

SADC Energy Investment Yearbook 2017





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Austrian Development Cooperation



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PREFACE

The SADC Energy Investment Yearbook 2017, the second in the series, profiles the major investments in the energy sector in the Southern African Development Community (SADC). The energy sector is one of the most important enablers for the integration agenda of the region, particularly now that SADC aims to industrialize its economy. Beyond its general use in daily life, energy catalyses infrastructure projects that drive socio-economic growth.

Recognizing the fundamental role of energy in accomplishing its goals, SADC has developed various policies, strategies, programmes and projects to make the energy sector attractive so that it meets its objective of ensuring "the availability of sufficient, least-cost, environmentally sustainable energy services." In this regard, the main aim of this publication is to highlight progress made towards attracting investment in the energy sector.

Lack of investment for energy projects has been identified as one of the challenges affecting the sector. To this end, SADC convened a special conference in Ezulwini, Kingdom of Swaziland, in July 2017 to present its multi-billion-dollar energy infrastructure development plan to potential funders. The energy conference showcased a chest of priority regional energy projects and discussed challenges facing the sector in attracting investment.

The priority projects are contained in SADC Energy Sector Plan of the Regional Infrastructure Development Master Plan 2012-2027. The Energy Sector Plan estimates the total cost of new electricity generation capacity for the region to be in the range US\$114 billion to US\$233 billion between 2012 and 2027. The related transmission investment costs to support the new generation capacity are estimated at about US\$540 million. The investment in transmission projects does not include planned transmission interconnectors and national backbone lines.

The *SADC Energy Investment Yearbook 2017*, underscores the need and importance for Member States to double their efforts in attracting investment to the energy sector and increase investment in energy provision for both domestic use and export to regional partners to deepen cooperation and integration.

Produced by the Southern African Research and Documentation Centre (SARDC) in consultation with the Energy Division at the SADC Secretariat, the SADC Energy Investment Yearbook 2017 is intended for policy-makers, officials of SADC Member States, the SADC Secretariat and its subsidiary organizations as well as international cooperating partners, the private sector and investors, researchers, academic institutions and the media.

It is our sincere hope that all stakeholders will find this publication useful in the conduct of their activities and that it will provide valuable information for current and future planning. The publishers of this yearbook will continue to engage all stakeholders in the energy and the investment communities to ensure that the contents of the yearbook can be further enriched in future editions and that recommendations are made available for policymakers to consider for implementation.

Finally, we wish to thank all individuals and organisations who contributed to the production of this publication.

SARDC

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The SADC Energy Investment Yearbook 2017 is the second edition following the inaugural edition for 2016. This book constitutes part of a valuable knowledge resource, together with the SADC Energy Monitor 2016, a series of policy briefs on energy and renewable energy, an energy portal available on www.sardc.net, and a number of feature articles on energy and related regional integration issues. The development of this knowledge resource was undertaken jointly with the SADC Secretariat through the Energy Division and subsidiary organisations in the Energy Sector.

These knowledge products are produced under the project "Communicating Energy in Southern Africa" whose purpose is to create and maintain a functional network platform for information sharing and knowledge dissemination that contributes to informed decisions about the implementation of policies and strategies in SADC.

SARDC would specially like to thank all stakeholders who contributed to the successful completion of this book. We are indebted to the SADC Secretariat Energy Division who were a highly valued resource and guided navigation of the various investment issues faced by the Energy Sector.

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SARDC



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ACRONYMS

ACTFCN	Africa Climate Technology Finance Centre and Network
ADA	Austrian Development Agency
ADC	Austrian Development Corporation
AfDB	African Development Bank
ANNA	Angola-Namibia Interconnector
BOSA	Botswana-South African Interconnector
BP	British Petroleum
BPC	Botswana Power Corporation
BRICS NDB	BRICS New Development Bank
BRICS	Brazil-Russia-India-China-South Africa
CABGOC	Cabinda Gulf Oil Company Limited
CBIPPPP	Coal-Based Independent Power Producer Procurement Programme
CIF	Climate Investment Fund
CODA	China Overseas Development Agency
COIDICChina	Overseas Infrastructure Development and Investment Corporation
CPF	Country Partnership Framework
CSP	Concentrated Solar Power
DAM	Day Ahead Market
DBSA	Development Bank of Southern Africa
DFID	Department for International Development
DFIs	Development Finance Institutions
DRC	Democratic Republic of Congo
EAPP	Eastern Africa Power Pool
EdM	Electricidade de Moçambique
EE	Energy Efficiency
EEP	Energy and Environment Partnership
EGP	Enel Green Power
ESI	Electricity Supply Industry
ESIA	Environment Social Impact Assessment
ETG	Energy Thematic Group
EU	European Union
FSDE	Fundo Soberano de Angola
FUNAE	Fundo de Energia
GCF	Green Climate Fund
ICCB	Industrial and Commercial Bank of China
ICPs	International Cooperating Partners
IEA	International Energy Agency
IGMOU	Inter-Governmental Memorandum of Understanding
IIPSA	Infrastructure Investment Programme for South Africa
IPPs	Independent Power Producers
JICA	Japan International Cooperation Agency
kt	kilo-tonnes
LEC	Lesotho Electricity Company
MOZISA	Mozambique-Zimbabwe-South Africa Interconnector
MW	Mega-watts
NEF	National Electrification Fund
NESC	National Electricity Standard Connection



OPPPI	Office for Promoting Private Power Investment
PAU	Project Advisory Unit
PPAs	Power Purchase Agreements
PPPs	Public Private Partnerships
PSAs	Production Sharing Agreement
PV	Photo-voltaic
RDF	Regional Development Fund
RE	Renewable Energy
REA	Rural Energy Agency/Authority
REARESA	Regional Association of Energy Regulators for Easter and Southern Africa
RECs	Regional Economic Communities
RED	Reginoal Electricity Distributors
REDI	Regional Economic Development Institute
REEESAP	Renewable Energy and Energy Efficiency Strategy and Action Plan
REF	Rural Electrification Fund
REFiT	Renewable Energy Feed-in-Tariff
REIF	Renewable Energy Investment Facility
REN21	Renewable Energy Policy Network for the 21st Century
REP	Rural Electrification Programme
RERA	Regional Electricity Regulators Association of Southern Africa
RIDMP	Regional Infrastructure Development Master Plan
RISDP	Regional Indicative Strategic Development Plan
RSS	Road Safety Secretariat
SACREEE	Southern African Centre for Renewable Energy and Energy Efficiency
SADC	Southern African Development Community
SAPP	Southern African Power Pool
SARDC	Southern African Research and Documentation Centre
SDGs	Sustainable Development Goals
SE4All	Sustainable Energy for All
SEFA	Small Enterprise Finance Agency
SIDA	Swedish International Development Cooperation Agency
SIDS	Small Island Developing State
SMEs	Small-to-Medium-scale Enterprises
SOLTRAIN	Southern African Solar Thermal Training and Demonstration Initiative
STAMICO	State Mining Corporation
STEM	Short Term Energy Market
STIP	Short Term Investment Programme
SUNREF	Sustainable Use of Natural Resources and Environment Finance
TAF	Technical Assistance Facility
TWh	Terawatt-hours
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisation
ZESA	Zimbabwe Electricity Supply Authority
ZESCO	Zambia Electricity Supply Corporation
ZETDC	Zimbabwe Electricity Transmission and Distribution Company
ZimAsset	Zimbabwe Agenda for Sustainable Socioeconomic Transformation
ZIZABONA	Zimbabwe-Zambia-Botswana-Namibia Interconnector
ZTK	Zambia-Tanzania-Kenya Interconnector
<i>L</i> 111	Zamora ranzama renya mereometeror



INTRODUCTION

Investment in energy infrastructure has been identified as one of the critical enablers for driving the regional integration agenda in southern Africa, including the successful implementation of the SADC Industrialisation Strategy and Roadmap 2015-2063. Southern Africa's economic growth and transition from a region comprising low-income economies into middle-income economies necessitate a transformation of the economic structure from predominantly agrarian and extractive activities to industrialisation in SADC requires the creation of an enabling environment that facilitates domestic capacity in respect of physical and social infrastructure, human capital, financial systems, research and development, technology and governance.

The ability of most African countries and regions to establish a competitive industrial sector and promote greater industrial linkages has often been hindered by the existence of poor energy and other infrastructure such as roads and telecommunications. This has led to high production and transaction costs. The development of infrastructure, particularly energy, has, therefore, been made a priority at national, regional and continental levels.

In August 2016, the 36th Summit of SADC Heads of State and Government endorsed the theme "Resource Mobilisation for Investment in Sustainable Energy Infrastructure for an Inclusive SADC Industrialization and for the Prosperity of the Region". In order to operationalise this theme the Extraordinary Summit of Heads of State and Government in March 2017 endorsed the convening of a High-Level Ministerial Workshop and Regional Investment Conference on Regional Energy Projects to showcase investment opportunities in the energy sector, focusing on specific flagship projects.

The energy investment conference provided a platform for resource mobilisation for sustainable energy infrastructure development to enable the energy sector to play a vital role towards industrialisation and prosperity of the region.

Increased investment in new energy infrastructure, combined with improved management, performance and additional spending on maintenance and cost reflectiveness, are prerequisites for industrial take-off. Similarly, implementation of the SADC Industrialization Strategy and Roadmap, SADC Regional Indicative Strategic Development Plan (RISDP) and the Energy Sector Plan of the SADC Regional Infrastructure Master Plan (RIDMP) 2012-2027 will require substantive investment in the energy infrastructure and its maintenance.

The region is cognisant of the fact that unless the current situation involving low power generation capacity is addressed, the SADC industrialisation agenda would remain an unfulfilled ambition.

The SADC Energy Investment Year Book 2017 tracks major investment activities within the SADC region. While this book reports on significant investments, it will also highlight other small energy projects which continue to make an impact at a regional level. Although every attempt has been made to gather as much information as possible on energy investments in the SADC region, it is also pragmatic to admit that even for some major investment, there may be no publicly available information on the level of finance involved and nature of the investment transaction.

Chapter 1 looks at investment by Member States and International Cooperating Partners (ICPs) into the development of policies and strengthening of institutional arrangements. It identifies the areas that Member States and ICPs are funding with respect to policy and institutional development.



The second chapter deals with investment trends in the SADC energy sector. The section assesses the major players actively involved in investing in the sector and attempts to identify the key success factors for those countries that are attracting the most investment. The analysis covers the following energy sectors: electricity; oil and gas; and renewable energy and energy efficiency.

Chapter 3 looks at the various innovative financing initiatives undertaken by SADC Member States to finance investment in the energy sector outside the traditional budgetary allocations and development aid.

The final chapter provides key observations and policy options for possible adoption by the Member States and the region.



FUNDING FOR POLICY, STRATEGY & INSTITUTIONAL DEVELOPMENT

Introduction

The Southern African Development Community (SADC) has the ability to meet its energy needs from the various energy sources that exist in the region, ranging from solar, wind and nuclear to hydro, thermal, gas and petroleum (SADC, SARDC, 2016). Electricity is generated mainly through thermal or hydroelectric resources. Coal is the most dominant source of electricity in the region, with more than two-thirds of electricity produced from coal-fired plants. Hydropower is the sole source of electricity generation in four SAPP member countries (Democratic Republic of Congo, Lesotho, Malawi and Zambia) while hydropower accounts for a sizeable proportion of capacity in Angola, Mozambique, Namibia, Swaziland and the United Republic of Tanzania.

Natural gas is becoming more significant to the region's energy sector, as Mozambique, Namibia, South Africa and Tanzania develop their extractive industry for natural gas fields in their respective countries (SARDC, 2010). New natural gas discoveries by international oil companies in Mozambique and Tanzania during the past decade have ignited investor interest in this previously under-explored region.

The SADC region has some of the most significant known reserves of uranium and the mineral is being mined in Namibia and South Africa for use as fuel for nuclear power while exploration is underway in Botswana and Zimbabwe. Nuclear technology is included in the electricity sub-sector but what is required is to demonstrate that nuclear power can be a safe option for electricity generation and win the confidence of the population and governments to endorse nuclear energy deployment in the SADC region. Only South Africa has nuclear capacity, with plans for a new nuclear programme.

The region has a significant potential for renewable energy, including hydropower which is already being exploited on a commercial scale. However, the necessary infrastructure for grid connection is poor. The prices for most renewable energy technologies are coming down but more needs to be done in the form of innovative financing.

However, the ability of SADC to fully exploit its vast energy resources is being hampered by a poor policy environment in Member States and at regional level, and the absence of strong institutional frameworks. This has often affected the ability of countries to attract energy investment and implementation of agreed regional decisions within agreed timeframes.

To address these challenges, SADC Member States are investing resources in the development of enabling policies and strategies as well as providing technical support to regional and national energy institutions to enable them to play an effective role in promoting sustainable development.

This chapter looks at investment by the Member States and International Cooperating Partners (ICPs) into the development of policies and strengthening of institutional arrangements. It identifies some of the energy policies and strategies that have been funded as well as key regional institutions created in SADC in the last few years. Therefore, the chapter is a slight departure from the normal analysis of the "brick and mortar" issues of energy investment which have tended to look at the financing of physical infrastructure projects. In this regard, this chapter provides a new dimension of understanding energy investment for "soft" projects such as studies, policy/regulatory framework formulation, planning and capacity-building projects.

Existing SADC Energy Policy and Institutional Landscape

The SADC energy policy framework is comprehensive and places great emphasis on the availability of sufficient, reliable and least-cost energy services. This addresses the broader SADC objectives which include attracting investment and promoting competitiveness and

trade as a means of eradicating poverty, bearing in mind the need for the environmentally sustainable use of energy resources. The policy framework is also supportive and responsive to the SADC's strategic priorities that are targeted at industrialisation, the promotion of economic and social infrastructure, developing agriculture, gender mainstreaming, human resources development and improving social welfare.

To achieve these broad and ambitious goals, SADC has put in place a number of legal documents, policies and institutional frameworks through the adoption of various instruments such as protocols, strategic guidelines and regulatory frameworks. The main legal document on energy development is the SADC Protocol on Energy of 1996, which entered into force on 17 April 1998 after ratification by two-thirds of the Member States. This provides a framework for cooperation on energy policy among SADC Member States.

The SADC energy policy and strategy landscape has continued to evolve during the past few years to reflect the changing dynamics in the region, the continent and globally. Since the adoption of the Sustainable Development Goals (SDGs) by the United Nations (UN) member states in September 2015, the SADC region has witnessed considerable transformation of the policy and institutional landscape. For example, Goal 7 of the SDGs commits UN member states to develop measures to ensure universal access to affordable, reliable and modern energy services by 2030. In this regard, SADC is seized with efforts to ensure that its policies, strategies, programmes, activities and projects are in line with this global initiative.

This alignment with the global initiative is aptly captured in three regional policy frameworks that have been developed since the adoption of the SDGs. The new policies and strategies are the Revised Regional Indicative Strategic Development Plan (RISDP), the SADC Industrialisation Strategy and Roadmap 2015-2063 and the SADC Renewable Energy and Energy Efficiency Strategy and Action Plan (REEESAP) 2016-2030. The past two years also witnessed the establishment of the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE).

Adopted by the SADC Extra-Ordinary Summit in Zimbabwe in April 2015, the Revised RISDP, sets a target for the revision, of the SADC Protocol on Energy by 2020 as the legal instrument is now considered to be outdated. Similarly, the SADC Industrialisation Strategy and Roadmap, approved by the same Extra-Ordinary Summit in Harare in 2015, identifies energy as a "key enabler" for industrial development in the region. The strategy and its accompanying Costed Action Plan, approved by a SADC Extra-Ordinary Summit held in March 2017 in Swaziland, calls upon Member States to increase power generation – in particular from renewable energy sources that are in abundance in the region – in order to support the current industrialisation thrust by the region.

Funding for Renewable Energy Policies and Strategies

The drive towards Renewable Energy (RE) has become part of the international development agenda during the past two decades because the world is fast running out of traditional energy sources such as coal. Furthermore, emissions from these fossil fuels have increased climate warming and caused environmental damage. RE sources are also regarded as affordable, secure, reliable and less polluting to the environment compared to fossil energy. The interest to increase RE and energy efficiency initiatives in SADC is also driven largely by electricity supply shortages affecting several countries in the region (REN21, 2015).

Furthermore, SADC is endowed with vast RE resources. According to the African Development Bank (AfDB), the region has the potential to become a "gold mine" for RE. For example, the AfDB estimates that the overall hydropower potential in SADC is estimated at about 1,080 terawatt hours per year (TWh/year), while according to the Southern African Power Pool (SAPP), the Inga Dam situated on the Congo River in the Democratic Republic of Congo has the potential to produce about 40,000 megawatts (MW) of electricity – enough to meet most of the energy needs in the region (SADC, SARDC, 2016).



Support to Strengthening Energy Policies and Regulatory Frameworks Table 1.1						
Programme	Funders					
Development of the SADC Regional Renewable Energy and Energy Efficiency Strategy and Action Plan (REEESAP)	Four experts provided to assist in the development of the REEESAP		2016-2030	European Union		
Programme on Renewable Energy and Energy Efficiency in the Southern African Power Pool (Phases I-IV)	Contribute to an environmentally and climate friendly energy supply in the SADC by refinancing DBSA's renewable energy and energy efficiency investments in the SADC region	€ 190 million	2010-2018	KFW Development Bank and Development Bank of Southern Africa (DBSA)		
Southern African Solar Thermal Training and Demonstration Initiative (SOLTRAIN)	Promote use of solar energy through Political Advocacy, Capacity Building, Technical Training, Infrastructure (Solar demonstration systems)	€2,53 million	2009–2019	Austrian Development Agency, Opec Fund for International Development		
Energy and Environment Partnership (EEP) in Southern and East Africa	Contribute to the reduction of poverty by promoting inclusive and job-creating green economy and by improving energy security while mitigating global climate change.	€25 million €35 million	2010-2013 2013-2017	Finnish Ministry of Foreign Affairs Finland, Austrian Development Cooperation, United Kingdom Department for International Development		

Source SADC Energy Portal https://sadc-energy.sardc.net/

In this regard, a scan of new energy policies and strategies in SADC over the past few years indicates that the region has sought to develop comprehensive and vibrant policy instruments that aim to allow the region to fully harness its vast RE resources. Below are some of the various interventions by ICPs that are targeted at strengthening energy policies and regulatory frameworks, planning as well as building the capacity of SADC to fully explore its RE.

Renewable Energy and Energy Efficiency Strategy and Action Plan

Development of the SADC Renewable Energy and Energy Efficiency Strategy and Action Plan (REEESAP) received support from the European Union (EU) through the SADC Directorate of Infrastructure and Services. The EU granted the support through its Technical Assistance Facility (TAF) for the SE4ALL – Eastern and Southern Africa. As part of the development process, various technical services wereas offered to mMember sStates to strengthen their RE sector. In addition to this, various consultative workshops were conducted to ensure that SADC countries contribute to the development of the REEESAP.

The REEESAP was approved by energy experts from the region in October 2016 at a validation meeting held in Johannesburg, South Africa. Following its endorsement, the REEESAP was adopted by SADC Energy Ministers at their annual meeting held in July 2017 in Mbabane, Swaziland.

The REEESAP spans the period 2016-2030 and aims to provide a framework for SADC Member States to develop renewable energy strategies, leading to the greater uptake of RE resources as well as mobilisation of financial resources in the sector. This will be achieved by a variety of measures, including establishing renewable energy agencies in all the 15 SADC

Member States that will have specific mandates for off-grid systems, as well as developing and adopting guidelines to meet the SADC target of cost-reflective tariffs by 2019 while ensuring that the poor are not prejudiced. The REEESAP also proposes to create a special purpose regional investment fund for renewable energy and energy efficiency projects of less than 10 megawatts (MW). The fund is expected to support, the packaging of projects up to bankability.

Energy and Environment Partnership in Southern and East Africa

The Energy and Environment Partnership (EEP) in Southern and East Africa promotes Renewable Energy (RE) and Energy Efficiency (EE) as well as clean technology investments. Jointly funded by the Ministry of Foreign Affairs of Finland (lead donor), the Austrian Development Agency (ADA) and the United Kingdom's Department for International Development (DFID), the programme started in southern and eastern Africa in March 2010. The overall objective of the EEP is to contribute to the reduction of poverty by promoting an inclusive green-economy conducive for job-creation and by improving energy security while mitigating global climate change.

The final beneficiaries of the programme include households, communities, health centres, schools, Small-to-Medium-scale Enterprises (SMEs) and industries that have access to improved energy services from EEP supported projects. To qualify for EEP support, applicants should demonstrate high innovation in delivering energy services, facilitating technology transfer, encouraging cooperation and local stakeholders' participation in projects.

Total funding for the first phase (2010-2013) was €25 million and €35 million has been set aside for the second phase spanning 2013-2017. Over the past four years, EEP Southern and East Africa has funded over 200 projects in 13 countries which all aim to provide sustainable energy services to the poor and combat climate change (EEP, 2017).

Programme on Renewable Energy and Energy Efficiency in the SAPP

The programme is supported by the German government through the KFW Development Bank, and has been subsequently extended to the Eastern and Western African Power Pool. Its main aim is to contribute to an environmentally and climate-friendly energy supply in the SADC region as well as to support regional integration through energy interconnections by supporting private and public investments in renewable energies and energy efficiency through credit lines to the Development Bank of Southern Africa (DBSA). Key features of the programme include the refinancing of DBSA's renewable energy and energy efficiency investments in the SADC region. The programme involves the provision of concessional loans. Currently in its fourth phase, the programme has been running since 2010 and is expected to end in 2018. Total loans provided so far amount €190 million.

Southern African Solar Thermal Training and Demonstration Initiative

The Southern African Solar Thermal Training and Demonstration Initiative (SOLTRAIN) is a regional initiative on capacity building and demonstration of solar thermal systems in the SADC region. The main objective of the project is to help to reduce the region's reliance on the use of environmentally unfriendly fossil fuels and promote the usage of renewable energies, with a focus on solar water heating. The focus on solar thermal systems was identified because solar radiation levels in SADC are high, and these systems can be manufactured or assembled in the region.

The initiative started in 2009 with support from the Austrian Development Agency (ADA) and the OPEC Fund for International Development, and is being implemented in six countries – Botswana, Lesotho, Namibia, Mozambique, South Africa and Zimbabwe. The first phase of SOLTRAIN ran from May 2009 to August 2012 while the second phase began in November 2012 and ended in February 2016. The third phase of the programme commenced in March and will run until July 2019.



The programme is valued at €2.53 million and between 2009 and 2015 more than 2,150 people were trained. It is estimated that about 7,000 people will benefit directly from these demonstration systems by reducing their energy bills and improving living standards.

Support to SADC Energy Institutions

International Cooperating Partners (ICPs) have played an important role in providing support to SADC energy subsidiary organisations and other institutions involved in the energy sector in the region. Table 1.2 shows some of these interventions by ICPs.

Support to SADC Energy Institutions Table 1.2					
Programme Support	Type of Support	Amount	Period	Funders	
SADC Centre for Renewable Energy and Energy Efficiency (SACREEE)	Contribution to the establishment of SACREEE, and First Operational Phase with Namibia University of Technology	€1.8 million	2013-2017	SADC Member States, Aus- trian Development Agency, United Nations Industrial Development Organisation,	
Creation of the SAPP Project Advisory Unit (PAU)		US\$20 million		World Bank	
Support to SAPP	Technical Advisor provided for support including balancing the market, capacity building on control performance standards			European Union	
Capacity strengthened at the SADC Secretariat	Financing a Power System Programme Officer		2010-2013	European Bank	
Contribution to the capacity development of SADC	Technical Assistance to SADC Secretariat, Energy Division	€600 000	2014-2016	Austria	
Small grant agreements for the Austrian Private Sector to Increase Energy Efficiency in SADC Member States	Capacity Building, Technical Training	€400 000		Austria	
Support to the implementation of a competitive electricity market in Southern Africa, Phase III	Technical assistance, capacity building, planning, studies		2013-2015	Sweden	

Source SADC Energy Portal https://sadc-energy.sardc.net/

SADC Centre for Renewable Energy and Energy Efficiency

The rationale for establishing the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE) is to enable the region to have the capacity to address its energy challenges through harnessing its vast renewable energy sources such as hydro, wind and solar (SARDC, 2016). Various cooperating partners such as the United Nations Industrial Development Organization (UNIDO) and the Austrian Development Agency (ADA) provided financial support towards the establishment of the centre, and continue to do so for the first three years (SARDC, 2015). After that, the centre should be self-sustaining. ADA has provided support of €1.8 million, while UNIDO has set aside €300,000 to support SACREEE.



Support to SACREEE on Industrial Energy Efficiency

In order to contribute to the competitiveness of the industrial sector in the region and in line with the SADC Industrialization Strategy and Roadmap 2015-2063, SACREEE with support from the EU Technical Assistance Facility for the Sustainable Energy for All (TAF SE4ALL) initiative for East and Southern Africa has launched a regional programme on Industrial Energy Efficiency. The programme will see a team of experts visiting Member States to conduct a scoping study in order to assess current practices and the potential of energy efficiency in the Industrial sector of SADC Member States. The exercise began in March 2017 and is expected to be completed by September. This will be followed by the development of the regional programme which will be presented to Member States for validation.

SAPP Project Advisory Unit

The establishment of the Southern African Power Pool (SAPP) Project Advisory Unit (PAU) is aimed at capacitating the SAPP to effectively prepare and implement bankable priority regional energy projects. SAPP is a regional power organization that coordinates the planning, generation and transmission of electricity on behalf of member state utilities in SADC, based in Harare, Zimbabwe. Various challenges, including limited capacity, have affected the preparation and implementation of energy projects in the region. In this regard, the World Bank has supported SAPP to create the PAU to accelerate the implementation of projects. The World Bank has pledged a grant of up to US\$20 million towards the PAU, which is operational (SAPP, 2016).

The various components of the grant are as follows:

- Component A: Setting up the PAU under the SAPP (US\$7 million), which would fund the mobilization of a team (including supporting specialist);
- Component B: Project Preparation Funds (US\$10 million, initially). The funds in this component would be managed by the PAU. Key focus will be on the environmental and social performance of projects;
- Component C: Analytical support to SAPP (US\$3 million). This component would support analytical work to update critical non-project-specific information used by SAPP to support project preparation, including revision of the SAPP Pool Plan.

Additional Support to SAPP

With financial support from the Norwegian government, SAPP is implementing a project to develop a competitive electricity market in SADC. The support includes technical assistance, capacity building, planning, and studies for the period 2013-2017. The competitive electricity market, commonly known as the Day Ahead Market (DAM) is an auction-type market that allows power utilities in the SAPP to weigh their options and ensure that they buy from the market when it is cheaper to get power than to generate. This helps SAPP members to bid on and sell electricity a day before transactions are made.

In addition to these efforts to interconnect all SADC countries, SAPP with support from DFID and Austria is also working with the Eastern Africa Power Pool (EAPP) to interconnect with countries in East Africa. EAPP is made up of seven countries in eastern and central Africa – Burundi, DRC, Egypt, Ethiopia, Kenya, Rwanda and Sudan. Its secretariat is based in Ethiopia. The support amounting €7 million spanning the period 2016-2019 includes the commissioning of studies to assess the technical impact of connecting the EAPP and SAPP. The assistance is also channelled through regional energy regulators such as the Regional Electricity Regulators Association of Southern Africa (RERA) and Regional Association of Energy Regulators for Eastern and Southern Africa (RAERESA).

Support to the SADC Energy Division

Various means of support continue to be channelled towards the SADC Secretariat to strengthen the capacity of the SADC region to respond to its energy needs and challenges.



The provision of technical assistance to the SADC Secretariat is through its Energy Division. For example, the Austrian Development Agency (ADA) seconded an energy expert to the Energy Division. This assistance valued at $\in 600,000$, came to an end in September 2016.

The European Union has also been supporting SADC through financing a power sector system programme office. The overall purpose of the support is to provide advice to the Energy Division on all strategic, technical and management issues contributing to an effective and efficient implementation of the Division's portfolio.

Support to Communicate Energy Issues in SADC

Communicating Energy in Southern Africa

Another critical area that has received significant funding in recent years is awareness-raising on energy issues in the SADC region, aimed at ensuring that the formulation and implementation of energy policies and frameworks is tracked and decisions are made from an informed position. The communication of energy issues and facts is intended to educate and inform the public about various energy issues, including best practices on energy efficiency methods and embracing alternative sources of energy such as solar and gas that are environmentally friendly compared to fossil fuels.

The Austrian government, through the Austrian Development Agency (ADA)/Austrian Development Cooperation (ADC) has taken a leading role in this regard over the past three years. As the Lead ICP for the SADC Energy Sector, Austria has provided support to the Southern African Research and Documentation Centre (SARDC) to implement various projects aimed at raising awareness on energy developments in the region. Between April 2014 and December 2019, ADA/ADC has provided €1.175 million to the SARDC towards implementation of the project on Communicating Energy in Southern Africa. The project has seen the SARDC providing information support to the SADC Secretariat, SADC Member States, RERA, SACREE, SAPP and other key energy stakeholders.

SARDC has created a functional platform for information-sharing and knowledge dissemination that contributes to informed policy decisions about the use and control of energy resources in the SADC region. Some of the key communication outputs under this project are:

- Production of Southern Africa Today newsletter and the Southern African News Features to communicate energy issues;
- Communication support to the SADC Energy Thematic Group (ETG) through maintenance of SADC Energy Portal (*https://sadc-energy.sardc.net/*), production of *ETG Bulletin* twice a year, and production of energy policy briefs;
- Production of the SADC Energy Monitor, which was published in 2016 as a reference resource to provide information on the energy sector in the region;
- Production of the SADC Energy Investment Yearbook, an annual publication first published in 2016 to track energy investment trends in the SADC region; and,
- Dissemination of the various communication tools.

ADA/ADC has also supported SARDC to implement a project to communicate efforts to mainstream gender in the SADC energy sector, Mainstreaming Gender in the SADC Renewable Energy Sector. The project has been running from October 2015 and is expected to end in September 2018. The project has received support of €500,000 and aims to encourage SADC countries to create conditions that promote gender mainstreaming in the renewable energy sector and, through the use of renewable energy sources, to enable women to stop carrying wood and water, and contribute to the regional economy in other ways. It involves not only knowledge dissemination, but also the promotion of changes in attitudes and behaviour, including a sense of commitment to the various regional and international policies and treaties to which the SADC Member States are parties.



Climate Financing

Climate financing has become increasingly important over the past few years. The term refers to funds channelled by national, regional and international entities for climate change mitigation and adaptation projects and programmes. These include climate-specific support mechanisms and financial aid for mitigation and adaptation activities to spur and enable the transition towards low-carbon, climate resilient growth and development through capacity building, research and development and economic development (Buchner & al, 2011)

Signatories to the United Nations Framework Convention on Climate Change (UNFCCC) convention have committed to mobilising US\$100 billion per annum by 2020 to support climate adaptation and mitigation in developing countries. In 2013 the amount that was actually transferred to developing countries was US\$34 billion, much less than the UNFCCC goal, and not enough to meet the needs of those countries.

Since the establishment of the Adaptation Fund in 2011, the volume, sources, and types of climate finance have all increased significantly. New funds include the Green Climate Fund (GCF), and the Climate Investment Fund (CIF). The CIF provides developing and middle-income countries with resources to manage the challenges of climate change and reduce their greenhouse emissions. Among the projects the Fund supports are those that create viable commercially oriented markets by eliminating barriers, including the lack of investor familiarity with new technologies, their associated risks, high upfront capital costs and the lack of accessible and affordable financing. Tanzania provides an example of the scope of work supported by the Fund, and has benefited in terms of financing and technical assistance towards establishing technical standards for a renewable energy mini-grids market, in utilising as well as expanding the geothermal energy and in harnessing renewable energy for rural electrification.

On the African continent, the African Development Bank (AfDB) launched a pilot of the Africa Climate Technology Finance Centre and Network (ACTFCN) with grant assistance from the Global Environment Facility (GEF) and the GEF Special Climate Fund. The ACTFN will support African countries in accelerating the deployment and expansion of low-carbon and climate resilient technologies for climate change mitigation and adaptation (SARDC, 2016).

Despite this proliferation of climate finance mechanisms, Southern African states still face challenges in accessing the funds because of the stringent conditions imposed. Conditions include fulfilling certain fiduciary standards and demonstrating high standards of project management and compliance with the environmental and social policies of the types of funding available. A significant hurdle faced by Southern African states is a lack of adequate technical capacity to successfully complete the accreditation process. Obtaining accreditation requires a thorough understanding of the accreditation standards and required documentation and financial resources to cover such activities as document translations or the consultation with stakeholders. Even though Article 9.9 of the Paris agreement, adopted in December 2015, clearly states the need for efficient access to financial resources through simplified approval procedures and enhanced support for developing countries, past experience has shown that developed countries are failing to live up to their commitments.

Conclusion

From the foregoing analysis, it is clear that significant investment has been channelled by ICPs towards the development of energy policies and strategies as well as the provision of technical support to regional and national energy institutions to allow them to play an effective role in promoting sustainable development. This is crucial in developing the enabling environment and strengthening the capacity of the region to implement energy projects.

¹ The United Nations Framework Convention on Climate Change (UNFCCC) was ratified in 1994. The main objective of the Convention is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".



SADC ENERGY INVESTMENT TRENDS

Introduction

Southern Africa is home to vast energy resources, ranging from hydro, wind and solar, to gas, oil and uranium. As the region implements strategies towards ensuring energy self-sufficiency, SADC presents an attractive destination for investment in hard energy infrastructure. The electricity sub-sector accounts for a significant share of new funds injected into the sector. There has also been a noticeable shift towards investment in renewables in the past few years

This chapter looks at the investments made in the energy sector over the past year. It assesses the major players actively involved in investing in the SADC region and gauges the level of investor appetite for the SADC energy sector. It attempts to identify the key success factors for those countries that are attracting the most investment. The analysis covers the following energy sectors: electricity; oil and gas; and renewable energy and energy efficiency. There is extensive use of tables and figures to illustrate the investment.

Electricity Sub-Sector

The past few years have been marked by significant activity in the SADC electricity sector as shown by the number of generation projects commissioned as well as the portfolio of new agreements signed.

Generation Projects Commissioned in 2016

According to the Southern African Power Pool (SAPP), more new generation capacity was added to the power pool in 2016 than had been initially planned. The region exceeded the target of 3,757MW for the year and commissioned 4,180MW from new power projects and the rehabilitation of old power plants.

South Africa had the largest number of projects commissioned in 2016, contributing 2,550MW to the SAPP grid or more than 61 percent of the total generation capacity added during the year (Figure 2.1). A salient feature of the commissioned projects in South Africa is that the majority of the new generation capacity – more than 60 percent – was produced by Independent Power Producers (IPPs). Of the total six new projects commissioned in South Africa in 2016, five were by IPPs. These included the 670MW gas-fired power plant commissioned by Avon Peaking Power in July 2016 in Shakaskraal, north of the port city of Durban.

According to Figure 2.2, around 61 percent of the new generation capacity in 2016 came from renewable energy sources, confirming the worldwide trend of moving towards more sustainable sources of energy. Hydropower dominated the new generation capacity, with solar – both Photovoltaic (PV) and Concentrated Solar Power (CSP) – and wind energy slowly coming onstream although the adoption of these technologies is still very low.

Gas is increasingly becoming a major source of electricity in the region, accounting for 995MW or almost 24 percent of new power generated in 2016 – from two projects in Mozambique and one each in South Africa and Tanzania. Unlike in the past, where coal-fired plants contributed the largest share of new generation capacity, 2016 saw only one new coal project in Zambia coming on board with a capacity of 300MW.

Generation projects commissioned in 2016 (MW per country) Figure 2.1



Source: SAPP, March 2017

Generation projects commissioned in 2016



Source: SAPP, March 2017



Figure 2.2

The move towards renewable energy follows a resolution made in 2012 by SADC Member States to increase the uptake of cleaner and alternative energy sources that result in reduced carbon emissions that would increase climate warming and cause environmental damage. In addition to being affordable, secure and reliable, renewable energy such as hydro, solar and wind will not be depleted and are in abundance in the SADC region. The long-term target set by SADC is to achieve a renewable energy mix in the regional grid of at least 32 percent by 2020 and 35 percent by 2030.

Target new generation capacity for 2017

Investment by ICPs

In addition to investing in "soft infrastructure" such as capacity development and policy and strategy development, International Cooperating Partners (ICPs) who are members of the SADC Energy Thematic Group (ETG) invest significantly in "brick and mortar" issues in the region. Table 2.1 shows some of the major investments by the ICPs during the past year. The most significant investments include a loan by the European Investment Bank to support the short-term investment programme for Mozambican power utility Electricidade de Moçambique (EdM).

Investments by ICPs in the SADC Energy Thematic Group, 2016 Table 2.1							
ICP	Project	Type of Support	Amount	Start Date/ Period			
Austria	Southern African Solar Thermal Training and Demonstration Initiative (SOLTRAIN), Phase III	Political advocacy, capacity building, technical training, infrastructure	€1.4m	March 2016 - Feb 2020			
European Investment Bank	Short Term Investment Programme (STIP) with Electricidade de Moçambique (EdM)	Sovereign loan for on- lending to EdM Supported by an interest rate subsidy from the Cotonou Subsidy Envelope (Public sector)	€23m	Jan 2016			
Japan	Kenya-Tanzania Power Interconnector	Loan	¥118.47m	Jan 2016			
Japan	Preparatory survey for the rehabilitation of Inga 2 Hydropower Station, DRC	Study	¥1m	Jan 2016 - Jan 2017			
World Bank	Scaling-up Solar, Zambia	Partial risk Guarantee to support private developers	n/a	Sept 2016			
	Malawi- Mozambique Interconnector	Credit	n/a				
USAID	Southern Africa Energy Programme	Technical Assistance and transaction advisory services	n/a	May 2017 - April 2022			

Source ETG ICPs Support Matrix, March 2017



Pledges For SADC Priority Energy Infrastructure Projects Table 2.2									
Project	Participating Member States	Cost Estimate	Progress Status						
A. World	A. World Bank Supported Projects								
Mozambique-Malawi Interconnector	Mozambique and Malawi	US\$94 million	The draft feasibility study was completed and discussions are ongoing with various stakeholders						
Zambia-Tanzania- Kenya (ZTK) Power Interconnection	Zambia and Tanzania	US\$ 625 million for the remaining components	Some components of the project are at advanced stage and target is commission complete project by 2018/2019						
Mozambique Transmission Backbone Project STE	Mozambique	US\$ 1.7 billion	 Target is to commission this project by 2021, The Environmental Social Impact Assessment, technical and economic feasibility studies have been completed and approved by the government 						
B. Africa	n Development Bank Suppo	orted Projects							
Zimbabwe-Zambia- Botswana-Namibia (ZIZABONA) Interconnector	Botswana, Namibia, Zambia and Zimbabwe	US\$ 223 million	The proposal is to develop the project in three components Zimbabwe-Zambia, Zimbabwe-Botswana, Zambia-Namibia. Negotiations are underway to secure funding for the construction of the Zimbabwe-Zambia component. The project is planned for commissioning in 2021.						
Batoka Hydro Electric Power Scheme	Zambia and Zimbabwe	US\$ 4.0 billion	 Detailed technical feasibility studies are completed and to be presented to the two Governments; and The plan is to commission Batoka Hydroelectric Scheme tentatively by the year 2023 						
Songwe River Basin Development Project	Malawi and Tanzania	US\$ 760 million	 Revised feasibility study completed Detailed designs completed in 2016 (AfDB support) Tender documents produced in 2016 						
C. Devel	opment Bank of Southern	Africa Supported Projects	s						
Mozambique- Zimbabwe-South Africa (MOZISA) Interconnector	Mozambique, Zimbabwe and South Africa	US\$ 350 million	Funding for project preparation secured from the Development Bank of Southern Africa (DBSA) Infrastructure Investment Programme of South Africa (IIPSA) and is scheduled for commissioning in 2019						
Angola –Namibia (ANNA) Interconnector	Angola and Namibia	To be decided	 Secured project preparation funding from the Swedish International Development Cooperation Agency and from DBSA under IIPSA supported by EU Procured advisory services for detailed feasibility study undertaken, Inter-governmental Memorandum of Understanding drafted and internal consultations ongoing in both countries Scheduled for commissioning by 2020 						
Botswana – South Africa Interconnector Project (BOSA)	Botswana and South Africa	To be decided	 BOSA secured funding for project preparation from the DBSA IIPSA supported by the European Union Procurement of Transaction Advisory Services completed 						
2nd Alaska-Sherwood (400km) 330kV Transmission line as component of Central Transmission Corridor	Zimbabwe	To be decided	 Grant funding received from DBSA for detailed feasibility studies Transaction Advisor appointed for the Alaska – Sherwood line project preparation where detailed feasibility study, ESIA and legal work streams are to be done. 						

Source SADC Energy Investment Forum, Swaziland, July 2017

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The World Bank offered non-financial assistance to some SADC Member States in scaling up their renewable energy initiatives, further emphasizing the priority given to sustainable energy. In addition, the World Bank also offered risk guarantees to support private developers in order to avert the high-risk perception that most investors have of the region.

SADC Energy Investment Forum

The SADC Secretariat showcased a number of priority energy projects during a High Level Ministerial Resource Mobilisation Workshop on Regional Energy Projects and SADC Energy Investment Forum held in Swaziland in July 2017. The workshop and investment forum were attended by ministers and energy and water senior officials, representatives of development finance institutions, private investors and other ICPs.

The objectives of the High Level Ministerial Resource Mobilisation Workshop and an Energy Investment Forum were to:

- enhance capacity in project preparation and development;
- identify measures needed to eliminate barriers inhibiting development and progress on implementation of energy projects;
- raise awareness on existing project preparation and financing vehicles within the region;
- discuss progress on key energy projects in the region; and
- attract resources and investments in energy and water projects.

The forum identified issues and constraints to speeding up the implementation of energy infrastructure projects and made recommendations and commitments to address these challenges.

Table 2.2 shows the list of priority energy projects. A number of ICPs, financial institutions and Development Finance Institutions (DFIs) such as the African Development Bank (AfDB), China Oversees Development Agency (CODA), China Overseas Infrastructure Development and Investment Corporation (COIDIC), Development Bank of Southern Africa (DBSA), EU and Japan International Cooperation Agency (JICA) made commitments to devise effective ways of facilitating accessibility and utilisation of the available funding for capacity building, project development and project financing. The recommendations from the workshop and the forum were:

- Project owners should ensure that financiers and the private sector are involved in the project at early stages of Project Feasibility Assessment;
- Member States should prepare, negotiate and sign relevant agreements that are binding for transboundary projects;
- Member States should strengthen their capacity to negotiate with the private sector, through dedicated and well-staffed Public-Private-Partnership units; and to effectively lead on donor coordination at country level;
- Project owners should build business cases during the project preparation phases for generation and transmission projects to ensure that their projects are attractive to investors.

Support from China and other partners

There have been significant Chinese investment commitments in the SADC energy sector using various investment vehicles that include the Chinese government and Chinese multilateral banking institutions. Most projects that have been supported thus far include hydro and thermal-fired power stations.

Chinese Inve	Table 2.3		
Country	Total (MW)	Amount (Billion USD)	Energy Resource
Angola	2200	4.5	Hydro
Botswana	600	1	Coal
DRC	240	0.667	Hydro
Malawi	1000	0.667	Coal
Mozambique	n/a	6	Gas
Zimbabwe	1200	3.1	Coal



Source SARDC compilation, 2017

Just over 32 percent of the Chinese investments were channelled towards renewable energy in the form of hydropower with the remainder committed to coal-fired power stations and gas infrastructure.

Total Chinese investment by energy resource, 2016 (USD billions) Figure 2.3

Private Sector participation in the SADC Energy Sector, 2016

The private sector is increasingly becoming a key player in the SADC energy sector. However, information on private sector investment is not easily available or, where it is available, it is not always clear if the respective projects are being implemented. Table 2.4 shows some of the investments that have been made by the private sector in a number of countries.

Hydro Coal Gas Source SARDC compilation, 2017

5.2

Private Sector Investment in SADC Energy Sector

Country	Project	Funders	Capacity	Amount	Type of support
Angola	Lubango and Matala Caculo Cabaca dam	Industrial and Commercial Bank of China	2.2 GW	US\$ 375,523 (China), \$4.5 billion	Debt
Botswana	Sese Coal Power plant	First Quantum Minerals Ltd and African Energy	450MW	US\$1.5 billion	Equity
DRC	Busanga p l ant	Sino Hydro and China Railway Group	240MW	\$660 mi l lion	Debt
Lesotho	Rehabilitation and expansion of power distribution networks	African Development Bank	Y	US\$10.6 million	Debt
Madagascar	-	-	- 2	-	-
Malawi	Tedzani IV	Japanese Government & Egenco	18MW	US\$67 million	Debt
Mauritius	-		-	-	-
Mozambique	Scatec Solar	Scatec Solar	40 MW	USD 80 million	Equity, Debt
Namibia	Ejuva 1 and 2	South African Company Consolidated Infrastructure Group	10 MW	N\$250 million	Equity
Sey <mark>chell</mark> es	-	Survey and the second	-38	- A REAL PROPERTY.	-
South Africa	L'Ormarins Power Project		1MW		Equity
	Port Elizabeth Solar PV1	Clean Energy Africa	5MW		Equity
	Thabametsi	Marubeni Corporation and Exxaro	630MW		Debt
Swaziland	Montigny	Montigny	35MW		Grant
Tanzania	Kiwiracoal-to-power project	State Mining Corporation	200MW	US\$500 million	Equity
Zambia	Solar Project	and the strength	100MW	US\$40 million	Debt
	Ngonye photovoltaic project	Enel Green Power	34MW	US\$40 million	Equity
Zimbabwe	Off-Grid Rooftop Solar project	Small Enterprise Finance Agency, (AfDB)	20MW	US\$ 1 million	Grant

Source Member State energy regulators; project sponsors; and newspaper articles, 2016/17

Table 2.4

6

According to SAPP, a significant share of electricity generation in South Africa and Zambia is already produced by IPPs. In the case of South Africa, the Independent Power Producer Procurement Programme (IPPPP) is a key vehicle for securing electricity capacity from the private sector for both renewable and non-renewable energy sources, as aligned with national policy. In 2014, approximately 2.2 terawatt hours (TWh) of renewable energy was generated by IPPs in South Africa, powering the equivalent of 700,000 typical South African homes.

IPP procurement in South Africa is managed by the "IPP Office", a specialised procurement office that was established by the South African Department of Energy, National Treasury and the Development Bank of South Africa. The IPP procurement programme, as developed by the IPP Office, has been designed with a rolling bid-window programme format whereby procurement of energy from IPPs is done in a cyclic manner, with a procurement cycle typically being completed in a year. The bid-window format attracts continued market interest, induces increased competitive pressure among bidders to offer reduced pricing, allows for improvements and lessons learnt with each bid-window to be incorporated in the refinement of procurement documentation in the following bidwindows, and uses standard contracts that avoid negotiations and enable consistency.

negulatory		
Country	Programme / Body	Year of Adoption
Angola	New Renewables Strategy	2017
Botswana	Botswana Energy Regulatory Authority	2017
DRC	Minerals for Infrastructure Deal	2007
Lesotho	Country Partnership Framework (CPF)	2016
	Renewable Energy Feed-In-Tariffs (REFiT)	2016
	National Strategic Development Plan 16/17	2016
Madagascar		
Malawi	Independent Power Producer (IPP) Framework for Malawi	2017
Mozambique	Renewable Energy Feed-in Tariff (REFiT)	2014
Namibia	National Renewable Energy Policy for Namibia	2016
	Namibia Renewable Energy Feed-in Tariff (REFiT)	2016
Seychelles	Small Island Developing State (SIDS) DOCK Support Programme	2016
	Exemption from goods and services tax	2016
South Africa	Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)	
	Regulatory Framework – PPAs and IPPs	2016
	Coal-Baseload Independent Power Producer Procurement Programme (CBIPPPP)	2014
	Renewable Energy Feed-in Tariff (REFiT)	2009
Tanzania	Sustainable Use of Natural Resources and Environment Finance (SUNREF)	2017
	Small Enterprise Finance Agency (SEFA)	2016
Zambia	Renewable Energy Feed-in Tariff (REFiT)	2015
Zumolu	Office for Promoting Private Power Investment (OPPPI)	2015
	Scaling Up Solar Project	2016
Zimbabwe	Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZimAsset)	2013
	Electricity Act (IPP Inclusion)	2009

Regulatory Frameworks to Support Private Sector Investment Table 2.5



Zambia has established a public institution, Office for Promoting Private Power Investment (OPPPI), which facilitates and promotes the implementation of IPPs. The OPPPI is a dedicated unit in the Ministry of Energy whose role is to promote new players to the electricity market. It is one of two institutions formed following the liberalisation of the Zambian power sector to attract private sector participation in the generation, transmission and distribution of electricity in the country. The other institution is the Energy Regulation Board whose responsibility is to regulate operations and pricing in the Zambian Electricity Supply Industry (ESI). The OPPPI interfaces directly with investors and champions support for privatesector hydropower generation and transmission projects. The creation of OPPPI has eased the process of investing in the Zambian ESI and has seen several private players entering the industry.

Most SADC countries are realising the importance of instituting regulatory frameworks to support private sector participation. The region has extremely low levels of electricity penetration with just over 40 percent electricity penetration rate and the rural population having a mere five percent access to electricity (SARDC 2016). The private sector can play a crucial role in ensuring that the region meets the SE4All targets and United Nations Sustainable Development Goal 7, which aims to deliver universal access to modern energy services by 2030.

Table 2.5 gives an overview of some of the regulatory frameworks established by the SADC Member States to attract private sector investment in the energy sector.

Key success factors for energy investment in SADC

According to the SADC Investment Forum held in July in Swaziland, the main challenges cited as affecting the successful resource mobilisation or implementation of energy infrastructure projects in the region include the absence of a coherent regional integrated plan and strategy that balance the national and regional needs; and an increasing focus on self-sufficiency and growing preference for domestic projects to regional projects for security of supply reasons.

Other challenges identified were difficulties in mobilising financing for regional generation and transmission investments due to inadequate project preparation; and the perceived high risk of cross-border projects and capacity constraints at national and regional levels. Table 2.6 gives an overview of some of the key factors that are attributed to the success of energy investment and, lack thereof, in SADC Member States.

Overview of Key Success Factors for SADC Energy Investment

Table 2.6

SUCCESS FACTORS

- A clear supporting regulatory framework for energy investment ensuring that there is both political and economic will.
- Support of local businesses and entrepreneurs to participate in energy projects.
- Stimulation by in-country energy regulators to transform the energy market to renewable energy as most international investors are moving towards green energy.
- Favourable tax and duty regimes.
- Instituting laws and regulations that enable ease of doing business for both international and local business
 players, which includes reducing bureaucracy at key institutions.
- Publicising in-country success stories and projects to the international community. This is usually done by participation at various energy-related fora that include conferences, summits and workshops
- Instituting strong and effective monitoring and evaluation and reporting processes including the strengthening of in-country skills, including key skills in project managemen.
- Incentives for Private Public Partnerships and effective management thereof.
- Creation of cost-reflective tariffs that make private and international investment in the energy sector attractive.
- Governments that commit their own resources particularly to early-stage projects in order to leverage private financing, thus minimising risks associated with early stages of project development.



Oil and Gas Sub-Sector

Investments in the SADC oil and gas sector are increasing, particularly in Angola, Mozambique and the United Republic of Tanzania due to the vast resources found in those countries. However, the sector is plagued by volatile prices, which have been uncharacteristically low in the last two years thus generally discouraging investment. Angola is currently southern Africa's only significant oil producer, producing more than 1.25 million barrels per day. The country is estimated to have crude reserves of 5.4 billion barrels, which constitute 96 percent of SADC's total estimated proven crude reserves. Crude oil production in Angola has quadrupled over the past 20 years. Smaller discovered reserves of oil are found offshore in Mozambique, Namibia, South Africa and Tanzania.

Angola ranks as the second largest petroleum producing country in sub-Saharan Africa and 14th in the world. For several months during 2016, Angola's petroleum production of 1.8 million barrels per day (bpd) surpassed that of historic sub-Saharan African leader, Nigeria. The oil industry in Angola is dominated by the upstream sector – exploration and production of offshore crude oil and natural gas. Almost 75 percent of the oil production comes from off-shore fields while ultra-deep water projects are being pursued by the French firm Total in Block 32 Kaiombo field that is expected to start production in 2017, as well as by the British multinational oil and gas company British Petroleum (BP) in Block 31.

The oil-rich continental shelf off the Angolan coast is divided into 50 blocks. The offshore blocks 0 to 4 are operated by American multinational energy corporation Chevron through its wholly owned subsidiary Cabinda Gulf Oil Company (CABGOC). CABGOC accounts for a significant share of Angola's oil production. In fact, US companies hold a strong position in the Angolan oil market, with Chevron and Exxon Mobile jointly accounting for one-third of national production, followed by Total and BP. Other international players with smaller operations include Italian firm ENI and Norwegian multinational oil and gas company Statoil ASA. Several other US companies have been active in deep-water exploration in Angola, including ConocoPhillips, Cobalt and Vaalco. ConoacoPhillips and Vaalco wells have shown limited results to date.

The state-owned oil company, Sonangol, maintains central control over the Angolan oil and gas sector, despite the nominal regulatory powers of the Ministry of Petroleum. Sonangol determines and collects the petroleum profits due to the government, while the Ministry of Finance collects income taxes from companies. Established in 1976, Sonangol works in partnership with various international oil companies through joint ventures and Production Sharing Agreements (PSAs) to produce and supply oil. Although exploration and production of crude oil and natural gas are quite well-developed, the refinery and distribution of the products derived from crude oil remain underdeveloped, resulting in the flaring of nearly 50 percent of the gas.

As mentioned earlier, natural gas is also becoming an important energy resource in the SADC region. New natural gas reserves have been discovered in various SADC Member States such as Mozambique and Tanzania during the past few years. These discoveries have interested various international investors. Tanzania is emerging as a force in this sector as new natural gas discoveries continue to be made along its coast while Mozambique has also seen a rapid expansion of its gas industry since the commissioning of the 865km gas pipeline by the South African multinational firm Sasol that runs from Temane and Pande gasfields in Northern Mozambique to Secunda in South Africa. The Rovuma area in Mozambique has seen positive natural gas exploration results while Tete Province, with its vast coal deposits, is also home to significant coal-bed methane gas.

South Africa is rich in shale gas and coal-bed methane gas. The DRC, and more recently Namibia, have discovered significant reserves of natural gas offshore. Other countries such as Botswana, Malawi, Zambia and Zimbabwe have large reserves of coal, and hence coal-bed methane gas. These reserves have not yet been extracted commercially although extensive pilot tests have been conducted especially in Botswana and Zimbabwe.

The petroleum and gas sub-sector is affected by the volatile and fluctuations in world prices of petroleum fuels, and yet little comparative, cross-border pricing data is available in the public domain although shortages have been felt in a number of countries. Ethanol from sugar cane is produced and blended with petrol in several SADC Member States that produce sugar.

Overview of SADC Oil and Gas Sector

The summary for the region is as follows:

- Countries extracting natural gas commercially (Angola, Mozambique and United Republic of Tanzania);
- Countries extracting crude oil commercially (mainly Angola)
- Countries that have discovered large deposits of natural gas but are still in the process of developing towards commercial extraction (DRC, Madagascar and Namibia)
- Countries that have discovered large deposits of shale gas (South Africa)
- Countries that have discovered large deposits of coal-bed methane gas but are still in the process of developing capacity for commercial extraction (Botswana, Mozambique and Zimbabwe)
- Countries that have discovered significant deposits of oil but are still developing capacity for commercial extraction (DRC and Madagascar).





INNOVATIVE FINANCING MECHANISMS & BEST PRACTICES

Introduction

Governments of SADC Member States are key financiers for infrastructure investment, but the fall in commodity prices for resource-based economies has created budgetary concerns. This has led to a reduction in government infrastructure spending, with private investors and development institutions needed to bridge the funding gap.

National Initiatives

Cognisant of the challenges faced in raising resources to fund energy projects, a number of SADC Member States have put in place measures to promote investment in the sector. Among the initiatives is the introduction of energy funds by governments, utilities and regulators. This chapter highlights these initiatives.

Angola Infrastructure Fund

The Angolan Sovereign Wealth Fund, commonly known as the Fundo Soberano de Angola (FSDEA), was created by the Angolan government in October 2012. With an initial capital base of US\$5 billion, it is the second largest sovereign wealth fund in Sub-Saharan Africa after Botswana's Pula Fund. The FSDEA makes investments in Angola and internationally in support of its mandate to promote the economic and social development of the country and generate wealth for its future generations.

The FSDEA has allocated US\$1.1 billion to a dedicated Infrastructure Fund as infrastructure investments are considered a catalyst for economic growth and development. The fund focuses on equity investments in energy, transport and large industrial developments domestically and across the sub-Saharan African region.

Botswana National Electrification Fund

The National Electrification Fund (NEF) was introduced in 2010 as a vehicle to facilitate connection of rural areas to the national grid. The NEF subsidises the cost of connecting households in poor communities to the electricity grid owned by the Botswana Power Corporation (BPC); and acts as a source of development funds for future electrification projects.

The subsidy payable from the NEF is the amount necessary to finance the difference between the actual market household electricity connection cost and the National Electricity Standard Connection (NESC). The NESC is the price determined by the Minister of Minerals, Energy and Water Resources to be the applicable national standard cost required for a household to connect to the national grid. The minister periodically reviews the NESC in line with movements in commercial electricity connecting a household to the BPC grid is, for example P20,000, then the family in question will be required to only pay P5,000 while the NEF pays the balance.

In April 2010, the government of Botswana introduced an electricity levy of 5 thebe per kilowatt hour consumed. The levy is payable monthly by all electricity customers to generate money for the fund from which household connections will be subsidised. As of October 2016, the NEF had enabled 94,727 additional households to connect to the national grid. The NESC subsidy is directed at properties and not individual customers, so a customer who owns more than one house can benefit from subsidies for all the houses.

¹ There are 100 thebe in a Botswana Pula. The exchange rate of the Botswana Pula to the US Dollar was pegged at 1 Pula to 0.098 US Dollars as of 26 June 2017



Lesotho Universal Access Fund

The Lesotho Electricity and Water Authority set up a fund in 2011 for purpose of subsidising the capital costs of electricity service infrastructure in rural areas. The Universal Access Fund is replenished by the electrification levy collected by the Lesotho Electricity Company (LEC).

The purpose of the Fund is to:

- receive and disburse funds to facilitate the development and expansion of electricity service infrastructure in areas where there are no such services and to provide access to the greatest number of users;
- provide funding towards the construction and upgrading of electrical systems for electrification of new areas;
- provide financial assistance towards the education and training of local communities in the safe and efficient use of electricity; and
- provide financial assistance to support research relevant to the supply of electricity to areas where there is no access to electricity.

The main source of money for the fund is the electrification levy collected by LEC. Other possible sources are grants from donor agencies or financiers and money paid from the government's Consolidated Fund. The Fund is administered by the board of the Lesotho Electricity Authority.

There is also the Lesotho Petroleum Fund which is responsible for funding viable energy projects and research and development in the petroleum sector as well as the Lesotho National Rural Electrification Fund which is mandated with ensuring investment in rural electrification.

Malawi Energy Fund

The Malawi Rural Electrification Programme (MAREP) is enacted through the Rural Electrification Act of 2004. The Act grants oversight of the implementation of MAREP to the Rural Electrification Management Committee (REMAC) including budgetary approval. MAREP is executed in phases with the objective of increasing access to electricity for people in peri-urban and rural areas.

The Act also established the Rural Electrification Fund (REF). This is financed by the Rural Electrification Levy from tariffs on all energy sales including petroleum products and electricity sales; donor funds and a parliamentary appropriated budget. Revenue from the Fund is allocated to the other Recurrent Transaction of the REMAC Secretariat (11 percent), i.e. the Department of Energy Affairs, while the balance (89 percent) is for the MAREP facility.

Mozambique Energy Fund Institute

Mozambique's Energy Fund Institute (FUNAE) aims at electrification of schools and clinics using photovoltaic (PV) and other renewables. The Mozambican government has promoted solar PV and mini-hydropower solutions in rural areas, reporting that 700 schools, 600 health centres and 800 other public buildings in rural areas now have electricity from solar PV. Although spearheaded by FUNAE, this initiative has promoted the participation of private players.

Namibia National Energy Fund

The National Energy Fund (NEF) was established in 1990 and receives monies collected in respect of levies imposed on controlled petroleum products. The NEF also receives money collected by NamPower for the electricity levy. The fund can be used towards, but not limited to, electrification funding, loans to electricity companies for financing capital projects, electricity price subsidies, and subsidising electricity tariffs to avoid temporary price shocks, and subsidising electricity pricing of identified poor communities. On 1 July 2013, the Government of Namibia approved NEF Electricity Levy that is applied towards:



- Electrification funding (complementing budgetary allocations);
- Equity co-funding of electricity undertakings;
- Loans to electricity undertakings for financing capital projects;
- Electricity price subsidies;
- Subsidising electricity tariffs to avoid temporary price shocks;
- Subsidising electricity pricing of identified poor communities;
- Financing of Regional Electricity Distributors (REDs) through soft loans for electricityrelated projects;
- Guarantees for REDs;
- Studies on Electricity Supply Industry (ESI) related projects;
- Improvement of quality of supply and services; and
- Renewable energy projects;

The NEF receives funds collected from the Petroleum Equalisation Levy as well as from levies imposed on actual petroleum products consumed per month in the country. The Fund also collects money on behalf of the Motor Vehicle Accident Fund and Road Safety Secretariat (RSS) and remits it to the respective institutions.

The NEF manages and administers the "Slate Account", which is an account kept under an agreement between the Government of Namibia and suppliers of petroleum products for purposes of determining – according to an agreed formula – the amount of compensation payable by the State to suppliers of petroleum products or by such suppliers to the State, as the case may be, in respect of losses suffered or profits gained by such suppliers as a result of fluctuations in the purchase price of petroleum products against the selling price thereof.

South Africa Integrated National Electrification Programme

The programme seeks to achieve universal access to electricity in the country by 2025. It focus on planning, project management and funding the bulk infrastructure, grid and nongrid new connections for households that cannot afford to pay on their own to receive access to electricity. Through the programme, the government of South Africa subsidies capital costs of connections made towards meeting the electrification targets.

Swaziland Rural Electrification Fund

The fund aims to increase electricity access in rural areas. The main source for the fund is a 15 percent electricity tariff on all electricity purchases.

Tanzania Rural Energy Fund

The fund was established in 2005 for the purpose of providing grants to qualified project developers. The Fund represents a mechanism by which the Rural Energy Board, through Rural Energy Agency (REA) fulfils its mandate. Funding sources include the five percent levy on the commercial generation of electricity to the national grid, as well as fees in respect of programmes, publications, seminars, consultancy services and other services provided by the REA.

Tanzania Renewable Energy Investment Facility

The AfDB-hosted Sustainable Energy Fund for Africa (SEFA) approved a US\$870,000 preparation grant for REA in November 2016 to structure the Renewable Energy Investment Facility (REIF), which will provide affordable finance to private sector clean energy projects providing energy access to rural communities. Just twenty-four percent of the country's total population of 47 million has access to electricity. There is a 10 percent rural access to electricity . The vastness of the country, coupled with low population densities, makes grid extension too expensive, creating a significant market potential for off-grid electrification schemes.

Within this context and the country's considerable and untapped renewable energy potential, the Government of Tanzania has set an objective of increasing access to electricity



by promoting renewable energy powered off-grid/mini-grid electrification schemes. The government estimates that about half of the country's rural population could be served by off-grid options in a cost-effective manner, and that mini-grids could benefit 9.1 million people in the country.

The government plans to achieve about 1.3 million connections in rural areas (including public facilities) and increase the average access rate to electricity (both urban and rural) to 35 percent by 2022. The REIF will, therefore, contribute to expanding rural electrification and increase access to energy services by channelling appropriately tenured and priced finance to private sector companies developing and operating energy access projects in rural areas based on renewable energy technologies.

Zambia Rural Electrification Fund

The fund was established in 1994 and seeks a portion of the sales tax on electricity to the fund through an administrative arrangement. A three percent electricity levy from the Zambia Electricity Supply Corporation Limited (ZESCO) is used to fund the initiative, which is administered by the Rural Electrification Authority (REA). The success of the fund has seen REA supplying electricity to more than 900,000 rural dwellers since 2006.

Zimbabwe Rural Electrification Fund

The Rural Electrification Fund (REF) is a statutory body governed by the REF Act. The policy framework was a deliberate intention to correct the imbalances between urban and rural electrification with the ultimate goal of socially and financially empowering the rural communities and enhancing their capabilities in their contribution towards the economic development of the country.

The Rural Electrification Programme (REP) commenced in earnest in 1983 when the Zimbabwe Electricity Supply Authority (ZESA) earmarked 48 growth points for electrification. The pace of project implementation was slow and characterized by underfunding and inequitable project distribution. In February 1989 the idea of a countrywide rural electrification programme was proposed. This idea culminated in the 1995 African Development Bank-funded Rural Electrification Master Plan Study that recommended:

- extension of the grid network to 415 rural service centres, business centres and growth points that would act as grid network hubs.
- dedicated funding arrangement through an electrification levy; and
- promotion of productive use of electricity by the projects selected for rural electrification In 1997 ZESA established the Rural Electrification Unit to dedicate its efforts towards

the rural electrification activities. In March 2001, the ZESA Board passed a resolution to embark on the Expanded Rural Electrification Programme, with Electricity End-Use Infrastructure Development. The resolution gave an unprecedented impetus to finalizing the electricity industry reform draft white paper, which culminated in the enactment of the REF Act and the Electricity Act, respectively, at the beginning of 2002.

The legal framework created an enabling environment that promoted and sustained the Rural Electrification Programme in that the Rural Electrification Agency builds the grid network infrastructure and the Zimbabwe Electricity Transmission and Distribution Company (ZETDC) collects the levy, operates and maintains the developed infrastructure

The major thrust of the REF is to ensure that there is an equitable distribution of resources in the electrification of the rural areas in Zimbabwe. It is hoped that by electrifying the rural areas, development will be accelerated. The major source of revenue for the agency comes from a six percent levy that is charged on electricity consumers.

Conclusion

Energy plays a vital role in the development and economic growth of the SADC region. The timely implementation of energy programmes and related projects by SADC Member States is needed to achieve the objectives of the SADC industrialisation agenda. This has an impact on the development of other sectors of the economy such as agriculture and food security, and delivery of services such as water supply and sanitation, education and training, health, job creation, and livelihoods.

The SADC Energy Sector has attracted significant support during the past year, with International Cooperating Partners (ICPs) investing in "soft" and "hard" infrastructure projects in the region, and the private sector increasing its participation to become a key player.

The main ICP support to the SADC Energy Sector has been in the provision of assistance in the development of energy policies and strategies as well as providing technical support to regional and national energy institutions. Some of the main ICP contributors to the SADC Energy Sector in this regard are Austria, European Union, Finland, Germany, Sweden and the World Bank.

Achievements include the development of the SADC Regional Renewable Energy and Energy Efficiency Strategy and Action Plan (REEESAP) with support from the EU, as well as the extension by another three years of the Southern African Solar Thermal Training and Demonstration Initiative (SOLTRAIN) programme by the Austrian government. The SOLTRAIN programme focuses on political advocacy, capacity building, technical training and infrastructure development (solar demonstration systems).

A highlight of the past year was the pledge to facilitate access to funding for capacity building, project development and project financing by several ICPs, financial institutions and Financial Development Institutions. These include the African Development Bank, China Oversees Development Cooperation, China Overseas Infrastructure Development and Investment Corporation, Development Bank of Southern Africa, EU and Japan International Cooperation Agency. China is playing an increasingly significant role in investment in infrastructure for the SADC energy sector. During the past year, the Chinese government and financial institutions invested or pledged to invest about US\$16 billion for the development of hydro and thermal-fired power stations in six SADC Member States – Angola, Botswana, Democratic Republic of Congo, Malawi, Mozambique and Zimbabwe.

Although information on all private sector investment is not readily available as yet, it is clear that the private sector is becoming a key player in the SADC energy sector. The Independent Power Producers (IPPs) could soon be among the major players in the SADC energy sector, thanks to current reforms by Member States.

According to the Southern African Power Pool (SAPP), a significant share of electricity generation in South Africa and Zambia is produced by IPPs. Both countries have established specialist bodies to promote IPP participation in energy infrastructure. IPP procurement in South Africa is done through the IPP Office, a specialised procurement office that was established by the South African Department of Energy, National Treasury and the Development Bank of Southern Africa. Zambia has established a public institution to facilitate and promote the implementation of IPPs. The Office for Promoting Private Power Investment (OPPPI) is a dedicated unit in the Ministry of Energy whose role is to promote new players to the electricity market.

The increased investment in SADC energy infrastructure over the past year is showing results as the region has enjoyed surplus electricity generation since the beginning of 2017. According to statisticsfrom the Southern African Power Pool (SAPP), mainland SADC Member States had installed capacity of 59,539MW and operating capacity of 54,397MW as of the end of April 2017 against peak demand of around 53,478MW. This resulted in excess generation capacity of 919MW, a situation that has prevailed since the beginning of the year.

Installed capacity in oceanic Member States was 782MW, 246MW and 106MW for Mauritius, Madagascar and Seychelles, respectively.

Total installed capacity for all SADC Member States is more than 60,670MW.

The excess in mainland SADC was attributed to a slowdown in the South African economy but also due to the impact of a coordinated approach in implementation of the SADC energy programme. South Africa's economy has been contracting in the past year due to a drop in mining and manufacturing production.

The surplus generation capacity comes five years ahead of the initial SAPP target of attaining electricity self-sufficiency by 2022. The SAPP figures showed that more new generation capacity was added to the power pool in 2016 than was previously anticipated. The region exceeded the target of 3,757MW for the year and commissioned 4,180MW from new power projects and the rehabilitation of old power plants. Mainland Member States are planning to commission more than 7,000MW of new generation capacity in 2017, a development that is expected to further strengthen the region's energy security.

Investment in the nascent SADC oil and gas sector is increasing, particularly in Angola, United Republic of Tanzania and Mozambique due to the vast resources found in those countries. Volatility in the price of oil on the world market has, however, tended to discourage investment. Most of the investment is dominated by multinational companies, mainly from Italy, France and the United Statesof America. The natural gas sub-sector is expected to continue attracting investment in Mozambique and Tanzania over the next decade.

Policy Options

Below is a summary of key policy options that can be considered by SADC Member States to promote investment in the energy sector.

The planning phase of energy infrastructure development presents a number of challenges for SADC and Member States, chief among them being the lack of capacity to develop bankable projects. There is need for strengthening the capacity of SADC and Member States to package bankable projects. This will require the strengthening of both the SADC Project Preparation and Development Facility (PPDF) and the SADC Regional Development Fund (RDF).

With the emergence of new players in infrastructure development, notably from the BRICS countries (Brazil, Russia, India, China and South Africa), governments need to ensure the availability of skills in negotiating infrastructure development that includes requests for appropriate skills transfer, use of local employment, as well as the integration of social and environmental considerations. In cases where the use of external consultants is inevitable, ensuring skills transfer and investigating the best models of the use of external consultants will be important.

Member States should vigorously pursue measures to encourage private sector participation in the energy sector. The region already has good examples in the form of South Africa's IPP Office and OPPPI of Zambia. Similarly, Member States can strengthen capacity to negotiate with the private sector, through dedicated and well-staffed Public-Private-Partnership units, and to effectively lead on donor coordination at country level.

There is need to move with speed to operationalize the proposed SADC Regional Development Fund to ensure that the region has a readily available pool of resources to fund energy and other infrastructure projects. The fund could be complemented by the introduction of alternative and innovative sources of funding as part of efforts to move away from over-reliance on donor support. Studies commissioned by the SADC Secretariat in 2016 showed that the regional body could earn at least US\$1.2 billion per annum from a proposed Export and Import Levy, a Regional Tourism Levy, Regional Financial Transaction Taxes, philanthropic initiatives, Regional Events and a Regional Lottery.

There is also a need to review energy-related legal documents, policies, institutional frameworks and strategies as some are out-dated and need to be reviewed in line with the



changing environment so they remain relevant and useful. If the region eventually adopts the proposal to introduce an Export and Import Levy or any of the options at its disposal, there will be need for a dedicated legal instrument in the form of a protocol or agreement to strengthen the policy framework provided by the SADC Treaty. National legislation will be necessary in each Member State to enable revenue authorities to collect the revenue.

There is need for project owners to ensure that financiers and the private sector are involved in energy projects at early stages of project feasibility assessment. This is crucial in ensuring ownership by all parties from the beginning of the project.

The "regional project" concept needs to be clarified, and there is a need for the development of a framework for the coordination, implementation, championing and financing of these projects. Existing frameworks such as the SAPP need to be fully utilised in this regard.

The SADC region should create an enabling environment for investment in the energy sector at both regional and national levels as investors look for stability, sustainability and returns. The environment should address the unique characteristics of energy sector projects, such as long lead-times and high start-up costs. A clear supporting regulatory framework for energy investment is needed.

SADC Member States can introduce feed-in tariffs to encourage renewable energy technology investments. These can offer long-term contracts for those who generate renewable energy based on technologies using wind, solar and tidal power. Feed-in tariffs are given based on the electricity produced by the renewable energy system, and any renewable energy producer can sell electricity to the grid.

The utility offers long-term contracts to producers, typically for a period of 15 to 20 years to ensure priority connection to the grid as well as paying for any necessary upgrades to the grid. A number of SADC Member States already have such tariffs in place.

Member States need to migrate towards cost-reflective tariffs that make private and international investment in the energy sector attractive. This comes with its own challenges since adoption of cost-reflective tariffs may negatively affect efforts to increase access to electricity. Countries wishing to migrate to cost-reflective tariffs should market the concept of cost of service tariffs to their customers. This can be done through awareness-raising campaigns that explain why cost reflectivity is needed, and how the removal of subsidies can benefit most customers.



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