SADC
Energy Investment Yearbook
2019




SOUTHERN AFRICAN DEVELOPMENT COMMUNITY
SADC
TOWARDS A COMMON FUTURE

SADC
Energy Investment Yearbook
2019




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PREFACE

The *SADC Energy Investment Yearbook 2019* is the fourth in the series profiling developments in the energy sector in the Southern African Development Community (SADC) with respect to investment. The importance of energy in the 16 Member States of SADC region is very evident now, given the SADC decision to frontload industrial development in its economic integration agenda. Industrial development has been placed at the core of the developmental integration agenda of SADC. Member States acknowledge that industrial development is central to diversification of their economies; development of productive capacity; and the creation of employment in order to reduce poverty and set their economies on a more sustainable growth path. Efficient and affordable energy infrastructure is a crucial enabler for economic activity as well as for efforts to attain sustainable development.

Energy is a critical area of the infrastructure pillar of the Revised Regional Indicative Strategic Development Plan (RISDP) and considerable preparatory work has been put in this area to develop enabling policies, systems and processes that will greatly facilitate project preparation as well as help to attract private sector investment and further promote Public-Private Partnerships (PPPs).

There is need to do more to secure funding for both project preparation and investment, which continues to be a major challenge for the region, resulting in costly delays in implementation of projects. The private sector has until now largely shied away from venturing into major infrastructure projects to boost regional power supply, citing, among others, restrictive national laws as one of the reasons for not investing. This has left governments and International Cooperating Partners (ICPs) as the primary sources to fund energy projects. It is commendable, as noted in this report, that the private sector is slowly warming up to efforts by Member States to improve the investment climate in the energy sector as witnessed by an increase in the number of independent power producers over the past few years.

The SADC Regional Development Fund (RDF), whose agreement was approved at the 36th SADC Summit in Eswatini and is in the process of being operationalized, should open a window for comprehensive packaging of infrastructure projects within the region. The objective of the fund is to mobilize resources for funding SADC's regional integration agenda, including infrastructure development.

The *SADC Energy Investment Yearbook 2019,* among other issues, underscores the importance for Member States to double their efforts to attract investment in the energy sector 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 2019* 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 policy-makers to consider for implementation.

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

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In the production process, SARDC REDI worked with various organizations, experts and individuals to gather and analysis the information. Valuable information came from organizations such as SADC Secretariat through its Energy Division, as well as its subsidiary organizations and other members of the SADC Energy Thematic Group (ETG) including the Regional Electricity Regulators Association of Southern Africa (RERA), the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE) and the Southern African Power Pool (SAPP).

We also acknowledge with deep appreciation the guidance and support of the SARDC Executive Director Munetsi Madakufamba, who supported the process throughout, from conceptualising the initiative through ideas and informed analysis, as well as Projects Coordinator Maidei Musimwa and Phyllis Johnson, SARDC Founding Director and Special Projects, for the active engagement through technical review and knowledgeable eye for accuracy that made this publication a cut above the rest.

Special thanks also goes to the creative work of the SARDC design and publishing team, comprising Tonely Ngwenya, Anisha Madanhi, Eunice Kadiki and Tonderai Mpofu who worked tirelessly to ensure an engaging product that is presented in an attractive and accessible manner.

We express our gratitude to the Austrian Development Agency (ADA) for its generous financial assistance offered for the research, development and publication of the *SADC Energy Investment Yearbook 2019*.

Last but not least, the contribution and pivotal role of all institutions and individuals who supported the preparation of this publication, and may not have been credited by name is gratefully acknowledged. We say thank you for your essential support.

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ACRONYMS

AFD	French Development Agency
AfDB	African Development Bank
ASX	Australia Stock Exchange
BOO	Build-Own-Operate
BOOT	Build-Own-Operate-and-Transfer
BOT	Build-Operate-Transfer
CSP	Concentrated Solar Power
CTF	Clean Technology Fund
DBSA	Development Bank of Southern Africa
DFIs	Development Financing Institutions
DRC	Democratic Republic of Congo
EA	Environmental Authorisation
EAPP	East African Power Pool
EDM	Electricidade de Moçambique
ENH	Empresa Nacional de Hidrocarbonetos
EPC	Engineering, Procurement and Construction
ESERA	Eswatini Energy Regulatory Authority
ESIA	Environmental and Social Impact Assessment
GEF	Global Environment Facility
GET FiT	Global Energy Transfer Feed-in-Tariff
ICPs	International Cooperating Partners
IDBZ	Infrastructure Development Bank of Zimbabwe
IGMOU	Inter-Governmental Memorandum of Understanding
IIPSA	Infrastructure Investment Programme of South Africa
IPPF	Infrastructure Project Preparation Fund
IPPs	Independent Power Producers
IRENA	International Renewable Energy Agency
IUMOU	Inter-Utility Memorandum of Understanding
LEC	Lesotho Electricity Company
LNG	Liquefied Natural Gas
MOU	Memorandum of Understanding
MW	Megawatt
NEPAD	New Partnership for Africa's Development
NORAD	Norwegian Agency for Development Cooperation
OPIC	Overseas Private Investment Corporation
OPPPI	Office for Promoting Private Power Investment
PAU	Project Advisory Unit
PFAN	Private Financing Advisory Network
PIDA	Programme for Infrastructure Development in Africa
PPAs	Power Purchase Agreements
PPDF	Project Planning and Development Fund
PPI	Private Participation in Infrastructure
PPPs	Public Private Partnerships
PROLER	Projeto de Promoção de Leilões para Energias Renováveis
PV	Photovoltaic
RDF	Regional Development Fund
REFIT	Renewable Energy Feed-In Tariffs
REN21	Renewable Energy Policy Network for the 21st Century
RERA	Regional Electricity Regulatory Association
RGMP	Regional Gas Master Plan
RIDMP	Regional Infrastructure Development Master Plan
RISDP	Regional Indicative Strategic Development Plan

SACREEE	SADC Centre for Renewable Energy and Energy Efficiency
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Authority
SAPP	Southern African Power Pool
SARDC	Southern African Research and Documentation Centre
SEFA	Sustainable Energy Fund for Africa
SIDA	Swedish International Development Cooperation Agency
SNEL	Société Nationale d'Électricité
SREP	Scaling up Renewable Energy in Low Income Countries Program
TFC	Trillion Cubic Feet
UNDP	United Nations Development Programme
USTDA	United States Trade and Development Agency
WEF	World Economic Forum
ZESA	Zimbabwe Electricity Supply Authority
ZESCO	Zambia Electricity Supply Corporation
ZiZaBoNa	Zimbabwe Zambia Botswana Namibia
ZTK	Zambia-Tanzania-Kenya

INTRODUCTION

Energy has been acknowledged as one of the critical pillars of the regional integration agenda of the Southern African Development Community (SADC). As the region pushes ahead with its effort to industrialize its economy, there is concerted push to ensure that there is adequate electricity and other forms of energy to meet the needs of an expanding economy. Such efforts include initiatives to strengthen the legal and legislative environment as well as reforms aimed at attracting the hitherto elusive private investors into the energy sector.

The *SADC Energy Investment Yearbook 2019* looks at the efforts being made by the region to ensure energy security as it embarks on the industrialization drive. It highlights the initiatives being undertaken by the region to improve energy infrastructure in support of industrialization and regional programmes, and outlines some policy options that SADC could adopt in order to ensure increased investment in new energy infrastructure, which together with improved management, performance and additional spending on maintenance, is a prerequisite for industrial development.

Implementation of the SADC Industrialization Strategy and Roadmap, the RISDP and the Energy Sector Plan of the SADC Regional Infrastructure Master Plan (RIDMP) 2012-2027 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 industrialization agenda would remain a far-fetched dream.

Besides highlighting investments in large-scale energy projects, the publication also captures inflows into smaller 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 deals with investment by Member States and International Cooperating Partners (ICPs) into the electricity sub-sector. Investment in this sub-sector is crucial, given that the region has recently relapsed into power shortages, a few years after recording a surplus in 2017.

Chapter 2 looks in greater detail at developments in the renewable energy sector, some of which may have been captured in the previous chapter. 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 third chapter deals with investment trends in the Oil and Gas sub-sector, including current efforts to create a robust regional framework for cooperation among Member States. It highlights that SADC has significant potential to become a global player in the production of oil and gas.

Chapter 4 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 Member States and the region.

CHAPTER ONE

INVESTMENT IN ELECTRICITY

1.1 Introduction

It is acknowledged that access to reliable and modern forms of electrical power is a key enabler to economic growth and development. Both public and private sector stakeholders in southern Africa, are cognisant of the strategic role that electricity plays in the advancement of regional economic development. The significance of the electricity sub-sector to regional integration and industrialisation is highlighted in the SADC Protocol on Energy of 1996, the Revised Regional Indicative Strategic Development Plan (RISDP), the Regional Infrastructure Development Master Plan (RIDMP) and its attendant Energy Sector Plan. At the continental level, the importance of electricity is emphasised in the Programme for Infrastructure Development in Africa (PIDA) which aims to modernise Africa's infrastructure by 2030.

While the SADC region has enjoyed electricity surpluses since 2017, an adverse situation has since ensued, with the region now experiencing deficits. Information from the SADC Infrastructure Directorate shows that as at May 2019, the region had a power deficit of 500MW. This has meant the re-introduction by some power utilities within southern Africa, of demand side management strategies such as load-shedding, in an effort to manage the situation.

This development has come at a time when electricity access levels in the region remain significantly low. For example the 2018 State of Electricity Access Report, shows that about 58 percent of people within sub-Saharan Africa do not have access to electricity. Evidently, the solution lies in increased investments in electricity generation, so as to improve access and create an enabling environment for sustainable economic development within the SADC region.

This chapter highlights investments in the power sector during the past year, and reviews some of the investment sources and targeted projects.

1.2 Generation Projects Commissioned in 2018/19

In 2018, the SADC region commissioned 19 power projects with a total generating capacity of 3,874MW as indicated in Table 1.1 (SAPP, 2019). This represents a growth of 29 percent from the 3,008MW commissioned in 2017.

Table 1.1 Generation Projects Commissioned in 2018

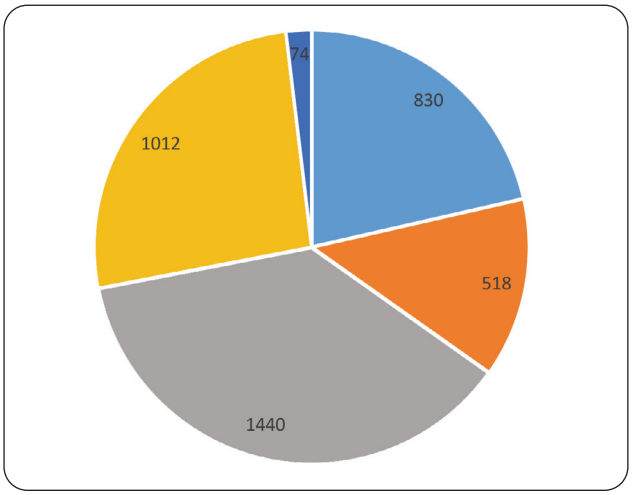
Country	Utility	Name	Type	Capacity (MW)
Angola	Empresa Rede Nacional de Transporte de Electricidade (RNT)	Lauca	Hydro	668
	RNT	Soyo	Gas	125
	RNT	Namibe	Gas	50
	RNT	Cuando Cubango	Gas	50
Malawi	Electricity Supply Corporation	Chichiri	Diesel	35
	IPP	Kanengo	Diesel	20
	IPP	Chinyama	Diesel	19
Mozambique	Electricidade de Moçambique	Central Termica	Gas	100
Namibia	IPP	Greenam	Solar	20
	IPP	Diaz	Wind	44
	NamPower	Hardap	Solar	37
South Africa	Eskom	Kusile 2 & Medupi 3	Coal	1 440
	Independent Power Producer (IPP)	Renewable	Wind and PV	666
	IPP	Renewable	Concentrated Solar Power	100
	IPP	Renewable	Solar	45
Tanzania	Tanzania Electric Supply Company	Kinyerezi 1 & 2	Gas	193
Zambia	Lunsemfwa Hydro Power Company	LHPC	Hydro	12
	IPP	Solar	Solar	100
Zimbabwe	Zimbabwe Electricity Supply Authority	Kariba South Extension	Hydro	150
Total				**3 874**

Source SAPP, September 2019

Of the 16 SADC Member States, only eight accounted for the additional electrical power investments during the period under review. South Africa contributed the most, adding 2,251MW or 58 percent of the total 2018. This was followed by Angola, which added 893MW through various projects in both the gas and hydro-electricity sub-sectors. The remaining six SADC Member States contributed a combined 730MW, which translates to 19 percent of generated power in 2018.

There was growth in the participation of Independent Power Producers (IPPs), both in terms of numbers and the amount of electricity produced when compared with the previous year. In 2018, eight IPPs produced 1,014MW accounting for 26 percent of commissioned capacity. This was significantly higher than the 639MW commissioned by six IPPs in 2017, contributing 21 percent of the total capacity in that particular year. The IPPs that commissioned projects in 2018 were from four SADC Member States, namely South Africa, Zambia, Namibia and Malawi. The increased interest by IPPs reflects a growing realisation within the region of the important role that the private sector can play in bridging southern Africa's infrastructure gap.

Figure 1.1 Commissioned Generation Projects by Energy Source in 2018



Source SAPP, September 2019

In terms of the energy mix, renewable energy sources such as hydro, solar and wind dominated the new generation capacity added in 2018. For example, renewable energy sources accounted for 1,842MW or 48 percent of the total. While this is below the 54 percent contribution made by renewables to the 2017 projects, the trend is consistent with the resolution made by Member States in 2012, to increase the uptake of cleaner energy sources and reduce carbon emissions. The 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.

1.1.1 Investment Trends in Power Generation Projects since 2009

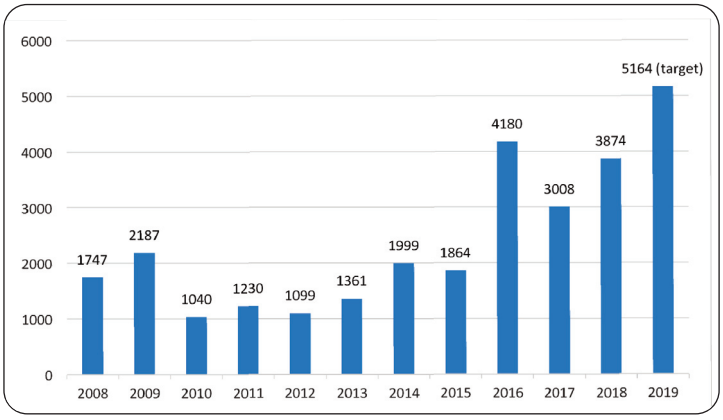
According to the SADC Infrastructure Directorate, the electricity peak load capacity in 2009 was 48,700MW. Since then, 21,842MW have been added to the regional grid during the period 2009 to 2018. This means that the region has been adding an average of 2,184MW each year for the 10 years since 2009, creating an average growth rate in the region's generating capacity of four percent.

The region anticipates to commission 5,164MW in 2019, which if successful, should bring total commissioned capacity since 2009 to 27,000MW. This in turn would increase the average to 2,455MW of additional electrical generating capacity each year at an average growth rate of five percent per year.

The trends in the commissioning of power generation projects since 2009, as shown in Figure 1.2.

The 2009 SAPP Regional Generation and Transmission Expansion Plan study projected an increase in power demand at a rate of four percent per annum, meaning that an additional 52,000MW would be required during the period 2009 to 2025. With the region returning to power deficits, it would be in the best interest of SADC Member States to intensify investments in the electricity sector at a rate above the projected demand of four percent, in order to ensure sustainability.

Figure 1.2 Investment Trends in Generation Projects (2008 to 2019)



Source SAPP, September 2019

1.2 Planned Power Generation Projects for 2019

As depicted in Figure 1.2, the SADC region intends to commission power generation projects with a combined capacity of 5,164MW in 2019. The Table 1.2 provides a summary of the projects earmarked for commissioning before the end of 2019.

Table 1.2 Generation Projects Planned to be Commissioned in 2019

No	Utility	Country	Name	Type	Capacity [MW]
1	RNT	Angola	Lauca	Hydro	728
2	RNT	Angola	Soyo	Thermal	375
3	RNT	Angola	Saurimo	Thermal	20
4	RNT	Angola	Kaluapanda	Thermal	20
5	RNT	Angola	Luena	Thermal	20
6	SNEL	DRC	Inga 2 Expand	Hydro	148
7	SNEL	DRC	Sanga	Hydro	5.4
8	IPP	Malawi	Solar	PV	100
9	ESCOM/ EGENCO	Malawi	Diesel	Diesel	36
10	TANESCO	Tanzania	Kinyerezi	Gas	185
11	IPP	South Africa	Solar	PV	40
12	Eskom	South Africa	Coal	Medupi	1 460
13	Eskom	South Africa	Coal	Kusile	1 440
14	IPP	South Africa	Miomass	Biomass	542
15	IPP	Mozambique	Mocuba	PV	30
16	NamPower	Namibia	Solar	Solar	15
TOTAL					5 164.4

Source SAPP, September 2019

1.3 Transmission Projects

In line with the regional integration thrust in the energy sector, several transmission projects are planned to help distribute power from countries with surplus electricity production to those with shortfalls. The development of regional power interconnectors will enable SADC Member States to share and benefit from increased generation capacity across borders. The planned transmission projects are classified in three categories:

- **Category 1** comprises projects that aim to interconnect the three SAPP non-operating members;
- **Category 2** is made up of projects to relieve transmission congestion; and
- **Category 3** involves transmission projects to move power from new generating stations to load centres.

There are six Category 1 transmission projects that aim to connect Angola, Malawi and Tanzania to the regional grid (Table 1.3).

Table 1.3 Transmission Projects to Interconnect Non-Operating SAPP Members

Project name	Countries involved
Zambia-Tanzania-Kenya Interconnector	Zambia, Tanzania and Kenya
Mozambique-Malawi Interconnector	Malawi and Mozambique
Angola-Namibia Interconnector	Angola and Namibia
DRC-Angola Interconnector	Angola and DRC
Mozambique-Tanzania Interconnector	Mozambique and Tanzania
Malawi-Tanzania Interconnector	Malawi and Tanzania

The Zambia-Tanzania-Kenya (ZTK) Interconnector Project will not only link Tanzania to the SAPP grid, but also connect the Eastern African Power Pool (EAPP) to SAPP, allowing countries in eastern Africa to share surplus electricity with those in mainland SADC. The ZTK interconnector is one of a number of SADC projects being considered under the Programme for Infrastructure Development in Africa (PIDA). The following Category 2 transmission projects are at various stages of implementation in the SADC region:

Table 1.4 Interconnector Projects to Relieve Transmission Congestion

Project name	Countries involved
ZiZaBoNa Transmission Project	Zimbabwe, Zambia, Botswana and Namibia
Central Transmission Corridor (Alaska-Sherwood)	Zimbabwe
Mozambique Backbone	Mozambique
Mozambique-Zimbabwe-South Africa	Mozambique, South Africa and ZimbabweTransmission

1.3.1 Status of regional interconnection projects

Table 1.5 Transmission Projects to Move Power from New Generating Stations to Load Centres

Project name	Countries involved
Grand Inga Transmission	DRC
Mozambique-Malawi Transmission	Malawi and Mozambique
Botswana-South Africa Transmission	Botswana and South Africa
Botswana-Namibia Transmission	Botswana and Namibia
South Africa-Namibia Transmission	Namibia and South Africa
Mozambique-Zambia Transmission	Mozambique and Zambia
Kolwezi-Solwezi Transmission	DRC and Zambia

Zambia-Tanzania-Kenya (ZTK) Interconnector Project

A Memorandum of Understanding (MOU) was signed between the SAPP and Zambia Electricity Supply Corporation (ZESCO) for the Project Advisory Unit (PAU) to assist with the implementation of the Zambia portion of the Zambia-Tanzania-Kenya (ZTK) Power Interconnector, while the Nile Equatorial Lakes Subsidiary Action Programme – Office for Promoting Private Power Investment (OPPPI) undertook the work for the Tanzania component of the ZTK. For the Kasama-Nakonde line in Zambia, the contract was awarded and construction will take 18 months. Nakonde-Mbeya (100km) and Mbeya-Iringa (292km) feasibility study was completed and funding has been obtained from the World Bank. The Iringa-Dodoma-Singida-Shinyanga (670km) line of 400kV transmission line was completed and is operating at 220kV. Phase II of the substation upgrading to 400kV substations is underway and will be expected to be completed by June 2020. Funding for the Singida-Arusha-Namanga (Kenya) was secured for the transmission and substation segments. Construction commenced and expected to be completed by April 2020. Technical studies are required for the remaining portion of the line between Pensulo-Nakonde to the Zambian border. Funding will be provided by the World Bank. Commissioning of Zambia-Tanzania Interconnector is expected in 2021.

Mozambique-Malawi Interconnector

The two utilities *Electricidade de Moçambique* (EDM) of Mozambique and Electricity Supply Corporation of Malawi (ESCOM) undertook the project on their own, albeit requested the Project Advisory Unit (PAU) to support the negotiation process, and commercial terms are under discussion at this stage. The draft feasibility study was presented in 2016 and discussions were held with various stakeholders. The technical and environmental feasibility studies were completed in 2017 and the project is expected to be commissioned by 2021.

Mozambique-Zambia Interconnector

The Feasibility Studies are in progress with funding from the NEPAD Infrastructure Project Preparation Fund (IPPF) administered by the AfDB together with contributions from the United States Trade and Development Agency (USTDA) and the national utilities, EDM and ZESCO. The Consultants contract for technical studies was signed on 15 January 2018 for a period of 18 months to August 2019. The Environmental and Social Impact Assessment (ESIA) contract was signed on 23 January for 15 months until 30 March 2019. The project is progressing well with the Preliminary Design Report submitted and training activities for the utilities in progress. The consultation for stakeholders for development ESIA feasibility studies was completed in 2017. The feasibility study was completed and discussions are ongoing with various stakeholders.

Botswana-South Africa (BOSA) Interconnector
The SAPP secured funding for project preparation from the Infrastructure Investment Programme of South Africa (IIPSA), which is supported by the EU and managed DBSA. A Transaction Advisor has been appointed to carry out detailed feasibility studies and prepare the project to reach financial closure. The consultant presented the commercial structure and available options. The ESIA study is yet to be approved for BOSA. The project is planned for commissioning in 2022. The termination point of the project in South Africa has not been finalised due to an interdependency on the environmental authorisation of another Eskom project on the Mahikeng Substation (expected in April 2019). However, the Environmental Authorisation (EA) for BOSA in South Africa has been obtained and an appeal was lodged against the record of decision by the South African Heritage Resources Authority (SAHRA). Delays on the project will be as a result of the EA appeal process as well as decision on the terminal point of the line in SA. The Project has been extended to be completed in December 2019. The Inter-Utility Memorandum of Understanding (IUMOU) for the BOSA project has been drafted but not yet signed by the utilities.

Mozambique-Zimbabwe-South Africa Interconnector
The project will be phased for the ease of implementation into two components comprising Mozambique-Zimbabwe and Zimbabwe-South Africa interconnectors. The project preparatory funding is available from SADC Project Planning and Development Fund (PPDF) through DBSA for feasibility studies. The IGMOU was signed by Mozambique and Zimbabwe on 21 June 2016 and by South Africa in June 2017. The utilities are in the process of redefining the two components and prepared terms of reference to procure consultants to prepare Bankable Feasibility Studies, with assistance from SAPP. The application for funding has been resubmitted to the DBSA for consideration under the SADC PPDF or IPPSA facility.

DRC-Zambia Interconnector
In order to increase regional integration, the plan is to build another transmission interconnector between DRC and Zambia. The technical and environmental bids were evaluated and consultants were appointed for the technical studies. Two separate consultants are undertaking the ESIA study and work is ongoing on the preliminary design and Inception Report. The feasibility study for the 200km line is being funded by the NEPAD IPPF and the utilities (Société Nationale d'Électricité [SNEL] of DRC and [ZESCO] of Zambia) are required to meet 5 percent of the costs as a condition for AfDB support. The technical consultant commenced activities under a contract signed on 17 January 2018 for 18 months to August 2019. The ESIA contract was signed on 10 July 2018. Final feasibility study was expected to be completed in May 2019.

Malawi-Zambia Interconnector
The feasibility and ESIA studies are in progress and will be completed in May 2018. The project is planned for commissioning in 2019.

Malawi-Tanzania Interconnector
Feasibility studies are underway for this interconnection project.

Zimbabwe-Zambia-Botswana-Namibia Interconnector
The Project has been repackaged into three (3) components – Component A (Zimbabwe-Zambia), Component B (Zimbabwe-Botswana) and Component C (Zambia-Namibia). Negotiations with the AfDB for funding the Zimbabwe part are underway. Zimbabwe Electricity Supply Authority (ZESA) completed the ESIA study. ZESA completed the process of aligning technical feasibility to environmental studies, which will inform final technical specifications and Engineering, Procurement and Construction (EPC) documents. The project has reached financial closure and is awaiting commitment from potential investors. Zimbabwe is at an advanced stage of discussions with AfDB for the funding of component A where a total of US$30 million is being considered. As for Component C, Namibia-Zambia, the SAPP is mobilising resources for project funding through the PAU.

Angola-Namibia Interconnector

The SAPP secured funding from the Infrastructure Investment Programme of South Africa (IIPSA), Norwegian Agency for Development Cooperation (NORAD) and Swedish International Development Cooperation Agency (SIDA). A Transaction Advisor was appointed on 1 March 2017 to carry out detailed feasibility studies and prepare the project to reach financial closure. A pre-feasibility report was approved by the stakeholders in September 2017 covering the options and line route selection, market analysis, preliminary design, pre-feasibility financial analysis and cost estimates and potential commercial structures. The Final Scoping Report was delivered in March 2018. The project is currently discussing the business case, commercial structure and financial model. A major issue for the environmental survey on the 366km interconnector is demining of the line route and this could potentially delay the project. The Inter-Governmental Memorandum of Understanding (IGMOU) between the governments of Angola and Namibia was prepared and signed by ministers responsible for energy in November 2018. The IUMOU was signed on 29 November 2018 at the SAPP Executive Committee Meeting held in Maputo. A pre-feasibility report was approved by the stakeholders covering the options and line route selection, market analysis, preliminary design, pre-feasibility financial analysis and cost estimates and potential commercial structures.

CHAPTER TWO

INVESTMENT IN RENEWABLE ENERGY AND ENERGY EFFICIENCY

2.1 Introduction

As SADC embarks on an industrialisation drive, there is an expected rise in the demand for energy, in particular electricity. However, given that available power generation is not enough to meet the expected spike in demand, there is a push by the region to promote investment in renewable energy and energy efficiency.

The SADC region has a huge potential for Renewable Energy (RE) due to an abundance of solar and wind resources, but exploitation of these energy resources on a large scale will require new investments in the form of generation plants and the evacuation of power to demand centres. At off-grid level there are few windmills in use for water pumping and solar Photovoltaic (PV) systems for households and institutions. The installed capacity is insignificant to register in the energy balance of Member States.

SADC's target is to increase the share of renewable energy in the grid to 21 percent by 2017, 33 percent by 2022, and 37 percent by 2027, in pursuit of the goal of having 100 percent renewable energy by 2050, according to the Regional Infrastructure Development Master Plan (RIDMP).

The chapter looks at developments in this area in terms of investments and the challenges faced.

2.2 Renewable Energy Projects Pipeline

There is a large number of renewable energy projects that are "in the pipeline" and are either awaiting funding or are at advanced stages of implementation. These represent significant financing opportunities for investors. Table 2.1 shows the pipeline of approved renewable energy projects (by technology) that are awaiting financial closure in the various SADC Member States.

Table 2.1 Pipeline of Renewable Energy Projects Awaiting Funding, by Technology

Country	Technology						
	Small-scale Hydro [<100MW]	Large-scale Hydro [>100MW]	Wind (MW)	Solar (MW)	Geothermal (MW)	Biomass (MW)	Total
Angola	65	1 470	78				1 613
Botswana				100			100
DRC		4 950		20			4 970
Eswatini	34.45	140		35		37	246
Lesotho	10	1 200	50	20			1 280
Madagascar	51	300		35		5	391
Malawi	60	460	200	303			1 023
Mauritius			29	97			126
Mozambique	39	236	330	585		10	1 200
Namibia		300		232		20	552
Seychelles				15			15
South Africa	4.7		1 363	913		42	2 323
Tanzania	293	3 135	450	209	5 000		9 087
Zambia	214.65	3 868		500			4 583
Zimbabwe	33.3	1 200		303			1 536
SADC	**805**	**17 259**	**2 500**	**3 367**	**5 000**	**114**	**29 045**

Source SADC Renewable Energy and Energy Efficiency Status Report 2018

As expected, large-scale hydroelectric projects (17,259MW) dominate the regional pipeline, led by projects in the DRC, Angola and Tanzania; but solar (3,367MW) and wind (2,500MW) power projects also represent significant opportunities (REN21 and SACREEE, 2018). Tanzania leads all

Member States with 9,087MW of projects in the pipeline, including 5,000MW of geothermal energy. This target for geothermal development was set by Tanzania and reflects preliminary work done under the Geothermal Risk Management Facility. Tanzania was initially the only SADC Member State involved in this process, although others such as the DRC and Zambia were added later. In its fifth round of submissions as of mid-2018, the Facility provides grants for geothermal infrastructure, surface studies, drilling and "continuation activities".

2.3 Sub-Sector Updates

This section provides an analysis of developments in the various renewable energy sub-sectors, looking at projects that have already reached financial closure and those for which funding is still being sought.

Hydropower projects

Faced with rising demand due to an expanding economy and a growing population, the SADC region has strengthened efforts to generate more electricity. Table 2.2 shows some of the hydropower projects that are in the process of being implemented or are nearing financial closure.

Table 2.2 **Planned and Ongoing Hydropower Projects**

Country	Project	Description and status of project
DRC	Lualaba IPP Hydropower Project	• PowerChina and the Lubumbashi-based Kipay Investment signed an agreement in April 2019 for the construction of a 150MW power station facility on the Lufira River in Lualaba; • PowerChina to have a 51 percent stake in the venture while Kipay will control 49 percent of the project; and • Construction works for the US$400 million project is expected to commence in early 2020 and take three years to finish.
	Kinshasa IPP Hydropower Project	• PowerChina finalised a contract with Great Lake Energy of DRC in March 2019 to build a 900MW plant in Kinshasa on the Congo River; • Feasibility studies in progress; and • Estimated total project cost is around US$3 billion.
Lesotho	Lesotho Highlands Water Project Phase II	• Feasibility and Environmental Impact Assessment studies have been completed; • Project will involve construction of a new 132kV power line from Katse to Polihali; • Construction of a new substation at Masakong; • Construction of a new 33kV power line from Tlokoeng to the permanent camp area (for future electrical distribution by the Lesotho Electricity Company); and • Negotiations with prospective cooperating partner are at advanced stage.
Madagascar	Sahofika Hydropower Project	• Construction of the 200MW power plant is expected to begin in December 2019; • Environmental and Social Impact Assessment began in 2018 and has been completed; • Framework agreement was signed between the Government of Madagascar and the New Onive Hydroelectric Energy Consortium; and • Financial support from Development Bank of Southern Africa (DBSA).
Malawi	Mpamatanga Hydropower Plant	• Agreement for the project was signed by the Government of Malawi and World Bank in April 2019 for construction of the 258MW power station; • Selection of private investor expected to be completed by December 2019; and • Estimated cost of project is US$472 million.
Mozambique	Boroma Hydropower Project	• Project located in Boroma, Tete Province in Mozambique; • South African-based financial advisory firm Eaglestone Capital Advisory was awarded contract in March 2019 to undertake feasibility studies for the 210MW hydropower plant; and • Feasibility studies funded by DBSA.
	Pavua Hydropower Plant	• Project will involve construction of a dam and hydroelectric power plant on the Pungué River in Sofala province; • Pavua will be one of Mozambique's first renewables Independent Power Producers (IPPs); and • Expected output will be 120MW of electricity.

continued...

Table 2.2 **Planned and Ongoing Hydropower Projects**

Country	Project	Description and status of project
Tanzania	Stiegler Gorge Hydropower Plant	• Project involves construction of a dam and a power station with capacity to produce 2100MW of electricity; and • Egyptian construction and contracting company Arab Contractors Company was in October 2018 awarded the contract to design and construct the dam and power plant.
	Rusomo Hydropower Plant	• Rusumo Falls Hydroelectric Project is a joint development by the governments of Burundi, Rwanda and Tanzania through a commonly owned Rusumo Power Company; • Construction of the 80MW power plant was 50 percent complete as of September 2019 and expected to be completed by 2020; and • Project funded by the World Bank to tune of US$340 million.
Zambia	Kafue Gorge Lower Hydroelectric Power Plant	• Construction of the power plant is expected to be completed in 2020; • The US$2 billion plant will produce 750MW when complete; • Jointly funded by the Zambian government and the Exim Bank of China; • Construction being done Sinohydro Corporation; and • To be operated by the Kafue Gorge Regional Training Centre
	Chipota Falls Hydropower Project	• A mini-hydro power station to be constructed at the Chipota Falls; • The 200-kilowatt plant will be constructed under a project to promote the transfer of renewable energy technology from China to Zambia using the South to South cooperation model; • The initiative is a partnership between the Department of Energy in Zambia, the Ministry of Science and Technology in China and the United Nations Development Programme (UNDP) country offices in Zambia and China and is being funded by the government of Denmark; and • Expected to be commissioned by 2021 and to be operated by the Kafue Gorge Regional Training Centre
	Batoka Gorge Power Plant	• Project jointly implemented with Zimbabwe and construction of the 2,400MW power plant is expected to commence in 2020; • Feasibility studies almost complete and a developer for the project is expected to be engaged by the end of 2019 • Short-listed contractors include a consortium of General Electric and Power Construction Corporation of China; Salini Impregilo of Italy; and a joint venture of Chinese firms Three Gorges Corporation, China International and Water Electric Corporation and China Gezhouba Group Company; • Project involves construction of a dam, powerhouses, roads, transmission infrastructure and houses in Zambia and Zimbabwe; and • Project will use a Build-Operate-Transfer (BOT) financing model.
Zimbabwe	Gairezi Hydropower Plant	• Project entails, design, procurement, construction and commissioning of a 30MW hydroelectric power plant at Gairezi River in Manicaland province; and • Sourcing of funding is in progress.

Sources African Development Bank Projects Database; Development Bank of Southern Africa; National utilities; and news articles

An interesting observation is that new hydroelectricity generation projects are now taking place from the Zambezi River northwards. This could be explained by the fact that most parts of the region are receiving less and less rainfall due to the impact of climate change. There is significant annual variation in quantity and distribution of the rainfall, with the north and east of the region being wetter than the south and west (SADC, 2016).

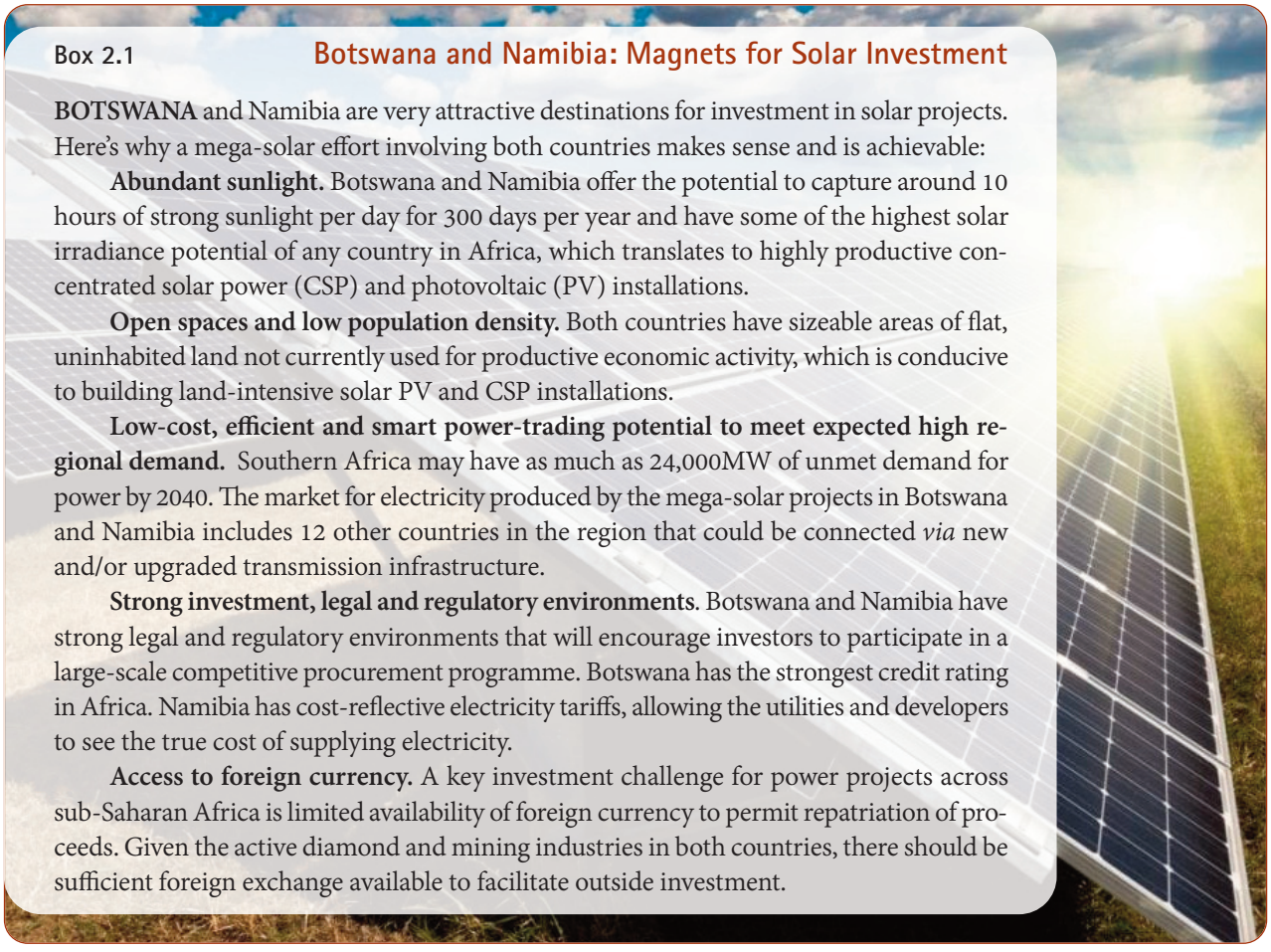
Solar projects

Cognisant of the impact of climate change and variability on available water bodies in the region, the past few years have seen an increase in investment in solar projects across southern Africa. Large-scale solar installations capable of producing upwards of hundreds of megawatts of power

are slowly becoming fashionable in sunny southern Africa. Another interesting development is that the bulk of activities in this sub-sector are being driven by IPPs. Some of the major planned solar projects are listed as follows:

Joint Botswana-Namibia Solar Project
With support from the World Economic Forum's (WEF) Global Future Council on Energy, the governments of Botswana and Namibia plan to develop a mega-solar project that could add up to 5,000MW of new solar power over the next two decades. The council, which includes organizations such as African Development Bank, Africa Renewable Energy Initiative, New Partnership for Africa's Development, the International Renewable Energy Agency (IRENA), the World Bank Group, and the United States government-led Power Africa initiative, said the project would involve a competitive tendering process that will phase-in the solar power – starting with 300-500MW to meet domestic demand. The intention is that this initial phase will develop the market and build local capacity for managing the required technologies. The next phase will seek to add 500-1,000MW to be sold regionally, timed with the completion of regional transmission interconnectors. Ultimately, this mega-solar programme could add another 1,000-3,000MW or more to be traded across regional power pools in Africa.

The project has received strong political will from both Botswana and Namibia following endorsements from leaders of the two countries. Members of the WEF Global Future Council on Energy continue to meet with officials from Botswana and Namibia to advance this ambitious effort. At the US-Africa Business Summit in June, Namibian President Hage Geingob and Botswana Minister of International Affairs, Dr Unity Dow, met with Power Africa and World Bank officials to discuss next steps. These meetings secured the high-level commitment necessary to start designing an African-led effort to develop mega solar in the region.



Box 2.1 **Botswana and Namibia: Magnets for Solar Investment**

BOTSWANA and Namibia are very attractive destinations for investment in solar projects. Here's why a mega-solar effort involving both countries makes sense and is achievable:

Abundant sunlight. Botswana and Namibia offer the potential to capture around 10 hours of strong sunlight per day for 300 days per year and have some of the highest solar irradiance potential of any country in Africa, which translates to highly productive concentrated solar power (CSP) and photovoltaic (PV) installations.

Open spaces and low population density. Both countries have sizeable areas of flat, uninhabited land not currently used for productive economic activity, which is conducive to building land-intensive solar PV and CSP installations.

Low-cost, efficient and smart power-trading potential to meet expected high regional demand. Southern Africa may have as much as 24,000MW of unmet demand for power by 2040. The market for electricity produced by the mega-solar projects in Botswana and Namibia includes 12 other countries in the region that could be connected *via* new and/or upgraded transmission infrastructure.

Strong investment, legal and regulatory environments. Botswana and Namibia have strong legal and regulatory environments that will encourage investors to participate in a large-scale competitive procurement programme. Botswana has the strongest credit rating in Africa. Namibia has cost-reflective electricity tariffs, allowing the utilities and developers to see the true cost of supplying electricity.

Access to foreign currency. A key investment challenge for power projects across sub-Saharan Africa is limited availability of foreign currency to permit repatriation of proceeds. Given the active diamond and mining industries in both countries, there should be sufficient foreign exchange available to facilitate outside investment.

Eswatini IPP Solar Programme

The Eswatini Energy Regulatory Authority (ESERA) in October 2019 made public the list of 13 independent power producers (IPPs) pre-selected for the implementation of two renewable energy projects in the Kingdom of Eswatini. These are the construction of solar photovoltaic plants capable of supplying 40MW to the grid, as well as biomass plants with a combined capacity of 40MW. The aim of this project is to reduce the country's dependence on imports of electricity from South Africa.

Among the companies pre-selected are Eswatini Green Energy Consortium, Mulilo Renewable Project Developments, Sturdee Energy Southern Africa, and the Sola Group-Ubombo Sugar and T. Colle/Jabil consortia. French firms Engie and EDF Renouvelables. Engie is expanding its operations in Africa, with projects under development in Egypt, Senegal and Djibouti. For the Eswatini project, Engie wants to work with GreenYellow, a subsidiary of another French group Casino. EDF Renouvelables is a subsidiary of Électricité de France (EDF). Other companies shortlisted include British IPP Globeleq, InnoVent SAS and Iib Vvogt, both of Germany, as well as Canadian firm JCM Power.

The proposed solar power plants are expected to start operating before the end of 2020 while the biomass plants are forecast to be operational in 2021. Currently, Eswatini has four power plants, which supply 60.4MW of electricity, representing 17 percent of the total energy consumed by its industries and 1.4 million inhabitants. The main primary energy sources currently used in the country for electricity production are hydropower, coal and biomass. The remainder is imported from South Africa and Mozambique, through their national electricity companies, Eskom and EDM, respectively.

Omburu PV Power Project

NamPower has announced two 20MW solar projects as part of a 220MW renewable energy strategy. One of these is the Omburu Photovoltaic (PV) Power Plant, which will be owned and operated by the utility. It will be built near Omaruru in the Erongo region in the northwest of the country. The tender for the selection of contractors was issued in September 2019, with the successful contractor expected to be announced in early 2020. The project is estimated to cost US$34.5 million and will be funded by the Namibian government. The power plant is expected to be commissioned by end of 2020.

The second 20MW solar project will be assigned to an Independent Power Producer (IPP) through a procurement exercise. This will be built near Gobabis and Rehoboth town in central Namibia at a cost of about US$26.7 million. It is expected to come online in 2021.

Malawi Golomoti Power Project

Malawian IPP Golomoti JCM Solar Corporation plans to construct a PV plant in Golomoti, 100km south east of Lilongwe. The project will sell power to utility ESCOM under a long-term Power Purchase Agreement (PPA). The IPP has shortlisted a number of contractors for engineering, procurement and construction and for operations and maintenance services for a 20MW solar plant. The project will also include construction of a transmission line.

Mozambique PROLER Solar Power Project

Mozambican power utility Electricidade de Mocambique (EDM), with support from French Development Agency (AFD), is developing two PV plants under the Projeto de Promoção de Leilões para Energias Renováveis (PROLER) or Project for Promotion of Auctions for Renewable Energies initiative, which is aimed at creating a regulatory framework and auction mechanism for the development of large-scale renewable energy projects. AFD floated a tender in October 2019 for consultants to conduct feasibility studies on the construction of the two solar power plants which will have a combined generation capacity of 80MW. The sites for the two projects have already been identified in Nampula and Niassa provinces.

Seychelles Floating Solar PV Project

Seychelles launched the tender process in June 2019 to select a contractor to construct Africa's first IPP floating solar PV project. The tender winner was expected to be announced in November 2019, with construction set to start soon thereafter. The target is to have the project commencing operations in 2020. The floating solar power plant will be located in Providence lagoon on Mahé Island and will have an estimated capacity of 3.5 to 4MW.

The project, launched by the Seychelles Ministry of Environment, Energy and Climate Change and the Seychelles Energy Commission, will be the first utility-scale, private-sector funded floating solar project in Africa, and aims to support the country's transition to renewable energy. It is being implemented by the Government of Seychelles and the Public Utilities Corporation, with support from the African Legal Support Facility and the Clinton Foundation.

Zambia Solar Projects
Japanese renewable energy company Univergy Solar plans to invest more than US$200 million in two solar power projects in Zambia that will add 200MW to the national grid by the end of 2020. The Japanese firm signed a Memorandum of Understanding with the Zambian government in November to start work on the projects in the first quarter of 2020. Univergy Solar Company will develop and implement a 135MW project in northern Zambia and another 65MW project in the Copperbelt region. The two projects were expected to be completed between six and eight months, according to the Zambian government. Zambia mainly relies on hydropower and has an electricity deficit of about 750MW due to low water levels at generation plants after a severe drought hit power production.

Caledonia Solar Power Plant
Canadian business Caledonia Mining Corporation plans to build a 19.65MW power plant and energy storage system at its Blanket Mine near Gwanda in Matabeleland South, Zimbabwe. The company floated a tender in October 2019 in which it asked energy firms to submit technical and financial proposals for the project. The plant is expected to be deployed in three phases on 40 hectares next to the mine, with each stage limited to 6.55MW of generation capacity. The engineering, procurement and construction services contract is expected to be awarded in the first quarter of 2020, with the power plant to be commissioned in the final quarter of the same year.

IDBZ Solar Parks
The Infrastructure Development Bank of Zimbabwe (IDBZ) floated a tender in September 2019 for contractors to develop seven solar parks, with a combined generation capacity of 235MW. The PV plants include the 50MW facilities at GDE Bulilima Solar Energy Project located 20km from Plumtree in Matabeleland South province; the Sable Solar Farm Project at Kwekwe, Midlands province; the Gwayi Solar Project, in the Kusile district of Matabeleland North; and the Rufaro Solar Farm Project at Marondera, 70km east of Harare in Mashonaland East. A 10MW scheme is planned to generate electricity for the national grid at an unspecified location while a 20MW plant will be developed in Gutu, Masvingo province; and a 5MW power station will be built at the National University of Science and Technology in Bulawayo.

Wind energy projects
A number of SADC Member States have capacity to generate electricity from wind. These include Mauritius, Mozambique, Namibia and South Africa. A number of projects are on the cards to harness the huge potential presented by wind in increasing the generation capacity of the SADC region.

South Africa Golden Valley Excelsior Wind Farm Projects
Developer BioTherm Energy reached financial closure in July 2019 on two wind farms it secured in a tender in 2015. The 120MW Golden Valley and 32MW Excelsior projects both have 20-year PPAs with state-owned utility Eskom, which are backed by sovereign guarantees provided by the national treasury. Golden Valley and Excelsior are located in Swellendam in Western Cape and Eastern Cape provinces, respectively.

Golden Valley will consist of 48 turbines and is expected to be commissioned by the fourth quarter of 2020 while Excelsior will comprise 13 turbines and is expected to enter commercial operations by the end of 2019. Chinese manufacturer Goldwind will supply both projects under an EPC (engineering, procurement and construction) contract.

2.4 Challenges for Investment in Renewables

The main challenges identified for deployment of renewables in the SADC region include high initial investment costs. The costs of renewable energy (solar in particular) have been prohibitive and for the intended market can be prohibitive to invest in the required infrastructure. Similarly, the fact that most renewable energy equipment is imported, raises the landed cost of renewable energy equipment/infrastructure. The expectations are that local manufacturing of renewable energy products would lower costs to consumers.

Another challenge is that there seems to be lack of regional capacity for large-scale connection of renewable energy projects to the Southern African Power Pool (SAPP) or national grids. Such capacity should exist and that exercise to assess capacity availability needs to be established before renewable energy plants are hooked to the grid. Only a few countries such as South Africa and Mauritius have undertaken that exercise.

The deployment of renewables in SADC has also been plagued by poor quality of equipment. For renewable energy infrastructure to take root, good quality products should be ensured, which can be assisted by testing equipment that is to be distributed in the SADC region. Some Member States have their own testing facilities, but a harmonised standard is required as the equipment is traded across countries.

The bulk of renewable energy equipment is produced outside the SADC region in industrialised countries and lately in the developing economies of China, India, and Brazil. There is need for investment in the manufacture of renewable energy technologies and products as well as in research and development to lower costs of the needed equipment and infrastructure.

Another challenge is that renewable energy has largely been promoted through short-term (usually less than five years) projects/programmes that are supported by donors. Renewable energy uptake usually stops after the donor support stops. There is need to ensure that renewable energy is embraced in regional planning.

There is need for regional guidelines and models to analyse the potential impacts and benefits of incentives such as Renewable Energy Feed-In Tariffs (REFIT), which have been seen as a panacea of introducing renewable energy into the tariff structure of the national electrical system. South Africa abolished its REFIT before it was operational. It would therefore be important to establish whether REFIT is a route for renewable energy investment.

On the other hand, basic electricity tariffs in many Member States are still not cost-reflective, making it difficult to ensure that FITs, when they are finally implemented, are high enough to attract investment. This is one of the challenges being addressed by German development bank KfW in its Global Energy Transfer Feed-in-Tariff (GET FiT) programme for Zambia, which is also expected to be implemented in several other SADC Member States.

CHAPTER THREE

INVESTMENT IN GAS AND OIL INFRASTRUCTURE

3.1 Introduction

Southern Africa has some of the largest oil and gas deposits in the world, and recent discovery of the commodity across the region has heightened the interest and prospects for SADC. Economic experts predict that the region could realise significant opportunities for sustainable development if SADC Member States put in place vibrant initiatives to harness oil and gas in the region.

According to the Development Bank of Southern Africa (DBSA), the oil and gas industry has the capacity to make a contribution towards the achievement of regional objectives as outlined in the Revised SADC Regional Indicative Strategic Development Plan (RISDP), SADC Industrialization Strategy and Roadmap, as well as the SADC Infrastructure Regional Infrastructure Development Master Plan. This chapter highlights some of the major investments made by SADC Member States in gas and oil infrastructure in the past year.

3.2 Regional Policy Environment on Gas and Oil Investment

Currently, SADC does not have a regional policy framework on gas and oil, meaning that most of the exploration and investment is guided by national policies of different SADC Member States. However, progress is now underway and at an advanced stage to build a regional consensus with regards to the role and future of natural gas in the region (SADC, 2019). This follows the historic decision by the 38th SADC Summit of Heads of State and Government held in Windhoek, Namibia in August 2018 to direct the SADC Secretariat to operationalise the Regional Gas Committee and to develop the Regional Gas Master Plan (RGMP).

3.2.1 Regional Gas Master Plan

The development of a Regional Gas Master Plan (RGMP) will guide the exploitation of the vast natural gas resources that exist in the region. The SADC Secretariat has secured funding from the DBSA to engage a consultant to undertake a study on the modalities and operations of the RGMP. The study is expected to run from November 2019 to April 2020.

According to the Terms of References of the study, SADC has resolved to adopt a phased and incremental approach to developing the RGMP, and the phases are:

- Phase 1: Defining the Conceptual and Policy Framework (focused on investigating natural gas supply and demand dynamics); and
- Phase 2: Master Planning (Visioning and Mapping the Strategic Location of Natural Gas Based Industries/Projects) and Final Master Plan and Investment Blueprint.

3.2.2 Regional Gas Committee

The decision to establish a regional gas committee is in line with a directive made by the 37th SADC Summit held in August 2017 in Pretoria, South Africa, which said there is need for the region to create a committee that will be charged with ensuring the inclusion and promotion of natural gas in the region. The committee is expected to commission and coordinate all studies to investigate options and plans related to the development and financing of natural, and gas projects in the region, as well as play an advisory role to the SADC Energy Ministers on approaches, strategies, policies and implementing actions for the development of the regional gas market and infrastructure. In the long-run, the committee will facilitate an increase in universal access to energy and promote industrial development in SADC.

3.3 Investment in Oil and Gas Infrastructure

Investment in oil and gas infrastructure is a top priority for most SADC Member States, particularly in the context that the region lacks a developed oil and gas infrastructure network. For example, the distances between production and consumption centres are usually large, resulting in the commodity becoming more expensive. Therefore, efforts are underway across the region to provide the critical infrastructure linking the supply of the commodities to end users. An assessment of the various investments being made by the 16 SADC Member States to develop a vibrant and robust infrastructure base for the oil and gas industry is shown in Table 3.1. The investment assessment first focuses on the SADC Member States that are major producers of oil and gas and then those that are making some discovery.

Angola

Angola is the main producer of oil and gas in SADC, and the second largest in Africa after Nigeria. Angola's proven natural gas reserves are estimated at 4 trillion cubic feet. In the last few decades, the country has been involved in repairing, expanding and modernizing its oil and gas infrastructure to ensure that it maintains its status as well as promote economic development. In fact, one of the priorities for the new government led by President João Lourenço is reforming the oil and gas industry to streamline foreign investment procedures. For example, in 2018, the country created a new oil and gas regulator, the National Oil and Gas Agency.

Other key regulatory reforms pursued by the country included a decree aimed at simplifying investment in the oil and gas industry, new rules and procedures for public tenders involving oil and gas contracts, a revised natural gas law – the first comprehensive antitrust law – and the announcement of a wave of privatizations of state-owned companies. Table 3.1 shows some of the investments made by Angola in the past years to improve its oil and gas infrastructure.

Table 3.1 **Major Developments in Oil and Gas Sector in Angola (2018-2019)**

Project	Description	Funders	Amount
Construction of an oil pipeline between Angola and Zambia	Angola and Zambia signed a memorandum of understanding in January 2019 to construct an oil pipeline between the two countries. Plans are underway to attract the Abu Dhabi National Oil Company in the deal.	Angola and Zambia	US$5 billion
Ultra-deepwater Kaombo project	The project was developed by a consortium involving Angolan, Chinese and French oil companies. It came online in 2018 and has increased Total's storage capacity at its two floating units at Kaombo reach 230,000 barrels per day in 2019.	Total Other partners are Sonangol P&P and Sonangol Sinopec	n.a
Zinia 2 development	Total concluded an agreement in 2018 to launch the Zinia 2 development, expected to have a production capacity of 40,000 barrels per day.	Total	n.a
Support to Angola oil export drive	The China Development Bank has granted a $2 billion loan to Angola to support the country's oil export drive	China Development Bank	US$2 billion
Development of refineries	State-owned Angolan oil company Sonangol plans to construct two refineries in Cabinda with the tender awarded to the United Shine consortium in June 2019. The tender for another refinery to be located in Lobito was awarded to Kinetics Technology in June 2019.	Sonangol	n.a

Compiled from project reports and newspaper articles

- *n.a = Investment figures were not available*

Democratic Republic of Congo

The DRC has the second largest crude oil reserves in SADC after Angola. It is estimated that the country has proven reserves of 180 million barrels. In April 2019, the country launched a licensing round for more than 20 onshore oil and gas blocks – the first since adopting a new hydrocarbons code in 2015. The hydrocarbons code was approved to revive the haphazardly regulated sector by imposing new transparency, such as requiring public tenders for exploration and exploitation permits.

The move to launch a licensing round for oil and gas blocks is expected to attract a lot of investment in the country, particularly if one considers that Perenco is the only active oil and gas producer operating in the DRC. The licensing bids are expected to be opened in the coastal basin along the Atlantic, the inland Cuvette Centrale and around Lake Tanganyika in the south-east. Some of the major infrastructure developments undertaken by the DRC in the past years are shown in Table 3.2.

Table 3.2 Major Developments in Oil and Gas Sector in DRC (2018–2019)

Project	Description	Funders	Amount
DRC-Pelfaco oil production project	Nigerian private oil and gas company Pelfaco in June 2019 signed a deal with DRC state-owned energy firm, Cohydro, to share production costs on a 32-million barrel oil field	DRC government and Pelfaco	n.a
Oil blocks exportation	In December 2018, DRC awarded an oil drilling license Guernsey-owned company Compagnie Minière Congolaise (CoMiCo)	CoMiCo	n.a

Compiled from project reports and newspaper articles
- *n.a = Investment figures were not available*

Mozambique

Mozambique is one of the leading producers of oil and gas in SADC. Recent discovery of over 180 trillion cubic feet (tcf) of natural gas reserves in the Rovuma Basin is expected to see the country become a major exporter by 2023. Mozambique is determined that most of the oil discovery should benefit local development, hence the country has launched a tender to identify local companies interested in developing industrial projects to use the gas.

There is a law that stipulates Empresa Nacional de Hidrocarbonetos (ENH), the state-owned hydrocarbon company, which represents the Mozambican Government in petroleum operations should participate as a stakeholder in all petroleum production operations, as well as exploration projects in the country. Table 3.3 shows some of the investments made by Angola in the past years to improve its oil and gas infrastructure.

Table 3.3 Major Developments in Oil and Gas Sector in Mozambique (2018–2019

Project	Description	Funders	Amount
Rovuma basin liquefied natural gas project	Anadarko Petroleum has given the green light to a gas project. The Anadarko-led project will be the country's first onshore Liquefied Natural Gas (LNG) development, with the potential to produce 12.88-million tonnes of LNG a year	Anadarko Petroleum Standard Bank will advance a substantial sum	US$20bn
Rovuma LNG project	Construction of the LNG project. Various partners such oil and gas majors Exxon Mobil and Eni have made a commitment to invest in the project	Exxon Mobil and Eni Standard Bank will advance a substantial sum There is potential for the Export Credit Insurance Corporation of SA to also arrange a similar facility should Standard Bank invest in the Exxon and ENI project	US$30bn
Deepwater Area 4 project development activity	In October 2018, ExxonMobil as operator and Rosneft and ENH as partners signed contracts for three offshore exploration blocks with the government of Mozambique. These concessions are A5-B in the Angoche Basin and Z5-C and Z5-D in the Zambezi Delta	ExxonMobil Rosneft ENH Mozambique	n.a

Compiled from project reports and newspaper articles
- *n.a = Investment figures were not available*

Tanzania

The United Republic of Tanzania has in recent years discovered a lot of natural gas reserves which are expected to influence sustainable development not only in the country but also in SADC. The discovery provides an opportunity for the country to attract domestic as well as foreign investment in the oil and gas sector.

In this regard, the country is pushing for the development of a viable oil and gas sector with various initiatives put in place to attract investment including the passing of the Oil and Gas Revenues Management Act in 2015. The Act sets out a comprehensive revenue management framework, including the establishment of an oil and gas fund and fiscal rules related to both gas revenues and wider public finances. As such most of the focus is on developing the right legal instruments and documents to facilitate the exploration of the natural gas.

For example, the Petroleum Upstream Regulatory Authority of Tanzania announced in October 2019 that the country will delay its launch for the bidding round for oil and gas exploration by two years to 2022. This is to allow the country to conclude the review process of the Production Sharing Agreements with the 11 active licenced operators. Some of the major developments undertaken by Tanzania in the past years are shown in Table 3.4.

Table 3.4 Major Developments in Oil and Gas Sector in Tanzania (2018–2019)

Project	Description	Funders	Amount
Lindi Liquefied Natural Gas Project	Tanzania is locked in talks with international oil companies to finalise the terms of developing the LNG project in Lindi	Norwegian oil and gas firm Equinor Royal Dutch Shell plc	US$30 billion
Kisemvule Oil Plant	The Tanzania Petroleum Development Corporation signed a five-year agreement in August 2018 with Knauf Gypsum Factory Limited to construct an oil plant at Kisemvule in Mkuranga District, Coast Region	Knauf Gypsum Factory Limited	n.a
Tanzania-Uganda Natural Gas Pipeline	Tanzania and Uganda signed an agreement in August 2018 for the construction a natural gas pipeline	French oil multinational Total will support the construction	n.a

Compiled from project reports and newspaper articles

- *n.a = Investment figures were not available*

Namibia

Namibia has until recently been largely overlooked by a number of oil and gas companies, however, a boom in the resources has seen a lot of local and international investors keen to investment in the country. In fact, offshore Namibia offers great exploration potential as it is largely unexplored, and estimates are that 11 billion barrels in oil reserves lay untapped off Namibia's coast. Most oil explorers note that the Namibian offshore geology is similar to two Brazilian basins – Santos and Campos – which have proved enormously rich in resources.

The Mines and Energy Ministry has been engaged in various efforts to encourage investors to explore the country's offshore areas for oil and gas by capitalizing on the favourable petroleum tax regime being offered by the country. For example, as of April 2019, petroleum income tax was levied at 35 percent, while state royalty was pegged at five percent, and a negotiable additional profit tax when the internal rate of return is greater than 15 percent. Some of the major developments undertaken by Namibia in the past years are shown in Table 3.5.

Table 3.5 Major Developments in Oil and Gas Sector in Namibia (2018–2019)

Project	Description	Funders	Amount
Construction of Oil Refinery	The Ministry of Mines and Energy announced in August 2019 some companies had expressed interest in constructing a local oil refinery	Various companies	N$120 billion
Construction of a local oil refinery	Clasox Petroleum, a Namibian registered company, has applied for 10 hectares of land just outside Walvis Bay for the construction of an oil refinery	Clasox Petroleum	N$21 billion
Construction of a local oil refinery	A Russian company, Comsar, has also expressed interest in establishing an oil refinery	Comsar	N$21 billion
Expansion of exploration area	ExxonMobil said in April 2019 that it will increase its exploration range in Namibia, adding about 28,000 square km	ExxonMobil	n.a
Drilling of oil blocks	London-based oil and gas company Tower Resources signed a new petroleum agreement in November 2018 with the Government of Namibia covering an 80 percent operated interest in blocks 1910A, 1911 and 1912B, offshore Namibia.	Tower Resources	US$5 million

Compiled from project reports and newspaper articles
- *n.a = Investment figures were not available*

South Africa

South Africa has over the years developed itself as a key location for many local, regional and multinational oil and gas companies active in the oil and gas value chain, thus making the country a hub providing services and expertise for oil and gas in SADC and the rest of the African continent. For example, the country is in discussion with Mozambique regarding the further development of the cross-border gas infrastructure linking South Africa's energy and chemical sectors to Mozambique's vast natural gas resources.

However, it should be noted that South Africa is also engaged in various activities to exploit the resource following the discovery of oil and gas at its offshore areas. For example, South Africa is working on a policy to govern the development of oil and gas resources after calls by potential investors to shield the industry from a long-running debate over laws that apply to mining exploration. The draft National Gas Infrastructure Development Plan draft also clearly calls for the urgent development of a vibrant infrastructure framework for future gas power. Some of the major developments undertaken by South Africa in the past years are shown in Table 3.6.

Table 3.6 Major Developments in Oil and Gas Sector in South Africa (2018–2019)

Project	Description	Funders	Amount
Drilling of oil blocks	In May 2019 Royal Dutch Shell Plc applied for rights to acquire an oil-block stake after Total discovered an estimated 1 billion barrels of oil	Royal Dutch Shell Plc	n.a
Oil exploration	Following its discovery of oil reserves, Total announced in February 2019 that it will investment substantial amount in the sector	Total	US$16 billion
Virginia gas project	Liquefied natural gas and helium producer, Renergen in August 2019 signed a loan agreement with the Overseas Private Investment Corporation (OPIC) for a gas project in the Free State province.	Renergen	US$40 billion

Compiled from project reports and newspaper articles
- *n.a = Investment figures were not available*

Other SADC Member States

This sub-section looks at some of the key investments being made by other SADC Member States, who are generally not necessarily major producers of oil and gas, but have in recent years witnessed substantial discovery of the commodity. Table 3.7 shows some of the developments and investment being undertaken by other countries in SADC.

Table 3.7 Major Developments in Oil and Gas Sector in Mozambique (2018-2019

Country	Project	Description	Funders	Amount
Botswana	Gas drilling of the Lesedi development pod	Tlou Energy Limited announced in April 2019 that the drilling exercise was successful and more testing are going on to determine the amount of gas available	Tlou Energy Limited	n.a
Comoros	Oil seismic survey	Comoros has awarded a batch of offshore oil and gas exploration permits to conduct the first seismic survey by December 2019 to determine the amount of oil that the country has	Tullow Oil Discover Exploration	n.a
Madagascar	Oil exploration	In December 2018, Madagascar offered more than 20,000 miles of untouched ocean in the Mozambique Channel for oil exploration		n.a
Mauritius Seychelles	Joint offshore area	In November 2018, the Joint Commission of the Mauritius-Seychelles Extended Continental Shelf, Mascarene Plateau region opened the two states' joint management area for oil and gas exploration	Spectrum Geo Mauritian and Seychellois governments	n.a
Zambia	Construction of an oil pipeline	Zambia signed an agreement with Angola in November 2018 to construct an oil pipeline linking the two countries		US$5 billion
Zimbabwe	Muzarabani Oil and Gas Project	Australia Stock Exchange (ASX)-listed miner, Invictus Energy announced in July 2019 an estimated resource of 206 billion litres of oil in the Cahora Bassa Basin in Muzarabani	Invictus Energy	n.a
	Lupane Gas Extraction	In January 2019, South African mining company, Tumagole Consortium committed to invest into the coal-bed methane mining project in Lupane.	Tumagole Consortium	ZAR55 billion

Compiled from project reports and newspaper articles

- *n.a = Investment figures were not available*

3.4 Conclusion and Way Forward

The last few years has seen significant offshore findings with more SADC Member States slowly turning into producers of both oil and gas. In this regard, the region's prospects look good, and the focus should therefore be on attracting investment since domestic and foreign investors are keen to invest in the sector as well as in SADC. The region and its Member States could consider the following policy options to fully harness the potential of natural gas and oil in promoting sustainable development in southern Africa:

- Develop viable and flexible legislature that cut bureaucracy and increase investment in oil and gas;
- Identify the risks associated with the oil and gas industry such as the volatile oil prices and then plan accordingly for uncertainty;
- Investing in local partnerships to ensure the exploitation of oil and gas also benefits the local community; and
- Improve access to finance and invest in technology and skills development.

CHAPTER FOUR

ENERGY FINANCING MECHANISMS

4.1 Introduction

Without access to funding, regional energy projects will not materialise. Given the capital intensive nature of energy projects, the SADC region would need to explore sustainable financing mechanisms that will help ensure the full realisation of the Regional Infrastructure Development Master Plan (RIDMP), the Energy Sector Plan and other initiatives within the energy sector.

A 2019 study conducted by the Southern African Research and Documentation Centre (SARDC) on behalf of the SADC Secretariat to assess the status of RIDMP projects, indicates that most regional infrastructure projects, including those in the energy sector, are facing stagnation. The study attributes this delay in project implementation, partly to funding issues, which would need to be resolved if southern African countries are to realise their developmental aspirations.

4.2 Funding Challenges for SADC Energy Projects

Some of the challenges affecting the funding of SADC Energy Projects include the following:

- SADC national governments face a skills and capacity shortage where preparation and implementation of RIDMP STAP projects is concerned. The lack of properly structured, bankable projects is a critical issue slowing the flow of funding to energy projects.
- The limited capacity to develop bankable projects has contributed to the funding mismatch between Member States and funding partners. On one hand, Member States cite the lack of funding for infrastructure projects whether national or regional, while on the other hand, funding institutions such as the DBSA and the AfDB are looking for bankable projects to invest in.
- In addition, the 2019 RIDMP assessment report established that some SADC Member States do not have the appropriate regulatory or policy environment through which the private sector can participate fully, thereby limiting access to alternative funding sources. For example, in the power sector, most Member States are yet to adopt cost-reflective electricity tariffs that ensure the viability of private sector investments in the energy sector, a situation that has contributed to limited private sector capital. Of the 16 SADC Member States, only Namibia had adopted cost-reflectivity in the power sector, as of September 2019. In addition, some project owners lack the capacity to structure Public Private Sector Partnerships (PPPs), a situation contributing to limited private sector participation in energy projects.
- Article 26A of the agreement amending the Treaty of the Southern African Development Community provides for the establishment of the Regional Development Fund (RDF). The purpose of the RDF is to mobilise financial resources to support the region's infrastructure, social development and regional integration requirements. Unfortunately, there have been delays by Member States in signing and ratifying the agreement required to operationalize the RDF.
- The SADC Project Preparation and Development Facility (PPDF) is inadequately resourced, to the extent that to date, the PPDF has funded just nine projects within the region yet the facility was established to capacitate the region with resources to develop bankable project proposals that can attract funding for implementation.
- Limited government funding for infrastructure projects, given competing social service requirements at the national level.

To this end, the region would need to strengthen its financing mechanisms, to ensure the existence of sustainable financing options for its energy projects. This could be accomplished by strengthening Public Private Partnerships (PPPs) to spread the burden of infrastructure financing, operations and management. In addition, the region may need to consider the establishment of Regional Infrastructure Development Financing Institutions (DFIs) and mechanisms. This includes the operationalisation of the RDF, Resourcing of the SADC PPDF and partnerships with non-traditional financial intermediaries such commercial banks, insurance companies, pension funds, among others. These funding options will now be discussed in greater detail.

4.3 Funding Initiatives

In order to mobilise the required level of financial resources for regional infrastructure projects, SADC Member States are working on various initiatives, which include the following:

Priority List of Infrastructure Projects for AfDB Support

SADC has partnered with the African Development Bank (AfDB) to mitigate funding challenges for regional energy and other projects. This development is in line with a decision made by regional leaders at the SADC Extraordinary Summit held in March 2017, in Ezulwini, Eswatini approving the recommendation for SADC to work with AfDB to develop the necessary financial instruments and frameworks to support RIDMP projects. Some of the instruments that the AfDB will develop to capacitate the resource mobilisation efforts by Member States include infrastructure bonds, partial risk guarantees, insurance guarantees and partial credit guarantees. The March 2017 Extraordinary Summit also directed Member States to create a priority list from the portfolio of infrastructure projects under RIDMP so as to make engagements with AfDB more focused and effective. Information from the SADC Infrastructure Directorate highlighted that as of June 2019, 62 regional infrastructure projects, including those from the energy sector, had been shortlisted for AfDB support.

SADC Regional Development Fund

Member States agreed to establish the SADC Regional Development Fund (RDF) in order to mobilise financial resources to support the region's infrastructure, social development and regional integration requirements. However, this process has taken longer than planned, as it requires the signature and ratification of two-thirds of the Member States for the amended Article 26A of the SADC Treaty to enter into force and bring the RDF into formation. The SADC Infrastructure Directorate advised that as of August 2019, nine out of 16 SADC Member States had ratified the amendment, with two additional Member States required to bring the number to the required two-thirds majority necessary to operationalise the fund.

Financing the PPDF through the SADC Reserve Fund

The SADC Council of Ministers Meeting held in August 2019 in Dar es Salaam, Tanzania approved the interim funding of the Project Preparation and Development Fund (PPDF) through the SADC Reserve Fund as an interim measure until the RDF has been put in place. The Reserve Fund is made up of Member State contributions that are surplus to the SADC Secretariat's budget in any given financial year. The region is now able to draw-down on such surplus funds held in reserve, to resource the PPDF so as to strengthen the project preparation and resource mobilisation efforts for energy projects among other infrastructure development initiatives.

Rise of non-traditional financial intermediaries

In recent years, there has been a notable rise in the use of non-traditional financial intermediaries to finance energy projects and reduce the risks associated with such projects. Examples are stock markets, pension funds and energy-sector specific risk management firms. It is worthy to note that African Green Co and Private Financing Advisory Network (PFAN) are examples of firms operating with SADC whose aim is to attract investments into the region's energy sector by mitigating credit risks associated with such projects.

Public-Private Partnerships

Public financing of infrastructure has traditionally been the norm for financing of energy projects. However, owing to the growing and competing needs within the public sector financing framework, in particular the socio-economic areas of health, education and other utility deliveries, the public sector has in recent years reduced its role in infrastructure financing, save where international financing partners are meeting almost all the costs of the project. The state has tended to finance high risk areas, which, in the majority of cases, the private sector does not deem viable. The recognition that public sector funding is inadequate, adds further impetus for the acceleration of Public-Private Partnerships (PPPs) within the region's energy sector.

Capacity Building for Project Preparation
The SADC Secretariat has partnered with the Development Finance Institutions (DFIs) at the regional and continental level, namely the AfDB and the Development Bank of Southern Africa (DBSA) on an on-going basis. Through this partnership, SADC seeks to strengthen the capacity of Member States in project preparation. This development is set to improve resource mobilisation efforts for regional infrastructure projects. As part of this initiative, the SADC Secretariat and AfDB convened a workshop in June 2019, held in Johannesburg, South Africa, to build the capacity of officials from the 16 SADC Member States to develop detailed project fiches. A project fiche is a document that provides information to potential funders and other stakeholders about a particular project, including the location, estimated cost, implementation status, potential risks and funding gaps.

Development Finance Institutions
Public sector investment in SADC also comes from a variety of sources, including the World Bank, the Global Environment Facility (GEF), the AfDB, DBSA, South Africa's Industrial Development Corporation (IDC), as well as public utilities such as Eskom. The AfDB has been particularly active in the renewable energy field, both through its own funding mechanisms and through various specialised funds such as the Sustainable Energy Fund for Africa (SEFA) and the Climate Investment Funds, in particular the Clean Technology Fund (CTF). The AfDB together with the World Bank are strong players in the Scaling up Renewable Energy in Low Income Countries Program (SREP), for which Lesotho, Malawi, Mozambique and Zambia have been selected as countries for the pilot phase (REN21, 2016).

Private Sector
Private investment is emerging as a significant source of funding within the energy sector, particularly for renewable energy projects. The World Bank tracks private participation in infrastructure projects through its Private Participation in Infrastructure (PPI) Project Database. The database captures publicly available information on private participation in infrastructure projects. The indication is that the bulk of the investment has been in the electricity subsector.

Private sector participation in the form of Build-Operate-Transfer (BOT), Build-Own-Operate (BOO), Build-Own-Operate-and-Transfer (BOOT) and PPPs are feasible modes of financing large infrastructure projects. Lately, infrastructure bonds and pension funds have been mobilised to finance infrastructure projects or leverage more financing from other sources such as commercial banks or multilateral banks such as the European Investment Bank, World Bank and the AfDB. Utilities should also use their balance sheets to borrow from the banks for their equity share. Close cooperation with the emerging economies of China, India and Brazil are also yielding new financial resources.

International Cooperating Partners
International Cooperating Partners (ICPs) have been a major source of financing "soft" projects such as studies, policy/regulatory framework formulations, planning and capacity building projects (Annex 1). Their resources can also be used to leverage financing from the banks. The soft projects will need to be implemented in the short-term to facilitate implementation of the physical projects. The costs of implementing these strategic options will be determined on a case-by-case basis.

4.4 Conclusion and Way Forward

For SADC to scale up investment in energy infrastructure, there is need for a number of aggressive measures to be taken. These include, but are not limited to the following:

- Strengthen the national and regional structures that mobilise resources or implement energy and other infrastructure projects;
- Establish appropriate multi-disciplinary project structures to coordinate and oversee projects in order to assist participating governments to speed up implementation of these cross-border projects;

- Member States and the region should allocate adequate budgets for the coordination as well as investment in energy projects;
- There is need to create an enabling environment to attract the private sector to invest in energy as well as to encourage it to partner with governments within the framework of Public Private Partnerships to share risk on investment in this area. This should involve identifying and reviewing all instruments and initiatives that create a conducive environment for investment, key among these initiatives are protocols and inter-Governmental Memoranda of Understanding signed at appropriate levels so that they are binding;
- Accord priority to projects preparation (both early stage preparation and preparation to bankability) to ensure availability of a pipeline of bankable projects for would-be investors;
- Develop multilateral agreements to jointly plan, mobilize resources and implement cross border projects that involve two or more Member States;
  Recognise the crosscutting nature of infrastructure projects and adopt an integrated approach to the design and implementation of infrastructure projects;
  Create Special Purpose Vehicles to implement projects at the level of Member States, including cross-border projects;
  Removal of political interference to facilitate collective design of projects, joint planning, joint resource mobilisation and joint implementation by Member States.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The region has made significant progress in developing its energy sector, in particular in addressing issues to do with augmenting its electricity generation. One of the major developments during the past year has been the emergence of Independent Power Producers (IPPs) as a major player in the SADC electricity sub-sector, particularly with respect to investment in renewable energy sources such as solar and wind. IPPs have recently come to the fore in terms of investing in power projects, thanks to current reforms by Member States. According to the Southern African Power Pool (SAPP), a significant share of electricity generation in a number of countries, mostly 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.

Despite the increased participation by IPPs in the electricity sub-sector, the power supply situation in the region has regressed to pre-2017 conditions where shortages were experienced. Information from the SADC Infrastructure Directorate shows that as at May 2019, the region had a power deficit of 500MW. This has meant the re-introduction of demand side management strategies such as load-shedding in an effort to manage the situation. The shortages are partly due to dwindling water resources which have affected power generation in Zambia and Zimbabwe, as well as due to the slow pace of approving projects or of concluding Power Purchase Agreements (PPAs) between IPPs and national utilities.

This development has come at a time when electricity access levels in the region remain significantly low. For example the 2018 State of Electricity Access Report, shows that about 58 percent of people within sub-Saharan Africa do not have access to electricity. Evidently, the solution lies in increased investments in electricity generation, so as to improve access and create an enabling environment for sustainable economic development within the SADC region.

SADC does not at present have a regional policy framework on gas and oil, meaning that most of the exploration and investment is guided by national policies of different SADC Member States. However, the process is at an advanced stage to build a regional consensus with regard to the role and future of natural gas in the region. This follows the historic decision by the 38th SADC Summit of Heads of State and Government held in Windhoek, Namibia in August 2018 to direct the SADC Secretariat to operationalise the Regional Gas Committee and to develop the Regional Gas Master Plan (RGMP). There is need to expedite the development of the RGMP, which is expected to guide the exploitation of the vast natural gas resources that exist in the region.

Energy investment and financing are being hampered by a number of challenges, which include low tariffs, poor project reparation, no off-takers that can sign Power Purchasing Agreements (PPAs) under single buyer models and other required policy/regulatory frameworks. The capacity for project preparation and implementation at utility and Member State levels is still very low.

5.2 Policy Options

The following is summary of key policy options that need to be considered by SADC Member States to promote the development of the energy sector in the region.

- The SADC region should take advantage of the ongoing process of reviewing the Protocol on Energy to include measures aimed at creating an enabling environment for investment in the energy sector at both regional and national levels. The environment should address the unique characteristics of energy sector projects, such long lead-times and high start-up costs.
- There is need to expedite the process of operationalizing the SADC Regional Development Fund as well as finalizing the development of the SADC Regional Resources Mobilization Framework, which will determine how fiscal space can be created to enable Member States to finance regional activities, programmes and projects.
- There is need to continue pushing for more private sector investment in the energy sector. This can be done through direct investments, syndication with multilateral development banks or Public-Private-Partnership arrangements;
- The region should develop viable and flexible legislature that cut bureaucracy and increase investment in oil and gas;
- There is need to promote local partnerships to ensure the exploitation of oil and gas also benefits the local communities.

ANNEX

Annex 1 Soft Funding Initiatives by ICPs in the SADC Energy

	CP	Funding focus
1	Austrian Development Agency/ Austrian Development Corporation (ADA/ADC)	• The Austrian government has been providing funding for the region's energy sector through its development agency ADA/ADC. • Primary focus has been to support "soft" energy sector investments which include funding for the following: (a) The Southern African Solar Training and Demonstration Initiative (SOLTRAIN), which comprises six southern African countries namely Botswana, Lesotho, Mozambique, Namibia, South Africa and Zimbabwe; (b) The Energy and Environment Programme (EEP) in partnership with Finland and the Nordic Development Fund; (c) The establishment of the SADC Centre of Renewable Energy and Energy Efficiency (SACREEE); and (d) Regional energy research in partnership with the Southern African Research and Documentation Centre (SARDC). • An estimated US$16.5 million has been availed by ADA/ADC since 2008 for these initiatives.
2	European Union (EU)	• The EU has been one of the major financiers of the SADC PPDF, a fund set up to strengthen project preparation for infrastructure projects including energy. • Since 2008, the EU has availed € 11.75 million for this purpose. • The EU has supported the development of the SADC Industrial Energy Efficiency Programme (SIEEP) being spearheaded by SACREEE.
3	Deutsche Gesellschaft fur Internationale Zusammenarbeit (GiZ)	• GiZ has been a financier of energy initiatives in southern Africa, having contributed € 10.8 million to the SADC PPDF through German bank KFW.
4	EEP Africa	• EEP Africa is a clean energy facility managed by the Nordic Development Fund (NDF) with funding from Austria, Finland and NDF. • It provides early stage grant and catalytic debt financing for innovative clean energy projects, technologies and business models in Southern and East Africa.
5	French Development Agency (AFD)	• Since 2009, the AFD has provided over € 600 million in financial support to various energy initiatives in the region, mainly in South Africa and Namibia.
6	International Renewable Energy Agency (IRENA)	• IRENA has supported various energy initiatives in the SADC region, among them the following: (a) Renewables Readiness Assessments (RRAs) in Mozambique, Swaziland, Zambia and Tanzania; (b) Advisory services on small hydro resource assessment for Mozambique, Swaziland and Zambia as follow up to the RRAs; (c) Africa Clean Energy Corridor covering EAPP and SAPP; (d) Advisory Services for Resource Assessments – contributing to the development of a Global Atlas of Renewable Energy and capacity building in renewable energy; and (e) Mapping of dedicated renewable energy financing opportunities with focus on off- grid renewable energy in Africa.
7	Japanese International Cooperation Agency (JICA)	• The Japanese government through JICA has been involved in the following soft energy investments in the region, among others: (a) The project for introduction of clean energy by Solar Electricity generation system, Botswana; (b) Power System Development Advisor, Zambia; (c) Study For Power System Development Master Plan, Zambia; and (d) Data collection survey on Southern African Power Pool (SAPP).
8	Renewable Energy and Energy Efficiency Partnership (REEEP)	• The Renewable Energy and Energy Efficiency Partnership is a Vienna-based international organisation that advances markets for renewable energy and energy efficiency with a particular emphasis on the emerging markets and developing countries. • In Southern Africa, REEEP has been involved in renewable energy initiatives mainly in South Africa and Namibia.
9	Southern Africa Energy Program (SAEP)	• The main objective of SAEP, which is funded by USAID, is to assist in the development of generation, transmission and distribution whilst promoting investment in the energy sector for a brighter, more sustainable future. • To date, Power Africa's more than 130 private and public sector partners have committed more than $52 billion to mobilize and organize international efforts to electrify Africa. • Support has included advisory support to governments within SADC in terms of policy formulation and implementation.
10	United Nations Environment Programme (UNEP)	• UNEP has been working on the Clean Energy mini-grid Programme in five SADC Member States; and • The project has involved the assessment of feasibility, Technical assistance, capacity building, planning and implementation.
11	United Nations Industrial Development Organization (UNIDO)	• UNIDO has been promoting the following programmes within the SADC Energy Sector, namely: (a) Switch Africa Green, involving South Africa and Mauritius; (b) Waste to Energy; and (c) Establishment of SACREEE.

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