDP actually occurred by analysing the indicators.

8.1.5.1 Awareness

Policy dynamics created by the implementation of EE in certain sectors such as the buildings industry tend to result in spill-over effects: The policy incentive creates awareness among investors. This may result in improved behaviour in terms of a more rational use of energy in other fields. For instance, a residential building owner may decide to also invest in other energy saving measures (e.g. in an energy-efficient TV or refrigerator) (BigEE, 2015).

8.1.5.2 Solar Water Heater impacts

SWH installed in low-income households increase the household's capital and decreases the vulnerability of the households to poverty. Solar water heaters contribute positively to the alleviation of energy poverty through providing a constant source of heated water. The extent, however, depends on the approach and strategies used by the project implementer. Improved physical health, increased wellbeing, transferred knowledge and skills around solar water heating and additional employment are major contributions to human capital (Wlokas, 2011).

8.1.5.3 Internalising CO_2 cost

Early action to reduce GHG emissions may avoid larger price increases in the future (DEA, 2017). A carbon tax is one way in which external costs can be internalised into consumption and production decisions. The most efficient way to achieve such an outcome would be to set a uniform tax rate that is equal to the marginal external cost from emitting an additional unit of GHG (Dept of National Treasury, 2010).

8.1.5.4 Assumed reductions of 26–33% by 2035 compared with Business-as-usual:

The modelling analysis exploring the implications of the South African carbon tax assumes significant reductions in emissions by 2035. This suggests that the policy will go some way towards reaching the 42% reduction by 2025 target but would need to be complemented by additional policies if this target is to be met. Alternatively, the carbon tax rate would have to be higher than considered in the modelling analysis (Partnership for Market Readiness, 2016).

8.1.6 Relations with other policy instruments

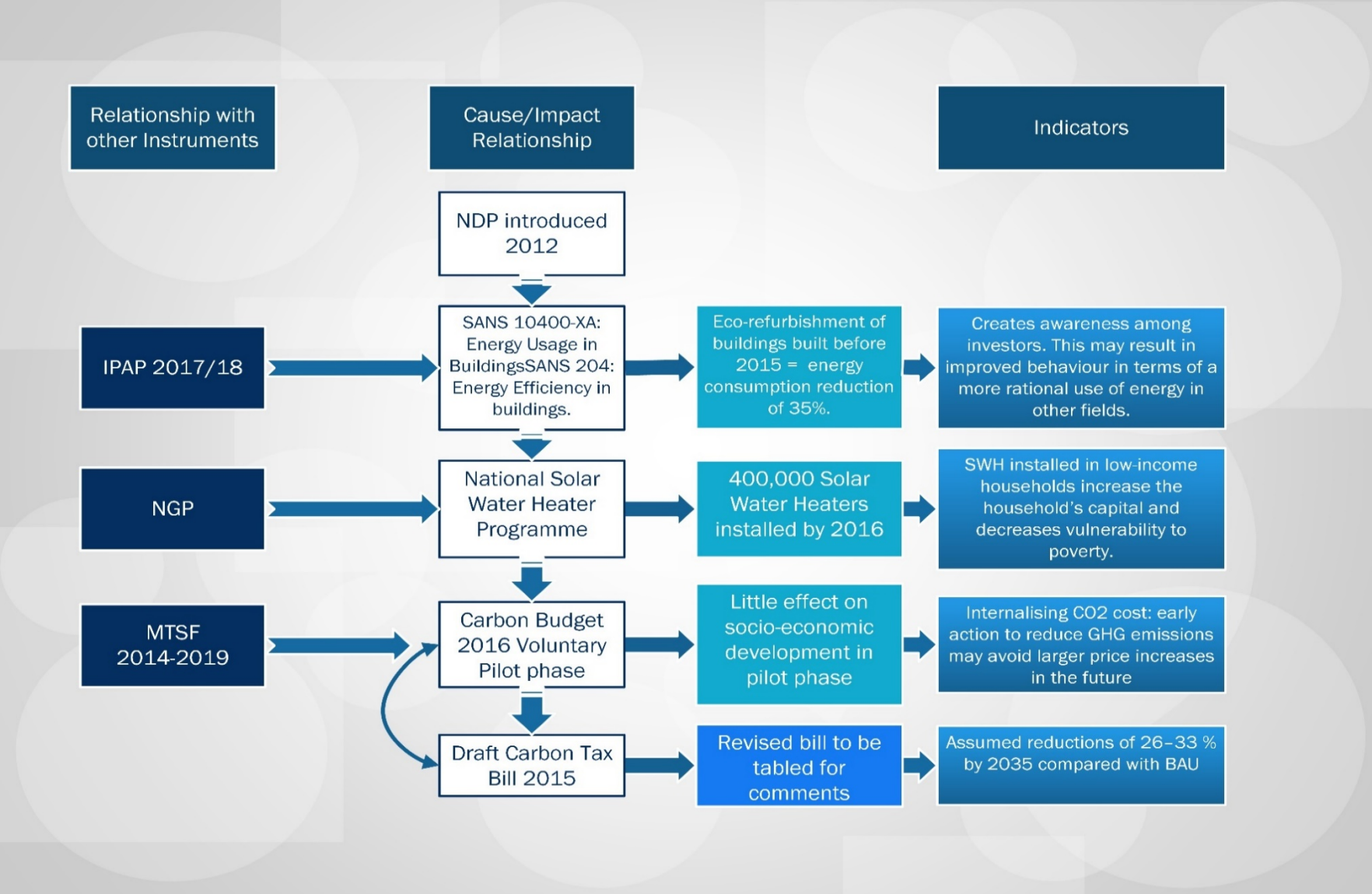
The NDP is the overarching directive for all policy alignment in South Africa. All government policies must align to the priorities set out in the NDP. The NDP integrates the Department of Trade and Industry's (DTI) Industrial Policy Action Plan (IPAP) and the Economic Development Ministry's New Growth Path (NGP) into the new National Planning Framework (Helen Suzman Foundation, 2013). The commitment to implement the NDP is set out in the MTSF (2014-2019). The MTSF specifies the actions Government will embark on and targets to be achieved. It also provides a framework for the other plans of national, provincial and local government.

8.1.7 Conclusions on Success and Failure Factors

- The NDP is the main policy guidance document pertaining to all socio-economic aspects of South Africa. Its objectives and actions permeate all aspects of policy-decision making from economic to environmental and social facets.
- Its objectives concerning EE (as it relates to the residential and light industrial sectors), are ambitious in certain instances, such as the target of 5 million solar water heaters by 2030 and an economy-wide carbon tax with sector exemptions, both of which are yet to be fulfilled.
- To date, little effect on socio-economic development in the pilot phase of the Carbon Budget has been observed, due to the recent implementation of the initiative.
- Should the Carbon Tax be implemented, it will assist in reaching the 42% reduction by 2025 target but would need to be complemented by additional policies if this target is to be met.
- It has, however, made significant inroads in ensuring the adoption of policy measures that will reduce GHG emissions, such as new building specifications (SANS 204), which resulted in eco-refurbishment of buildings built before 2015, leading to an energy consumption reduction of 35%.
- The roll-out of solar water heaters has resulted in 400,000 SWH installed up to 2016.

One may therefore conclude that the EE proposals made in the NDP has been adopted with mixed results.

Figure 11: Policy Flowchart for the NDP



8.2. Ex-post Evaluation of the New Growth Path (2010)

8.2.1 Policy Description/Characterisation

The New Growth Path (NGP) Framework aims to enhance growth, employment creation and equity, with a principal target to create five million jobs over the 10 years after its promulgation (Government of SA, 2018).

The NGP identifies five priority areas as part of the programme to create jobs, through a series of partnerships between the State and the private sector. The most salient pertaining to energy are:

- Development of the Green Economy: expansions in construction and the production of technologies for solar, wind and biofuels are supported by the draft Energy on Integrated Resource Plan.
- Government signed a Green Economy Accord on 17 November 2011, as an outcome of social dialogue on the New Growth Path. The aim of the Accord is to create an enabling environment in which partnerships can be developed to conduct business by employing innovative and sustainable technologies.
- It envisions that the IRP will identify options for RE generation, development of green industrial support package with IDC as champion and special measures for SMEs and co-ops; codes for commercial buildings to reduce energy use and waste; social pact to support greening the economy; targeted skills development; and public works to drive environmental programmes.

8.2.2 Policy Theory

The policy theory, including all the assumptions on how policy makers and executors thought that the NGP should reach the targeted effect, is included in Figure 12:

8.2.2.1 Initiation of the NGP

Government, under the leadership of Minister Ebrahim Patel, on 23 November 2010 released the New Growth Path Framework aimed at enhancing growth, employment creation and equity. It identifies strategies that will enable South Africa to grow in a more equitable, inclusive manner while attaining SA's developmental agenda (Government of SA, 2018).

8.2.2.2 Assumptions

It was assumed by policy makers that the NGP would lead to the implementation of EE in the following ways:

8.2.2.2.1 Implicit

- Jobs Driver 3 of the NGP (Seizing the potential of new economies): Stronger programmes, institutions and systems to diffuse new technologies to SMEs and households.
- Green Economy Accord Commitment Four: Energy Efficiency: Establish a Business Network for Leadership in Energy Efficiency to drive the improvement of EE in support of NEES to be underpinned by pledges signed by individual companies and business organisations (Dept of Economic Development, 2011).

8.2.2.2.2 Explicit

- Jobs Driver 3 of the NGP (Seizing the potential of new economies): Comprehensive support for EE and RE as required by the IRP 2, including appropriate pricing policies, combined with programmes to encourage the local production of inputs, starting with solar water heaters (Dept of Economic Development, 2011).
- Green Economy Accord Commitment One: Rollout of Solar Water Heaters
- Green Economy Accord Commitment Four:
    - Develop benchmarks for sector EE and company energy-management plans in support of NEES, including a transition to aspirational sectoral energy intensity targets by 2015.
- Developing an Energy Efficiency Campaign to build public awareness.
- The local manufacture (or assembly) and installation of Solar Water Heaters, including collectors, metal frames, glass, geysers and piping.
- Retrofitting buildings with EE equipment and replacing incandescent lamps with CFL or LEDs.

8.2.3 The role of the NGP in the general energy / climate policy:

Concerning energy policy, the NGP envisions the following pertaining to achieving national EE uptake:

- Comprehensive support for EE and use of RE; strategies to encourage domestic production of inputs, starting with solar water heaters.
- Establishment of a Business Network for Leadership in Energy Efficiency.
- Joint workplace committees to discuss and implement energy efficiency plans.
- Pursue proposals for including green awareness issues in future curriculum development.
- Energy Efficiency Campaign to build public awareness.

8.2.4 Political support for the NGP

The NGP was the result of social discourse between government, business and labour. It was the first multi-stakeholder effort to recognize the tangible benefits of a transition to a green economy. The subsequent enabling policy environment and public and private sector green investments seek to increase schemes that will deliver positive environmental, social and economic outcomes (Green Times, 2017). The adoption of the NGP's Green Economy Accord raised the profile of government action on the environment.

There is agreement that the NGP's Green Economy Accord was a good start; The choice of some of the commitments was strategically smart because pledges had already been approved and actions initiated, therefore progress was relatively assured. This was a valuable symbolic action to build confidence among stakeholders (HSRC, 2013).

8.2.5 Cause-impact relationships

This subsection evaluates whether the cause-impact relationships assumed by policy makers for the NGP actually occurred by analysing the indicators.

8.2.5.1 Benchmarks for sector EE and company Energy-Management Plans

The NEES of 2005 sets out the targets also espoused in the Green Economy Accord. The DoE estimates that energy efficiency across the whole South African economy has improved by about 24% between 2000 and 2012. Nevertheless, it must be noted that a decomposition analysis was

performed on changes in the total final energy consumption of the South African economy between 2000 and 2012, which revealed:

- An increase in total final energy consumption of 819,155 TJ due to increased overall activity levels in the economy;
- A decrease in total final energy consumption of 115,463 TJ due to structural changes in the economy;
- A decrease in total final energy consumption of 637,570 TJ due to improvements in energy efficiency.

8.2.5.2 Decrease in reliance on coal and paraffin

- Although the Solar Water Heater Programme aimed to equip one million homes with SWH over a period of 5 years, this did not realise. Since the programme is currently on hold, no more SWH have been installed. Consequently, those who do not have affordable access to electricity continue to use solid fuels (wood, animal dung, coal), paraffin, candles and gas to fulfil basic needs.

8.2.5.3 Job creation potential while contributing to energy savings

- The New Growth Path targets 300,000 additional direct jobs by 2020 to green the economy, with 80,000 in manufacturing and the rest in construction, operations and maintenance of new environmentally friendly infrastructure (CSIR, 2014).
- The IDC has allocated R7.6 billion for 18 green industry projects since 2011, with an emphasis on renewable energy (mainly solar panels and wind turbines). This was expected to create more than 3,700 permanent jobs and many more temporary jobs.
- Accurate stats on South Africa's Green Economy employment profile is lacking. Furthermore, there is not consensus on the definition of a green job. A strict definition would be only those jobs in industries and sectors that produce environmentally beneficial goods and services (Borel-Saladin & Turok, 2013).
- The DoE's solar water heater (SWH) programme in 2008 aimed to equip one million homes with SWH over a period of 5 years. However, it was characterized by "chasing the numbers" indicators and neglected to measure the quality of skills developed, the ability to achieve long-term sustainable jobs, the community buy-in and ownership of the new technology.
- Eskom's CFL replacement programme resulted in 65 million CFLs installed by January 2017, saving 7 million tonnes of CO_2 emissions, and creating more than 30 000 temporary jobs.

8.2.5.4 Encourage Domestic production of EE inputs

- A key component of both the NDP and NGP is local procurement. It was envisioned that EE and RE projects would promote local industrial manufacture of components, inputs and technologies in South Africa.
- The energy saving lights sector and specifically the Light Emitting Diode manufacturers had been in a growth phase recently. It is unclear what impact Eskom's cancellation of its IDM programmes has on this sector, but it does seem that the local manufacturing sector has largely been excluded from these markets (GreenCape, 2014).
- Similarly, the low pressure solar geyser programme was subject to products containing local content as per SATS 1286:2012. However, some of the systems proposed in the tender submissions did not adhere to the stipulated requirement of 70% local content on collector or

storage tanks. This is a challenge, as the current standard for solar water heaters SANS1307:2012 is a system testing standard and the designation is a component-based definition (Ibid., p.7.).

- Although a total of 395 088 systems were installed, the programme was halted in October 2013 due to financial constraints.

8.2.6 Relations with other policy instruments

- The primary policy instrument taking precedence over the NGP is the NDP of 2012. The NDP is a Country Vision: Vision 2030 and the NGP is a government strategy in pursuit of the Country Vision. The NDP envisions the NGP as Government's key strategy to place the country onto a higher growth trajectory.
- Th NSSD's objective of strategic priority 3 - Towards a green economy- is given as: "A just transition towards a resource efficient, low carbon and pro-employment growth path"; this aligns with objectives espoused in the NGP (CSIR, 2014).
- The latest iteration of IPAP aligns with the programmatic perspectives of the NGP and is framed by the National Industrial Policy Framework (NIPF).
- The National Energy Act (2008) ensures that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy. This aligns with the NGP Jobs Driver 3's comprehensive support for EE and RE as required by the IRP 2.
- The draft NEES Post-2015 document identifies three energy savings opportunities within the residential sector namely, appliances, lighting and buildings. It emphasises the fact that energy savings are possible with the continued implementation of Solar Water Heating (SWH) and Mass Roll-Out (MRO) programmes in the residential sector. This aligns with the aims of the NGP as well as the NDP.

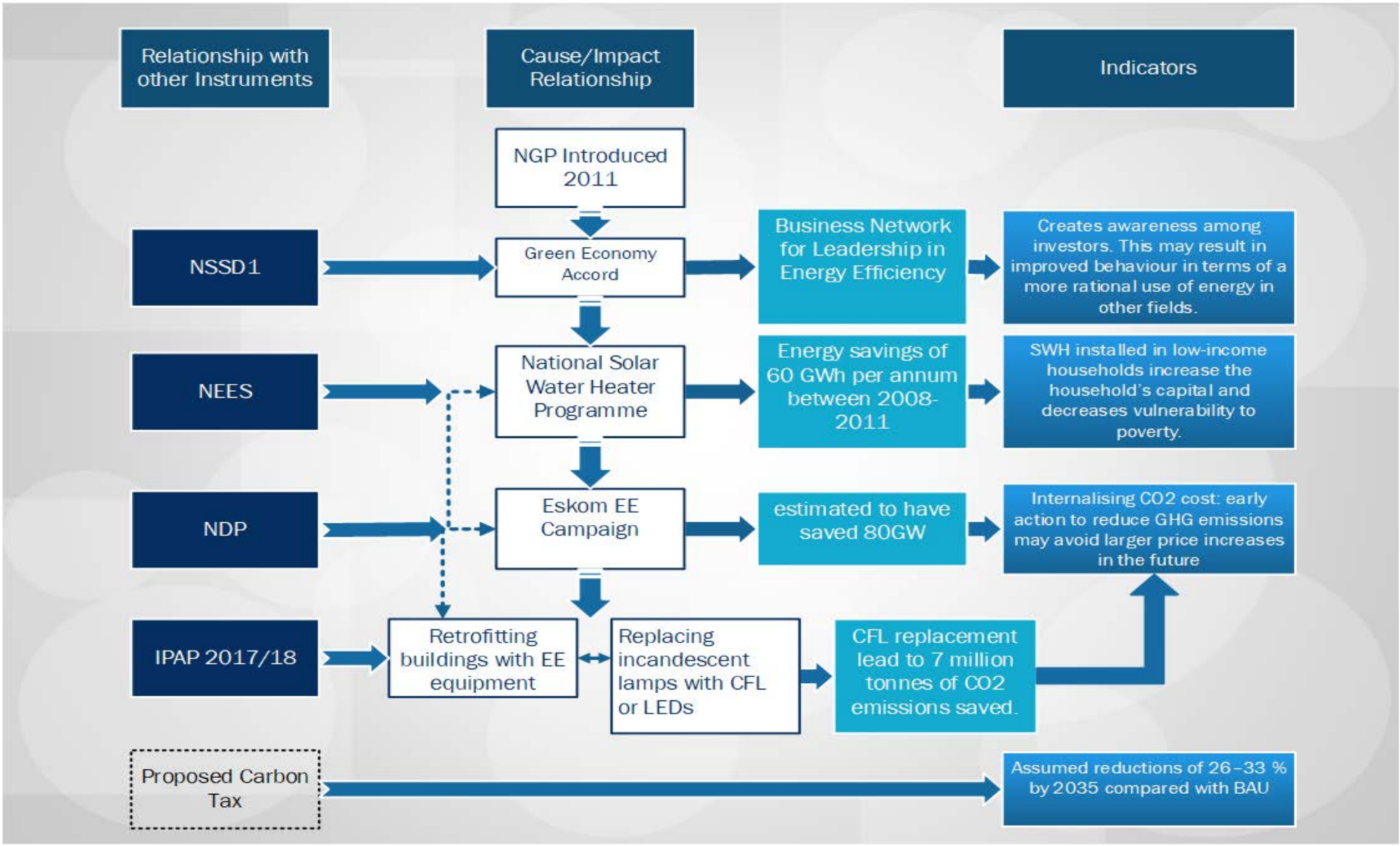
8.2.7 Conclusions on Success and Failure Factors

The New Growth Path views the seizing of potential of new economies such as the Green Economy as key to deliver jobs and localise production of EE components. It envisions that the IRP will identify options for EE and RE generation, with accompanying job creation opportunities.

- To date, some success has been achieved in the IDC Green Industries SBU, as well as incentives such as Eskom's SWH and CFL programmes. However, the introduction of the NDP resulted in a halt to the attempt to forge an alignment of the macroeconomic policies, in particular the monetary policy, with the industrial policy and job creation as proposed in the NGP.
- The halting of Eskom's IDM programmes has significantly reduced the prospect for job creation in the EE sector. A lack of skilled expertise and adherence to international standards further hampers local procurement in EE (GreenCape, 2014).

One may therefore conclude that the EE proposals made in the NGP and the Green Accord has made some limited inroads in addressing the adoption of efficiency measures by business and households, but has largely been hampered by lack of funding, skills, and political commitment and the precedence given by government to the NDP.

Figure 12: Policy Flowchart for the NGP



8.3. Ex-post Evaluation of the White Paper on Energy Policy of 1998

8.3.1 Policy Description/Characterisation

- The White Paper on Energy Policy of 1998 was developed to clarify government policy regarding the supply and consumption of energy in South Africa.
- The Paper states that government will facilitate the sustainable production and management of solar power and non-grid electrification systems.
- Government would establish energy efficiency norms and standards for commercial buildings and industrial equipment, and voluntary guidelines for the thermal performance of housing.
- A domestic appliance-labelling programme would be introduced.
- Publicity campaigns would be undertaken to ensure that appliance purchasers are aware of the purpose of appliance labels (Department of Minerals and Energy, 1998).
- Increasing access to affordable energy services
- Improving energy governance
- Stimulating economic growth
- Managing energy-related environmental and health impacts
- Securing supply through diversity

8.3.2 Policy Theory

The policy theory, including all the assumptions on how policy makers and executors thought that the White Paper should reach the targeted effect, is included in Figure 13:

8.3.2.1 Initiation of the White Paper

The process commenced with the drafting of an Energy Policy Discussion Document by a multi-disciplinary team of experts. It described the energy sector and identified 111 major energy policy issues. In August 1995, a team of expert 'issue rapporteurs' was appointed to draw up the first draft white paper. Their contributions were then edited for review by an editorial committee. The Draft White Paper was revised during 1997/98 in the Department and Cabinet approved its release in July 1998.

8.3.2.2 Assumptions

It was assumed by policy makers that the White Paper would lead to the implementation of EE in the following ways:

8.3.2.2.1 Explicit

- The promotion of energy efficiency awareness amongst industrial and commercial energy consumers that will encourage the use of energy efficient practices.
- The establishment of energy efficiency norms and standards for commercial buildings.
- The establishment of energy efficiency standards for industrial equipment.
- The implementation of an energy efficiency programme to reduce consumption.
- Promotion of energy efficiency awareness in households.
- The establishment of relevant standards and codes of practice for the thermal performance of dwellings, the inclusion thereof in the national building codes, and the promotion of their implementation through appropriate measures.
- Promotion of the introduction of a domestic appliance labelling programme.
- Promotion of the performance of audits, demonstrations, information dissemination, sectoral analyses and training programmes.

8.3.3 The role of the White Paper in the general energy policy:

The Paper provides the overall direction for energy decision making in South Africa, by outlining the objectives and priorities for energy policy in the country. Concerning energy policy, the White Paper envisions the following pertaining to achieving national EE uptake:

- Establishment of energy efficiency norms and standards for commercial buildings
- A domestic appliance-labelling programme
- Certification & Accreditation
- Education, Information & Awareness: Public campaigns on energy efficiency & targets for commercial energy efficiency improvements will be set and monitored.
- Regulation & Energy audits
- Research & Technology adoption to promote EE gains

8.3.4 Political support for the White Paper

- The 1998 White Paper allowed for inputs from various stakeholders within the energy sector. Once the Energy policy was finalised, the IRP 2010 was developed.
- The NEES (2005) derives its mandate from the White Paper, and links energy sector development with national socio-economic development plans as well as being in line with other Government departmental initiatives.
- The White Paper was supported by South African industrial and residential consumers alike, who hoped that competition in the electricity sector would help maintain low energy prices.
- Eskom supported the document but was wary of any further efforts to eat away at its hold on electricity generation. In practice, the utility fought against any attempt to unbundle its activities into separate entities (Morris & Martin, 2015).

8.3.5 Cause-impact relationships

This subsection evaluates whether the cause-impact relationships assumed by policy makers for the White Paper actually occurred by analysing the indicators.

8.3.5.1 Adequate energy conservation regulations, EE standards and norms

- By now the document is “outdated” as it was understood to set government policy for the decade up to 2008. A review may be needed to assess what has been achieved, and to determine appropriate short and medium-term priorities in line with the current energy and environment.
- Many of the present-day key EE challenges are discussed and supported by the medium-term policy priorities contained in the White Paper. While some objectives and measures have been achieved, a number have yet to be effectively implemented on a wide scale.
- Some capacity constraints and barriers to EE that were identified in the White Paper are still apparent (GIZ & Unlimited Energy, 2014).
- Energy efficiency programmes have not realised the initially-set targets as outlined in the White Paper, hindering relevant state organs to act in a coherent and integrated manner in implementing EE programmes (Webb, 2015).
- Evaluation, measurement, and verification (EM&V) in South Africa has a good model and government is exploring ways to improve it. Standard guidelines of measurement and verification of energy savings are given by SANS 50010, intended to provide a standard approach to EM&V of energy savings and efficiency for use in voluntary and regulatory

processes. The Council of Measurement and Verification Professionals of South Africa (CMVPSA) offers training and certification of professionals (de la Rue du Can, et al., 2013).

- NERSA-funded EEDSM programmes have generated many funding models and has begun to incorporate energy efficiency as an integrated resource for future planning. However, these initiatives have focused on savings from lighting, industrial process optimization, compressed air and industrial and commercial HVAC systems. Insufficient action in terms of technologies in the residential sector has been taken (de la Rue du Can, et al., 2013).

8.3.5.2 Improving Energy Efficiency Governance

- At present, Government is further investigating the establishment of appropriate institutional infrastructure and capacity for the implementation of energy efficiency strategies to complement the work of SANEDI (SANEDI, 2016).
- Governance is hampered by overlap, as the DTI, DoE and Eskom are driving EE programmes resulting in strategic outputs lying beyond the exclusive ambit of the DoE. This is due to the cross-sectoral nature of the outputs, in terms of legislation as well as in terms of powers and duties. At present, alignment of national economic, industrial, energy and climate objectives is lacking and increased involvement of the provincial and local government departments in EE is required.
- The need for co-operative governance in the energy sector has been recognised by a cabinet decision in 2009 to establish the Inter-Ministerial Committee on Energy (IMCE) (Rosenberg & Winkler, 2011).

8.3.5.3 Appliance Standards and Labelling to produce more efficient appliances

- The South African Government views appliances as highly relevant to achieve energy savings in the residential sector. The necessary policies to adopt EE are in place, however, thus far, the country has been lacking in implementation and enforcement. The voluntary labelling programme for refrigerators was launched in 2005. Circumstantial evidence indicates the programme was unsuccessful (An interview with SA's largest manufacturer and supplier of fridges indicated that, based on the European scale, local refrigerators averaged the previous G European rating) (UNDP, 2016).
- Minimum Energy Performance Standards (MEPS) came in force for refrigerators and freezers in South Africa during 2015. A performed initial evaluation conducted by Götz, et al. (Götz, et al., 2016) showed that the current S&L programme, (mainly concerning cold appliances), is already outdated and ineffective to achieve additional energy and cost savings.
- Götz, et al. suggests that even though the implementation of the S&L programme was delayed, the real drawback was the lost local innovation potential and the cost disadvantages. Consequently, socio-economic benefits have been lost and related GHG emissions have been locked in for the foreseeable future.
- South Africa is developing a much more comprehensive S&L programme that will offer new opportunities to foster a successful transition of the appliances market. The Department of Energy (DoE) in collaboration with the Departments of Public Works (DPW); Trade and Industry (the dti), are collaborating on a planned energy efficiency programme, incorporating the new South African Energy Efficiency Label and the Building Energy Savings Campaign Identity (News24, 2016).

8.3.5.4 Raising public awareness

- Awareness of the significance of EE is still lacking among the public, despite the recent focus on energy efficiency through initiatives such as the “49 million”- campaign; a fact that may also explain why EE is not receiving the necessary consideration, in terms of programmes and acquiring funding (GIZ & Unlimited Energy, 2014). Consumers often lack basic knowledge of EE in appliances. Modern consumers are asked to pay extra for energy efficient appliances, and from an uninformed standpoint, the running cost is immeasurable, as its not quantified on an electricity bill. This emphasises the importance of distributing information amongst consumers on opportunities to save electricity and money by purchasing EE appliances (UNDP, 2016).
- This initiative is sometimes hampered by municipalities as evidenced by the DoE’s report:” Assessment of Policy to Enable the Implementation of Energy Efficiency in the Building Sector” (DoE, 2015) - while municipalities are expected to lead the education and awareness initiatives, some neglect to do so, for fear of losing revenue from electricity sales. They argue that informed consumers are more energy efficient and use less electricity, which negatively affects municipal revenues, especially those that depend on electricity sales as a major source of revenue.

8.3.5.5 Skills development and training in EE

- According to an executive briefing given at the 2017 WEF, (WEF, 2017), new energy supplies and technologies are the 8th driver of change for future jobs in Africa between 2015–2020.
- It is estimated that by 2025, South Africa alone could create 462,000 additional jobs by “going green”, including in clean energy generation, energy efficiency, pollution control and natural resource management (Ibid.).
- Energy efficiency managers and technicians are identified as occupations in high demand by the DHET (Government Gazette no. 39604, 2016).
- The National Skills Development Strategy III lists the need to develop skills in support of the green economy as a national priority; while the Integrated Youth Development Strategy for South Africa (National Youth Development Agency) identifies the need to establish a Green Economy Training Academy to focus on short learning programmes. The academy aims to train 2 000 youth annually through partnerships with municipalities, the DEA and other stakeholders. The NYDA also makes clear that green economy projects it envisages to cover include energy efficiency. Such projects will cost up to R1.5 billion across all provinces, with nine small to medium enterprises (SMEs) established per each green economy sector and a total of 180 000 jobs created over a period of five years (Nhamo, 2015).

8.3.6 Relations with other policy instruments

- The White Paper on Renewable Energy of 2003 aligns with the objectives set out in the White Paper on Energy Policy, as it specifies government’s commitment to:
    - The development of an information strategy for EE;
    - Thermally efficient house designs being a requirement of government housing subsidies; and
    - The development and enforcement of energy efficient standards for electrical appliances and appliance labelling.
- The latest iteration of IPAP (2017/18) emphasises the need to drive EE production and carbon mitigation efforts and measures; this aligns with the goals of the White Paper, i.e. the promotion

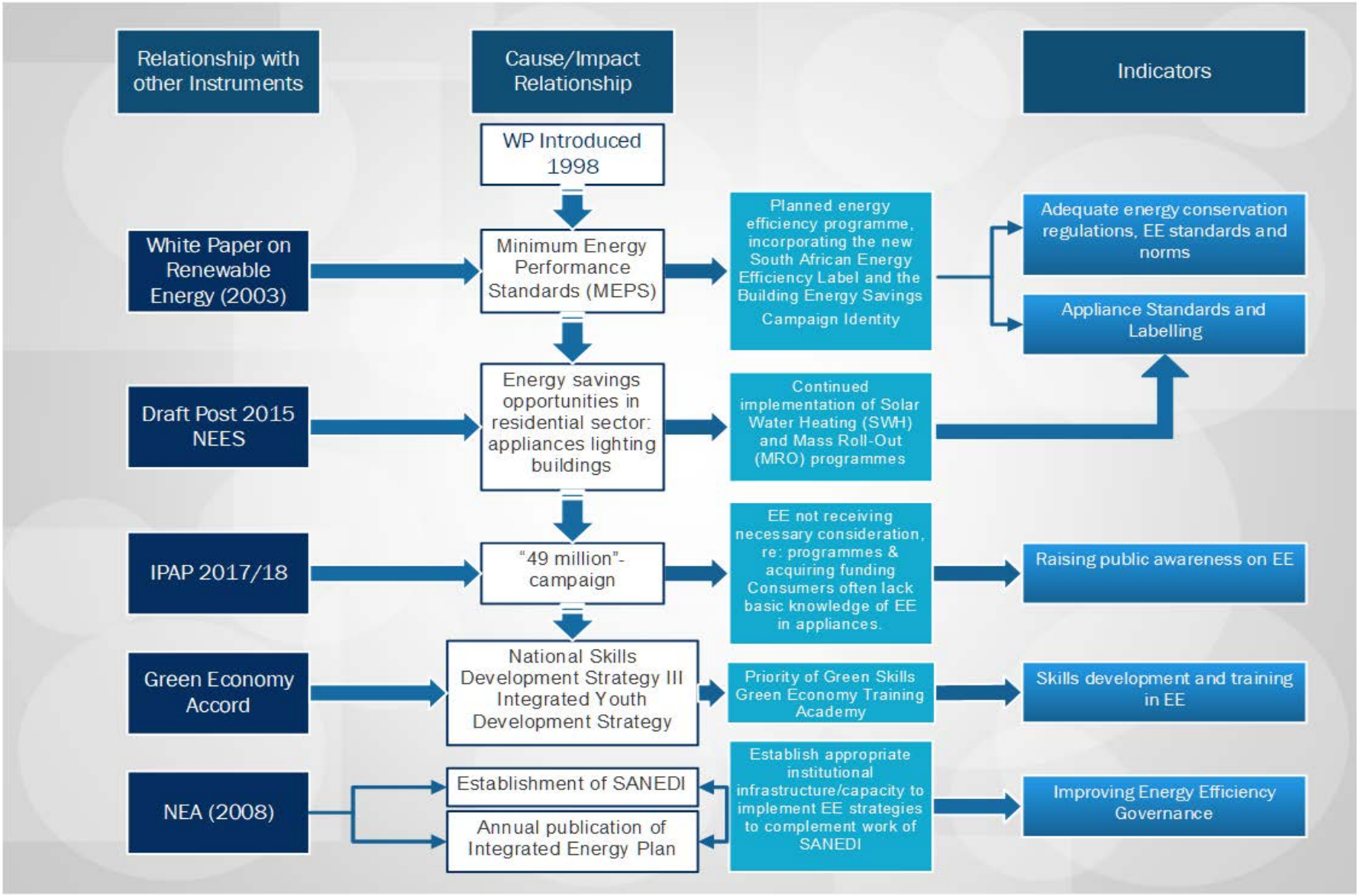
of an energy efficiency awareness amongst consumers that will encourage the use of energy efficient practices.

- The National Energy Act (2008) provides for the establishment of SANEDI and requires the annual publication of an Integrated Energy Plan (IEP) covering at least a 20-year planning horizon. The White Paper explicitly refers to the need for such regulation and planning.
- The draft NEES Post-2015 document identifies three energy savings opportunities within the residential sector namely, appliances, lighting and buildings. It emphasises the fact that energy savings are possible with the continued implementation of Solar Water Heating (SWH) and Mass Roll-Out (MRO) programmes in the residential sector. This directly supports the aims of the White Paper.
- The NGP's Green Economy Accord pledges to develop internal energy efficiency targets that are appropriate to company operations and activities; to report publicly on progress towards company energy efficiency targets and to develop skills development programmes for employees to implement energy efficiency programmes. These pledges are comparable to the goals of the White Paper to improve EE Governance and develop EE skills.

8.3.7 Conclusions on Success and Failure Factors

- The White Paper is regarded as a well-formulated document. Although in need of an update, it does set clear expectations for EE policy in terms of norms and standards for commercial buildings, the domestic appliance-labelling programme, education and awareness and energy audits.
- Although Evaluation, Measurement, and Verification (EM&V) in South Africa has a good model and government is exploring ways to improve it, EE programmes have not realised the initially-set targets as outlined in the White Paper.
- Governance in EE, envisioned by the White Paper as a key to improving energy consumption, is hampered by overlap, as the dti, DoE and Eskom are driving EE programmes resulting in strategic outputs lying beyond the exclusive ambit of the DoE, due to the cross-sectoral nature of the outputs.
- Appliances are highly relevant to achieve energy savings in the residential sector. The necessary policies to adopt EE are in place, however, thus far, the country has been lacking in implementation and enforcement.
- Minimum Energy Performance Standards (MEPS) have had moderate success and the more comprehensive S&L programme currently under development will offer new opportunities to foster a successful transition of the appliances market.
- Awareness of the significance of EE is still lacking among the public, despite the recent focus on energy efficiency through initiatives such as the "49 million"- campaign; a fact that may also explain why EE is not receiving the necessary consideration, in terms of programmes and acquiring funding.
- It is estimated that by 2025, South Africa could create 462,000 additional jobs by "going green"; Energy efficiency managers and technicians are identified as occupations in high demand by the DHET. A lack of skills in the energy efficiency market remains an enormous challenge that will require further attention.

Figure 13: Policy Flowchart of the White Paper on Energy Policy 1998



8.4. Ex-post Evaluation of the National Energy Efficiency Strategy-2005

8.4.1 Policy Description/Characterisation

- The White Paper on Energy Policy (1998) gives a mandate to the DoE to pursue EE programmes as low-cost options for reducing energy consumption.
- The NEES was released in 2005 to explore the potential for improved energy utilisation through reducing the nation's energy intensity (thus reducing GHG emissions) and decoupling economic growth from energy demand.
- NEES 2005 aimed to ensure that the necessary resources were made available to establish systems and legislation to facilitate the specification, collection, storage, maintenance and supply of energy-related data, according to the requirements of integrated energy planning (DoE, 2013).
- The expansive goals of the strategy include: improve national health, support job creation, alleviate energy poverty, reduce environmental pollution, reduce carbon dioxide emissions, improve industrial competitiveness, enhance energy security and reduce the need for additional generation capacity.
- The Strategy is divided into 4 sector programmes: Industry and Mining; Commercial and Public Buildings; Residential; and Transport.
- The Strategy set a target of 12% reduction in the overall primary energy consumption by 2015.

8.4.2 Policy Theory

The policy theory, including all the assumptions on how policy makers and executors thought that the NEES 2005 should reach the targeted effect, is included in **Error! Reference source not found.**:

8.4.2.1 Initiation of the NEES 2005

- The DoE drafted the NEES in 2005 to implement the provisions of the White Paper in respect of EE and was approved by Cabinet in March 2005 and reviewed in October 2008.
- Implementation plans were drawn up for each of the sectors with forecasted targets of energy use reductions based upon assumptions about energy demand over the following 10 years.
- Interventions were to be implemented by concentrating on no-cost and low payback options with a high impact. These were to be followed by medium to long-term higher investment interventions.
- Since the release of the 2005 NEES, several legislative frameworks had to be developed to support the implementation of the Strategy.

8.4.2.2 Assumptions

It was assumed by policy makers that the NEES 2005 would lead to the implementation of EE in the following ways:

8.4.2.2.1 Explicit

- Voluntary national target of a 12% reduction in final energy demand by 2015.
- Residential EE measures:
    - Final demand reduction of 10% by 2015
    - Appliance labelling
    - Awareness campaign
    - Mandatory EE standards for housing and appliances

8.4.2.2.2 Implicit

- Alleviate energy poverty
- Reduce environmental pollution
- Reduce CO_2 emissions

8.4.3 The role of the NEES 2005 in the general energy policy:

The Strategy links energy sector development with national socio-economic development plans. The NEES intended to strengthen national capacities to achieve the goal of 10% reduction of energy demand in the residential sector. The Strategy's eight goals are grouped in terms of social, environmental and economic sustainability (DME, 2005).

The goals are:

- Improve the health of the nation
- Job creation
- Alleviate energy poverty
- Reduce environmental pollution
- Reduce CO2 emissions
- Improve industrial competitiveness
- Enhance energy security
- Reduce the necessity for additional power generation capacity

8.4.4 Political support for the NEES 2005

The NEES (2005) derives its mandate from the White Paper, and links energy sector development with national socio-economic development plans. It is reviewed on a five-year basis with the latest iteration (the Post-2015 NEES Draft) being published in 2016 for comments.

The first review of the 2005 NEES was done in 2008, a revised document was then issued for public comments. However, the comments received were disapproving, primarily due to a lack of a clear definition of energy efficiency, monitoring system and baseline information that considers the fact that companies are at different levels of target achievements. Clarity on these issues was requested before the NEES could be finalised. The second review of the NEES commenced in 2011, which included public and sector participation to discuss the scope and elements requiring re-evaluation. Cabinet approved the publication of the draft second NEES review document for public comment, and it was then published through the government gazette on the 29 November 2012. The current draft Post-2015 NEES has been published for comment.

8.4.5 Cause-impact relationships

This subsection evaluates whether the cause-impact relationships assumed by policy makers for the NEES 2005 actually occurred by analysing the indicators.

8.4.5.1 National target of a 12% reduction in final energy demand by 2015

- The Strategy set a national target for energy savings, of at least 12%, that was to be achieved by 2015. This target was expressed in relation to the forecast national energy demand at that time, based on the 'business as usual' baseline scenario.
- The intensity or efficiency effect reflects the change in demand due to change in energy use per unit of sectoral activity.

- The Energy Efficiency Target Monitoring System's Annual Monitoring Report on EE notes that between 2000 and 2012, the energy intensity of the economically productive sectors reduced by over 28%. It further suggests that the residential sector's intensity (measured in terms of energy consumption per household) fell by over 15%. The DoE concedes that resource constraints meant that the data base was very limited; hence the margin of error on any conclusions drawn is relatively large.
- It must also be cautioned that an increase in overall energy intensity because of an economy moving to less energy intensive activities (structural shifts) does not indicate that energy is being used more efficiently, but simply that it is being used in a different way. One must not attribute a reduction in energy use due to a decline in economic activity to increased energy efficiency (DNA Economics, 2014).
- Brent Cloete noted in 2014 that there has been a steady decline in South Africa's energy intensity since 2000, comparatively independent of business cycle influences. It is uncertain if this can be attributed to increased energy efficiency and decoupling between economic growth and energy usage, or whether the decline is the result of structural changes in the local economy (Ibid.).
- Decomposition analysis conducted by the DoE revealed that efficiency changes accounted for a reduction of almost 24% in economy-wide energy consumption relative to a baseline projected from 2000 (DoE, 2015).

8.4.5.2 Strengthening of the Energy Efficiency Accord

Initially, the Energy Efficiency Accord was established as a mutually beneficial framework for the implementation of voluntary energy efficiency initiatives that lasted from 2006 to 2011 (GIZ & Unlimited Energy, 2014). It involved a voluntary commitment agreed to by the DoE and various large South African companies. The accord led to increased awareness and investment by signatories in EE technologies and increased collaboration and sharing of best practice. However, the number of signatories was limited and did not include for government departments and most state-owned entities. It had a narrow focus on EE in terms of electricity only, therefore not enabling the calculation of overall energy intensities of companies. Also, the voluntary nature of the Accord meant that participants could selectively participate in EE measures.

Subsequently, in 2011, The EELN was established to respond to the changing energy policy environment, offering a platform for members from all business sectors to develop and implement their own energy management plans, baselines and EE targets and report to a national monitoring system. The organisation obtained donor funding (£8.6 from the UK's Department for International Development (DFID)) in 2014 to establish the Private Sector Energy Efficiency Programme (PSEE), as an implementation arm. The PSEE offers subsidised assistance to SMEs and large businesses to help them identify potential energy savings (via energy audits). To date, more than 700 medium-sized businesses and more that 35 large businesses have been assisted by the PSEE in this manner (EELN, 2018).

8.4.5.3 Extension of labelling for the energy efficiency status of appliances and implementation of a labelling scheme for the fuel consumption of new vehicles

In 2014, government published mandatory performance standards coming into force in 2015/2016 for a first set of appliances consisting of refrigerators, washing machines, dryers, dishwashers, electric water heaters, ovens, A/C and heat pumps. A number of appliances are now required to be labelled with a South African Energy Efficiency Label. The purpose of the is

to ensure that consumers are informed about the relative energy efficiency of an appliance before they decide to purchase.

Initially, the programme faced resistance from local manufacturers who were reluctant to retool and upgrade their manufacturing facilities (GIZ & Unlimited Energy, 2014). To date, South Africa has been unable to implement and enforce its S&L programme to make a significant impact. Prior to 2016, the only action taken was the voluntary labelling program for refrigerators in 2005. The programme was not sufficiency promoted or monitored and no research has been conducted on any impact to date. The limited data available would suggest it was unsuccessful (UNDP, 2016). This is evidenced by an interview undertaken by UNDP consultants with the country's largest manufacturer and supplier of fridges (~40% market share).

An initial evaluation conducted by GIZ and Unlimited Energy revealed the current S&L programme, in particular for cold appliances, is already obsolete and ineffective (Ibid.). The lost local innovation potential and concomitant socio-economic benefits and GHG reduction for South Africa is the biggest disadvantage. Fortunately, South Africa is now investing in a much more comprehensive S&L programme development and revision cycle that will provide new prospects to enhance the transition of the appliances market towards real EE savings.

8.4.5.4 Improvements in EE via "enabling instruments and interventions"

- The Strategy indicated that EE improvements would 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 (DME, 2005). The Strategy placed a strong emphasis on mandatory measures and regulatory enforcement but neglected to implement these in the initial implementation phase, since 2006.
- The implementation of the NEES 2005 relied on the execution of the accelerated Demand Side Management (DSM) Programme, directed by Eskom and the National Energy Accord. The implementation of the NEES reveals a neglect of public interest energy efficiency programmes. Also, the delivery of its strategic outputs lies beyond the sole domain of the DoE, due to the cross-sectoral nature of the outputs, in terms of legislation and duties (Rosenberg & Winkler, 2011).
- The strategy sets voluntary targets with no penalties for not entering into agreements; also, failure to comply does not result in any censure or penalty. The Strategy indicated that sub-sectoral targets may become mandatory in time.

8.4.5.5 Implementation via Sector Programmes which would include systems to monitor and evaluate progress in energy efficiency improvements and review implementation

For this study, the relevant sector programme is the residential sector that includes the following key actions pertaining to EE:

- Appliance labelling
- Awareness campaign
- Mandatory EE standards for housing and appliances

The Strategy sets a target for the residential sector of a 10% improvement in energy efficiency by 2015 relative to a baseline projected from 2000.

- The voluntary labelling programme for refrigerators was launched in 2005. Circumstantial evidence indicates the programme was unsuccessful (An interview with SA's largest manufacturer and supplier of fridges indicated that, based on the European scale, local refrigerators averaged the previous G European rating) (UNDP, 2016).
- Awareness of the significance of EE is still lacking among the public, despite the recent focus on energy efficiency through initiatives such as the "49 million"- campaign; a fact that may also explain why EE is not receiving the necessary consideration, in terms of programmes and acquiring funding (GIZ & Unlimited Energy, 2014). Consumers often lack basic knowledge of EE in appliances. (UNDP, 2016).
- Minimum Energy Performance Standards (MEPS) came in force for refrigerators and freezers in South Africa during 2015. A performed initial evaluation conducted by Götz, et al. (Götz, et al., 2016) showed that the current S&L programme, (mainly concerning cold appliances), is already outdated and ineffective to achieve additional energy and cost savings.

8.4.6 Relations with other policy instruments

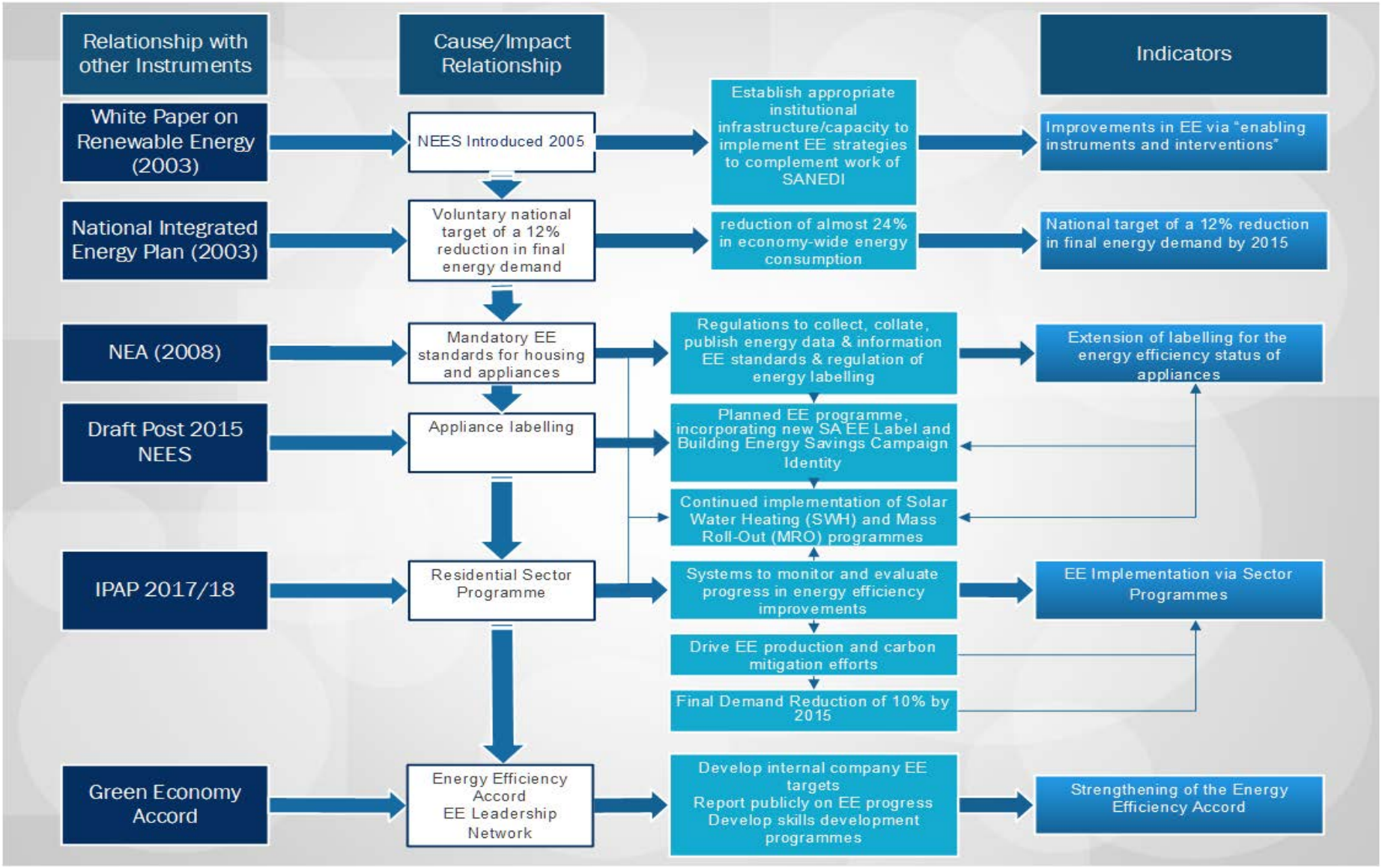
- The latest iteration of IPAP (2017/18) emphasises the need to drive EE production and carbon mitigation efforts and measures; this aligns with the goals of the NEES, i.e. improve industrial competitiveness, enhance energy security, reduce environmental pollution and reduce CO2 emissions.
- The National Energy Act (Presidency, 2008) has set a significant platform for regulatory, legislative and institutional enablement. 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.
- The draft NEES Post-2015 document identifies three energy savings opportunities within the residential sector namely, appliances, lighting and buildings. It emphasises the fact that energy savings are possible with the continued implementation of Solar Water Heating (SWH) and Mass Roll-Out (MRO) programmes in the residential sector. This directly supports the aims of the NEES 2005.
- The mandate given by the White Paper on Energy Policy says that the DoE (DME at the time of the first NEES) should promote EE through various means as well as consider the establishment of an agency to be instrumental for the coordination, leadership and sector capacity development for the implementation of energy efficiency.
- The NGP's Green Economy Accord pledges to develop internal energy efficiency targets that are appropriate to company operations and activities; to report publicly on progress towards company energy efficiency targets and to develop skills development programmes for employees to implement energy efficiency programmes. These pledges are comparable to the goals of the NEES to strengthen the Energy Efficiency Accord via agencies such as the EELN.

8.4.7 Conclusions on Success and Failure Factors

- In terms of reduction in energy demand, decomposition analysis by the Energy Efficiency Target Monitoring System suggests that efficiency changes resulted in a reduction of almost 24% in economy-wide energy consumption relative to a baseline projected from 2000 (DoE, 2015), which would suggest that South Africa had already met its cumulative 2015 energy efficiency improvement target by 2012.
- Structural effects had a positive impact while efficiency improvements (technology/substitute) reduced demand over the period from 1994-2006. Significant energy-efficiency gains took place despite falling electricity prices.
- During the 3-year multi-year price determination period that ran from 2010/11 to 2012/13 the DoE made a significant R5.4bn investment in integrated demand management initiatives, which were implemented by Eskom, in a bid to reduce electricity demand in the face of serious power constraints. The verified demand-side savings show that a total annualised energy saving of 4859 GWh was realised over the period
- The abovementioned must be considered with the caveat that an increase in overall energy intensity because of an economy moving to less energy intensive activities (structural shifts) does not necessarily indicate that energy is being used more efficiently, but simply that it is being used in a different way.
- The Energy Efficiency Leadership Network (EELN), the successor of the Energy Efficiency Accord, is a well-functioning body that offers valuable services to its members, such as assistance to develop and implement their own energy management plans.
- The delay in implementing the S&L programme resulted in lost local innovation potential and concomitant socio-economic benefits and GHG reduction. Fortunately, South Africa is now investing in a much more comprehensive S&L programme development and revision cycle that will provide new prospects to enhance the transition of the appliances market towards real EE savings.
- The Strategy placed a strong emphasis on mandatory measures and regulatory enforcement. Despite such prudence, the strategy failed to respond to the energy crises of 2008, contrary to expected, initial outputs, i.e. enabling instruments and interventions. The neglect to follow up after the initiation of the Strategy was the result of the lack of regulatory guides to enforce and monitor these strategic outputs. Consequently, a number of the anticipated outputs have not been achieved ((Rosenberg & Winkler, 2011).
- Several of the support mechanisms for the implementation of the Strategy have either not been developed or implemented (Götz, et al., 2016).
- Several measures to implement the NEES 2005 targets have not taken place. Therefore, the NEES 2005 was not entirely successful in assessing progress towards the targeted outcomes.
- Awareness of the significance of EE is still lacking among the public.

One may therefore conclude that the NEES 2005, although ambitious and well-formulated, did not optimally translate its policy intent into implementation. The draft Post-2015 NEES aims to address these shortcomings via a number of measures to overcome barriers and to achieve EE in key sectors within the economy.

Figure 14: Policy Flowchart for the NEES (2005)



8.5. Ex-ante Evaluation of the Draft Post-2015 National Energy Efficiency Strategy

As the Post-2015 NEES is currently still in draft form and awaiting ratification by Government after the public consultation process, this evaluation will be an ex-ante instead of an ex-post one to consider the possible intended outcomes of the Strategy.

8.5.1 Policy Description/Characterisation

In 2016, government published the draft Post-2015 NEES which is under consideration to replace the first NEES adopted in 2005 (DoE, 2016). The main focus of the latest iteration is on:

- Improving household EE (reducing residential energy demand) - especially after the blackouts of 2008.
- Providing support to the Appliance & Equipment Efficiency Standards & Labelling Programme; the focus of the programme is to replace all energy inefficient appliances and to halt the introduction of such appliances into the market.

This strategy aims to build on the achievements of the first NEES, which saw higher than targeted improvements in energy intensity, by stimulating further EE improvements through a combination of financial incentives, enabling measures, legal and regulatory frameworks (i.e. through policy development and incentive programmes). In addition, the Draft Strategy is in line with the DoE's vision that seeks to promote EE as the 'first fuel' in driving balanced, socially inclusive and environmentally sustainable economic growth, boosting job creation and leading technological innovation across the region.

8.5.2 Policy Theory

The policy theory, including all the assumptions on how policy makers and executors think that the Draft Post-2015 NEES may reach the targeted effect, is included in Figure 15:

8.5.2.1 Initiation of the Draft Post-2015 NEES

The DoE published the Draft Post-2015 National Energy Efficiency Strategy (NEES) in Government Gazette 40515 on 23 December 2016. Written comment on the draft strategy was invited within 30 days of the date of publication. The due date for public comments was later extended to 28 February 2017.

8.5.2.2 Assumptions

It is assumed by policy makers that the draft Post-2015 NEES will lead to the implementation of EE in the following ways:

8.5.2.2.1 Explicit

- Streamlining the 12L Tax incentive to other sectors of the economy
- Promulgation of the Carbon Tax
- A review of the IRP on a regular basis
- Closer engagement with the Private Sector
- A follow-up on regulations and enforcement of legislation to help with its implementation
- Specific targets to be achieved by 2030:
    - Reduction of 15% in energy consumption within the industry and mining sectors;
    - Reduction of 37% in the commercial and public sectors;
    - Reduction of 33% in the residential sector;
    - Reduction of 39% in transport;

  - Reduction of 30% in agriculture;
  - Reduction of 29% for the economy as a whole
- The feasibility of introducing an energy endorsement label
- Successive tightening of appliance MEPS will ensure that the market is continually pushed in the direction of improved EE for the duration of the strategy period
- A scrappage scheme for old, energy-inefficient appliances
- Successive tightening of building standards
- The issuing of mandatory Energy Performance Certificates (EPCs) for new construction

8.5.2.2.2 Implicit

- Cooperative governance between departments
- EE should be made a priority on a national scale

8.5.3 The role of the Draft Pots-2015 NEES in the general energy policy:

The strategy aims to contribute towards reducing South Africa's overall energy consumption to 29% by 2030 through the implementation of the suggested EE measures. Specific targets to be achieved by 2030 have also been suggested for each of the sectors – reduction of 15% in energy consumption within the industry and mining sectors; 37% in the commercial and public sectors; 33% in the residential sector; 39% in transport; 30% in agriculture; and for the economy as a whole a reduction of 29% by 2030 is envisaged.

8.5.4 Political support for the Draft Post-2015 NEES

The strategy has been framed to complement the policies and strategies of the Department of Environmental Affairs (DEA), the Department of Public Works (DPW), the Department of Science and Technology (DST), the Department of Trade and Industry (dti), the Department of Transport (DoT) and the National Treasury (DoE, 2016).

8.5.5 Cause-impact relationships

This subsection evaluates whether the cause-impact relationships assumed by policy makers for the Strategy may be feasible by analysing the indicators.

8.5.5.1 Continued Review and Improvement of the 12L Tax Incentive

The 12L Tax incentive is administered by SANEDI to promote EE in the manufacturing environment. The programme is aimed at combating greenhouse gasses and for manufacturers to become more energy efficient, as well as safeguarding the security of energy supply. It allows taxpayers to claim deductions of 45 cents per kilowatt hour, or kilowatt hour equivalent, of EE savings made against a baseline measured at the start of each year of assessment. The allowance amount was increased to 95c/kWh by the Minister of Finance during the Budget Vote speech in March 2015.

8.5.5.2 EPC mandatory certificates

Nearly 100 000 public buildings require energy efficiency retrofitting. This creates opportunities for many in the EE value chain. Regulation on the energy performance of buildings (as amended in 2013) stipulates that an energy performance certificate (EPC) will require all government owned and leased premises to disclose a building's energy consumption through an Energy Performance Certificate (EPC) that gives information on primary energy demand and CO_2 emissions (in accordance with SANS 1544). Although the regulations will only apply to

government buildings that have a floor area greater than 1 000m2, it is expected that the regulations will be extended to the commercial sector by 2020 (GreenCape, 2017). The mandatory display of energy performance certificates (EPCs) in government owned properties is currently being implemented. This will be extended to rented public buildings on signing of a new lease (DoE, 2016).

Some government buildings are already leading by example, such as, inter alia, the Environmental House (Department of Environment), Batho Pele House (Department of Public Service), Tshedimosetso House (Government Information System) and Freedom Park in Pretoria. Other public buildings that apply green and energy efficient principles are the Mapungubwe Interpretation Centre in Limpopo, and the Gallows Hill Traffic Department in Cape Town.

EPC allows building owners to systemically analyse their building stock's energy performance. Such analysis is useful in guiding interventions that will decrease energy use and also reduce the GHG emissions of the building. It may also lower energy costs which will give the owners a competitive advantage over other landlords when leasing out their buildings.

8.5.5.3 Public sector awareness programmes

The Strategy's implementation plan for the following five years refers to the development of a public-sector awareness raising campaign to facilitate the "leading by example" approach. The large civil service workforce presents an opportunity to improve the EE performance of government buildings and to raise awareness among the civil service. The Strategy's two central themes of the package of policy measures for the public sector are to build institutional energy efficiency culture and to significantly reduce energy consumption government. The DPW is developing a "Leading by Example" brand that supports the programmes of building retrofits, raising awareness and greening of procurement. The DoE intends to develop the brand across all government departments; This will require that EE becomes embedded in the organisational culture.

8.5.5.4 Draft Carbon Tax (2015)

The NDP (2011) acknowledges that South Africa needs to reduce GHG emissions and improve EE. The prime purpose of the proposed carbon tax is to reduce the growth of South Africa's GHG emissions in an economically efficient manner which also contends with the commitments of South Africa's NDC to the Paris agreement. The first draft Carbon Tax Bill was published for public comment in November 2015 after an extensive consultative process on carbon-tax policy.

The Bill should enable South Africa to meet its 2015 Paris Agreement commitments and to reduce its GHG emissions. Estimates suggest the tax would lead to an estimated decrease in GHG of 13% to 14.5% by 2025, and 26% to 33% by 2035.

The date of implementation of the carbon tax will be determined through a separate and later process during 2018, or at the time of the 2019 budget, taking into account the state of the economy.

A package of tax incentives and revenue recycling measures will also be introduced to minimise the impact in the first phase of the policy (up to 2022) on the price of electricity and energy-intensive sectors, such as mining, iron and steel. This will be intended to be revenue-neutral in terms of its accumulated impact, when assessed with the complementary tax incentives and revenue-recycling measures; A credit for (or reduction in) the electricity-generation levy and the

renewable-electricity premium (built into the current price of electricity) will also be instituted (Ensor, 2017).

8.5.5.5 Successive tightening of building standards

The Strategy proposes a target for public buildings to reduce specific energy consumption (annual energy consumption per m^2) of lettable or habitable floor area across the sector by 50%.

The updated National Building standards (SANS 204), and the Green Building Council of South Africa provide guidance for voluntary green building initiatives. In addition, the recent SANS 10400 XA standard provides energy efficiency standards that are mandatory for new buildings. Some examples of green building design include (CSIR, 2014):

- Using insulation and passive heating and cooling systems for reducing energy requirements
- Using renewable energy supply to fulfil energy demands
- Incorporating and applying measures to improve water use efficiency and reduce wastes
- Using low carbon and resource efficient building materials.

8.5.5.6 Financing schemes for energy efficiency

The DoE continues to collaborate with national governing bodies, such as National Treasury, the dti and other government departments to develop effective financing schemes for EE. It consults with international financial institutions and donor organisations, with the local banking sector and with industry sector stakeholders to obtain and sustain financing (Ibid.,26.).

The fact that renovation of existing building stock in the public sector will require considerable investment will necessitate innovative financing models, such as encouraging partnerships between local and international energy service companies (ESCOs) to secure the financing for large-scale renovations.

The feasibility of establishing an 'ESCO Incubator' as a public-sector body, will be assessed, with the main function of implementing large public-sector projects through energy performance contracting, using local private sector ESCOs as sub-contractors (Ibid.,16.).

8.5.5.7 Broadening the scope of mandatory labelling and MEPS

The draft document identifies three energy savings opportunities within the residential sector namely, appliances, lighting and buildings. It emphasises the fact that energy savings are possible with the continued implementation of Solar Water Heating (SWH) and Mass Roll-Out (MRO) programmes in the residential sector.

Although the draft Post-2015 NEES concedes that mandatory labelling is already implemented, it suggests that mandatory labelling and the Minimum Energy Performance Standards (MEPS) programme should have a broader scope to include appliances that are commonly used in the public sector- such as large-scale cooking and heating appliance. It therefore recommends the tightening of MEPS and its expansion to other sectors.

The Strategy suggests exploring the feasibility of introducing an energy endorsement label to function alongside the existing system of comparison labels for appliances. Such labels are designed to provide consumers with a simple indication that an endorsed product is among the most energy efficient in its class. International experience suggests that a strongly branded endorsement label may be a valuable addition to the existing label group (Ibid.,27.).

8.5.6 Relations with other policy instruments

- The latest iteration of IPAP (2017/18) emphasises the need to drive EE production and carbon mitigation efforts and measures; this aligns with the goals of the Draft Post-2015 NEES, i.e. to contribute towards reducing South Africa's overall energy consumption to 29% by 2030 through the implementation of the suggested EE measures. Specific targets to be achieved by 2030 have also been suggested for each economic sector.
- The National Energy Act (Presidency, 2008) has set a significant platform for regulatory, legislative and institutional enablement and provides the legislative basis for several important EE-related issues. It enables the minister to make regulations to collect, collate and publish energy data and information, the establishment of energy efficiency standards and the regulation of energy labelling, and the setting of minimum levels of EE in each economic sector. This aligns with the intended outcomes of the Post-2015 NEES to successively tighten appliance MEPS and building standards, issuing mandatory EPCs and broadening the scope of the mandatory S&L programme.
- The White Paper on Energy Policy envisioned the promotion of Energy Efficiency through various means, such as appliance S&L, MEPS, awareness campaigns and certification and accreditation. The Post-2015 NEES elaborates on these targets in its five-year implementation plan with mandatory EPC certificates, the successive tightening of MEPS, building on the existing awareness campaign and overcoming market barriers.
- Government released the first NEES in 2005. The NEES set an overall reduction target in energy intensity of 12% by 2015, and sectoral energy intensity improvements. The post-2015 NEES aims to build on the NEES 2005 achievements, stimulating further energy efficiency improvements through a combination of fiscal and financial incentives, a robust legal and regulatory framework, and enabling measures.
- The NDP supports the introduction of a carbon tax as an instrument to incentivise efficiency.

8.5.7 Possible Success and Failure Factors if the Draft Post-2015 NEES were implemented

8.5.7.1 12L Tax Incentive

- Concerning the 12L tax Incentive, amendments to the Act now include co-generation. Where previously only waste heat recovery was claimable as savings in co-generation, the Minister has announced that co-generation in terms of combined heat and power are now claimable with the addition of captive power plant at energy conversion efficiency of the plant greater than 35%.
- Interest in 12L has increased significantly since the suspension of the Eskom IDM programme and as at the end of February 2014 sixty project applications had been received.
- The SANEDI Energy Efficiency and Demand Side Management Hub at the University of Pretoria have produced over 100 Master and Doctoral students who have specialised and graduated in Energy Management and who are now playing a pivotal role in filling the skills gap for this sought-after expertise in the country.
- Key concerns raised with the incentive in its current format is that the tax credit is only valid for one year's worth of energy savings, meaning that on average only projects with energy savings of > 1 GWh are viable. However, National Treasury has tasked SANEDI to conduct a review of the programme on its first anniversary (November 2014) to determine its effectiveness and make recommendations as to how it can be improved.

- The 12L tax structure is not streamlined with other sectors. In addition, high transaction cost makes the incentive prohibitive, such as; project preparation facilities and investment are also challenges towards the uptake of energy efficiency projects.
- 12L regulations do not make provisions for concurrent consumption or any related benefits.
- The 12L tax incentive has implications for business which entail:
    - An additional cost burden implied by the M&V body which can be as high as 10% of the project costs.
    - The Act does not stipulate how charges are set and therefore are left at the discretion of the specific M&V body.
    - The financial viability of registering a project under the 12L or against another state-led incentive such as the MCEP is an obstacle, as the 12L regulations do not make provisions for concurrent consumption or any related benefits.

8.5.7.2 EPC Mandatory Certificates

- Concerning EPCs, it is expected that the regulations will be extended to the commercial sector by 2020 (SANAS, 2016).
- As a policy instrument, EPC addresses two critical market failures in the building sector: incomplete information and the split incentive problem. Incomplete information refers to the situation in which insufficient, inaccurate or untrustworthy information leads building owners and users to under-invest in energy efficiency.
- Split incentives occur when market actors have different goals or incentives, which may lead to less investment in energy efficiency than could otherwise have been made (IEA, 2010)
- Energy certification schemes help to increase the awareness of energy efficiency opportunities by providing building owners, purchasers and tenants with relevant information at a time when investment decisions are being made. This information can include estimates of the costs and benefits of energy efficiency investments in the property.
- The impact of energy performance certification of buildings can be increased when the scheme is part of a set of complementary measures, including energy requirements in building codes and financial incentives (IEA, 2010).

8.5.7.3 Public Sector Awareness

- From a business perspective, reducing energy usage is an opportunity to save money, enhance corporate reputation and helps lead the fight against climate change. A first step is to raise awareness amongst the public of energy use and its implications. Most businesses could save at least 10% off their energy bills through no or relatively low-cost measures. Energy efficiency in the workplace cuts costs, improves competitiveness and helps safeguard profits and employment.
- The provision of training and high-quality targeted awareness-raising material may therefore offer a considerable impact on energy usage. The public-sector awareness raising campaign to facilitate the “leading by example” approach may also assist in this regard to modify public perception of EE.

8.5.7.4 Draft Carbon Tax

- According to estimates, the tax would lead to an estimated decrease in greenhouse gas emissions of 13% to 14.5% by 2025, and 26% to 33% by 2035.
- The Davis tax committee has indicated it would be detrimental to introduce a new tax in times of low economic growth (Davis Tax Committee, 2015). Although local modelling exercises have shown that, depending on how revenue raised by the tax are recycled, the carbon tax is not expected to have a large negative effect on growth (Partnership for Market Readiness, 2016), even a small negative effect on growth could be enough to tip SA back into recession. Studies have shown that the economic effect of the carbon tax depends critically on how it is spent (Visser, 2017).
- An unintended consequence of a carbon tax could be to drive beneficiation offshore with harmful effects on currency flows and the exchange rate. It is also possible that this carbon shifting may even increase net global CO_2 emissions (Davis Tax Committee, 2015).

8.5.7.5 Successive Tightening of Building Standards

- Although the cost of construction of a green building can be 2-3% above those of a conventional building, the reduced operational costs over the entire life-span of the building can significantly reduce the overall cost. The retrofitting of existing buildings can yield notable savings in energy and water use, such that the costs of the retrofitting are returned through long-term operational savings with reasonable payback periods, thereby also reducing the demand for these public services (CSIR, 2014).
- The Green Building Council of South Africa indicates that buildings certified by them can consume 85% less energy, 65% less potable water and send 69% less waste to landfill than non-certified buildings (Ibid).
- The United Nations Environment Programme has estimated that for every US $1 million invested in efficiency retrofitting, 10 to 14 direct jobs and 3 to 4 indirect jobs can be created.
- The target for building standards of the Post-2015 NEES is based on the supposition that successive tightening of building standards will result in reductions in specific energy consumption of 49% for half of the new buildings added between now and 2030, and 67% for the subsequent half. It is assumed that concerted effort to eco-refurbish buildings constructed before 2015 to result in improvements in specific energy consumption averaging 35%. Therefore, the weighted mean of these improvements across the whole 2030 building stock is assumed to offer an overall reduction of 50% in specific energy consumption (DoE, 2016).

8.5.7.6 Financing Schemes

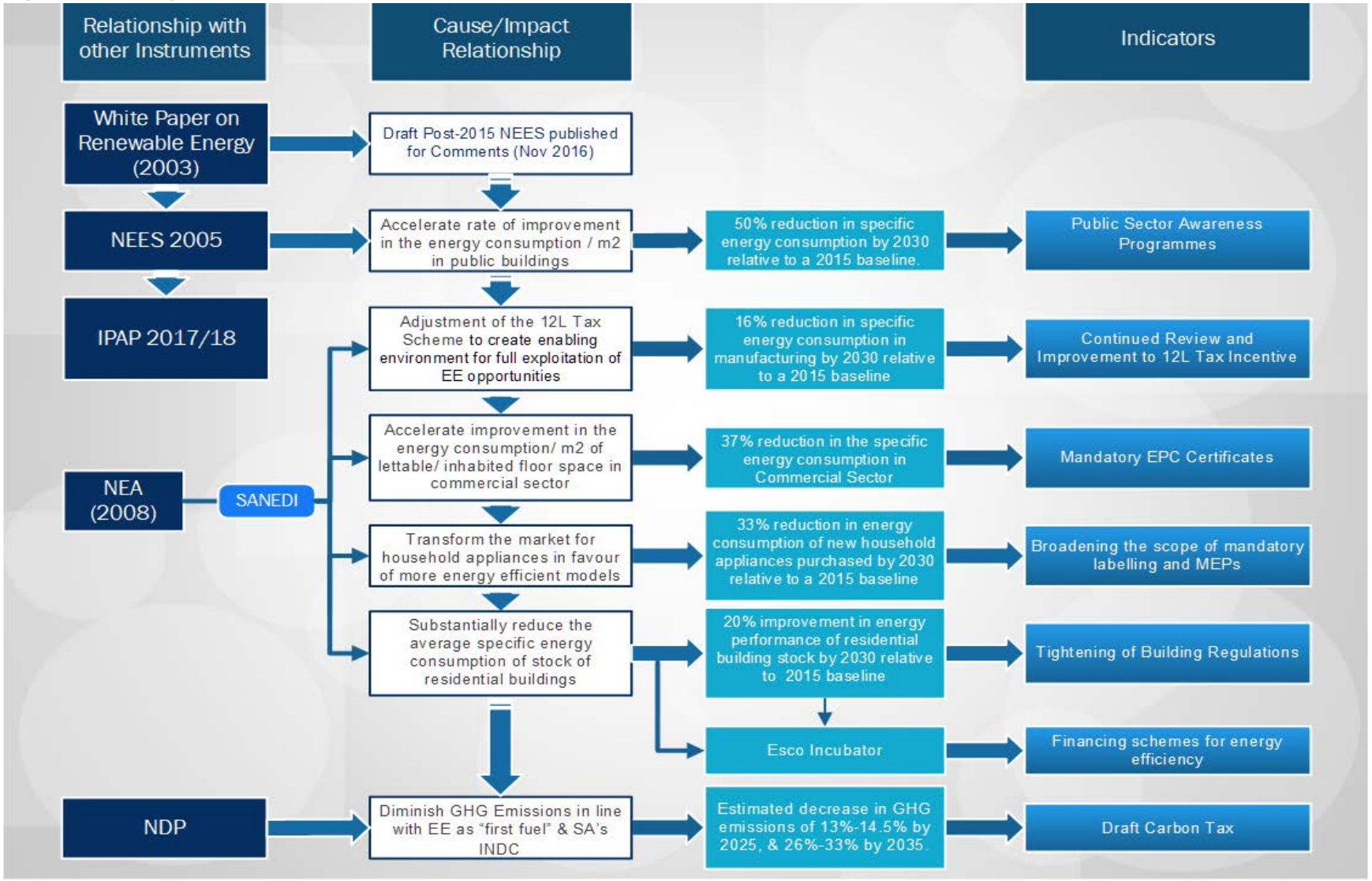
- The Draft Post-2015 NEES suggests alternative financing mechanisms could be exploited, such as energy performance contracts with private sector ESCOs, reducing the investment burden on the government and municipalities. Novel financing includes green financing policies and plans such as guarantees and concessional loans, and payment for the provisioning and maintenance of ecosystem services (CSIR, 2014).
- There are also several financial mechanisms of the South African government that could facilitate investment in EE; including the Municipal infrastructure grant, MCEP and the Green Fund.
- A shift in financing priorities, coupled with strong economic incentives (via taxes, charges and subsidy reform) can promote behavioural change and ensure Energy Efficiency options are commercially feasible (UNEP, 2010).

- Establishing an ‘ESCO Incubator’ as a public-sector body, will create a conducive environment for ESCOs that can focus on the reduction of energy costs through best management practices, including M&V. The main function of the incubator would be implementing large public-sector projects through energy performance contracting, using local private sector ESCOs as sub-contractors; this would enable clients to renew their technology and improve competitiveness and productive assets.

8.5.7.7 Mandatory Labelling and MEPS

- MEPS have a minimal fiscal and political impact for the government (compared to other instruments like financial incentives) (BigEE, 2018).
- There is a certainty of delivering energy savings, if compliance can be ensured.
- Final users benefit indirectly in terms of reduced energy consumption and cost savings.
- MEPS is useful when dealing with a target group which is unwilling to act and difficult to address by other policy instruments.
- Incremental investments in very energy-efficient products may still be high for consumers (especially for low income households).
- One limitation of MEPS is that regulation can only be applied to what can be objectively defined and measured.
- MEPS usually focus on removing the least energy-efficient products from the market, not driving markets towards the absolute best.
- Appliance standards are often combined with labelling and rebates to give incentives for investments beyond the level required by the MEPS. Conversely, labelling programmes cannot completely transform the market and, therefore, are completed by MEPS (Tholen & Thomas, 2013).
- Standards and Labelling may increase consumers’ motivation by making it as easy as possible to choose the energy efficient option if S&L were to make appliance energy consumption and quality visible and comparable (Ibid.).

Figure 15: Policy Flowchart for the Draft Post-2015 NEES



9. Appendix C: Ex-post Evaluations of South Africa's EE Incentive Programmes

9.1. Manufacturing Competitiveness Enhancement Programme (MCEP)

The MCEPs aim to provide incentives to manufacturers to upgrade their facilities by investing in new machinery and processes. A component specifically related to EE is the Green Technology and Resource Efficiency Improvement Grant.

9.1.1 Assumptions

9.1.1.1 Implicit

- Promote enterprise competitiveness and job retention through Green Technology and Resource Efficiency Improvement

9.1.1.2 Explicit

- Capital Investment
- Green Technology & Resource efficiency improvement
- Enterprise-level Competitiveness improvement
- Feasibility studies & Cluster Competitiveness improvement
- Industrial Financing loan facilities
- Pre- and post-dispatch working capital facility
- Industrial policy niche projects fund

9.1.2 Cause-impact relationships

This subsection evaluates whether the cause-impact relationships assumed by policy makers for the MCEP actually occurred by analysing the indicators.

9.1.2.1 Production Incentive

Manufacturing companies can apply for incentives in five areas:

- Capital investment (for upgrades and expansions)

In the 3 years it operated, MCEP had approved funding to the value of R5.2-billion. Some 890 businesses received funding to give them a competitive edge in their markets. About R1 billion of the programme's money was used for facilities to create working capital.

- Green technology and resource efficiency improvement

This incentive provides support to manufacturers investing in green technology upgrades that will lead to cleaner production. Interventions that were considered for the grant included: cleaner production, waste management, energy efficiency, renewable energy, water usage efficiency and conformity assessments. However, to date, no data is available as to the success of this grant.

- Enterprise-level competitiveness improvement (for new or increased market access, as well as product and process improvement, including related skills development).

The objective of the incentive is to enhance the competitiveness of enterprises through the enhancement of conformity assessments and improving processes, products and related skills development through the use of business development services.

MCEP has assisted companies with existing manufacturing facilities to become more competitive through better financing or through investing in new equipment. Businesses in the metal,

motoring and plastics and jewellery sectors in particular, have benefitted. The investment allowed these companies to take on the competition from global competitors.

- Feasibility studies

The purpose is to facilitate feasibility studies that are likely to lead to bankable business/project plans that will result in investment in new components or products or processes not currently manufactured or performed by the applicant or creation of new markets that will result in a substantial increase in manufactured products. The businesses supported by MCEP are expected to invest more than R24-billion in the manufacturing sectors, particularly in agro-processing, metals and chemicals (dti & IDC, 2015).

- Cluster competitiveness improvement

The purpose is to provide financial assistance to clusters and partnerships of companies, engineering services and conformity assessment services in the manufacturing industry to define and implement collaborative projects related to production and marketing. It offers the ability to create export opportunities. Exports of primary products such as iron ore, coal and agricultural products constitute the largest part of the country's exports; the Government envisions the need for the export of high value manufactured goods as a critical component to the country's growth.

9.1.2.2 Industrial Financing Loan Facilities

- Pre- and post-dispatch working capital facility

The objective of the Facility is to offer finance to manufacturers at a preferential interest rate that will lead to improved competitiveness by reducing the cost of finance. By 2013, R3bn MCEP approvals had been made, which would support industrial investments by 436 applicants and would a sustain more than 116 000 manufacturing jobs (dti & IDC, 2015) .

- Industrial policy niche projects fund

Projects that focus on new areas with potential for job creation, diversification of manufacturing output and contribution to exports, that would otherwise not be candidates for commercial or IDC funding, may be eligible for an MCEP grant that may be structured as part of the borrower's equity contribution. The MCEP has offered grants for manufacturers of e.g. food supplements, animal vaccines and nanotechnology (City Press, 2016).

9.1.3 Conclusions on Success and Failure Factors

- This government incentive scheme has been so successful that it has been oversubscribed and new applications for MCEP have been temporarily suspended with immediate effect due to the large number of applications. The R1-billion loan component of MCEP has since been reopened.
- Significant uptake of the programme is evidenced by dti approvals more than R5 billion reached more than two years earlier than the anticipated MCEP end date in 2018 (Manufacturing Circle, 2015).
- The results of the Manufacturing Circle survey support the above assertion (Ibid., 19.). Sixty-nine responses were surveyed comprising both Manufacturing Circle members and general industry participants representing a total possible forecast investment value of R3,1bn. Of the 69 applications submitted, 41 approvals were obtained for a grant value of R723m. Of the R723m approved grant value, R280m (or 40%) of claims had been submitted to dti for payment at the time of the survey and R196m had been paid.
- The MCEP covers expansions only, which means that there is a gap in support for new projects. There is support involving new and expansion projects for black industrialists, but only

for investments exceeding R30-million. Consequently, the industrywide tax incentive, 12I, is only available for projects of R30-million and above.
- Applicants indicated there was a lack of communication between the department and applicants.

9.2. Integrated Demand Management (IDM)

The programme coordinates and consolidates a variety of initiatives aimed towards promoting EE and demand reduction for sectors that include (industry and mining, commercial, residential and agriculture

9.2.1 Assumptions

9.2.1.1 Implicit

- The promotion and implementation of energy-efficient technologies, processes and behaviours amongst all consumers.

9.2.1.2 Explicit

- Solar Water Heating Programme
- Energy Service Company (ESCO Model)
- Standard Offer & Standard Product
- CFL Rollout Programme

9.2.2 Cause-impact relationships

This subsection evaluates whether the cause-impact relationships assumed by policy makers for the IDM actually occurred by analysing the indicators.

9.2.2.1 Solar Water Heating Programme

- The programme aimed to equip one million homes with SWH over a period of 5 years.
- The DoE target was to meet 50% of the S.A. residential water heating through solar water heating technology by 2020. The programme would be managed by ESKOM.
- Funding for the programme was initially provided through the National Treasury from 2009 to 2012. Funding for 2013 to 2016 was to be provided through Eskom MYPD2, but it was discontinued in October 2013 due to Eskom's financial crisis, after which the programme was halted. The DoE then placed the programme for low pressure SWHs under the control of municipalities, subject to criteria set by the DoE.
- The programme subsidized the purchase of 38 000 high pressure SWHs and 84 000 low pressure SWHs between 2008 and 2011. This resulted in energy savings of 60 GWh per annum, as well as a saving of 60kt of CO2 emissions per annum.
- The DoE Parliamentary report for 2014 indicated a total of 395 088 systems installed.

9.2.2.2 Energy Service Company (ESCO Model)

- The ESCO Model Programme considers funding for commercial and industrial sector projects that can shift electrical load outside Eskom's evening peak.
- In 2016, Eskom invited ESCOs to identify and scope opportunities to improve energy efficiency, reduce energy usage and shift energy load from evening peak to off-peak hours.

- Most Eskom funding has been distributed through a fairly small number of ESCOs. The total number of ESCOs registered is relatively high compared to many other countries where only a handful of ESCOs dominate (IDC, 2012).
- According to the DSM data provided by Eskom (dated 6 February 2012), 1 045 applications were received from 148 ESCOs for access to IDM funding. Of the 1 045 projects, 613 were completed or were being verified and a further 312 were in the implementation phase (Ibid., 21.).

9.2.2.3 Standard Offer & Standard Product

- Under this approach, the buyer offers pre-determined tariffs for delivery of energy efficiency resources from different technologies. It is different from demand side bidding where demand resources compete on price.
- Eskom indicates that 244 projects have been registered since inception, 177 in the financial year ending March 2013 (Eskom, 2013).

9.2.2.4 CFL Rollout Programme

- At the end of 2011 more than 47 million CFLs were installed, bringing about demand savings of 1,958 MW. A second phase was launched in 2015 with the target of another 5 million CFLs. The programme was launched in Gauteng on 1 March 2017.
- The programme was supported by intensive marketing and communications through the media, pamphlets and leaflets.
- The 65 million CFLs installed by January 2017 meant that 7 million tonnes of CO2 emissions were saved. This contributed to environmental sustainability.
- More than 30 000 temporary jobs were created through the programme.

9.2.3 Conclusions on Success and Failure Factors

- Eskom's IDM programme has been instrumental in stabilising the national power network through demand management and EE programmes that have significantly reduced supply constraints, while assisting customers to contain their energy costs. The IDM scheme aims to promote and implement more energy efficient technology, processes and behaviour by all electricity consumers. In addition, the programme focuses on both short-term and long-term security of electricity supply and delivery of the national EE policy objectives. For local, by the end of the 2012 financial year, the IDM programme reported verified cumulative savings of 3,072 MW (Covary & Urich, 2013).
- Due to financial constraints, a number of the Eskom IDM programmes have been placed on hold.
- The suspension of the IDM programme has had a negative impact on SMME's efforts to implement energy efficiency.
- The reduction in Eskom's IDM incentives has caused a large growth in the number of enquiries and applications received for the 12L tax incentive (SANEDI, 2016).

9.3. 12L Tax Incentive

The 12L Tax incentive, according to Income Tax Act, 1962 (Act No. 58 of 1962) provides an allowance for businesses to implement energy efficiency savings. The savings allow for tax deduction of 95c/kwh saved on energy consumption.

9.3.1 Assumptions

9.3.1.1 Implicit

- Safeguard the country's energy security through energy efficiency mechanisms.

9.3.1.2 Explicit

- Allows for tax deductions calculated at 95 cents per kilowatt hour (kWh) or kilowatt hour equivalent of energy efficiency savings.

9.3.2 Cause-impact relationships

This subsection evaluates whether the cause-impact relationships assumed by policy makers for the 12L tax Incentive actually occurred by analysing the indicators.

- Amendments to the Act now include co-generation. Where previously only waste heat recovery was claimable as savings in co-generation, the Minister has announced that co-generation in terms of combined heat and power are now claimable with the addition of captive power plant at energy conversion efficiency of the plant greater than 35%.
- Key concerns raised with the incentive in its current format is that the tax credit is only valid for one year's worth of energy savings, meaning that on average only projects with energy savings of > 1 GWh are viable. However, National Treasury has tasked SANEDI to conduct a review of the programme on its first anniversary (November 2014) to determine its effectiveness and make recommendations as to how it can be improved.
- The 12L tax structure is not streamlined with other sectors. In addition, high transaction cost makes the incentive prohibitive, such as; project preparation facilities and investment are also challenges towards the uptake of energy efficiency projects.
- 12L regulations do not make provisions for concurrent consumption or any related benefits.
- The 12L tax incentive has implications for business which entail:
    - An additional cost burden implied by the M&V body which can be as high as 10% of the project costs.
    - The Act does not stipulate how charges are set and therefore are left at the discretion of the specific M&V body.
    - The financial viability of registering a project under the 12L or against another state-led incentive such as the MCEP is an obstacle, as the 12L regulations do not make provisions for concurrent consumption or any related benefits.

9.3.3 Conclusions on Success and Failure Factors

- The 12L tax incentive is an opportunity to increase business profits through reduced energy costs and tax reductions. The incentive ultimately serves to stimulate energy performance improvements.
- The incentive has resulted in a total investment in the manufacturing sector of approximately R48 billion, with 14 projects fully implemented and approximately 1.5 TWh of energy saved on an annual basis (SANEDI, 2016).
- The process of applying for the 12L Tax incentive be very challenging to business.

- There is an additional cost burden implied by the M&V body which can be as high as 10% of the project costs.
- The Act does not stipulate how charges are set and these decisions are left to the discretion of the specific Measurement &Verification (M&V) body.
- The financial viability of registering a project under the 12L or against another state-led incentive such as the MCEP is an obstacle, as the 12L regulations do not make provisions for concurrent consumption or any related benefits.
- The incentive is not available to small-scale EE projects, as SMMEs generally do not qualify.

9.4. The Green Energy Efficiency Fund (GEEF)

The Green Energy Efficiency Fund was launched by the Industrial Development Corporation (IDC) in partnership with the German Development Bank (KfW). The funding aims to encourage investments in EE and renewable energy projects to support the transition towards a low-carbon economy.

9.4.1 Assumptions

9.4.1.1 Implicit

- Improving South African SMMEs' energy efficiency and the country's green economic development.

9.4.1.2 Explicit

- Improved energy efficiency through reduced energy consumption, facilitating South Africa's transition towards a low-carbon economy.
- Long-term enterprise competitiveness and job creation through energy savings.
- Support of self-use renewable energy technologies in South Africa.
- Continued contribution to global climate protection, while supporting South Africa's economic development and growth.

9.4.2 Cause-impact relationships

- GEEF gives loans to entrepreneurs and businesses that want to invest in energy efficiency and renewable energy technologies. Priority is given to companies with yearly revenues of less than R51 million, with assets of less than R55 million and employing no more than 200 people.
- GEEF gives loans to entrepreneurs and businesses that want to invest in energy efficiency and renewable energy technologies. Priority is given to companies with yearly revenues of less than R51 million, with assets of less than R55 million and employing no more than 200 people.
- Between 2011-2014, 19 projects had been approved, with a projected annual energy saving of 388.6 MWh, and an associated reduction in Greenhouse Gas emissions of 385.1 tons CO_2-equivalent per annum. In the 2014-15 financial year 12 projects totalling R366 million were approved, which were assumed to achieve 523 000 MWh in energy savings annually, and an associated reduction in greenhouse gas emissions of 480 000 tonnes CO_2–equivalent per year (DEA, 2017).

9.4.3 Conclusions on Success and Failure Factors

- The Fund has been well-subscribed, but not enough projects have benefited.
- There is an opportunity for energy start-ups to access finance from the IDC which is offered at a reduced interest loan (prime -2%), which eases the financial burden on SMMEs.
- The Fund offers a long payback term of up to 15 years, thereby easing the debt burden of companies.
- The GEEF supports the introduction of self-use renewable energy technologies.

9.5. The Green Fund

The Green Fund provides catalytic finance for green initiatives that support South Africa's transition towards a green economy and the overall NDP mandate of poverty reduction and job creation.

9.5.1 Assumptions

9.5.1.1 Implicit

- To support Green Initiatives that contribute to the country's transition towards a low-carbon and resource-efficient path.

9.5.1.2 Explicit

- Promoting innovative and high impact green programmes and projects
- Reinforcing climate policy objectives through green interventions
- Building an evidence base for the expansion of the green economy, and
- Attracting additional resources to support South Africa's green economy development

9.5.2 Cause-impact relationships

This subsection evaluates whether the cause-impact relationships assumed by policy makers for the NGP actually occurred by analysing the indicators.

- A total of 590 funding applications for potential sustainable-development projects worth R10.9-billion had been received by the Green Fund by 2013.
- The Green Fund has identified three (3) thematic funding windows:
    - Green Cities and Towns (GCT)
    - Low Carbon Economy (LCE)
    - Environmental and Natural Resource Management (NRM)
- The Fund notes on its website that as of 2016, it has fully committed its funding allocation and would therefore only consider new applications through a request for proposals once the replenishment of the new funding allocation has been confirmed (DEA, 2016).
- By 2016, the Fund had approved 55 projects and disbursed R 782 million (DEA, 2017).
- The Fund is beginning to see encouraging performance results regarding environmental, social and economic impacts, consistent with its mission and objectives, e.g. 7451 training opportunities presented as a result of Fund investments (DBSA, 2015).
- Some 8,857 people have been trained via Green Fund projects (DEA, 2017).
- Job creation and capacity building have been key for the Green Fund. To date, it has created 2,355 direct jobs and 9,285 indirect jobs.

9.5.3 Conclusions on Success and Failure Factors

- The Green Fund has been unable to gain traction in provinces such as the Northern Cape and Mpumalanga, but otherwise it has reached national footprint in its programmatic support (DBSA, 2015).
- The significant demand for green finance is illustrated by the overwhelming response to the public calls for proposals (Ibid.).
- Strategic partnerships with key stakeholders have been critical to the success of the funded initiatives.
- The Fund offers opportunity to be instrumental in the development of the country's green finance architecture and its articulation with global funds such as the Global Environmental facility (GEF) and the Green Climate Fund (GCF) (DBSA, 2015).
- Job creation and capacity building have been key for the Green Fund (DEA, 2017).
- A number of green economy sectors are being supported: notably sustainable waste management, renewable energy, sustainable land use management, green buildings (DBSA, 2015).
- The strength of the Fund has been its willingness to fund new and emerging green technologies (DEA, 2017).

10. Appendix D: Stakeholder Survey Response Summary

The purpose of this stakeholder engagement is to discuss the change in the energy landscape in South Africa and ways to improve the policy incentive environment to increase the uptake of EE in South Africa. The stakeholder engagements also addressed the barriers that prevent scaling up EE in SA. The various responses from the engagements were essential tools for the identification of barriers of EE and drafting the recommendations. The responses from the engagements are summarised in the following section:

10.1. Sanedi

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Summary of the Interview

- There is still a lot of room for improvement in terms of coordination between the private and public sector.
- Proper co-ordination and inter-governmental activities will enable closer engagement between the private and the public sector.
- Policing of existing policies and the finalisation of pending policies, is necessary; such as Energy Performance Certification for public buildings, more regulations on EE, in particular the SMME sector, and the mandatory reporting of energy consumption and improvement plans for large users of energy.
- The 12L tax incentive needs to be further streamlined with other sectors together with the approval of other taxes for the energy sector.
- Public awareness and education initiatives also need to be increased and must be ongoing and repetitive in nature.
- Inclusion of EE in the school Curriculum can also develop EE awareness at an early stage.
- Most businesses have a had positive response in terms of getting an energy rebate, except for those that are specifically excluded from current regulations, e.g. the residential sector and renewable energy projects.
- More programmes that are more aligned with EE need to be developed in South Africa.
- Include EE in school curricula and introduce organised EE exhibits at conferences and trade fairs.

10.2. National Regulator for Compulsory Specifications

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Summary of the Interview

- Further investigation of tax incentives is needed which will further stimulate the uptake of EE. Suggestions include; to allow tax-deductible investments, reduction on excise duty, etc.
- Public awareness and education initiatives also need to be increased and must be ongoing and repetitive in nature. Inclusion of EE in the school Curriculum can also develop EE awareness at an early stage.
- In terms of public awareness initiatives there was a delay or a lag in starting the education and awareness with respect to users, manufacturers, and suppliers. There is still not enough awareness and education, especially with consumers.
- An energy management policy within institutions/organisations is a good strategy to show commitment by the organization on energy management. Having an energy management policy is a good and necessary route for all companies to follow. This may also include MOUs being drafted.
- Institutional capacity is a concern as most institutional capacity to scale up EE initiatives is still lacking.
- However, considering existing legislation the enforcement remains lacking. There is a need for follow-up in terms of legislation and implementation. More work needs to be done on policies and they need to be correctly implemented and properly 'policed'.
- Development of appropriate/innovative financing schemes to incentivise banks to provide loans to EE projects with longer payback periods.
- MEPS should be broadened to include appliances that are commonly used in the public sector (such as large-scale cooking and heating appliances).
- EE labels and MEPS should be frequently revised to ensure that the best EE category is only available for the "best not yet available technology".

10.3. National Cleaner Production Centre of South Africa/CSIR

Authority/Institution	NCPC/CSIR
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Summary of the Interview

- SA requires more mechanisms that provide for ongoing stakeholder engagement, as a crucial component of an overall EE governance system.
- There is need for the development of comprehensive public information campaigns and promotions to extoll the virtues of EE.
- Political will and commitment from various Government departments are essential if EE is to become a national priority.
- Mandates seem to be spread around different departments and agencies which needs a better degree of coordination.
- In terms of regulations, some gaps still exist, for example with respect to penalties and end-of-life regulations.
- Having legislation focused on EE would help SA meet its Paris Agreement Accord commitments.
- Further investigation of tax incentives is needed which will stimulate the uptake of EE: Suggestions include tax-deductible investments, reduction on excise duty, etc.

10.4. University of Cape Town (Energy Research Centre)

Authority/Institution	University of Cape Town (Energy Research Centre)
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Summary Interviews

- It is very clear that market structures and access to finance have been barriers to upscaling EE in SA. A healthy market structure would reflect energy policy (and vice-versa), but this is not the case in SA, where many reforms stipulated in the 1998 Energy White Paper have not been introduced.
- Structural inadequacies also have led to Eskom's bad pricing of electricity (prices stagnated from 1994 – 2008) until a programme for new supply capacity required a sharp increase in unit prices, which affects financing of EE in a number of ways. It is less clear how financing affects EE in SA because there are different issues that affect public or private funding of EE, and also for different technologies.
- There has been some prioritisation of EE in SA, with the implementation of Eskom's EEDSM programmes. However, experience of the Measurement and Verification role (within those programmes) is that the (resource and financial) support for these programmes has diminished along with SA's improved electricity supply capacity.
- There are aspects of EE that affect different technologies and environments in different ways.
- There is not enough sharing of public data, or publicly funded data.
- The stakeholder's own experience of Eskom's EEDSM programmes is that there is a strong policy of not sharing data in case company IP or sensitive data is released. However, this priority can lead to unnecessary secrecy and possibly manipulation, unless there are appropriate forums available that can deal with issues that arise. Therefore, it is always important to understand the role of information and awareness in any project or programme, and to address this with suitable feedback structures and clearly stipulated priorities.
- South Africa still suffers from institutional capacity constraints to implement EE policy in the public sector and relies significantly on private capacity.
- Development of clear and appropriate institutional mandates for EE is necessary.
- There should be an increase in financial and human resource capacity of key institutions participating in EE, such as the DoE, SANEDI and SABS.

10.5. Industrial Development Corporation (IDC)

Authority/Institution	IDC
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Summary Interview

- The current legislative and regulative structure does not enable the achievement of a low carbon economy. The regulatory framework needs to be strengthened to show a commitment towards a low carbon economy.
- Appropriate schemes to incentivise banks to provide soft loans with longer payback periods, is required; therefore, SA needs to develop appropriate/innovative financing schemes to incentivise banks to provide loans to EE projects with longer payback periods.
- Stakeholder engagements need to be repetitive in nature, as currently stakeholder engagements are limited.
- Still a lack of awareness among consumers.
- The current legislative structure still has gaps that need to be addressed.
- There is need for the development of comprehensive public information campaigns and promotions to extoll the virtues of EE.
- More emphasis needs to be placed on penalties and regulations which will help with the uptake of EE.
- Many reforms which were stipulated in the 1998 Energy White Paper have not been introduced.
- There is need for a follow up in terms of legislation and implementation. More work needs to be done on policies and they need to be correctly implemented.

10.6. Department of Environmental Affairs

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Summary of the Interview

- The government through DEA set up the Green Fund to provide catalytic finance to facilitate investment in green initiatives that will support poverty reduction and job creation. DBSA is the implementing agency.
- The 12L tax incentive needs to be further streamlined to other sectors together with the improvement of other taxes for the energy sector.
- Agreements between financial institutions and government need to be developed and implemented which will enable the development of EE markets and the identification of issues related to this market development.
- Skills shortages in the private sector should be addressed.
- Policies should be developed that sways the behaviour of consumers choices to more energy efficient decisions.
- SA requires more mechanisms that provide for ongoing stakeholder engagement, as a crucial component of an overall EE governance system.
- South Africa still suffers from institutional capacity constraints to implement EE policy in the public sector and relies significantly on private capacity.
- The development of clear and appropriate institutional mandates can ease the challenges of institutional capacity together with skills development and training.

10.7. Department of Human Settlements

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Summary Reponses

- Proper co-ordination and inter-governmental activities will enable closer engagement between the private and the public sector.
- In terms of regulations, some gaps still exist.
- Having legislation focused on EE would help SA meets its Paris Agreement Accord commitments.
- Developing database(s) containing information on building certification and systems inspections as an information source on the energy performance of buildings.
- More investment in Research and Development is necessary.
- Local EE policies need to be aligned with international policies as models of best practice for the local EE milieu is currently limited.
- There is a need in the South African EE market for skills development and accreditation of professionals to bridge the skills gap and provide for growth in the industry.
- Skills shortages in the private sector should be addressed via dedicated sector programmes by capacitating tertiary institutions, SETAs and research institutes.
- There are not comprehensive promotional campaigns to raise public awareness of EE.
- It is important to obtain public support for energy reforms which will enable an early buy in for EE initiatives.

10.8. National Treasury

Authority/Institution	National Treasury
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Summary Responses

- National Treasury has implemented an Energy Efficiency Savings Tax Incentive (section 12L of the Income Tax Act) which is administered by the South African National Energy Development Institute (SANEDI). This tax incentive is structured in a way allows SMMEs' participation.
- In terms of engagement with the private and other key government departments to ensure that EE objectives are achieved, National Treasury has an open-door policy for engagement and industry always engages Treasury when there are issues with any of the policies.
- On the 12L, Treasury has engaged extensively on the incentive from the design phase, to implementation and post-implementation phase. It held road shows on the 12L in the various provinces together with the Department of Energy in 2014 and again in 2017.
- Treasury also monitors how well the incentive is working and have even worked on an explanatory memorandum with the South African Revenue Service to clarify some issues on the 12L.

10.9. Eskom

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Summary Responses

- At the moment, Eskom is not actively involved with efficiency legislations, regulations and standards in the residential and commercial sector. Energy Efficiency Demand Side Management (EEDSM):2004 is the policy by NERSA that mandated Eskom to implement the type of projects.
- There used to be the National Energy Efficiency Strategy (NEES) signed by DoE for the reduction of energy in the Power Generation Sector, however this ended in 2015. There is work in enhancing Eskom's Internal Energy Efficiency strategy.
- In terms of the uptake of energy efficiency in the residential and commercial sector, Eskom is busy implementing the CFL exchange programme specifically targeted at the residential sector. There are no plans for the commercial sector at the current moment.
- There should be more awareness, training and incentives for black owned (BO) companies to be more active in the Energy Services Companies (ESCO) space, particularly in enhancing energy efficiency. Every energy saved or reduced by an energy efficient intervention results in the energy not generated and amount of coal and other resources not used, thereby contributing positively emissions targets. It is also possible to contribute towards achieving the commitments made in the Paris Climate Accord by exchanging coal powered stoves for electric and gas stoves. Eskom IDM is in the process of developing this programme.
- In order to develop a Super ESCO to foster the scale up of EE, there should be a focus on BO companies. As there are tariff increases for electricity and other fuel sources, so should their increased programmes to up skill BO companies. This, however, does not necessarily mean that Eskom should be the driver of such programmes. Engagement with Businesses to ensure that there is wider use of existing ESCOs, which will improve competition and the development of the of the industry. Government departments and public works can encourage the industry by establishing a special panel of suppliers that look at efficiency in their buildings (Refurbishment and New Build) projects.
- IDM would regularly implement education and awareness campaigns around the country to promote energy efficiency. These campaigns would include making presentations at conferences, advertising on various media platforms, implementing activations at various public areas, schools and universities, etc. As part of the ESCO program, it was a requirement that ESCOs train and subcontract with black owned ESCOs. The aim was to increase participation of BO companies in the ESCO programme.

- There has been a large amount of businesses and individual households that have turned efficient on their own funding due to awareness from Eskom, an example of an effective tool used by Eskom is the Power Alert used during load shedding periods.
- Energy efficiency is a priority for Eskom, especially with regards to enabling the reduction of environmentally harmful substances being released from Eskom's power plant. Currently there is the CFL exchange programme that is being rolled out. With Eskom's financial constraints, other programmes have been slow to implement but as strategies are being enhanced, it is expected that there will be a greater uptake of energy efficiency, especially internally within Eskom. Eskom also has embarked on its own internal energy efficient programme which aims to uplift energy efficiency awareness/culture and implementation in its plant and buildings.
- IDM is in the process of enhancing an energy efficiency programme, with the focus being enhancing energy efficiency internally within Eskom as mentioned above. There are no immediate plans to stimulate energy efficiency externally to the sectors, however depending on the Eskom business needs and funding there may consideration.
- Regarding the policies and incentive programmes in South Africa, further investigation would be a step to stimulate the uptake of energy efficiency, however, given Eskom's current situation, Eskom would not be able to commit financially to the investigations unless to be used internally within Eskom.
- While Eskom networks were constrained and were not able to meet demand, it was necessary for Eskom to implement energy efficiency programmes across all sectors. Now that Eskom is able to meet demand, the sectors should continue to seek opportunities to consume electricity efficiently to avoid the network being constrained once again. However, the driver of these initiatives does not necessarily have to come from Eskom.

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