REPUBLIC OF ZAMBIA

ZAMBIA POWER DEVELOPMENT FRAMEWORK

2021

EU-ZAMBIA PAMODZI FOR ENERGY

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FOREWORD

A viable energy sector plays an important role in the development of any economy. It is therefore important for the policy framework which is in place to be responsive to the changing needs of the sector.

The National Energy Policy 2019 (NEP 2019) seeks to ensure that the sector's potential to drive economic growth and reduce poverty is harnessed. The policy recognizes the important role that can be played by the private sector for the continued growth of the electricity sector. In this regard, the policy among other things, aims to further remove barriers for private sector investment.

Therefore, the NEP 2019 requires additional frameworks and strategies to impact developments in the energy sector such as increasing the country's electricity generation capacity.

The country has abundant resources for power development which include; hydropower, biomass, coal, wind, geothermal, solid waste, uranium and solar power. However, despite the availability of these resources the country has lagged behind in the development of power projects due to among other issues the lack of a clear framework to guide private sector participation in the development of power generation, transmission and distribution infrastructure.

Zambia Power Development Framework (ZPDF) is therefore a government power sector initiative to facilitate public and private sector investments in power development for sustainable development. The Framework is a guide to the private sector on the procedures and processes involved in the electricity subsector.

The development of the ZPDF was undertaken through a wide legislative evaluation and consultative process as a way of fostering collective involvement and effective participation of all relevant stakeholders. The Framework is an organic document and will continue to be revised and updated to address concerns of stakeholders.

It is my sincere hope that this framework will clearly demonstrate Government's intention for expanding and diversifying the electricity subsector in Zambia for the mutual benefit of developers and the nation.

In conclusion, I would like to take this opportunity on behalf of my Ministry to thank the European Union for their support in the development of the ZPDF through the Increased Access to Electricity and Renewable Energy Production Project. I also wish to thank all stakeholders that participated in the consultative process leading up to the conclusion of this document.

Peter C. Kapala, MP
Minister
MINISTRY OF ENERGY

ACKNOWLEDGEMENT

The formulation of the Zambia Power Development Framework (ZPDF) was based on a consultative process involving various stakeholders. Accordingly, appreciation is extended to all the key stakeholders who took part in the framework document formulation process. These included representatives from the following institutions:

1. Cabinet Office;
2. Various Government Ministries/ Institutions;
3. Energy Utilities;
4. European Union and other Cooperating Partners;
5. Private Sector;
6. Civil Society; and
7. Institutions dealing with different aspects of private sector investment promotion.

The successful implementation of this framework document will depend on the continued participation of the institutions listed above and the support of all the Zambian citizens.

Francesca **CHISANGANO** Zyambo (Mrs.)
Permanent Secretary
MINISTRY OF ENERGY

WORKING DEFINITIONS

Bankable Feasibility Study	An extensive technical, economic, environmental, social, and financial study to assess the commercial viability of a project, of sufficient detail and integrity that it can be used to arrange project financing.
Connection Agreement	Agreement between the “Transmission Network Service Provider or Distribution Network Service Provider as the case may be” and the power generation company on the construction of certain transmission and/or distribution lines and other related infrastructure to connect the plant to the grid and the right of the generation company to connect the plant to the grid.
Environmental and Social Impact Assessment	A process for predicting and assessing the potential environmental and social impacts of a proposed project, evaluating alternatives, and designing appropriate mitigation, management and monitoring measures.
Evaluation	The systematic and objective assessment of an on-going or completed project, programme or policy, its design, implementation and results.
Generation License	The license issued to the power generation company by the Energy Regulation Board (ERB) in connection with the generation of electricity at the power plant.
Implementation Agreement	The agreement between the power generation company and the Government of the Republic of Zambia in relation to the development and operation of the project.
Independent Power Producer	A private entity which owns and or operates facilities in relation to the generation of electricity for sell to a utility and or end users.
Inspection	Examination or analysis in relation to the activities performed on the development and operation of power projects.
Investment License	The license issued to the power generation company by the Zambia Development Agency in relation to the development of the power plant.

Lease Agreement	Agreement between the power generation company and any institution or organization in relation to the lease of land or property for a specified period.
Monitoring	A continuing function that uses systematic collection of data on specified Indicators to provide management and the main Stakeholders of an ongoing development intervention with indications of the extent of progress and achievement of Goals and correlation of such progress to the use of allocated funds.
Optimization Study	The methodology of finding an alternative option to the development of the power project, with the most cost effective or highest achievable performance under the given constraints, by maximizing desired factors and minimizing undesired ones.
Off-Taker	Any person or company who is counterparty to a Power Purchase Agreement with the power generation company and any successor thereto
Power Purchase Agreement	Agreement between the power generation company and the power off-taker in relation to the sale and purchase of electricity.
Pre-feasibility Study	The early-stage analysis and assessment of the potential to establish a power project.
Project Developer	A person or entity intending and/ or developing power generation, transmission, or distribution infrastructure facilities.
Review	An assessment of the performance of an intervention, periodically, or on an ad hoc basis.
Self-Generation	Production of electricity for own use with a captive power plant installed usually on one's own premises.
Water Permit	A permit issued by the Water Resources Management Authority in relation to the use of water for power generation or abstraction of water for cooling in thermal power generation plants.

ACRONYMS AND ABBREVIATIONS

7NDP	Seventh National Development Plan
CA	Contracting Authority
CPs	Cooperating Partners
EA	Electricity Act No. 11 of 2019
EoI	Expressions of Interest
ERA	Energy Regulation Act No. 12 of 2019
ERB	Energy Regulation Board
GET FiT	Global Energy Transfer Feed-in Tariff
GRZ	Government of the Republic of Zambia
IA	Implementation Agreement
M&E	Monitoring and Evaluation
MoE	Ministry of Energy
MW	Megawatts
NEP	National Energy Policy
NHCC	National Heritage and Conservation Commission
OPPPI	Office for Promoting Private Power Investment
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
RE FiT	Renewable Energy Feed-in-Tariff
RfP	Requests for Proposals
RfQ	Request for qualifications
SAPP	Southern Africa Power Pool
WARMA	Water Resources Management Authority
ZDA	Zambia Development Agency
ZEMA	Zambia Environmental Management Agency
ZESCO	ZESCO Limited
ZPDF	Zambia Power Development Framework
ZPPA	Zambia Public Procurement Authority

CHAPTER ONE
INTRODUCTION

1.1 Introduction

Electricity access and use are key indicators of socio-economic development for any country. For this reason, Government has taken measures to accelerate the development of power resources and power infrastructure through both the public and private sectors.

Identifying the private sector as a key partner in the development, financing and implementation of projects, Government has expressed commitment to the promotion of private sector involvement in power projects in the Vision 2030, National Development Plans, and the National Energy Policy 2019.

The development of Zambia Power Development Framework (ZPDF) is aimed at re-affirming the Government's support to investors and developers who wish to carry out power developments in the country. The document serves as an investment prospectus as well as a guide to prospecting developers.

The ZPDF will ensure effective and efficient private and public sector participation in power development.

1.2 Objectives

The objectives of the ZPDF are:

1. To guide power project developers through the Zambian legal and institutional framework required to develop power projects;
2. To promote private sector participation in the development of power projects;
3. To aid the increase of power generation capacity of the country; and
4. To assist in the process of promoting the diversification of the national energy mix as an additional strategy for security of supply and climate change mitigation.

1.3 Scope

The ZPDF has been developed following an extensive stakeholder review of all legal and regulatory frameworks governing the electricity sector in Zambia. The ZPDF provides an overview of the Zambian electricity sector, entities and sector players. It documents the procedures to be followed by developers of primarily on-grid projects from inception to operation. Although the focus of the document is not primarily on off-grid systems, some of the procedures are common to both types of projects. The major difference being in the type of operational licence issued to off-grid systems which combines a generation, distribution and supply licences into one. The rational for this combination is premised on two points; firstly, off grid systems are generally small projects and secondly to ease the regulatory procedures for these types of projects.

While the ZPDF seeks to document and provide guidance to developers on the key steps that developers need to take in order to develop power projects, it does not eliminate the need for developers to undertake their own due diligence on the Zambian legislative and regulatory framework.

CHAPTER TWO
GENERAL INFORMATION ON ZAMBIA

2.1 Geographical Status
Zambia is located in Southern Africa. It is a landlocked country, situated between latitude 8 and 18 degrees south and longitudes 22 and 34 degrees east. The country is situated on the great plateau of Central Africa, with average altitude of 1200m above sea level. The highest elevation ranges between 1525m to 1650m above sea level.

The country covers a total land area of 752 612 km^2 and is administratively divided into ten provinces, namely: Central, Copperbelt, Lusaka, Western, Luapula, Muchinga, Northern, North-western, Eastern, and Southern Province. The capital city of Zambia is Lusaka City, which is a commercial centre of the country. Other major cities are Chipata, Choma, Kasama, Livingstone, Mansa, Mongu, Ndola, Kabwe, Kitwe, and Solwezi.

Zambia shares a boundary with eight other countries namely: Democratic Republic of Congo and Tanzania in the north; Malawi and Mozambique in the east; Zimbabwe and Botswana in the south; Namibia in the south-west; and Angola in the west. This is as depicted in Figure 1 below:

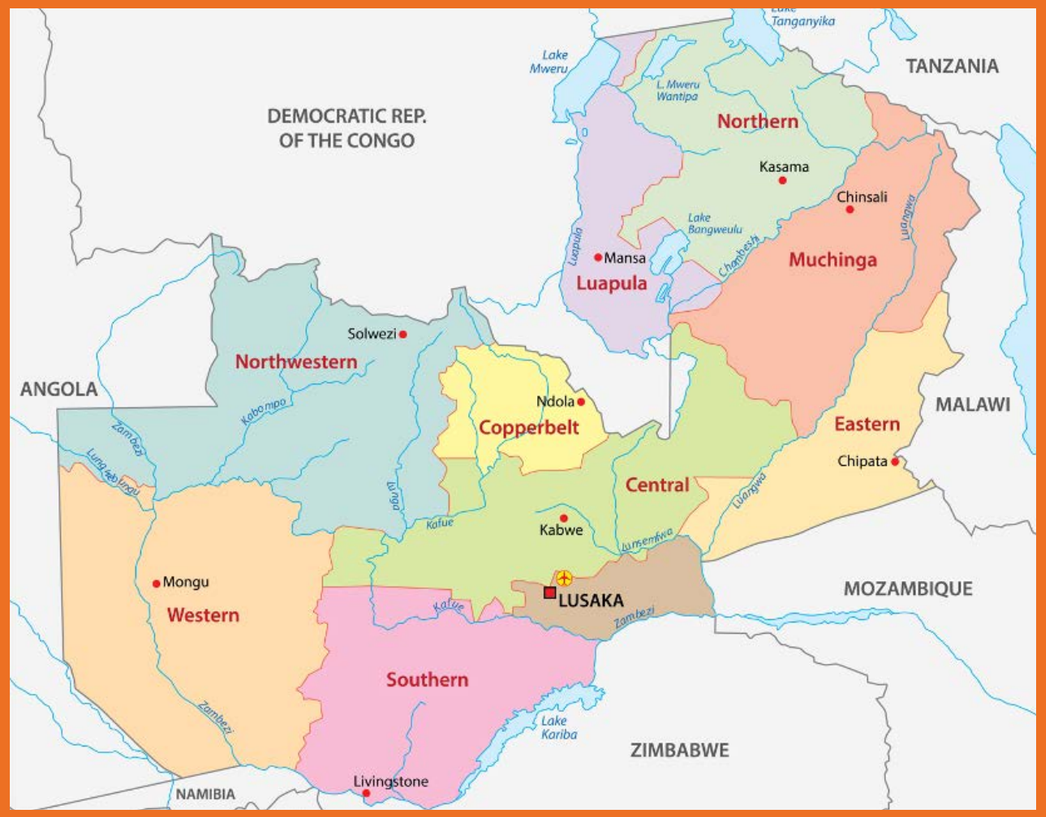


Figure 1: Zambia and its Neighbours

2.2 Population
The population of Zambia is estimated at 17.3 million and the annual population growth was estimated in the 2010 Census of Population and Housing at 3.1%. Zambia is one of the most urbanised countries in Africa with a sparse rural population.

2.3 Climate and Vegetation
Zambia's climate is sub-tropical, characterized by three distinct seasons: the cool dry season, which stretches from May to August; the hot dry season from August to November and the rainy season from November to April. The annual rainfall decreases from an average of 1000 mm in the northern parts of the country to an average of 600 mm in the southern parts.

The mean annual temperature ranges between 18° and 20° Celsius. The highest annual average temperature is 32° Celsius and the lowest is 4° Celsius.

Miombo woodlands, a sub-category of the Savannah is the predominant vegetation. The next in predominance is the grassland, followed by closed forest and lastly the termitaria bush group.

2.4 Political, economic, and social factors
The Government consists of three organs namely: Executive, Legislature (Parliament); and Judiciary. It has a multi-party political system were presidential and general elections are held every five (5) years to elect the Executive and Legislature. The country has an open market system.

The unit of currency in Zambia is the Zambian Kwacha (ZMW) with some foreign currencies such as US Dollar (US$) being accepted in multinational transactions. Bilateral and on spot electricity trading has been dominated by the US Dollar, however, the parties in such trading are at liberty to use the Zambian Kwacha.

The major export commodity for Zambia is copper which accounts for about 80% of the nation's foreign exchange earnings. As at the end of 2019, Zambia's GDP was estimated at US$ 28.5 Billion, and mining accounted for 12% of Zambia´s GDP and 70% of total export value.

Agriculture is an important economic activity accounting for about 23% of GDP. About 85% of the country's labour force is employed in the agriculture sector while the predominant food crops grown throughout the country include maize, sorghum, finger millet, rice, beans, cassava, groundnuts, and sweet potato. The cash crops include tea, tobacco, wheat, and sunflower. The important fruit tree crops are mango, banana, papaya and avocado.

The major staple food for Zambia is maize, ground in powder form and prepared as a thick porridge served with vegetables and meat. Cassava and millet are also consumed in a similar manner in parts of the country.

Tourism is another major industry in Zambia. The major tourist attractions include:

1. Waterfalls such as the Victoria Falls, Lumangwe Falls, Kalambo Falls, Ntumbachushi Falls and Kundalila Falls.
2. National Parks and Wildlife such as the Kafue National Park, Lower Zambezi National Park and Lochinvar National Park; and
3. Traditional Ceremonies such as the Kuomboka, Kulamba, Ncwala and Mutomboko.

2.5 Health and Education

The major health facilities in Zambia are the University Teaching Hospital (Lusaka), Levy Mwanawasa Hospital (Lusaka), Ndola Teaching Hospital (Ndola) and the Kitwe Teaching Hospital (Kitwe). Selected health facilities located in provincial and district headquarters do offer specialised treatment. Other specialised health facilities can be found around the country operating as fee paying private hospitals.

The major government owned educational facilities are the University of Zambia (Lusaka), Copperbelt University (Kitwe), Mulungushi University (Kabwe) and Levy Mwanawasa University (Lusaka) where a pool of skilled labour can be harnessed.

Other subsidiary government owned educational facilities are technical and vocational colleges around the country. There are also private universities and colleges.

These educational institutions offer a diversity of qualifications relevant to the electricity sector and project development, ranging from bachelors and master's in electrical, civil, and mechanical engineering, finance, management, and law. Technical colleges also produce skilled technicians in electrical engineering, plant operators, lines men and women and other non-engineering skills such as account technicians and social sciences.

[1] https://www.zamstats.gov.zm/

CHAPTER THREE
ZAMBIAN ELECTRICITY SUPPLY INDUSTRY

3.1 Introduction

The electricity industry in Zambia is overseen by the Ministry of Energy (MoE). The MoE is responsible for the development and management of the National Energy Policy and implementation of various strategies.

3.2 Structure of the Electricity Industry in Zambia

The structure of the electricity industry in Zambia is as shown in Figure 2 below:

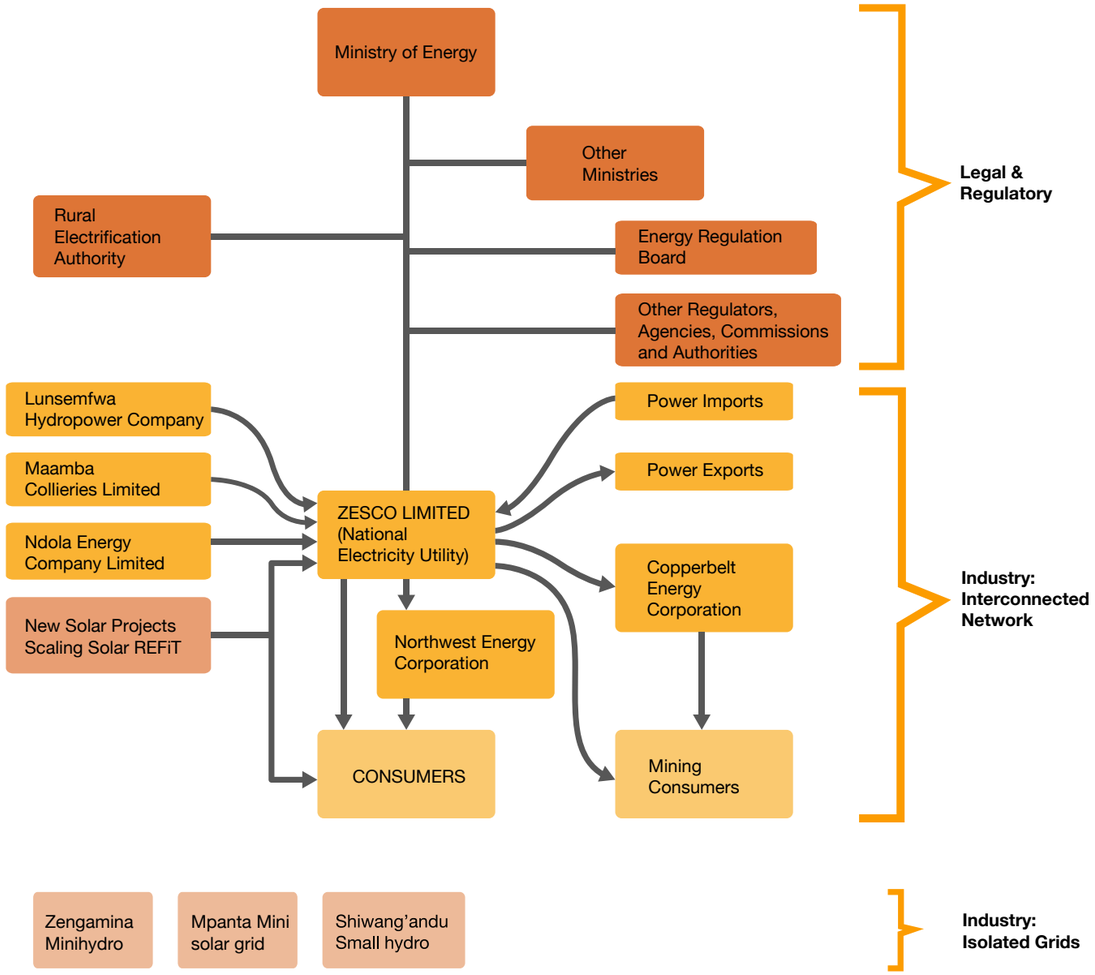


Figure 2: Structure of the Electricity Industry in Zambia

3.2.1 Ministry of Energy (MoE)

The MoE is charged with the responsibility of development and management of energy resources in a sustainable manner for the benefit of the people of Zambia. MoE plays a policy setting and facilitation role in the Zambian energy sector. The Ministry comprises the Departments of Energy, Planning and Informatics, Petroleum, Human Resources and Administration, Finance, and the Office for Promoting Private Power Investment (OPPPI). Other government institutions in the electricity subsector that fall under MoE are Energy Regulation Board (ERB) and the Rural Electrification Authority (REA).

i. Department of Energy (DOE)

The DOE is a technical department in the Ministry of Energy which is responsible for the development and implementation of policies, programmes and projects in renewable energy, energy efficiency, electricity, and power development.

ii. Department of Petroleum (DOP)

The DOP is a technical department in the Ministry of Energy which is responsible for the management and development of the petroleum industry in the country. DOP coordinates the development and implementation of petroleum programmes and projects.

iii. Office for Promoting Private Power Investment (OPPPI)

OPPPI is a unit in the MoE specifically established to be a link between Government and the private sector to promote private sector investment in the electricity subsector.

The primary function of OPPPI is to:

a. Identify projects for development by the Government and the Private Sector.
b. Undertake feasibility studies to create a pipeline of projects for development.
c. Develop Implementation strategies for the development of power projects.
d. Procure developers through the granting of implementation Agreements to developers and investors.
e. Coordinate with other government institutions for the grant of relevant permits, licenses, rights, and approvals required for the development of power projects; and
f. Monitor the life cycle of power projects with respect to government agreements, permits, licenses, rights, and approvals granted to power projects.

3.2.2 Other Ministries

The operation of the electricity sector requires the collaboration of other government ministries such as:

i. Ministry of Finance and National Planning (MFNP)

The Ministry of Finance and National Planning (MFNP) is responsible for public finances and finance related activities in Zambia. In respect of the energy sector, the MFNP is responsible for formulating tax policy for the energy sector in Zambia as part of the fiscal policy of the country. Through the Ministry of Energy, the MFNP also plays the role of guarantor of state enterprises which may include financing requirements of ZESCO Limited and its operations such as in the case of power off take from Independent Power Producers (IPPs). The award of guarantees to power projects takes various forms which include provision of sovereign guarantees under the Power Purchase Agreement, tax exemptions and/or stabilization periods.

[2] Gazette Notice No. 6526 of 2016 delegates responsibility for the energy sector to the Ministry of Energy

ii. Ministry of Justice (MOJ)

The Ministry of Justice (MOJ) is charged with the responsibility of facilitating the administration of justice and promoting the observance of the rule of law.

Government contractual agreements and all legal components of energy sector projects and dealings are undertaken by the Ministry of Justice through administrative channels established between the Ministry of Energy and the Ministry of Justice.

iii. Ministry of Lands and Natural Resources (MLNR)

The Ministry of Lands and Natural Resources is responsible for the administering and management of Land and Natural resources in Zambia. The Lands Act Chapter 184 of the Laws of Zambia governs the issuance of leases for use of state land from the Government or any titled land.

In Zambia, land is allocated by the State through the MLNR and through traditional leaders responsible for customary land. Customary land can be converted into state land through a process that involves the respective traditional leaders giving written consent which is then submitted through the local council before the Ministry of Lands can issue a certificate of title.

The land tenure system in Zambia provides for leasehold tenure for a maximum of ninety-nine (99) years. Land in Zambia cannot be leased to a foreigner unless to one holding a residence permit or a company incorporated or registered in Zambia. Companies incorporated in Zambia and whose controlling shareholding is owned by non-Zambians will require an investment license from the Zambia Development Agency (ZDA) to acquire land, unless the land will be used for charitable purposes.

Through the Lands and Deeds Act Chapter 185 of the Laws of Zambia, MLNR also regulates any land leases above a lease period of twelve (12) months which is required to be registered with the Lands and Deeds Registry. Failure to register can render such lease unenforceable in case of a dispute.

Power projects, just like any other infrastructure development, will require land and therefore power project developers are required to comply with the prescriptions of the Lands Act.

iv. Ministry of Mines and Minerals Development (MMMD)

The Ministry of Mines and Minerals Development (MMMD) is responsible for the development and management of mineral resources in Zambia. The Ministry regulates the establishment and operation of mines. Mining products such as coal can be harnessed to produce power.

The MoE and the MMMD collaborate on power projects anchored on resources derived from mining activities. Developers of such projects are expected to own the respective mining licenses, concessions, approvals, rights and permits in accordance with the Mines and Minerals Act.

v. Ministry of Water Development

The Ministry of Water Development and Sanitation (MWDS) is responsible for the development and management of water resources, provision of water supply and sanitation. The development of power projects has an impact on the existing water resources. Power projects thus require licenses, permits and approvals from the MWDS and the subordinate Water Resources Management Authority (WARMA).

The development of power projects has an impact on the existing water resources and the ecological balance in the environment. Power projects thus require licenses, permits and approvals from the Ministry of Water and the Agencies under it. The agencies under this Ministry that influence the electricity sector are the Water Resources Management Authority (WARMA) and the Zambia Environmental Management Agency (ZEMA).

vi. Ministry of Tourism and Arts (MOTA)
The Ministry of Tourism and Arts (MOTA) is responsible for the development of tourism and art in Zambia. The development of power infrastructure impacts on the tourism industry. Hydropower projects built across waterfalls may diminish the falls while the development of such infrastructure becomes tourist attractions when designed with a concept of tourism.

The Ministry of Tourism has statutory bodies such as the National Heritage Conservation Commission (NHCC) and Department of National Parks and Wildlife (DNPW) with which power developers will need licenses, lease agreements, concessions, rights and/or approvals before projects can be implemented.

vii. Ministry of Commerce Trade and Industry (MCTI)
The Ministry of Commerce, Trade, and Industry (MCTI) is responsible for the development of a globally competitive, sustainable, commercial, trade and industrial base in Zambia. MCTI is Zambia's principal Government body responsible for administering national policy for private sector development. It coordinates industrial, commercial and trade matters and liaises with various public and private sector organisations to facilitate the implementation of government sector policies related to trade and industry.

The operation of the energy sector in Zambia is subject to the guidelines of MCTI through institutions such as the Business Regulatory Review Authority (BRRA), Patents and Companies Registration Agency (PACRA), Competition and Consumer Protection Commission (CCPC), Zambia Bureau of Standards (ZABS), Zambia Metrology Agency (ZMA), Zambia Compulsory Standards Agency (ZCSA) and the Zambia Development Agency (ZDA) all of which fall under this Ministry.

viii. Ministry of Transport and Logistics
The Ministry of Transport and Logistics is responsible for the formulation and administering of policies in the transport sector in Zambia.

The development of power projects may impact or be impacted by transport and communication networks in the country. Principal regulators under the Ministry are the Civil Aviation Authority (CAA), Zambia Airports Corporation Limited (ZACL), Road Transport & Safety Agency (RTSA), and Zambia Chartered Institute of Logistics.

ix. Ministry of Home Affairs and Internal Security (MHAIS)
The Ministry of Home Affairs and Internal Security (MHAIS) is charged with the responsibility of providing and maintaining internal security in Zambia.

Through the Immigration Department, the (MHAIS) is responsible for issuance of immigration documents as well as work permits for foreign project staff working on project developments.

Project developers are required to satisfy the requirements and guidelines of the (MHAIS).

x. Ministry of Foreign Affairs and International Cooperation (MFAIC)
The Ministry of Foreign Affairs and International Cooperation (MFAIC) is responsible for the formulation and administration of Zambia's foreign policy. The ministry promotes and protects Zambia's interests and maintains good international relations. The ministry oversees the Zambia Diplomatic Corps and provides overseas services on behalf of the Country.

Developers abroad are encouraged to utilise the Zambian embassies in their home countries on investment opportunities available in the energy sector in Zambia.

xi. Ministry of Green Economy and Environment
The Ministry of Green Economy and Environment is responsible for management of environmental protection in Zambia. The development of power projects has an impact on the ecological balance in the environment. Therefore they require licences, permits and approvals from Ministry of Green Economy and Environment and the subordinate Zambia Environmental Management Agency (ZEMA) and Meteorological Department, which is a resource for weather and climatic information to power projects during design and operations.

3.2.3 Energy Regulation Board (ERB)
The Energy Regulation Board (ERB) is a statutory body established under the Energy Regulation Act, No. 12 of 2019 of the laws of Zambia, to regulate the provision of energy and services including electricity generation and supply industry.

The regulation of the sector is achieved primarily through licenses and permits which prescribe conditions for technical, economic, and other regulatory compliance benchmarks. The ERB undertakes monitoring and compliance audits to ensure adherence to the license conditions.

The ERB collaborates with other regulatory agencies such as the Zambia Environmental Management Agency (ZEMA), the Competition and Consumer Protection Commission (CCPC), the Zambia Bureau of Standards (ZABS) and the National Heritage Conservation Commission (NHCC), among others .

In Zambia, all energy undertakings must be approved and licensed by ERB. The approval processes and license procedures are outlined in Chapter 5.

3.2.4 Other Regulators
The operation of the electricity sector in Zambia is subject to other government regulators, authorities and agencies that include:

i. Zambia Environmental Management Agency (ZEMA)
The Zambia Environmental Management Agency (ZEMA) established by the Environmental Management Act (EMA) No. 12 of 2011, is the principal environmental regulator and coordinating agency in Zambia. ZEMA is responsible for the integrated environmental management, protection and conservation of the environment and the sustainable management and use of natural resources.

In Zambia, all developments that potentially have an impact on the environment are subjected to the approval of ZEMA through the submission of an Environmental Impact Assessment (EIA) that takes the form of an Environmental Project Brief (EPB) or Environmental Impact Statement (EIS), depending on the nature of the project.

ZEMA approval processes are outlined in Chapter 5.

ii. Water Resources Management Authority (WARMA)
The Water Resources Management Authority (WARMA) created pursuant to Statutory Instrument No. 7 of the Water Resources Management Act No. 21 of 2011, is responsible for the preservation and protection of Zambia's ground and surface water resources. WARMA regulates the abstraction, allocation, use, development, and management of water in a sustainable manner.

WARMA grants water permits from inland water bodies to power developers when required, following specific procedures and timelines. The procedures and timelines are outlined in Chapter 5.

iii. National Heritage Conservation Commission (NHCC)
The National Heritage Conservation Commission (NHCC) is responsible for the protection of heritage sites, national monuments, and historical remnants in Zambia. The National Heritage Conservation Act Chapter 173 of the Laws of Zambia established the NHCC.

Project developers planning a project in or near national heritage sites must apply for a permit pursuant to section 37 of the Act. Notwithstanding the prohibition to disturbance of such sites, there are exceptions provided for under section 41 which permit "engineering" operations to be undertaken on or near heritage sites.

The initial contact with this agency is ordinarily during the feasibility study phase and EIA preparation and approval process through the Zambia Environmental Management Agency (ZEMA), however, developers are encouraged to initiate preliminary screening processes at an early stage.

The process and procedures for NHCC approvals and permits are highlighted in Chapter 5.

iv. Department of National Parks & Wildlife (DNPW)
The Department of National Parks & Wildlife (DNPW) is a department under the Ministry of Tourism & Arts which is mandated by the Zambia Wildlife Act No. 14 of 2015 to manage and conserve Zambia's wildlife.

Zambia's wildlife covers about 31% of the country's land mass and projects that are earmarked for development in wildlife management areas require permits and approvals from DNPW. The initial contact with this department is ordinarily during the feasibility study phase and EIA preparation and approval process through ZEMA, however developers are encouraged to initiate preliminary project screening with the DNPW at an early stage of the project.

The process and procedures for DNPW approvals and permits are highlighted in Chapter 5.

v. Zambia Public Procurement Authority (ZPPA)
The Zambia Public Procurement Authority (ZPPA) is a regulatory agency that regulates procurement procedures in public institutions. ZPPA was created by the Public Procurement Act No. 8 of 2020.

The regulation of public procurement and tendering for project concessions is undertaken through administrative channels established by Government and therefore developers may not have direct relations with the agency for purposes of energy sector projects.

[4]S.4 ERA and s.3 of the EA

vi. Zambia Development Agency (ZDA)
The Zambia Development Agency (ZDA) is responsible for fostering economic development through promoting and facilitating investments, trade, and competitiveness of businesses in Zambia. The ZDA was established through the Zambia Development Act No. 11 of 2006.

ZDA grants investment licenses and Investment Promotion and Protection Agreements (IPPA) to investors in Zambia. The licenses issued by ZDA carry investment incentives applicable to the respective sectors while the IPPA offers protection of the investment. Developers are encouraged to register with ZDA at an early stage to unlock the subsequent services offered by Government.

Procedures for applications and guidelines are available on ZDA website (www.zda.org.zm).

vii. Public-Private Partnership Department (PPPD)
The Public-Private Partnership Department (PPPD) is responsible for the promotion, facilitation, implementation and monitoring the procurement, contracting and delivery of public infrastructure and social services through partnerships between public sector and private sector entities.

The PPPD is a department under the Ministry of Finance, established under the Public-Private Partnership Act No. 14 of 2009 as amended by the Public Private Partnership Act No. 9 of 2018. One of the primary objectives of the PPPD is to facilitate the effective and efficient delivery of public infrastructure and related services and promote innovation in the development of infrastructure and social services, through private sector participation.

The procedure for the procurement of PPP projects is highlighted in Chapter 5.

viii. Competition and Consumer Protection Commission (CCPC)
The Competition and Consumer Protection Commission (CCPC) was established with a dual mandate to protect consumers and to protect the competition process in the Zambian economy.

The CCPC was established in 1997 under the name Zambia Competition Commission (ZCC). The name was then changed in 2010 to CCPC following the enactment of the new Act called the Competition and Consumer Protection Act (CCPA) No. 24 of 2010 and repeal of the old Act.

CCPC is responsible for acting as a primary advocate for competition and effective consumer protection in Zambia ; advise Government on laws affecting competition and consumer protection and provide information for the guidance of consumers regarding their rights under this Act among other things. Also, in cases where a developer seeks to take over an already existing entity, approval for merger/acquisitions purposes will have to be obtained from the CCPC.

In power projects, CCPC through administrative channels with ERB ensures competition in business models and tariff setting. Section 30(c) of the Electricity Act requires the ERB to take into account and encourage competition and to enforce standards.

[5] Section 5 (f) of Competition and Consumer Protection Commission Act No. 24 of 2010
[6] Ibid, Section 5 (g)
[7] Ibid, Section 5 (h)

ix. Patents and Companies Registration Agency (PACRA)
Patents and Companies Registration Agency (PACRA) is an agency under the MCTI and is established under the Patents and Companies Registration Agency Act No. 15 of 2010 with the mandate of providing business registration and intellectual property protection services.

The incorporation process is governed by the Companies Act No. 10 of 2017 that came into force in June 2018. The guidelines for company registration and/or incorporation are highlighted in Chapter 5.

x. Zambia Revenue Authority (ZRA)
The MFNP is responsible for tax policy and law whilst the ZRA established under chapter 321 of the Zambia Revenue Authority Act is an agent responsible for tax administration and collection. Companies in Zambia are subjected to corporate and other taxes. The following is a list of taxes that a power project company may be amenable to:

i. Corporate tax at 35%;
ii. Value Added Tax (VAT) at 16%;
iii. Withholding Tax on Dividends at 15%;
iv. Property Transfer Tax at 5% of the value of asset subject of transfer;
v. Employee Taxes (Personal Income Tax) ranging from 0% to 37.5%;
vi. Import Duties - 0% to 5% (Capital equipment and raw materials). Note that importation of Solar Energy Equipment is currently zero rated (0%); and
vii. Other taxes – Applicable depending on sector and the taxable item.
Electricity tariffs in Zambia are subject to two taxes which are borne by the consumers but collected by the power company and remitted as follows:

a. Exercise duty which is at 3% collected as electricity levy under the Rural Electrification Authority and used for the expansion of the Rural Electrification Programme."
b. Value Added Tax (VAT) which is at 16% and remitted to ZRA.

As an initial step, the power project company must apply for a Tax Identification Number (TPIN) with the ZRA which is also a prerequisite for opening of bank accounts and other operational matters.

xi. National Council for Construction (NCC)
National Council for Construction (NCC) is a statutory body set up under the National Council for Construction Act No. 13 of 2003 under the Laws of Zambia. Some of the functions of the NCC relevant to IPPs is the registration and monitoring of contractors and maintenance of a register of projects.

Engineering Procurement and Construction contractors must be registered with the NCC in order to operate as contractors in Zambia.

xii. The Engineering Institution of Zambia (EIZ)
The Engineering Institution of Zambia (EIZ) is a statutory professional body mandated with the promotion and regulation of the engineering profession in Zambia in accordance with the Engineering Institution of Zambia Act No. 17 of 2010. The EIZ registers all engineering professionals and entities engaged in the practice of engineering.

An IPP being an entity practicing engineering will have to be registered as an entity and the engineers and contractors it employs must also be individually registered with the EIZ.

3.2.5 Rural Electrification Authority (REA)
The Rural Electrification Authority (REA) is mandated by the Rural Electrification Act No. 20 of 2003 to provide electricity infrastructure in rural areas. The functions of REA include managing the Rural Electrification Fund (REF); and developing, updating, and implementing the Rural Electrification Master Plan (REMP).

Projects under REA include grid extension aimed for rural areas, solar home systems, mini grids and off-grid systems which may be implemented by REA itself or in partnership with the community in the area or the private sector.

REA identifies potential projects and facilitates formation of appropriate institutions to generate, distribute or supply electricity and is mandated to provide smart subsidies for capital costs on projects that are designed to supply energy for development of rural areas.

Developers targeting generation, transmission and/or distribution of power to rural areas in Zambia are advised to liaise with REA considering the existing REMP. However, it must be pointed out that REA is not a regulatory or licensing agency.

3.2.6 ZESCO Limited
ZESCO Limited is a vertically integrated national electricity utility, which generates, transmits, distributes and supplies electricity in Zambia. ZESCO is established under the Companies Act and 100% of its shares are owned by the Government through the Industrial Development Corporation (IDC).

ZESCO is the off-taker of choice by most Independent Power Producers (IPPs). However, IPPs are at liberty to identify their own power off-takers and use the ZESCO transmission line for wheeling, at a fee. ZESCO is also a member of the Southern African Power Pool (SAPP) which is an association of public utilities and private power producers located in Southern Africa.

3.2.7 Other Utilities
i. Copperbelt Energy Corporation Plc (CEC)
CEC is a private company incorporated under the Companies Act and listed on the Lusaka Securities Exchange (LuSE). It is a power distribution company that purchases bulk power from ZESCO and supplies it to the mines through its transmission and distribution grid on the Copperbelt. CEC also owns 80MW of stand-by diesel generation assets for supply of emergency power to the mines to support critical operations. 45% of the national electricity consumption goes through CEC's transmission and distribution network.

At present CEC does not own base load generation assets but is in the initial process of developing a 20-40 MW hydro project at the Kabompo Gorge in the North-western province of Zambia.

ii. North-western Energy Corporation Limited
North-western Energy Corporation (NWEC) is a private electricity distribution company incorporated under the Companies Act and it purchases power from ZESCO for distribution to mine townships and commercial entities that were developed around the Lumwana Mine in the North-western Province of Zambia. Currently, NWEC does not own electricity generation assets.

[8] S.4(h) RE Act
[9] S.15(2)(b) RE Act

3.2.8 Independent Power Producers (IPPs)

i. Maamba Coal Fired Power Plant

The Maamba Coal Fired power plant is owned by Maamba Collieries Limited, a private company incorporated under the Companies Act and jointly owned by Nava Bharat Singapore (Pte) Limited (65%) and ZCCM-Investment Holding Plc (35%) a subsidiary of the Government owned IDC. It generates 300MW of electricity into the national grid from its mine -mouth coal fired power plant.

ii. Lunsemfwa Hydro

Lunsemfwa Hydro Power Company (LHPC) is a private power generation company that has an installed capacity of 56MW which is supplied into the national grid.

iii. Itezhi Tezhi Power Corporation Limited

Itezhi Tezhi Power Corporation Limited (ITPC) is a private joint venture (SPV) established in 2007 and is jointly owned by Tata Africa (50%) and ZESCO Limited (50%). It generates 120MW from its hydro power plant on the Kafue River and supplies into the national grid.

iv. Ndola Energy Company Limited

Ndola Energy Company Limited (NECL) is a private company owned by Great Lakes (GL) Africa. It generates 105 MW into the national grid from its heavy fuel oil (HFO) power plant located next to the INDENI Petroleum Refinery in Ndola.

v. Ngonye Solar Power Plant

The Ngonye Solar Power Plant is a joint venture power company owned by Enel Green Power (EGP) (80%) and IDC (20%). It is located in the Lusaka South Multi-Facility Zone. It generated 34MW of power that is fed into the national grid. It is one of two projects that were facilitated by the World Bank Scaling Solar Program.

vi. Bangweulu Solar Photovoltaic Plant

The Bangweulu Solar PV Plant is a joint venture between Neoen and IDC. It is located in the Lusaka South Multi-Facility Zone. It generates 54MW of power that is fed into the national grid. It is one of two projects that were facilitated by the World Bank Scaling Solar Program.

3.2.9 Power Consumers

The power consumers are divided into eleven (11) sectors with the largest being mining which consumes 51% of the power generated in the country, followed by domestic consumers at 33%. The other nine sectors consume a combined 16% of the power generated with Finance and Property at 6% and manufacturing at 5%.

This structure of the electricity consumers thus has a significant bearing on power projects in the country. Developers may enter into power purchase agreements with mining companies, or the power distribution companies such as ZESCO and Copperbelt Energy Corporation (CEC) that supply the mines.

The other significant markets are the domestic consumers who are predominantly serviced by ZESCO. This customer category is responsible for the two-peak daily demand curve of 06-10hrs and 17-22hrs on the national grid. This demand curve presents the opportunity for the establishment of peaking plants that can potentially charge a premium tariff.

The price of electricity to these and the other non-mining customers are governed by a tariff model approved by the energy regulator as discussed in 3.3.3.

3.3 Electricity Situation in Zambia

The Zambian electricity industry is dominated by ZESCO Limited the state-owned utility, which owns and operates generation, transmission, and distribution infrastructure across the country.

Private sector utilities that are operating in the country include Copperbelt Energy Corporation (CEC) which owns and operates transmission and distribution infrastructure in the Copperbelt Province, Maamba Collieries Limited (MCL) which owns and operates a coal fired power generation plant in Southern Province, Lunsemfwa Hydropower Company (LHPC) which owns and operates two power generation plants in Central Province, Ndola Energy Company Limited (NECL) which owns and operates a thermal (Heavy Fuel Oil) power plant in Copperbelt Province, the Ngonye and Bangweulu Power Companies which own and operate solar power generation plants in Lusaka Province and North Western Energy Corporation (NWEC) which owns and operates electricity distribution infrastructure in North Western Province.

In the recent past, the electricity industry has seen a sharp rise in mini-grid power plants which include Zengamina mini-hydro in North-western Province, Mpanta off-grid solar plant in Luapula Province and Sinda, Katamanda, Solera and Chitandika, mini-grids in Eastern Province and many others that are owned and operated by public and private sector institutions.

3.3.1 Electricity Supply

i. Generation

The installed on-grid generation capacity in Zambia is 2,981.23 MW. This comprises 80.45% hydro, 10.06% coal, 3.69% heavy fuel oil, 2.8% diesel and 2.99% solar PV. The generation mix is as shown in Figure 3 below:

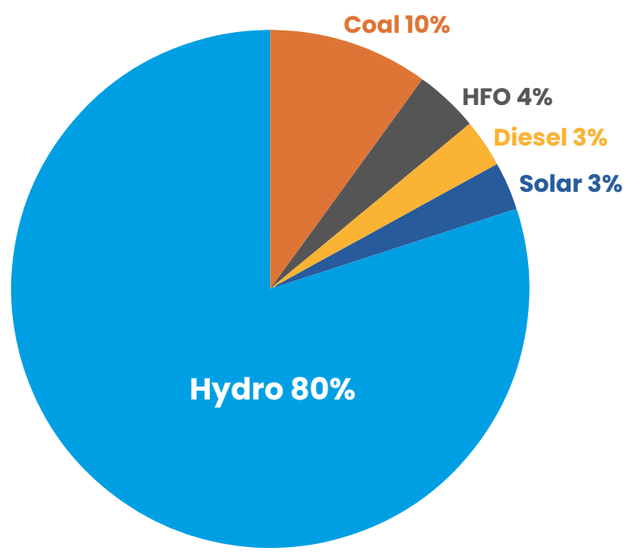


Figure 3: Zambia's generation mix

[10] Energy Regulation Board, 2019 Energy Sector Report.

The power stations making up the national installed capacity for both on-grid and off-grid are shown in Table 1 below:

Power Station	Enterprise	Installed Capacity	Technology
Kafue Gorge (Upper)	ZESCO Limited	990	Hydro
Kariba North Bank	ZESCO Limited	720	Hydro
Kariba North Bank Extension	ZESCO Limited	360	Hydro
Victoria Falls	ZESCO Limited	108	Hydro
Lunzua River	ZESCO Limited	14.8	Hydro
Lusiwasi	ZESCO Limited	12	Hydro
Chishimba Falls	ZESCO Limited	6	Hydro
Musonda Falls	ZESCO Limited	10	Hydro
Shiwang'andu	ZESCO Limited	1	Hydro
Itezhi Tezhi	Itezhi Tezhi Power Corporation	120	Hydro
Ikelengi	Zengamina Limited	0.7	Hydro
Mulungushi	Lunsemfwa Hydro Power Company	32	Hydro
Lunsemfwa	Lunsemfwa Hydro Power Company	24	Hydro
Maamba Power Plant	Maamba Collieries Limited	300	Coal-thermal
Luano	CEC Generation Plants	40	Diesel
Bancroft	CEC Generation Plants	20	Diesel
Kankoyo	CEC Generation Plants	10	Diesel
Mclaren	CEC Generation Plants	10	Diesel
Luangwa	ZESCO Limited Generation Plants	2.6	Diesel
Shang'ombo	ZESCO Limited Generation Plants	1	Diesel
Ndola Energy	Ndola Energy Company Ltd	110	HFO

Power Station	Enterprise	Installed Capacity	Technology
Bangweulu Solar Plant	Bangweulu Power Company Ltd	54	Grid tied Solar
Ngonye Solar Plant	Ngonye Power Limited	34	Grid tied Solar
Kitwe	Copperbelt Energy Corporation	1	Grid tied Solar
Samfya	Rural Electrification Authority	0.06	Off-grid Solar
Sinda Village	Muhanya Solar Limited	0.03	Off-grid Solar
Kafue	Standard Microgrid	0.02	Off-grid Solar
Luangwa bridge	Solera Power	0.01	Off-grid Solar
Chirundu	Mugurameno	0.01	Off-grid Solar

Usually not included in the national installed capacity are the captive generation facilities which do not supply to the national grid. These are the 40MW bagasse plant in Mazabuka for Zambia Sugar and 30MW coal fired power plant for Dangote Cement in Masaiti.

There are a limited number of off grid systems, most of which are below 1 MW. These are mostly dominated by solar with battery storage and their total installed capacity is 1.112MW.

ii. Transmission

The transmission infrastructure in Zambia comprises transmission lines of 66 - 330 kilovolts (kV) primarily owned by ZESCO Limited and Copperbelt Energy Corporation (CEC). The location of the large generation facilities is in the south of the country while the major load centres are on the Copperbelt and North-western Provinces.

The Electricity Act provides for an open access regime that creates several opportunities for the private sector. Therefore, an IPP is at liberty to generate power in any part of the country with grid access and sell the power to an off-taker located in another part of the country. Further, a private sector developer can build a business model around wheeling charges either from transmission networks which may primarily be for evacuating power from their power plants in isolated parts of the country, or built solely to provide a power wheeling service from IPPs to load centres.

iii. Distribution
The distribution network is made up of power lines with capacities below 66 kV. Although the distribution infrastructure is predominantly owned and operated by the national utility, ZESCO, the Electricity Act does provide for establishment of power distribution enterprises and there are presently two licensed by the ERB namely CEC and Northwestern Energy Corporation Limited (NWEC).

3.3.2 Electricity Demand
The installed generation capacity as at the end of 2019 was 2,981.23 MW which was an increase of 2.9% from the previous year. However, despite this increase there was a 7.1% decline in generation due to low water levels in the hydro power plants which resulted in a deficit of 425MW by September 2019.

According to estimates from the Seventh National Development Plan, 33.1% of Zambian households had access to grid power in 2016, with 67.3% accessing electrification in urban areas but only 4.4% in rural areas. It was noted that a further 7.4% of rural households may have access to electricity through some form of solar PV, but the form of this technology is not specified (it is assumed that the majority have access to small Solar Home Systems (SHS) or solar lamps).

3.3.3 Tariffs
Tariffs between power generation plants, distributors and consumers are governed by connection agreements and Power Purchase Agreements (PPAs) which are approved by the regulator, ERB.

The regulated tariff structure of the national utility ZESCO excludes the mining sector. This tariff structure is divided into four consumer categories which are:

i. Residential (domestic consumers);
ii. Commercial;
iii. Social Services; and
iv. Maximum demand.

The mining companies and other bulk consumers enter into bilateral supply agreements with the power suppliers.

3.4 Energy Sector Reforms
The Government of the Republic of Zambia is concerned about streamlining decision making and promoting investment in the energy sector of the country. The energy sector is gradually moving towards a less vertically integrated electricity sector with a clear ambition to increase power generation, transmission and distribution and supply capacities as well as encourage private sector participation.

In 2019, Government replaced the 2008 National Energy Policy with the 2019 National Energy Policy (NEP 2019) which continues and enhances the objective of promoting private sector participation in the energy sector. The NEP 2019 recognises the important role that can be played by the private sector for the continued growth of the electricity sector. Therefore, among other things, the policy aims to further remove barriers for private sector investment.

The NEP 2019 set ground for the enactment of the Electricity Act of 2019 and the Energy Regulation Act of 2019.

[11] USAID Zambia Power Africa Fact Sheet at https://www.usaid.gov/powerafrica/zambia

3.4.1 Electricity Act No. 11 of 2019
The Electricity Act No. 11 of 2019 (EA) provides for additional functions of the ERB in relation to regulation of generation, transmission, distribution and supply of electricity , the powers of the Minister to grant feasibility study rights and obligations of licence holders in the sector. The establishment of an enterprise in the electricity sector is subject both to this Act, the ERA and compliance with the Environmental Management Act (EMA). Sections 5(1) and 6(1) of the EA respectively provides as follows:

> *"A person shall not generate, transmit, distribute or supply electricity or trade in electricity as an intermediary or establish or carry on an activity for or related to the generation, transmission, distribution or supply of electricity, trading in electricity as an intermediary or the operation of a transmission or distribution system, except as provided in this Act and the Energy Regulation Act, 2019."*

> *"Subject to the provisions of the Environmental Management Act, 2011, or any other written law, a person who intends to construct and establish a generating station shall do so in accordance with this Act, and any requirement of the Energy Regulation Board which is consistent with this Act."*

The requirement to obtain a licence does not apply to generation, transmission, distribution, or supply of electricity solely for an enterprise's own use of two hundred and fifty kilowatts (250kW) or less. However, for own generation, transmission, distribution, and supply of electricity above this quantity, or a capacity below 250kW intended for supply to a third party, the activity shall be undertaken in accordance with regulations made under the Act.

The EA also governs the prior approval of Power Purchase Agreements (PPAs) or Supply Agreements, setting and mode of adjustment or variation of electricity tariffs charged by an enterprise. In addition to regulating the export of power, the EA also provides the mechanism for the ERB to review and approve PPAs for both local and export of power.

Furthermore, the EA provides for ancillary issues of importance to licensees such as compulsory acquisition of land, wayleaves, and rights of way for transmission lines and interference of municipal infrastructure to allow for inspection and maintenance works to electricity infrastructure.

3.4.2 Energy Regulation Act No. 12 of 2019
The Energy Regulation Act No. 12 of 2019 (ERA) creates a regulatory body entrusted with the regulation of the Zambian electricity generation and supply industry , the ERB. The regulation of the sector is achieved primarily through licensing, economic and technical regulation, and compliance monitoring as well as through collaboration with other regulatory agencies such as ZEMA, CCPC, ZABS and NHCC among others.

A developer of an energy enterprise such as an Independent Power Producer (IPP), mini-grid or other renewable energy project must obtain a licence from the ERB to establish and operate an undertaking.
Section 10(1) provides that:

> *"A person shall not establish or operate an enterprise without a licence issued under this Act."*

Subsection (2) makes it an offence to establish or operate an enterprise without a licence.

The ERA prescribes in detail the process that needs to be followed to obtain a licence, which includes publication of the proposed licensed activities in the Gazette as part of a compulsory process that must be followed . The application process is augmented by the Energy Licensing Regulations that provides further detailed process requirements to apply for an operational licence .

Licences are issued subject to licence conditions, of which some are set out in the ERA itself and others determined by the ERB unique to each project site and enterprise.

3.5 Private Sector Participation

The Government's strategy for increased private sector participation in the electricity sub-sector was captured in the 2008 National Energy Policy's objective on the electricity sub-sector as "to expand the electricity generation and transmission capacity and access to electricity through the public and private sector participation". The 2019 National Energy Policy re-affirms Government's commitment to promotion of private sector in the development of the energy sector.

Despite Government's efforts, the private sector has faced several challenges in actualising their respective projects. Power generation from IPPs increased by 73.77 GWh from 3,519.26 GWh in 2018 to 3,593.04 GWh in 2019.

Isolated mini-grids owned and operated by the private sector are found around the country. These include Zengamina mini-hydro, Sinda, Katamanda, Solera and Chitandika solar mini-grids.

3.6 Legal Framework

The following are the key legislation that form the backbone of the power sector legal framework:

1. The Constitution of Zambia (Amendment Act No. 2 of 2016).
2. The Electricity Act, No. 11 of 2019.
3. The Energy Regulation Act No. 12 of 2019.
4. The Environmental Management Act No. 12 of 2011.
5. Water Resources Management Act No. 21 of 2011.
6. The Rural Electrification Act No. 20 of 2003.
7. The Lands Act Chapter 184 and the Lands and Deeds Act Chapter 185 of the Laws of Zambia
8. The National Heritage Conservation Commission Act, Chapter 172 of the Laws of Zambia.
9. The Zambia Development Act No. 11 of 2006.
10. The Public Procurement Act No. 8 of 2020.
11. The Public Private Partnership Act No. 14 of 2009 as read with Public Private Partnership (Amendment) Act No. 9 of 2018.
12. Zambia Bureau of Standards, Chapter 416 of 1994; and
13. The Compulsory Standards Act No. 3 of 2017.

Other pieces of legislation that supplement the above are:

14. The Forestry Act No. 4 of 2015.
15. The National Parks and Wildlife Act No. 14 of 2015; and
16. The Competition and Consumer Protection Commission Act No. 24 of 2010.

[11] USAID Zambia Power Africa Fact Sheet at https://www.usaid.gov/powerafrica/zambia

[12] The Electricity Act No. 11 of 2019.
[13] S.3 EA
[14] s. 6(1) EA.
[15] S.3(i) & (j) EA
[16] S.19(1)
[17] S. 22(1)
[18] Not only electricity is regulated, but also petroleum, coal and firewood
[19] S.4 ERA and s.3 of the EA
[20] Section 2 of the ERA defines an "enterprise" as "an entity engaged in the production, generation, transmission, distribution, supply of energy, intermediary power trading, refining, transportation, storage, trading or supply of fuel or any other licenced activity under this Act".
[21] Depending on the activity performed, different types of licences are required. An IPP needs a generation licence, whilst a mini grid would need a combined generation and distribution licence.
[22] Section 8 of the ERA. Note the Act is clear on both "establish" and "operate" as activities that need licensing.
[23] S.12 ERA
[24] Statutory Instrument No. 2 of 1998.
[25] The regulation seems limited to applications for the "…operating of an undertaking…", i.e., it does not include a process to apply for a construction licence

CHAPTER FOUR

PROCESSES AND PROCEDURES FOR POWER DEVELOPMENTS AND OPERATIONS

4.1 Introduction

The Vision 2030 aims to set Zambia as a prosperous middle-income nation by 2030. Because energy cuts across most economic and social activities, the Vision 2030 has recognised energy as one of the important driving forces necessary for the development of the economy.

Strategies to actualize the vison 2030 are contained in the 7th National Development Plan whose development outcomes include Economic Diversification and Job Creation through Improved Energy Production and Distribution in which the Government seeks to enhance the generation, transmission and distribution of electricity and the promotion of renewable and alternative energy.

Programs for the enhancement of generation, transmission and distribution of electricity and the promotion of renewable and alternative energy have targeted the synergies with the private sector that can be exploited.

The Government of Zambia has set deliberate policies and measures to ensure power projects are offered to the private sector using various development models that may be appropriate for given projects. These development models may include Public Private Partnerships (PPP), Build Own and Operate (BOO/IPP) and Build Own Operate & Transfer (BOOT).

The ZPDF has been developed to attract private sector investment by providing clearly set out power projects development and operation processes that may be applicable to the energy sector. It is envisaged that the ZPDF will provide a clear procurement and regulatory environment for both private and public sector power developments.

4.2 Process for Power Developments in Zambia

The development of power projects in Zambia takes many forms depending on the project needs and requirements. The development forms include:

1. Government initiated (Solicited) through the Ministry of Energy, PPPD and other government agencies such as IDC, ZESCO, REA, Local Authorities and Provincial Administrations.
2. Private Sector Initiated (Unsolicited) as IPPs; and
3. Self-Generation for industrial use and/ or local area distribution.

[26] Although ZESCO, IDC and REA have corporate character, they are entities whose shares are owned by the Government, or in the case of REA is a statutory body established to fulfil a state function. The process by which the state allocates access to resources to these entities to establish energy infrastructure is outside the scope of this document,

The processes and procedures except for Self-Generation are summarised in Figure 4 below:

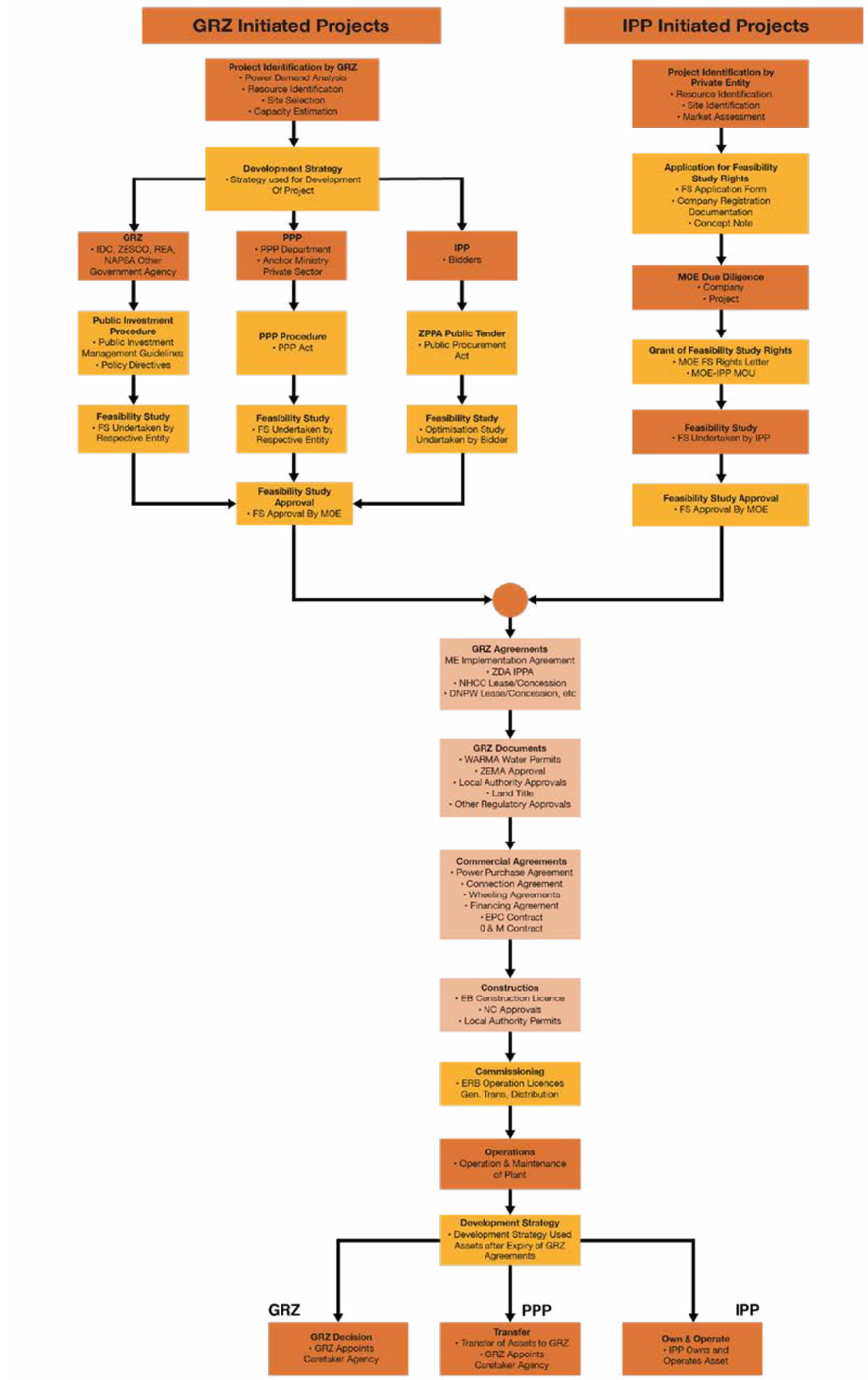


Figure 4: Processes and Procedures for Power Developments in Zambia

4.2.1 Government Initiated Projects (Solicited Process)

4.2.1.1 Site identification

The Ministry of Energy in collaboration with other stakeholders identifies priority areas for the development of the electricity sector depending on the national plans to meet the current and projected national power demands. The MoE then undertakes reconnaissance studies to determine the sites power generation capacity, evacuation options and environmental assessments. Other sites can also be identified by other Government related entities like ZESCO, REA or IDC.

4.2.1.2 Pre-feasibility Study

Power project sites with positive reconnaissance study results proceed to Pre-feasibility Study stage in which the preliminary project parameters are confirmed. These parameters include the resource availability, accessibility of the project location, project generation, transmission, distribution capacity and the environmental and social aspect of the project.

4.2.1.3 Development Strategy

The Government through the responsible Ministry and/or institution determines the project development strategy to be applied on the implementation of the project. The development strategy will determine among other factors how the project will be developed and the operations of the projects after the expiry of the project development Agreements. The project development strategies to be considered are as follows:

i. Development by Government Institutions

Through consultations and obtaining of the necessary approvals, Government institutions (IDC, ZESCO, REA, etc.) may develop power projects with financing by the Government, other project financing options and by partnering with the private sector through shared equity contributes for the project development.

The projects to be developed by Government institutions utilize the public investment procedures for procurement of the project implementation. The procurement process highlighted in section 4.2.1.5 may be applied. After completing the approval process, the projects feasibility studies are undertaken as highlighted in section 4.2.2.2.

ii. Public Private Partnership Development

Power projects development in which the Government enters into a partnership agreement with the private sector may be developed in accordance with the Amended Public Private Partnership Act No. 9 of 2018. The development of the projects is facilitated by the Public Private Partnership Department (PPPD) under the Ministry of Finance.

The power projects would be procured and developed in accordance with the PPP development flow charts highlighted in section 5.10.

iii. Independent Power Producer Development

The Ministry of Energy upon undertaking the necessary consultations with relevant stakeholders would determine to develop power projects through the independent power producer development strategy. The MoE would proceed to procure a project developer in accordance with the Zambia Public Procurement Guidelines for solicited projects as highlighted in section 4.2.1.5.

After the procurement process, the developer will be required to undertake a feasibility study for the power project as highlighted in section 4.2.2.2.

4.2.1.4 Bankable Feasibility Study

Upon the recommendation of the Prefeasibility Study findings, the Ministry or Government entity will undertake a detailed feasibility to include other project components as geotechnical assessments, financial and economic assessment culminating into a bankable document ready for public tender.

4.2.1.5 Procurement of a Developer

The development of power projects through Government Institutions and IPP development strategies will be through the ZPPA procurement guidelines and processes. It should be noted that the procurement processes outlined here do not cover Open Access as the regulatory regime, the Open Access mechanism is still being developed by the ERB at the time of this report.

The usual procurement process shall be employed as follows:

1. Procuring entity publishes an Expression of Interest (EoI) or the Pre-qualification Tender Document and advertise it in the local and international media for not less than three and not exceeding five weeks.
2. In response to the EoI, the power development companies with the required technical expertise and financial integrity will prepare and submit their EoI documents as bidders.
3. After the close of the EoI submission timeline, the submitted bids will be evaluated by the procurement entity and shortlisted after which the shortlist will be published.
4. The procuring entity then launches the Request for Proposals (RfP) tender to the shortlisted bidders. The RfP document is prepared based on the bid document which outlines the details of the project including technical specifications. The shortlisted bidders are then given a timeline of six to nine weeks to prepare and submit their offers in accordance with the specified technical requirements.
5. Submitted responses to the RfP are evaluated by the procuring entity and the bidder whose technical offer matches the RfP requirements, and whose financial offer will be the most attractive, is selected as the winning bidder.

4.2.1.6 Optimisation Study

The successful bidder is issued with a letter of offer pending signing of the Implementation Agreement (IA). The successful bidder will be required to undertake an optimisation study at their own cost and risk. The letter of offer granted to the successful bidder outlines among other issues the timeline for completing the optimisation study and the submission of quarterly progress reports to the Ministry of Energy.

4.2.1.7 Implementation Agreement

The procurement process of a developer for a power project by IPP and Government Institution development strategy is finalised by the signing of an Implementation Agreement (IA) between Government, represented by the Ministry of Energy and the successful bidder, the Developer. An IA is a comprehensive agreement that incorporates, among other things:

1. The exclusive concession or development right granted to the developer;
2. Obligations of the parties;
3. The extent of Government Support to the project;
4. Risk Allocation and Risk Mitigation Measures; and
5. Dispute Resolution.

The IA is an umbrella document that opens negotiations and interactions with other government agencies for approvals, permits, rights, licenses, waivers, and incentives. The execution of an IA is preceded by negotiation by the Developer with a Government team comprising of stakeholder ministries and agencies.

The life of the project is monitored by the Ministry of Energy in line with the guidelines provided in the Implementation Agreement.

4.2.1.8 Other Rights, Permits, Clearances, Licenses, and Approvals
Some of the Rights, Permits, Licenses, and Approvals applicable in the energy sector are:

i. Land Lease
The Title Deed for Land to be obtained from the MLNR will grant the developer a lease to the project site for a specified period as provided for in the Lands Act.

ii. Environmental Permit
Environmental Permits are granted by ZEMA following the approval of the Environmental and Social Impact Assessments (ESIA) or Environment Project Brief (EPB) undertaken by the developer. The ESIA or EPB is undertaken at the cost and risk of the Developer.

iii. Water Permit
Some power projects require substantial amounts of water for construction and during operations. The Water Permit to be obtained from WARMA will grant the developer the right to abstract water resources from the river or lake/dam for purposes of power generation in the cases of hydropower and thermal power projects development in line with the Water Resources Management Act of 2011.

iv. NHCC Clearance
Some power projects will require clearance from the National Heritage Conservation Commission (NHCC). This is to ensure that projects are executed with minimal impacts on listed heritage sites. Where a project is expected to impact a heritage site, a Concession Agreement is entered into between the developer and the NHCC.

The NHCC Concession will grant the developer a lease for a specified period on the development of the project on a Heritage site in accordance with the National Heritage and Conservation Commission Act of 1994.

v. ZDA Investment License
The IPPA to be entered between ZDA and the developer will grant the developer protection on their investment and the Registration Certificate (formerly Investment Licence) will grant incentives on the investment if it is in a priority area in accordance with the Zambia Development Act. Energy is a priority area and as such will get incentives.

vi. ERB Construction License
The enactment of the Energy Regulation Act No.12 of 2019 has introduced a Permit for the construction of an energy facility, installation or common carrier prior to the issuance of an operating licence . This Permit assures the developer that if the facility is built in accordance with the design specifications and in compliance with national technical standards, the ERB would issue the substantive licence for generation, distribution or transmission, as the case may be.

vii. Operational Licenses
Any developer intending to engage in the generation, transmission, distribution, and retail of electricity must apply to the ERB for a licence. The developer will be required to submit proof that an environmental impact assessment has been approved, business registration completed and proof of the financial viability of the project as evidenced by a business plan, power purchase agreement, tariff model, and connection agreements with an off-taker.

4.2.1.9 Power Purchase and Connection Agreements
i.Power Purchase Agreement (PPA)
Project developers usually enter into Power Purchase Agreements (PPAs) with energy off-takers prior to the development of the project. The PPAs are contractual agreements that principally specify the amount of power and the tariff to be paid by the off-taker. On-grid IPPs sign PPAs with utilities for supply to the grid. Under the new Electricity Act an IPP may enter a PPA with any other entity such as bulk user or distribution company and use a transmission network owned by another entity to wheel the power through a wheeling agreement.

Draft PPAs and the financial models on which they are based must be submitted to the ERB for approval prior to the execution or signing of the agreement between the parties. The ERB however, is not a party to the PPA.

ii. Connection Agreement
The new regulatory regime under the Energy Regulation Act and Electricity Acts now provides for an open access framework. IPPs can enter into connection agreements with transmission providers to evacuate power to off-takers through connection agreements. The Connection Agreement to be entered into between the Transmission Network Service Provider (TNSP) or Distribution Service Provider and the developer, will grant the developer the right to connect the power generation project to the Zambian grid for the purpose of evacuating the power to be generated. The draft connection agreements are subject to approval by the ERB before implementation.

4.2.1.10 Financial Closure
Once the feasibility study, IA, PPA and permits are obtained, the developer is expected to achieve financial closure within a specified period failure to which the IA is terminated.

4.2.1.11 Project Construction
The developer is required to apply for and obtain a construction permit from the ERB before construction begins. The developer must also be in possession of a decision letter which is valid for three years from ZEMA following preparation of an EIA.

The developer is expected to implement the project in line with the IA signed with government. The Government through the MoE will among others undertake project inspections and monitoring and evaluation to ensure the project meets the set milestones and project schedules.

4.2.1.12 Project Commissioning
The constructed power infrastructure will then be inspected and tested by the ERB to verify technical conformity. Upon finalisation and successful testing, the ERB will issue a Generation, Transmission and/or Distribution License to the developer. These licenses are also called Operational Licenses.

[29] Verify with EE Act

4.2.1.13 Project Operations

i. Project Operations during IA Period

During its operation, the infrastructure will be inspected and monitored by the Ministry of Energy to ensure the project is operated according to the provisions of the Implementation Agreement.

ii. Project Operations Post IA Period

Upon the expiry of the IA, provisions in the IA are invoked in which case if the project is a Build, Own and Operate (BOO), such a project continues to operate under the normal IPP framework in the energy sector and where the project was developed as a Build, Own, Operate and Transfer (BOOT), such a project will be handed over to Government in line with the IA.

4.2.2 Private Sector Initiated (Unsolicited process)

4.2.2.1 Site identification

Private developers may undertake their own reconnaissance and identification of potential project sites for power generation in partnership with other private entities without the involvement of government. The private developer will be required to identify a viable power project for development and submit a detailed project proposal to the MoE.

Acceptable site location and detailed project proposals submitted will form the basis for the issuance of feasibility study rights (permission letter/ memorandum of understanding) by the MoE to undertake a feasibility study.

The developer also must arrange its own off-taker and negotiate a connection agreement with a system operator or transmission service provider.

4.2.2.2 Feasibility Study Rights

i. Grant of Feasibility Study Rights

Any person who intends to undertake a feasibility study for the development of a new electricity project in Zambia is expected to apply for an authorisation to the Minister responsible for Energy in a prescribed form.

The key details to be provided in the application include:

1. Name and legal status of project proposer;
2. Location of the project site, indicating the name of the proposed project site, district; province and geographical coordinates of the project site;
3. Project type i.e., generation/ transmission/distribution;
4. Technology type (e.g., hydro, solar, wind, biomass, bagasse, geothermal);
5. Technical and Financial capacity to undertake the feasibility study;
6. Expected project installed capacity; and
7. Benefits of the project to the country.

Upon the submission of the application, the Ministry will then engage relevant project stakeholders such as the proposed off-taker, authorizing, and licensing agencies. The Ministry through the Office for Promoting Private Power Investment (OPPPI) undertakes due diligence on the proposed project. The Ministry of Energy reserves the right not to issue feasibility study rights where there is cause. The following are some of the conditions that govern the feasibility study rights issued to the project developer[30]:

[30] Part II of the Electricity Act s. 4-21

1. The feasibility study rights are granted for a period of two (2) years and may be extended for a further one (1) year on demonstrating that the study could not be completed within two years;
2. The developer undertakes the study at its own cost and risk;
3. The developer submits quarterly progress reports;
4. The developer shall not transfer or sale the feasibility study rights to another person or entity without approval of the Ministry; and
5. If the feasibility study is approved, the developer will negotiate an Implementation Agreement with MoE and a Power Purchase Agreement (PPA) with any willing off-taker.

Failure to abide by the above conditions will result in the revocation of the feasibility study rights.

ii. Obligations of the Ministry during Feasibility study

The following are the obligations of the MoE to the developer at feasibility study stage:

1. Provide necessary support and advice to the project developer for undertaking and completing the feasibility study;
2. Where necessary facilitate for interactions between the project developer and relevant institutions, for the purpose of obtaining information to complete the feasibility study; and
3. Review the quarterly progress reports and feasibility study reports submitted by the developer.

iii. Obligations of the developer during feasibility study

The following are the obligations of the project developer to the project during the feasibility study period:

1. Undertake the feasibility study on the project site area within the agreed timelines and schedule.
2. Provide quarterly progress reports including the costs incurred in the feasibility study activities. The progress report format shall include but not limited to:
   - Period of reporting;
   - Activities undertaken during the reporting period;
   - Risks and challenges encountered;
   - Mitigation measures for risks and challenges;
   - Indication of progress against work plan; and
   - Activities to be undertaken in the next quarter.
3. Acquire necessary permits and licences for undertaking the feasibility study; and
4. Comply with all existing laws of the Republic of Zambia.

4.2.2.3 Review and Approval of the Bankable Feasibility Study

After the completion of the Feasibility Study, the project developer will submit the Feasibility Study report to the MoE for review and approval.

After the approval of the Bankable Feasibility Study Report, MoE and the project developer will negotiate and sign an Implementation Agreement. The developer will also be expected to obtain the relevant permits, rights and approvals from other government agencies and institutions.

Following the signing of the Implementation Agreement, the unsolicited process proceeds in the same way as the solicited process highlighted in sections 4.2.1.7 to 4.2.1.13 above.

4.2.3 Self-Generation for industrial use and/or local area distribution

4.2.3.1 Capacity greater than 250 kW

Application for feasibility study rights to the Ministry of Energy must be distinguished from a generation licence from the Energy Regulation Board.

Project developers undertaking the development of an electricity project for self-generation, of above 250 kW capacity will be required to apply for feasibility study rights as outlined in section 4.2.2 and a licence from the Energy Regulation Board.

4.2.3.2 Capacity less than 250 kW

Development of power projects with a capacity equal or less than 250 kW and aimed for distribution to a third party shall be undertaken following the obtaining of feasibility study rights as outlined in section 4.2.2.2.

However, establishments intending to install power generation plants of two hundred and fifty kilowatts (250kW) or less for self-generation, would generally require no feasibility study rights and developers would be free to choose any site/location subject to fulfilment of environmental requirements. However, the developers are required to inform the MoE on their undertaking to ensure the projects are captured. Further, in cases where such plants are proposed to be located on irrigation canals, the technical clearance of the concerned Government institutions shall be obtained.

A project developer undertaking a generation project of below 250kW for its own use does not require to apply for a licence under the Energy Regulation Act. However, if the generation is meant for supply to a third party or for entrepreneurial activities, the developer must apply for a generation licence irrespective of the amount of power generated.

[31] Review section for clarity

CHAPTER FIVE
PERMITTING PROCESSES BY SELECTED GOVERNMENT INSTITUTIONS

5.1 Ministry of Energy

The Ministry of Energy (MoE) is the overall government Ministry charged with the responsibility for the development and management of energy resources in a sustainable manner for the benefit of the people of Zambia. The Ministry of Energy plays a policy setting and facilitation role in the Zambian energy sector.

The Ministry of Energy procures developers on competitive bidding basis, issues feasibility study rights and executes Implementation Agreements for power projects as outlined in section 4.2.1.7.

5.2 Energy Regulation Board (ERB)

The Energy Regulation Board (ERB) is an autonomous statutory body established under the Energy Regulation Act No. 12 of 2019 of the Laws of Zambia. In power developments, the ERB undertakes the following activities:

1. **Issuance of the Generation, Transmission and Distribution Licenses**

   A developer of an energy enterprise such as an Independent Power Producer (IPP), mini-grid or other renewable energy project must obtain a licence from the ERB to establish and operate an undertaking

   Section 10(1) of the Energy Regulation Act 2019 provides that:

   "A person shall not establish or operate an enterprise without a licence issued under this Act."

   Subsection (2) makes it an offence to establish or operate an enterprise without a licence.

   Further, sections 5(1) and 6(1) of the Electricity Act respectively provides as follows:

   "A person shall not generate, transmit, distribute or supply electricity or trade in electricity as an intermediary or establish or carry on an activity for or related to the generation, transmission, distribution or supply of electricity, trading in electricity as an intermediary or the operation of a transmission or distribution system, except as provided in this Act and the Energy Regulation Act, 2019."

   "Subject to the provisions of the Environmental Management Act, 2011, or any other written law, a person who intends to construct and establish a generating station shall do so in accordance with this Act, and any requirement of the Energy Regulation Board which is consistent with this Act."

   The application for the licence is made after the developer has signed an Implementation Agreement with the Ministry of Energy.

The issuance of a licence includes publication of the proposed licensed activities in the Gazette as part of a compulsory consultation process that must be followed. The application process is augmented by the Energy Licensing Regulations that provides further detailed process requirements to apply for an operational licence as indicated in Figure 5 below:

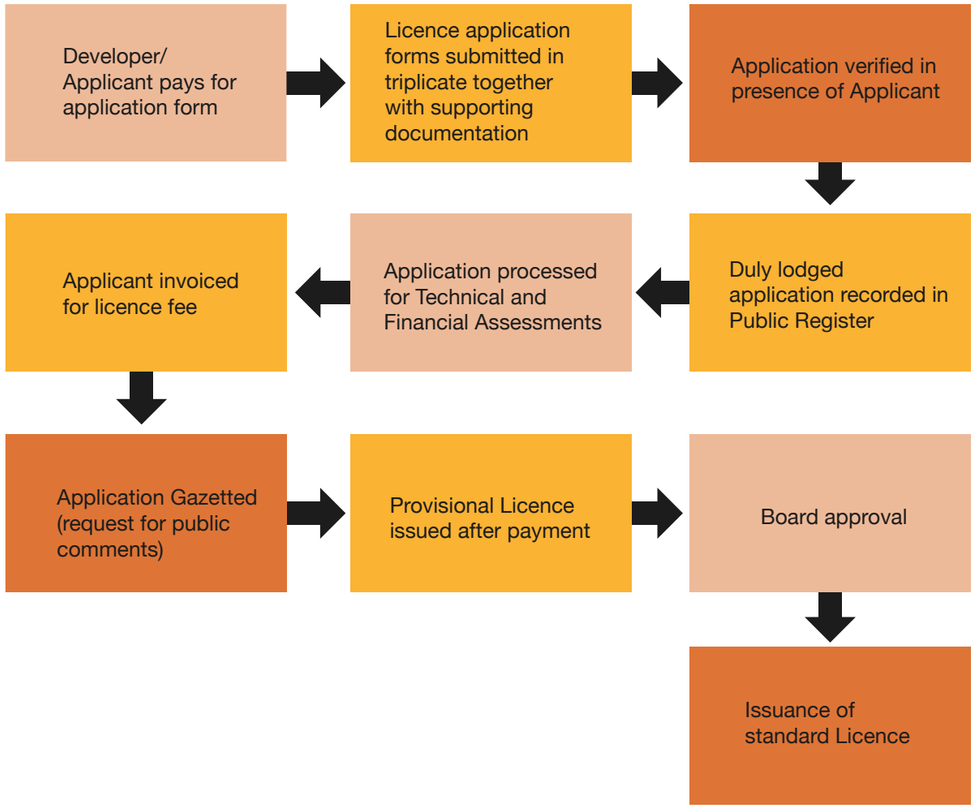


Figure 5: ERB licensing process

Templates of the Licenses are available on the ERB website (www.erb.org.zm).

2. Tariff Management

The ERB determines and regulates tariffs in the energy sector . It also approves Power Purchase Agreements (PPAs) and the key provisions of Power Supply Agreements (PSAs) prior to final execution of these agreements by the parties. The EA governs the prior approval of Power Purchase Agreements (PPAs) or supply agreements, setting the mode of adjustment or variation of electricity tariffs charged by an enterprise. In addition to regulating the import and export of power, the EA also provides the mechanism for the ERB to review and approve PPAs for both local and export of power.

The export and import of electricity is approved by the Minister following consultation with the ERB.

The EA provides for declaration of an emergency by the ERB following an application by a licensee. The significance of this provision is that the licensee may be permitted by the ERB to adjust its tariff for the duration of the emergency without conducting a public hearing.

3. Technical Compliance

Following completion of construction of the energy infrastructure, the ERB conducts a commissioning inspection prior to the issuance of a substantive licence with accompanying licence conditions. This inspection is a verification of compliance with national technical standards for the electricity sector.

Following the issuance of the substantive license, the ERB specifies in the licence conditions the frequency of reporting by the IPP. The ERB also undertakes periodic audit inspections and verification inspections to confirm implementation of audit directives or enforcement notices.

5.3 Ministry of Finance and National Planning

The MFNP is responsible for formulating tax policy for the energy sector in Zambia as part of the fiscal policy of the country and as has been explained earlier, it is responsible for formulating tax policy for the energy sector in Zambia as part of the fiscal policy of the country. Through the Ministry of Energy, the MFNP also plays the role of guarantor of state enterprises which may include financing requirements of ZESCO Limited and its operations such as in the case of power off-take from Independent Power Producers (IPPs).

5.4 Ministry of Lands and Natural Resources (MLNR)

Access to state land for project development is obtained from the Ministry of Lands directly through an application to the Commissioner of Lands. As regards customary land, the developer applies through the traditional leadership in the area and the local municipality surveys and inspects the land before submitting the application to the Ministry of Lands for processing of title.

It is important to first confirm that the feasibility study, environmental, and site approvals are secured before proceeding to secure title to the land on which the proposed project will be situated. The feasibility and EIA studies may recommend that the project be relocated to another site than the one proposed and if land acquisition has been concluded, this might be difficult and expensive to reverse. This is particularly true for acquisition of land that is already on title from a private entity. An MOU during the feasibility and EIA process phases might be more appropriate and after approvals are secured then the land acquisition formalities or long-term leases maybe completed.

[31] Review section for clarity

The process for land acquisition is as shown in Figure 6 below.

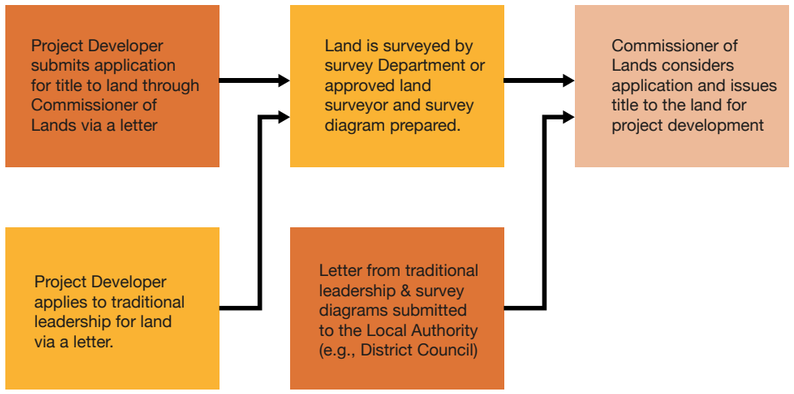
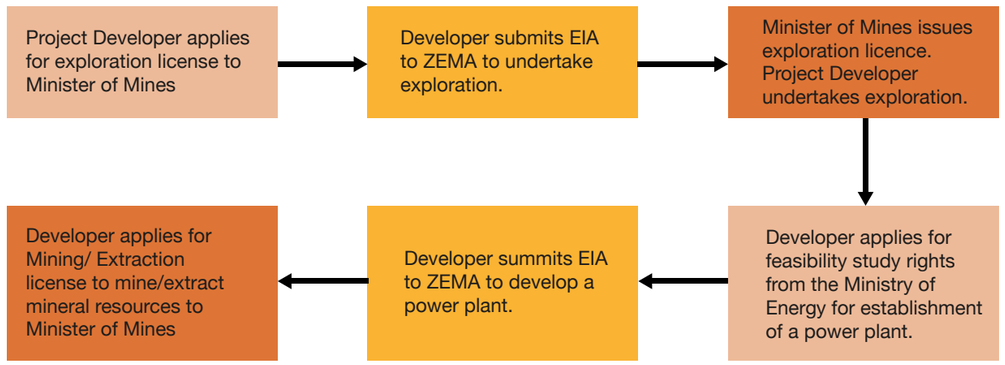


Figure 6: Land acquisition flow chart

5.5 Ministry of Mines and Minerals Development (MMMD)

The requirements for MMMD for licenses and approvals for the extraction of mineral resources for energy production is as shown in the Flow chart in Figure 7 below:



5.6 Zambia Environmental Management Agency (ZEMA)

Following the approval of the feasibility study and successful execution of the Implementation Agreement, the developer of an energy project is required by section 29 of the Environmental Management Act No. 12 of 2011 to carry out an Environmental Impact Assessment (EIA) before commencing with project development. The detailed guidelines for the EIA process are provided in the Environmental Impact Assessment Regulations Statutory Instrument No.28 of 1997 (EIA Regulations) .

The EIA document submitted to ZEMA takes two forms, the Environmental Project Brief (EPB) which if approved results in a decision within 40 days, and the Environmental Impact Statement (EIS) which is a more detailed study and report, and once submitted results in a decision between 77 to 122 days from the date of submission depending on whether a public hearing, is considered necessary by ZEMA.

The EIA Regulations provides guidance as to the format and content of an EPB and an EIS document .

When satisfied that the project has provided adequate mitigation measures, ZEMA issues a Decision Letter valid for three (3) years . Figure 8 illustrates a summary of the EIA process.

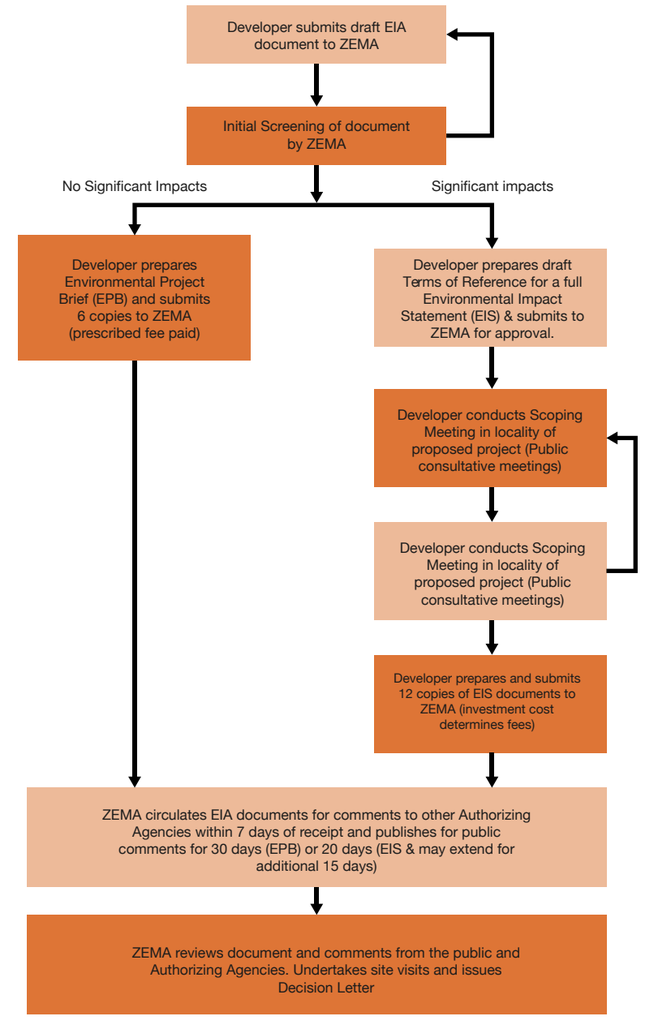


Figure 8: Summary of EIA process

Templates and procedures for application is available on ZEMA website (http://www.zema.org.zm).

[32]RS.4(j) ERA
[33]S.4(k)
[34]S.3(i) & (j) and s.19(1) EA
[35]S.19(1)
[36]The EIA Regulations although promulgated under the repealed Environmental and Pollution Control Act, are still valid until updated by another statutory instrument. At the time of publication of this report, the EIA Regulations were undergoing review.
[37]Regulation 3-6 of EIA Regulations.
[38]Regulations 7-27 of EIA Regulations.
[39]Regulation 4 of EIA Regulations.
[40]Regulation 11 7 12 of EIA Regulations.
[41]Regulation 30 of EIA Regulations.

5.7 Water Resources Management Authority (WARMA)

Following the granting of feasibility study rights by the Ministry of Energy, the developer is expected to apply for temporal water rights for purpose of feasibility study in accordance with the Water Resources Management Act No. 21 of 2011. Permanent water rights are to be obtained following the signing of the Implementation Agreement with the Ministry of Energy. The WARMA act outlines the application process for water rights for hydro generation as indicated in Figure 9 below.

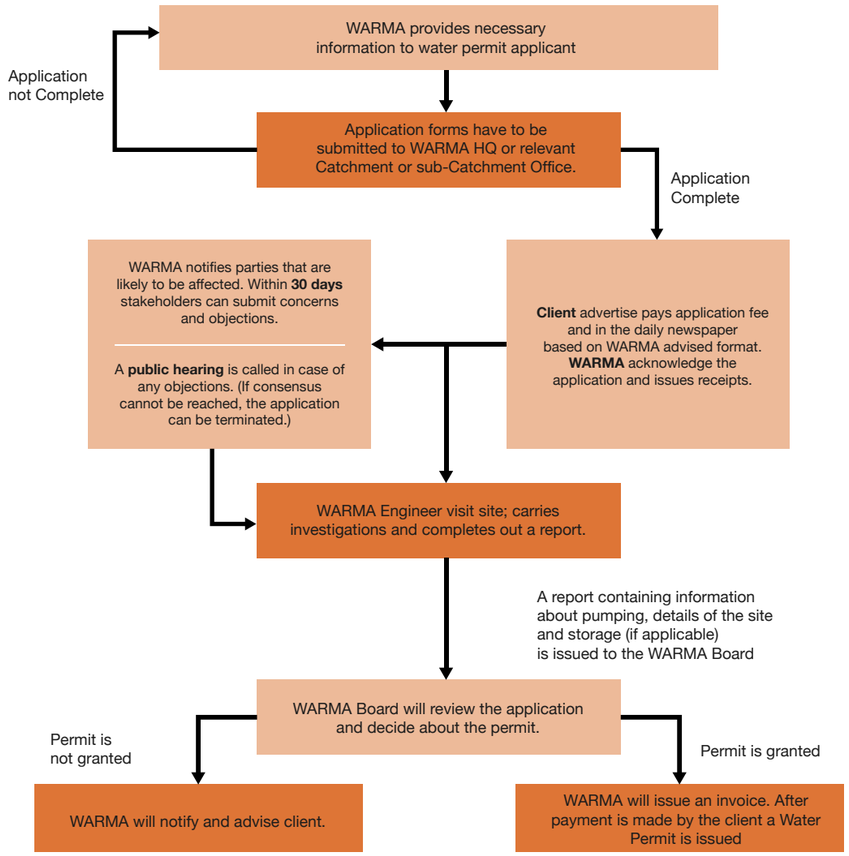


Figure 9: Summary of the water permit process
Templates and procedures for applications are available on WARMA website (www.warma.org.zm).

5.8 National Heritage Conservation Commission (NHCC)

The National Heritage Conservation Commission Act, Chapter 173 of the laws of Zambia gives guidance on how to deal with activities such as engineering operations that may impact upon national heritage sites. A developer of a power plant in a heritage site must obtain permission to undertake a feasibility study and developments at a heritage site.

The application process is outlined in Figure 10 below :

Figure 10: Summary of NHCC process for power projects

[42] Source, Zambia Environmental Management Agency (ZEMA).[33]S.4(k)
[43]SRefer to preamble of the NHCC Act on the issue of all waterfalls being heritage sites.

5.9 Zambia Public Procurement Authority (ZPPA)

The procurement of power projects in Zambia is undertaken in accordance with the Public Procurement Act in which a tender process is initiated by the procuring agency.

Due to the intrinsic nature of power developments, the Public Procurement Act makes provision for the Ministry to entertain initiatives led by the private sector using an unsolicited process.

However, even under the unsolicited model, adherence to the procurement Act is required. This demands that the procuring agency provides justifications for procuring using an uncompetitive model. Typical justifications include patented technology, intellectual property rights, private led initiatives with significant benefits to the country etc.

5.10 Zambia Development Agency (ZDA)

The developer also applies for and is issued with an Investment Licence (IL) by the Zambia Development Agency (ZDA). The IL serves as an Investment Promotion and Protection Agreement (IPPA). The IPPA grants the developer protection and incentives on their investment in accordance with the Zambia Development Act.

5.11 Public-Private Partnership Department

The PPP process is provided for by the PPP Act 14 of 2009 and Amendment Act No. 9 of 2018. Approvals for all PPP projects are granted by the PPP Council of Ministers who are the apex Committee established to approve all PPP projects. The PPP approval processes can either be solicited or unsolicited:

i. Solicited proposals

Solicited Project proposals are initiated by the contracting authority which includes Government ministries, parastatal or state-owned enterprise, local authorities, and agencies. In this case, the Government institution should submit the project proposal in line with the Section 21 – 26 of the Amended PPP Act No. 9 of 2018 to the PPP Department to structure a project on a PPP basis.

The solicited proposal process is shown in Figure 11 below.

Figure 11: Guiding Steps for Solicited PPP Projects

ii. Unsolicited Proposals
Unsolicited proposals are initiated by the private sector. In this case, the private party must submit a proposal to the contracting authority and PPP Department, but should be in line with the provisions of section 42 of the PPP Act No. 14 of 2009. Therefore, the Government institution must obtain authority from the PPP Department to proceed with an unsolicited project and consequent implementation once approved."

The unsolicited PPP process is shown in workflow of Figure 12 below:

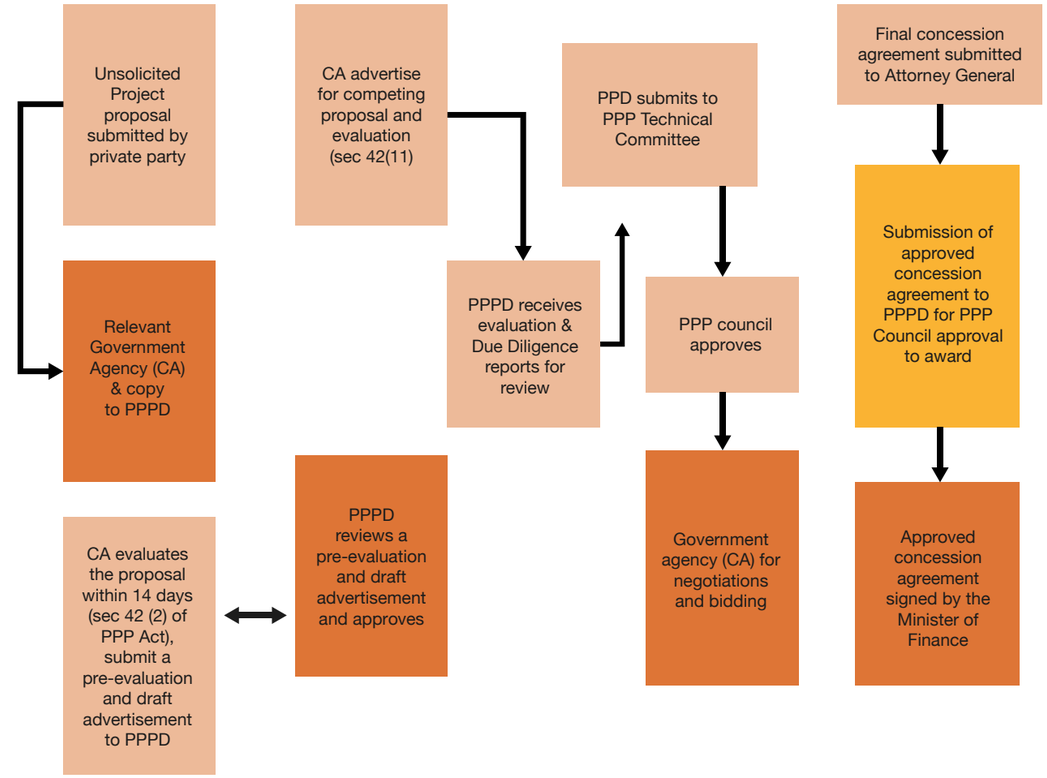


Figure 12: Guiding Steps for Unsolicited Proposal

5.12 Patents and Companies Registration Agency (PACRA)
Incorporation of a Special Purpose Vehicle (SPV).

A project developer applies to PACRA for clearance of a proposed name of a company in accordance with sections 39 and 40 of the Companies Act No. 10 of 2017. The applicant then completes the Application for Incorporation Form 3 and attached supporting documentation and prescribed by sections 12 and 13 of the Companies Act. PACRA issues a certificate of incorporation within 5 days of the application as prescribed by section 14 of the Companies Act.

The process of incorporating a company is shown in Figure 13 below:

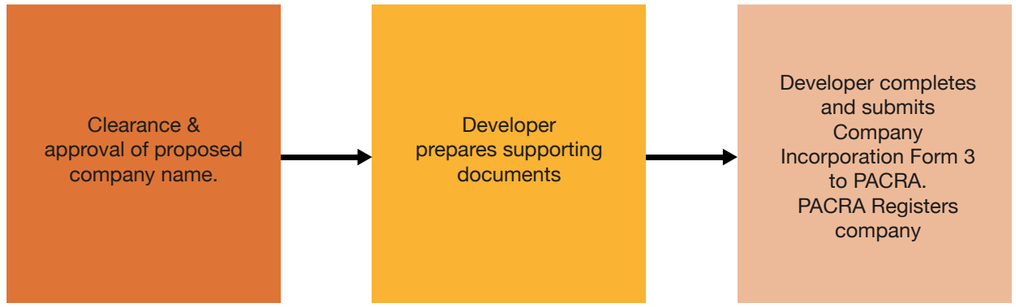


Figure 13: Process of incorporating a Company

Application for Name Clearance Form 1 may be accessed on https://www.pacra.org.zm/applications/pacra/html/attachments/2019form1.docx
Application for Incorporation Form 3 may be accessed on https://www.pacra.org.zm/applications/pacra/html/attachments/2019form3.docx

5.13 Zambia Revenue Authority (ZRA) – Taxpayers Identification Number (TPIN)
The TPIN is a unique ten-digit computer generated taxpayer identification number that allows the ZRA to track all tax issues rated to that taxpayer. The banking sector requires a TPIN before a bank account can be opened. The application process for a TPIN is done online on the ZRA website, or a paper application can be made through one of many ZRA customer care centres throughout the country.

The TPIN Application Form 1 may be downloaded from the ZRA Website at www.zra.org.zm (https://portal.zra.org.zm/index)

5.14 Department of National Parks and Wildlife
The process for the development of power projects to be undertaken in the national parks is as shown in Figure 14 below.

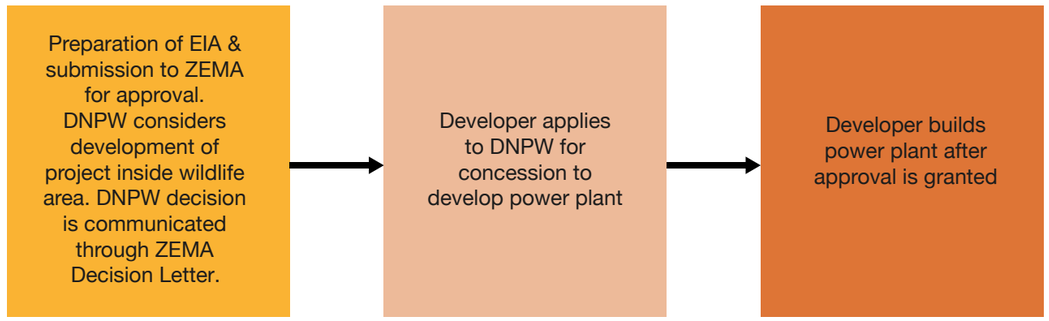


Figure 14: Process for Power Projects in the National Park

5.15 IPP, ZESCO Limited, Transmission System Operator (TSO), and any other off-taker

PPAs may be entered into between IPPs and any off-taker or ZESCO for the supply of power to or through the grid. An IPP usually initiates the discussion with ZESCO through the submission of a letter with the accompanying documentation such as feasibility study report, Implementation Agreement signed with the Ministry of Energy and the project technical details, specifying the type of generation technology, type of power, plant capacity, financial model, and power plant availability/reliability specifications.

If the proposed project is deemed suitable for ZESCO's needs, then ZESCO would enter in further discussions and negotiations with the proposed project developer. The flow chart for the PPA process between ZESCO and IPPs is shown in Figure 15 below:

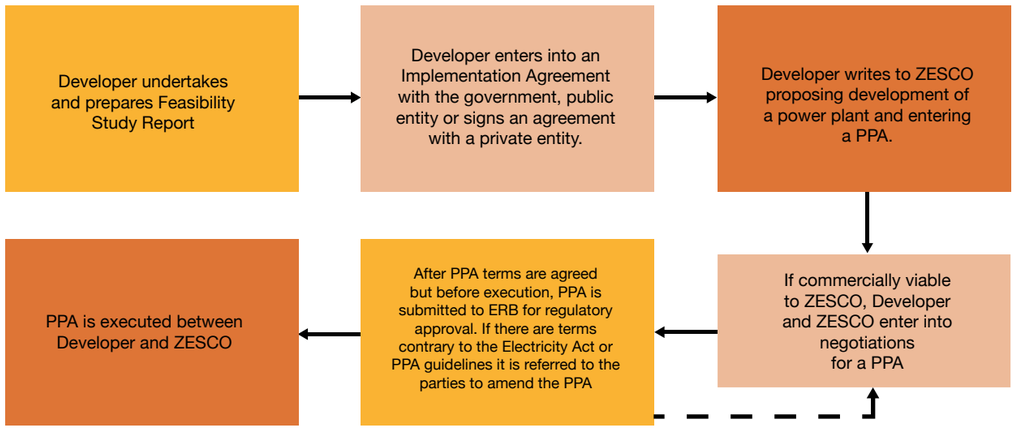


Figure 15: Flow chart for ZESCO PPA process

The integration of power projects into the national grid requires a grid integration study to confirm the safety and reliability of the resultant network. For this reason, power developers are required to undertake a grid integration study in collaboration with the TSO.

The process for undertaking a grid integration study with TSO is outlined in Figure 16 below:

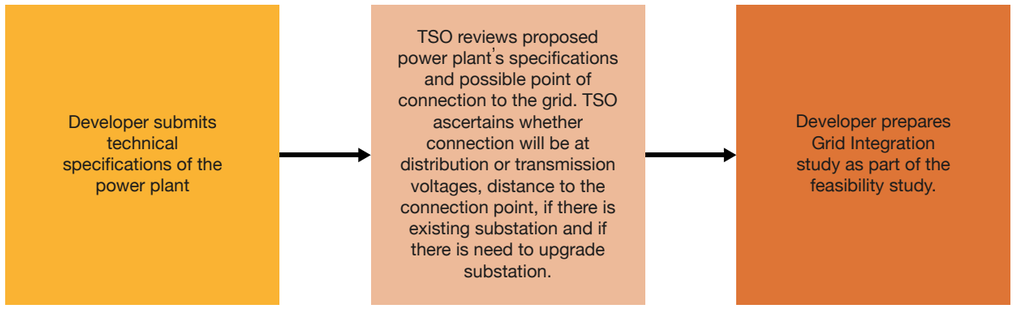


Figure 16: Flow Chart for Grid Impact Study

Further to a grid integration study, developers that wish to connect their networks to the national grid are supposed to enter into a Connection Agreement with the TSO. The Connection Agreement covers the technical and economic considerations that may arise as a result of the interconnection. The procedure for negotiating a connection agreement is shown in Figure 17 below:

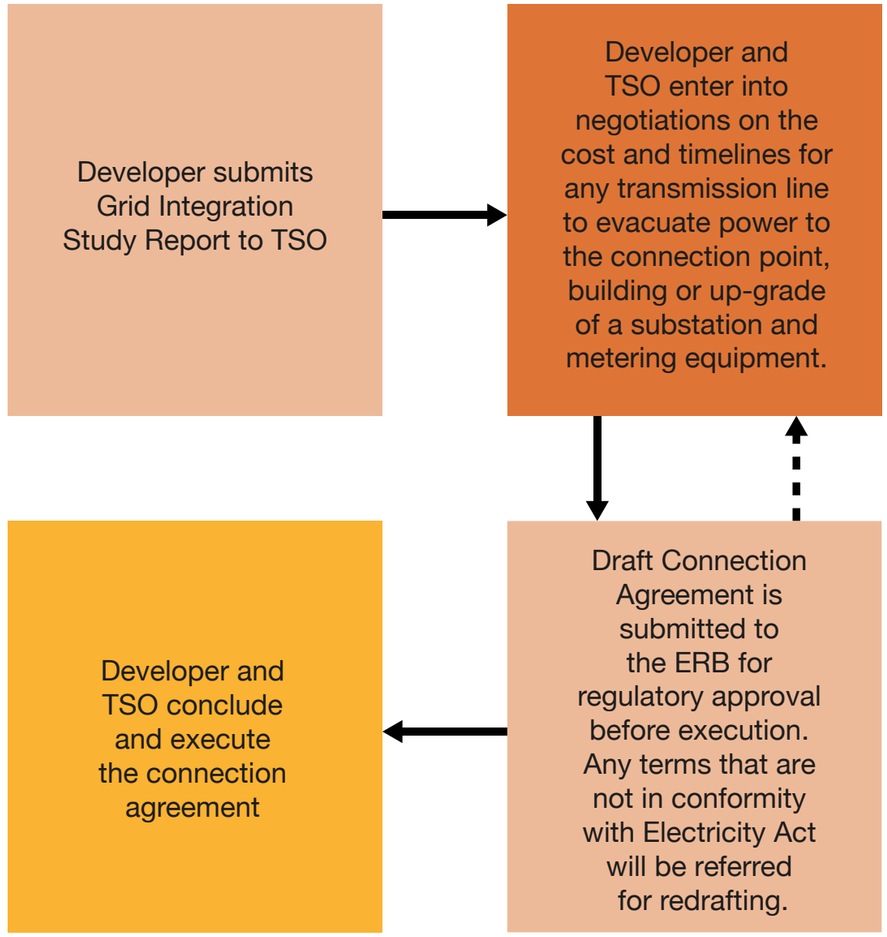


Figure 17: Flow Chart for Connection Agreement

[44] S.30(1) of EA

CHAPTER SIX
BUSINESS ARRANGEMENTS

6.1 Tariffs

One key aspect of investment by IPPs is the issue of electricity tariffs. The bankability of a project and its economic viability largely depends on the anticipated cash flow that the project can generate during its lifetime. The project cash flow is a component of the PPA signed with the off-taker. PPAs between off-takers and IPPs are subjected to regulatory approval by the ERB prior to final signing by the parties.

The more significant issue concerning PPAs is the level of tariffs that the utility can charge and consequently its cash flow. Based on the 2006 Cost of Service Study (CoS) commissioned by the ERB, electricity tariffs were determined to be low. From that time several non-legislative efforts were made to migrate the tariffs towards cost reflectivity. This had limited success, but in 2019, with the enactment of the Electricity Act No. 11 of 2019, cost reflectivity of tariff is now law. The provisions in the Act make it mandatory for the ERB to ensure that cost of power in PPAs between off-takers and IPPs are cost reflective. Section 30 (1) of the Electricity Act sets out the following five Tariff Principles:

The Energy Regulation Board shall, in determining a tariff or variation of a tariff, consider the following principles:
(a) a tariff shall be fair, reasonable, and reflects the cost of efficient business operation;
(b) a tariff shall ensure quality of service, predictability of tariff adjustment and reasonable rate of return on capital investment;
(c) a tariff shall encourage competition, economical use of the source of the electricity, good performance, and optimum investment;
(d) a tariff shall reward efficiency in performance; and
(e) a tariff shall reflect enforceable standards for the quality and cost of the supply of electricity to retail consumers and non-retail consumers.

The legal regime also allows IPPs to sign power supply agreements directly with bulk purchases and the national grid can be used to wheel power to those consumers. This allows an IPP to spread its cash flow risk between supplying to the utility and other bulk clients such as distribution companies and other bulk consumers.

Figure 18 indicates the process for obtaining ERB approval to adjust tariffs.

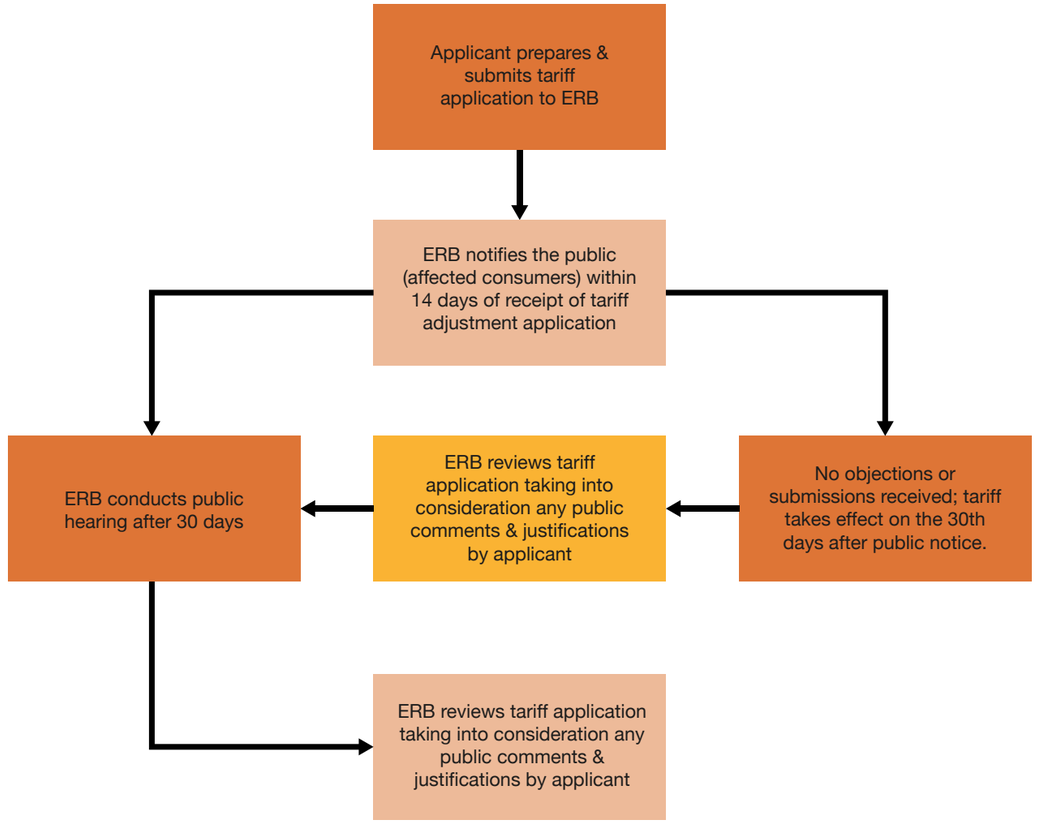


Figure 18: Tariff Adjustment Process

2. Tariff Management

The ERB determines and regulates tariffs in the energy sector . It also approves Power Purchase Agreements (PPAs) and the key provisions of Power Supply Agreements (PSAs) prior to final execution of these agreements by the parties. The EA governs the prior approval of Power Purchase Agreements (PPAs) or supply agreements, setting and mode of adjustment or variation of electricity tariffs charged by an enterprise. In addition to regulating the import and export of power, the EA also provides the mechanism for the ERB to review and approve PPAs for both local and export of power.

The export and import of electricity is approved by the Minister following consultation with the ERB.

CHAPTER SEVEN

GENERATION POTENTIAL AND POWER PROJECTS UNDER IMPLEMENTATION

7.1 Generation Potential

7.1.1 Hydropower

Zambia has a hydropower potential in excess of 6,000 MW out of which about 2,354 MW has been developed. Hydropower dominates the electricity supply industry with up-to 83%.

7.1.2 Coal to Power

The proven reserves of coal in Zambia are estimated to be over 30 million tonnes, mainly consumed by electricity, mining, and commercial industries. The generation capacity from coal accounts for 10% of the total installed capacity. More exploration work is required to ascertain the quality and extent of the coal deposits for electricity generation. Production of electricity from coal is considered unclean and this poses a challenge for mobilisation of project financing. However, this resource has the potential to provide base-load power and improve security of supply.

7.1.3 Solar Power

Zambia has an average solar irradiation of 5.5 kWh/m²/day with approximately 3,000 sunshine hours annually providing good potential for photovoltaic and solar thermal applications (including electricity generation, solar home systems, solar water pumping, solar water heating, etc.). Solar power generation accounts for 3% of the total installed generation capacity

7.1.4 Waste to Energy

Zambia has potential to utilize waste to produce energy, electricity, and other by-products. The forms of waste to be targeted may include but not limited to municipal solid waste, sewerage wastewater, agricultural crop residues, livestock manure or waste, wood chips or biomass, and industrial waste. This potential has been noted and several private developers have expressed interest to undertake feasibility studies for Waste-to-Energy projects in Zambia.

7.1.5 Wind power

The Ministry of Energy through a World Bank funded Renewable Energy Wind Mapping for Zambia Project published a 24-Month Site Resource Report that collected wind data from 8 different sites in the country. The report gives an average wind speed ranging from 6.9 – 8m/s. This available wind resource data indicates that there are sufficient wind speeds at specific locations to support electricity generation. Currently, there is no power generation from wind energy.

7.1.6 Geothermal Power

There are more than eighty (80) hot springs spread out in different parts of the country which indicate potential for Geothermal for both power generation.

7.1.7 Uranium

Zambia has deposits of Uranium. However, the utilization of Uranium in nuclear technology in Zambia has been limited to research, education, industrial and medical applications to achieve the desired impact for socio-economic development. There is no electricity generation from Uranium resource.

7.2 Projects under implementation

Table 2 below shows some of the power projects currently under implementation.

NO.	PROJECT NAME	DEVELOPER	PROJECT TECHNOLOGY	CAPACITY (MW)	STATUS
1.	Kafue Gorge Lower	ZESCO Limited	Hydro	750	Construction
2.	Ngonye Falls Hydroelectric	Western Power Company	Hydro	180	IA Signed
3.	Lufubu Hydroelectric	Lufubu Power Company Limited	Hydro	163	IA Signed
4.	Kabompo Hydroelectric	Copperbelt Energy Corporation	Hydro	40	IA Signed
5.	Chavuma Hydroelectric Project	Sinohydro	Hydro	30	IA Signed
6.	Afri Energy Biomass Projects	Afri Energy Ventures Limited	Biomass/Waste to energy	36	IA Signed
7.	Bulemu East & West (GET FiT)	Building Energy & Pele Energy	Solar	40	Financial Mobilisation underway
8.	Aurora Solar 1 & 2 (GET FiT)	Globeleq & Aurora Power Solutions	Solar	40	Financial Mobilisation underway
9.	Garneton North & South (GET FiT)	InnoVent & CEC	Solar	40	Financial Mobilisation underway
10.	Mulembo & Lelya Hydroelectric Projects	Mulembo & Lelya Hydro Electric Power Limited	Hydro	106	Detailed Feasibility Study underway
11.	Mutinondo and Luchenene Hydroelectric Projects	Mutinondo Luchenene Power Company Limited	Hydro	110	Detailed Feasibility Study underway
12.	Access wind project	Access Wind One Zambia Limited	Wind	130	Detailed Feasibility Study completed
13	Kalahari	Kalahari	Geothermal	15-20	Detailed Feasibility Study completed

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