



ENERGY IN SOUTHERN AFRICA



Energy Efficiency Key to the SADC Industrialisation Agenda

Introduction

Energy efficiency (EE) has become an important consideration and innovative way of reducing energy consumption and use. This is particularly critical for the Southern African Development Community (SADC), which is facing crippling challenges in meeting its energy requirements due to a combination of factors that has resulted in rising energy costs and low access to clean and affordable energy across the region, among others. Ultimately, inadequate access and supply of energy has affected the pace of regional integration and industrial development. For example, the SADC Industrialisation Strategy and Road Map (2015 – 2063), aims to increase Competitiveness (at the firm/industry, country and regional level) with a quantitative goal to lift the regional growth rate of real Gross Domestic Product (GDP) from 4 percent annually (since the year 2000) to a minimum of 7 percent a year.

However, to attain this goal, there is need for SADC to adopt energy efficient technologies to reduce the cost of production, making industries competitive and minimise greenhouse gas (GHG) emissions that contribute to climate change. The region through the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE), is developing a regional SADC Industrial Energy Efficiency Programme (SIEEP) in support of the SADC Industrialisation Agenda as part of its overall EE programme. This policy brief, therefore, presents the current status of industrial EE in the SADC region including barriers and opportunities, including, some of the key interventions proposed by the SIEEP to assist the SADC region's industrial sector to utilise energy efficiently in a cost effective manner for its economic development and sustainable development agenda.

Brief Background on SACREEE and SIEEP

SACREEE was established by the SADC ministers responsible for energy in 2015 as a subsidiary agency of the SADC Secretariat with a mandate to contribute to:

- Increased access to modern energy services, and
- Improved energy security across the SADC region.

The centre is also expected to contribute substantially to the development of thriving regional renewable energy (RE) and EE markets through knowledge sharing and technical advice in the areas of policy and



regulation, technology cooperation, capacity development, as well as investment promotion. Based in Windhoek, Namibia, the centre is supported by the Austrian Development Agency (ADA) and the United Nations Industrial Development Organisation (UNIDO).

The SIEEP, which is funded by the European Union (EU) through its Technical Assistance Facility (TAF), is meant to support the implementation of the SADC Industrialization Strategy and Roadmap, 2015-2063. The SIEEP will contribute to the competitiveness of the industrial sectors of SADC Member States by building their capacity to adopt, invest and utilise EE technologies and practices. The target group are medium and large scale industries. The objectives of the Program (SIEEP) contributes to the region's goals of:

- Energising SADC towards adequate, reliable, least cost and environmentally sustainable energy service; and
- Long-term transformation of the SADC economy and creating the knowledge economy of the future.

Regional Status on Energy Efficiency

The Scoping and Assessment Study of SIEEP conducted in 2017 revealed that the performance of industries in the region is low based on capacity utilisation and other measures. This is attributed to the poor global economic environment, ageing infrastructure, labour issues, shortage of energy and quality of supply, and high energy costs. In all countries, food and beverages, agro-based industries and those based on natural resources such as forestry are operating at

relatively high capacity levels and are least affected by changes in national and global economies.

The general state of play in the region is that little effort has been made in the industrial sector regarding industrial EE, save for a couple of countries such as Mauritius and South Africa that have achieved a significant level of success in the promotion of EE through a combination of governmental incentives (policies, regulation and tax incentives) and of private sector led initiatives.



The industrial sector has been the least active in developing and implementing EE measures compared to other sectors in the SADC region. The lack of activities towards industrial EE can be attributed to the general lack of guiding policy frameworks for EE. The Scoping and Assessment study identified that the majority of countries in the region do not have dedicated policies and strategies to address EE as illustrated in Table 1, below:

In the last few years, two significant programmes covering industrial EE were implemented at regional level. The two programmes are the SADC Industry Management Programme (SIEMP) and the Efficiency Energy Management Programme in Southern Africa (EEMP), both implemented to promote EE awareness and capacity building in industry. The objective of SIEMP, which was funded by the Canadian International Development Agency (CIDA) was to promote energy management in industry through delivery of training of trainers and production of training manuals and material on energy management. Some of the achievements realized by the SIEMP that ran from 1994 to 1998 included the training of technicians and engineers in the selected industries and the conduction of numerous basic energy audits and introduction of some level of energy management.

Table 1: SADC MS energy statistics, policy framework and economic contribution of manufacturing sector top GDP

Country	Electricity Access rate % ¹	Energy Policy in place (year)	EE Policy / strategy/ action plan /master plans in place (year)	EE Target- National & Industry % savings	RE Policy strategy/action plan/master plan/ Act in place (year)-	RE Target Total/grid share (%)	REFIT (year)	Net metering exists	Subsidized Industrial tariff in USD cents ² ***	Financial incentives for EE measures in industries	Share of industry in energy consumption %	Share of manufacturing sector in GDP (2016) ³
Angola	32	2011					D		6.37		8	5.4 (2015)
Botswana	56	D	2016 S	10N	2016S				5.7		18	6 ⁴ (2015)
DRC	14	2013							5.6		16	18
Lesotho	28	2003							2.0		36	10 (est)
Madagascar	17	2015		60 ⁵ ***					7-8	P	19	15
Malawi	12	2003							2.7		26	10
Mauritius	100		2011A/ 2016 MP/IN	10N					16.5	CL	26	14.1
Mozambique	21	2009S							1.8		20	10
Namibia	50	2017	IN		2017	70 by 2030 (NDC)	E	T	9.2-16.2 ⁵		12	
Seychelles	100	2012 S 2012A							25-30 ⁶		28	15.3 (2014)
South Africa	86		2016S IN	15I	2011P		CB	T	8-10	CL/TR	39	13
Swaziland	65	2017D	2017(P) D			32 by 2030		2017D	7.1		52	36 (2014)
Tanzania	16	2010S	(A)D	20(electricity)					7.0		15	6 (18 ⁷)
Zambia	28	2008					D	+D	1.5-3.3		32	11
Zimbabwe	40	2012	IN		2017D IN				7.0		8	10

D- draft; P- Policy, IN- dedicated RE/EE institution, S- Strategy, A- action plan; CL Credit Line; TR- tax rebate, I Industry share; T- Trail net metering in municipality (South Africa) and Regional Electricity Distributor region (Namibia); N- national, I-industry, CB- competitive bidding; E-exists; p-pending; The tariffs are for energy charge only and does not include max demand and fixed charges; *** industry penetration not energy improvements; NDC – Nationally Determined Contributions.

¹ Source of electricity access data is SE4ALL Global Tracking Framework database 2017 and validated by the MS during the SIEEP design.

² Estimated from various sources and converted to USD cents using exchange converter.

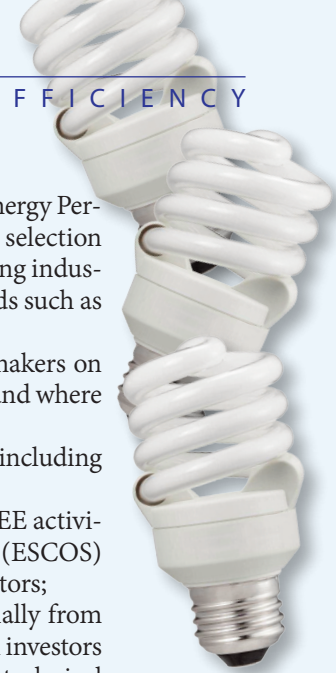
³ Majority of figures from <https://data.worldbank.org/indicator/NV.IND.MANF.ZS>

⁴ 31% including mining

⁵ Mining is 9USD cents/kwh then commercial/industrial is 16.2 USD cents/kwh

⁶ Spanning range of maximum demand level

⁷ Figure from consultation is 18% from literature review is 6%



The objective of the EEMP funded by the EU from 2007 to 2014 was to create and enhance awareness on the value of energy management among Small to Medium Enterprises in selected sectors to improve their energy consumption and improve their competitiveness thus ensuring long term sustainability of energy usage. Monitoring of energy consumption was key in the programme to identify the need for replacing existing inefficient equipment and installation of integrated renewable energy systems.

In as much as the regional programmes were useful in creating awareness and building some technical capacity of a few consultants, their sustainability was not ensured. The design and development of SIEEP, which will set an agenda for the region's industrial efficiency programme, will be informed by these and other past activities.

Opportunities and Challenges

Opportunities exist in the industrial sector to reduce energy intensity and improve EE in their operation. The SIEEP has identified the following possible actions to increase EE in the industrial sector across the SADC region:

- ❖ Implementation of energy audits to identify opportunities for energy reduction;
- ❖ Benchmarking energy use in different sectors of activity and setting targets;
- ❖ Ensuring that EE policies, strategies, action plans are put in place;
- ❖ Involvement of the private sector and creation of industries in the region producing energy efficient technologies;
- ❖ Creating awareness to the industry community about the benefits of EE through demonstration programmes;
- ❖ Setting up energy services companies to deal with energy audits, monitoring and verification; and;
- ❖ Imbedded power generation from RE facilities to offset electricity uptake from the grid.

In most member states a number of barriers still exist for mainstreaming EE in industries. Most countries are affected by inadequate power supply and lack of investment in new EE equipment and technologies. There is still lack of dedicated or comprehensive EE policies, strategies and action plans in the countries to promote EE. In some countries, EE appears in the National Energy policies but without any action plans or targets which makes it difficult to guarantee their implementation and measure effectiveness. The level of cooperation between government and the private sector is lacking in most of the Member States. The other issue is the lack of coordination and limited dialogue among the different market players. The low tariffs which are not cost-reflective as well as subsidies do not incentivise EE investments. Furthermore, some of the main challenges include:

- Lack of EE standards such as Minimum Energy Performance Standards (MEPS) to guide the selection of technologies, and low capacity in guiding industry to adopt energy management standards such as ISO 50001;
- Lack of understanding by key decision makers on the use of energy by the industrial sector and where opportunities exist for EE;
- Limited expertise in energy management including conducting energy audits;
- Low involvement of the private sector in EE activities such as Energy Service Companies (ESCOS) due to the small market, among other factors;
- Limited financing facilities for EE especially from local commercial banks and direct foreign investors (DFI's) due to lack of awareness as well as technical expertise in assessing energy efficiency projects;
- Complexity of integrating EE applications and technologies including solar thermal applications;
- Lack of regulatory frameworks allowing for self-generation of renewable energy; and;
- Limited use of Measurement and Verification in energy efficiency projects.

Legal and Institutional Landscape

Despite the challenges and opportunities, there are a number of legal documents, policies and institutional frameworks, aimed at facilitating availability of energy and energy security for the SADC region. The main existing frameworks are:

- ❖ The SADC Treaty (1992);
- ❖ The SADC Protocol on Energy (1996);
- ❖ The SADC Energy Cooperation Policy and Strategy (1996);
- ❖ The SADC Energy Action Plan (1997) and (2000);
- ❖ The SADC Regional Energy Access Strategy and Action Plan (2010);
- ❖ The SADC Regional Indicative Strategic Development Plan (RISDP) 2010 to 2020;
- ❖ Revised Infrastructure Development Master Plan (2015 – 2020);
- ❖ The SADC Industrialisation Strategy and Roadmap (2015 – 2063); and,
- ❖ The 2015 Renewable Energy and Energy Efficiency Strategy and Action Plan (REEESAP).

These frameworks have, to a certain extent, created an enabling environment for investment in the energy sector and economic cooperation among the SADC Member States. The Directorate for Infrastructure at SADC Secretariat is tasked to coordinate developments in the energy sector through the Energy Division.

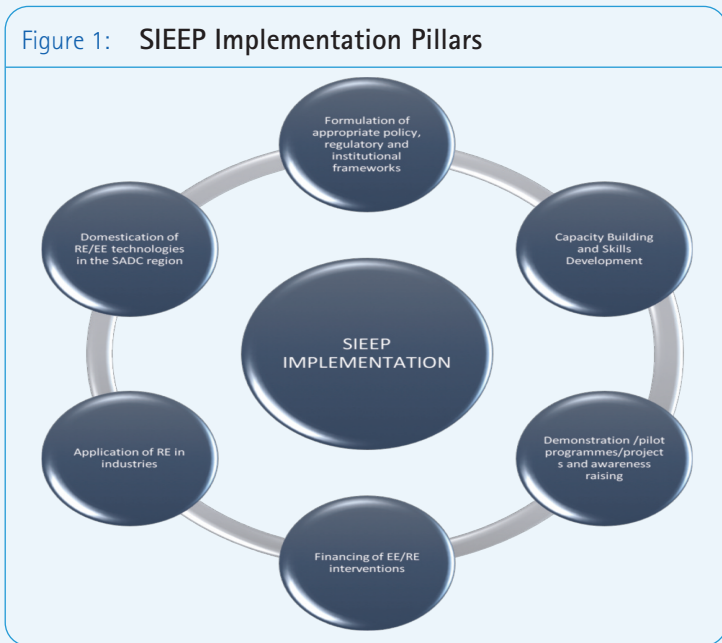
Structuring and Implementation of SIEEP

Based on extensive consultations with Member States, industry and other key stakeholders, the need to develop a regional industrial EE programme was high-



lighted to be long over-due. The design and implementation of SIEEP will be focussed on addressing the barriers and gaps and seize opportunities identified in the scoping and Assessment Study. The Programme will be based on the following six (6) pillars as summarised in Figure 1, below:

Figure 1: SIEEP Implementation Pillars



The SIEEP will also contribute to previous and on-going efforts to establish the role of RE and EE in improving access to energy.

Policy Options/Way Forward

To ensure a sustainable regional industrial EE programme for the region, Member States are encouraged to develop clear EE policies and strategies for their implementation. The policies should have targets for the industrial sector. The SIEEP will inform the formulation of such policy environment as it pertains to industry. In creating policies, SIEEP will assist

SADC Member States to articulate standards, regulations, incentives, tariff structures and mechanisms such as, net-metering for self-generation. The SIEEP can assist Member States to develop legislations that will ensure EE is adopted to ensure security of energy supply in the region. Legally binding directives with targets to be met by the SADC region and Member States should be considered by SIEEP. The SIEEP will ensure that there is support to financial institutions to develop financial packages and mechanisms for business opportunities in energy efficiency in industry. Voluntary or mandatory approaches can be adopted working in partnership with the regional standards bodies, such as SADC Cooperation in Standardisation (SADCSTAN) and the involvement of the private sector.

Conclusion

In as much as the foundation for regional collaboration in developing a sustainable energy sector has been laid though the SADC Energy Protocol of 1996, the 2013 SADC Regional Indicative Strategic Development Plan, among other regional policy instruments, very limited programmes have been initiated to promote EE in the region. The region has an enormous task of transforming its energy supply towards a low carbon economy as well as its industrial sector to make its companies and products cost competitive. It is very clear that energy plays a significant role in the overall manufacturing costs, hence EE can contribute to improved industrial competitiveness. Targeting the industrial sector for SIEEP is the right choice especially with the importance the SADC region has placed on its industrialisation efforts. There are recommended pillars, objectives and Actions for SIEEP to elaborate with the engagement of key stakeholders to ensure ownership of the programme. The SIEEP will support the Member States to achieve their targets for Sustainable Development Goals by doubling the rate of improvement in energy efficiency.

THIS POLICY BRIEF is produced by SARDC and SACREEE through the project on Communicating Energy in Southern Africa supported by the Austrian Development Agency (ADA)/Austrian Development Cooperation (ADC). SACREEE is established through the support of SADC Secretariat, ADA and the United Nations Industrial Development Organisation (UNIDO). Responsibility for the content of this brief lies entirely with the authors. The information and analysis does not reflect the official opinion of ADA/ADC. April 2018



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