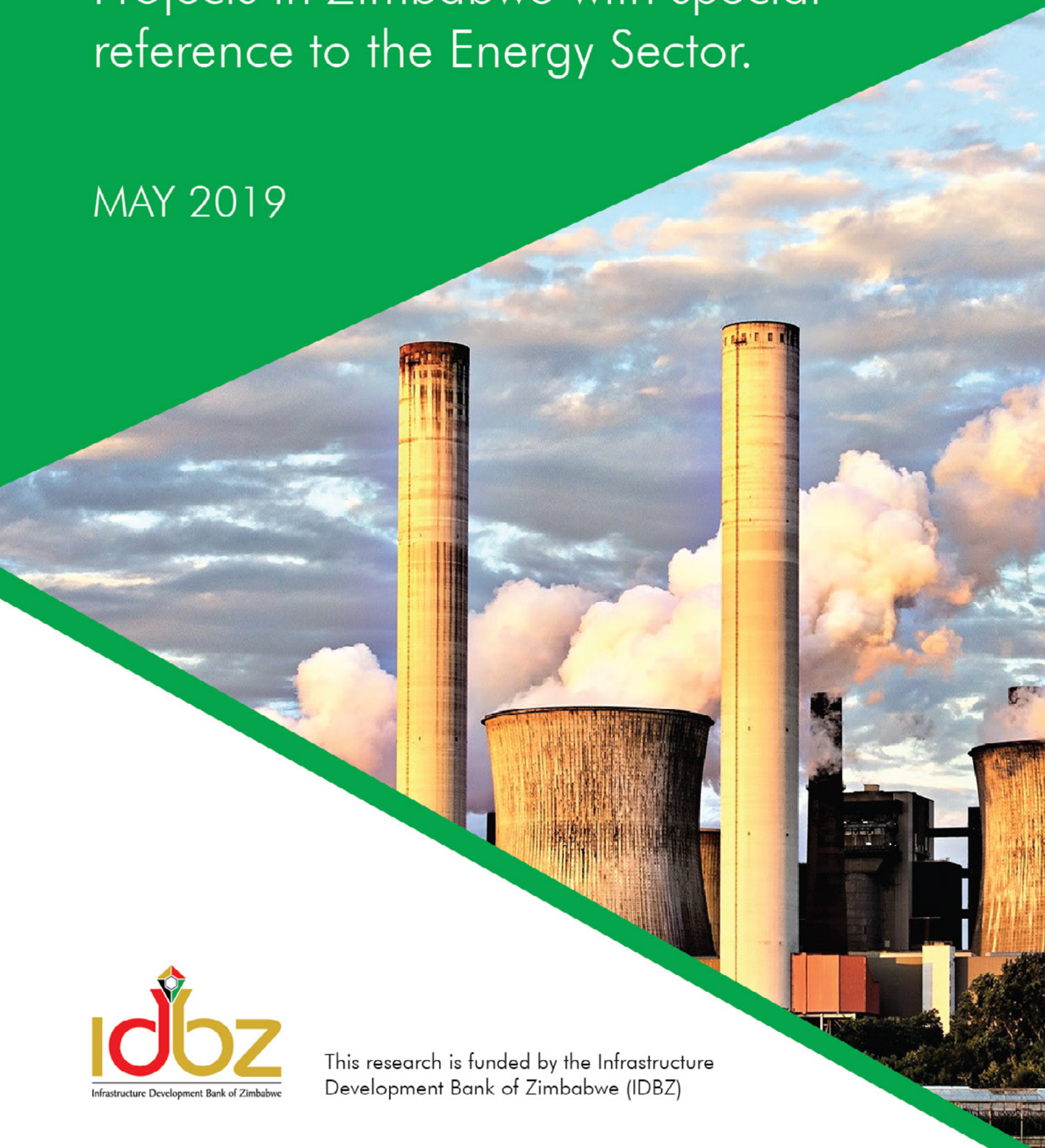
ANALYSIS OF FACTORS THAT AFFECT BANKABILITY OF INFRASTRUCTURE

Projects in Zimbabwe with special reference to the Energy Sector.

MAY 2019



Infrastructure Development Bank of Zimbabwe

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Analysis of factors that affect bankability of infrastructure projects in Zimbabwe with special reference to the energy sector

Preface

Studies have noted that the major problem in infrastructure development is not necessarily lack of funding but a dearth in bankable projects. This study confirms this long-held view that in Zimbabwe, a limited pipeline of bankable projects is one of the major causes of the infrastructure deficit. In the energy sector, in 2017, there were some licensed projects with a capacity to generate 285.8 MW. However, these projects remained at prefeasibility stage. Other five projects with a capacity to generate 833.3 MW remained at feasibility study level. Furthermore, there were five projects with a capacity to produce 1227.40 MW that had completed their feasibility studies. However, they still remained behind in terms of fulfilling other bankability conditions to reach financial closure for them to attract investments. The study confirms the importance of ensuring that proper feasibility studies should be done to reach bankability. Thereafter investors can be solicited leading to implementation and hence ensuring the that the power challenges are addressed.

This report highlighted some issues that are peculiar to Zimbabwe as key impediments to bankability of infrastructure projects that include: policy inconsistence regarding attracting private investment, unstable macroeconomic environment (currency and tariff issues) and lack of project development skills locally. Some of Independent Power Producers (IPP) licensee holders did not provide equity to sponsor the project and this raised the risk profile of projects in Zimbabwe. This trend has been observed across all sectors on some players who managed to get concessions or land but lacked the necessary capital or skills to develop these projects to bankability. A transparent/ open market system for issuing concessions, licenses or land should be adopted to enhance efficient delivery of infrastructure projects in Zimbabwe. This report proffers recommendations which if acted upon could transform infrastructure financing in the country. The Bank is quite excited to continue sharing knowledge in the infrastructure development space and learn from experience.

Thomas Zondo Sakala

Chief Executive Officer
Infrastructure Development Bank
12 September 2019

Foreword

This report is one of the first in the series of work the Bank is undertaking contributing to the infrastructure development through knowledge generation and sharing. The concept of bankability is critical in project development. As elucidated in the report, bankability means the ability to attract funding based on the soundness of the project concept. In this regard, a Bankable project is that which can attract funding. The report has detailed the factors that contribute to project bankability that include economic; political; regulatory; technical; financial structure; risk sharing; project specific (technical, environmental and social); legal/contractual agreement; and procurement.

Experience has shown that most challenges faced by various non-performing projects of licensed producers in the energy sector or any other sector have emanated from the non-compliance to the requisite project preparation methodology activities addressing all the bankability factors. Failure to properly plan a project usually lead to false starts with disastrous results downstream.

It is estimated that project preparation constitutes approximately 10-12% of the total project costs for large regional projects in Africa. However, most project promoters lack requisite resources to finance project preparation work. This calls for establishment of project preparation facilities for funding project preparation work. Scope of project preparation should be wider enough to cover all the essential elements of project bankability. This report shows that Zimbabwe has limited project preparation facilities available whose scope is limited because of limited resources. The challenge to all stakeholder in infrastructure development value chain is strengthening project preparation in Zimbabwe to create a credible pipeline of bankable projects. The study also noted that there should be an integration between project preparation cycle and environmental social impact assessment (ESIA). This report has covered financing trends of infrastructure projects in Zimbabwe and provides a detailed analysis of the energy sector. Lessons drawn from both regional and local case studies are discussed. It is recommended that there should be; increased fiscal allocations towards infrastructure development, a stable macroeconomic environment, a credit rating for the country, innovative revenue collection and allocation to cater for infrastructure development needs in the country, improved efficiency for players in the infrastructure value chain to improve their bankability and a multiple local project preparation fund (PPF) and mobilization of funding to resource a specialized PPF. There is need to vigorously pursue the easy of doing business reforms (this should include tariff setting models and regulatory fees setting). There is also need for standardization and enforcement of compliance to procurement standards for all infrastructure projects. This report offers all players in the infrastructure financing space especially energy sector critical areas to reflect on.

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List of Abbreviations

Acronym	Full Name
AfDB	African Development Bank
EMA	Environmental Management Agency
EPC	Engineering, Procurement and Construction
ESIA	Environment and Social Impact Assessment
EY	Ernst & Young
GFCI	Global Future Council on Infrastructure
ICT	Information Communication Technology
IDBZ	Infrastructure Development Bank of Zimbabwe
IPP	Independent Power Producer
MoEPD	Ministry of Energy and Power Development
MoFED	Ministry of Finance and Economic Development
NPV	Net Present Value
OECD	Organisation for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
PCM	Project Cycle Management
PPA	Power Purchase Agreement
PPDF	Project Preparation Development Fund
PPFs	Project Preparation Facilities
PPP	Public Private Partnerships
R&D	Research and Development
REA	Rural Electrification Agency
SADC	Southern African Development Community
SAIF	South Africa Infrastructure Fund
SAPP	Southern African Power Pool
SARDC	Southern African Research and Documentation Centre
SDGs	Sustainable Development Goals
SDIP	Sustainable Development Investment Partnership
ToRs	Terms of Reference
TSP	Transitional Stabilization Programme
WB	World Bank
WEF	World Economic Forum
ZENT	ZESA Enterprises
ZESA	Zimbabwe Electricity Supply Authority
ZERA	Zimbabwe Energy Regulatory Authority
ZETDC	Zimbabwe Electricity Transmission and Distribution Company
ZIMASSET	Zimbabwe Agenda for Sustainable Socio-Economic Transformation
ZPC	Zimbabwe Power Company

1 Introduction and Background

1.1 Study Rationale and Objectives

Infrastructure investment and development is a pre-requisite for poverty reduction, social progress and inclusive economic growth and many governments, globally, have made it their top priority. The Sustainable Development Goals (SDGs) emphasise the need for infrastructure to catalyse innovation, industrialization, and urbanization. The increased need for infrastructure investment is emanating from population growth, ageing infrastructure, technological advancement and climate change.

The country is faced with a huge infrastructure deficit in all sectors of the economy despite that efficient, safe, reliable and affordable infrastructure is essential for competitiveness and economic development. In the energy and power sector the country faces persistent power outages due to excess demand. Capacity utilisation in the energy generation sector is estimated at 42% giving approximately 1,066MW on average as at May 2019 against an estimated peak demand of 2200MW (ZESA, 2019).

To close the infrastructure gap, there is need to ensure that adequate project identification, preparation and development is carried out. This is critical since infrastructure projects are usually complex, significant in size & scope. Often, infrastructure development requires multiple financing arrangements that include government, private sector, donor agencies, development financing, bilateral and multilateral arrangements. Most infrastructure projects seek to provide essential social services; therefore, they attract public scrutiny. As a result, this calls for extensive stakeholder engagement and involvement over the entire project cycle.

Infrastructure development is inhibited by lack of bankable projects among many other reasons. The term 'bankability' refers to the ability to attract finance. This is determined by the attributes of the project such as technical feasibility, financial and economical soundness, legal viability, environmental and social sustainability. Chaponda, Nikore and Chennells (2014), noted that the main obstacle to sustainable investment in infrastructure is not the lack of capital but 'a deficiency in well packaged, bankable projects pipelines. Multiple factors have been attributed to the lack of investment in infrastructure through the various financing and/or funding models available. Bankability is not looked at uniformly across different funders as some aspects are more emphasised than others. In general, there is growing convergence on the factors that affect bankability.
Our study, indicates that in Zimbabwe, a limited pipeline of bankable projects is one of the major cause of the infrastructure deficit. The macroeconomic environment and lack of funding for feasibility studies and other preparatory work compounds the situation.

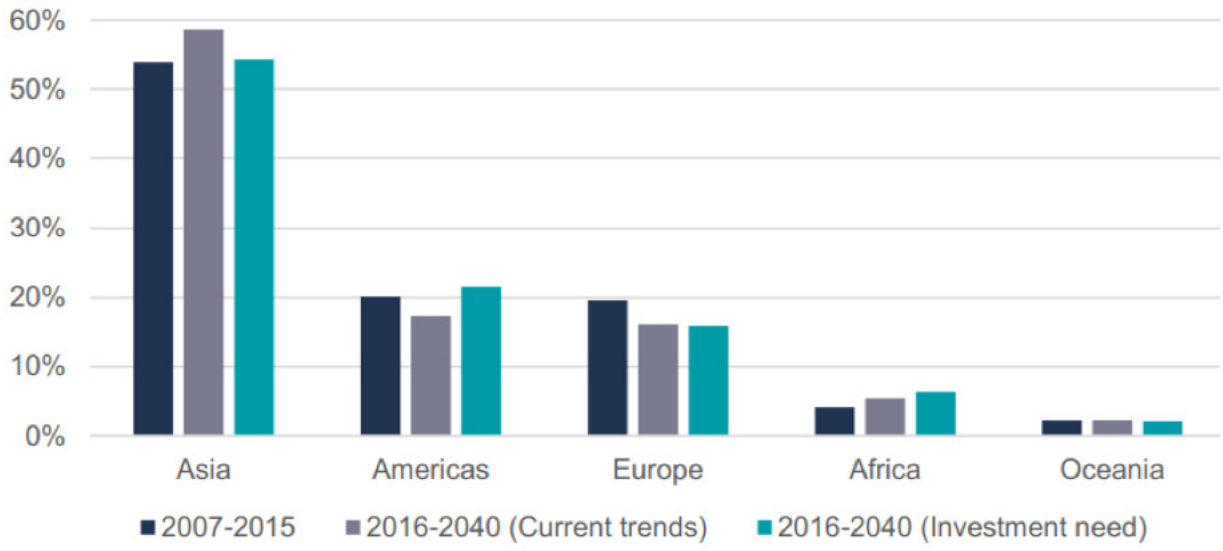
2 Bankability of Infrastructure Projects

2.1 Bankability Trends

2.1.1 Global Trends in undertaking Bankable Infrastructure Projects

According to the Global Infrastructure Hub (2019), the world is facing a USD $94 trillion infrastructure deficit by 2040 (WEF, 2019). OECD (2017) projected a global need to invest USD $6.3 trillion annually in infrastructure between 2016-2030. Asia has the largest share of infrastructure investments with Africa and the Oceania regions receiving a significantly lesser share as shown in Figure 1. Africa is projected to require continue increased investment in infrastructure.

Figure 1: Regional Share of Global Infrastructure Investment Trend between 2007-2040



Source: Global Infrastructure Hub (2019)

The World Economic Forum's Global Future Council on Infrastructure (GFCI) (WEF, 2019) identified the key challenges to infrastructure investment as the lack of bankable project pipelines and low level technological innovation in infrastructure systems. This can be addressed by:

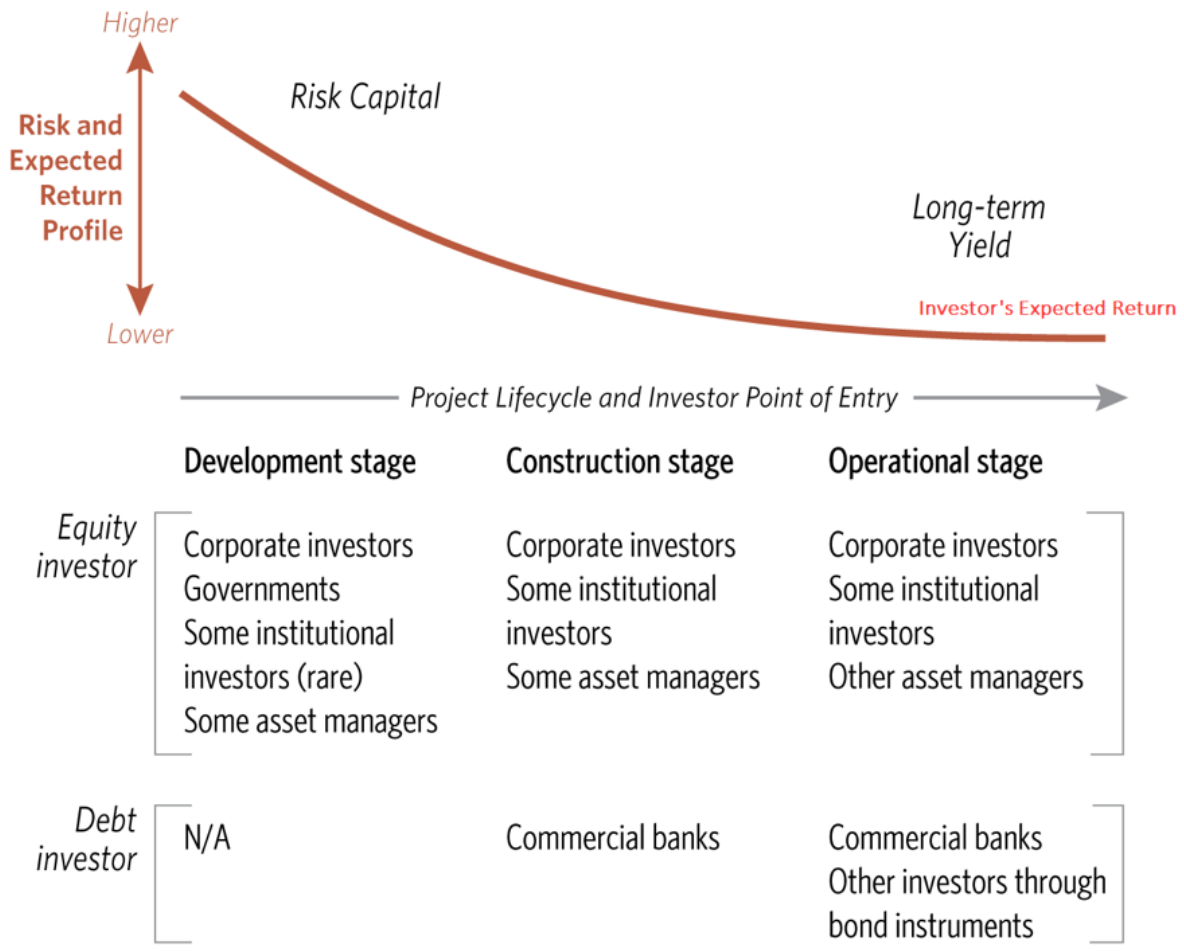
- efficient promotion and mapping of available project preparation facilities and tools;
- developing enabling policies to support the various funding options; and
- upscaling infrastructure systems to improve the performance and economic viability of infrastructure.

Oberholzer et al., (2018) indicates that the factors required to demonstrate bankability are contained in feasibility studies; financial viability, demand planning, funding of operations, acceptance in the community, regulatory approvals (including ESIA), and legal compliance. Most projects fail to achieve bankability due to insufficient project development, missing links to the financial sector and insufficient returns. Other factors such as the long-term nature of infrastructure investment and resistance from the local community also contribute. Hence, good project preparation is essential in making infrastructure projects bankable.

Tonkonogy et al., (2018) focusing on developing countries and clean energy argue that the top risks identified for projects are off-taker risk, currency risk, policy risk, and liquidity and scale risks. They also argued that many early stage projects and clean energy companies face barriers in accessing financing due to higher risk and lower expected return as explained in Figure 2.

Figure 2 highlights that infrastructure projects pose greater risks during the early development stages of the project lifecycle. Investors expect a higher rate of return if they are to finance projects during the development stages. The investor expected risk and return profile declines as the project progresses through the development stages. Investors receive a lower real return if they invest during the later stages of the project. Private capital's point of entry, guided by investor expectations, is usually during the construction and operational stage after project risks have been reduced.

Figure 2:Project Risk and Investor's Expected Returns at each Project Stage



Source: Climate Policy Initiative (CPI) (2019), adapted

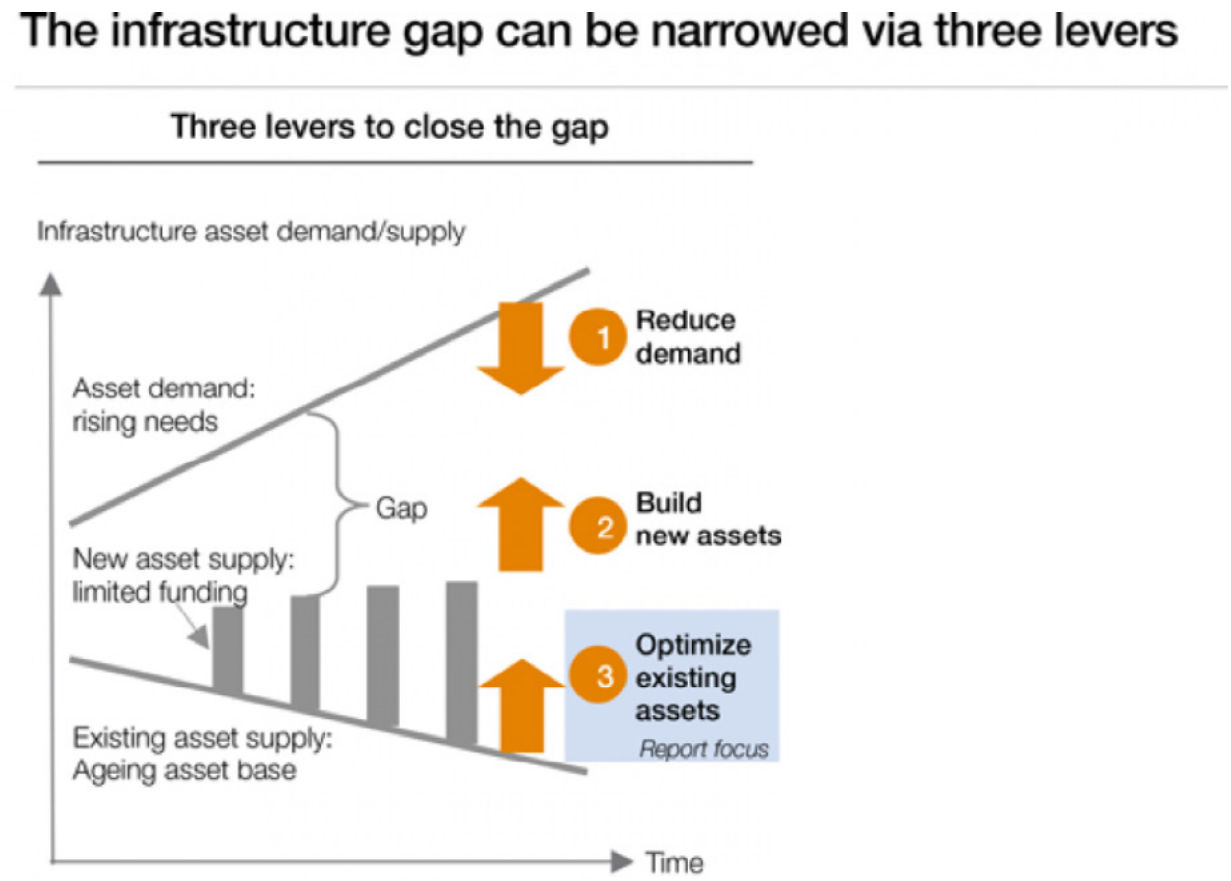
There is a deficiency in the availability of funding and financial products to de-risk projects at the early development stage. Structured financing options require innovative products to provide solutions for project preparation activities. Governments traditionally come up with de-risking options and ensure the development of national projects up to bankability. De-risking options, usually through either financial or policy interventions, are used to enhance project preparation activities.

WEF (2014) stated that infrastructure deficit can be closed through:

- Reducing demand,
- Building new assets, and
- Optimizing existing assets

Figure 3 illustrates the deficit reduction options.

Figure 3: Levers to Close the Infrastructure Gap



Source: World Economic Forum (2014)

2.1.2 Regional Experiences in undertaking Bankable Infrastructure Projects

Africa experienced an estimated 22% increase in infrastructure financing from US$66.9 billion in 2016 to US$81.6 billion in 2017 (ICA, 2017). As shown in Table 1, the increase is largely attributed to:
Chinese investments increasing from US$6.4bn to US$19.4bn in the same period; and
African governments increasing spending by approximately US$3.7 from US$30.7 billion to US$34.4 billion.

Table 1: Infrastructure Financing Sources in Africa

Description	African National Governments	China	ICA Members	Arab Co-ordination Group	Multilateral/ Bilateral	Private Sector
Amount (US$ Billion)	34.3	19.4	19.7	3	2.9	2.3
Percentage	42.1%	23.8%	24.1%	3.7%	3.5%	2.8%

Source: ICA (2017)

Oberholzer et al., (2018) argues that investors require higher returns for projects in Africa than comparative projects in advanced economies, Asia and Latin America. This is attributable to perceived high sovereign risk. This requirement correspondingly exerts pressures on electricity tariffs in Africa contributing to lack of competitiveness. Other issues highlighted include difficulties in securing the requisite competencies in project development in developing and emerging economies as compared to advanced economies.

The role of private sector project developers is more demanding in developing and emerging economies due to these concerns. To address these issues, partnerships between public and private sector may create an enabling environment for developing bankable infrastructure projects. In addition, government programmes should focus on project development. Moreover, increased use of risk

mitigation instruments, guarantees, and finance facilities should be employed to ensure access to the much-needed long-term financing for project development.

Since investors are more likely to pursue projects with credibly determined bankability, there is need for patient capital for infrastructure project development. G20 Development Working Group (2014) argues that there should be a clear path for countries to transition from receiving grant support for project preparation to eventually having the capacity to finance project preparation initiatives independently (Adam Smith International, 2014).

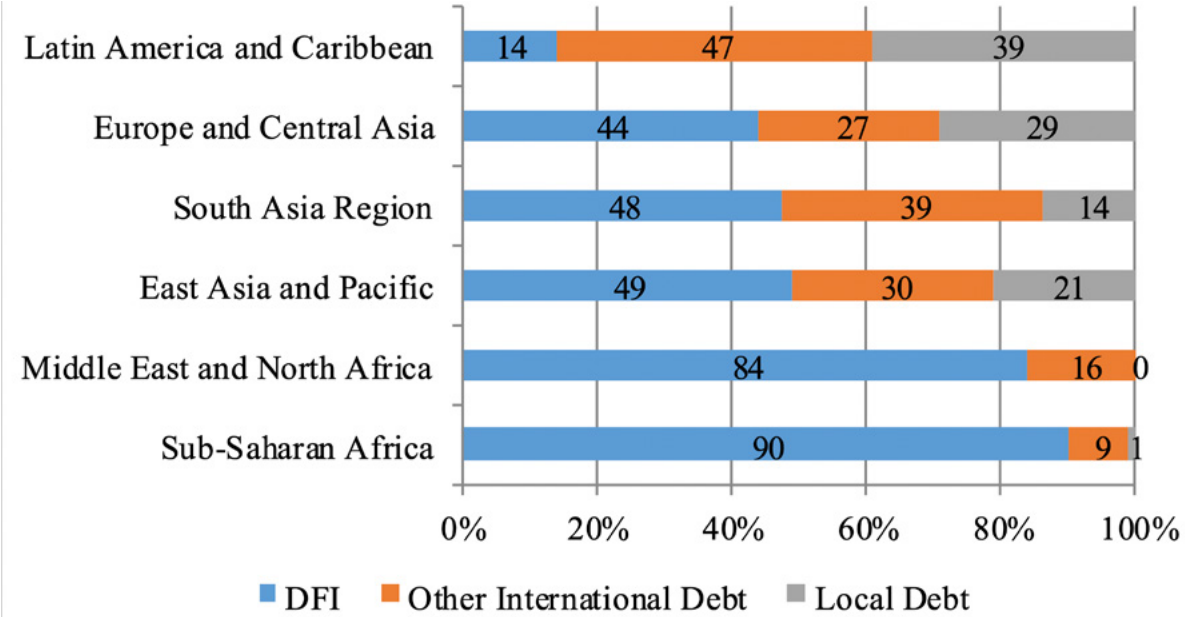
2.1.2.1 Project Preparation and DFIs in Africa

Globally, there is an increase in private sector participation in infrastructure investment. The energy sector witnessed an approximate 11% increase in 2017 with a total of US$51.9 billion as compared to the US$46.8 billion in 2016 (World Bank, 2018). In 2017, investments were undertaken in about 203 projects, an increase from 183 projects registered in 2016. Private capital investments in the energy sector dominates other main infrastructure sectors such as water, transport and information and communication technologies (ICT) etc. The energy sector accounted for 56% of all private participation in infrastructure investments in 2017. However, the share of energy investments declined by 13% from the previous year. Investments in renewable energy continued to increase in 2017 with 173 projects (88 percent) out of the 197 electricity-generation projects registered in 2017. East Asia and Pacific attracted the most private-sector investment in energy, though unlike other regions, most of this was for conventional energy. Government policies were targeted to stimulate investment in the renewables, as almost all government support went towards renewable energy projects. The private sector is however mostly interested in energy generation, leaving investment in the transmission and distribution subsectors to other financiers such as governments e.g. African governments and China (Sy and Copley, 2017).

The Renewable Energy IPP programme in South Africa has also shown that private investors can be attracted to develop significant projects if the conditions are conducive for private investment e.g. Enel Green Power, Total and EDF Renewables etc (Bertrand-Hardy, 2015). Figure 4 shows that DFI funding for renewable-energy projects quadrupled in 2017, with about 56 renewable-energy projects receiving multilateral support in 2017, compared to only 14 in 2016 (World Bank, 2018). Similarly, 45 renewable energy projects received bilateral support in 2017, compared to only 18 in 2016. Sub-Saharan Africa and Middle East & North Africa predominantly rely on DFI funding as opposed to other regions which have diversified financing options.

Sub-Saharan Africa projects were predominantly financed by DFIs (90%) with other international debt and local debt constituting only 9% and 1%, respectively. This shows too much reliance on international financing. Most regions raised debt internationally for their energy projects, with the exception of Latin America and Caribbean (LAC), where 39 percent of debt was from local lenders. Europe and Central Asia also tried to balance DFI financing (44 percent) with other international financing (27 percent) and local debt (29 percent). Local financing plays a significant role in financing projects in these regions. There is a need to diversify the funding base for energy infrastructure projects in Sub-Saharan Africa.

Figure 4: Sources of Financing for Energy Projects by Region

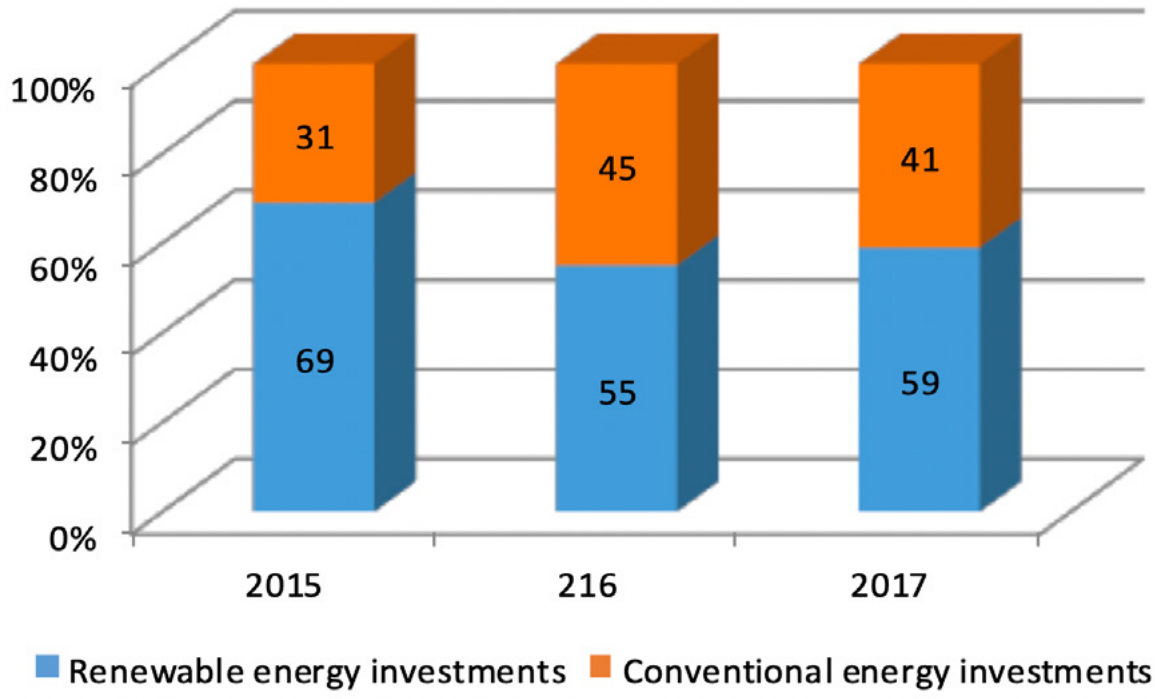


Source: World Bank, 2018

The Sub-Saharan Africa region received the lowest cumulative investments among the six regions at US$1.2 billion (World Bank, 2018). About 59% of the total private participation investments were earmarked for renewable-energy projects in 2017, up from 55 percent in 2016 as shown in Figure 5. Only eight countries in the region attracted renewable-energy PPI investments worth about US$717 million which translated to about 59.8% of the total investments.

Rwanda received the most renewable-energy investments, reaching US$362 million. This accounted for slightly more than half of all renewable-energy private investments in the region (51.1%). By comparison, only four countries (Ghana, Mali, Mozambique and Senegal) saw conventional-energy private sector investments, worth US$497 million. Mozambique was the leader on the conventional-energy front, while Mali saw the highest investment (US$136 million) for a thermal power plant.

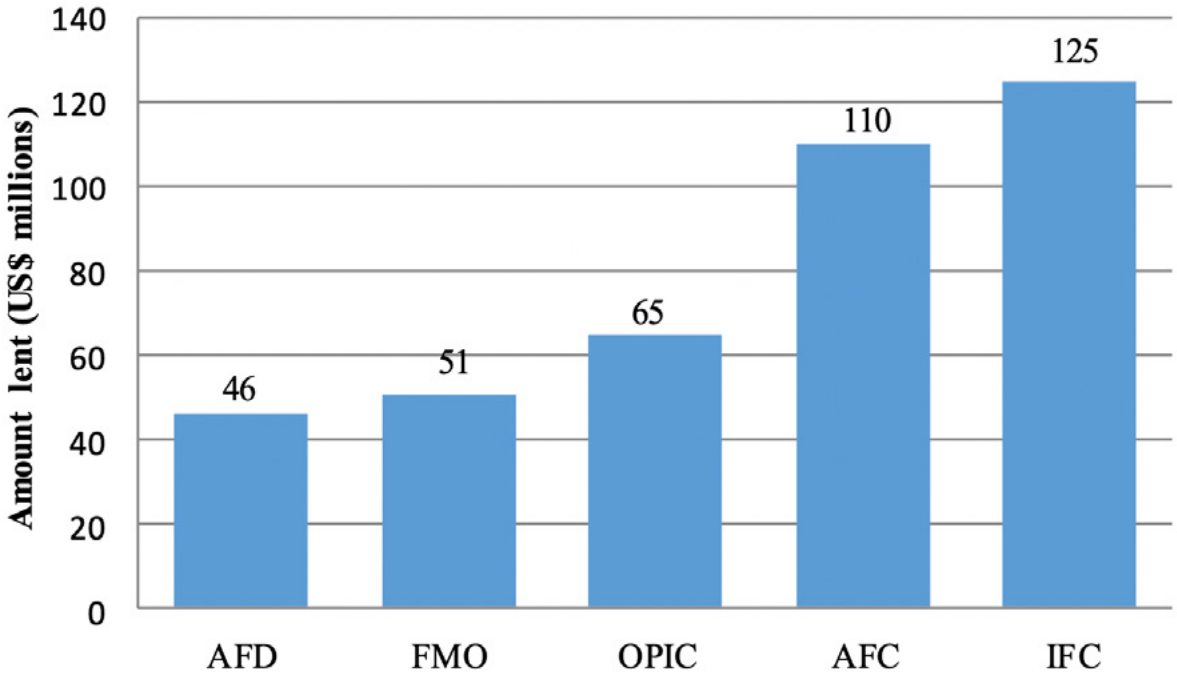
Figure 5: Categorisation of Energy Investments in Sub-Saharan Africa



Source: World Bank, 2018

In 2017 the major financier for energy projects was the International Finance Corporation (IFC) which contributed US$125 million (31.5%) followed by Africa Finance Corporation (AFC) which financed US$110 million translating to about 27.7% as shown in Figure 6. The remainder which constitutes the Overseas Private Investment Corporation (OPIC), Netherlands Development Finance Company (FMO) and Agence Française de Dévelopment (AFD) were trailing behind with financing of US$65 million, US$51 million and US$46 million respectively. Their overall contribution was about 40.8 percent. All of the top five financiers were DFIs, and no local commercial banks acted as major financiers due to lack of local debt markets in the region.

Figure 6: Top Lenders in the SSA Region and Amounts Funded



Source: World Bank, 2018

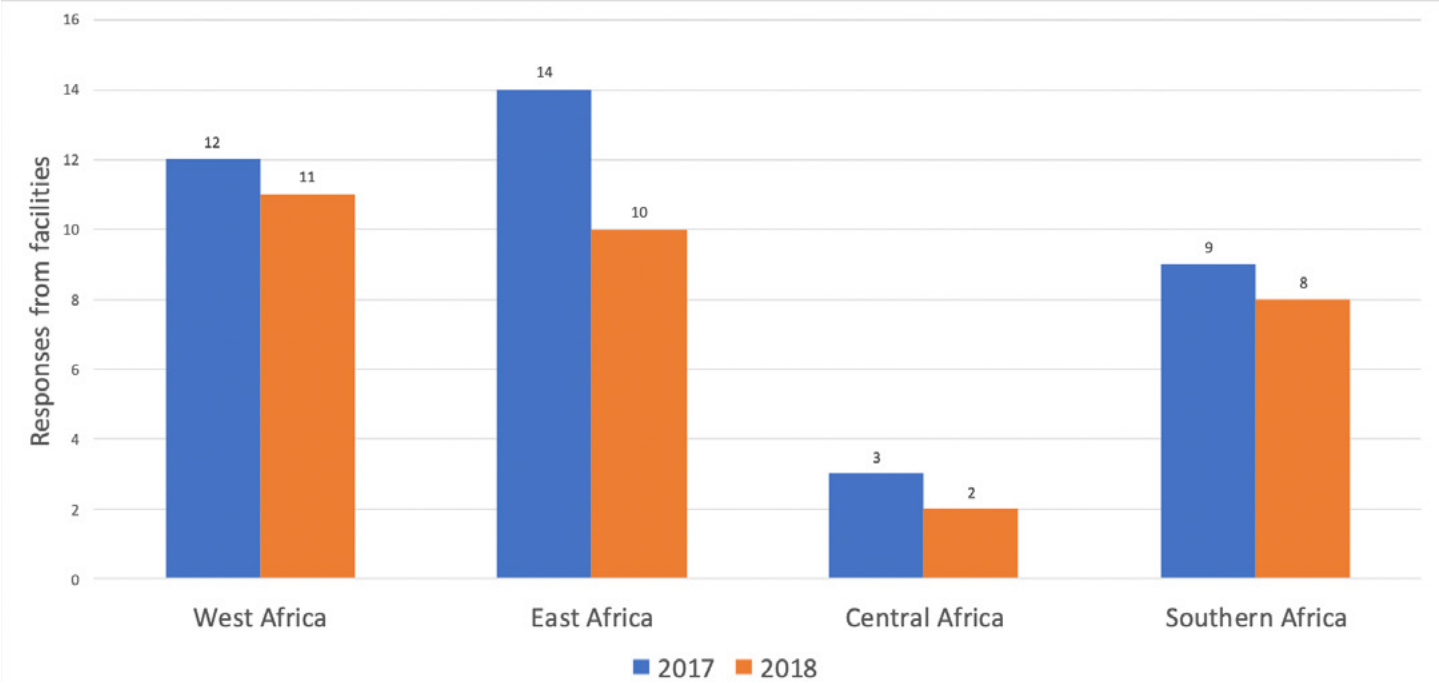
Bertrand-Hardy (2015) argues that governments and Development Finance Institutions (DFIs) must focus on nurturing new projects to enhance bankability. According to the key informant interviews, the infrastructure gap in Zimbabwe is exacerbated by limited fiscal capacity of the Government of Zimbabwe to fund projects up to feasibility level to enhance the chances of projects attracting potential private investors. The most common obstacle faced by investors in African is not lack of financial capacity but the scarcity of bankable projects (African Development Bank, 2018), of which Zimbabwe is not spared.

Some of the initiatives done at regional level to enhance development of bankable projects include establishment of regional information hub being advocated by the New Partnership for Africa's Development (NEPAD) Infrastructure Project Preparation Facility (NEPAD-IPPF).[1] The regional information hub can be used to advertise bankable projects in Africa. Each country should have a window, or channel, that is linked to its centralised information hub to unlock bankable investment opportunities throughout the continent (African Development Bank, 2017). Other regions like North America, Europe, Asia and Latin America have strong private sector project developers and sponsors which makes it easier for infrastructure projects to be developed to a bankable stage (African Development Bank, 2017).

Despite some initiatives on the African continent to enhance investment in infrastructure, the Programme for Infrastructure Development in Africa (PIDA) reported that approximately 44% of its 306 projects are still caught up in preparation phases, from concept to detailed structuring with the project development estimated at US$360 billion between 2011 and 2040 (Sustainable Development Investment Partnership (SDIP), 2018). Project preparation costs range from 1% - 4% of total project cost, rising to 12% for regional mega and innovative projects. Investors often cite the lack of bankable or investment ready infrastructure projects as the main reason why private capital is not flowing as expected to developing countries (SDIP, 2018).[2]

The most successful projects in Sub-Saharan Africa have been developed in South Africa, Kenya, Senegal and Ivory Coast (Bertrand-Hardy, 2015). Numerous examples on the continent show that bankability can be reached, even in the face of unfavourable political conditions as has happened for electricity supply in Ivory Coast which has been privately managed for close to 30 years (Bertrand-Hardy, 2015). SPID (2018) observed that there is strong support for projects in the energy sector, with almost half of the projects in Africa (46%) and 35% in Association of South East Asian Nation (ASEAN) region focusing on generation, transmission and distribution. Renewable energy projects received greater support than traditional power projects (52% in Africa and 46% in ASEAN) as shown in Figure 7. Zimbabwe, therefore should extend more focus on developing renewable energy projects to bankability. Traditional generation projects and transmission and distribution had a lesser focus at 24% each for African and ASEAN regions. The focus on green energy is in line with the Transitional Stabilisation Programme, the National Energy Policy, AfDB's High 5 specifically Light Up Africa and SDG 7.

Figure 7: Focus regions for funding of Bankable Projects in Sub-Saharan Africa and ASEAN region



Source: Development Bank of Southern Africa: Insights on Project Preparation and Development Capital in Africa and the ASEAN region (SPID, 2018).

Regional focus areas have been East and West Africa with Southern Africa trailing behind the two and with very little focus on Central Africa. Indonesia and Myanmar were highlighted as priority geographies in ASEAN from 2018 onwards. This shows that the Southern African region including Zimbabwe is lagging behind in terms of accessing project preparation facilities. Kenya was cited as the most

[1] http://www.infrastructurene.ws/2017/07/26/elevating-africas-bankable-projects/, accessed 4 March 2019

[2] https://www.dbsa.org/EN/About-Us/Publications/Documents/DBSA%20SDIP%20insights%20into%20Project%20Preparations%20in%20Africa%20and%20ASIAN%20regions.pdf, accessed 29 February 2019

current geographical focus of project preparation facilities in 2017, while Ghana and Nigeria were most frequently indicated as priority countries in the future (SDIP, 2018).

These project preparation facilities outline projects that can qualify for funding and the targeted sectors which can be classified as the eligibility criteria to access the funding. This is in line with SDIP (2018) which argues that project preparation remains the most critical component for attracting private capital flow to infrastructure investments in developing countries.

2.1.2.2 Key regional project preparation facilities

Key regional project preparation funding providers in Southern Africa are described in Table 2. For these project preparation facilities, the energy sector is among the sectors that can access the fund and national and regional projects under the Regional Infrastructure Development Master Plan in SADC and PIDA qualify which means Zimbabwean priority projects under these initiatives can qualify for funding.

Table 2: Key regional project preparation facilities

Organization in Southern Africa	Project Preparation Facilities	Key Eligibility Criteria
Southern Africa Development Community (SADC)	Project Preparation and Development Facility (PPDF)*	• Funds are administered, managed and disbursed by DBSA on behalf of the SADC Secretariat. • Funding is provided by the European Union and KFW Investment Bank • A grant facility will be made available for 95% of the required amount. A 5% monetary value of the grant is required from the recipient. • Financing the preparation of infrastructure projects. • projects that will be considered as enablers of regional integration. • Provide technical assistance for infrastructure project preparation • The funds are limited to projects within the SADC region. • The projects should span over two or more SADC countries or if located in one country should facilitate and promote regional integration
Project Preparation Facilities Network (PPFN)	AFREXIMBANK – Project Finance	Entities promoting projects in Africa; and Entities promoting projects outside Africa provided that African content in the procurement for such a Project is at least 60%. Maximum tenor of 7 years for advances Procurement procedure must be conducted in a manner that involves competitive bids and multiple quotes Cash disbursements are not made to parties other than suppliers Raw material and critical input plan must be provided Promoters or their managers to show evidence of considerable previous experience in developing and managing the project type; All corporate and Government approvals are to be in place
	Africa50	Provides project finance options Focus is on medium to large scale infrastructure projects with an appropriate return to investors. Fund invests in fully developed projects and project development support Africa50's staff actively contribute to project development. Fund seeks to bring projects to financial close and risk mitigation Delivery of financial structuring and appraisals. Provision of project guarantees. Takes significant minority stakes of $2-10 million in projects or platforms, playing an active role alongside the main sponsor Provides equity and quasi equity with flexible exit options, while accessing preferential debt from the AfDB and DFIs.
	African Development Fund - PPF	ADF is the concessional window of the AfDB for project financing and project preparation activities ADF provides concessional funding for projects and programs, as well as technical assistance for studies and capacity-building activities. The Fund's resources consist of contributions from internal Bank resources and periodic replenishments by donor countries, usually on a three-year basis.

	African Water Facility	Awards grants of between €50,000 and €5,000,000 to water projects that need financial and technical help for implementation, or to meet the strict criteria expected by development partners and the global investment community. Strategic focus is in supporting Project Preparation, Water Governance and Water Knowledge projects designed to catalyse the development of the Provides occasional grants to fund the implementation of small-scale pilot projects. Provides technical expertise and know-how to support project grantees all the way to project completion.
	Climate Resilient Infrastructure Development Facility (CRIDF)	Preparation and delivery for climate resilient water infrastructure projects Supports for water infrastructure projects to access finance Stakeholder engagement with key organs (national and regional stakeholder) Technical assistance and capacity building support for project preparation and implementation Mobilisation of technical experts from diverse fields Leveraging finance for project implementation
	Development Bank of Southern Africa (DBSA)	Earmarked for projects that can be included in DBSA's lending pipeline. Funding creation of an enabling environment for infrastructure projects Conducting pre-feasibility studies Conducting bankable feasibility studies Assistance with costs to reach financial close
	ECOWAS Projects Preparation and Development Unit	Resource mobilisation and funding preparation for regional integration infrastructure projects in ECOWAS Member States; Promoting PPPs in investment financing and project management in ECOWAS
	EU-Africa Infrastructure Trust Fund	Provision of grant support for various stages of project development[<?>] Technical assistance Interest rate subsidies Investment Grants Financial Instruments e.g. guarantees, insurance premia, equity investments/participations, risk-sharing instruments.
	Fund for African Private Sector Assistance (FAPA)	Provision of untied grants for project preparation Promotion of innovative programs that support small- and medium-sized enterprises.
	NEPAD Infrastructure Project Preparation Facility (NEPAD-IPPF)	Funding project preparation for African countries, Regional Blocs and related infrastructure development institutions. Support the creation of an enabling environment for private participation in infrastructure, Support targeted capacity building initiatives to enhance the sustainability of existing and planned infrastructure developed in the continent
	NEPAD Business Foundation	A non-profit organization that mobilises private sector support for the implementation of New Partnership for Africa's Development (NEPAD) goals. Provides a networking platform for its members to discuss, debate, share ideas and collaborate with the public sector and other stakeholders in investment, project or commercial activities.
	Private Infrastructure Development Group (PIDG)	Upstream technical assistance in project preparation Origination and development of innovative projects Provision of long term foreign currency loans in sub-Saharan Africa Provision of innovative foreign currency credit solutions
	Public-Private Infrastructure Advisory Facility (PPIAF)	A multi-donor trust fund that provides technical assistance to governments in developing countries Developing an enabling environment Framing infrastructure development strategies; Designing and implementing policy, regulatory, and institutional reforms; Organizing stakeholder consultation workshops; Building government institutional capacity; and Designing and implementing pioneering projects.

[<?>] http://www.eu-africa-infrastructure-tf.net/about/aitf-what-we-can-offer.htm

	Sustainable Energy Fund for Africa (SEFA)	Funding for projects focusing on untapped clean energy resources. Project Preparation grants and technical assistance to private project promoters Requests originated or championed by AfDB staff. Screened and pre-assessed against the basic eligibility criteria by the SEFA Equity Investments early stage capital for small-and medium-sized projects Enabling Environment: grants to support public-sector activities that create and improve the enabling environment for private sector investments in sustainable energy
	SADC PPDF*	Funds are administered, managed and disbursed by DBSA on behalf of the SADC Secretariat. Funding is provided by the European Union and KFW Investment Bank A grant facility will be made available for 95% of the required amount. A 5% monetary value of the grant is required from the recipient. Financing the preparation of infrastructure projects. projects that will be considered as enablers of regional integration. Provide technical assistance for infrastructure project preparation The funds are limited to projects within the SADC region. The projects should span over two or more SADC countries or if located in one country should facilitate and promote regional integration
	Sustainable Infrastructure Foundation	SOURCE is a joint global MDBs initiative to deliver well-prepared projects that address the global infrastructure gap and advance the United Nations' sustainable development goals. Sustainable Infrastructure Foundation (SIF), is a not-for-profit Swiss foundation that coordinates the operational provision of SOURCE. SIF ensures adequate project preparation through Providing capacity building assistance to SOURCE users Ensuring the adoption of SOURCE by governments, public agencies and international organisations seeking funding from SOURCE.
	US Trade & Development Agency	USTDA provides grants directly to overseas project developers (public and private sector) who use U.S. companies to perform project preparation activities Beneficiaries supported include public, private, public-private partnerships
Development Bank of South Africa (DBSA)	DBSA Project Preparation Funding	Earmarked for projects that can be included in DBSA's lending pipeline. Funding creation of an enabling environment for infrastructure projects Conducting pre-feasibility studies Conducting bankable feasibility studies Assistance with costs to reach financial close
	Infrastructure Investment Programme for South Africa (IIPSA)	Support the implementation of the government infrastructure programme. Address the constraints to infrastructure development in South Africa and in the SADC region. Provide innovative financing involving the blending of EU grants together with loans from participating Development Finance Institutions (DBSA, KFW, EIB and AFD). IIPSA is a grant facility with the condition of a loan from one or more of the participating DFIs. IIPSA funding is limited to South Africa and the SADC region. SADC projects have to be a trans-border project involving two or more countries in the SADC region or a national project with a demonstrable regional impact on one or more countries in the SADC Region.
	SADC PPDF*	Funds are administered, managed and disbursed by DBSA on behalf of the SADC Secretariat. Funding is provided by the European Union and KFW Investment Bank A grant facility will be made available for 95% of the required amount. A 5% monetary value of the grant is required from the recipient. Financing the preparation of infrastructure projects. projects that will be considered as enablers of regional integration. Provide technical assistance for infrastructure project preparation The funds are limited to projects within the SADC region. The projects should span over two or more SADC countries or if located in one country should facilitate and promote regional integration

	Pan African Capacity Building Programme	A programme focused on skills development in critical infrastructure development areas A partnership initiative of the DBSA and the Industrial Development Corporation (IDC). The programme builds capacity through regional DFIs, government departments, state-owned enterprises (SOEs) or other semi-government institutions (parastatals), and through any other locally based development stakeholders across sub-Sahara Africa.
	The Green Fund	Promotion of innovative green projects. Reinforcing climate policy and SDGs. Building an evidence base for the expansion of the green economy. Attracting additional resources to support SA's green economy development.
	Global Environment Facility	A partnership for international cooperation where 183 countries work together with international institutions, civil society organizations and the private sector, to address global environmental issues. Undertaken in South Africa as a GEF funding eligible country. The project also has to be consistent with national priorities and programs. To this effect, projects are endorsed by the country's GEF Operational Focal Point (OFP), the Department of Environmental Affairs. Consistent with the GEF strategy Involves the public in project design and implementation. Endorsed by the government of South Africa. The project has to be co-funded.
	DBSA and U.S. Trade and Development Agency (USTDA) – Cooperation Agreement	Acceleration large scale infrastructure projects preparation across sub Saharan Africa. Linking African project sponsors with U.S. expertise at the critical early preparation stages. Pilot projects to provide a base line and empirical data of projects which can be replicated across Sub Sahara Africa.

Source: CRIDF (2019), DBSA (2019), SA Green Fund (2019), IC Africa (2019), EUAIT (2019), Negotiation Support (2019), SOURCE (2019)

2.1.2.3 General Incentives to increase the development of projects in Africa

In addition to increased funding options, Dentons (2016) proposed incentives to achieve targeted increases in power generation capacity and availability of bankable projects. Government and IPPs need to take many wide-ranging steps to incentivise the development of a pipeline of bankable IPPs on a sustained basis. Table 3 outlines the proposed steps that are necessary to incentivise IPPs with reference to Nigeria.

Table 3: Steps to incentivise the development of bankable IPPs in Nigeria

(a)	Economic, Regulatory and Political Reforms	ensuring fiscal stability, cost reflectivity and transparency of the electricity pricing structure that supports a level of economic returns to IPP Developers without compromising affordability of power supply to final consumers. facilitating a reliable supply of gas from upstream and midstream activities and facilitating investment in power transmission and distribution infrastructure to avoid a scenario where generated power becomes a stranded asset.
(b)	Liquidity and Credit Enhancements	improving liquidity and continued provision of credit enhancement of the Nigerian Bulk Electricity Trading (NBET) to preserve the bankability of Power Purchase Agreements (PPAs).
(c)	Investment and Capital Expenditure in Technology	providing regulatory and fiscal support to distribution companies in their deployment of technology and funding of capital expenditure programmes required to develop a robust system of metering, billing and revenue collection.
(d)	Boosting Private Sector Investment	implementing investment-friendly market reforms in order to attract private investment.
(e)	Increasing Operational Efficiencies	reducing system inefficiencies across the power value chain whilst reducing bureaucracy within the relevant governmental agencies.
(f)	Improvement of Technical Competencies amongst the project company and project stakeholders	engage its transactional advisors to conduct extensive due diligence on IPPs in order to ascertain the exact scope of requisite Permits; development of extensive project and an action plan with stipulated procedure, timelines and allocation of responsibility. anticipation of project financier requirements. consideration of project risks and relevant mitigates. engage with the relevant regulatory authorities at an early stage in the project development phase.

Source: Denton (2016)

2.1.3 Overview of the Infrastructure Sector in Zimbabwe with an emphasis on the Energy Sector

Pushak and Garmendia (2011) highlight that Zimbabwe has made significant progress in infrastructure development. The country has, amongst other accomplishments:

- Developed national electricity network and established regional interconnection in the power sector;
- Established an extensive network of roads for countrywide accessibility and integration into the regional transport corridors; and
- Setup a functional water and sewerage system; and made progress through building dams and tapping into the significant irrigation potential that exist nationally.

Under the prevailing challenging economic conditions, Zimbabwe has grappled with securing funding to finance the development, maintenance and rehabilitation of the country's infrastructure network. The power system has become costly, inefficient, and unreliable due to growing demand and generation capacity constraints. Challenges were compounded by limited investment in the sector over a protracted period. There remains vast potential for development within the power sector, both locally and regionally through the Southern African Power Pool (SAPP) initiatives (ibid).

Zimbabwe faces huge infrastructure financial requirements estimated at US$33 billion over a twenty-year period from 2012 (World Bank, 2012). This funding requirement under the World Bank is distributed as follows:

- Energy and Power supply (US$11.3 billion);
- Transport (US$13.39 billion);
- Water (US$1.81 billion); and
- Telecoms (US$ 6.75 billion).

This implies that the country requires about US$1,65 billion per annum to meet its overall infrastructure needs and US$565 million per annum in the energy sector alone. Evidently, the energy and power supply sector is one of the most affected sectors in terms of financial requirements, only second to the transport sector.

According to AfDB (2011), Zimbabwe requires around US$1.7 billion annually between 2011 and 2020 towards the rehabilitation of existing infrastructure networks. The country requires about US$27 billion for the two-year period of the Transitional Stabilisation Programme (TSP- 2018 - 2020). In line with the TSP the Budget capital expenditures are expected to increase from 16% of total Budget expenditures to over 25% from 2019. In the energy sector, focus is on renewables and thermal power generation, transmission and rural electrification projects. South Africa through its National Development plan targets public infrastructure investment at 10% of GDP by the year 2030. Various states in America spent between 6.6% - 22.7% of their budgets on infrastructure capital expenditure (McNichol, 2019).[3]

2.1.3.1 Profiling of Zimbabwe Energy Projects and their Bankability

Zimbabwe has developed a number of bankable energy infrastructure projects such as the Kariba South Power Station Refurbishment and Extension, Hwange Thermal Power Station Expansion, Nyangani Renewable Energy and other private IPPs.

Many large energy infrastructure projects in Zimbabwe have delayed as a result of failure by project promoters to raise the required funding to develop and implement them. Within the Zimbabwe energy sector, small IPPs; particularly in the mini hydro space have taken off due to the lesser risks associated with such investments as compared to other energy sources. (Bulawayo24, 2017). [4]

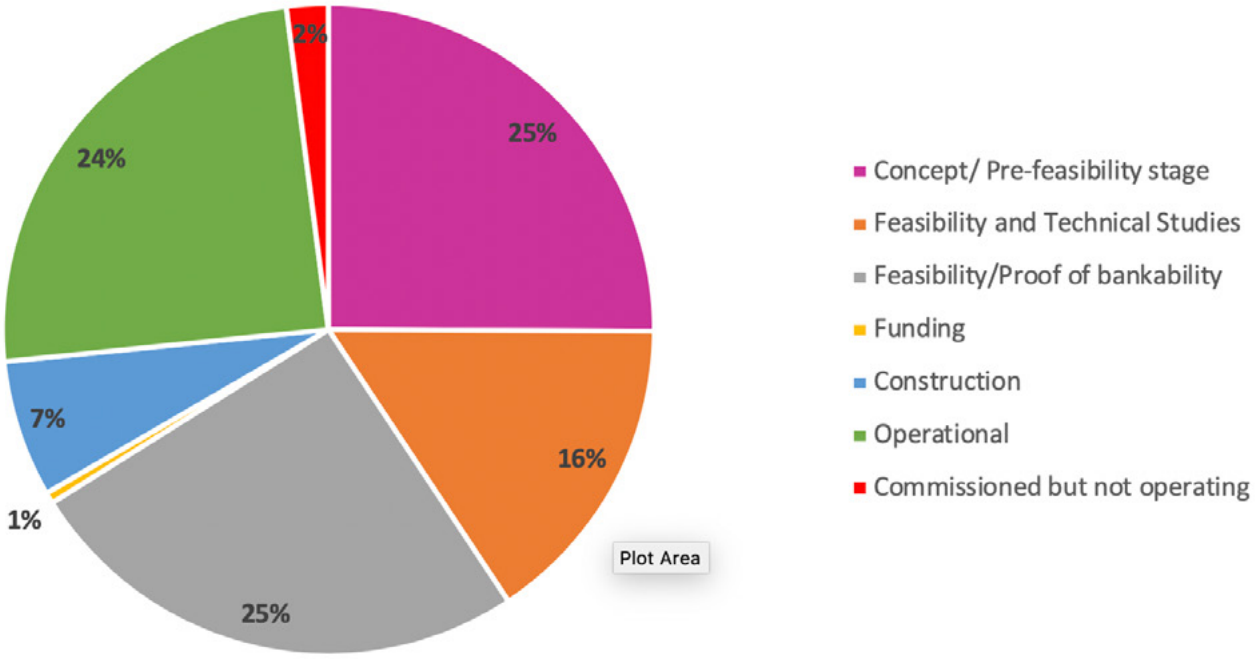
2.1.3.2 Major Future Energy Projects in the Pipeline to Address the Supply Gap

List of Licensed Power Projects

Over 40 energy generation companies (public utility "ZPC" and IPPs), as at 2017, were licensed by ZERA. The licenses are for the development and operation of power generation facilities in Zimbabwe. The licensed entities are at various stages of project development and implementation as indicated in Figure 8.

[3] https://www.cbpp.org/research/state-budget-and-tax/its-time-for-states-to-invest-in-infrastructure
[4] https://bulawayo24.com/index-id-news-sc-national-byo-116612.html

Figure 8: Licensed Projects Development Stages



Source: ZERA (2019)

The Zimbabwe energy sector has seen an increase of small power generation players since 2006. Projects continue to stall due to challenges faced in attracting funding as shown in Figure 8. This has been compounded by many factors which are predominantly pivoted around macroeconomic and policy uncertainties. Government has provided substantive guarantees to de-risk projects to catalyse private sector involvement. Some of the projects have also stalled due to the capacity of the project developers. Smaller projects have had a higher success rate of project completion and are operational as shown in Table 4. Only public-sector projects have been fully implemented for the larger infrastructure projects.

Table 4: Summary of Licensed Power Companies in 2019

POWER GENERATION PROJECTS PROGRESS	
STAGE OF DEVELOPMENT	**CAPACITY (MW)**
Stage 1 - Concept/ Pre-feasibility stage	2427,6
Stage 1(b) Feasibility and Technical Studies	1 511
Stage 2- Feasibility/Proof of bankability	2 460
Stage 3 – Funding	53,3
Stage 4- Construction	657,9
Stage 5 - Operational	2 371,3
Stage 5a Commissioned but not operating	200,5
TOTALS	**9681,6**

Source: ZERA – 2019

Table 5 shows the summary of the project stage progress made by licensed power generation companies as of 2017.

Table 5: Detailed List of Licensed Power Companies as of 2017

POWER GENERATION PROJECTS PROGRESS			
Stage of Development	**Licensed Companies**	**Name of Power Station**	**Capacity (MW)**
Stage 1 – Concept/Pre-feasibility Stage			
Stage 1a: Concept/Pre-feasibility (completion of all activities required to define projects for full feasibility)	Great Zimbabwe Hydro	Great Zimbabwe Hydro Power Station	5.0
	Manako Power (Pvt) Limited	Osborne Dam Mini Hydro Power Plant	2.5
	H T Glen (Pvt) Limited	Tsanga Hydro Power Station	3.3
	Yellow Africa (Pvt) Limited	Ntabazinduna Power Plant	50.0
	Sinogy Power Zimbabwe (Pvt) Limited	Sinogy Solar Power	175.0
	Solarwise Energy (Pvt) Ltd	Solarwise Triangle Solar	50.0
Sub Total			**285.8**
Stage 1b: Feasibility and technical studies	Sengwa Power Station (Pvt) Limited Phase 1	Sengwa Thermal Power Station	700.0
	Zimbabwe Power Company	Gairezi Hydro Power Station	30.0
	Immaculate Technologies (Pvt) Ltd	Nyahode Mini Hydro Power	1.7
	Wild Bush Investment (Pvt) Ltd	Mutambara Mini Hydro Power Plant	1.6
	Zimbabwe Power Company	Gwanda Solar Plant	100.0
Sub Total			**833.3**
Stage 2 Feasibility/Proof of Bankability			
Stage 2: Feasibility/Proof of Bankability Completion of all activities to prove project bankability including EPC contract and PPA approval	Southern Energy (Pvt) Limited	Shangano Power Station	600.0
	China Africa Sunlight Energy (Pvt) Limited	Gwayi Power Station	600.0
	Eastern Hydro and	Odzani A Power Plant	2.4
	Electricity Supply Company (Pvt) Ltd	Indo Africa Mutorashanga	
	Utopia Power Company (Pvt) Limited	Utopia Power Company	10.0
Sub Total			**1,227.40**
Stage 3 Funding			
Completion of all activities leading to financial close and fulfillment of conditions precedent	Hwange Electricity Supply Company (Pvt) Limited	Hwange Power Station Stage III	600.0
	PER Lusulu (Pvt) Phase 1	Lusulu Power Plant	350.0
	TD Energy (Pvt) Ltd	Norton Solar Plant	40.8
	The Solar Group Zimbabwe (Pvt) Ltd	Midlands Solar Photovoltaic Farm	50.0
	Plum Solar (Pvt) Limited	Wartrail Power Plant	5.0
	Shilands Enterprises (Pvt) Limited	Shilands Power Plant	345.0
	De Green Rhino Energy (Pvt) Limited	Rufaro Solar Farm 1	50.0
	Lueven Investments (Pvt) Limited	Lueven Solar Plant	10.0
	Solgas (Pvt) Limited	Cross Mabale Power Plant	5.0
	Richaw Solar Tech (Pvt) Limited	Sunset Technologies Solar Park	5.0
	CentraGrid (Pvt) Limited	CentraGrid Power Station	2.3
Sub Total			**1,4631.1**
Stage 4 - Construction			
Progress of all activities to project commissioning	Riverside Power Station (Pvt) Limited	Riverside Power Station	2.5
	Kariba Hydro Power Company	Kariba Power Station Expansion	150.0
Sub Total			**152.5**

Stage 5 – Operational			
Commercial Operation	Border Timbers Limited	Border Timbers Sawmill Generation Plant	0.5
	Duru Power Station (Pvt) Limited	Duru Mini Hydro Power Plant	2.2
	Nyamingura Power Station (Pvt) Limited	NRE Namingura Power Station	1.1
	Pungwe A Station (Pvt) Limited	Pungwe Mini Hydro (A) Power Station	2.7
	Pungwe B Station (Pvt) Limited	Pungwe Mini Hydro (B) Power Station	15.3
	Pungwe C Station (Pvt) Limited	Pungwe C Power Station	3.72
	Hippo Valley Estates Limited	Hippo Valley Estate Power Station	39.0
	Triangle Estate Limited	Triangle Power Station	35.0
	Green Fuel (Pvt) Limited	Green Fuel Ethanol Plant	18.3
	Sakunda Holdings (Pvt) Limited	Dema Power Station	200
	Kupinga Renewable Energy (Pvt) Limited	Kupinga Power Station	1.6
	Hauna Power Station (Pvt) Limited	Hauna Power Station	2.3
	Bonemarrow Investments (Pvt) Ltd	Claremont Power Station	0.3
	Nottingham Estates (Pvt) Limited	Nottingham Solar/Diesel Power Plant	2.25
	Kariba Hydro Power Company (Pvt) Ltd	Kariba Power Station Expansion	150.0
Sub Total			**474.27**
Grand Total			**4436.37**

Source: ZERA – 2017 Annual Report

2.1.3.2.2 Public Sector Priority Power Projects and Opportunities

Zimbabwe has identified power generation potential across the country and the power utility has prioritised projects to develop to bankability. A summary of the list is given in Table 6.

Table 6: Public Sector Priority Power Generation Projects and Opportunities

PROJECT	SCOPE	ESTIMATED COST	PROJECT STATUS
Hwange Power Station Expansion, Unit 7 & 8 Thermal)	Expansion of power plant by 2 x 300MW units Construction of 320km, Hwange – Insukamini 400kV transmission line	US$1.9billion	EPC contract was awarded to Sinohydro Project duration – 42 months, project being implemented through an SPV, the Hwange Electricity Supply Company (HESCO), in which ZPC has majority shareholding Project Works officially commenced on the 1st of August 2018 following Financial Closure 10-15% earmarked for local procurement of critical material
Batoka Hydro Electric Scheme	Construction of dam and 2400MW power plant on the Batoka Gorge to be shared equally with Zambia	US$5.4billion	Feasibility study updates are being finalised Mobilisation of funding in progress Project duration estimated at 6 to 7 years from financial closure Expression of Interest closed
Deka Water Pumping Station and Pipeline	Construction of a 2nd pipeline from Zambezi River to cater for Hwange Power Station Expansion	US$48.1million	Procurement in progress US48.1million funding secured from Indian Exim Bank Fully committed
Gwanda Solar Power plant	Construction of a 100MW solar plant in Gwanda	US$139million	Feasibility studies available Some works already done Fully committed

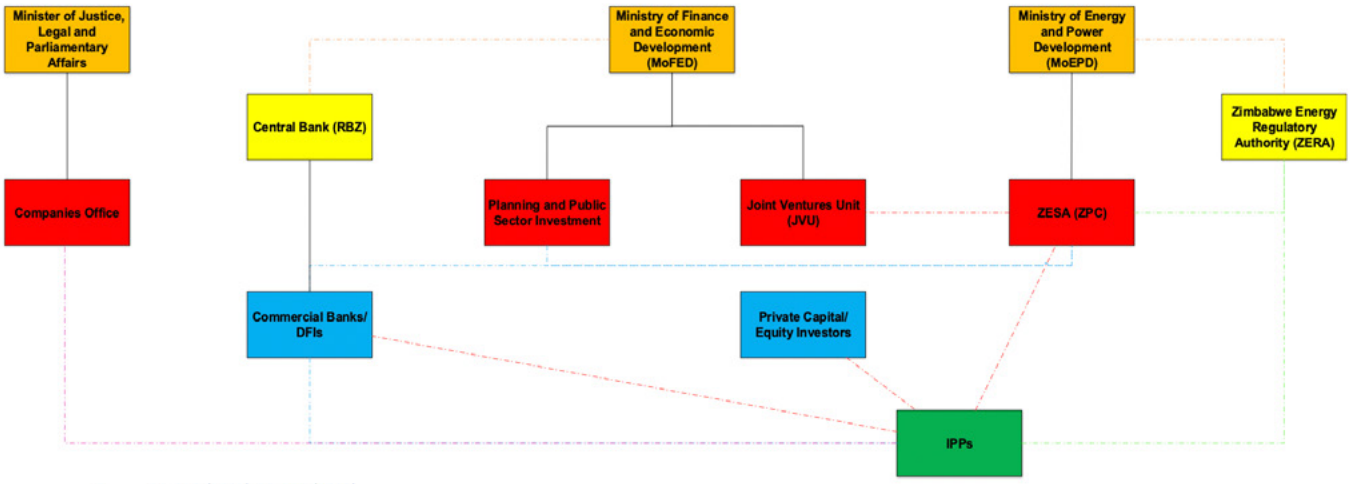
Munyati Solar Power plant	Construction of a 100MW solar plant	US$198million (EPC US$165million)	EPC contract awarded to Number 17 Metallurgical Construction Contractor requested for extension of contract and offered to reduce EPC contract to US$129million, this is being reviewed Fully committed
Insukamini Solar Power Plant	Construction of 100MW solar plant	US$173million	Still to tender for EPC and secure funding ZPC still seeking for funding for the project
Gairezi Mini-hydro	Construction of 30MW run-of-river small hydro power station 35km 132kV transmission line	US$190million (EPC 110million)	Feasibility studies, EIA and Geotechnical survey were completed Contract was awarded to an Indian company, Angelique-BHEL consortium Financial Closure expected within 24 months
Bulawayo Thermal Power Station Repowering and Water Supply Project	Repowering 90MW	US$120million	GoZ secured US$87million funding from India Exim Bank, the line of Credit was valid to December 2018.
Munyati Thermal Power Station Repowering and Water Supply Project	Repowering 100MW	US$140million	EPC + F contracted awarded to Jaguar Overseas Limited and cancelled Project for re-powering the plant and replacement with modern technology Rehabilitating civil works and water supplies
Harare Thermal Power Station Repowering and Water Supply Project	Repowering 100MW (from the current 30MW)	US$102million	Contract was awarded to Jaguar Overseas of India The project is to be funded under the US$52million term sheet issued by Afreximbank EPC, balance (US$20million) plusUS$30million for the water supply component
Hwange units 1-6 Life Extension	Refurbishment of the boiler, turbine and all associated auxiliaries and balance of plant	US$500million	Fund raising in progress US$310million have been secured from the Government of India. The balance of funding to be secured through Original Equipment Manufacturers (OEMs) or any other suitable financier Feasibility studies completed.

Source: Ministry of Energy and Power Development (2018)

2.1.3.3 Institutional Framework for Infrastructure Development in Zimbabwe

The regulatory authority in the energy sector is ZERA. The regulatory authority in the Banking sector is the Reserve Bank of Zimbabwe (RBZ). RBZ provides oversight over the financial institutions in the country. RBZ is under the purview of the Ministry of Finance and Economic Development (MoFED). The MoFED is also responsible for recommending Joint Ventures/Public Private Partnerships (PPP) proposals to cabinet for approval. Project promoter companies (ZESA and IPP) obtain funding from private investors and/or financial institutions and obtain operating licences from ZERA. IPPs and/or Special Purpose Vehicles (SPVs) are registered as companies to operate in Zimbabwe under the Companies Act. A general overview of the institutional investment framework for Zimbabwe in the energy sector is described in Figure 9.

Figure 9: Institutional Framework for Infrastructure Projects Investment in Zimbabwe

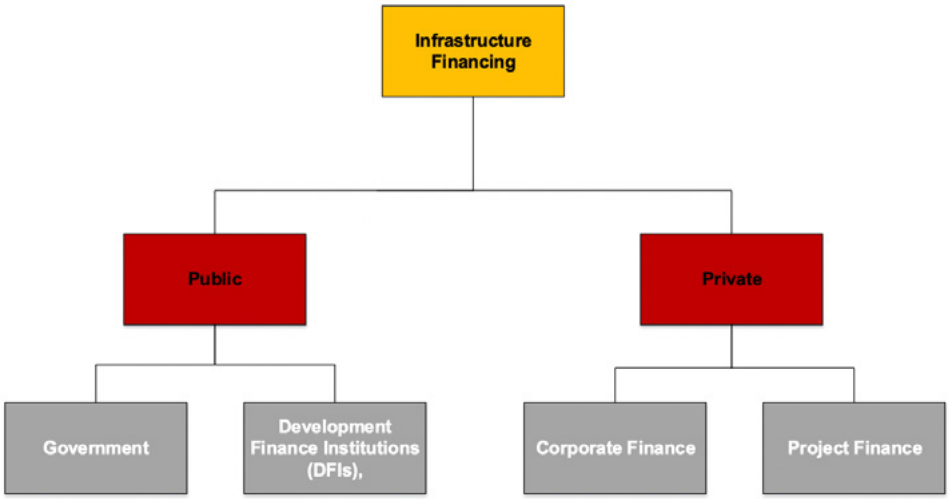


Source: MoEPD (2019), MoEFD (2019)

2.2 Project Finance and Infrastructure Funding

Marsh & McLennan Companies (2017) noted that Infrastructure finance is mainly derived from two sources; public funding and private capital as shown in Figure 10. Public funding is mainly sourced from governments and development finance institutions (DFIs). DFIs include multilateral development banks (MDBs), bilateral development banks and agencies, and national development banks (The New Climate Economy, 2016). Private capital for infrastructure development is mainly structured as either corporate finance or project finance.

Figure 10: Sources of Infrastructure Finance



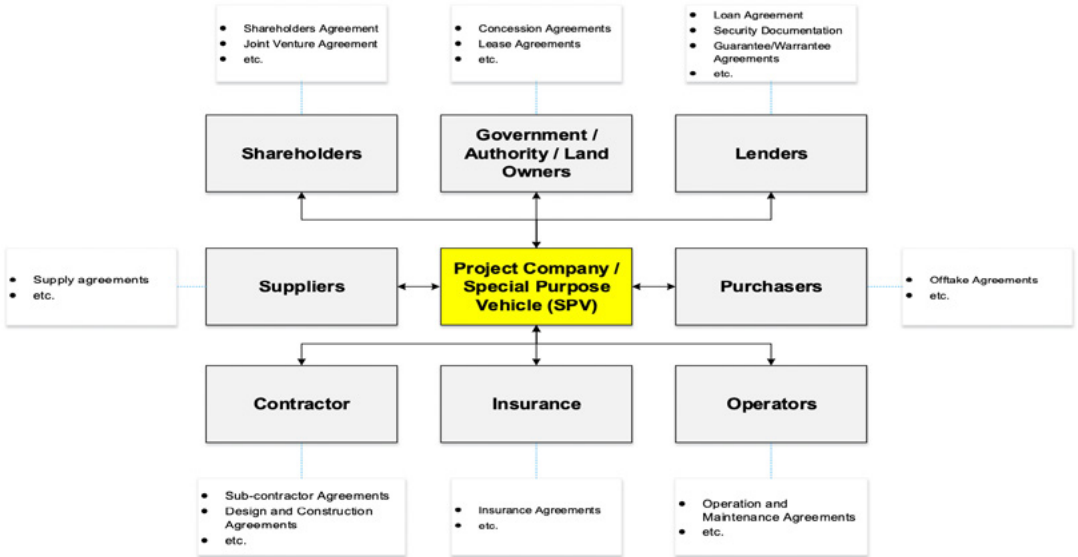
Source: Marsh & McLennan Companies (2017), Bhattacharya et al (2016), World Economic Forum (2015)

World Bank estimates that in developing countries 80% of infrastructure financing traditionally comes from public funding (70% by government and 10 % by MDBs). The remaining 20% is financed through private capital (Marsh & McLennan Companies, 2017). OECD (2105) concurred that infrastructure has traditionally been financed through public funds. Fiscal deficits and increased public debt to GDP ratios have however led to a reduction in the level of public spending on infrastructure. Governments have sought alternative financing sources to reduce the growing gap shown in figure 3. Governments have focused on creating conducive conditions to increase the involvement of private capital in project development. Private capital in infrastructure financing involves off-balance sheet financing (project finance) and on-balance sheet financing (corporate finance). Corporate financiers have legal claim on the project corporate entities and/or investors if a project fails. The size of the corporate entity is scrutinized against the relative size of the infrastructure investment and asset in consideration.

Project finance is financing using a non-recourse or limited recourse structure for the repayment of an extended loan. It is non-recourse because lenders have limited or no claim against the sponsors or shareholders of the project company. Project finance involves the creation of a legally independent project company (special purpose vehicle) financed through equity from one or more sponsoring firms and the raising of non-recourse debt for investing in a capital asset for a determinate period (Esty, 2004). The debt and equity used to finance the project are primarily repaid from the future cash flows generated by the project with the project's assets, rights, and interests held as secondary collateral.

Project financing enables companies to fund major projects off-balance sheet through establishing a special purpose project company that implements the project and raises the required funding with the project company being legally independent from its shareholders. The special purpose vehicle (SPV) is established to ring fence the project revenues and debt liabilities. Project sponsors are responsible for producing necessary documentation for submission to investors and financial institutions for assessment of bankability as shown in Figure 11.

Figure 11: Project Company/Special Purpose Vehicle Structure



Source: AFME (2015), Yescombe (2002), Sihombing et al (2018), Detons (2018)

Proposals to enhance infrastructure financing offerings and attract private capital in developing countries are discussed in Table 7.

Table 7: Infrastructure Financing Enhancement Proposals

Infrastructure Financing Enhancement	Details
Fundamentals, systems and models	• Strengthening legal and regulations frameworks and capacity • Enhancement of national infrastructure planning and execution. • Meeting credit rating requirements by lenders and investors • Resolving fundamental macroeconomic and price distortions • Boosting investments in clean technology R&D and deployment • Reforming DFIs to adopt 'originate-to-distribute' project preparation facility business models • Transformation of financial systems to deliver the scale and quality of investment needed
Products	• Tailoring of financing options to individual project needs • Provision of credit enhancement and guarantees required by lenders or investors • Development of securitisation instruments to crowd in institutional investors. • Sufficient hedging for long-tenure project risks • Developing sustainable funding models
Capacity and scaling	• Upscaling of project-preparation facilities • Upscaling DFI seed funding • Increase in domestic financing of infrastructure through pension and life-insurance markets. • Cooperation between project preparation facilities with a tunnel of funds approach • Sharing and adoption of best practices on organization and governance issues • Knowledge management and disseminating information on current project preparations facilities (PPFs), financing sources, forms and instruments

Source: Tyson (2018), Chaponda et al (2014), AFME (2015) and The New Climate Economy (2016)

2.2.1 Infrastructure Financing Trends in Zimbabwe

The projected investment estimates in the electricity sector in Zimbabwe since 2006 is US$1,807,865,434. This estimation is based on operational projects and projects under construction in the sector as shown in Table 8.

Table 8: Estimated Investments in the Energy Sector

LICENSEE	CAPACITY (MW)	TECHNOLOGY	ESTIMATED COST
A	2.2	Mini-hydro	5,575,000
B	1.1	Mini-hydro	2,969,604
C	2.75	Mini hydro	6,769,053
D	15.25	Mini-hydro	26,588,488
E	3.72	Mini-hydro	6,961,668
F	1.6	Mini-hydro	4,495,520
G	2.30	Mini hydro	7,300,000
H	0.3	Mini hydro	375,000
I	2.5	Solar PV	3,800,000
J	0.45	Solar PV	724,000
K	300	Hydro	483,000,000
Total Investment in operational projects			**548,558,333**
L	25	Solar	50,334,049
M	6.9	Mini hydro	15,000,000
N	1.0	Mini hydro	1,859,000
O	20	Solar PV	29,922,000
P	5	Solar PV	8,400,000
Q	600	Coal – fired	1,153,792,052
Total infrastructure investments in energy trends			**1,259,307,101**
Total Estimated Invested Costs			**1,807,865,434**

Source: ZERA (2019)

2.3 Factors affecting Bankability of Energy Infrastructure

2.3.1 Definition and Attributes of Bankable Infrastructure Projects

The term 'bankability' refers to the ability to attract finance. This is determined by the attributes of the project such as technical feasibility, financial and economical soundness, legal, environmental and social sustainability (CEPA, 2015, Ellis and Pillay, 2017, Hampl, Freund, Flink; 2011, Dentons - Cuthbert, 2018, McNair, Fover, 2018, Bull, Carmona, 2015). Components of bankability include:

- Creditworthiness;
- Acceptability of the;
    - project financing structure,
    - project feasibility,
    - contractual & legal agreements; and
    - risk sharing arrangements.

Creditworthiness is determined by various factors, including project returns, the allocation of risk to different parties and the quality of security offered in the event of a default (CEPA, 2015). Financial institutions consider bankability as an expression of trust in debt servicing and the achievement of secure returns, predictable and stable cash flows over the entire financing period (Hampl, Freund, Flink; 2011). A bankable contract is a contract with a risk allocation between the contractor and the project company that satisfies the lenders. (McNair, Fover, 2018) (Bull, Carmona, 2015).

Developing a project to bankability seeks to address the concerns of private finance/capital, government, donors, development financiers and other philanthropic funders. Bankability therefore is understood differently from different funders. Project preparation packaging and development seeks to determine or to enhance the bankability of a project. Activities during this stage include carrying feasibility studies, seeking statutory and regulatory approvals, and stakeholder engagement.

Project Bankability is therefore viewed as encompassing various components which include:

- Positive returns on investment;
- Stable and predictable future cashflows;
- Attractive financial transaction structure;
- Risk mitigation framework and an equitable allocation/sharing of risk amongst the various project stakeholders;
- Sufficiency of collateral and/or the quality of the security offered in the event of a default;
- Technical proficiency of project deliverers, technology/equipment and the probability of project success/delivery;
- Contractual agreements; and
- Project governance and quality assurances.

2.3.2 Factors Affecting Bankability of Infrastructure Projects

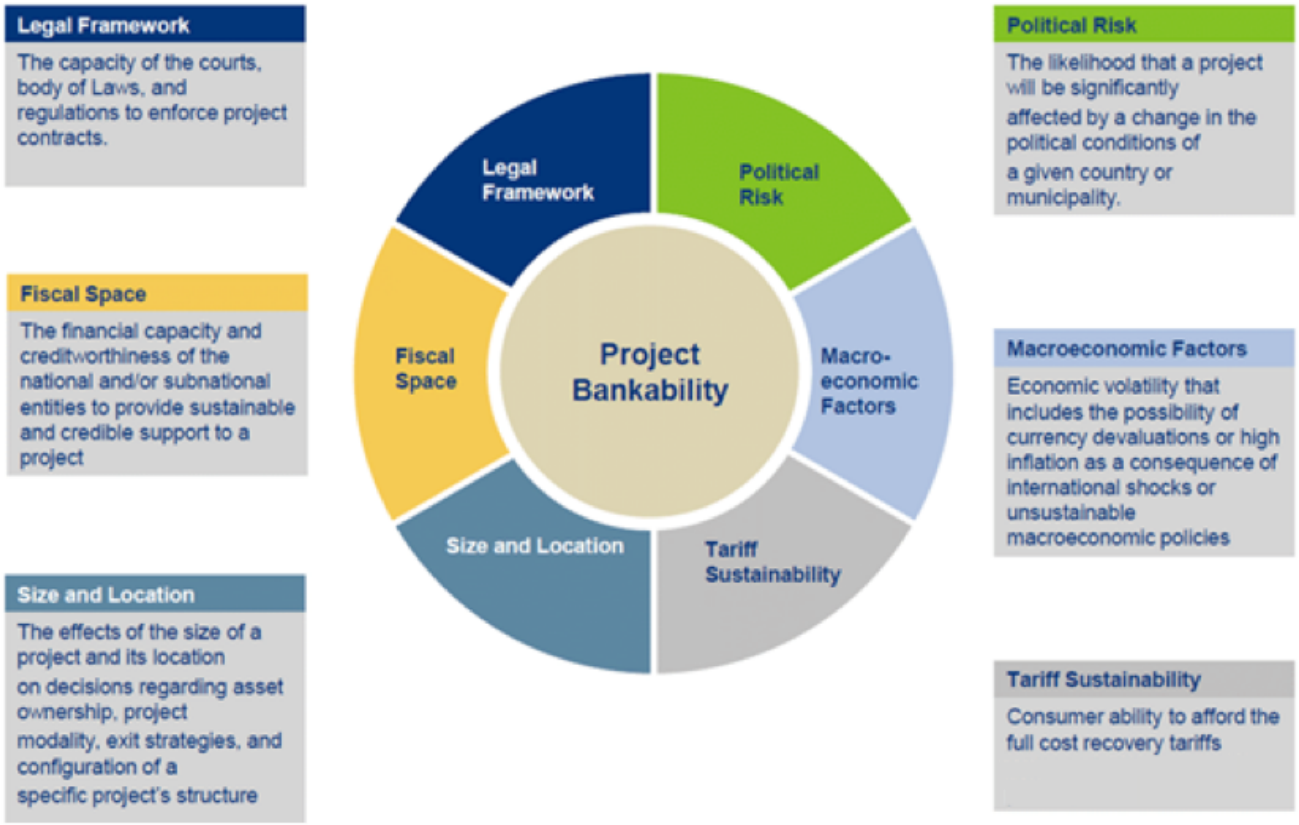
Both, public and private investors attest to the lack of bankable projects as a major constraint to investment in infrastructure projects. The New Climate Report (2016) argued that neither capital nor projects are lacking but rather bankable projects. World Economic Forum (WEF) (2013) and Omisore (2014) concluded that there is need for a clear understanding of the technical scope, the commercial viability and the other project prerequisites before investment decisions are made. Project sponsors need to further ensure that technical specifications are innovative, applicable and cost efficient (Adamu, Adamu and and Bioko, 2016).

Rana (2017) argues that in literature there seems to be a lack of understanding of what factors constitute and which parties contribute the most to making infrastructure projects bankable. Infrastructure projects by their nature have a longer gestation period; hence investors pay greater consideration to all the aspects of a project's bankability concerns before committing to invest. Creation of a pipeline of bankable infrastructure projects entails complex legal and financial arrangements, which requires multi-skilled inter disciplinary teams to execute. Setting up the necessary expertise and project documentation is costly. Investors are usually not prepared to meet these costs (see figure 2). There is also need for risk mitigation, legal framework and enforceable contracts (Ehlers, 2014).

Bankability of an infrastructure project is determined during the earlier phases of project life i.e. at the project development stages (Rana, 2017) as described in section 2.4. If project risks are not allocated to the right parties during project conceptualization phase, investors and lenders will not be willing to invest. Canilao (2017) argues that investors consider projects as bankable if risks are fairly allocated between parties in the project. The level of government's commitment in projects such as PPPs might be a good indicator in terms of risk sharing. For developing countries, however, bankability involves de-risking; projects, the country and its infrastructure programme. The issue of the availability of an enabling environment for private sector participation in infrastructure delivery is also a critical consideration for bankability.

Omisore (2014) enumerated the major factors affecting bankability of road infrastructure projects to include; (i) legal and regulatory framework; (ii) political risk; (iii) macro-economic factors; (iv) tariff sustainability; (v) size and location of the road projects; and (vi) fiscal space as shown in Figure 12.

Figure 12: Bankability factors case study for Nigerian infrastructure projects.



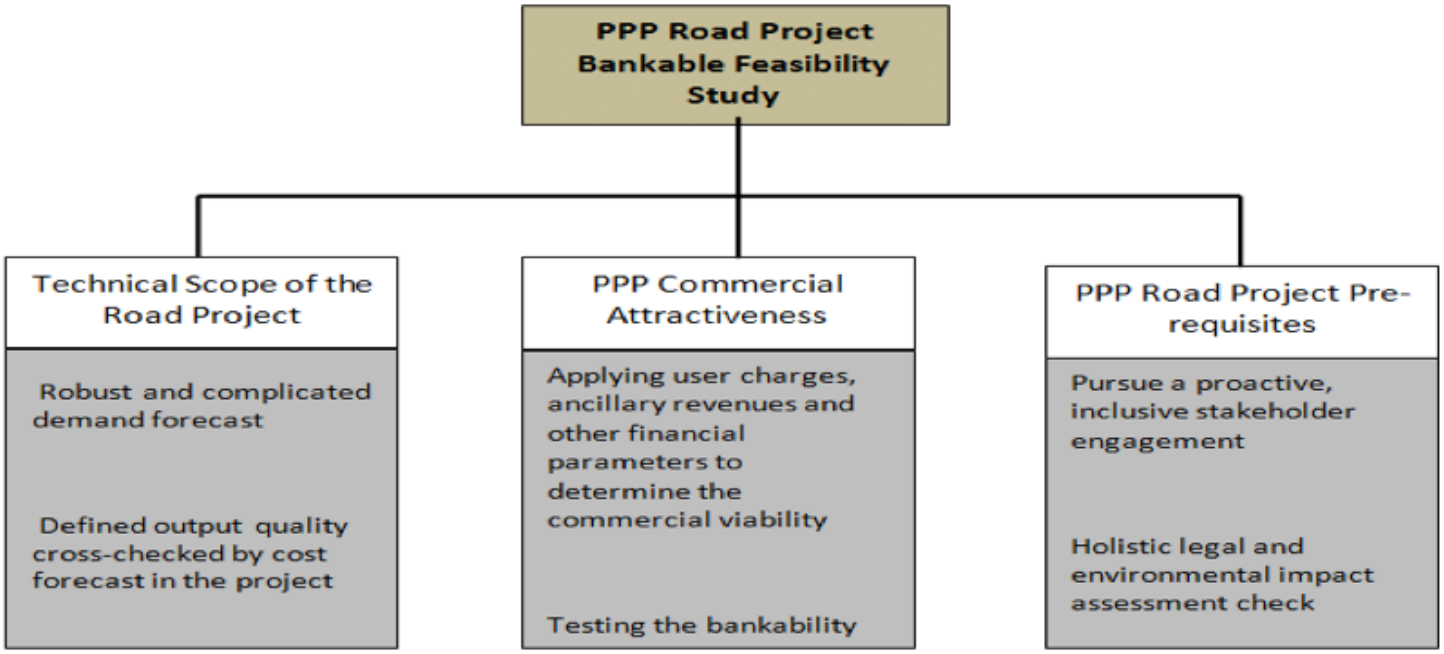
Source: Adamu et al (2016), Omisore (2004),

Each of the factors is described in turn as follows:

- Political risk arises due to government changes to contractual terms or the cancellation of projects. This may entail the risk of expropriation or nationalization of project assets by government. When the perceived political risk is very high, it may inhibit financing of projects which could be viable. This increases the reliance on government or multilateral and export credit agencies to carry the burden since commercial lenders are reluctant to offer finances (World Bank, 2018b).
- Generally macroeconomic factors that affect bankability include exchange rate risk, interest rate risk, fiscal deficit/surplus, national debt, inflation etc. The exchange rate risk occurs when project revenues are denominated in a local currency, divergent from the currency where the debt was obtained. This may result in increase in the cost of servicing the debt (World Bank, 2018b). Interest rate changes similarly affect the cost of servicing debt. Inflation may also erode or appreciate the value of revenue collected by the project assets. Public deficit and debt may affect a country's capacity to service financial obligations and invest. The credit worthiness of the country may also be affected which may result in high premium charges to infrastructure investment finances.
- Tariff sustainability is critical to investors recouping their principal investments and profit. The tariff should balance this with affordability to consumers to ensure that they will continue to use the service.
- Legal framework governs the sector through the broad system of laws and regulations that enforce agreements, contracts, operations and decision making etc.
- Fiscal space regards the Government's ability to provide financial resources for infrastructure development and project bankability preparation. This also entails the Government's capacity to provide guarantees as and when required.
- Size and location refers to a project's structure, asset size and national significance. This particularly views how this impacts the asset's long-term ownership and exit strategies for project sponsors after the duration of project agreements.

In response to the bankability factors identified in Figure 12, Okonjo-Iweala (2014) and Omisore (2014) proposed the review of the PPP framework for road infrastructure development in Nigeria. The changes once effected would enhance the effectiveness and efficiency of project development activities (Adamu et al, 2016). Figure 13 shows the project preparatory framework proposal to ensure the undertaking of feasibility studies to ensure bankable PPP projects.

Figure 13: Bankable PPP Road Project Feasibility Study: Factors Affecting Bankability of Road Infrastructure Development



Source: Adamu et al (2016), Omisore 2004

Bankability attestation is critical for attracting private capital in infrastructure development funding. Rana (2017) argues that the Group of Twenty (G20)[5] aims at boosting infrastructure finance by developing and promoting bankable and investment-ready infrastructure project pipelines. This is aided by enhancing the role of Multilateral Development Banks as catalysts for private sector investment (ibid). Zimbabwe like the rest of the world also lags in terms of developing a bankable pipeline of investment ready infrastructure projects.

Developing bankable projects can be enhanced through project preparation facilities where technical and/or financial support is provided to project owners or concessionaires to;

- undertake project feasibility studies,
- develop procurement documents and project concession agreements,
- undertaking social and environmental studies, and
- creating awareness among the stakeholders.

Alternatively, market sounding can give important feedback from the lender community during the project preparation phase and shape the risk allocation matrix to make the project bankable. Many projects appear non-bankable due to unfavourable risk-adjusted returns and the allocation of costs and risks (The New Climate report, 2016). Rana (2017) argues that an infrastructure project that has a risk-sharing protocol based on broad-level, early feedback from the lending community will be more likely to raise the required funding. Multi-lateral development banks have an important role to play in helping governments develop such protocols and improve the bankability of potential infrastructure projects. A robust legal framework for infrastructure projects is required for the creation of a pipeline of attractive and bankable projects (Ehlers, 2014).

Canilao (2017) also highlights a number of factors that can be used as a yardstick to enable the bankability of infrastructure projects. These include putting in place consistent policies on improving the ease of doing business targeting registration of new businesses and the ease of capital repatriation. The country's credit worthiness is also a fundamental requirement in encouraging project finance. Availability of local financing enables ease of structuring of deals and lowers attendant financing costs. Frameworks for aligned and smoother infrastructure implementation, such as right of way laws, sectoral regulations and arbitration processes, are also a prerequisite. Lack of commitment from the public sector also derails many infrastructure projects. The Government should state the sectors they expect private participation. Any major changes in government policies impact private sector confidence and commitment, which could take a considerable amount of time to redevelop.

[5] The G20) is an international forum that brings together the world's 20 leading industrialised and emerging economies. The group accounts for about 85% of world gross domestic product (GDP) and two-thirds of its population.

2.3.3 General Overview of the Key Bankability Factors in Zimbabwe

According to views from the stakeholders, major factors that are faced by African countries in financing energy infrastructure projects as cited by stakeholders are summarised as follows:

- Lack of good policy positions to attract private investment,
- Lack of bankable projects,
- Lack of financing from local financial institutions, and
- Lack of project development skills.

Some of the measures that were cited to improve the situation are to make regulators in the energy sector independent and ensure market driven utilities.

It was also noted that many IPP proposed projects have faltered at the funding stage due to inabilities to secure committed investors and some licensed IPPs have lost or are on the verge of losing their licenses for not meeting the conditions precedent on the licenses with regards to project development expectations and timelines.

Previous government policies such as the Indigenization and Economic Empowerment Act (IEEA); which has been repealed; accommodated speculative tendencies by entities without the technical competencies and/or financial capacity required to develop the project to bankability. Some of these IPP licensee holders did not provide equity to sponsor the project and this raised the risk profile of projects in Zimbabwe. This is different from South Africa where most projects are undertaken under the purview of the Development Bank of Southern Africa which arrange for the provision of equity to attract other private players into the projects (eNCA, 2017). [6] The DBSA assists large infrastructure projects development through the project preparation fund or other financing mechanisms. DBSA provides funding for the electricity, transport and ICT sectors across Sub-Saharan Africa.[7] DBSA has also developed partnerships with other international infrastructure financing partners such as the United States Trade and Development Agency (USTDA).[9]

Despite the new political dispensation, Zimbabwe has struggled to secure financing due to high perceived country risk. Consultations with stakeholders revealed that investors and international development finance institutions prefer to deal with countries with a track record of the delivery on large scale infrastructure projects and protection of foreign investments. Examples in the region include Botswana and South Africa (Polity, 2014).[8] Financing of energy infrastructure projects is affected by; the country's poor credit rating, inadequate financing structures and high perceived country risk.

Investors cited issues such as bureaucracy and uncertain macroeconomic policies as a hindrance to the implementation of infrastructure projects. Hindrances to the bankability of infrastructure projects include a lack of capacity within the implementing agencies, and reluctance by project promoters (especially public promoters) to ensure that projects undergo comprehensive and adequate project preparation before investment promotion. Other issues cited include; absence of relevant permits, licences and regulatory approvals, absence of a proper institutional structure (i.e. project SPV, raw material supply and offtake together with supporting agreements) to facilitate ring-fencing of the project asset and its operation and cashflows. The risk sharing framework was also noted as not being equitable with one party having to assume a large portion of the risk (Chiweshe, 2019).[9]

Survey results identified the reasons for low uptake of projects by potential investors which include country risk factors, high operational costs, currency risk and an unstable macroeconomic environment. The situation has been worsened by the weakening of the local currency after the liberalisation of the foreign exchange market on both the interbank market and the parallel exchange market. The current electricity price tariffs have not been adjusted following the devaluation of the local currency, the RTGS dollar, resulting in a marked decrease in real revenue from electricity sales. Resultantly, the credit worthiness of major off- takers or project sponsors of power projects has been dented.

Opaque procurement practices are a deterrent to investors as the prefer projects that follow best-practice and transparent procurement processes. Lack of bankable projects can also be attributed to reluctance by project promoters to have projects undergo adequate preparation before investment promotion.

The challenges experienced regarding energy projects' bankability in Zimbabwe can be summarised in Table 9.

Table 9: High Level Challenges Experienced Regarding Bankability in Zimbabwe

Category	Details
Country level	Country and currency risk. Lack of good policy positions to attract private investment. Political influence on the energy regulator and the national utilities.
Project level	Poor credit rating of the off taker. Inability to pay shareholder forex remittances to the country of source. Lengthy procurement by financiers and lengthy approval process by financiers.

[6] https://www.enca.com/money/development-bank-to-target-early-stage-projects
[7] https://www.dbsa.org/EN/Pages/default.aspx, accessed 6 June 2019
[8] https://www.polity.org.za/article/economic-empowerment-and-foreign-direct-investment-the-cases-of-botswana-south-africa-and-zimbabwe-2014-02-13
[9] https://furtherafrica.com/2019/05/15/mitigating-infrastructure-project-risks-in-zimbabwe/

Promoter/ Sponsor level	Signing of many memorandums of understanding without going to tender or completing project preparation activities. Lack of financial capacity by promoters as shown by a number of IPPs that have licenses but with no financial resources to prepare and implement projects Lack of financial resources. Inability of local project partners to raise/invest an appropriate level of equity into the project.

Examples of success stories in terms of the bankability and delivery of infrastructure projects that have been implemented locally and regionally were cited by stakeholders and are further discussed under the case studies detailed in section 6 include:

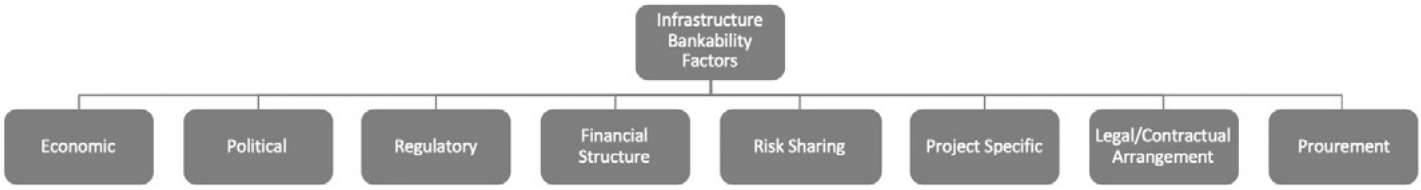
- Kariba South Extension project,
- Hwange Expansion Project (Hwange 7 and 8),
- Nyangani Renewable Energy (Nyamangura - 1.1MW, Pungwe A - 2.75MW, Dururu - 2.2MW, Pungwe B - 15MW, Riverside Solar)
- Alaska Karoi Transmission line,
- Batoka Gorge,
- ZETDC Pre- paid metering project,
- Emergency Power Infrastructure Rehabilitation Project (EPIRP), and
- Other energy projects and including independent power producers.

2.3.4 Factors Affecting Bankability Explained

Factors that contribute to the bankability of infrastructure projects can be classified as:

- Economic;
- Political;
- Regulatory;
- Technical;
- Financial Structure;
- Risk Sharing;
- Project Specific (Technical, Environmental and Social);
- Legal/Contractual Agreement; and
- Procurement.

Figure 14: Factors Affecting Bankability



Source: Detons (2018), AFDB (2018), OPIC (undated), Marsh & McLennan (2017), DBSA (2016), Adamu (2016), Zhu and Chua (2018), WEF (2013), Watson (2016), IRENA (2013

2.3.4.1 Economic Factors

Economic factors are a set of fundamental macroeconomic conditions and policies that affect the country's economy, growth and value of investments.

Table 10: Economic Factors Affecting Bankability

#	Factor	Theme	Details
1.	Pricing & Tariff Regulations and Framework	Cost reflectivity/recovery and financial viability	• Revenue generated by the assets of an infrastructure project should adequately cover operational costs, debt repayment and provide a reasonable return on equity for project sponsors. • Tariffs/pricing of the project product should enable the recovery of efficient and marginal/incremental project costs.
		Stable and predictable tariff/ pricing framework	• The pricing/tariff framework should provide a predictable and constant cashflow and return on capital for the infrastructure project and encourage an optimum level of investment from the financial markets. • Certainty and stability in the tariff/pricing framework enables private sector confidence and investment in the energy/power sector. e.g. ensuring that tariffs reflect the true cost of production and are responsive to changes in macroeconomic fundamentals whilst ensuring competitiveness

		Risk incorporation and allocation	• The tariff framework should incorporate and allocate financial risks equitably. Risks such as:
			  • Operational Risks e.g. revenue leakages, revenue collection inefficiencies
			  • Financial Risks e.g. currency risk for foreign financiers

		Transparency/fairness	• The licencing and tariff framework should be transparent and ensure equitable access to the investment opportunities in the energy sector. • Provisions to mitigate unforeseen changes in the market that have adverse effects on the infrastructure project e.g. pricing flexibility and revenue collection structures.

2.	Foreign Exchange	Currency exchange rates stability	• Fluctuations in currency rates can adversely affect the project through exposing projects to currency risk. e.g.
			  • A local utility infrastructure project denominating its revenues/ costs in its local currency, whereas all or part of its debt is likely to be denominated and serviced in the currency of the foreign financer (e.g. South African Rand (ZAR), Euro (EUR), Chinese Yuan (CNY), Indian Rupee (INR)).
			  • Adverse cost fluctuations due to importation of raw materials that are sourced internationally and priced in a foreign currency which affect the project bottom line.

		Convertibility, repatriation and transferability	• Restrictions on foreign currency amounts per transaction.
			• Limited availability of foreign currency.
			• Foreign currency retention laws.
			  • South African businesses/individuals sell earned foreign currency to an authorised dealer within 30 days of accrual. This is to ensure that exports accruals are received in South Africa. Businesses are permitted to retain unutilised foreign currency accruals within 90 days for recurring business requirements.
			  • There are currently no exchange controls in Botswana. The Exchange Control Act (CAP 55:03) was retracted in 1999. Businesses are free to remit funds out of Botswana in foreign currency. Foreign currency can be held and earn interest in Botswana banks.
			  • Zimbabwean businesses/individuals sell earned and unutilised foreign currency to an authorised dealer after 30 days. The currency is sold on the interbank market at the prevailing exchange rate and reported to RBZ Exchange Control. I addition exporters are permitted to retain a percentage of the export earnings as prescribed by the RBZ with the remainder being sold to the RBZ. The sale to RBZ is to be concluded within 24 hours of the sale.
			• Foreign currency repatriation laws.
			  • Proceeds from the sale of assets, profits, dividend or foreign loans can be remitted outside of South Africa. Loans require FSD approval and dividend need to be supported by an auditor's report. Only an authorised dealer is permitted to remit the funds.
			  • Authorised Dealers are required to ensure efficient utilisation of retained foreign currency as guided by the RBZ.

3.	Macroeconomic and financial markets stability	Interest rates levels and stability	• Stability of interest rate regime to ensure predictability of returns on investment in the project and cost of capital.
		Economic/GDP growth and product demand	• Sustained economic and GDP growth increases future demand for the infrastructure products/ services and investment opportunities. • An increase in current and projected demand for the product of the infrastructure investment will increase the likelihood of investment in the project. • Low demand will result in a lack of/low investment as this will have an adverse effect on the bankability of the project.
		Inflation rates	• Low sustainable inflation rates influence investment potential by giving confidence to the market and reduce uncertainty over the cost of investment, operational modalities and revenue value from the infrastructure product/ services and project.
		Industrial and Technological Advancements	• Evidenced long-term investment and changes in technology increases the attractiveness of investment in the energy sector. • A general slowdown in the rate of technological progress results in the decrease of investment across an economic sector due to inefficiencies in production and costs.
		Availability of project preparation funding	• Liquidity and the availability of funds to finance project preparation activities and develop a comprehensive pipeline of priority infrastructure projects improves that bankable projects pipeline.

4.	Government/Public Policy	Priority government infrastructure plans and strategy	• Development of national infrastructure plans and goals. • Development of a comprehensive list of national priority infrastructure requirements and projects. • Coordinated review and implementation of national infrastructure plans.
		Taxation policies	• Tax incentives enhances viability of infrastructure projects. • Protection of project owners/financers from discriminative changes in taxation policy that may adversely impact the economics and standing of the project. • Project financers may seek commitments from the relevant government not to change its taxes or introduce new taxes that will have a negatively impact a project's economics through the prevention of discriminatory taxes.
		Competition/Barriers to Entry	• An enabling legislative and regulatory environment is mandatory for bankability. • A competitive environment with regards to licensing requirements. • Equitable access to project inputs for all market participants e.g. coal, electricity, natural resources, labour.
5.	Country Credit Rating	Upgrades, downgrades in country credit ratings	• Affects bankability as it determines the ability of government and local corporates to access credit on global financial markets.

Source: Detons (2018), AFDB (2018), OPIC (undated), Marsh & McLennan (2017), DBSA (2016), Adamu (2016), Zhu and Chua (2018), WEF (2013), Watson (2016), IRENA (2013)

2.3.4.2 Political Factors

Political factors are the conditions and environment created by government policies and legislation that affect investment decisions and business operations.

Table 11: Political Factors Affecting Bankability

#	Factor	Theme	Details
1.	Political environment and risks	Adverse changes in law	• Protection against discriminatory changes in law that may have material and adverse effects on the project or the project's economics and structure. • Equitable sharing and distribution of risks associated with adverse changes in law.
		Non-continuity in national infrastructure projects plans and implementation between successive national administrations.	• The non-commitment by successive government administrations to continue or honour approved priority infrastructure projects agreements from previous administrations. • Continuous refocus and non-commitment to infrastructure plans and priorities committed to by previous government administrations.
2.	Project assets ownership and indigenization	Expropriation or nationalisation.	• Provision of assurances to investors and lenders against any expropriation or nationalisation of part/ all of assets or shares. • Equitable resolution of issues arising from nationalization. Issues include outstanding obligations, incurred project costs and expenses, lost entitlement to future equity returns etc.
		Land rights/Concessions / Leases/Site clearances	• Enforceable agreements. • Protection against or adequate compensation for the revocation of contracts. • Provision of all essential permits required to execute the project. • Alignment of the term of life of all permits/concessions etc. to at least the term of financial obligations of the project to lenders, financiers etc.

Source: Detons (2018), AFDB (2018), OPIC (undated), Marsh & McLennan (2017), DBSA (2016), Adamu (2016), Zhu and Chua (2018), WEF (2013), Watson (2016), IRENA (2013)

2.3.4.3 Regulatory Factors

The set of business laws adopted by a country, used by government to regulate businesses activities. Business operations need to comply to legal requirements and guidelines enacted by government regulations.

Table 12: Regulatory Factors Affecting Bankability

#	Factor	Theme	Details
1.	Regulatory framework and environment	Policy framework transparency and consistency.	• Avoidance of frequent and uncoordinated revisions to government policies during the project lifetime.
		Inter-government agency coordination.	• Consolidation of purpose and sanitization of inter-ministerial policies to remove legislative inconsistencies and incoherent requirements for infrastructure projects between ministries. • Clear division of responsibility or jurisdiction between ministries and government agencies.
		Implementation of regulatory and legislative provisions	• Transparent, consistent and impartial implementation of regulatory and legislative provisions.
		Upstream alignment between regulations/policy and energy goals	• Frequent review and alignment of legislation and national/regional energy requirements to strategies and goals.
2.	Bureaucracy/Ease of doing business	Competitive and integrated market	• Licencing and regulatory policies to ensure a competitive market for all players. • Non-discriminatory regulatory policies to ensure competition in the energy sector in Zimbabwe.
		Excessive bureaucracy and administrative requirements	• Avoidance of winding and non-transparent administrative procedures. • Ensuring coordination among different government agencies for requisite approvals. • Alignment of terminology and requirements between various pieces of legislation.

Source: Detons (2018), AFDB (2018), OPIC (undated), Marsh & McLennan (2017), DBSA (2016), Adamu (2016), Zhu and Chua (2018), WEF (2013), Watson (2016), IRENA (2013)

2.3.4.4 Legal/Contractual Factors

The operational environment set by and effects off the country's legal policies and framework on investment decisions and business operations.

Table 13: Legal Factors Affecting Bankability

#	Factor	Theme	Details
1.	Legal framework	Contract enforceability	• Ensuring contractual protection and the ability to effect relevant compensation clauses against contractual breach and adverse conditions e.g. cost increases and time delays. • Consistency in legal clauses across all project contracts. • Execution of judicial decisions on contractual matters.
		Force majeure risks	• Availability of a force majeure clause in project agreements. • The determination and equitable allocation of costs and risk associated with the force majeure events. • Ensuring that force majeure provisions are consistent across the spectrum of project contracts for the entire energy project.
		Termination and compensation	• Ensuring availability and enforceability of equitable compensation clauses.
		Dispute resolution	• The availability of neutral and fair arbitration procedures. • Enforceability of arbitration awards.
		Third parties and Direct Agreements with the project company/SPV	• Ensuring that contractual arrangements agreed between the project company and third parties are sacrosanct.
		SPV/Project Company contractual framework	• Establishment and transparency of the project company/SPV structure and project contractual framework e.g. supply agreements, purchase agreements, contractor agreements, shareholder agreements, lease/ concession agreements.

Source: Detons (2018), AFDB (2018), OPIC (undated), Marsh & McLennan (2017), DBSA (2016), Adamu (2016), Zhu and Chua (2018), WEF (2013), Watson (2016), IRENA (2013)

2.3.4.5 Project Specific Factors

Factors that influence and have an impact on how a project progresses, investment decisions and business operations. i.e. technology, human resources, environment, social.

Table 14: Project Specific Factors Affecting Bankability

#	Factor	Theme	Details
1.	Project preparation activities	Up-to-date feasibility studies.	• Ensuring the completion and availability of up to date feasibility studies to assess in detail the technical soundness and economic viability of infrastructure projects so as to determine the bankability of infrastructure projects. • Clear description of the project and definition of the scope and objectives for the infrastructure project. • Socio-economic assessment and environmental impact analysis and management plans for the infrastructure project. • Definition of a viable project structure. • Relevant land/site acquisition and ensuring access to the land for the project i.e. license, permits and authorization etc.
		Preparation of bankable documents	• Preparation of relevant project documentation for submission to banks, investors and other financial institutions for investment decision making. • Preparation of documentation outlining technical and financial attributes of the project as inferred through comprehensive project preparation activities. • Availability of relevant project authorizations e.g. Permits and Concessions.
		Project team and human resources	• Identification of the resources, experience and qualifications/skills required to deliver the project. • Constitution of the project team, partners and structure.
2.	Supply management	Supply and raw materials agreements	• Identification of the amount and specification of raw materials required for the project. • Establishment of the availability and access to the required raw materials. • Determination of contingency measures to be taken to protect the project against the unavailability of raw materials and/or quality of materials not meeting the required specifications. • Ensuring that the project company enters into long-term supply contracts with reliable and creditworthy suppliers where project success is dependent on the uninterrupted supply of raw materials. • Ensuring that the term for supply agreements lasts the duration of the financing agreement.
3.	Technology	Sustainability and cost effectiveness	• Suitability and capacity of the technology and/or equipment to be used to ensure project completion and delivery i.e. processing efficiency, geographic conditions etc. • Replacement of obsolete and inefficient national technical infrastructure for generation, transmission and distribution of energy. • Availability of climate resilient technology.
		Transmission and Distribution Infrastructure	• Limitations in transmission and distribution infrastructure. • Severity of grid and transmission losses. • Maintenance and/or replacement of aging transmission and distribution infrastructure.

Source: Detons (2018), AFDB (2018), OPIC (undated), Marsh & McLennan (2017), DBSA (2016), Adamu (2016), Zhu and Chua (2018), WEF (2013), Watson (2016), IRENA (2013) UNDP (2013)

2.3.4.6 Financial Structure Factors

The determination of the project's commercial viability and financial model. This entails the project's finance and transaction structure; between the project company and financial stakeholders.

Table 15: Financial Structure Factors Affecting Bankability

#	Factor	Theme	Details
1.	Deal Structure	Due diligence	• Enabling and completion of a detailed due diligence on the legal and financial structuring of the project and project stakeholders.
		Financing structure	• Determination of a transparent financing requirements and structure i.e. project finance, capital finance, debt etc.
		Shareholder agreements and financing	• Establishment of a transparent and enforceable shareholders' agreement that clearly outlines the respective rights and obligations of the project sponsors. • Establishment of an appropriate shareholders' equity contribution. • Establishment of the dividend payment conditions and timeframes.
		Revenue collection and/or off-taker structure	• Establishment of agreements between relevant authority, the project company and/ or financers guaranteeing the revenue stream from the completed infrastructure to ensure the collection of revenue and recovery of financial outlays to service debt and financial obligations. • Establishment of mitigates to demand, price and market risks to future project revenues fluctuations. • Ensuring efficiencies in revenue collection.
2.	Credit and Governance	Cash management controls – receipts and disbursements	• Establishment of transparent controls for receipt, disbursement and monitoring all project cashflows and cost management.
		Creditworthiness of project participants/contributors	• Establishment of the creditworthiness of the project company and all third parties involved with a project to ensure and establish that all project participants are financially robust and able to deliver their assumed commitments/obligations over the life of the project
3.	Insurance	Insurance coverage	• Establishment of a comprehensive insurance coverage package for the loss or damage to the project's assets from natural or unnatural causes and clear claim procedures. [<?>] i.e. capacitation of local insurance companies to offer infrastructure insurance, regularization of the country's credit rating to qualify for or reduce cost of regional insurance schemes such as IISD Insurance Scheme[<?>], international private insurance companies

[<?>] https://www.fanews.co.za/article/short-term-insurance/15/commercial/1006/infrastructure-insurance-the-best-way-to-approach-the-insurance-of-a-large-project/22104

[<?>] https://iisd.org/credit-enhancement-instruments/institution/sovereign-risk-insurance-ltd/

Source: Detons (2018), AFDB (2018), OPIC (undated), Marsh & McLennan (2017), DBSA (2016), Adamu (2016), Zhu and Chua (2018), WEF (2013), Watson (2016), IRENA (2013), George (2018), Cook (2017)

2.3.4.7 Risk Sharing Factors

Factors that determine the equitable distribution of project risks amongst relevant project players to mitigate the likelihood and/or impact of risk occurrences.

Table 16: Risk Sharing Factors Affecting Bankability

#	Factor	Theme	Details
1.	Identification and Allocation	Identification, classification and allocation of risks	• Performance of a comprehensive and efficient due diligence process • Identification and classification of project risks e.g. construction, supply, quality, legal, land access rights, operating, regulatory and market risks. • Transparent and equitable allocation of risks to decrease the number of occurrences of disputes between the parties during project implementation and execution resulting in project delays. • An effective risk allocation process, results in a decrease in contingency funds usage, and a reduction in project costs. • Efficient risk allocation increases confidence and trust amongst the various project stakeholders to ensure the coherent execution/ implementation of the project.
2	Mitigation Framework	Risk sharing and mitigation framework	• Establishment of an optimal and equitable risk-sharing framework assigning risks to the best placed party to quantify, control and mitigate the risk. • Ensuring that risks are not lumped to the project company or a specific entity. • Development and implementation of risk mitigation controls and strategies. • Transfer of risk through effective contractual agreements. • Development and dissemination of a management risk dashboard on key risks
		Institutional governance frameworks	• Ensuring high standards of corporate governance, transparency and efficiency in project undertakings across the various project institutions e.g. project company, financers, government for the various project activities such as project identification, project preparation activities, procurement and monitoring.

Source: Detons (2018), AFDB (2018), OPIC (undated), Marsh & McLennan (2017), DBSA (2016), Adamu (2016), Zhu and Chua (2018), WEF (2013), Watson (2016), IRENA (2013)

2.3.4.8 Procurement Factors

Factors that influence and have an impact on supplier management for project development activities.

Table 17: Procurement Factors Affecting Bankability

#	Factor	Theme	Details
1.	Policies	Procurement policies and processes	• Establishment of adequately equipped procurement policies and structures for all major procurements as required by public procurement laws/regulations or best practice. • Frequent monitoring of compliance of an organization's procurement processes and documentation to the relevant procurement act and or policies.
2.	Organizational Structure and Governance	Organization and Staff Capacity	• Delegation of procurement responsibilities to technically competent and senior officials/professionals. • Establishment of dedicated, fulltime procurement professionals with relevant experience to effectively coordinate procurement initiatives where relevant.
		Information Management and Communication	• Development and adherence to adequate data storage and policies for all procurement processes. • Adequate access to procurement documentation to approved stakeholders within sufficient timelines e.g. auditors, regulators, bid process participants and other parties who may need access to the procurement documents.

3.	Project Procurement	Risk Management and Transfer	• Efficient evaluation of project risks and mitigation plans and inclusion of relevant clauses within procurement contractual obligations to mitigate the risks where applicable.
		Default and/or insolvency	• Establishment of relevant and enforceable mitigates against the default/non-delivery of procured services or products before the commencement of the project and on-boarding of service providers and project stakeholders/financiers
		Performance Management	• Establishment and enforcement of effective supervision, monitoring and evaluation of procurement contractual obligations and achievement of procurement goals. • Provision of quality assurance over workmanship by contracted project stakeholders.
		Project Plan and Cost Management	• Alignment of procurement processes to the project plan and budgets to ensure project efficiencies, project deliverables and cost management by all project stakeholders. • Mitigation against regulatory and market adverse movements e.g. statutory wage increases for project staff, high or increases in inflation and interest rates.

Source: Detons (2018), AFDB (2018), OPIC (undated), Marsh & McLennan (2017), DBSA (2016), Adamu (2016), Zhu and Chua (2018), WEF (2013), Watson (2016), IRENA (2013), Payne and Watt (n.d.)

2.4 Project Cycle Management (PCM)

2.4.1 Project Development Phases

Nassiry, Nakhooda and Barnard (2016) assert that within the project life cycle; project development represents a subset of activities from project conceptualisation to project packaging. Project development involves a number of key stages which include:

- upstream activities – establishing a supporting and enabling environment, engaging in stakeholder consultations, project conceptualization and identification, and assessing project feasibility.
- downstream activities – involving financial structuring, determining bankability, providing transaction support and reaching financial closure.

Project development stages as outlined by Nassiry, Nakhooda and Barnard (2016) are detailed in Table 18:

Table 18: Project Development Phases

	Stage	Step	Activity
Upstream	Early stage	1. Enabling environment	• Developing regional and national Infrastructure plans, goals and priorities. • Developing Government/Ministry/Sectorial/Local Authority Infrastructure Plans. • Building consensus around project. • Developing an enabling legislation and regulatory framework. • Institutional reforms and building capacity to support the project.
		2. Project conceptualisation and definition	• Definition of need and project scope. • Identifying desired project outputs • Examination of various alternative solutions. • Comparison with other projects. • Identifying project partners. • Identifying project champions. • Preparing action plans including implementation tasks and terms of reference. • Conducting prefeasibility studies • Preliminary risk allocation • Set-up and manage advisory team • Start public procurement process, if applicable for consulting services. • Pre-feasibility analysis
	Mid-stage	3. Project feasibility	• Organisational/administrative arrangements. • Financial modelling. • Technical/engineering options analysis • Cost Benefit Analysis. • Conducting Economic/Financial, Technical, and Social & Environmental Impact Assessments. • Other specialist studies including empowerment and gender.
Downstream	Late stage	4. Project structuring	• Assessing public/private finance options • Coming up with institutional arrangements. • Developing technical/engineering designs

"Bankability"		
	5. Transaction support	• Project financing (ongoing) • Legal structuring (ongoing) • Finalising engineering/technical designs • Drafting procurement contracts • Conducting bid process • Drawing up covenants and contracts.
Financial Closure		
	6. Implementation	• Training • Construction and/or project execution • Monitoring and evaluation • Controls and Quality assurance • Performance management • Plan management (project, ESIA etc.) • Communication and Reporting
	7. Post-implementation support	• Monitoring of outcomes • Conducting impact evaluation • Renegotiating or refinancing project • Environment Management Plan Review • Site Handover

Source: Nassiry, Nakhooda and Barnard (2016), Ramboll (2015), Chaponda et al (2014), Kortekaas (2015), CEPA (2015). adapted

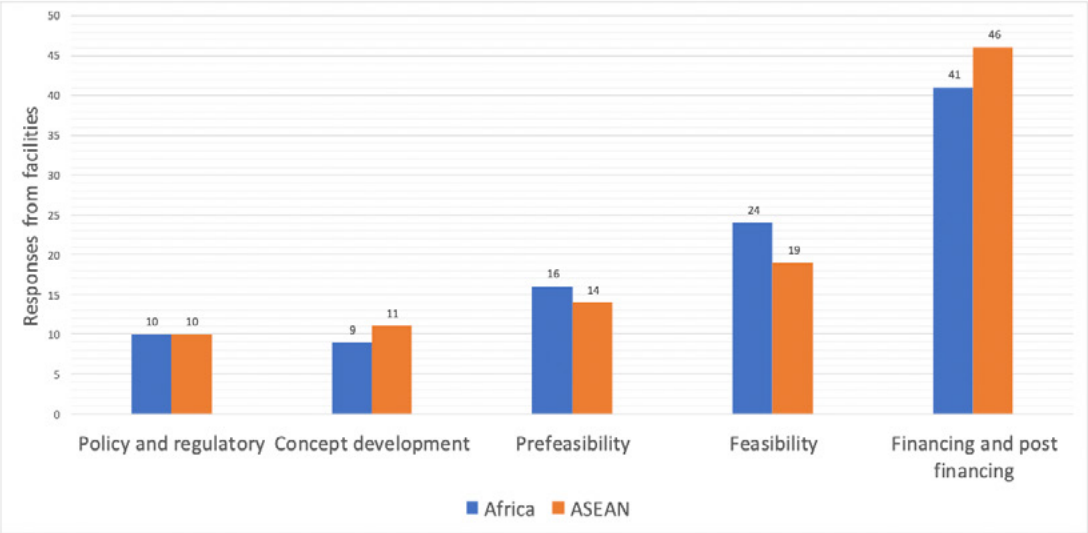
Chaponda et al (2014) postulates that project preparation constitutes approximately 10-12% of the total project costs for large regional projects in Africa. Each phase in the project development cycle requires specialist skills and expertise which are drawn from all project stakeholders i.e. government, multilateral development banks, development finance institutions, commercial banks, private equity or venture capital investors, industrial or technology companies environmental/legal and financial advisors, and monitoring and evaluation specialists.

Government plays a central role and anchor the critical steps in the project development process in both the upstream and downstream stages. It engages the requisite technical and financial expertise for completion and delivery of each stage in the project development cycle.

The private sector engages the project development process at any stage of the project development cycle for investment opportunities.

SDIP (2018) conducted a survey between December 2017 and February 2018 which reveals that most support for infrastructure is available for projects at later stages of project development as opposed to early stages as shown in Figure 15. In Africa, 41% of facilities indicated support of projects at the financing and post-financing stage, compared to 24% at the feasibility stage and 16% at the pre-feasibility stage. The same trend happened in the Association of South East Asian Nations (ASEAN) region with facilities responding at 46%, 19% and 14% respectively. In addition, most responding facilities prefer to finance PPPs (67%) across both regions as opposed to supporting projects exclusively developed by the private sector (29%) and a mere 4% for exclusive public-sector projects.

Figure 15: Project Financing at different stages of Energy Project Development



Source: Sustainable Development Investment Partnership (SDIP) (2018)

2.4.2 Project Turnover Periods in Zimbabwe

IFC (n.d.) stated that smaller hydro plants have a 9 to 18-month construction timeframe. Larger hydro plants may take up to 4 years to complete construction. Hydro plants are expected to have a 40 to 50-year lifespan. Aqper (n.d.) agreed that hydro plants can take on average 4 to 7-years to complete[10]. Vorrath (2017) noted that coal/gas power stations can take up to 6 years to complete and solar projects can take approximately 1 to 3-years to complete[11].

Tables 19 and 20 provide a view of the construction time for projects in Zimbabwe. Small Hydro plants in the country take on average 2 years to complete, Solar Plants take about a year and Large Hydro Plants take approximately 4 to 5-years to complete.

Table 19: Zimbabwean Project Turnover Days

LICENSEE	CAPACITY (MW)	TECHNOLOGY	DATE OF LICENCING	DATE OF COMMISSIONING	NUMBER OF DAYS TAKEN TO DEVELOP THE PROJECT	ESTIMATED COST
OPERATIONAL PROJECTS						
A.	2,20	Mini-hydro	13/02/2012	26/3/2013	407	5 575 000
B.	1,10	Mini-hydro	10/10/2008	30/9/2010	720	2 969 604
C.	2,75	Mini hydro	15/10/2010	8/1/2013	816	6 769 053
D.	15,25	Mini-hydro	15/10/2010	4/2/2015	1573	26 588 488
E.	3,72	Mini-hydro	11/05/2014	24/3/2016	683	6 961 668
F.	1,60	Mini-hydro	21/01/2014	21/12/2016	1065	4 495 520
G.	2,30	Mini hydro	23/06/2015	25/1/2017	582	7 300 000
H.	0,30	Mini hydro	5/042017	6/10/2017	184	375 000
I.	2,50	Solar PV	15/12/2016	1/1/2018	385	3 800 000
J.	0,45	Solar PV	2027/03/18	10/4/2019	379	724 000
K.	300,00	Hydro	05/08/2013	10/05/2018	1739	483 000 000
Total Investment						**548,558,333**
Average	**30**				**776**	**49 868 939**

Source: ZERA 2019

Table 20: Average Generation Technology Project Turnover Days in Zimbabwe

CAPACITY (MW)	TECHNOLOGY	NUMBER OF DAYS TAKEN TO DEVELOP THE PROJECT	ESTIMATED COST (USD
3,65	Mini-hydro	754	7 629 292
1,48	Solar	382	2 262 000
300,00	Large-Hydro	1 739	483 000 000

Source: ZERA 2019

[10] https://www.aqper.com/en/how-long-does-it-take-to-build-a-hydroelectric-power-station
[11] https://reneweconomy.com.au/five-reasons-not-to-build-new-coal-power-plant-in-queensland-45488/

2.4.3 Project Preparation and Bankability

2.4.3.1 Integrated Infrastructure Planning in Zimbabwe

Zimbabwe needs to develop a long term integrated infrastructure plan in line with country's needs. An integrated plan improves stakeholder coordination and resource mobilization. Public and private players in the power generation sector have identified investment opportunities within the country. This has resulted in unsolicited bids being submitted to ZERA which might not be aligned to an integrated plan model. A competitive procurement framework structured around an integrated infrastructure plan and energy mix (technology) targets improves efficiency. The Government of Zimbabwe is currently working on an Integrated Resource Plan and System Development Plan to analyse and address the country's energy supply and demand side requirements over the next 20 years (MoEPD, 2019). This will enable the government to determine the most cost-effective and technologically efficient ways to build the power generation capacity in the country (ZESA, 2019). Implementation of an integrated infrastructure plan includes funding feasibility studies for the establishment of a robust pipeline of bankable projects.

2.4.3.2 Infrastructure Project Preparation Phase

Chaponda, Nikore and Chennells (2014) define 'project preparation' as a process which comprises the entire set of activities undertaken to take a project from conceptualisation to implementation. The primary aim of the project preparation process is to develop a project idea to the point where it attracts financing. This involves producing a suite of project documents which demonstrate bankability and thus motivating financier interest.

Our study observed that there is little evidence of the standardization of the project development and project preparation methodology between players (public and private) in the energy sector. This has contributed to different success rates in the implementation of energy projects in Zimbabwe.

Most of the challenges faced by various non-performing projects of licensed producers have emanated from the non-compliance to the requisite project preparation methodology activities addressing all the bankability factors described in this paper as proposed in section 2.3.4. Conversely, most successfully implemented projects have employed a comprehensive project preparation methodology to de-risk and determine the feasibility and bankability of the project. The major impediment to the completion of preparatory activities is the lack of funding to undertake the development activities (The Standard, 2019).[12] An example is the challenges faced by Jaguar Overseas Limited in raising funding for the repowering of Munyati Power Station (The Herald, 2019).[13]

There is scope through regulatory provisions or the empowerment of a formal monitoring entities to ensure that projects are not progressed to implementation phases before adequate project preparation requirements have been fulfilled.

2.4.3.3 Project Preparation and Infrastructure Pipeline Development Challenges in Africa

Infrastructure projects preparation activities are fraught with common obstacles. Leigland and Roberts (2007), Oberholzer et al (2018) and Rohde (2015) listed the shortcomings in the preparation activities of infrastructure projects as defined in Table 21:

Table 21: Shortcomings in the Project Preparation Activities for Infrastructure Projects in Africa

#	Challenges	Details
1.	Low Assistance for "upstream" and preliminary preparation activities	• a lack of adequate "upstream" preparation produces adverse effects on infrastructure projects prioritization, identification, planning i.e. financing, carrying out feasibility studies, legal and regulatory environment enablement. • Lack of buy in for project preparatory activities. • Private players and financiers willing to finance projects were bankability has been reasonably established but having little appetite to spend on preliminary assessments of bankability
2.	Lack of funding for preparation activities	• lack of funding capacity, products and organisations for project preparatory activities. • Project preparation constitutes approximately 10-12% of the total project costs for large regional projects in Africa, which is a substantial amount
3.	Inadequate project appraisals	• Inadequate or non-comprehensive financial, ESIA and technical appraisal methods often leads to unrealistic evaluations and project failures. • Supplementation of project with out-of-date feasibility studies, providing little additional analysis or project viability.
4.	Inefficient and Inadequate Resources	• Lack of capacity and/or inefficient deployment of financial, technical and human resources for project preparation activities.
5.	Inadequate Data availability and inclusion	• Non-availability, inadequate and/or poor-quality data providing negative bearings on project quantitative and qualitative appraisals. • High levels of misinformation about infrastructure projects preparation due diligence analysis. • Underestimation of true project costs and overestimation the asset's future demand. • Failures to anticipate fundamental factors in the determination of bankability e.g. financial, economic, and political issues that may affect project or asset performance

[12] https://bulawayo24.com/index-id-news-sc-national-byo-157312.html
[13] https://www.herald.co.zw/zpc-cancels-113m-power-tender/

6.	Non-alignment of regional projects and national plans	• Non-incorporation of regional project plans in the national project planning and prioritization • Failure to identify and plan for beneficial opportunities that qualify for regional financial programmes.
7.	Project Identification	• Failure to identify and adequately prepare projects that can attract private investors
8.	Lack of private sector participation	• A lack of participation by local financial institutions and capital. • A lack of capacity by national/local authorities to institute sustainable collaboration with private players through PPPs. • Failure to attract private players during the early stages of project development. • Failure to adequately mitigate the high levels of risk exposure to the private players in the project preparation stages.

Source: Leigland and Roberts (2007), Oberholzer et al (2018) and Rohde (2015)

2.4.3.4 Project Preparation Facilities (PPF)

Perera et al (2018) and Rhode (2015) define PPFs as entities that provide technical and financial support for project preparation activities to develop projects to bankability. They propose the assignment of responsibility on growing a pipeline of bankable projects and de-risking projects to PPFs and public finances (e.g., taxes, pensions). Effective use of PPFs, guarantees a sustainable supply of bankable and investment-ready projects. Such support can cover a wide range of activities including:

- undertaking project feasibility studies including value for money analysis;
- developing procurement documents and project concessional agreements;
- undertaking social and environmental studies;
- creating awareness among the stakeholders; and
- Provision of financial assistance to local governments or special public-sector agencies to support the financial, legal and technical advisory services required to facilitate private investment into infrastructure projects.

2.4.3.4.1 Scope of Project Preparation Facilities (PPFs)

Kortekaas (2015) stated that even large and important projects in emerging and developing countries sometimes lack sufficient feasibility and financial analysis to ensure their bankability. As a result, the projects may:
be abandoned during the project preparation phase,
progress without adequate information, and
suffer cost escalations (potentially to the point that the project is no longer financially feasible)

The effectiveness of a PPF in growing the bankability pipeline is limited to its mandate and scope. Table 22 lists the scope of PPFs.

Table 22: Scope of PPFs

1.	Sector Reform (Upstream)	• Development of an enabling environment and policy modification • Advisory services on enabling reforms (such as legislation and regulation frameworks, incentive schemes) • Development of suitable project prioritization, training, market and stakeholder awareness programmes.

2.	Due diligence	• Performance of feasibility verification, covering:
		  • technical,
		  • financial,
		  • economic,
		  • social and gender,
		  • legal,
		  • regulatory,
		  • institutional,
		  • governance,
		  • transaction structuring and management activities

3.	Preparation of information memoranda and marketing	• Performance of market canvassing and identification of investors. This may include:
		  • market soundings;
		  • creating and managing data resource centres
		  • managing the bidding process; and
		  • assisting with evaluations, awards and contract negotiations.

4.	Attracting high-quality sponsors/ investors	• preparing strong project documentation and robust financial models.

Source: Kortekaas (2015), World Bank (2016), Perera et al (2018) and Rhode (2015)

2.4.3.4.2 The Different Types of Project Preparation Facilities (PPF) Structures

World Bank (2016) stated that the PPF is an important funding vehicle for project preparation activities under both private and public financing models. PPF structures vary according to financing needs and are listed in Table 23.

Table 23: Different types of PPF structures

#	Segment	Details
1.	Sector-specific	• Niche facilities used to prepare projects for a specific infrastructure sector or subsector.
2.	Independent multi-sector	• Global focus and provide support to developers across a range of infrastructure sectors.
3.	Integrated	• Attached to Funds as a step to preparing projects that the Fund will then finance post development.

4.	Programmatic	• Work further upstream in the project development process
		• Ensure a supportive enabling environment
		  • Strategic pipeline development and capacity building.
		  • Core functions strengthening e.g. institutions, resources
		  • Multiple projects support e.g. feasibility studies, engineering designs
		• Encourages project developers to take on the later-stage preparation activities themselves.

5.	Government units	• Perform similar functions to external PPFs • Focus on building projects to attract private developers. • Coordinate government ministries (e.g. Finance, Planning, Energy).

Source: Nassiry, Pickard, Whitley and Scott (2018), Kortekaas (2015), World Bank (2016). Adapted.

South Africa has set up the South Africa Infrastructure Fund (SAIF) to enhance development and implementation of infrastructure projects. The fund will be supported by an 'Infrastructure Execution Team' under the Presidency, comprising of experts drawn from both the public and private sectors. The experts are proficient in relevant sectors such as financial advisory, project design, engineering and project management. Government will contribute R400 billion from the fiscus towards the fund. The fund will be used to leverage additional resources, from DFIs or private players, and innovative financial products such 'blended finance' instruments (SA News, 2018).

DFIs also provide and manage PPFs. Development Bank of South Africa (DBSA) alone for example provides or manages multiple PPF product offerings for project preparation i.e. Green Fund, SADC Project Preparation and Development Facility (SADC PPDF), Infrastructure Investment Programme for South Africa (IIPSA), DBSA Project Preparation Fund, Green Climate Fund (GCF) and the Global Environment Facility (GEF). Government of Zimbabwe and IDBZ, therefore, need to play a more active role to mobilize resources to provide adequate funding for project development to bankability.

2.4.3.5 Zimbabwe Project Preparation Facilities (PPF) Structures and Offerings

The Infrastructure Development Bank of Zimbabwe (IDBZ) is the only institution besides Government that formally manages and offers project preparatory funds through its Project Preparation and Development Fund ("PPDF"). The PPDF was seeded through internal capital and is offered towards both greenfield and brownfield projects. The sectors covered by the IDBZ PPDF include the Energy and Power, Transport, Water and Sanitation, Information Communication Technology (ICT) and social infrastructure. Activities eligible for financing under the PPDF facility include:

- local master plans;
- pre-feasibility studies;
- feasibility and detailed design studies;
- economic and financial analysis/financial modelling;
- Environmental and Social Impact Assessments (ESIAs) and Resettlement Action Plans; and,
- Legal and Transaction Advisory Services.

In addition to the bank's PPDF initiative, the Government allocated US$7 million in 2017 and US$15 million in 2018 towards the establishment of a national PPDF to focus on the packaging of priority national projects (Zimbabwe Independent, 2018). [14] The facility is used to fund detailed feasibility and design studies; and ESIAs in order to prepare national projects thus develop them to bankability.

Ministries are meant to submit project proposals to access funding from the PPDF (Zimbabwe Treasury, 2018).[15] Approximately, only about 30% of the fund has been utilised (MoFED, 2019). This can be attributed to lack of understanding of the PPDF requirements. Infrastructure investments entail complex legal and financial arrangements, requiring a lot of expertise (Ehlers, 2014). The Government PPDF allocations are also project specific and inadequate to cover all projects requiring preparation funding.

Project preparation activities consume 10-12 % of the total project cost, according to Chaponda et al (2014). Zimbabwe's infrastructure deficit is estimated at US$11 billion over a period of two decades beginning 2012 which translates to approximately US$565 million dollars per year for the energy sector, (World Bank, 2012). To meet the WB recommendations Zimbabwe requires between US$56,5 million - US$67,8 million per annum to close the infrastructure gap in the energy sector alone. The country would need US$170 million - US$204 million per annum over a decade to close the country's infrastructure gap.

Resources allocated towards project preparation funds (IDBZ and GoZ) in Zimbabwe are therefore insufficient to close the country's infrastructure gap and prepare an adequate pipeline of bankable projects. Government needs to increase allocations towards project

[14] https://www.theindependent.co.zw/2018/02/23/resolution-lima-plan-key-attracting-fresh-funding/
[15] http://www.zimtreasury.gov.zw/index.php/media-centre/press-statements/151-treasury-budget-call-circular-number-6-of-2018

preparation. IDBZ as a national DFI needs to mobilize and manage more resources to develop projects to bankability. The country is competing against with regional projects to prove of bankability and provide equitable returns on investment for funding. The increased project preparatory allocations and resources will need to be consistently sustained over a period to address the infrastructure financing gap.

2.4.3.6 Infrastructure Pipeline Development and Project Preparation Funding Options

Nassiry et al (2018) propose that PPFs be used to guide projects development cycles and complement financial innovation initiatives. PPFs can be used to close the gap between the needs of investors and project developers. The various options are listed Table 24.

Table 24: Different types of PPF structures and funding sources

Funding Options	Funding Structure/Source of Funding	Examples
Public Sector Financing	• Fiscus allocation • Non-tax revenue •	• The SA government has spent R3 trillion on infrastructure between 1998/99 and 2017/18, the public sector spent. Expenditure increased from R48.8 billion in 1998/99 to R236.2 billion in 2017/18. In real terms, infrastructure spending grew by an annual average of 4.3 per cent.<?>
	• Public debt financing (bond issuance)	• America, has, amongst other initiatives, initiated proposals for public structured finance options to address infrastructure challenges. The bonds are the Qualified Public Infrastructure Bonds (QPIBs) and America Fast Forward (AFF) bonds. • QPIBs seek to involve the private sector in designing, building, financing, operating, and maintaining public infrastructure assets. AFF bonds seek to attracting new investors classes into the infrastructure market e.g. pension funds, sovereign wealth funds, insurance companies, and taxpayers in lower income brackets[<?>].
	• Local government/ municipality funding	• AfDB manages and offers an Urban and Municipal Development Fund. This is a multi-donor trust fund to scale up investment in urban cities across the African continent<?>. • States and local governments in America have financed more than $1.65 trillion of infrastructure investment between 2003 and 2012 through the tax-exempt municipal bond market. The infrastructure projects mostly financed through municipal bonds include schools, hospitals, water and sewer projects, highways and public power projects[<?>].
	• Sovereign Wealth Funds	• The National Investment and Infrastructure Fund (NIIF) is an Indian sovereign wealth fund established by the Government of India. The fund focuses on infrastructure investments in commercially viable Greenfield and Brownfield projects. NIIF raises funds for infrastructure investments from domestic and international institutional investors[<?>].

[<?>] http://www.treasury.gov.za/documents/National%20Budget/2019/review/Annexure%20D.pdf
[<?>] https://www.brookings.edu/research/building-better-infrastructure-with-better-bonds/
[<?>] https://www.afdb.org/en/news-and-events/african-development-bank-launches-pan-african-urban-and-municipal-development-fund-19166/
[<?>] https://patimes.org/financing-infrastructure-projects-municipal-bonds/
[<?>] https://en.wikipedia.org/wiki/National_Investment_and_Infrastructure_Fund

Private Sector Financing	• Debt financing	• The German financial market offers climate bonds called "Green Bonds" worth over US $10 billion. The climate bond market is supported by a strong energy policy and industrial sector. The market is backed by the banking sector with over 80% of issuance to date coming from development, state-owned or commercial banks. <?>
	• Equity financing/ Private Investors/Asset Management Firms	• AMP Capital has over US$10.6 billion in infrastructure equity funds under management.<?> • Lazard's Global Listed Infrastructure Equity Fund invests in equity securities of infrastructure companies with a minimum market capitalization of $250 million. The Fund focuses primarily on equity securities of companies that own physical infrastructure assets that meet certain preferred criteria, such as revenue certainty, profitability and longevity[<?>].
	• Pension/Trust Fund Investments	• A consortium comprising Canada Pension Plan Investment Board ("CPPIB"), OMERS and Ontario Teachers' Pension Plan ("Ontario Teachers'"), entered into an agreement to acquire Skyway Concession Company LLC ("SCC") for US$2.8 billion. SCC manages, operates and maintains the Chicago Skyway toll road under a concession agreement, which runs until 2104. Skyway is a 12.5 km toll road that forms a critical link between downtown Chicago and its south-eastern suburbs[<?>].
	• Insurance Firms	• China Life Insurance Company Limited has assets under management in excess of US $450 billion. The firm has interests in many fields, including equity investment, healthcare investment, senior care and immovable property investment, infrastructure investment. China Life Insurance and Shin Kong Life Insurance from Taiwan are investors in a €6bn infrastructure fund from Macquarie.[<?>]
	• Commercial/Investment Banks	• Investment bank Macquarie of Australian has raised €6bn to invest in infrastructure in Europe[<?>]. • Nedbank has invested mainly in renewable energy, targeting Renewable Energy Independent Power Producer Programme (REIPP). Over 23 deals have been funded, worth over ZAR 25 billion. committed and 10 awards won in the), we are the clear leader in the energy space. Nedbank has to date provided debt funding, interest rate hedging and forex hedging. Nedbank was joint mandated lead arranger for the Euro 623 million of the landmark Lake Turkana Wind Power Project in Kenya, which is part of the case studies for this report in section 6.<?>
	• Infrastructure Developer/ EPC Financing	• ZPC awarded an 'EPC and funding' contract to Sino Hydro, a Chinese company to undertake the capacity extension of Kariba Power Station. China Exim Bank provided the finance for the project under the contract. The EPC contract cost was $355 million, but the total cost to completion is estimated at $533 million, including development costs such as consultancy, statutory payments and equity input. The extension project was for the addition of two generating units with the capacity to generate 300 MW<?>.
	• Private/Key Off-takers e.g. mining companies, private corporates	• SolarReserve, an Australian company, was awarded AU$78/MWh offtake contract for new 150 MW power plant. The contract is a 20-year PPA. The technology adopted will store up to eight hours of molten salt storage and has a projected cost of AU$650 million. The offtake contract has been structured to ensure the state benefits from lower spot prices that are expected to arise from growing renewable capacity[<?>].
Public-Private Partnerships	• Joint Venture between the public and private sectors	• Rwanda's Musanze hydropower plant is the result of a PPP between DC HydroPower (Rwanda) which signed a PPA with the Rwanda Energy Group. The plant is expected to add 3.6MW to the grid providing power to 100,000 households. Frontier Energy (Denmark) and ResponsAbility Renewable Energy Holding are investment partners with DC HydroPower. The Germany government, through KfW development bank, injected $6 million into the project. The US government provided technical assistance for feasibility studies through its Power Africa initiative[<?>].

[<?>] https://www.climatebonds.net/files/files/Climate%20Bonds%20Germany%202017.pdf
[<?>] https://www.ampcapital.com/africa/en/capabilities/infrastructure/infrastructure-equity
[<?>] https://www.lazardassetmanagement.com/uk/en_uk/funds/funds/lazard-global-listed-infrastructure-equity-fund/F400/S29/?shareClass=1445
[<?>] https://www.omersinfrastructure.com/News/Press-Release/Canada-Pension-Plan-Investment-Board,-OMERS-and-On
[<?>] https://www.chinalifepe.com/en/about-us
[<?>] https://www.ft.com/content/9aee7cd8-91db-11e9-b7ea-60e35ef678d2
[<?>] https://www.nedbank.co.za/content/nedbank/desktop/gt/en/corporates/financing/infrastructure-energy-and-telecomms.html
[<?>] https://www.herald.co.zw/kariba-south-project-nears-completion/
[<?>] http://analysis.newenergyupdate.com/csp-today/solarreserve-wins-australia-offtake-contract-abengoa-completes-100-mw-south-africa-plant
[<?>] https://www.esi-africa.com/news/power-africa-back-kenyas-green-energy-ambition/

Grant Financing	• Multilateral Development Banks (MDBs)	• The Asian Infrastructure Investment Bank established a $500m fund that will hold a diversified portfolio of bonds from corporate issuers in the emerging and frontier markets of Asia to finance infrastructure investments.<?>
	• Foreign governments loan/ aid/grant	• Tororo Solar Power Plant is a 10MW solar power plant, in Uganda. The development project was funded by the EU and its partners. Building Energy (an IPP) developed and delivered the project with a capacity to contribute 16 GWh per annum to the grid. The $19.6 million project cost was partially funded by the Dutch Development Bank (DDB). DDB as lead arranger, coordinated a $14.7 million facility. The equity contribution of the shareholders was $4.9 million. 50% of the facility was syndicated to the Emerging Africa Infrastructure Fund (EAIF). EAIF is a member of the Private Infrastructure Development Group (PIDG), which is funded by the UK, Switzerland, Australia, Norway, Sweden, Netherlands, Germany and the World Bank Group<?>.
	• Regional Development Banks	• DBSA provided US$4.9m towards Joule Africa's, Bumbuna II Hydropower Project in Sierra Leone. Joule Africa is a developer, owner-operator of sustainable power projects across Africa.<?> Seli Hydropower, the local project company jointly owned by Joule Africa and its local partner Energy Services Company (ESCO,) will be responsible developing the Bumbuna II plant and project. • Bumbuna II is Sierra Leone's largest infrastructure project and is a key part of the Government of Sierra Leone's long-term Energy Plan. The project entails the extension to the existing 50 MW Bumbuna I facility. Bumbuna II will an additional 143MW capacity. The plant is expected to provide a minimum and reliable 80MW all-year round. Bumbuna II will also feed into the West African Power Pool (WAPP) transmission line. • Joule Africa signed a 25-year PPA with the Government of Sierra Leone as the project sponsor and is responsible for procuring a EPC contractor.<?>
	• Donor funding	• Tozeur Solar Plant is a photovoltaic plant in Tunisia. The EPC contract for Tozeur 1 was awarded to TerniEnergia and then later to Enerrai, by the Tunisian Electricity and Gas Company. Both are Italian companies. • The project received a €500,000 donation from the German government as part of the International Climate Initiative (IKI)<?>. • Tozeur also received a subsidised loan of €11.5 million from the German Development Bank (Kfw). The facility enabled the facilitation of requisite project technology such as a battery storage system. • The initiative is driven by the Ministry for the Environment, Nature Conservation and Nuclear Safety. • The German Federal Ministry of Economics and Energy and the Tunisian Ministry of Industry signed a partnership for the development of renewable energy in Tunisia in 2012.<?>

ICA (2017), Verougstraete (2017), AFDB (2018), Marsh & McLennan (2017), Bhattacharya et al (2016), SIDA (2015)

2.5 Environmental and Social Impact Analysis for Energy Infrastructure Projects

2.5.1 Best Practices in Environmental and Social Impact Analysis for Energy Infrastructure Projects

The Environmental and Social Impact Assessment (ESIA) is an instrument used for the assessment of the effects and impacts of infrastructure projects on the environment and society at large. ESIA provides more value when undertaken during the early stages of project development to enhance decision-making and bankability. ESIA provides guidance in identifying the most suitable and practical option, environmentally and socially, to implement infrastructure projects. This early intervention enables the avoidance or minimization of adverse and costly negative environments and social impacts; and enables the maximization of positive impacts, (Environmental Mainstreaming Initiative, 2009).

<?> https://www.ft.com/content/d1f2e362-13a6-11e9-a581-4ff78404524e
<?> https://eeas.europa.eu/delegations/uganda_hu/34013/10%20MW%20EU%20funded%20Tororo%20Solar%20Power%20Plant%20opens
<?> https://www.dbsa.org/EN/DBSA-in-the-News/NEWS/Pages/20190613-DBSA-Joule-Africa-Hydropower-Sierra-Leone.aspx
<?> http://www.selihydropower.sl/
<?> http://northafricapost.com/31514-tunisia-to-commission-10-mw-tozeur-photovoltaic-plant-this-month.html
<?> https://www.afrik21.africa/en/tunisia-e11-5-million-from-kfw-for-tozeur-solar-power-plant-extension/

ESIA issues need to be considered throughout the project lifecycle. For instance, thermal power plants have to address issues such as pollution, emission levels and contamination of water sources. Infrastructure projects generally may involve large scale population resettlement, forest destruction, land degradation and diversion of water sources affecting the ecological system (African Legal Support Facility and Commercial Law Development Programme, 2017). Social considerations may also include workers' rights, gender issues, impact on the local community and resettlement issues (Ibid).

In Zimbabwe, the Environmental Management Act (EMA Act) (Chapter 20:27, No 3 of 2002) provides for protection of the environment. It is mandatory for each energy infrastructure project to have an Environmental and Social Impact Assessment (ESIA) approved by EMA.

Kennedy (1999) listed the objectives and outputs of the ESIA with regards to bankability and delivery of infrastructure projects as:

- The environmental soundness/feasibility of projects;
- Possible changes in project design;
- Development of mitigative measures needed to minimise adverse impacts;
- Determination of measures which can bring about additional environmental benefits to the project; and
- Adequate environmental management during implementation of the project.

Table 25 shows the ESIA stages.

Table 25: ESIA Stages

Stage	Activity	Details
Stage 1	Screening	• executed by a legal ESIA Authority or using published checklists • ascertains whether an ESIA is required • Screening decision must be issued and made public.
Stage 2	Alternatives	• Consideration of possible alternatives should be undertaken before a choice is made. (demand, activity, location, process & design, scheduling, inputs, 'no project' etc.) • Some projects can be site specific. In such cases the ESIA might focus more on measures such as scale, mitigating measures and traffic management.
Stage 3	Scoping	• A scoping opinion from a regulator identifies the extent of the assessment and specifies the information to be included in the ESIA Report. • Development of terms of reference for the ESIA. • Scoping should involve all stakeholders such as promoters, consultants, environmental agencies and members of the public. • Identifies site specific issues.
Stage 4	Main ESIA study	• Implementation of the impact analysis study, • Prediction of impact significance. • Proposal of mitigating measures

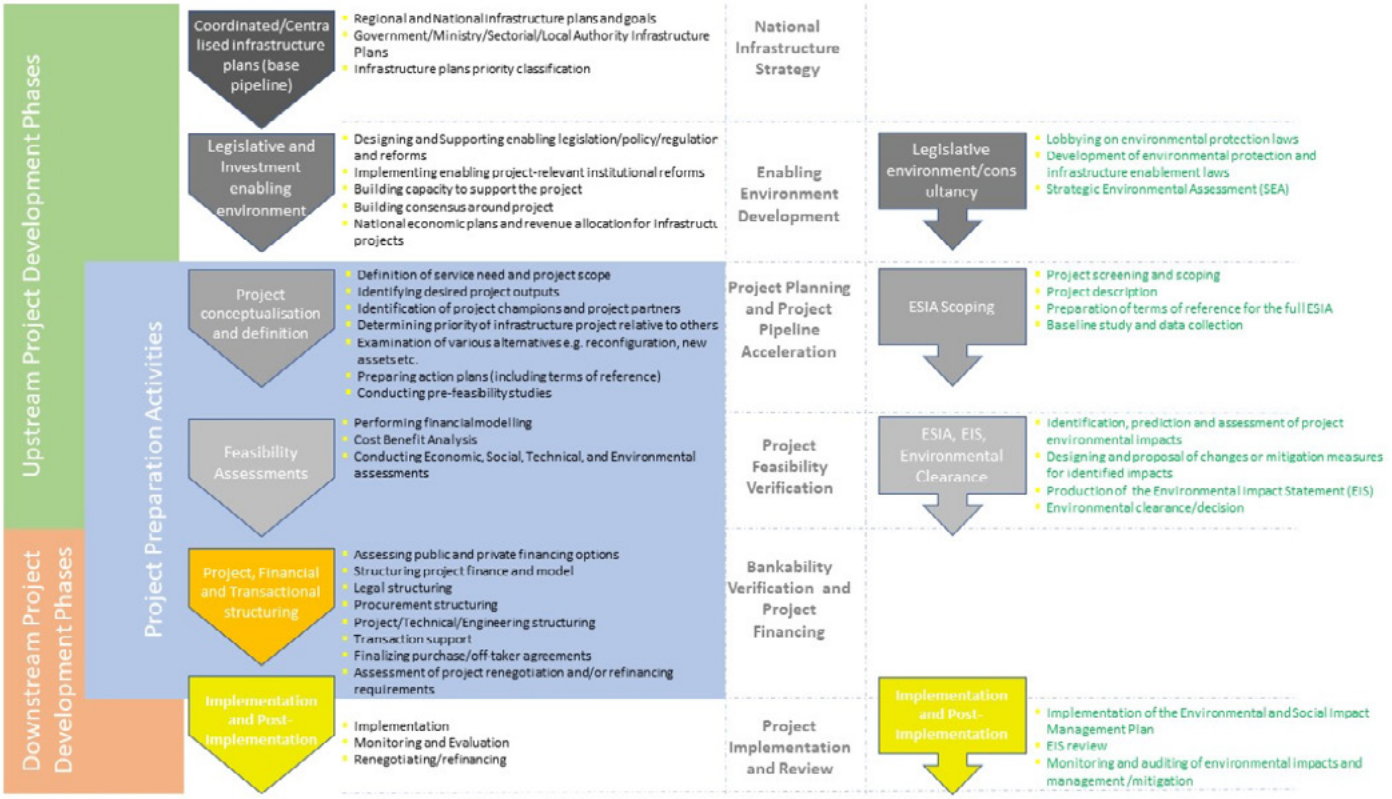
Stage 5	ESIA Report / Environmental Impact Statement (EIS)/ Report	• Presentation of the outputs of the assessment in an ESIA Report which contains:
		  • information regarding the project,
		  • the Baseline scenario,
		  • the likely significant impact/effects of the project,
		  • the proposed alternatives and/or mitigates,
		• Focuses on the issues most relevant to decision-making.

Stage 6	Environmental Clearance	• Issuance of a consent decision and reasoned conclusion on whether the project entails significant effects on the environment.
Stage 7	Review and Monitoring	• Monitoring of Environmental Management Plan (EMP) and Social Management Plan (SMP) during project implementation and operation (including decommissioning). • Audit of the project after its completion.

Source: European Union - Environmental Impact Assessment of Projects (2014), Environmental Mainstreaming Initiative (2009)

The integration of the project development activities and the ESIA are detailed in Figure 16.

igure 16: Integration between ESIA and Project Development



Source: Nassiry, Nakhooda and Barnard (2016), Ramboll (2015), Chaponda et al (2014), Kortekaas (2015), CEPA (2015). European Union - Environmental Impact Assessment of Projects (2014), Environmental Mainstreaming Initiative (2009) adapted

3 The Zimbabwe Energy Sector

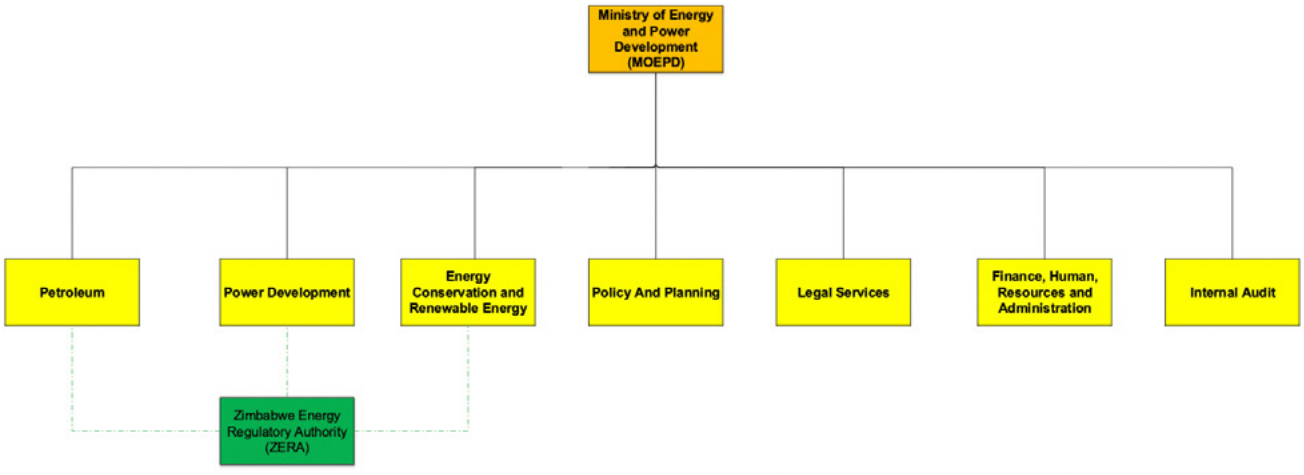
The Ministry of Energy and Power Development (MoEPD) is responsible for oversight of the energy sector through:

- Policy development, sector planning and implementation;
- Legal and regulatory formulation, guidance and monitoring;
- Power generation, development and distribution options;
- Investment promotion in the energy sector with special emphasis on renewables; and
- Energy sector knowledge generation and sharing.

The structure of the energy sector is summarised in Figure 17.

The Zimbabwe Energy Sector Structure

Figure 17: Zimbabwe Energy Sector



Source: MoEPD (2018)

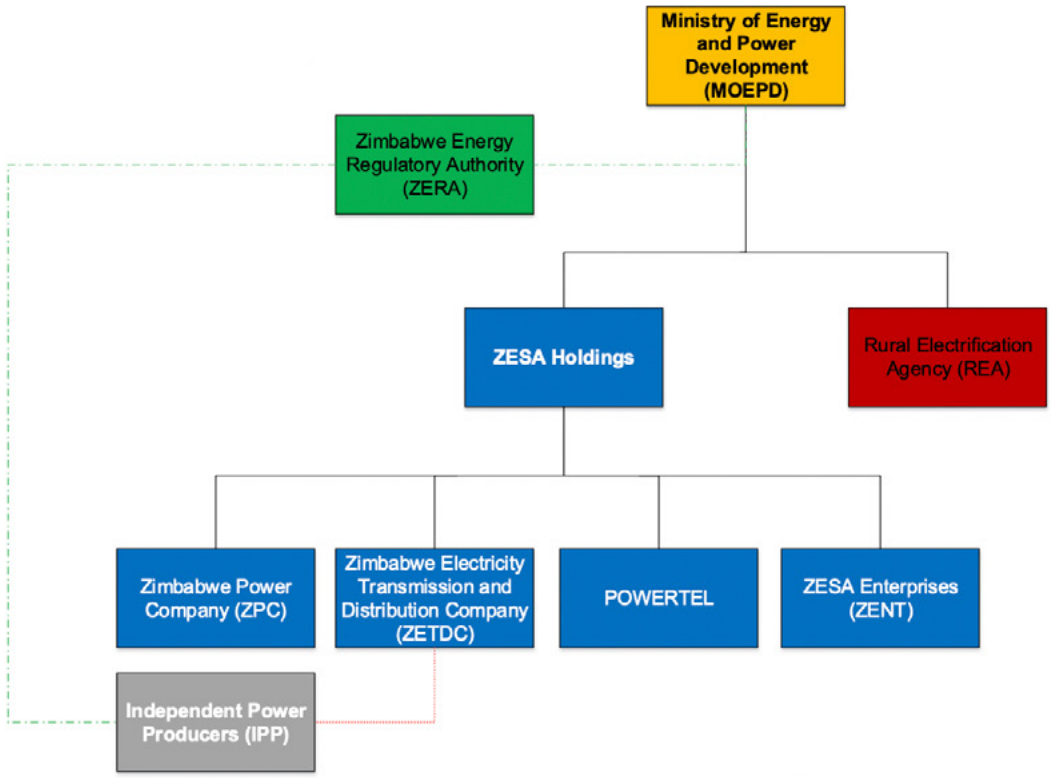
3.1 The Zimbabwe Power Generation Sector Structure

MoEPD coordinates and collaborates with different ministries for the promotion of the energy sector in Zimbabwe.
The Zimbabwe Energy Regulatory Authority (ZERA) is mandated to regulate the energy sector in Zimbabwe in line with the Zimbabwe Energy Regulatory Authority Act [Chapter 13:23] of 2011 (ZERA Act). The other relevant energy sector Acts include the Electricity Act no 4 of 2002 [Chapter 13:19], the Petroleum Act [Chapter 13:22] of 2006 and their subsequent amendments. ZERA sets and controls the tariffs in the energy sector to enable investors to get a reasonable return. ZERA developed a renewable energy feed in tariff (REFIT) scheme that determine the electricity selling price. The REFIT is a tariff designed to promote greater private sector investment in renewable power generation technologies. The Feed in Tariffs were developed for renewable energy projects of up to a maximum capacity of 10MW. The eligible projects include Solar Photovoltaics (PV), Small Hydro, Biomass, Bagasse and Biogas.

In the event of Zimbabwe generating excess power, there is room to export to the Southern African Development Community (SADC) region through the Southern African Power Pool.

The Rural Electrification Agency (REA) has the responsibility of operating the Rural Electrification Fund (REF) as well as development of electrical energy supply to the rural areas. The Zimbabwe power sector structure is illustrated in Figure 18 below.

Figure 18: Zimbabwe Power Sector



Source: MoEPD (2018)

The Zimbabwe power sector is dominated by state owned enterprises and has diversified electricity generation and production systems i.e. hydro, thermal and renewable. The country's electricity transmission system is also interconnected to Zimbabwe's neighbouring countries through the Southern African Power Pool (SAPP).

3.2 Energy Sources in Zimbabwe

Energy can be generated from renewable and non-renewable sources. Sources of energy include the following: solar; wind; hydrogen; geothermal; tidal; wave; hydroelectric; biomass; nuclear power; and fossil. There is need for an optimal energy mix to produce safe, reliable and sustainable power for the national electricity grid. The sources of energy in Zimbabwe can classified as:

- Non-renewable (Nuclear, Coal, Natural Gas and Oil)
- Renewable resources (Solar energy, Wind power, Geothermal, Biomass and Hydropower).

Zimbabwe energy sources and resources are summarised in Table 26. Coal resources are estimated at about 12-25 billion tonnes. Oil & petroleum products, geothermal and natural gas are still under exploration while there is some limited potential for the exploitation of wind energy. Despite huge potential of solar energy, it remains underutilised. Hydro is the main source of renewable sources though it is vulnerable to climate change.

Table 26: Zimbabwe's Energy Resources

Coal	Zimbabwe possesses vast deposits of high-grade coal with about 12 - 25 billion tonnes of good quality coal estimated to exist in about 29 coal localities known. The major producers are Hwange Colliery and Makomo Resources. Coal is a major source of fuel for thermal power.
Oil/Petroleum	There are no petroleum reserves confirmed yet in Zimbabwe although there are possibilities of existence in the northern part of the country according to geologists. All petroleum primary products are therefore imported into the country. Exploration of oil in the Zambezi Basin was done by Mobil in late 1980s. The exploration covered Mana Pools, Kanyemba, Bumi Hills, Kariba, Mhangura, Mt Darwin, Binga, Hwange, Victoria Falls and Kamativi. Explorations for potential deposits were carried out in the Muzarabani area starting 2018 and is still ongoing.
Natural gas	Coal Bed Methane Gas was discovered in Lupane with reserves estimated at 800 million cubic metres per square kilometre (up to 100 Billion Cubic Metres). In 2019 exploration was still on-going and feasibility studies were still being done.
Wind	Zimbabwe's wind speeds are generally low (<3m/s threshold typically required) and hence areas around Bulawayo and Eastern Highlands have potential for power generation application since the most prevalent wind speeds range from 4 to 6 m/s. Specific areas where wind turbines could operate are Chipinge, Chimanimani, Gweru, Harare, and Nyamandlovu.
Solar	Zimbabwe has a high annual daily average solar radiation of over 20MJ/m2 and up to 3,000 sunshine hours per year. The average solar irradiation is 5.7 kWh/m2/day with the north and west regions of the country having the highest irradiation potential. Best sites in Zimbabwe are found in Matebeleland North region and Midlands region, although the average resource in the country is good compared to world averages.
Hydro	Zimbabwe has a hydropower potential of over 3000MW with Batoka hydropower project alone having a power potential of 2400MW. The total small-hydropower stations are over 26MW with potential estimated at 120 MW. Kariba hydro power station and Kariba South Extension project have installed capacities of 750MW and 300MW, respectively. Most inland dams in Zimbabwe were designed with provision for hydropower. The gross theoretical hydropower potential is 18,500 GWh/year. The technically feasible potential is 17,500 GWh/year, of which 19% has been exploited. Over 10 micro, mini and small hydropower plants (20Kw – 16MW) were built and commissioned to date and mainly in the Eastern Highlands of Zimbabwe.
Geothermal	About 50 MW of geothermal potential was identified in Hwange and Bubi in 1985, but little has been done since then to explore further through feasibility studies.

Source: Energy Sector Module for Parliamentarians (2018)

Despite having abundant energy resources, there are challenges which prevent the harnessing of the various forms of energy. Some of the challenges are:

- Low investment;
- Ageing infrastructure;
- Brain drain that result in inefficient energy production methods;

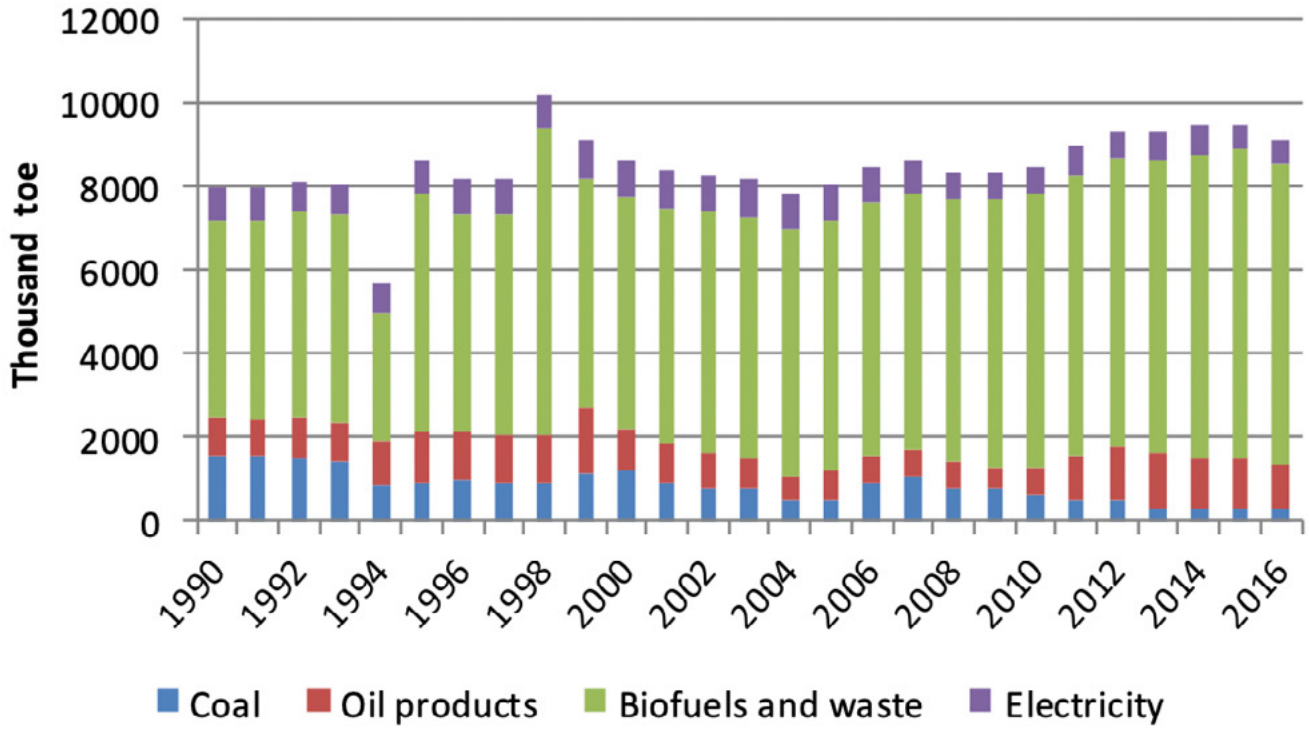
- Lack of adequate skills in the industry; and
- Limited qualified staff, outdated curriculum and laboratory equipment, in training institutions.[16]

Zimbabwe should increase substantially the share of renewable energy in its energy production matrix, enhance energy efficiency measures and promote investment in energy infrastructure to enable the country to achieve universal energy.

3.3 Zimbabwe Energy Consumption

Zimbabwe's energy consumption pattern is dominated by biofuels and waste. These constituted an average of about 69.7% between 1990 and 2016, followed by oil products (11.4%), coal (9.8%), and electricity (9.1%) as shown in Figure 19. Biofuels include fuelwood which is mainly used by about 52% of the population which resides in rural areas for cooking and heating. In addition, some tobacco farmers use waste wood for curing tobacco. This shows that Zimbabwe is still heavily relying on sources of energy which are not regarded as clean energy such as biofuels and coal. Biofuels and coal constitute about 79.5% of total energy consumption. The contribution of biofuels and waste to total energy has generally been increasing at the expense of coal and to a lesser extent electricity. Coal which was used predominantly by white farmers to cure tobacco has been substituted by waste wood by the new farmers which came on board in 2000. This is happening at a time when Zimbabwe and the rest of the world is targeting to achieve universal access to sustainable energy by 2030 through adoption of SSDG 7. This shows that Zimbabwe has a tall order to reverse the trend for biofuels and substitute with green energy like renewable energy sources. However, achieving universal electricity access must be supported by an enabling environment with the right policies and institutions.

Figure 19: Energy consumption in thousands of tonnes of oil equivalent (toe)



Source: International Energy Agency (2018)

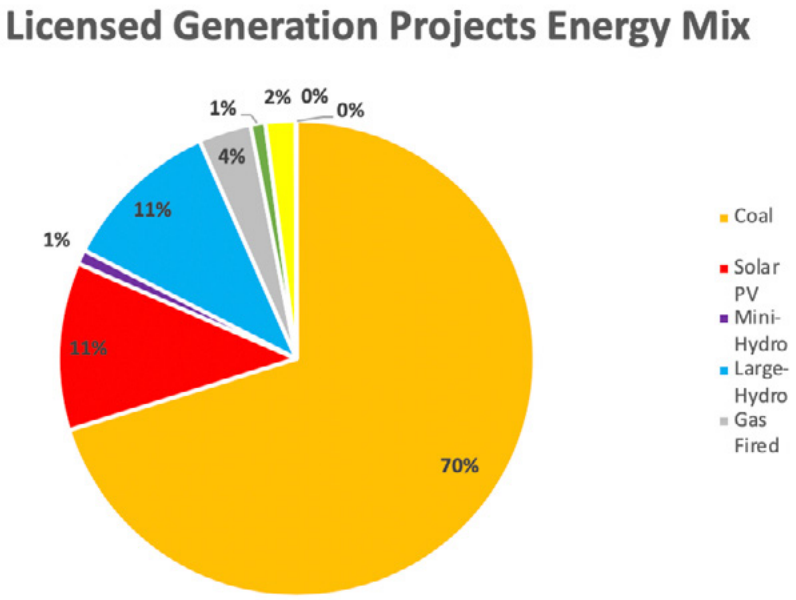
3.4 Planned Energy Mix and Generation Technologies for Licensed Projects in Zimbabwe

The MoEPD is currently developing sectoral energy generation mix targets. The proposed energy mix is expected to be included in the Nation Integrated Energy Resource Plan (NIERP). Zimbabwe needs to diversify its energy mix and power generation technologies to ensure a sustainable supply of electricity and balanced grid. Climate change and other factors have contributed to the unreliable supply of electricity under the current infrastructure. This has contributed to significant recurring power outages and underutilisation of economic capacity. Licensed power projects have various sources of energy which include Bagasse, Diesel Fired, Gas Fired, Hydro, Solar PV, Thermal, Wood waste.

[16] http://www.euei-pdf.org/en/recp/innovation-and-skills-development/renewable-energy-masters-programme-at-university-of-zimbabwe

Figure 20 shows that Coal (70.2%), Solar (11.4%) and Hydro (10.9%) are the projected largest energy source contributions to the grid from the current licensed power producers.

Figure 20: Licensed Generation Projects Energy Mix as of 2019



Source: ZERA (2019)

Table 27 shows that Thermal power solutions (6,792.3 MW) have the largest energy production potential, with most of the projects being undertaken by the public utility (5). Solar PV projects (1103,18 MW) collectively have the second largest contribution with 32 of the projects being undertaken by IPPs and 2 by the public utility. Hydro plants (1142.1MW) have the largest number of combined licensed project developers (22) for large and mini-hydro plants. Mini-hydro plant licenses are all mainly by IPPs (19) and one by the public utility. There are only 2 large hydro projects and both are being undertaken by the public utility.

Table 27: Licensed Generation Projects Technology as of 2019

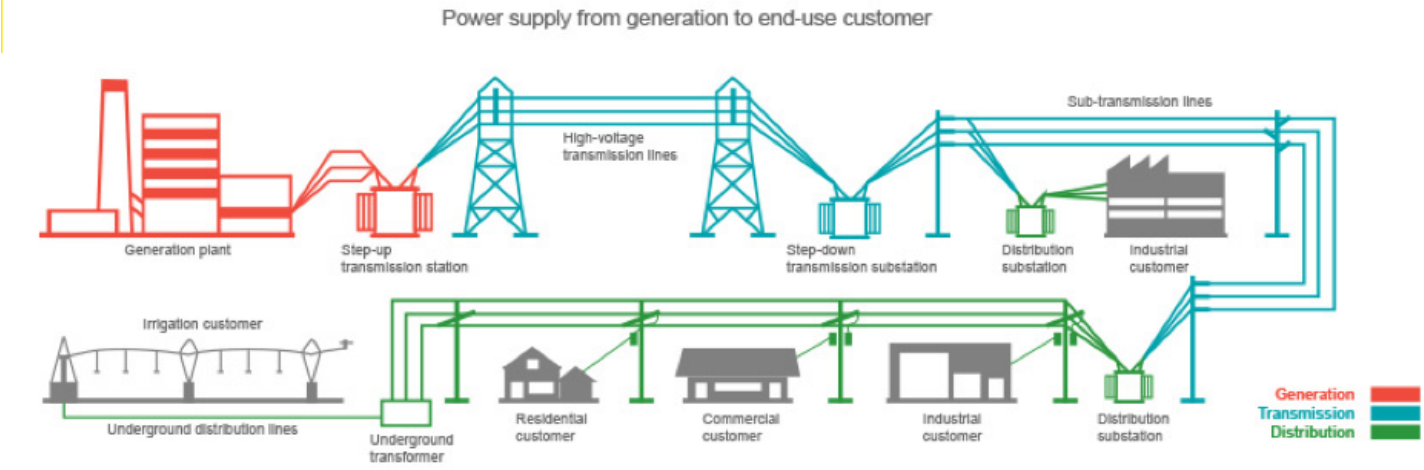
Technology/Energy Resource	Total Energy Generation Capacity (MW)	Number of IPP Projects	Number of Public Utility Projects	Number of Projects
Coal	6792,3	3	5	8
Solar PV	1103,18	32	2	34
Mini-Hydro	92,12	19	1	20
Large-Hydro	1 050	0	2	2
Gas Fired	345	1	0	1
Bagasse	96,3	3	0	3
Diesel	200	1	0	1
Woodwaste	0,5	1	0	1
Solar/Diesel	2,25	1	0	1
Grand Total	**9681,65**	**61**	**10**	**71**

Source: ZERA (2019)

3.5 Power Generation, Distribution and Transmission

Electricity generated at various power stations across a nation is transmitted through a transmission grid of interconnected transmission lines and substations over long distances and is distributed to end users through a distribution network system which incorporates amongst other things transformers, switches, distribution lines etc. For a graphical illustration of the above refer to Figure 21.

Figure 21: General Electricity Generation Value Chain



Source: EY Resources

A major challenge faced in transmission and distribution is energy distribution losses which are predominantly: technical losses through heat and noise; and commercial losses through illegal connections; and theft and vandalism of infrastructure.

Significant and consistent energy losses affect the credibility of an off-taker and the bankability of infrastructure projects, particularly in countries like Zimbabwe where there is one transmission and distribution entity.

3.5.1 Power Development and Generation in Zimbabwe

Power generation in Zimbabwe is heavily reliant on its thermal (coal) and hydroelectricity resources (water) to produce electricity. The country has grappled through an unprecedented energy production crisis which is caused by among other things:

- lack of investment;
- ageing power plants and transmission & distribution network;
- low electricity generation contributions to the grid by the renewable energy sector; and
- climate change.

The country faces excess demand in the energy sector and augments the gap through imports. The country imported 1,629MW in 2018, which accounted for 19% of total energy consumed. Power generation is done through the government's state-owned enterprise Zimbabwe Electricity Supply Authority (ZESA) and licensed independent power producers listed in section 2.1.3.2.

3.5.1.1 Power Generation

Zimbabwe's power utility, ZESA generates electricity through its subsidiary Zimbabwe Power Company (ZPC). The power utility produces the bulk of electricity in Zimbabwe. The Independent Power Producers (IPPs) participate in power generation whilst transmission and distribution is exclusive to Zimbabwe Electricity Transmission and Distribution (ZETDC) (a subsidiary of ZESA). Zimbabwe operates under a single buyer model with ZETDC buying power from both ZPC and IPPs for distribution to the end user at the agreed price.

Zimbabwe Energy Regulatory Authority (ZERA) is responsible for licensing IPPs which authorises them to own and operate power generation stations. This obliges the IPP to supply energy to ZETDC or immediately to a customer under special dispensations granted by ZERA. ZERA regulates energy tariffs to ensure fairness and competitiveness within the sector.

This research reviews IPP related challenges within the ZETDC revenue collection model and country level pricing/tariff regimes. These challenges have adversely contributed to concerns around cost reflectivity and the limited energy bankability pipeline due to concerns about financial risk and the ability to service debt and other financial commitments. As of 2017, Zimbabwe currently had 71 licensed IPPs and 17 (31%) which are operational as described in Table 28.

Table 28: Summary of Licensed Power Projects Development Status

Stage Of Development	Capacity (MW)	Number Of IPP Projects	Number Of Public Utility Projects	Number Of Projects
Stage 1 - Concept/ Pre-feasibility stage	2427,6	4	0	4
Stage 1(b) Feasibility and Technical Studies	1 511	22	2	24
Stage 2- Feasibility/Proof of bankability	2 460	7	1	8
Stage 3 – Funding	53,3	3	0	3
Stage 4- Construction	657,9	7	1	8

Stage 5 - Operational	2 371,3	16	6	22
Stage 5a Commissioned but not operating	200,5	2	0	2
Totals	**9681,6**	**61**	**10**	**71**

Source: ZERA (2019)

3.6 Zimbabwe Electricity Supply and Demand Analysis

When electricity is generated it has to be utilised, since currently there is no technology to store electricity for future use. The pattern of electricity demand determines the type, size and timing of electricity supply provisions. To ensure consistent and stable electricity supply, the supply of electricity to the power grid needs to match the electricity demand at any given time.

3.6.1 Power Generation Installed Capacity in Zimbabwe

The current installed generation capacity for electricity imports are summarized in Table 29.

Table 29: Zimbabwe Power Generation Installed Capacity

	2014	2015	2016	2017	2018
Installed Generating Capacity (MW):					
Hydro	750	751	774	924	1050
Thermal	1230	1230	1230	1230	1230
Solar					3.2
Capacity of Interconnector Link (MW):					
South Africa	228	288	288	288	288
Zambia	530	530	530	530	530
Other	524	524	524	524	524

Source: Ministry of Energy and Power Development (2018)

Much of the country's electricity is produced at the Kariba Dam Hydroelectric Power Station whose capacity is 1050 MW following the construction of two additional units (Kariba Units 7 & 8) with a capacity of 150MW each. The Hwange Thermal Power Station has an installed capacity of 920 MW. The successful expansion of Hwange Thermal Power Station to add Units 7&8 will add another 600 MW to the plant. Other power stations include Harare (80MW), Bulawayo (90MW) and Munyati (100 MW); which are generating below installed capacity. This is mainly due aged infrastructure and erratic raw material supplies. Efforts are being made to rehabilitate, repower and optimize the power stations.

The Batoka Hydro Power station on the Zambezi River is another potential power plant. Construction is earmarked to begin between 2019-2020 once the environmental and social feasibility assessments are concluded. Other potential power supply sources include Gairezi Mini Hydro (30 MW) and Dema Emergency Peak Plant (200 MW). Licensed IPPs have several solar power and mini-hydro projects that are at various stages of development. Licensed IPPs could potentially add 7,109.8MW to the grid.

Regardless of these efforts by Government to develop power and energy infrastructure projects, the country still faces power deficit. As of 2017 generation (capacity utilization) stood at about 861 MW (44%) against an estimated national peak demand of about 1950 MW. The deficit is met by power imports from neighbouring countries, increased energy use efficiency and demand side management (DSM)[17].

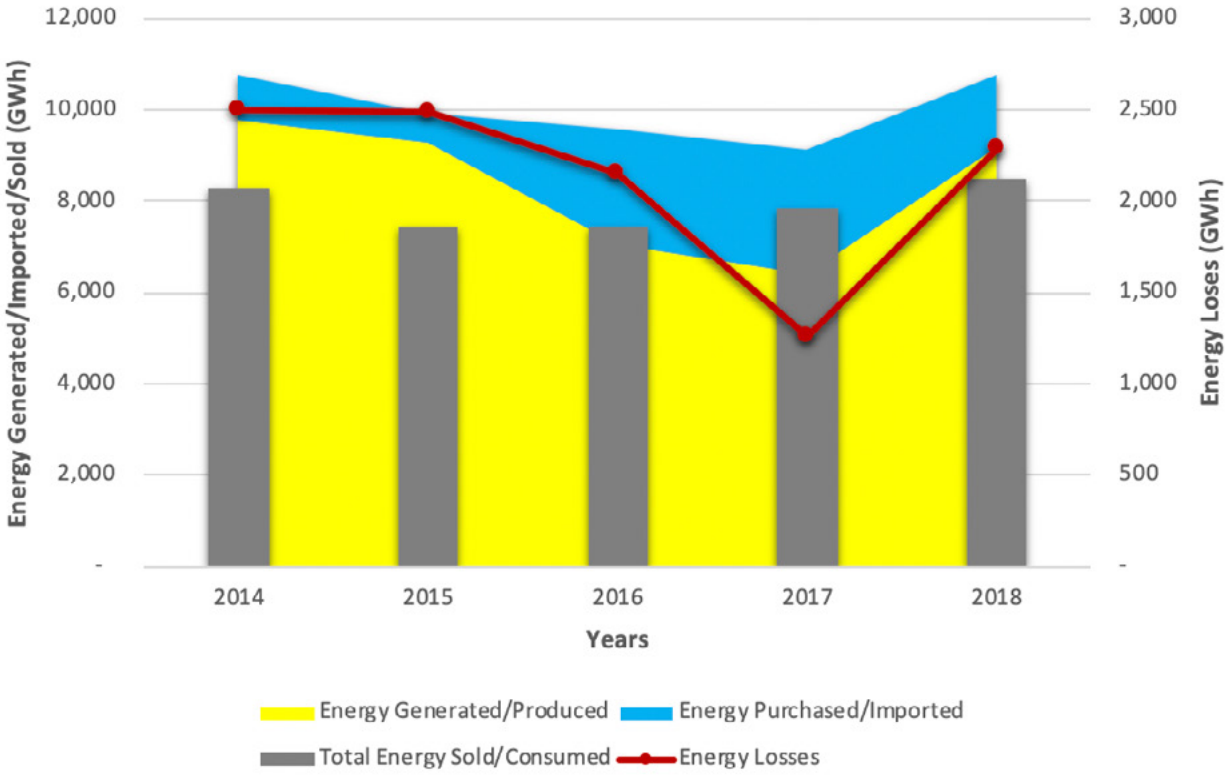
3.6.2 Zimbabwe Energy Sector Statistics

3.6.2.1 Zimbabwe Power Generation Demand and Supply Statistics

Zimbabwe experienced a steady decrease in the amount of energy generated between 2014 – 2017 and experienced a significant increase in 2018 as shown in Table 7. During the period, energy losses and consumption declined as shown in Figure 22.

Figure 22: Zimbabwe Electricity Supply and Demand Statistics

[17] (MoFED and MoEDP, 2018)



Source: Ministry of Energy and Power Development (2018), ZESA (2019)

The total power generation progressively declined between 2014-2017 from 5 percent in 2015 to 24 percent in 2016. In 2017, the decline slowed down to 9% to reach 6397 GWh. In 2018 energy generation increased by 43 percent to reach 9173 GWh as shown in Table 30.

Energy consumption has progressively increased throughout the observed period. Transmission and distribution 'energy losses' decreased progressively by 50% through 2014 to 2017 and increased significantly in 2018 (from 2,508MW to 1,133MW then back to 2,975MW. At 26% Zimbabwe experienced significant energy losses. International benchmarks are anchored between 2.24% to 10.44% across Europe (CEER, 2017), 5% annually in the US (EIA, 2019)[18] and 12% in Sub-Saharan Africa.[19]

[18] https://www.eia.gov/tools/faqs/faq.php?id=105&t=3
[19] https://data.worldbank.org/indicator/EG.ELC.LOSS.ZS

Table 30: Zimbabwe Power Generation Demand and Supply Statistics

	2014	2015	2016	2017	2018
Energy Generated (GWh)					
· Hydro	5,402	4,938	2,917	2,85	5,377
· Thermal	4,38	4,289	3,862	3,367	3,66
· IPP	0,0289	0,0538	0,2777	0,1804	0,136
Total Energy Generated (GWh)	**9,811**	**9,281**	**7,057**	**6,397**	**9,173**
Changes in Total Energy Generated		-5%	-24%	-9%	43%
Total Energy Imported (GWh) regionally	0,977	0,677	2,551	2,729	1,629
Total Energy Generated and Imported	**10,788**	**9,904**	**9,368**	**9,032**	**11,236**
Changes in Total Energy Generated and Imported		-8%	-5%	-4%	24%
Total Energy Sold/Consumed (GWh)	-8,28	-7,474	-7,458	-7,864	-8,505
Energy Losses	**2,508**	**2,348**	**1,856**	**1,133**	**2,975**
Energy Losses percentage of generation (%)	23%	24%	20%	13%	26%
Total Number of customers	735,032				
Rural areas access to electricity	27.7%				
Urban areas access to electricity	86%				
Overall national electrification rate	47.8%				

Source: Ministry of Energy and Power Development (2018), ZESA (2019)

3.6.2.2 Zimbabwe Energy Consumption Analysis by Sector

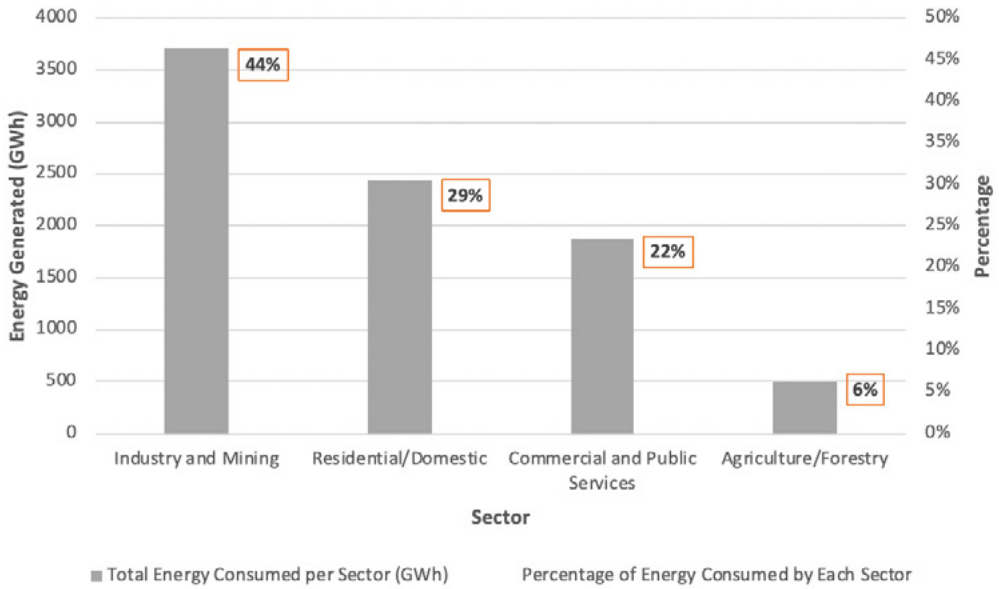
In 2018, the industry/mining sector accounted for 44% of electricity consumption in Zimbabwe as shown in Table 31. The residential, commercial and agriculture sectors consumed 29%, 22% and 6% respectively as shown in Figure 23 (ZESA, 2018). Table 31 details the sectoral electricity consumption analysis in Zimbabwe.

Table 31: Electricity Consumption Analysis by Sector

Energy Sales in GWh					
Consumer Category	**2014**	**2015**	**2016**	**2017**	**2018**
Industry and Mining	3388	3083	2654	3329	3701
Residential/Domestic	2742	2237	2368	2298	2437
Commercial and Public Services	1361	1679	1890	1778	1866
Agriculture/Forestry	687	477	546	459	501
Total	**8238**	**7476**	**7458**	**7864**	**8505**

Source: Ministry of Energy and Power Development (2018)

Figure 23: Zimbabwe energy consumption analysis by sector, 2018



Source: ZESA Holdings (2018)

3.6.2.3 Zimbabwe Power Generation Capacity Utilization Statistics as of 2017

Zimbabwe has an average capacity utilization of 58% over the observed period as shown in Table 32. All power stations had an average capacity utilization of below 45 % except for Kariba. Zimbabwe is seeking partnerships to undertake power station repowering projects and refurbishment to improve the efficiency of technology. India experiences a capacity utilization of 64% (CII, n.d.), 75%-80% in America (ALFRED, 2019)[20] and 73% in China (CEIC, 2018).[21]

Table 32: Electricity Generation and Capacity Utilization Analysis

Power Plant	Current Installed Capacity	Average Output (MW)								Average Power Plant Generation for the Period	Capacity Utilisation % per Power Station
		2010	2011	2012	2013	2014	2015	2016	2017		
Kariba	1050	661,96	593,76	613,31	568,67	616,72	563,71	332,09	439,53	548,72	52%
Hwange	920	301,06	390,39	356,7	436,86	436,23	424,75	395,35	365,56	388,36	42%
Harare	100	0	8,41	6,87	16,54	24,62	23,88	18,46	8,6	13,42	13%
Bulawayo	90	0	14,32	20,31	19,63	19,12	19,87	12,58	5,87	13,96	16%
Munyati	100	8,50	22,08	23,18	21,61	20,09	19,78	13,28	4,37	16,61	17%
IPPs (Hydro)	31,85	0,08	0,23	0,30	1,62	3,30	6,17	8,26	15,06	4,38	14%
IPPs Solar	2,5	0	0	0	0	0	0	0	0	0	0%
Dema	100	0	0	0	0	0	0	53,94	22,34	38,14	10%
Average Power Generated per Year	2 394,35	971,60	1 029,19	1 020,67	1 064,93	1 120,08	1 058,16	833,96	861,33	994,99	42%
Power Generation Capacity Utilization for the year		**42%**	**45%**	**45%**	**46%**	**49%**	**46%**	**35%**	**36%**	**42%**	

Source: MoFED (2019)

3.6.2.4 Electricity supply and demand forecasts

Zimbabwe electricity consumption has averaged 7,790 million kilowatt hours (kWh) per annum, whilst nominal Gross Domestic Product (GDP) averaged US$ 19,709 billion per annum between the period 2012 to 2017 as shown in Table 33. For the five-year period to 2017, 1 kilowatt of electricity generated an average GDP value of US$ 2.53.

Table 33: Trend in GDP and electricity consumption

	2012	2013	2014	2015	2016	2017	Average
Nominal GDP at market prices (Million US$)	17 115	19 091	19 496	19 963	20 549	22 041	19 709
Electricity consumption (million kWh)	7 831	8 285	8 237	7 426	7 276	7 732	7 798
$ GDP/kWh	2,19	2,30	2,37	2,69	2,82	2,85	2,53

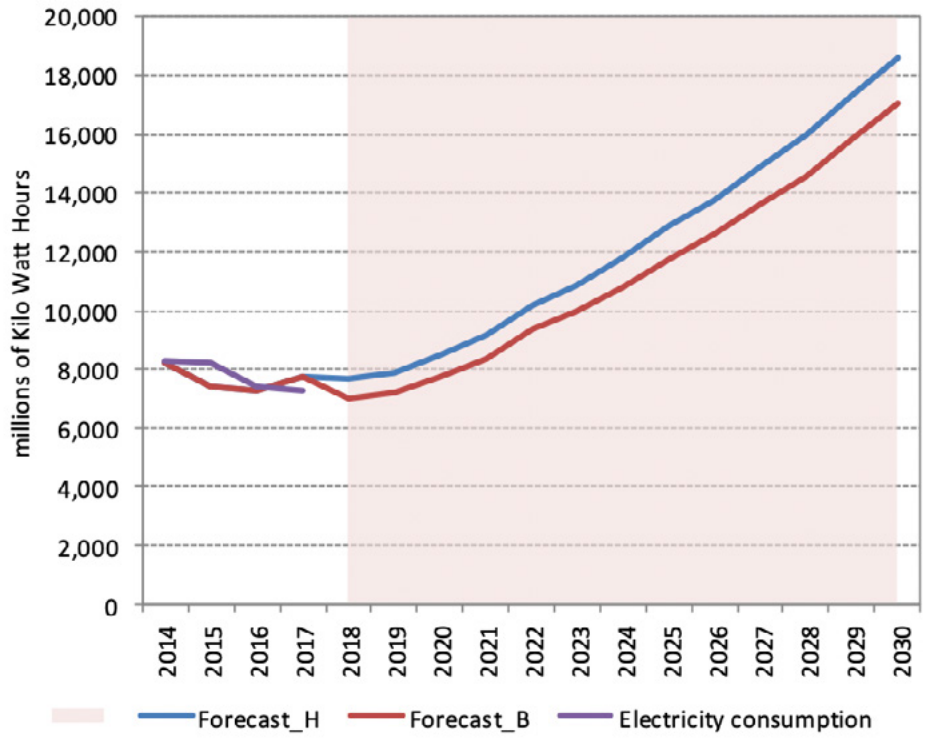
Source: Zimbabwe National Statistics Agency (ZIMSTAT)

The Government of Zimbabwe Vision 2030 targets achievement of an upper middle-income economy status. The country is targeting GDP of US$ 48.55 billion by 2030. Thus, using both the historical and baseline value added per kilowatt hour the electricity demand is projected that in order to achieve the desired level of economic activity the country would require between 17,031 and 18,624 million kWh by 2030 as shown in Figure 24.

[20] https://alfred.stlouisfed.org/series?seid=CAPUTLG2211S&utm_source=series_page&utm_medium=related_content&utm_term=related_resources&utm_campaign=alfred

[21] https://www.ceicdata.com/en/china/capacity-utilization-rate

Figure 24: Electricity Supply and Projected Electricity Demand (2018- 2030)



Source: ZIMSTAT

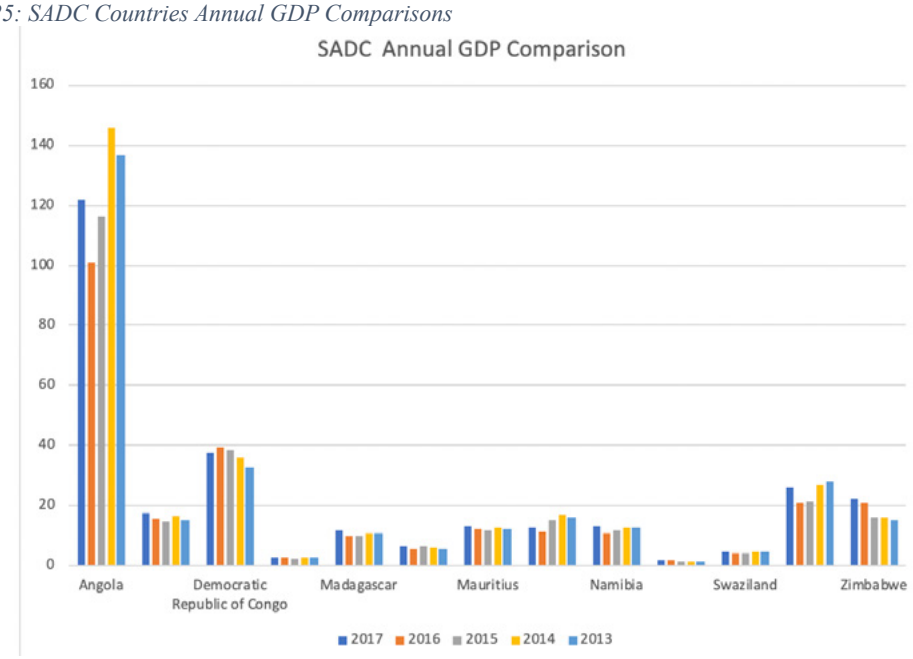
3.6.2.4.1 Factors Affecting Electricity Demand

DESA (2014) listed the historical sources on "drivers" of electricity consumption and demand forecasting, amongst others, as:

- Gross Domestic Product (GDP) and forecast growth
- Consumer Pricing Index (CPI)
- Index for manufacturing/industry production volumes
- Index for mining production volumes (gold, coal, iron ore etc.)
- Price elasticity of demand
- Population statistics and growth projections (number of households and average household sizes)
- Housing and national infrastructure projections

Figure 25 illustrates the GDP of Zimbabwe in comparison with regional countries, excluding South Africa.

Figure 25: SADC Countries Annual GDP Comparisons

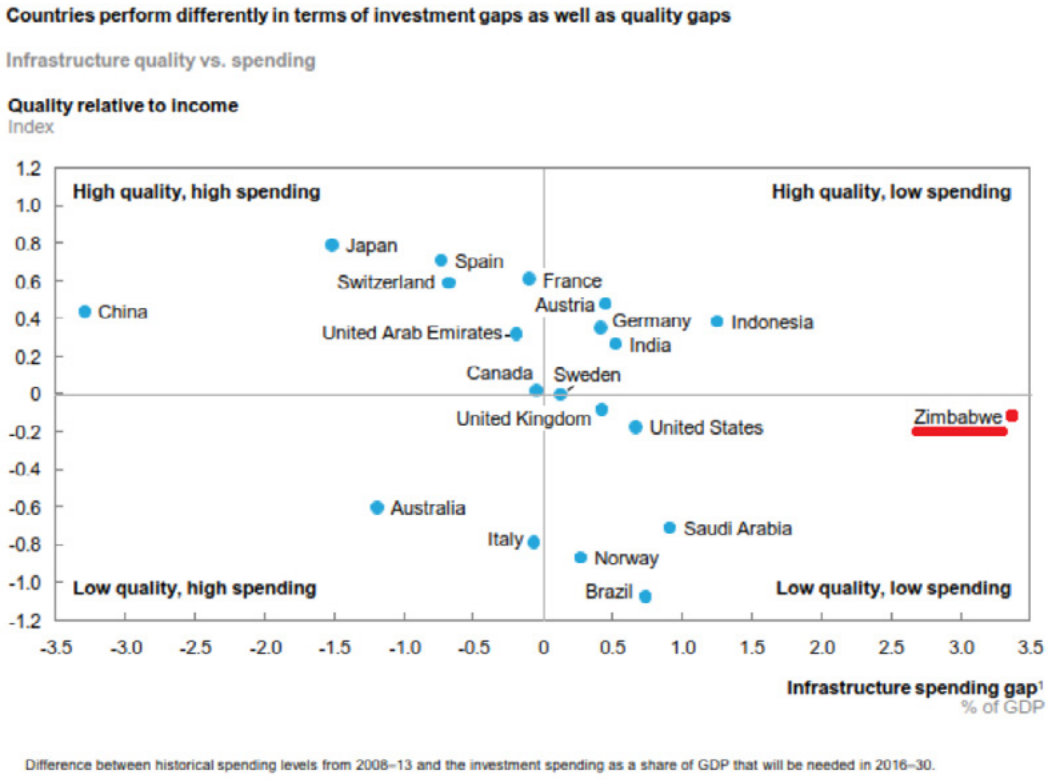


Source: Country Economy (2019).

3.6.2.4.2 Electricity Demand, GDP Growth, Infrastructure Spending and Quality of Infrastructure

A McKinsey study estimates that the share of total infrastructure financing in GDP will need to increase from around 3.8% to 5.6% in 2020 worldwide (Ehlers, 2014). Popov (2019) stated that countries with a higher percentage GDP expenditure in infrastructure (2.7-3.4%) had higher economic growth rates. Countries that underinvest in infrastructure often have uncertain infrastructure investment returns and longer pay off periods. Figure 26 details the quality of infrastructure against the corresponding expenditure in infrastructure for various countries.

Figure 26: Infrastructure Spending and Quality Comparisons

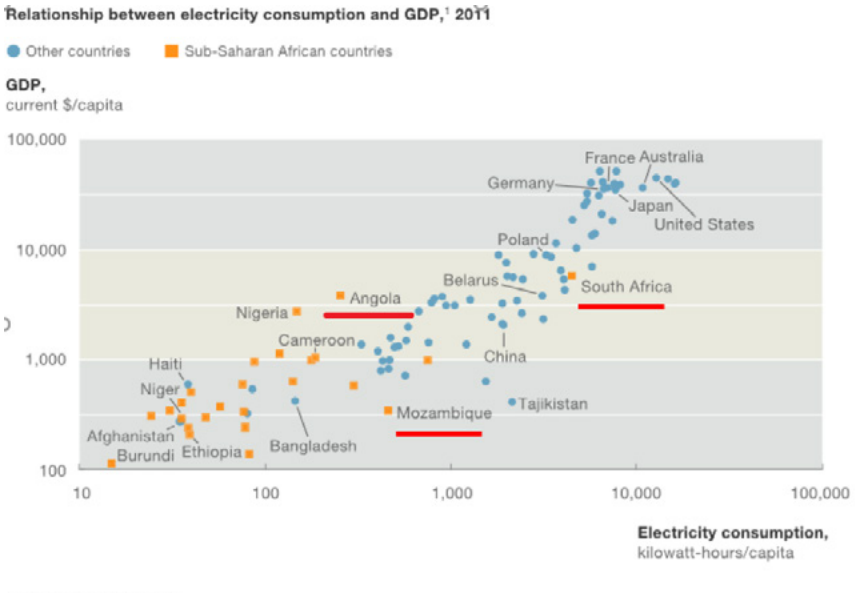


Source: McKinsey Global Institute (MGI) (2016)

3.6.2.4.3 GDP Growth and Energy Consumption

Lu (2016) argued that there is an integration between electricity consumption and real industrial GDP. Phillips (2014) further argued that the electricity generation and sales are linked to macroeconomic factors and economic growth. Figure 27 illustrates the relationship between the growth in GDP and electricity consumption amongst various nations.

Figure 27: Relationship between electricity consumption and GDP



Source: Mckinsey, 2015

4 Regulatory and Legal Frameworks

4.1 Regional Electricity Tariffs Comparison

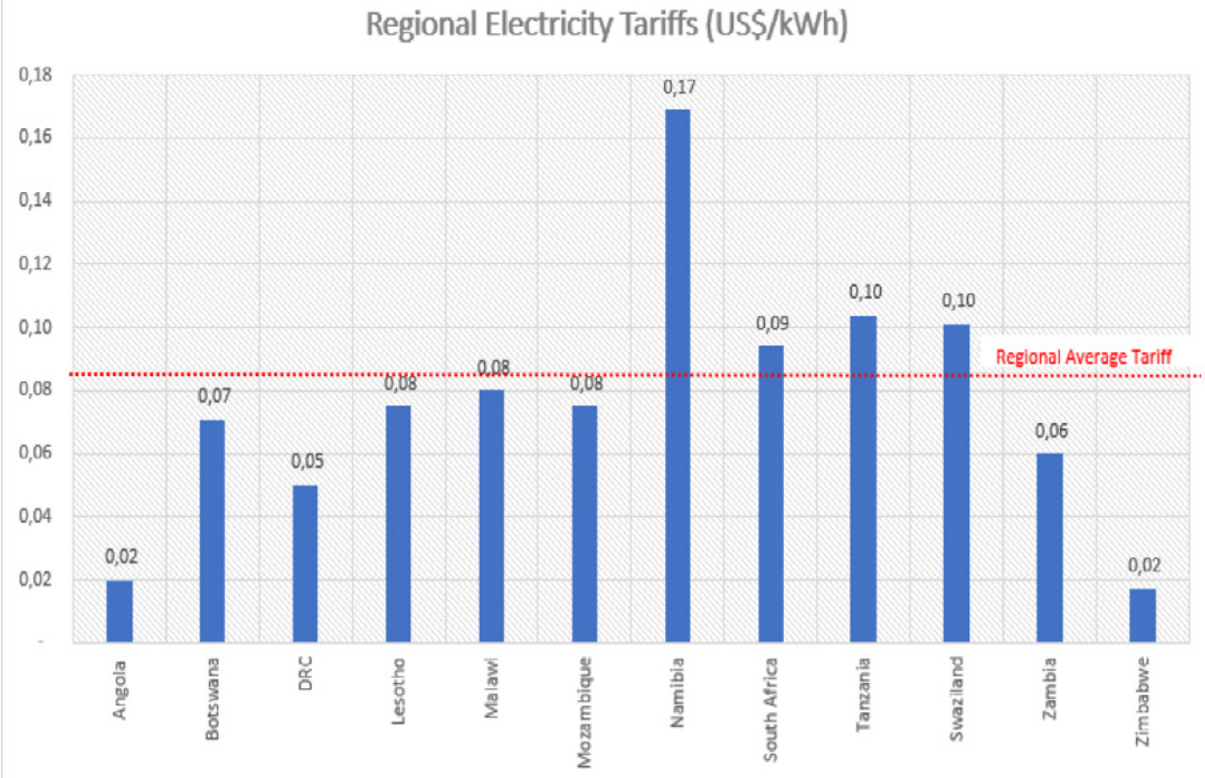
Recent changes in the country's monetary policy through S.I. 33 of 2019 have resulted in the adoption of the RTGS dollar as a legal tender. The statutory instrument (SI) stipulates RTGS dollars as the reference currency within the basket of currencies adopted by Government and industry i.e. for pricing goods and services, recording debts, accounting and settling domestic transactions. The SI further stipulated the establishment of an inter-bank market for trading RTGS dollars with foreign currencies using an Interbank Rate (IBR).

Figure 28 illustrates Zimbabwe's tariff of RTGS 9,86c (US$0.017 at the IBR of US$ 1 = RTGS 5,8) is now the lowest in the region. This is lower than countries that predominantly rely on cheaper hydroelectricity such as Zambia with a tariff of US$0.06. Countries which rely mostly on thermal power generally have higher relative tariffs e.g. South Africa and Namibia tariffs are at US$0.12.

Zimbabwe's lower tariff affects the viability of investments and sustainability of operations in the electricity sector. Financial transactions for infrastructure projects are normally denominated in US dollars. Devaluation of the tariff value and revenue base may result in the:

- Lack of development of power generation projects,
- Non-viability of investments and operations in the energy sector,
- Inability to service financial obligations,
- Unsustainability of electricity supply, and
- Fiscal pressures through government guarantee commitments and/or unbudgeted subsidies of electricity sector,

Figure 28: Regional Electricity Tariffs (US$/kWh)



Source: SAPP (2017)22, ESKOM (2019), ESCOM (2019), MRC (2018), LEWA (2019), ZERA (2017)

4.1.1 Zimbabwe Energy Sector Tariff Framework

4.1.1.1 General Energy Regulatory Designs

Different tariff frameworks are being adopted by various nations to ensure cost reflectivity in energy tariffs and the attainment of strategic goals.

[22] http://www.sapp.co.zw/sites/default/files/SAPP.pdf

Cost Plus

- A form of economic regulation where regulators create a margin system based on the costs of power generation, compensation provisions and a return on investment.
- It is usually prevalent in monopoly economies.
- The major challenge faced with this structure is operational inefficiencies.

Regulatory Asset Base (RAB)

- A more liberalized system for power generation and energy sales.
- The model proffers a long-term tariff design aimed primarily at encouraging investment in the expansion and modernization of infrastructure.
- The RAB model attempts to approximate and maximize company investments and realize a return on those investment.
- Provides efficiency incentives to power generation operators (or capex intensive industries) to ensure infrastructure delivery efficiency and operational performance efficiency
- Seeks to estimate the efficient cost of providing a service for the next regulatory period (price review period) and allow the regulated company to recover that cost, if it met the efficiency target. (BKIR, 2010)[23].
- The RAB system provides a secure payback and return on investment sufficient to service financial obligations and generate profits. Operators are stimulated to reduce operational costs because, unlike conventional cost-plus pricing, the RAB system allows power generation companies to retain the funds resulting from cost cutting, Rosseti (2019)
- The RAB model promotes competitiveness in markets with limited market participants.

Incentive Based

- Incentivize certain utility behaviours by rewarding approved activities with improved utility rates.
- The official set of behaviours can be based on customer needs, laws, policies and other stakeholder demands.

Combination

- Regulator objectives and methods are resulting in an increasingly convergence of regulatory structures to ensure cost reflectivity and attainment of national and stakeholder strategic goals.

4.1.1.2 Power Purchase Agreements (PPA) and Tariff Designs

Nehme (n.d.) defined a PPA as legal binding agreement between power generation entities and power purchasers (typically a utility or a bulk trader) for the sale of electricity. A PPA plays a key role for project promoters to access project financing. PPAs provide certainty of revenue for project promoters and lock in prices for the tenor of the agreement.

Overseas Private Investment Corporation (OPIC) (n.d.) argues that for the electricity sector, a credible and enforceable power purchase agreement (PPA) is critical. OPIC further outlined important features to consider for a PPA, which include how to resolve currency risk, change in law or taxes and disputes. Nehme (n.d.) defined the key risks for PPAs and tariff frameworks as:

- Political
- Legal
- Operational
- Construction
- Financing
- Market and revenue

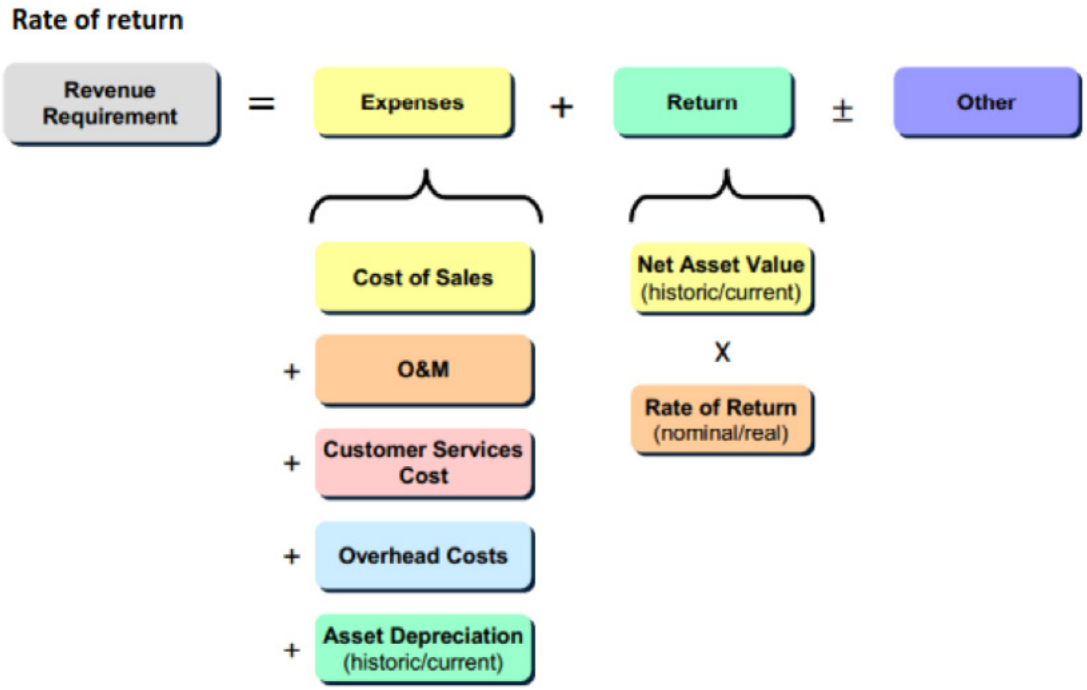
Louw and Bhengu (2012) argued that a PPA that enables project promoters to recoup the investment costs, is the foundation of a project's bankability. Regarding economic changes and risks, PPAs should have sufficient flexibility to accommodate unexpected and unfavourable changes. For example, exchange rate movements can put considerable pressure on revenues, particularly where a project is denominated in US dollars, but collection is done in local currency.

4.1.1.3 Zimbabwe Tariff Design

Zimbabwe has adopted the Combination Tariff Design. ZERA approves the expenses for the efficient generation of power and determines a tariff to ensure competitiveness and equitable returns on investment. ZERA has a predefined criterion for allowable and qualifiable expenses and reviews tariffs annually. The Zimbabwean tariff model is shown in Figure 29.

[23] http://regulationbodyofknowledge.org/faq/price-level-and-tariff-design/incentives-for-improved-performance-how-can-a-regulator-develop-incentive-to-discourage-energy-water-losses/

Figure 29: ZERA: The Tariff Code (2013)



Source: ZERA (2017)

Stakeholders in Zimbabwe had noted that the current tariff at 9,87c per kilowatt-hour (kWh) was not sustainable during the dollarization regime. The recent monetary policies have compounded the problems with the tariff still pegged at 9,87c in RTGS currency. Industry stakeholders have been advocating for the adoption of a more cost-reflective tariff. In 2013, consultants, Norconsult, recommended a price tariff of about US $0,14 per kWh (businesstimes.co.zw)

The currency liberalization reforms have devalued the ZETDC's revenue base. The tariffs undervaluation has a knock-on effect throughout the industry. The revision in foreign exchange currency has effectively reduced the country's tariff from 9,87c (US $) to 1,7c (US $) at the interbank rate (IBR) as at May 2019 at the current. This currency value revision will also exert pressure on projects viability, PPA agreement commitments and the ability of ZESA to import electricity. Government will be required to essentially subsidize the pricing differences until such a time when tariffs have been rationalised.

4.1.1.4 Zimbabwe Power Cost Recovery effects on Bankability

ZETDC, the country's off-taker has incurred losses in excess of $524 million due to below-cost billing and a non-cost reflective tariffs (Business Times, 2018). ZETDC (ZESA) is also owed more than a billion dollars which signifies inefficiencies in its revenue collection systems and structures (Sunday Mail, 2018). This increases the off-taker risk profile of the public utility and in turn the viability of energy infrastructure projects in the country. The phased rollout of the prepaid metering system has increased efficiencies in revenue collection and energy usage.

4.2 Legal, Policy and Institutional Framework that enables Effective Energy Sector Funding

A summary of policies, laws and acts governing the energy sector can be summarised in Table 34.

Table 34: Summary of Policies, Laws and Acts within the energy sector

Policy/Law/Regulation	Year	Description
National Energy Policy (NEP)	2012	Provides a framework for the exploitation, distribution and utilisation of the country's energy resources and outlines the principal strategies for implementing policy. It strongly advocates for the promotion of renewable energy to address the current electricity supply gap. The policy also provides for the formation of the Rural Energy Agency, the establishment of REFIT, National Grid Code and IPPs.
Electricity (Licensing) (Amendments) Regulations 2015 (No. 1)	2015	Provides for the issuance of generation, transmission and distribution licenses by ZERA, including detailed application guidelines.
Electricity (Licensing) Regulations (Chapter 13:19, No 103 of 2008)	2008	

Electricity (Distribution Code) Regulations	2017	Establishes the rules, procedures, requirements and standards that govern the operation, maintenance, and development of the electricity Distribution System in Zimbabwe. The code promotes the sound planning, operational and connection standards in a bid to provide for reliable, secure, economic and coordinated operation of the Distribution System.
Energy Regulatory Authority Act (Chapter 13:23, No. 3 of 2011)	2011	Establishes ZERA and defines, the regulatory framework for the procurement, production, transportation, transmission, distribution, importation and exportation of energy derived from any energy source.
Electricity Act (Chapter 13:19, No.4 of 2002 amended in 2003 and 2007	2002	Provides the framework for the unbundling commercialisation and privatisation of ZESA's different business areas. It specifies licensing requirements for energy generation systems greater than 100kW.
Rural Electrification Fund Act (Chapter 13:20, No. 3 of 2002)	2002	Establishes the Rural Electrification Fund (REF) to facilitate the rapid and equitable electrification of rural areas using the grid and off-grid technologies.
Zimbabwe Energy Pricing Study	2004	Provides a basis for establishment of cost reflective prices for the three segments of the electricity supply industry which includes generation, transmission and distribution.
Electricity Licensing Guidelines and Requirements	2013	Provide simple guidelines on the licence application process including the required documentation. It applies to systems above 100kW.
Electricity (Grid Code) Regulations (SI 91 of 2017)	2017	Established the reciprocal obligations of industry participants around the use of the National Transmission System (NTS) and operation of the Interconnected Power System (IPS).
Zimbabwe Grid Code	2013	It establishes the basic rules, procedures, requirements and standards that govern the operation, maintenance and development of the electricity distribution systems in Zimbabwe to ensure the safe, reliable and efficient operation of the electricity distribution system.
Environmental Management Act (Chapter 20:27, No. 13 of 2002)	2002	It provides for the sustainable management of natural resources and protection of the environment in accordance with global commitments. Energy is a prescribed activity under schedule 1 of the act. Thus, it is mandatory for Environmental Impact Assessment of all projects
The Water Act of 1998	1998	Provides provisions for approval for the use of water for electrical purposes, mining purposes or miscellaneous purposes. This entails any undertaking involved in the generation and/or transmission, distribution and supply of electricity.

Source: Government of Zimbabwe Ministries (2019)

4.2.1 National Energy Policy (NEP)

The policy aims to create and promote a conductive environment for the development of sustainable energy solutions for the sector and country (LSE, 2012). The NEP provides a framework for the exploitation, distribution and utilisation of energy resources. The policy ensures a balance between the need for investment viability and customer affordability through cost-reflectivity and competitiveness. It seeks to reduce dependency on traditional energy sources by diversifying through modern energy technologies.

The NEP, under MoEPD aims to fulfil five broad policy principles:

- to increase access of all sectors of the economy to affordable and diversified energy;
- to stimulate sustainable economic growth by promoting competition, efficiency and investment in the energy sector;
- to improve the institutional framework and governance in the energy sector;
- to promote research and development in the energy sector; and
- to develop the use of renewable energy sources to complement conventional energy sources.

4.2.2 Energy Regulatory Act

The Zimbabwe Energy Regulatory Authority (ZERA) is the regulator for the energy sector in Zimbabwe. The functions of the regulator include:

- regulation of the procurement, production, transportation, transmission, distribution, importation and exportation of energy derived from any energy source;
- to develop an efficient energy sector for the provision of sustainable energy;
- to promote and ensure best standards in the energy sector;
- to perform licensing and regulatory functions for the energy sector;
- to ensure competitive and fair pricing in the energy sector;
- to promote technological advancement within the energy sector;
- to promote the development of renewable energy sources.;

Through Electricity Licensing Guidelines, ZERA provides a framework for the licensing of electricity undertakings. The three categories of energy licenses are:

- generation licenses,
- transmission and bulk supply licenses; and
- distribution and retail licences.

4.2.3 The Joint Venture Act and Public-Partnership Partnerships

Public-Partnership Partnerships (PPPs) are long-term contracts between a private party and a government entity, for the construction and/or provision of a public asset or service. The private party usually bears significant risk (financial, technical and operational) and management responsibilities (design, building and operation) for the project. Remuneration is linked to performance and achieved through direct payments from the government entity and/or collection of revenue from the users of the service or asset.

Public Partnership Partnerships (PPPs) are implemented in Zimbabwe through the Joint Ventures Act (SI 6/2015). The act provides for the implementation of joint venture agreements between contracting authorities and counterparties. The act is enforceable through the establishment of a Joint Venture Unit (JVU), under the supervision of the Secretary for Finance and Economic Development. The JVU is responsible for evaluating project proposals to ensure that Joint Ventures/PPPs attain:

- competitiveness,
- affordability,
- value for money, and
- t • he optimum transfer of technical, operational and financial risks to the counterparty.

Through the Joint Ventures Act, the government monitors and ensures that all PPP projects are consistent with national priorities; and make continuous recommendations to Cabinet for the approval or rejection of PPP project applications.
Regarding the submission of PPP proposals for approval by government, the contracting authority is responsible for:

a) Project development – project identification, appraisal, development and monitoring
b) PPP procurement activities to identify a suitable counterparty
c) Undertaking and submitting feasibility studies to ascertain whether a project requires a PPP agreement to be approved by the JCU;and
d) Preparing a project proposal and model PPP agreement based on the approved feasibility study for approval

The contracting authority may only enter into a PPP/joint venture agreement for a project only after the project proposal and model PPP agreement has been approved by Cabinet in accordance with the Act.

4.2.4 Taxation

Power generation projects in Zimbabwe are currently exempt from paying corporate income tax for the first five years of operation. The structure for taxable income from a power generation project licensed in terms of the Energy Regulatory Authority Act is:

- First 5 years 0% or exempt
- Thereafter 15% (which is lower than the nominal rate of 25%)

4.2.5 Environmental and Social Impact Assessment (ESIA) legislative policy

The Environmental Management Act of 2002 and S.I 7 of 2007 (Environmental Impact Assessment and Ecosystems Protection) compel prescribed projects to undergo an ESIA process prior to implementation.

The Environment Management Agency (EMA), established under the Environmental Management Act [Chapter 20:27], is a statutory body responsible for ensuring the sustainable management of natural resources and protection of the environment.

EMA through the Ecosystems Protection Unit (EP) is responsible for activities which include:

- Production of environmental quality standards
- Environmental impact assessment (EIA) policy
- Hazardous Substances/Waste use and handling
- Production of guidelines for ecosystems protection, management and utilisation
- Waste management

Projects that require an ESIA include:

- Power generation and transmission- thermal power stations, hydropower schemes and high voltage transmission lines;
- Dams and manmade lakes;
- Conversion of forest land to other use;
- Conversion of natural woodland to other use within the catchment area of reservoirs used for water supply, irrigation or hydropower generation or in areas adjacent to the Parks and Wildlife estate;
- Mining and quarrying-mineral prospecting; mineral mining; ore processing and concentrating; quarrying;

The project developer is responsible for the identification and engagement of independent qualified consultants to conduct the ESIA and prepare the environmental and social impact assessment report. Project developers are expected to comply to the recommendations of the ESIA report during project implementation and development stages. EMA performs bi-annual environmental audits to ensure that all energy infrastructure projects are compliant to EMA regulations and ESIA recommendations. The developer is responsible for submitting Quarterly Environmental Monitoring Reports on any ESIA Report issues and/or any other relevant issues.

4.2.6 Public Procurement Regulation in Zimbabwe

The Procurement Regulatory Authority of Zimbabwe (PRAZ) is responsible for the supervision of public procurement. in Zimbabwe. PRAZ ensures:

- that procurement is transparent, fair, honest, cost-effective and competitive;
- the promotion of competition and fair treatment among all bidders;
- procurement contracts represent value for money; and
- the implementation of any environmental, social, economic and any other relevant policy.

PRAZ prepares standard documentation and templates to be used with regards to public procurement that enable procuring entities to maintain records and prepare reports on procurement activities. PRAZ has statutory oversight over all public project procurement related activities e.g. engineering, procurement and construction (EPC) contracts, contract performance reports, contract payment details and documentation for contract variations etc.
Public sector procurement is conducted in a more transparent framework due to legislation requiring public entities to conduct and report on procurement activities within a regulated framework. Private sector procurement currently has lesser requirements on compliance and regulatory reporting for projects with public welfare significance.

4.2.7 Transitional Stabilization Programme (TSP)

The Transitional Stabilisation Programme prioritises a functional public infrastructure framework as a key enabler to unlocking economic growth. The TSP focuses on Government initiatives complemented by the private sector on public infrastructure development.

Zimbabwe's Infrastructure Investment Plan, for the 12 years extending between 2018-2030, aims to support key priority infrastructure projects that support the country's development agenda. The projects will be identified through the relevant line ministries, public entities and other relevant stakeholders.

Contracting Authorities, for the identified priority projects, are responsible for executing the requisite project development activities. They are also responsible for drawing from available government funding sources e.g. Project Preparation Development Fund,

For the energy sector, government investments will seek to maximise domestic generation capacity at the lowest social, environmental and economic cost. Focus also includes upgrading transmission infrastructure to ensure delivery of generated electricity with minimal losses. The Rural Electrification Fund will focus on extending electricity coverage to rural communities.

5 Research Methodology and Results

5.1 Methodology used for the assignment

The research team used a quantitative and qualitative analysis approach to address the study objectives. An extensive desk review and analysis of literature was carried out on, amongst other things:

- factors that affect bankability of infrastructure,
- review of key government policy documents on energy;
- regulatory frameworks; and
- consultancy reports/studies focusing on energy infrastructure bankability.

Examples of reviewed policies and legislative frameworks include the Transitional Stabilization Programme (TSP); the National Energy Policy, EMA Act and the Infrastructure Investment Plan. Regional and local case studies were reviewed to identify features which enhanced their bankability to come up with lessons which can be applied in Zimbabwe. These reviews enabled the research team to extract key issues that can be applied by Zimbabwe and IDBZ in general to boost development of bankable infrastructure projects in the country.

The literature review also assisted the research team to contextualize the study and aided in the development of relevant data collection instruments for the study. The research team also developed research instruments that were used to collect primary data from key informants to complement and triangulate with secondary data analysis. The data collection instruments captured both qualitative and quantitative information and had closed and open-ended questions to enable the research team to capture all the requisite information. A purposive sampling technique was used to select the participating institutions for the interviews. Mapping of stakeholders was done in order to compile a list of stakeholders to be interviewed.

The research team constituted five categories of stakeholders to remotely represent the stakeholders involved within the energy infrastructure sector within Zimbabwe; namely regulator and regulatory consultants; government agencies; technical and implementation experts; socio-economic experts and investors and development finance institutions. Five questionnaires were developed and each questionnaire was specifically crafted for each target group. The approach for the questionnaires was to capture and analyse information on the factors affecting bankability in Zimbabwe. This entailed a holistic and consolidated perspective on the challenges faced when implementing projects in Zimbabwe. In addition, the extraction of the issues affecting the lack of funding for project preparation activities were explored.

The team had a series of in-depth discussions with key stakeholders in the infrastructure value chain. This included project sponsors, Government officials, regional experts, IDBZ and other organizations dealing with infrastructure in general and the energy sector predominantly. The aim of the stakeholder interviews was to obtain and extract in depth and practical information and insights on the issues affecting bankability of projects in Zimbabwe.

The questionnaire was circulated via e-mail/hard copy and follow-ups were made. More than 50 questionnaires were distributed and to date, 15 out of a target have responded. Follow up, face to face meetings with key stakeholders were done to probe further and have in depth discussions on pertinent issues or topics that were of interest. Simple statistical analysis method was employed to interpret the results of the questionnaire as presented in this report.

5.2 Summary of Findings from Fieldwork on the Key Factors Affecting Bankability of Energy Projects in Zimbabwe

The research team consulted various categories of stakeholders namely;

- Regulators (ZERA, EMA)
- Public utilities
- Consultants – (Legal, Technical)
- Government agencies
- Technical and Implementation Experts (Project promoters)
- Socio-economic experts
- Investors and Development Finance Institutions.

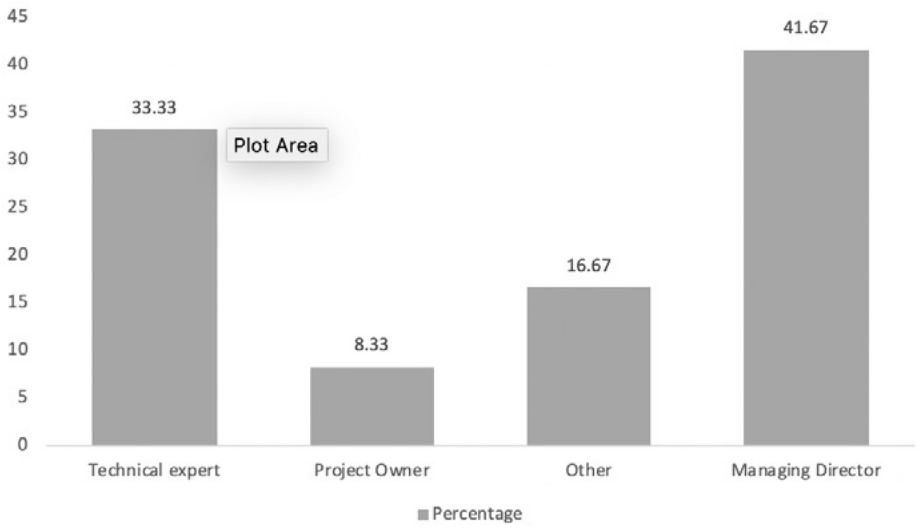
The issues that identified during the fieldwork are summarised in the sections below:

The respondents of the questionnaires are generally very qualified since the majority were either Managing Directors (41.7 percent) or Technical Experts (33.3 percent) within their various fields. (Figure 30).

5.2.3 General Respondent Profiles

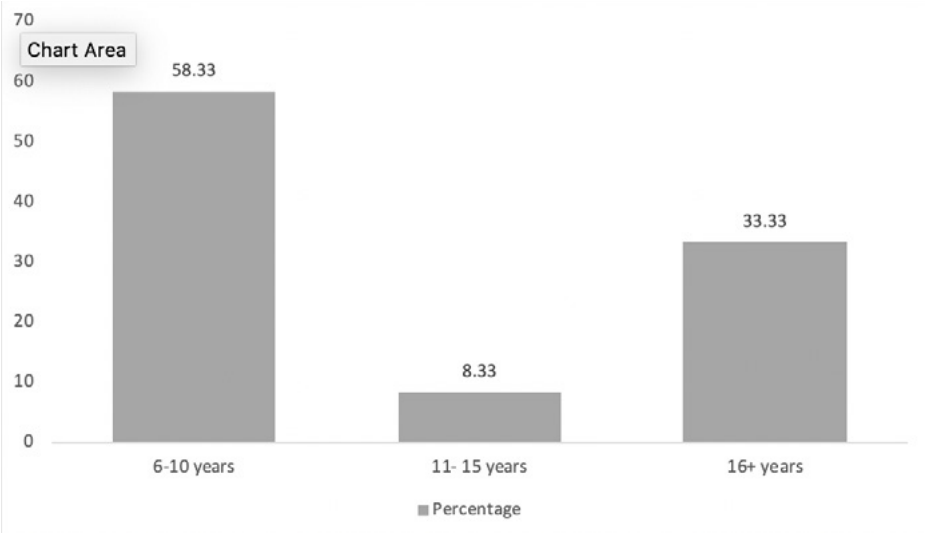
The majority of respondents were senior officials and experts within the energy industry as shown in Figure 30.

Figure 30: Position of Respondent at the Organisation



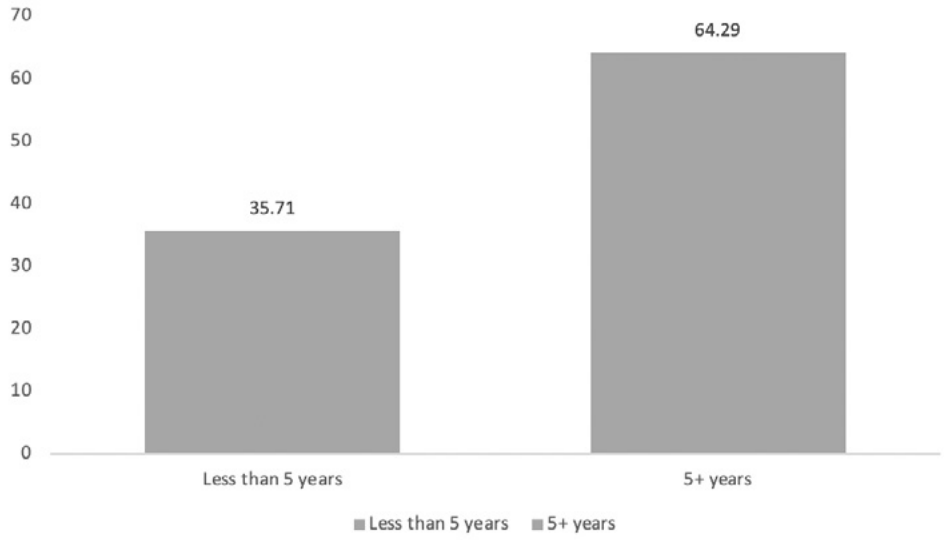
The respondents have experience working in the energy sector in Zimbabwe as demonstrated in Figure 31. The majority of respondents have 6-10 years of experience (58.3 percent), with about a third of the respondents having at least 16 years' experience working in the energy sector.

Figure 31: Experience (Number of Years) of Respondents in the Energy Sector



The majority of respondents (64.3 percent) also have at least five years' experience dealing with projects as shown in Figure 32.

Figure 32: Respondents' Experience in the Energy Sector



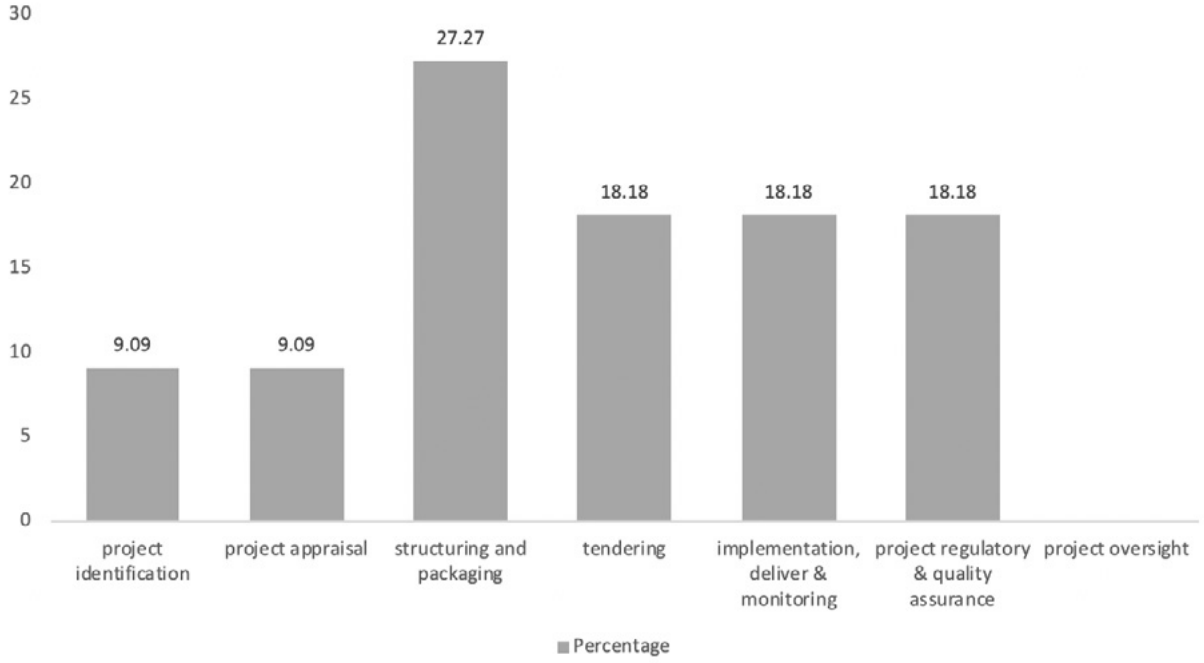
5.2.2 Key Insights into the Infrastructure Planning and Funding Structure

5.2.2.1 Project Development Stages Experiencing the Most Bottlenecks in Zimbabwe

Most respondents cited that bottlenecks are most prevalent during the structuring and packaging stages of energy projects (27.3 percent). The second most common bottlenecks were in procurement; implementation and monitoring; and project regulatory and quality assurance which garnered 18.2 percent each as shown in Figure 33.

The effectiveness of project preparation in the country remains a concern amongst stakeholders. The findings corroborate the list of licensed projects in section 2.1.3.2, where 48% of the licensed projects have stalled between the feasibility and funding stages.

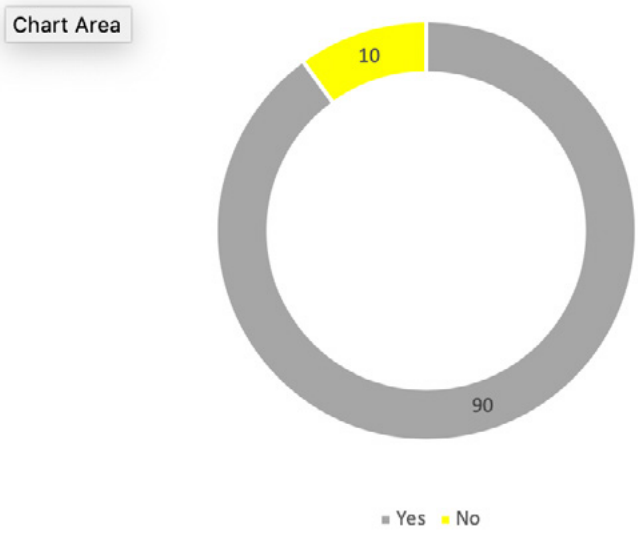
Figure 33: Project Development Stages Experiencing the Most Bottlenecks in Zimbabwe



5.2.2.2 Long Term Infrastructure Plans

Respondents largely agreed that Zimbabwe has provisions for long term integrated infrastructure plans as shown in Figure 34. The government is working on the development of an Integrated Energy Resource Plan and System Development Plan for the energy sector.

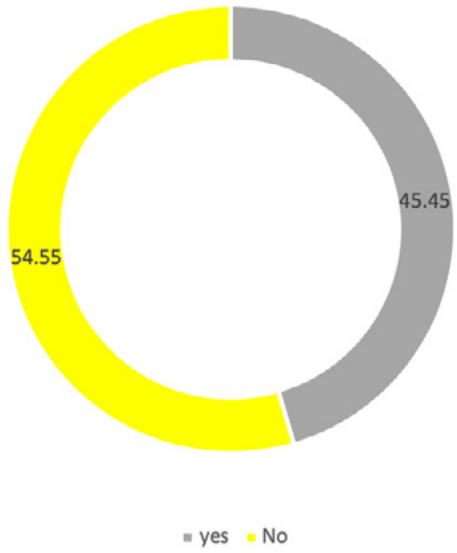
Figure 34: Existence of long-term Energy infrastructure plans in Zimbabwe



5.2.2.3 Stakeholder Engagement in the Development of Energy Infrastructure Plans

Respondents indicated a non-inclusive sector wide stakeholder engagement process in the development of the energy integrated plan (54.5 percent as shown in Figure 35). This shows the need to increase the involvement of all relevant stakeholders to incorporate views on energy requirements, suitable technology, capacity etc.

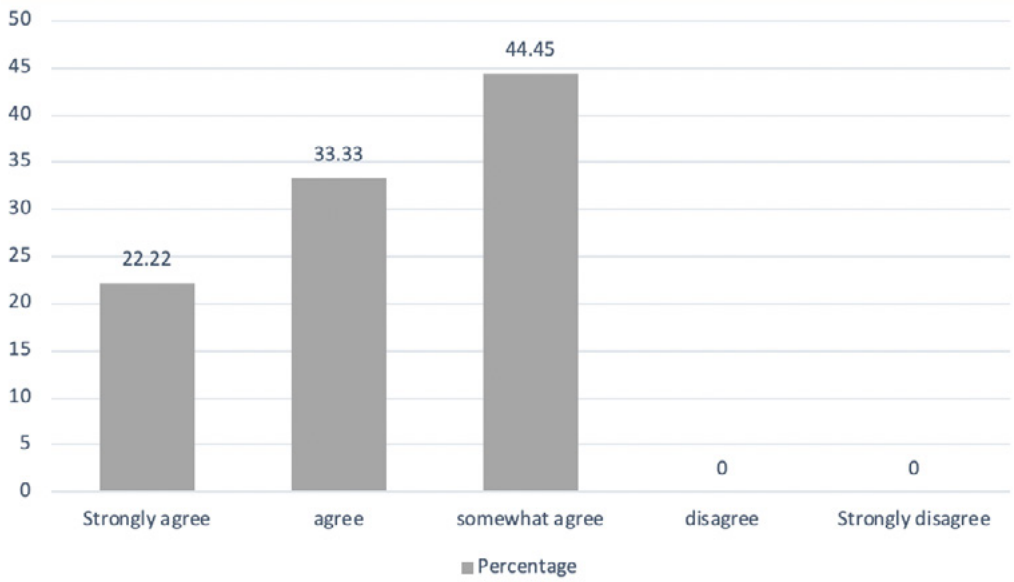
Figure 35: Existence of a consultation process to determine long term energy infrastructure strategic plan



5.2.2.4 Coordination structure/mechanism in infrastructure projects preparation

Respondents largely expressed the existence of a coordination structure for inter-sectoral project preparation activities. The existence of inter-sectoral support and a coordinated mechanism for infrastructure projects preparation is a positive development which ensures the progression in development of projects to ensure the availability of a bankable projects pipeline as shown in Figure 36.

Figure 36: Existence of a coordinated mechanism for infrastructure projects preparation



5.2.2.5 Funding Structure

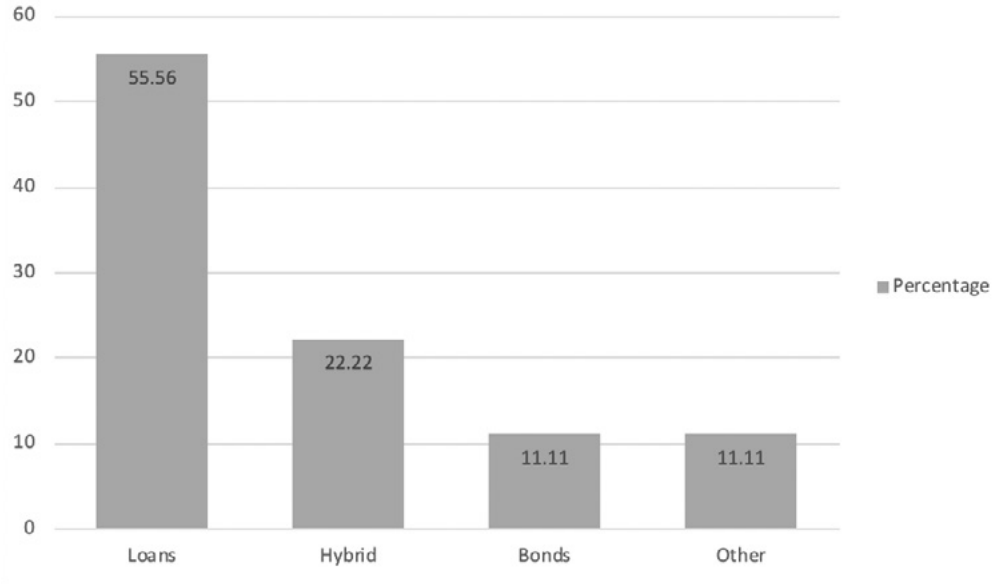
The survey revealed that most project funding in Zimbabwe is structured through debt/loans (55.6 percent) followed by a hybrid model (22.2 percent), bonds (11.1 percent) and the remainder constitutes other funding mechanisms such as equity as shown in Figure 37.

There is a significant reliance on debt financing, thus government policy should prioritise the upgrading of the country's debt profile or credit rating and the upliftment of the country's perceived risk profile.

Zimbabwe's external and domestic debt is unsustainably high at US$7.7 billion and US$9.6 billion respectively, translating to US$17.3 billion in total debt as at end of September 2018 (MoFED, 2018). With regards to the external debt, interest arrears and penalties constituted about US$5.9 billion, which translates to about 76.6 percent of external debt (MoFED, 2018).

The transition from the US dollar to the RTGS dollar as a reference currency for the country has strained the revenue base for players in the sector. This has hampered capacity to support local operations and settle external obligations, thus limiting project financing structure options in the current environment.

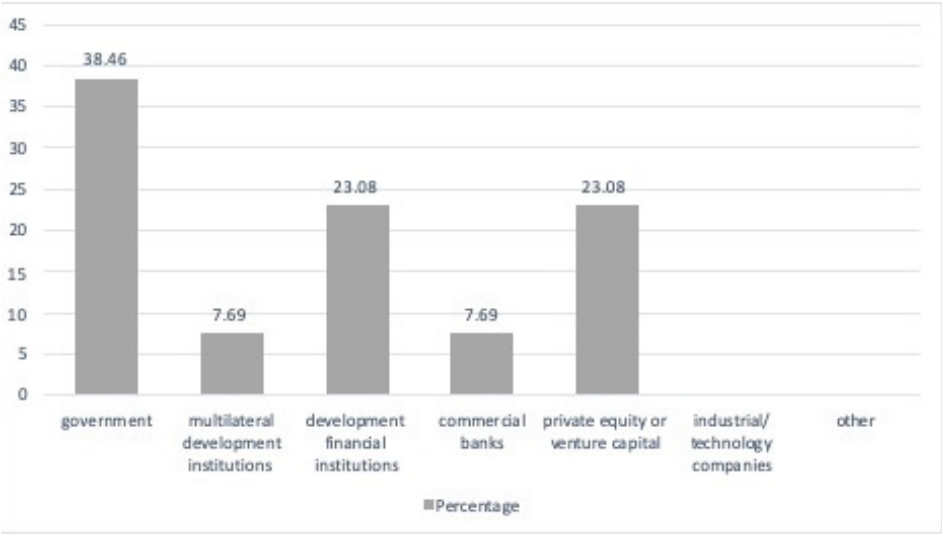
Figure 37: Infrastructure Financing Structure for Projects in Zimbabwe



5.2.2.6 Common Sources of Funding for Feasibility Studies in Zimbabwe

Stakeholders cited that funding for feasibility studies is mainly derived from the Government of Zimbabwe as highlighted by 38.5 percent of respondents followed by Development Financial Institutions and private capital at 23.1 percent each. Multilateral development institutions and commercial banks had the least percentage at 7.7 percent each. The government is the main driver for project preparation activities and feasibility studies for potential infrastructure projects in Zimbabwe as shown in Figure 38.

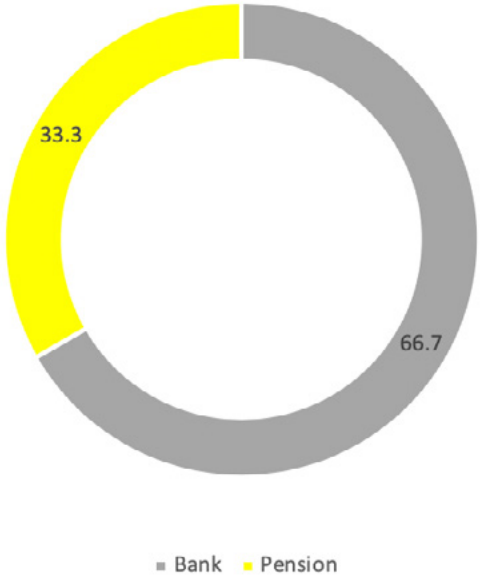
Figure 38: Common Sources of Funding for Feasibility Studies in Zimbabwe



5.2.2.7 Local Financial Institutions Investing in Infrastructure Projects in Zimbabwe

According to the respondents, Banks are the predominant financial institutions that provide finance for infrastructure projects in Zimbabwe (66.7 percent) as described in Figure 39. Table 24 provides alternative sources of funding.

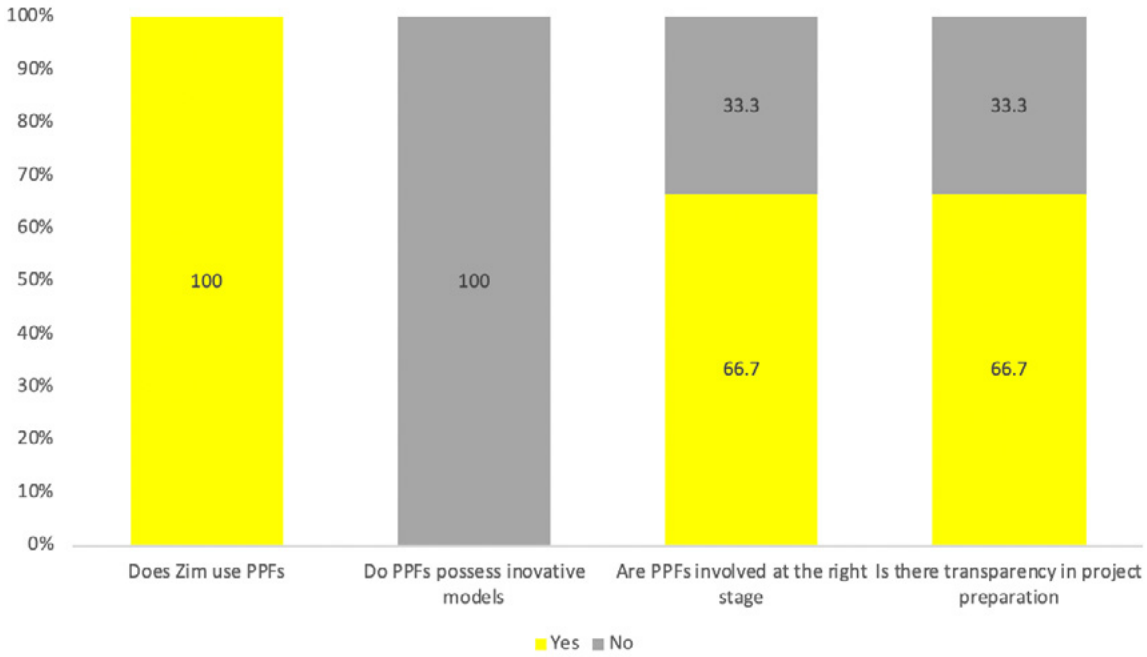
Figure 39: Categories of Local Financial Institutions Financing Energy Infrastructure Projects



5.2.2.8 Project Preparation Facilities Experiences in Zimbabwe

Respondents indicated that project preparation facilities have commonly been used for project development in Zimbabwe as illustrated in Figure 40. Respondents also believe that project preparation facility funds are involved at the right stage in the project cycle (development stage) and are transparently dispersed (66.7 percent). There is however a limited innovation and PPF products available to project promoters. To resolve this challenge there is a need to improve partnerships with Financial Institutions, Development Finance Institutions (DFIs) and Multilateral Development Banks (MDBs) to improve the range of PPF product offerings locally.

Figure 40: Project Preparation Facilities Experiences in Zimbabwe

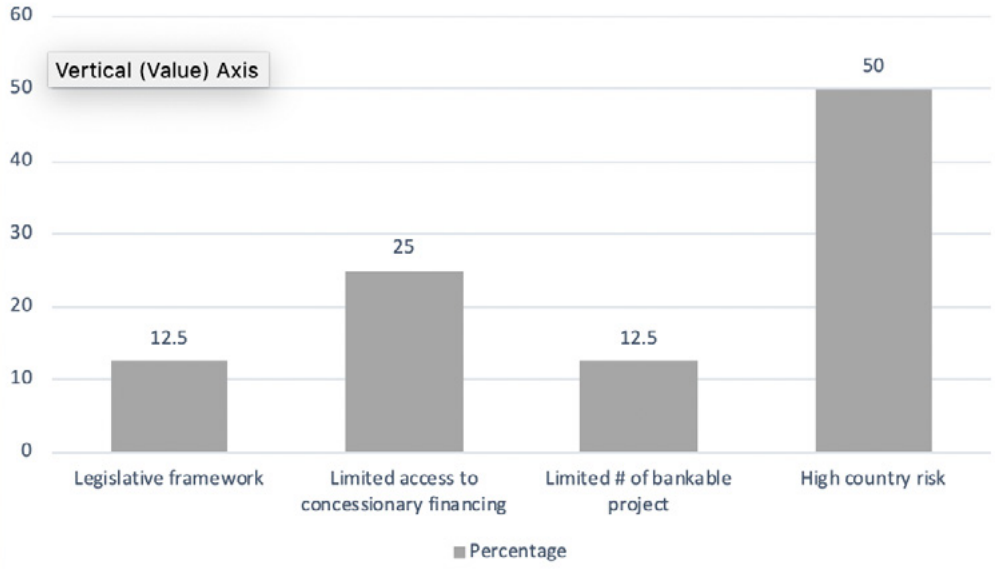


5.2.3 Insights on the Key Issues Affecting Bankability in Zimbabwe

5.2.3.1 General Bankability Factors

Stakeholders generally perceive high country risk as the main factor that affects bankability of infrastructure projects as indicated by 50% of the respondents in Figure 41. The next main factors affecting bankability of projects is limited access to concessionary financing at 25%.

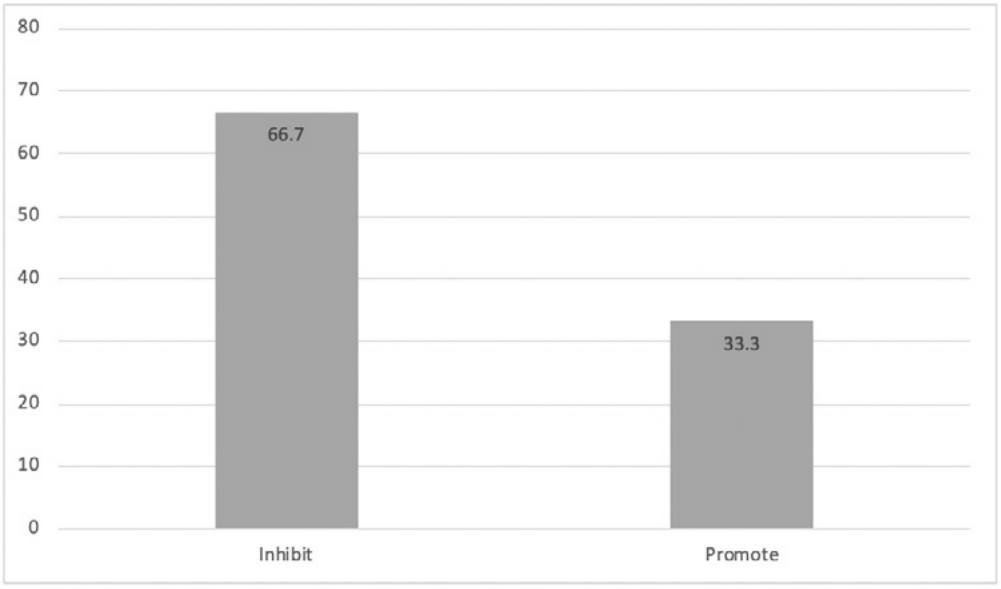
Figure 41: Top factors that hinder uptake of energy infrastructure projects in Zimbabwe



5.2.3.2 Legislative Framework Effects on Bankability

About 66.7 percent of the respondents highlighted that current legislative frameworks inhibit funding by private sector as shown in Figure 42.

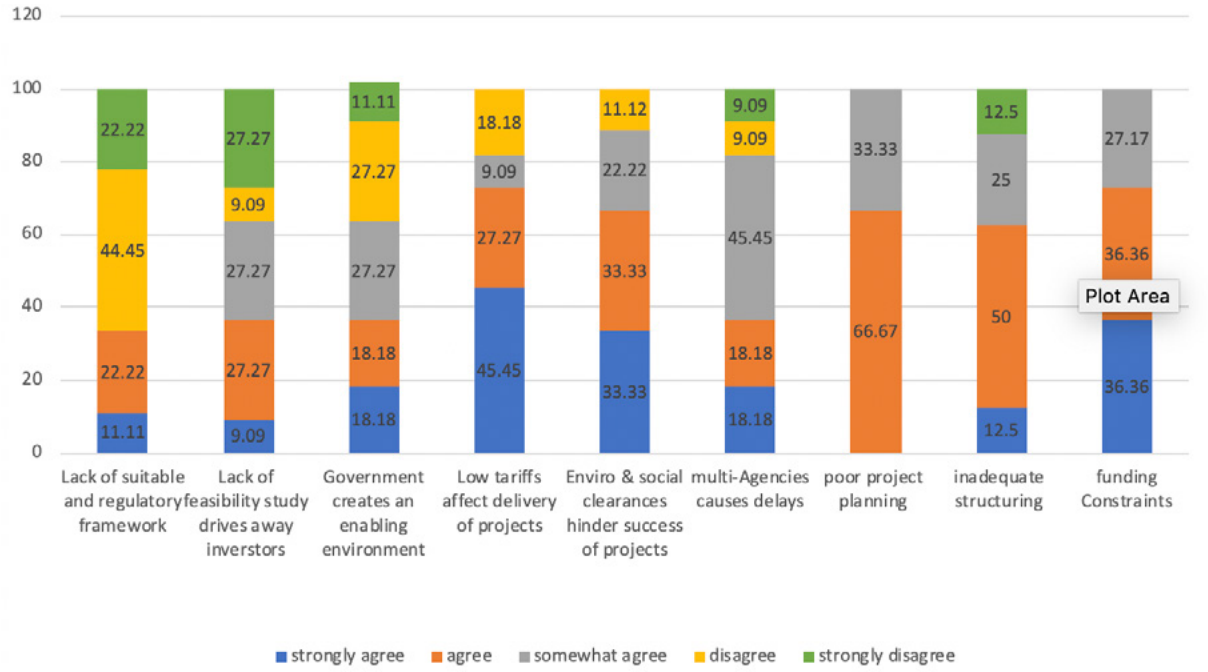
Figure 42: Legislative Framework Effects on Bankability



5.2.3.3 Various factors affecting bankability

Figure 43 highlights other factors that negatively affect the bankability of energy projects to include low tariffs, environmental and social clearances, funding constraints, inadequate structuring and poor planning of projects. Lack of feasibility study for prospective projects is also cited a factor that hinders energy sector performance (Figure 45).

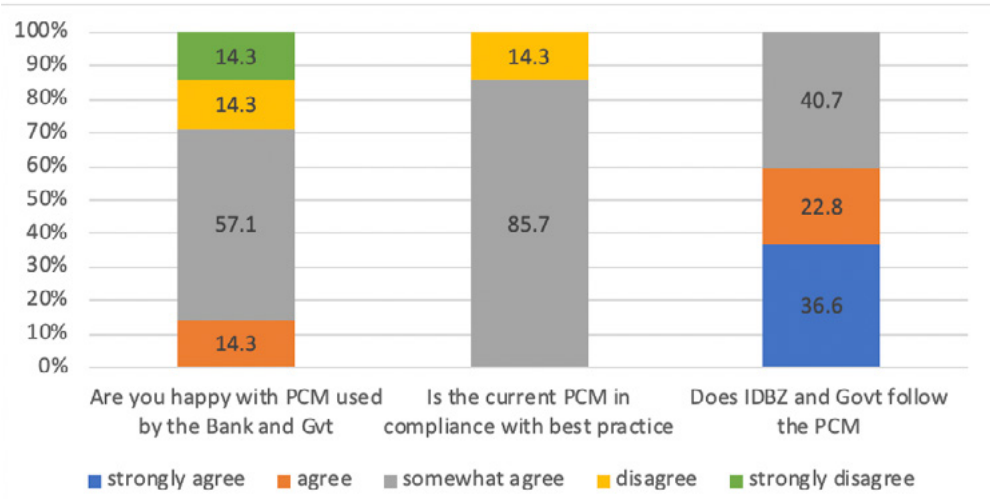
Figure 43: Other Factors affecting bankability



5.2.3.4 PCM Structure for infrastructure projects in Zimbabwe

Stakeholders agree that PCM is followed in Zimbabwe and that the PCM adheres to best practice as shown in Figure 44.

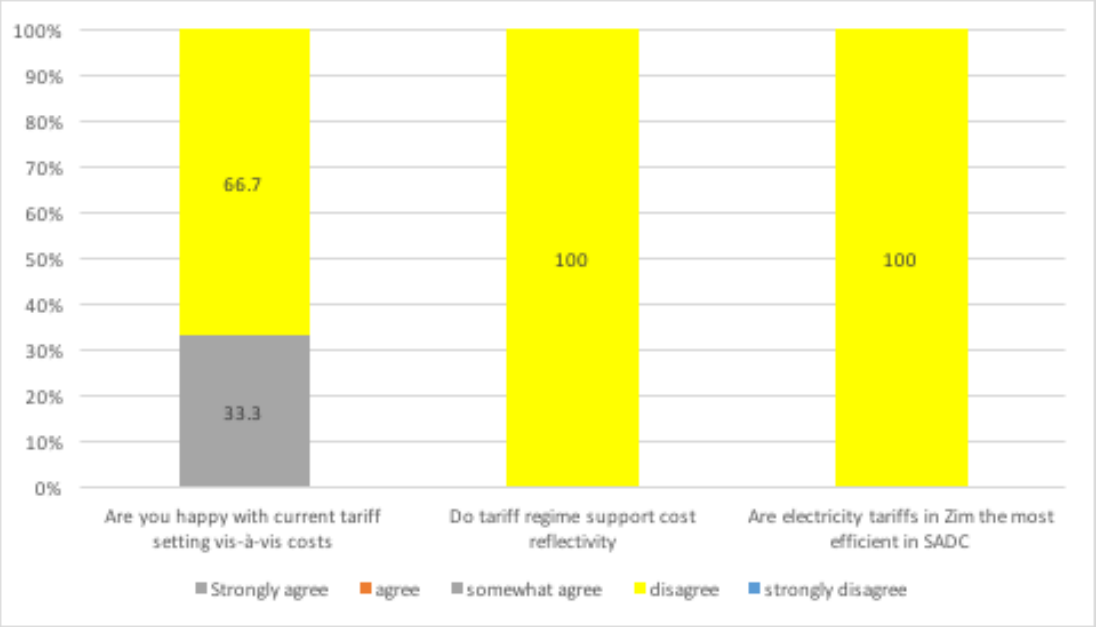
Figure 44: Adherence to PCM in Infrastructure Project Development in Zimbabwe



5.2.3.5 Tariff Effects on the Bankability of Infrastructure Projects

Stakeholders registered dissatisfaction with the current tariff regime in Zimbabwe as shown in Figure 45. The respondents indicated that the tariff is neither cost reflective nor competitive.

Figure 45: Tariff Effects on the Bankability of Infrastructure Projects



5.2.3.6 Fiscal Effect on the Bankability of Infrastructure Projects in Zimbabwe

On fiscal issues the major factor which was cited by stakeholders as hindering uptake of energy infrastructure projects is currency risk as shown in Figure 46. In Figure 47 respondents indicated that their current or last project has been affected by currency risk.

Liquidity risk, capital repatriation and credit ratings have also had a significant effect on energy projects in Zimbabwe. Fiscal policy impact and financial regulations are other factors that were cited as having an impact on the uptake of energy infrastructure in Zimbabwe.

Figure 46:Economic and Fiscal Factors Impact on Energy Infrastructure Projects in Zimbabwe

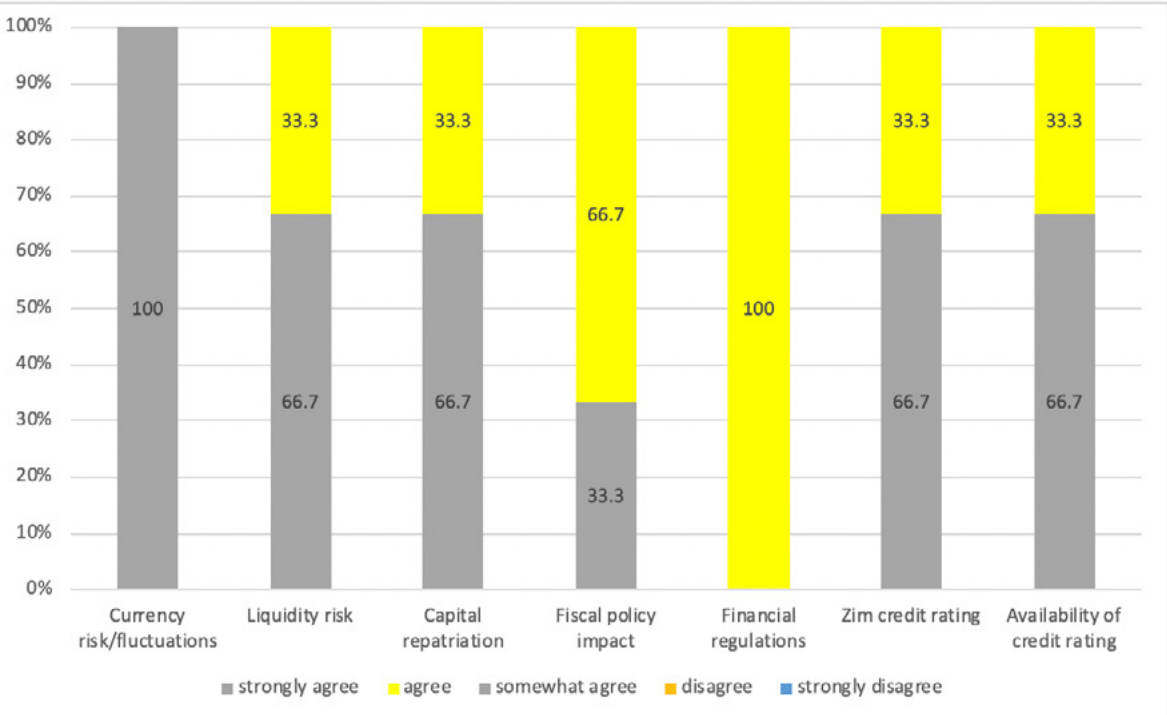
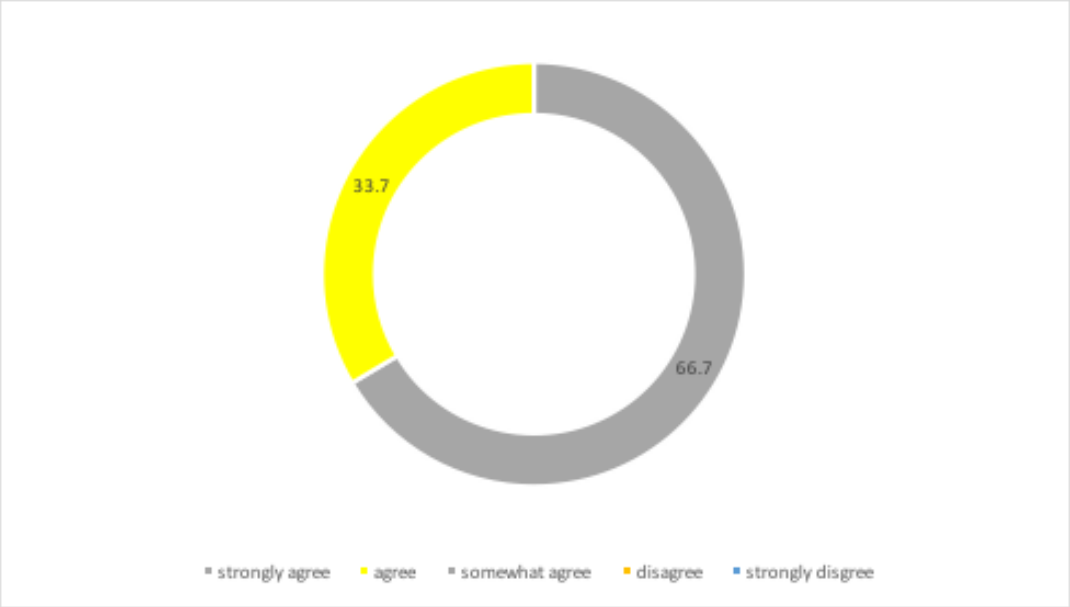


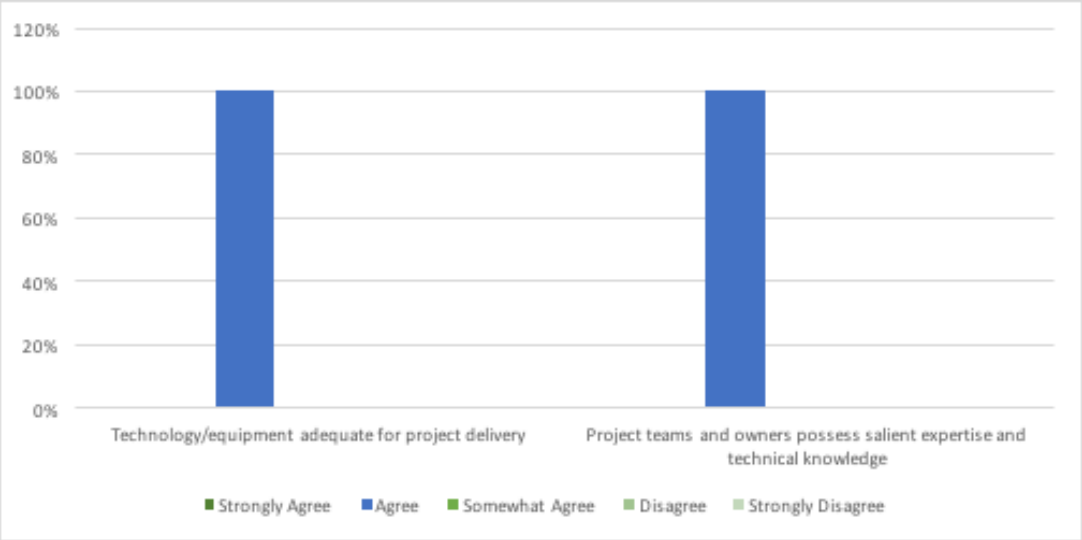
Figure 47: Currency Risk Effects on Infrastructure Projects



5.2.3.7 Technical/project specific factors

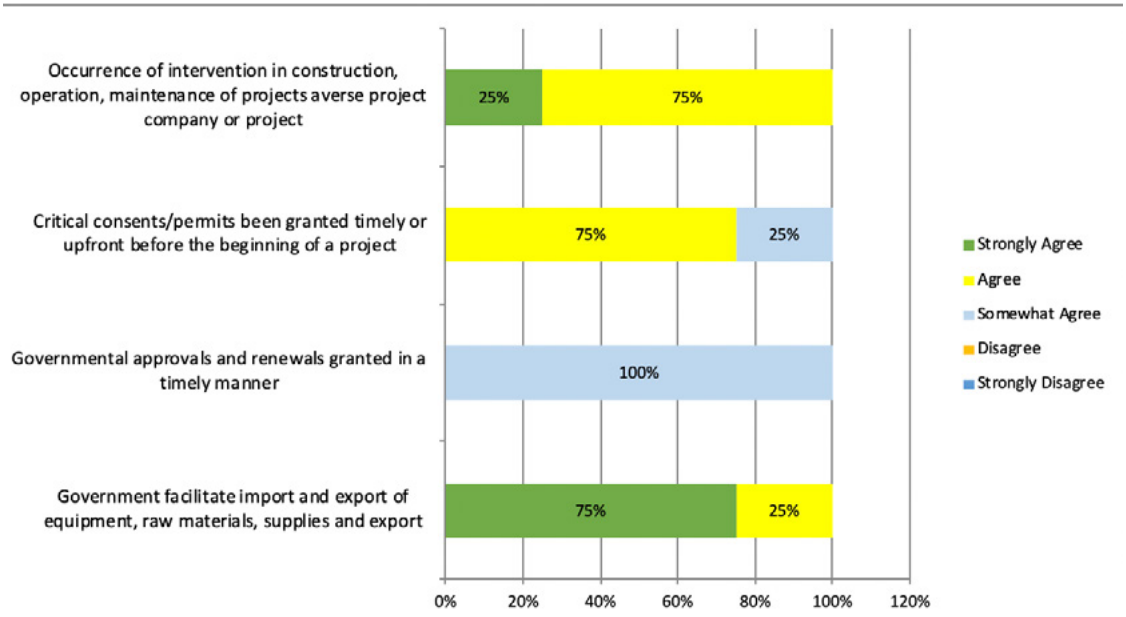
The technology and equipment used for Zimbabwe's infrastructure projects is regarded as adequate as shown in Figure 48. Project promoters also possess sufficient expertise and technical knowledge to efficiently deliver energy projects in Zimbabwe.

Figure 48: /Project specific factors affecting the implementation of infrastructure projects



5.2.3.8 Political factors

Stakeholders have indicated that political factors have a significant impact on projects in Zimbabwe. They highlighted adverse effects from intervention by government in infrastructure projects. Government has positively facilitated the import of equipment, raw materials, supplies and export of energy as shown in Figure 49. They also expressed that project permits are granted on a timely basis. Stakeholders were non-committal to the efficiency with which Government processes project approvals. *Figure 49: Political factors which have a bearing on infrastructure projects*

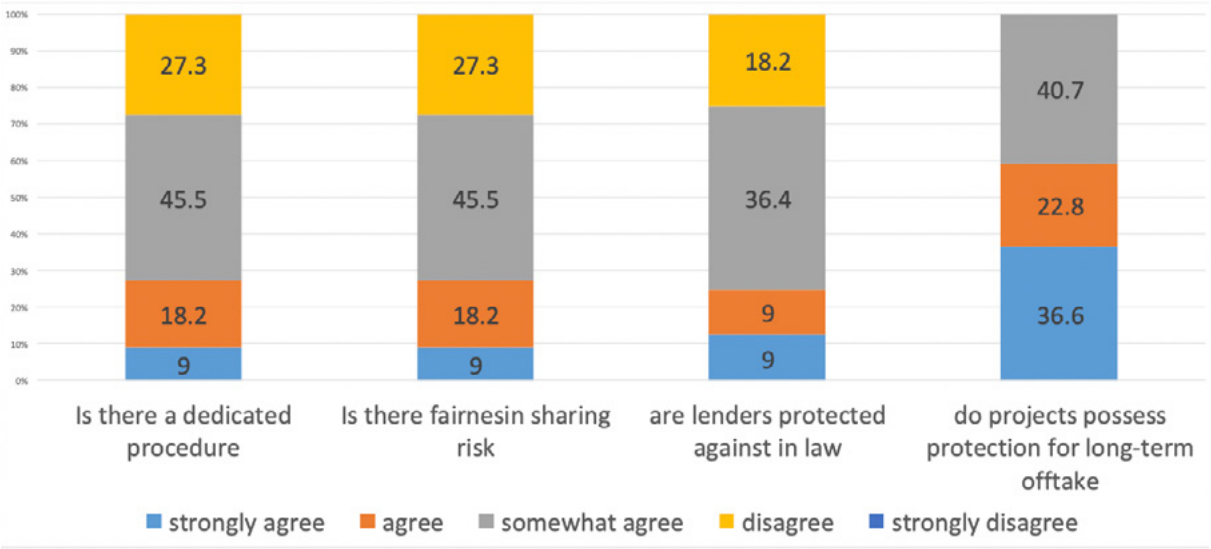


5.2.3.9 Risk sharing factors

On risk sharing, respondents were largely non-committal to the effectiveness of current risk sharing frameworks for infrastructure projects in Zimbabwe. Stakeholder interviews further highlighted that the lack of competition in securing capital funding resulted in the negative cost and risk impacts for the country. This is also compounded by the country's perceived risk profile.

The correlation of responses in Figure 50 highlighted a feeling of the absence of an equitable risk sharing framework in the country. Greater emphasis needs to be exerted on the risk sharing frameworks and technical competencies within Zimbabwe. Stakeholders identified potential challenges due to the capacity of local stakeholders to either adequately identify and quantify all project risks. Limitations in the local capital outlays on infrastructure projects were highlighted as limiting the ability of local stakeholders to demand equitable risk sharing structures.

Figure 50: Risk Sharing Factors in the Current or Last Infrastructure Projects



5.2.3.10 Environmental and Social Impact Factors

ESIA for the energy sector in Zimbabwe is regarded as being effective as shown in Figure 51. The different weightings suggest a difference in understanding and/or valuation of the ESIA process from different stakeholders. In order to harmonize expectations and value derived from the ESIA, an integration between the ESIA stages and the project development phases has been described in section 2.5.

Figure 51: Effectiveness of ESIA on the Energy Sector Projects in Zimbabwe

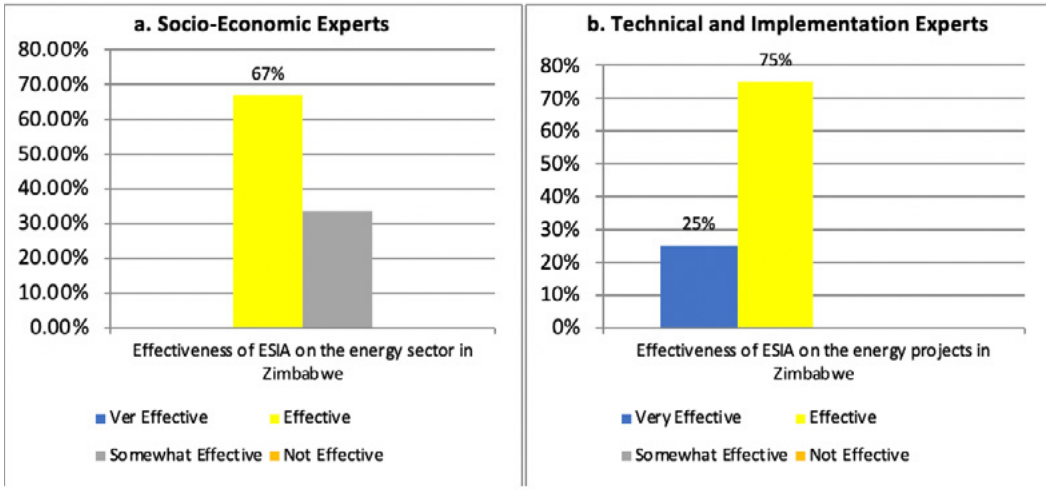


Figure 52 shows that only 50% of technical and implementation expert respondents indicated that ESIA is carried out in accordance with best practices and has been used as a decision-making tool. This indicates ambiguity and an absence of consensus on the quality and value of ESIA usefulness, recommendations and their assimilation into the project lifecycle. Respondents believe that ESIA is carried out by qualified individuals and environment management plans are being complied with.

Figure 52: ESIA Views by Technical and Implementation Experts

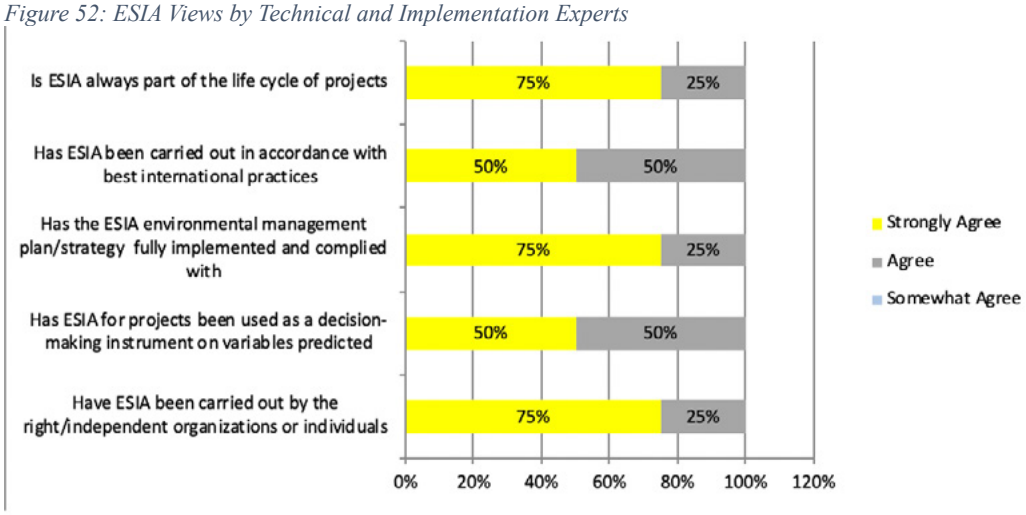
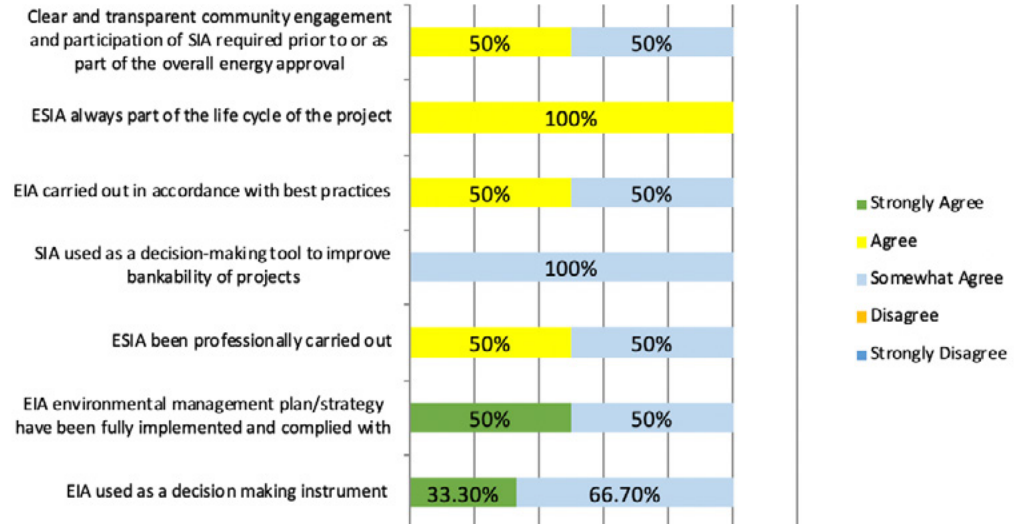


Figure 53 shows that socio-economic expert respondents are not fully agreed to ESIA reports being key to decision making processes for the project. Respondents were also non-committal to ESIA being carried out in accordance with best practice and with sufficient community involvement.

Figure 53: ESIA Views by Economic and Socio-Economic Experts



6 Regional and Local Case Studies on Bankable Energy Infrastructure Projects

6.1 Comparative Credit Ratings and Cost of Capital

6.1.1 Country Credit Ratings

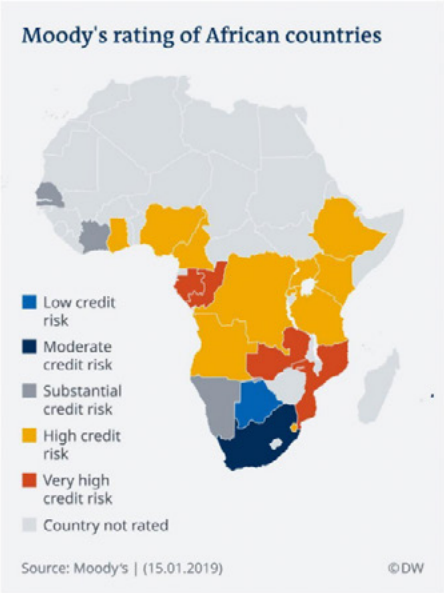
Table 35 and Figure 54 expresses Zimbabwe's credit rating in reference against regional and global countries. The ratings have also been grouped by economic blocs. This highlights the development Zimbabwe as a country and SADC as an economic bloc need to attain to raise their credit ratings profile and attract fiercely competed resources.

Table 35: Credit rating comparisons between nations and economic blocks

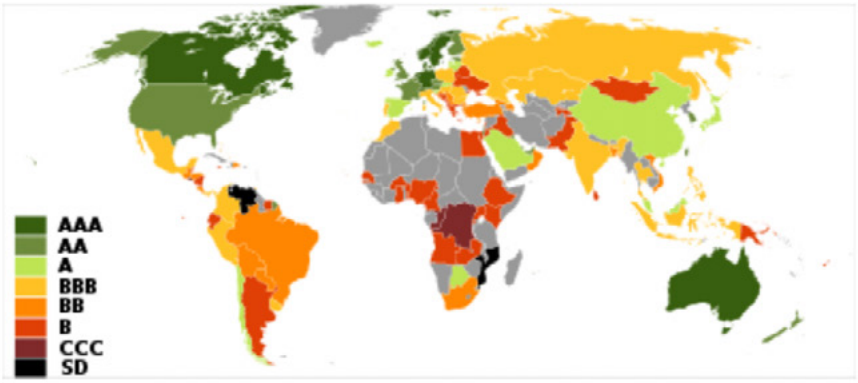
Block	Country	S&P	Moody's	Fitch
SADC	Angola	B-	B1	BB-
SADC	Botswana	A-	A2	
SADC	Congo, D.R.	B-	B3	
SADC	Lesotho			BB-
SADC	Mozambique	D	Caa3	B
SADC	Namibia		Ba1	BBB-
SADC	South Africa	BB+	Baa3	BB+
SADC	Swaziland		B2	
SADC	Zambia	B	B3	B+
SADC	Zimbabwe	NR	NR	NR
BRICS	Brazil	BB-	Ba2	BB
BRICS	China	A+	A1	A+
BRICS	India	BBB-	Baa2	BBB-
BRICS	Russia	BBB-	Baa3	BBB-
G20	Australia	AAA	Aaa	AAA
G20	Canada	AAA	Aaa	AAA
G20	France	AA	Aa2	AA
G20	Germany	AAA	Aaa	AAA
G20	South Korea	AA	Aa2	AA-
G20	United Kingdom	AA	Aa2	AA
G20	United States	AAA	Aaa	AAA
AFRICA	Burkina Faso	B-		
AFRICA	Cameroon	B	B2	B
AFRICA	Cape Verde	B		B+
AFRICA	Congo	B-	Caa2	
AFRICA	Egypt	B	B3	B
AFRICA	Gabon	N/A	B3	BB-
AFRICA	Ghana	B-	B3	B+
AFRICA	Ivory Coast		Ba3	B+
AFRICA	Kenya	B+	B1	B+
AFRICA	Mauritius		Baa1	
AFRICA	Morocco	BBB-	Ba1	BBB-
AFRICA	Nigeria	B	B1	BB-
AFRICA	Rwanda	B	B2	B
AFRICA	Senegal	B+	Ba3	
AFRICA	Tunisia	N/A	B1	BB-

AFRICA	Uganda	B	B2	B

Figure 54: Moody's Credit Ratings for African Countries and Standard & Poor's Global Credit Ratings



Moodys Credit Rating for African Countries



Standard & Poor's Global Credit Ratings

6.1.1.1 Credit Rating Tiers

Table 36 explains the significance of ratings shown in Table 30. Zimbabwe and SADC countries will need to develop policies and investment related strategies that will assist to upgrade their credit ratings to at least the 'BBB- 'status.

Table 36: Credit rating tiers comparisons between rating agencies

Moody's		S&P		Fitch		Equivalent to SVO Designations	Rating description	
Long-term	Short-term	Long-term	Short-term	Long-term	Short-term	NAIC		
Aaa	P-1	AAA	A-1+	AAA	F1+	1	Prime	Investment-grade
Aa1		AA+		AA+			High grade	
Aa2		AA		AA				
Aa3		AA−		AA−				
A1		A+	A-1	A+	F1		Upper medium grade	
A2		A		A				
A3	P-2	A−	A-2	A−	F2			
Baa1		BBB+		BBB+		2	Lower medium grade	
Baa2	P-3	BBB	A-3	BBB	F3			
Baa3		BBB−		BBB−				

Ba1	Not prime	BB+	B	BB+	B	3	Non-investment grade	Non-investment grade
Ba2		BB		BB			speculative	AKA high-yield bonds
Ba3		BB−		BB−				AKA junk bonds
B1		B+		B+		4	Highly speculative	
B2		B		B				
B3		B−		B−				
Caa1		CCC+	C	CCC	C	5	Substantial risks	
Caa2		CCC					Extremely speculative	
Caa3		CCC−					Default imminent with little	
Ca		CC				6	prospect for recovery	
		C						
C		D	/	DDD	/		In default	
/				DD				
				D				
Not rated		Not rated		NR				

Securing funding to support infrastructure development is critical to bridging the infrastructure deficit in Zimbabwe. Budgetary pressures and funding constraints have limited public investment in the infrastructure sector (ibid.). Debt financing plays a crucial role in infrastructure financing due to the long tenures of infrastructure project horizons. Low ratings or downgrades, have a negative impact on the ability of governments/project sponsors to attract investment into projects. Credit ratings provide a strong indication to investors on the project sponsor's ability to service financial obligations.

Zimbabwe's credit rating has been classified as being non-gradable. This often results in the increased cost of capital for investments in comparison to other countries. Most countries with significant access to investment financing have a credit rating of "BBB- "or better (S&Ps rating scale). The ideal minimum rating target for Zimbabwe should be the "BBB- "rating. Most developed and developing countries within BRICS have attained or surpassed this. Only Brazil and SA have not attained this in the BRICS bloc.

6.2 Regional Case studies

6.2.1 Avon Peaking Power (Avon)

Avon Peaking Power is a privately owned, 670 MW energy generating facility. It is located in Shakaskraal, KwaZulu Natal province, South Africa. The power station generates and supplies electricity to the national grid (Eskom) during peak demand and emergency situations under a 15-year Power Purchase Agreement (PPA). The power plant is located adjacent to an existing high-voltage Eskom substation. The facility achieved commercial operation date on 20 July 2016 after a 30-month construction period.[24]

The cost of constructing the plant was approximately R6 billion. It provides energy to the national grid when the electricity demand spikes.[25] The power station consists of two diesel-fired, open cycle electricity generation plant based on the conversion of gas to power. The procurement selection criteria veered towards the lowest bid for a Build, Own, Operate (BOO) model. The project was granted national project status.

Table 37 highlights the capital structure of the project, has been populated with information that was readily available and may consist of gaps where the information could not be sourced

[24] http://www.peakers.com/avon.html, accessed 1 March 2019
[25] http://www.peakers.com/news.html, accessed 1 March 2019

Table 37: Avon Peaking Power (Avon) structure

Country	**South Africa**				
Project summary	A privately owned 670 MW energy generating which generates and supplies electricity to the national grid (Eskom) during peak demand and emergency situations under a 15-year power purchase agreement.				
Project company	**Avon Peaking Power**				
Contract type	Power-Purchase Agreement (PPA) for 15 years				
Project cost / funding	**Total**	**Equity**	**Debt**		
			Total	**subordinated**	**senior**
	US$984 million				
Sponsors	**Sponsor**	**Amount of equity**	**% of ownership**	**Sponsor Country**	
	Mitsui & Co.	Not Available	25	Japan	
	Legend Power Solutions -	Not Available	27	South Africa	
	The Peaker trust - A Broad-Based Black Economic Empowerment (BBBEE) Trust	Not Available	10	South Africa	
	A Venture of Engie (formerly GDF SUEZ, France)	Not Available	38	France	
Debt	**Debt provider**	**Type**	**Local/International**	**Amount (USD)**	
	Barclays	Commercial	International	140.5	
	Development Bank of Southern Africa (DBSA)	Public	Local	140.5	
	Investec Bank	Commercial	Local	140.5	
	Nedbank	Commercial	Local	140.5	
	Other Sanlam	Commercial	Local	140.5	
	RMB (South Africa)	Commercial	Local	140.5	
	Standard Bank	Commercial			
Financial closure	2013				

Source: World Bank Private Participation in infrastructure Database[26]

Bankability Lessons Learnt

- The project was awarded under competitive international bidding. This helps to ascertain the true value of the project since interested bidders will try to submit bids with the reflective cost of the project.
- The consortium of equity owners and investment funds for the project were drawn from multiple countries i.e. Japan, South Africa, France
- The project is privately owned and structured on a Build Own Operate (BOO) model. IDBZ and Zimbabwe can take a cue from this project that if the conditions are conducive, private players can play a big role in financing infrastructure.
- The South African economy is stable, which encourages investment and an ability to recoup investment. Economic stability may enhance the participation of IPPs in the sector.
- 15-year term Power Purchase Agreement (PPA) with Eskom for the sale of the power generated by Avon provides guarantees to enable investors to recoup their investment.

6.2.2 Bujagali Hydropower Project (BHP)

The Bujagali Hydropower Project (BHP) is a 250MW electricity power generation project located on the Nile river, in Uganda. The project is a 30-year public private partnership (PPP) project under BOT, awarded through competitive bidding. The selection criteria were to choose the bidder with lowest cost on construction and operation.

The project was sponsored by Aga Kahn Fund of Switzerland and Sithe Global Power of the United States of America. The project also received multilateral support which included a guarantee from the Multilateral Investment Guarantee Agency (MIGA), an international financial institution which offers political risk insurance and credit enhancements. It also received multilateral support from the International Development Association (IDA), loans from European Investment Bank (EIB), African Development Bank (AfDB) and International Finance Corporation (IFC).

The project was successfully completed and commissioned in 2018. Table 38 highlights the capital structure of the project, has been populated with information that was readily available and may consist of gaps where the information could not be sourced.

[26] https://ppi.worldbank.org/snapshots/project/avon-ocgt-7959, accessed 4 March 2019

Table 38: Bujagali Hydropower Project structure

Project summary	A 250MW electricity power generation project located on the river Nile, at Dumbell island in Uganda. The project is a 30-year PPP project under BOT, awarded through a competitive bidding process.				
Project company	**Bujagati Hydro Power Station**				
Contract type	Power-Purchase Agreement (PPA) for 30 years from commissioning				
Project cost / funding	**Total**	**Equity**	**Debt**		
			Total	subordinated	senior
	US$250 million				
Sponsors	Sponsor	Amount of equity	% of ownership	Sponsor Country	
	Aga Khan Fund (Industrial Promotion Services)		31	Switzerland	
	Sithe Global Power (Bujagali Energy Limited)		58	United States	
Multilateral support	**Year**	**Agency**	**Support type**	**Support amount* (USD)**	
	2007	EIB	Loan	130	
	2007	MIGA	Guarantee	115	
	2007	IDA	Guarantee	115	
	2007	AfDB	Loan	110	
	2007	IFC	Loan	130	
	2012	MIGA	Guarantee	5	
	2018	MIGA	Guarantee		
Financial closure	2007				

Source: World Bank Private Participation in infrastructure Database[27]

Bankability Lessons learnt

- BHP was undertaken through a Public-Private Partnership between the GOU through the state-owned transmission company, the Uganda Electricity Transmission Company Limited ("UETCL"), and Sithe Global Power and Industrial Promotion Services.
- Sithe Global Power and Aga Khan Fund were selected pursuant to a competitive international bidding process. This gave Uganda assurance that the bids that they received reflected the real cost of the project. This is a good measure to ensure that potential funders compete among themselves globally.
- The project is regarded as a success story as it was funded by both the private sector and DFIs, with strong support from the Ugandan government. The blended financial structure helps reduce the project cost component for potential private players.
- The project received multilateral institutional support through guarantees from MIGA and IDA. This reduced the project risk given the perceived political and country risk in Uganda.

6.2.2 Kafue Gorge Lower hydroelectric project

Kafue Gorge Lower Hydro Power Station is a 750 MW (5x150 MW) plant and Zambia's first major public-private partnership (PPP) investment. It is owned and operated by the Zambia Electric Supply Corporation (ZESCO). The project was executed through a special purpose vehicle owned by Sino hydro, China Africa Development Fund (CADFund) and ZESCO Ltd. It was developed on a Build, Operate and Transfer (BOT) model.

The project is located on a primary tributary of the Zambezi River, Chikankata district, about 17.3km downstream of the existing Kafue Gorge Upper Hydro-power station dam site. The project cost is estimated at US$1.97 billion is expected to be delivered over a six-year period between 2015 to 2020.

The Government of Zambia and the Government of China signed a Memorandum of Understanding to develop the Kafue Gorge Lower Hydro Project in August 2010. The project had a competitive bidding process and was granted national project status. The project was financed by the Zambian government and foreign financial institutions including the Exim Bank of China. The Government of Zambia supported the project through a capital subsidy of approximately US $1,97 billion. The project is meant to increase electricity production by 38% to address growing demand and alleviate the power deficit in Zambia. The Government of Zambia appointed ZESCO as the project sponsor. Table 39 highlights the capital structure of the project, has been populated with information that was readily available and may consist of gaps where the information could not be sourced.

[27] https://ppi.worldbank.org/snapshots/project/bujagali-hydro-project-3751, accessed 1 March 2019

Table 39: Factsheet for Kafue Gorge Lower Hydro Power Station

Project summary	A 750 MW (5x150 MW) project owned and operated by ZESCO. The project was executed through a special purpose vehicle owned by Sino hydro, China Africa Development Fund (CADFund) and ZESCO Ltd on a BOT basis.			
Project company	Kafue Gorge Lower Hydro power station			
Contract type	BOT Power-Purchase Agreement (PPA) for 30 years			
Project cost / funding	**Total**	**Equity**	**Debt**	
	US$1.97 billion	33%	67%	
Sponsors	**Sponsor**	**Amount of equity**	**% of ownership**	**Sponsor Country**
	ZESCO		30	Zambia
	Sinohydro		50	China
	China Africa Development Fund (CAD Fund)		20	
Debt	**Debt provider**	**Type**	**Local/International**	**Amount**
	China Development Bank (CDB)			
Financial closure	2010			
Public-sector support	Capital subsidy			

Source: World Bank Private Participation in infrastructure Database[28]

Bankability Lessons learnt

- The Zambian government provided a capital subsidy which enabled private sector participation under a PPP. Government support is critical for the success of the energy infrastructure projects.
- The project is funded by the Zambian government and international financial institutions.
- The government allocated an initial investment of $186m for the project to unlock foreign investment.
- Access to foreign debt may imply that Zambia's debt thresholds and credit ratings are sustainable.
- Availability of a sustainable market for generated electricity. The project is expected to increase Zambia's power supply by 38%. This is sufficient to meet the country's electricity growing demand for the next 5 to 10 years (Njoroge, 2019).

6.2.3 Lake Turkana Wind Power Project

The Lake Turkana Wind Power (LTWP) is Africa's biggest wind power scheme. It provides reliable, low-cost energy to the national grid in Kenya. The project comprises of 365 wind turbines, each with a capacity of 850kW. It is located in Loiyangalani district, Kenya.[29]

The wind farm provides approximately 17% of the country's installed capacity. The project aimed at reducing greenhouse gas emissions in the country. The project site was selected for the strength of its wind resources together with its social and geographical specifications. The project placed emphasis on engaging local communities during the early stages of the project.

The project is a 20-year contract BOT model. The Power Purchase Agreement states that electricity is sold at a fixed price to Kenya Power & Lighting Company Ltd (KPLC) over the 20-year period. The Lake Turkana consortium consists of KP&P Africa, Aldwych International, Investment Fund for Developing Countries, Finnish Fund for Industrial Cooperation, Norwegian Investment Fund for Developing Countries, Sandpiper and Vestas.

Challenges in securing financing delayed construction. Aldwych International, the original sponsor of the project signed financing agreements with various financial institutions such as African Development Bank (AfDB), Standard Bank of South Africa and Nedbank as the lead arrangers. Other lenders included the European Investment Bank (EIB), FMO, Proparco, East African Development Bank, PTA Bank, EKF, Triodos and DEG. The finance raising initiatives resulted in the attainment of €623 million (US$685 million) worth of funding for the delivery of the 300MW wind power project.[30] The Overseas Private Investment Corporation (OPIC) was also earmarked to join the lender group. The cost of financing the project which translated to €623 million, is Kenya's single largest private investment in history (Cookson et al., 2017). The project was successfully completed and commissioned in 2018. Table 40 highlights the capital structure of the project, has been populated with information that was readily available and may consist of gaps where the information could not be sourced.

Table 40: Factsheet for Lake Turkana Wind Power Project

[28] https://ppi.worldbank.org/snapshots/project/Sinohydro-Kafue-Gorge-Lower-HPP-6484, accessed 3 March 2018

[29] https://ltwp.co.ke/overview/

[30] http://www.aldwych-international.com/announcements_detail.php?id=73, announcement made on March 25th, 2014

Project summary	A 310 MW operated by Lake Turkana Wind Power Limited. The project is a BOT project with a 20-year contract period. The Power Purchase Agreement states that electricity is sold at a fixed price to Kenya Power & Lighting Company Ltd over a 20-year period.							
Project company	**Lake Turkana Wind Power Limited**							
Contract type	BOT Power Purchase Agreements for 20 years							
Funding details	Funding year	Private debt funding	Capital grants	Government funding	Local public bank funding	Donor funding	Debt equity grant ratio	Private equity funding
	2011	61		0	0	354	71/29	172
Sponsor	**Sponsor**	**% Ownership**	**Country of origin**					
	Aldwych International Ltd	51	United Kingdom					
	Industrial Development Corporation	25	South Africa					
	Others	24						
Commissioning date	2018							

Source: ltwp.co.ke/overview/.

Bankability Lessons learnt

While the project faced delays, it significantly impacted Kenya's development goals and local communities surrounding the project site. Lessons drawn from the project include:

- Even lower middle-income countries like Kenya sometimes face challenges in accessing financing of infrastructure projects, despite better performing economies. This emphasises the importance of developing bankable infrastructure projects. This is particularly true for Zimbabwe as it recovers from more than a decade of economic isolation.
- DFIs enabled the ability to unlock funding during the project development phase. Guarantees provided by DFIs enhanced private investor involvement.
- The Kenyan government and AfDB provided guarantees to LTWP against the PPA, in the event LTWP failed to meet its obligations.
- Donor financing was critical in the blended financing structure to attract private players. Blended finance may boost funding for African and Zimbabwean projects where risk is regarded as high. Such a model can be replicated locally.
- Community involvement is vital during the project's development phases.
- The power station is designed to provide reliable and low-cost electricity to Kenya's national grid
- Project promoters negotiated a 20-year PPA with KPLC
- The Renewable Energy Project was able to attract multiple funding sources as it fits a leading thrust for infrastructure investments globally. Zimbabwe may also explore further opportunities for sustainable renewable and/or wind energy power generation. Areas with noted potential areas include Chipinge, Chimanimani, Gweru, Harare, and Nyamandlovu as discussed in section 3.2.

6.2.5 Kathu CSP Power Plant

Kathu Solar Plant is a 100 MW greenfield, Concentrated Solar Power (CSP) project. It uses parabolic trough technology, equipped with a molten salt storage system that allows 4.5 hours of thermal energy storage. This limits the intermittent nature of solar energy.

The consortium led by ENGIE (48.5%), includes a group of South African investors comprising SIOC Community Development Trust, the Investec Bank, Lereko Metier and the Public Investment Corporation. The project was successfully completed and commissioned in March 2018. Table 41 highlights the capital structure of the project has been populated with information that was readily available and may consist of gaps where the information could not be sourced.

Table 41: Factsheet for Lake Turkana Wind Power Project

Country	South Africa				
Project summary	The project is funded by a mix of debt and equity. The debt is funded from a club of South African banks, namely Rand Merchant Bank, Nedbank Capital, ABSA Capital, Investec and the Development Bank of South Africa.				
Project company	**Kathu Solar Park (RF) Pvt Limited**				
Contract type					
Project cost / funding	**Total**	**Equity**	**Debt**		
			Total	**subordinated**	**senior**
	$m	$171.7m	$607.5m	$m (x%)	$m (x%)
Investors	**Organization**	**Amount**	**Guarantor**	**Risk**	
	Lereko investments	$22.1m			
	Public Investment Corporation				
	SUEZ	$83.3m			
	Investec	$22.1m			
	Others	$22.1m			
	Total equity	$171.7m			
Lenders	**Organization**	**Amount**	**Subordinated**	**Guarantor**	
		$m	$m		
	Development Bank of Southern Africa (DBSA)	$121.5m			
		$m			
	Total public debt	**$m**			
		$m	$m		
		$m	$m		
		$m			
	Total bilateral DFI debt	$m			
	Barclays	$121.5m			
	Investec Bank	121.5m			
	Nedbank	121.5m			
	RMB (South Africa)	$121.5m			
	Total commercial bank debt	**$486m**			
	Total debt	**$607.5m**			
	Senior debt: years; Subordinated debt: years				

Source: www.kathusolarpark.co.za

Bankability Lessons Learnt

- Use of modern technology (molten-salt storage system, reflective mirrors etc.) to increase efficiency and revenue. The plant can store 4.5 hours of solar energy.
- Integrated infrastructure planning, alignment of supply and demand (pre-market determination for the surrounding areas). This was facilitated through a PPAs to supply up 179,000 homes with electricity in local municipality community and the nation.
- Optimization of the geographical location. The Northern Cape region has the highest level of solar radiation in South Africa and an abundance of available land for project use. The area is ideal for the application of CSP technology.
- The project was funded by a blend of debt and equity. The debt is funded from a club of South African banks, namely Rand Merchant Bank, Nedbank Capital, ABSA Capital, Investec and the Development Bank of South Africa.
- Socio-economically, approximately 1,200 jobs will be created by the project. It is estimated that the Kathu Solar Park will save six million tons of CO2 over 20 years and will further promote local economic development.

6.3 Local Case Studies

6.3.1 Kariba South Extension Project

The Kariba electricity generation units have been operational since 1962 and upgraded to a total installed capacity of 750MW. ZPC embarked on a project to add two additional units with a total generation capacity of 300MW. Kariba Hydro Power Company (KHPC) (Private) Limited was the investment company through which the company developed the Kariba South Extension Project.

The extension project cost is estimated at US$508 million. ZPC appointed Hatch Africa (Pty) Ltd as a technical consultant, KPMG as the financial advisor and Norton Rose as the legal advisor for the project. Sinohydro Corporation of China was contracted under an Engineering, Procurement and Construction (EPC) contract. The construction period was 40 months. The project was successfully completed and commissioned in March 2018. Table 42 highlights the capital structure of the project has been populated with information that was readily available and may consist of gaps where the information could not be sourced.

Table 42: Factsheet for Kariba South Extension Project

Country	Zimbabwe				
Project summary	The expansion to the existing hydro-electric energy plant by ZPC and at an estimated cost of about US508 million. The expansion resulted in the addition of two units with a total capacity of 300 MW.				
Project company	Zimbabwe Power Company (ZPC) – Kariba Hydro Power Company (Private) Limited (KHPC)				
Contract type	Power purchase agreement with Manpower (as a second off taker alongside ZETDC).				
Project cost / funding	**Total**	**Equity**	**Debt**		
			Total	Subordinated	senior
	US$508 million	U$ 35 million			
Investors	**Organization**	**Amount**	**Guarantor**	**Risk**	
	Nam Power	U$ 35 million			
	Zimbabwe Power Company (ZPC)	US$ 81 million			
	Total equity	$200 million			
	Organization	**Amount**	**Subordinated**	**Guarantor**	
Lenders	China Exim Bank	US$320 million		Sovereign Loan Agreement	
	ZPC	US$38.8 million			
	Total commercial bank debt				
EPC contractor	Sino Hydro				
Public-sector support	Government of Zimbabwe lending agreement and Sovereign Loan agreement with China Exim bank guaranteed ZPC loan repayment obligations				

Source: www.insideafricalaw.com/publications/kariba-south-dam-extension-project-profile

Bankability Lessons Learnt

- The Government of Zimbabwe provided guarantees for the project which unlocked investor confidence and funding. This approach can be extended as a funding model for Zimbabwe's infrastructure projects.
- As part of the EPC the contractor is expected to provide funding for the project,
- ZPC contributed approximately 10 per cent of the project costs, through equity. This unlocked external investment into the project.
- KHPC (ZPC) entered into a PPA with ZETDC. KHPC will service financial obligations through revenue derived from electricity sales
- Off-taker risk concerns were raised regarding the credit-worthiness of the off-taker. Government guarantees; a PPA signed with Nampower were used to alleviate the risk concerns. Nampower is a regional creditworthy off-taker
- The PPA with Nampower also enables ZPC to earn foreign currency through energy exports.
- Alignment of the PPA and funding (loan) tenures to ensure the fulfilment of financial obligations
- Efficient technology use on expanded sub-plants will generate cost-efficient, sustainable electricity
- Water supply agreement with Zambezi River Authority was established. Water allocation and power generation varies based on river levels and environmental considerations
- KHPC (ZPC) owned the rights to the land where the expansion project was constructed. A resettlement action plan has been effectively implemented for the path of the transmission line.
- Plant commissioning and handover, to be under a two-year warranty period
- Raising finance for the project involved a public tender process with a strong emphasis on the contractor's ability to raise the required funds.
- The funding for the EPC Contract involved a hybrid finance structure

6.3.2 Hwange Power Station expansion

Hwange Power Station is the largest coal-fired power station in Zimbabwe with an installed capacity of 920MW. The power station's six units are currently at 40% utilization. ZPC commenced expansion works at Hwange plant to add 2 x 300MW units.

Hwange Electricity Supply Company (Private) Limited (HESCO) was established as the investment vehicle for the expansion project. ZPC (64%) and Sino-Hydro (36%) are the equity holders in HESCO. The construction period for the power station is estimated at 42 months between 2018-2022. The life of the new plant is 40 years. The total project cost is estimated at US$2.148 billion.

The project was proposed to be funded through a 70:30, debt to equity structure. The projects secured part of its funding through Standard Bank and AfreximBank. Afreximbank approved a US$176 million loan facility for the project.

Bankability Lessons Learnt

- DFI/Afreximbank onboarding assists in de-risking the project and making it more attractive to private investors.
- Use of innovative financial products by commercial banks such as counterpart funding provided by Stanbic Bank
- Use of expected plant life-terms to effectively plan investment requirements and reserves
- As part of risk mitigation and bank requirements, Syno Hydro shall continue to hold shares in the SPV (HESCO), for at least a further 5 years after construction has been completed. Within this period, they will continue to oversee operations and maintenance and be responsible to clear any defects which may arise on the plant
- HESCO, the project company, entered into a PPA with ZETDC. HESCO will service financial obligations through revenue derived from electricity sales
- Exposure to currency risk leaves the SPV project revenue, cost and legal structure exposed. Foreign costs account for approximately eighty to ninety percent of the project cost. PPAs and financial obligations are expected in foreign currency. Revenue collected would need to reflect and meet contractual obligations. Government guarantees or other instruments may have to absorb any realized shortfalls and essentially subsidize the cost of electricity in Zimbabwe where there are differences in value between the local currency revenue collected and contractual revenue projections.
- Efficient technology used for the project and power plant for the generation of sustainable energy. New units are expected to have a lower cost of production than existing units.
- Supply chain management contracts with Hwange Colliery Company and Makomo have been secured.
- Procurement process included EPC and funding to ensure the availability of funds to deliver the project.
- Alignment of the PPA and funding (loan) tenures to ensure the fulfilment of financial obligations

6.3.3 Kupinga Hydro Power Plant

The Kupinga Hydro Project, financed by Old Mutual Zimbabwe, has a capacity of 1.6MW. The power station provides a third of the power to Chipinge town. The project was successfully completed and commissioned in 2018. Table 43 highlights the capital structure of the project has been populated with information that was readily available and may consist of gaps where the information could not be sourced.

Table 43: Factsheet for Kupinga Hydro Power Plant

Country	Zimbabwe				
Project summary	1.6-MW Kupinga small hydropower station				
Project company	Kupinga Renewable Energy Private Ltd				
Contract type	PPP				
Project cost / funding	**Total**	**Equity**	**Debt**		
			Total	**subordinated**	**senior**
	$5.7m	$5.7m	$m	$m	$m
Investors	**Organization**	**Amount**	**Guarantor**	**Risk**	
	Old Mutual	$5.7m			
	Total equity	**$5.7m**			
Lenders	**Organization**	**Amount**	**Subordinated**	**Guarantor**	
		$m	$m		
		$m			
	Total public debt	**$m**			
		$m	$m		
		$m	$m		
	Total bilateral DFI debt	**$m**			
	Total commercial bank debt	**$m**			
	Total debt	**No information available**			
	Senior debt: years; Subordinated debt: years				

Source: World Bank Private Participation in infrastructure Database

Bankability Lessons Learnt

- The hydro power station plant was commissioned to provide power to the rural community in Zimbabwe's Manicaland Province. The project had socio-economic benefits that include uplifting the Chipinge district and the country at large through supply of clean energy.
- The project is expected to have a 17% return on investment.
- A 20-year PPA was finalised with ZETDC.

6.3.4 Lusulu Power Plant – Phase 1

Lusulu Power Plant is a coal power plant owned by, Pan-African Energy Resources (PER). PER entered into an EPC contract with China State Construction Engineering Corporation and debt financing for the project will be secured through the Bank of China. The project will be developed in phases, starting with Phase 1 which entails a 350MW plant which will ultimately expand into a 2100MW power plant (3 * 700MW, being 1A of 350MW; 1B of 350MW; phase 2 of 700MW; and phase 3 of 700MW). PER was provided with a licence to build a $3 billion thermal power plant in the country and secured $1,1 billion for the implementation of Phase 1. Table 44 highlights the capital structure of the project has been populated with information that was readily available and may consist of gaps where the information could not be sourced.

Table 44: Factsheet for the Lusulu Power Plant – Phase 1

Country	**Zimbabwe**				
Project summary	350MW coal power plant in Binga, Matabeleland North. The project is sited on the southern side of Lake Kariba. The project will be developed in phases, starting with Phase 1 which entails a 350MW plant which will ultimately expand into a 2100MW plant.				
Project company	PER Lusulu Power [Group Ventures (Pvt) Ltd (Pan-Africa Energy Resources)]				
Contract type	• Engineering, Procurement and Construction (EPC) contract with China State Construction Engineering Corporation • Power Purchase Agreement with Zimbabwe Electricity Transmission and Distribution Company (ZETDC)				
Project cost / funding	**Total**	**Equity**	**Debt**		
			Total	**subordinated**	**senior**
	$1,1 b	$m (15%)	$m (85%)	$m (0%)	$m (85%)
Investors	**Organization**	**Amount**	**Guarantor**	**Risk**	
		$m			
		$m			
		$m			
	Total equity	$m			
Lenders	Organization	Amount	Subordinated	Guarantor	
		$m			
		$m			
		$m			
	Total multilateral DFI debt	$m			
		$m			
		$m			
		$m			
	Total bilateral DFI debt	$m			
	Bank of China	$0,95b	$0,95b		
		$m			
	Total commercial bank debt	$m			
	Total debt	$0.95b			
	Senior debt: 15 years; Subordinated debt: years				
EPC contractor	China State Construction Engineering Corporation				
O&M contractor	PER Lusulu Power				
Public-sector support					

Project development	Lusulu Power Project – Phase 1 (i) Unsolicited bid Power Generation License Concession Secured a US$950 million loan from China Signed an EPC (engineering, procurement, and construction) agreement with China State Construction Engineering Corporation (CSCEC) Accorded national project national status. Implementation Agreement with the Government have been granted and signed. The Environmental Social Impact Assessment has been approved. Coal Supply Agreements have been signed with the Coal Supplier. Water supply has been agreed.

Source: www.perzim.com/about-us/

Bankability Lessons Learnt

- The EPC contractor, China State Construction Engineering Corporation facilitated the sourcing of debt financing for the project and build power lines to transmit the electricity
- Early conclusion of the supply chain management agreements. The project will use surrounding coal concessions located in Binga to fire the power plant. The Lusulu coal fields in Binga are estimated to hold 1.2 billion tons of coal reserves
- Off-taker agreement structured to include both local and regional power supply and revenue streams
- Government support and granting of the National Project Status

Case Study: UHURU ENERGY SOLAR PLANT PROJECT

The Uhuru Solar Energy project is a greenfield solar photovoltaic (PV) project. It is located in Donnington West, Bulawayo, Zimbabwe. The project is estimated to cost $60 million. Uhuru Energy plans to set up combined solar photovoltaic power plants with a total capacity of 310 megawatts, making it the country's largest investment into renewable energy.

Phase one of the project which will be set up in Donnington West in Bulawayo will cost $60 million while phases 2 to 4 will cost $240 million. Construction of phase 1 is estimated to take 18 months to complete beginning at the end of the third quarter in 2018. Table 45 highlights the capital structure of the project has been populated with information that was readily available and may consist of gaps where the information could not be sourced

Table 45: Factsheet for the Uhuru Energy Solar plant Project

Country	Zimbabwe				
Project summary	A greenfield solar photovoltaic (PV) project located in Bulawayo. The project was funded by a Chinese firm (85%) and Uhuru Energy (15%). The Chinese firm will also undertake the construction of the power plant.				
Project company	Uhuru Energy (Private) Ltd				
Contract type	Build, own, and operate				
Project cost / funding	**Total**	**Equity**	**Debt**		
			Total	subordinated	senior
	$60m	$60m	$m	$m $m	

Investors	**Organization**	**Amount**	**Guarantor**	**Risk**
	Chinese State-owned firm	$51m		
	Uhuru Energy	$9m		
	Total equity	$60m		
Lenders	**Organization**	**Amount**	**Subordinated**	**Guarantor**
		$m	$m	
	No data available	$m		
		$m		
	Total multilateral DFI debt	$m		
		$m	$m	
	No data available	$m	$m	
		$m		
	Total bilateral DFI debt	$m		
		$m		
		$m		
	Total commercial bank debt	$m		
	Total debt	$m		
	Senior debt: years; Subordinated debt: years			

Source: World Bank Private Participation in infrastructure Database

Bankability Lessons Learnt

- Once completed, Uhuru Energy will be one of the largest Solar PV power undertaking in Zimbabwe and Sub-Saharan Africa
- Production of low-cost electricity to the grid.
- A 25-year lease agreement with the NRZ for the land where the power plant will be situated.
- Uhuru Energy sought a "prescribed asset" status for the project to engage pension funds and insurance firms for investment/ financing.

7. Conclusion and Recommendations:

7.1 Conclusion

Zimbabwe has faced multiple challenges in developing a pipeline of bankable infrastructure projects. This has mainly been due to bottlenecks within the project preparation lifecycle and investor confidence. Extensive adjustments and in certain instances, reforms are required to ensure that energy projects produce risk-adjusted globally competitive returns. In order to de-risk the country and project pipelines, the government must create a roadmap to the resolution of policy and structural impediments to the production of bankable project pipelines. Some of recommendations aid the objectives off the Transitional Stabilization Program.

Zimbabwe faces growing energy demand, aging infrastructure (networks and technology) and lack of a comprehensive energy projects bankability pipeline. The country will need to develop a comprehensive structural and policy implementation matrix to address the recommendations proposed in section 7.2. The implementation matrix will aid the resolution of bottlenecks impeding the development of bankable infrastructure projects in Zimbabwe. The objectives of the structural and policy implementation matrix include, but are not limited to:

- Integrated project planning and resourcing
- Local infrastructure funding and capital raising
- Enhancing investor confidence and protection
- Improving the ease of doing business in the country (laws and bureaucracy)
- Improving regulatory provisions
- Enhancing procurement efficiencies for both public and private projects
- Project preparation enhancements
- Enhancing institutional operational efficiencies
- Energy security reforms (diversification, demand, supply and distribution)

7.2 Recommendations

Based on the research findings regarding the factors affecting bankability, Table 46 outlines the structural and policy implementation matrix discussed in section 7.1

Table 46: Recommendations for a structural and policy implementation matrix

	Factor	Theme	Details

1.	Economic enhancements	Increased Fiscal Allocations towards infrastructure development	• Increasing the fiscal allocations towards the PPDF fund
			  • Zimbabwe faces an annual US$1.7 billion infrastructure deficit to recover over the next decade. The deficit translates to an approximate US$ 500 million annual allocation for energy projects.
			• There is a need to increase Treasury allocations towards infrastructure projects to US$ 500 million or increasing fiscal allocation to a minimum of 5.6% of GDP as recommended by the McKinsey study
			• Increased and targeted financing and resourcing for project preparation activities needs to be sustained over the recommended period
			  • The project profiles for Zimbabwe infrastructure are from million to billion-dollar projects. The current PPFs by IDBZ ($10m) and GoZ ($15m) are not sufficient to close the infrastructure deficit in Zimbabwe and the energy sector. The resources also compete with projects from other sectors as well.

		Currency stabilization and investment protection	• Ensuring protection of revenues guaranteed and espoused in the PPA agreements in the denoted contractual currencies. This can be achieved through either subsidizing differences or ensuring adjustable price reflectivity with regards prevailing economic conditions • Protection of investments and revenue value from adverse changes in economic policies. e.g. for USD/foreign currency capital injections prior to policy changes Ensuring stabilization and market acceptance of the country's monetary and exchange rate policies
		Country credit rating	• Engagement of credit rating agencies to profile and raise the credit profile for Zimbabwe. This will enhance the availability and access to affordable lines of credit for infrastructure projects. • Zimbabwe competes for limited financial resources with regional and global countries. It is the only country in SADC without a credit rating. • Continuation of efforts to clear local and international arrears to that effect.

2.	Financial considerations	Innovative revenue collection and/ or mobilization	• Exploration on the levying of infrastructure tax e.g. as a general tax, energy sales tax. • Exportation of a portion of generated power by power producers to into the region to ensure foreign currency generation. • Incentivized crowd funding/product offering for Zimbabwean nationals, including the diaspora e.g. Argyll Hydro Power Station<?>, Reading Hydro Community Benefit Society (CBS)<?>.
		ZESA operational efficiency and growth of capital reserves	• Improved capacitation and planning for ZESA revenue, profits and capital reserves to fund project preparation activities. • The MoEPD currently relies on fiscal allocations and PPDF funding for project preparation activities funding • Ensuring the parastatal operations efficiently deliver consistent returns and capital retention for growth and expansion initiatives. • Improvements in the cost recovery and revenue collection mechanisms of the off-taker i.e. debts, pre-paid metering.
		Off-taker creditworthiness and transmission grid losses	Reduction of energy losses to at least below 10%. • Urgent investment into the upgrading, rehabilitation and replacement of the transmission and distribution infrastructure to limit technical and commercial losses to operate within international benchmarks. • Ensuring operations efficiency and minimization of energy losses are essential to the creditworthiness rating of the off-taker. This has a bearing on a project's bankability and confidence in the PPA.
		PPF Funding and innovative infrastructure funding product offerings	• Creation and diversification of multiple local PPFs and mobilization of funding to resource the specialized PPF funds e.g. trust funds pooling, energy infrastructure levy fund. • Capacitation of IDBZ to on-board and manage multiple PPF products of their own and on behalf of multiple multilateral organisations (regional/international). • In addition to their own, DBSA also manage the PPFs for Green Fund, SADC Project Preparation and Development Facility (SADC PPDF), Infrastructure Investment Programme for South Africa (IIPSA), DBSA Project Preparation Fund, Global Environment Facility (GEF) • This will ensure a wide array of PPDF funds for project preparation activities. • Developing foreign currency denominated infrastructure bonds with guarantees.
3.	Political factors	Perceived country risk	• Continued re-engagement with the global and international finance communities. Sanitization of ambiguous policies with a bearing on investor confidence e.g. monetary policy, electricity tariffs. • Canilao (2017) argues that for developing countries, bankability involves more than just de-risking projects; it, more importantly, entails de-risking the country as a whole. • Continuous review of political, regulatory, and institutional frameworks, though legislative instruments to continuously improve the investment framework in Zimbabwe.
		Ease of doing business	• Acceleration of the establishment of the one stop shop for investors to participate in relevant sectors of preference such as energy. • Review and alignment of requirements, fees and approvals within the energy sector e.g. alignment of EMA, National parks and Wild Life and Ministry of Lands approvals and fees • the current fees levied by some entities are perceived as exorbitant. e.g. EMA charges up to 1.2% of the total project cost.

<?> https://www.bmmagazine.co.uk/get-funded/44322/
<?> https://www.crowdfunder.co.uk/reading-hydro-pioneers

4.	Regulatory enhancements	Quality of project sponsors or licensed project developers	• There is a need to review and create a licencing framework that licenses are only granted to stakeholders with the demonstrated capacity (technical and financial) to deliver energy projects
		Ensuring Tariffs are cost reflective and regionally competitive	• Continuous review of the tariff's value against the monetary policy developments. • Employing consultants to determine the true cost of efficient production of electricity in the market to improve cost reflectivity and competitiveness in the region. • PPA agreements are denominated in foreign currency. • If revenue collected does not match contractual agreements this exposes the off-taker, power producers and country to legal risk. • Alignment with competitive bidding can help eliminate overpricing on EPC contracts which has an overall impact on project tariffs and overall financial viability.
		Regulatory fees	• Review of the total regulatory fees required for the approval of the projects across all ministries to ensure regional competitiveness in attracting foreign investment i.e. ZERA, EMA etc. • Some regulatory fees are significant e.g. EMA fees are approximately 1.2% of the total project cost. e.g. For large scale projects that are worth over a billion dollars the EMA ESIA fee will cost at least twelve million dollars in foreign currency denomination.
5.	Procurement alignment	Standardization and enforcement of compliance to procurement standards for all infrastructure projects.	• Ensuring open and consistent procurement processes across all energy infrastructure projects for both public and private projects. • Enabling PRAZ compliance reporting and monitoring for all projects with a national interest • Multilateral development institutions operating in Africa require coherence across procurement standards, and many infrastructure projects require development in this regard.
		Packaging of projects and diversification of investors	• Improved packaging of projects as per an Integrated Project Plan to attract a diverse range of national and international investors into the IPP sector.
		Competitive bidding/procurement processes	• Ensuring a competitive bidding framework for all generation licenses to maximise infrastructure planning, technology and cost efficiencies etc.

		Private sector general compliance monitoring for projects of national interest	• Extension of the mandate of PRAZ to ensure compliance monitoring to the Procurement Act for all private projects classified as either being in the national interest or national status
			  • Frequent monitoring of compliance of an organization's procurement processes and documentation to the relevant procurement act and or policies.
			• Extension of the procurement framework to include compliance reporting and monitoring for all licensed power generators
			  • the framework should continue to allow market freedom but ensure that technical competencies and standards for infrastructure projects are adhered to at all times.

6.	National Requirements Planning	Integrated National Project Plan	• Creation of a national integrated infrastructure plan that cuts across all sectors as discussed in section 2.4.3 • Creation of an National Infrastructure Advisory/Implementation Committee to monitor and ensure that integrated infrastructure plans are implemented according to plan and budget. • Alignment of competitive bidding procurement initiatives to the National Integrated Infrastructure Plan and to the Budget.
		Optimal Sustainable Energy and Technology Mix	• Researching and developing a long-term plan for optimizing Zimbabwe's available energy resources. • Developing policies and structures to secure the country's energy supply chain with regards to the energy source quality and efficiency, plus environmental and economic considerations. • Devising a targeted investment strategy with regards to the integrated National Project Plan and Optimal Sustainable Energy and Technology Mix for the energy sector. • Completion and alignment of the System Development Plan to include optimal mix considerations.
		Renewable Energy Policy and Development Thrust	• Scaling up focus on and development of renewable energy potential in Zimbabwe. • Researching and developing a base study for the full renewable energy generation potential for the whole country. • Developing energy efficiency policies guided towards producing an optimal energy mix and development of renewable energy plants with minimum environmental and financial cost • The World Bank is leading an effort to assist countries to transition from coal and fossil fuels. They offer financial, technical and advisory support for developing countries that have decided to transition away from coal and accelerate the uptake of renewable and cleaner sources of energy. The WB has earned green credentials for ending direct lending to coal-fired power plants. • Adoption and implementation of a renewable energy policy to provide a more conducive environment for attracting investment. • Providing clarity on and the finalization of the Renewables Energy Feed In Tariff (REFiT) to stimulate investment in the renewable energy sector
7.	Project specific enhancements	Quality of project developers	• Determining and confirming the suitability of the technical capacity, business skills and experience of project promoters to execute energy infrastructure projects at the licensing stage. • Ensuring the financial capability of project developers to contribute or raise the counterpart funding for project preparation activities that may be required to complete the project at the licensing stage.
		Technology (cost efficiency and legacy)	• Ensuring technology adopted by license bidders is current, best in the market and power station designs provide reliable and low-cost electricity to the national grid • Non-reliance on the perpetuation of legacy systems at the expense of modern technology • Exploration and investment in non-legacy and more efficient energy generation technology where relevant

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