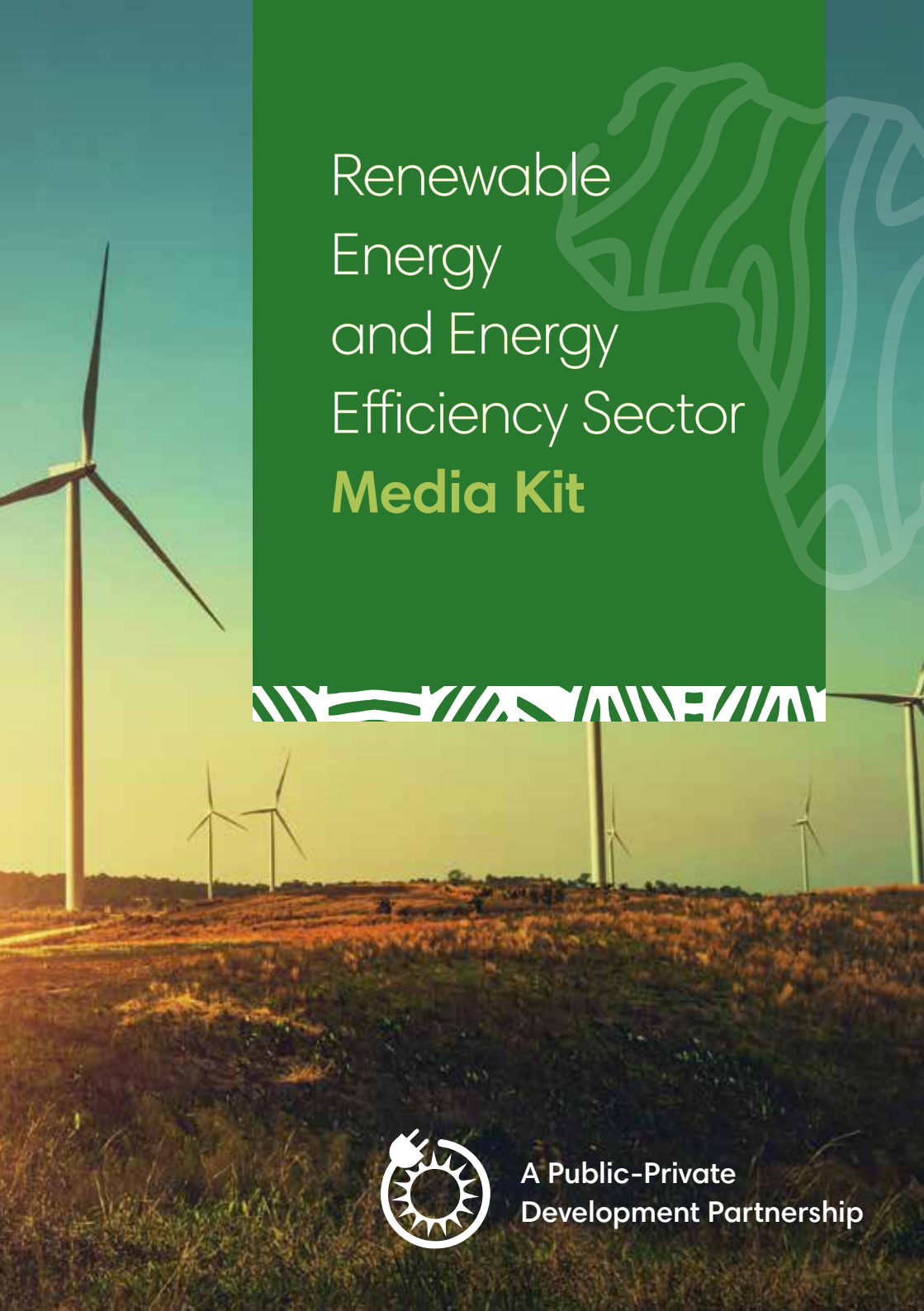


A large wind turbine stands prominently on the left side of the frame, its three blades reaching towards a clear sky. In the background, several other wind turbines are visible, scattered across a rolling landscape covered in dry, golden-brown grass. The scene is captured during the 'golden hour' of sunset, with a warm, orange glow illuminating the horizon and the lower parts of the turbines. A semi-transparent green rectangular box is overlaid on the right side of the image, containing the title text. At the bottom of this green box, there is a decorative horizontal band with a repeating geometric pattern of green and white zig-zags and chevrons.

Renewable Energy and Energy Efficiency Sector **Media Kit**



A Public-Private
Development Partnership

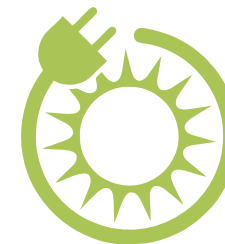


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Introduction to RE and EE



Access to affordable, reliable and sustainable energy is one of the main drivers for social and economic development, resulting in better living conditions and introduces new employment opportunities and enterprise development.

In 2015, an energy deficit of close to 700MW occurred, with demand standing at 1,949MW while supply only stood at 1,281 MW¹. This situation was attributed to inadequate and delayed investments in generation and transmission infrastructure and the failure to diversify energy generation sources over the last 30 years. At the household level, only 31% of Zambians have access to electricity of which 67% are in the urban areas and 4% (on-grid) in the rural areas².

¹ SCALING-UP RENEWABLE ENERGY IN LOW INCOME COUNTRIES Report, Investment Plan for Zambia

² Zambia National Energy Policy, 2019 pp48

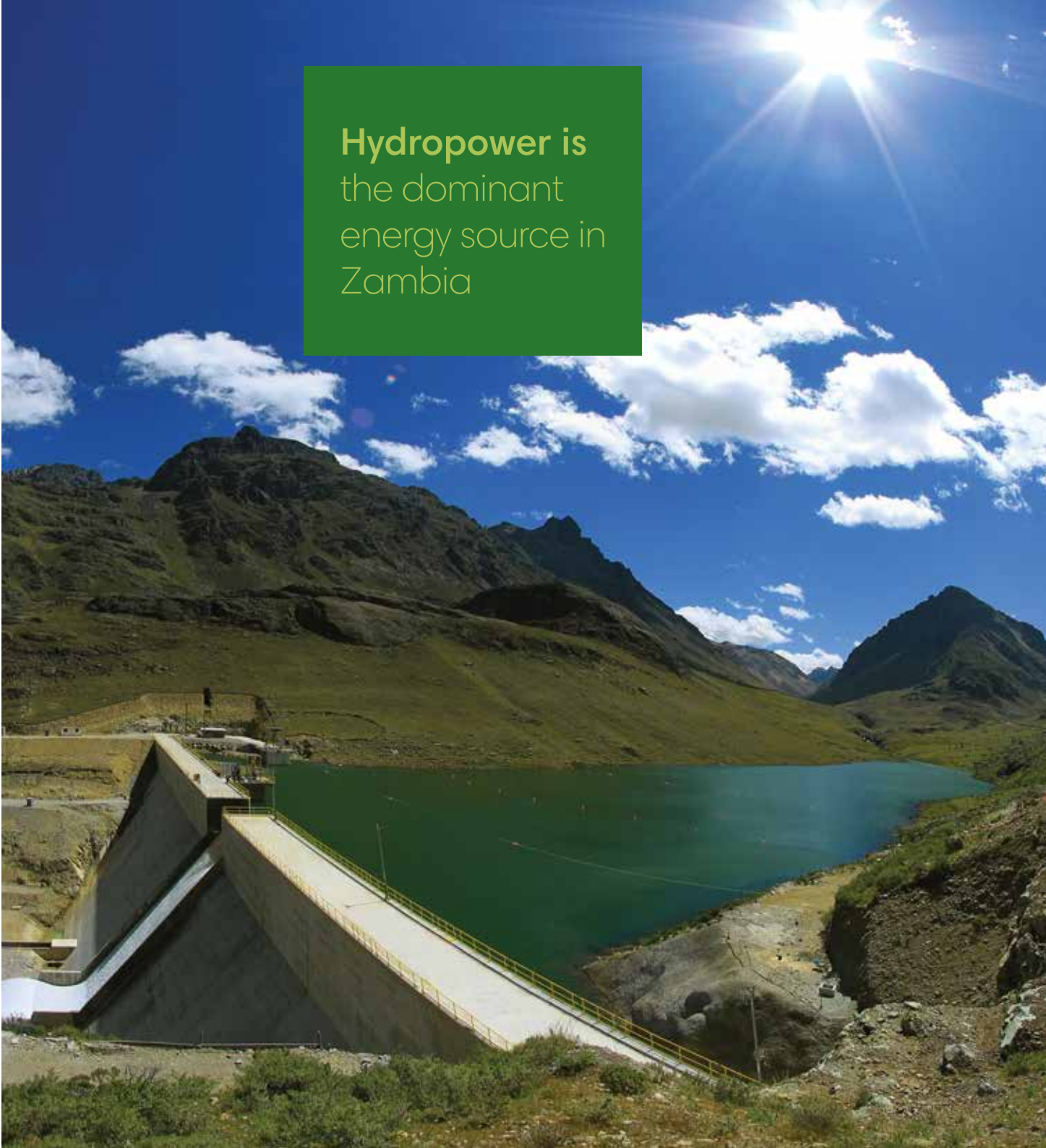


Hydropower is the dominant energy source in Zambia, providing most of the Zambia's Hydro electricity supply (80.8%), followed by coal 10%, HFO 3.5%, Solar PV 3% and diesel 2.7% and coal fuelled energy plants (3%). Total Installed capacity as at September 2019 is 2976.3 MW³.

Renewable Energy (RE), such as solar, although having a huge potential to complement existing energy sources, are currently underexploited only providing limited amounts of energy to the Zambian population and the market penetration is very low. In addition, the Government has recognised Energy Efficiency (EE) as a priority issue because it can result in economic benefits, energy security, environmental protection and climate change mitigation. While the main driver and ambition of the Government of Zambia is to diversify and expand its energy mix and by doing so, reduce its reliance on hydropower, a skills gap in renewable and energy-efficient technologies has been observed⁴.

Domestically available skills are critical to ensure a smooth transition and diversification of the energy mix, while contributing to economic growth, jobs and opportunities for development of enterprises along RE and EE related value chains.

³ Zambia National Energy Policy 2019 pp11
⁴ SKIDRES Market System



Hydropower is
the dominant
energy source in
Zambia

Key Definitions

- **Biofuels** – A wide range of liquid and gaseous fuels derived from biomass including liquid fuel ethanol and biodiesel, as well as biogas which can be combusted in vehicle engines as transport fuels and in stationary engines for motive power, heat and electricity generation. (MOE, NEP)
- **Biomass** – An organic matter such as wood fuel (firewood and charcoal), agricultural wastes, forestry wastes, industrial/municipal organic waste, energy crops and products and animal waste that is available for conversion into energy. (MOE, NEP)
- **Bulk Power Supply** – often used interchangeably with wholesale power supply. In broader terms, it refers to the aggregate of electric generating plants, transmission lines, and related-equipment.

The term may refer to those facilities within one electric utility, or within a group of utilities in which the transmission lines are interconnected.

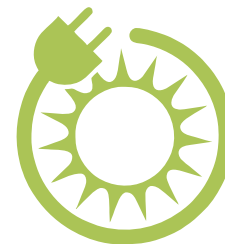
- **Cost Reflective Tariffs** – Tariffs set to recover all the allowable costs of each regulated and licensed activity. “Allowable costs” in this case means all operating costs reasonably incurred, all capital costs prudently invested, and a fair rate of return on used and useful utility assets.
- **Distribution** – Transportation of electricity on a distribution system for delivery to a consumer.
- **DSM (Demand Side Management)** – Programs to influence the amount or timing of customers’ energy use.

- **Electricity** – Electrical energy produced by physical sources of energy such as hydropower, wind power, solar power, petroleum, coal, biomass, nuclear energy or any other source.
- **Energy** – Any source of electrical, mechanical, thermal, nuclear or chemical power for any use.
- **Energy Conservation** – The sustainable management and use of energy resources for their inherent value and for the benefit of society, bearing in mind that future generations have as much a right to these resources as our own.
- **Energy Efficiency** – Measures (practices, efficient devices & appliances, regulatory e.g. labelling and codes) undertaken to reduce the losses in generation, transmission and distribution networks on the supply side and to reduce the consumption of energy in demand sectors that include household, industry and commerce.
- **Gel Fuel** – An energy source obtained from ethanol.
- **Generation** – The process of converting energy into electricity and or useful heat from a primary energy source such as wind, solar radiation, natural gas and biomass.
- **Geo-thermal Energy** – Energy available as heat emitted from within the earth’s crust, usually in form of hot water steam.
- **Hydropower** – Electricity generated from the potential energy of water captured when moving from higher to lower elevations.
- **Human and Environment rights** – The essence of what constitutes the rights of people is codified through the first, second and third generation of human rights enshrined by the United Nations. The

first-generation rights were given status in international law first by Articles 3 to 21 of the 1948 Universal Declaration of Human Rights and later in the 1966 International Covenant on Civil and Political Rights (entered into force in 1976).

- **Independent System Operator (ISO)** – A neutral and independent organisation with no financial interest in generating facilities that administers the operation and use of the transmission system. ISOs exercise final authority over the dispatch of electricity from generators to customers to preserve reliability and facilitate efficiency, ensure non-discriminatory access, administer transmission tariffs, ensure the availability of ancillary services, and provide information about the status of the transmission system and available transmission capacity. An ISO may make some transmission investment decisions.
- **Installed Capacity** – The maximum aggregate capacity of the plant that generate, transmit or distribute electricity.
- **Interconnected System** – A system consisting of two or more individual electric systems that have connecting tie lines and whose operations are synchronised.
- **Interconnection** – The facilities that connect two systems or control areas. Additionally, an interconnection refers to the facilities that connect a nonutility generator to a control area or system.
- **Load** – An end use device or customer that receives power from an energy delivery system. Load should not be confused with Demand, which is the measure of power that a load receives or requires. See Demand.

- **Long Range Planning** – The process of forecasting long term loads, determining a reasonable set of potential resources to meet these loads (including reduction of loads through energy efficiency), analysing the costs (sometimes including externality costs) of several possible mixes of such resources, and identifying the resources to be secured to meet such future needs.
- **Peak Load or Peak Demand** – The electric load that corresponds to a maximum level of electric demand within a specified time, usually a year.
- **Power** – The rate at which energy is converted per unit of time, expressed in watts.
- **Power Purchase Agreement (PPA)** – A contract for generating and selling electricity between two parties.
- **Power Pool** – Two or more interconnected electric systems planned and operated to supply power for their combined demand requirements.
- **Public Good** – A good (or a service) that will not be produced and delivered solely by the free market. Economists call these “public goods” because the public consumes them, but they do not solely benefit a single buyer or group of buyers. There is no way to produce a public good without producing a value to society at large. It is unlikely that an individual would pay out of his or her own pocket to ensure that a public good is produced because the value is not exclusively individual.
- **Public Private Development Partnership (PPDP)** – A modality for concrete cooperation between public partners and private sector actors to achieve development objectives. PPDPs encourage the private sector to proactively contribute towards improving conditions for people in poverty and aim at maximising the development value of private investments.
- **Reliability** – Electric system reliability has two components —adequacy and security. Adequacy is the ability of the electric system to supply the aggregate electric demand and energy requirements of the customers at all times, taking into account scheduled and unscheduled outages of system facilities. Security is the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system facilities. Reliability also refers to the security and availability of natural gas and petroleum supply, transportation and delivery.
- **Renewable Energy** – Non-fossil sources of energy capable of use for the generation of electricity including wind, solar, hydro, bio-mass and geothermal. Solar Energy – Energy irradiated from the sun to the earth for thermal applications and electricity generation
- **Sustainability** – may be defined as the use natural resources to meet the needs of present generations without compromising the ability of future generations to meet their needs.
- **Tariff** – A document, approved by the responsible regulatory agency, listing the terms and conditions, including a schedule of prices, under which utility services will be provided.
- **Transmission** – Transportation of electricity from the source of electricity production on a transmission system for delivery to distribution network service providers and final consumers.
- **Unbundling** – Disaggregating utility service into its basic components and offering each component separately for sale with separate rates for each component. For example in electric service, generation, transmission and distribution could be unbundled and offered as discrete services with separate payment for each.
- **Universal Service** – Energy service sufficient for basic needs (an evolving bundle of basic services) available to and affordable by virtually all members of the population.
- **Utility** – A corporation, person, agency, authority, or other legal entity that owns or operates facilities for the generation, transmission, distribution, or sale of electric energy or natural gas primarily for use by the public and is defined as a utility under the statutes and rules by which it is regulated.
- **Wind Energy** – Kinetic Energy of wind exploited for electricity generation in wind turbines.





Situation Analysis of the Energy Sector in Zambia

Only 31% of Zambians have access to grid-based electricity, and in rural areas it is as low as 4%⁵. Whilst connecting more of the population to the national grid is a national ambition, it is recognised that many consumers will rely on off-grid sources.

Currently, the country's energy consumption is mainly wood fuel (i.e., firewood and charcoal), which accounts for over 70% of total primary energy supply.

Hydropower is the dominant energy source in Zambia, providing most of Zambia's electricity supply (84%), while solar photovoltaics (PV) is the fastest growing technology. The growth in solar comes from a range of installations, from small solar

home systems, to mini- and micro-grids, as well as some commercial-scale solar parks. Other renewable energy sources with some potential in Zambia include wind, geothermal and biomass energy. Of these, the latter is likely to present the greatest opportunity in the short to medium term⁶.

The increased use of solar PV has many benefits, not least the fact that installations are scalable, flexible and quick to install. Despite this, integration of solar PV also introduces some challenges. Perhaps the most important is that, because of the intermittent nature of solar, backup, in the form of batteries or baseload power is required. With the connection of solar to the grid, the challenge becomes one of how to integrate solar as a source so that the power system is balanced.

⁵ These and further figures in this section are taken from the following source, unless otherwise indicated: Zambia Ministry of Energy 'Scaling up renewable energy in low-income countries: investment plan for Zambia', available at: <https://www.moe.gov.zm/wp-content/uploads/2019/02/Zambia-SREP-IP.pdf>

⁶ Source: stakeholder consultations in Lusaka, January 2020.

Despite attempts by the government to manage the situation – by regulating the introduction of new intermittent sources of supply and simultaneously increasing the baseload capacity of the grid – this will continue to be an ongoing challenge in the Zambian power sector (as it is in most other countries where renewables are coming online).

ZESCO Ltd is the state-owned utility which owns and operates 90% of the generation, transmission and distribution of electricity in Zambia. Energy Regulatory Board (ERB) is at the helm of this development and the new energy policy.

The Southern Africa Power Pool (SAPP) was developed to enable countries in Southern Africa to trade electricity across borders and thus counter some of the challenges related to supply and intermittency. Due to both general production shortages in the region as well as technical barriers associated with the transport of electricity across Zimbabwe, SAPP is currently an underutilised resource from a Zambian perspective. The second issue relates to the potential for energy efficiency to reduce some of the load shedding as well as baseload capacity needs of the country. Energy efficiency is an under-explored issue in the Zambian context, but one where both ZESCO and ERB express an interest in increasing their activity levels.

Broadly speaking, the most significant potential for energy efficiency is currently two-fold: on the one hand, increase the availability of products and knowledge about energy-efficient consumer products and public infrastructure (e.g. street lighting) and

on the other hand create incentives (or a change of mindset) amongst large industrial consumers to increase the efficiency of their production and operations (e.g. in the sugar and mining industries).

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Legal Frameworks

Energy is an important driver of the economy. Due to the need to transition to low carbon economies, the prominence and increase in the supply and demand of renewable energy technologies and the efficient use of energy. As a result an enabling legal, regulatory and policy environment is inevitable to support this paradigm shift.

According to the Vision 2030, energy is one of the essential driving forces behind the development of an economy as it cuts across most economic and social activities. In Zambia, for instance, the critical policy frameworks for the energy sector include the vision 2030, the Seventh National Development Plan, the Energy Policy and Laws and Regulations.

Vision 2030 – Vision for the Energy Sector: Universal access to clean, reliable and affordable energy at the lowest total economic, financial, social and environmental cost consistent with national development goals by 2030.

Targets for the energy sector by 2030:

- Abundant and reliable supply of affordable energy to both urban and rural areas;
- Increased renewable alternative sources of energy,
- Export-led energy industry, and
- Reduced share of wood fuel to 40 percent by 2030.



Seventh National Development Plan (7NDP)

The Strategic direction for the country is improved energy production and distribution for sustainable development. The goal is to ensure universal access to clean, safe, reliable and affordable energy at the lowest cost, consistent with national development aspirations.

The 7NDP proposes an expansion in the utilisation of hydro-electricity potential sites and diversification into other sources of energy such as solar, gas and wind. The peak demand for electricity in the country is likely to be 3,000 MW by 2021 and is expected to increase to over 3,525 MW in 2030. Other sources of energy including geothermal, wind, solar and coal are envisaged to grow to about 15 percent by 2030

The National Energy Policy (NEP)

The 2019 NEP builds on previous policies of 1994 and 2008 and anchored on the Seventh National Development Plan (7NDP) and Vision 2030. The Policy aims to guide the energy sector in the development of the electricity generation, transmission and distribution capacity. The policy puts into consideration aspects of climate change and environmental sustainability.



INSTITUTION	ROLE
Cabinet Office	Provide the overall leadership and guidance in the coordination and implementation of this Policy.
Ministry of Energy:	Oversee and ensure the effective implementation of measures stipulated in this policy nationwide
Ministry of Finance:	Ensure sufficient financial resources are allocated in the annual national budgets for the implementation of the policy.
Development Planning:	Monitoring and Evaluating the overall implementation of the Energy Sector programmes.
Ministry of Justice:	Review and strengthen the legal framework to the energy sector ensuring, and not limited, provisions for emergency situations; open access regime; and establishment of Energy Fund.
Line Ministries	Support the implementation of this policy by ensuring that the activities outlined in this policy are budgeted for by the relevant line ministries in their annual budgets
The Energy Regulation Board:	Monitor the efficiency and performance of licensees and enterprises in the energy sector as well as establishment and management of the Energy Fund.
Zambia Atomic Energy Agency:	ZAMATOM is engaged in different activities to enable success in the reforms being undertaken by the radion active industry.
Zambia Statistics Agency:	Coordinate the development of a comprehensive energy sector Statistical database.
Implementing Agencies:	ZESCO Limited, REA, ZRA, TAZAMA, INDENI. These Agencies will develop and maintain energy infrastructure; regulate the sector; implement some of the energy efficiency and conservation measures; contribute to ensuring citizen participation in development initiatives; and utilise M&E findings to inform programme and resource allocation decisions.
Local Authorities:	Facilitate provision of necessary facilities for development of energy sector.
Private Sector/Non-State Actors:	Support the implementation of energy sector activities outlined in this Policy.
Traditional Leaders and Local	Facilitate community consultations in implementation of on energy sector projects.
The Media:	Facilitate and disseminate information on energy plans, programmes and projects

The effective implementation of the energy policy is envisioned to be achieved through a coordinated institutional framework as presented in the table below.

Laws and regulations

According to the National Energy Policy (2019), the energy sector is currently governed by four (4) major statutes namely:

1. **The Energy Regulation Act** - established the Energy Regulation Board (ERB), as a body corporate, whose primary role is to license entities that intend to produce energy
2. **The Electricity Act** - provides for the regulation of generation, transmission, distribution and supply of electricity.
3. **The Petroleum Act** - provides for the importation, conveyancing and storage of petroleum and other inflammable oils.; and
4. **The Rural Electrification Act** - established the Rural Electrification Authority (REA) whose primary role is to provide electricity to rural areas of Zambia.



Key Resources

The key resources in renewable energy include:

Training

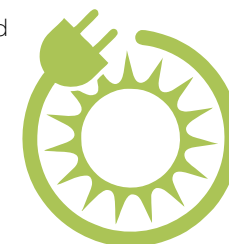
- The Kafue Gorge Regional Training Centre (KGRTC)
- SADC Centre for Renewable energy and energy efficiency Human Resources
- University of Zambia
- Copper belt University
- Mulungushi University
- International Training Centre for ILO
- Technical Education, Vocational and Entrepreneurship Training Authority

Financial and Institutional Support

- International Labour Organization (ILO)
-Training related
- Swedish International Development Cooperation Agency (Sida)
- African Development Bank
- Industrial Development Corporation (IDC)
- United Nations Development Programme (UNDP)
- The World Bank
- The African Development Bank
- EU European Union
- World Bank
- Africa Development Bank
- United Nations in Zambia
- Southern Africa Development Community

Associations and Related Renewable Energy Institutions

- Regional and Electricity Regulators Association (RERA)
- International Renewable Energy Agency (IRENA)
- Southern African Power Pool (SAPP)
- SADCC Centre for Renewable Energy and Energy Efficiency



Role of media in the energy sector

In any democratic country the media plays a vital role in creating, moulding and reflecting public opinion. Media plays a significant role in information dissemination, awareness-raising and can also be used as a tool to create an enabling environment for behaviour change in decision making, communities and any other sector of society.

The engagement of media provides an opportunity for journalists to play a strategic role in enhancing communication/dissemination on impact of renewable energy and energy efficiency programs to enhance policy debates, accountability and decision making.

It is well researched that the project interventions for renewable energy and energy efficiency will contribute to a growing number of women and men with relevant skills for the rapidly developing renewable energy and energy e-efficiency sector and to speeding up and decreasing costs for universal access to clean, affordable, reliable and sustainable energy, which in turn will contribute to poverty reduction and improved livelihoods. Therefore, media is a key stakeholder in informing the public and driving the process of change and transformation of the energy sector through quality information sharing and reporting on the results and impact of programs. This area therefore requires research-based/analytical journalism.

Below are some of the roles journalists can undertake:

- Write feature stories on impacts of skills development concerning job creation and energy demand in the market for renewable energy and energy efficiency, which in turn will contribute to poverty reduction and improved livelihoods.
- Critically monitor partnerships with the private sector, related to market needs, as well as the demand-driven training (with a gender dimension),
- Staying in touch with the KGRTC, relevant government agencies, workers, employers, the ILO staff and professionals from other development agencies to monitor progress on skills development for renewable energy and energy efficiency.
- Investigate the contribution of energy efficiency made towards decreasing costs for universal access to clean, affordable, reliable and sustainable energy
- Carry out photojournalistic work.
- Special reports on skills development related renewable energy, energy efficiency, job creation and increased demand.
- Prioritise skills developed for renewable energy and energy efficiency on job creation and improved livelihoods



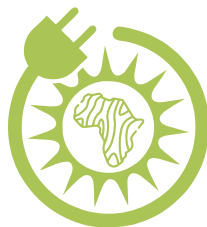
Gender dimensions in RE and EE sub-sectors

As with most sectors, the energy sector in Zambia is mainly male-dominated. This is as a result of longstanding socio-cultural norms that suggest that being an engineer is a role for men, largely relating back to when most engineering jobs were in the mines and were much more manual and physically demanding and as such considered unsuitable for women.

Whilst these perceptions are shifting over time, and in fact global studies show that the renewable energy sector perhaps shows that gender discrimination is less pronounced than in other sectors, there are still clear barriers that prevent women and girls from seeking opportunities.

These are typically common across the workplace and skills delivery institutions and include; the lack of flexibility in the workplace or in skills delivery, including the timing and location of training programmes and places of work, the lack of female or child-friendly facilities such as toilet facilities, nurseries, nursing rooms and in some cases accommodation. The lack of female mentorship and role models across industries also means that perceptions do not shift as quickly as they could, despite there being a good number of women in leadership positions within the RE sector in Zambia.

Finally, the lack of equal pay and targets for diversity means that gender is not a priority for companies. So recruitment or enrolment processes do not seek to overcome any gender gaps and are likely to be biased towards attracting male candidates.



SKIDRES

Project in RE and EE

The International Labour Organisation (ILO), with funding provided by Sida, the Swedish International Development Cooperation Agency, and in close collaboration with Kafue Gorge Regional Training Centre (KGRTC), launched a technical cooperation project to contribute to the development of a Public-Private Development Partnership (PPDP) for skills development for the Renewable Energy (RE) and Energy Efficiency (EE) sub-sectors in Zambia and rest of the Sub-Sahara region.

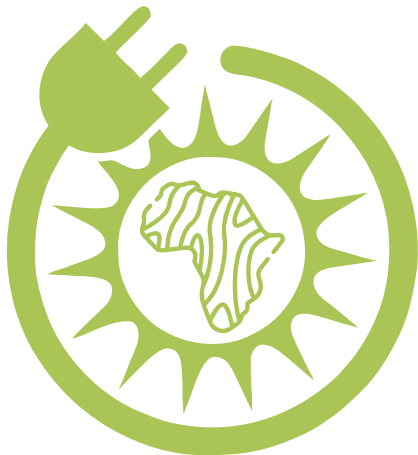
Through strong buy-in by the private sector, both foreign and domestic, it aims to contribute to the region having the necessary skilled people to tap into the rapid development of technology in renewable energy and energy efficiency.

Power utilities and independent power producers, as well as energy-intensive industries and business, will be able to employ professionally skilled local staff to improve their skills and energy efficiency and expand on renewable energy operations. This will close the skills gap in renewable energy and energy efficiency sub-sectors in Sub-Saharan Africa.



Donors and other implementing partners

The SkidRES Project is funded by the Government of Sweden and implemented by the Kafue Gorge Regional Training Centre (KGRTC) while the International Labour Organization plays the role of a coordinating agency.



Through the delivery approach of a Public Private Development Partnership, the Project is also jointly delivered through various collaborations with the public, and private sectors, academia, civil society and others who are key players in the industrial and commercial energy space (specifically the Renewable Energy and Energy Efficiency Sub sectors) projected through the skills development lens.

The project by using skills development aims to contribute to the country's aspirations to transition to a low carbon economy through energy transition which presents both opportunities and implications for job creation.



Sector Opportunities

- Cost of alternative energy technologies reducing
- Renewable Energy and Energy Efficiency Skills are beginning to be developed
- Demand is available for alternative sources of energy – access to national electricity grid is 31%
- Legal and regulatory framework is being reviewed to accommodate and promote growth in Renewable Energy and Energy Efficiency
- There is increasing investment in necessary infrastructure for Renewable Energy and Energy Efficiency growth

Implications for jobs

- Creation of jobs/retention of jobs as results of new businesses around manufacturing, supply & servicing of energy facilities
- Quality jobs
- Reduced carbon footprint

Useful Resources

1. Ministry of Energy – www.moe.gov.zm
2. Industrial Development Corporation – www.idc.co.zm
3. <https://www.moe.gov.zm/wp-content/uploads/2019/02/Zambia-SREP-IP.pdf>
4. Vision 2030
5. Seventh National Development Plan (7NDP)
6. National Energy Policy (2019) – Zambia





“Skills development for the Renewable Energy Sector – SkiDRES” Project

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