THE INTERNATIONAL REC STANDARD

Country Assessment Report: Zimbabwe

Zimbabwe/Southern Africa:

Zimbabwe is a landlocked country in Southern Africa, with a total population of 15 178 979 as per the 2022 Population and Housing Census. Most of the population (61.4%) live in the rural areas of the country and the remaining 38.6% live in urban areas (based on 2022 Population and Housing Census). Statistics indicate that 23.4% of the rural population have access to grid electricity whereas 87.4% of the urban population have access to grid electricity. Countrywide, 33.7% have access to grid electricity, 28.3% have access to off-grid electricity and 38% have no access to electricity. The Gross Domestic Product (GDP) of Zimbabwe increased from 10.74 billion US dollars in 2002 to 32.87 billion US dollars in 2021 growing at an average annual rate of 8.59%, (World Bank Data). Furthemore, the Government of Zimbabwe is committed to make carbon trading a huge component of renewable energy production in Africa. A functional national carbon credit framework, guiding on compliance of voluntary carbon market is now in place. In addition, establishment of the country as Africa carbon trading hub is on track launch of the inaugural Africa voluntary carbon markets credits maker forum where a pan-African carbon credit register was created and is being traded at the Victoria Falls Stock Exchange (VFEX).

Generation and demand: (type, MW, TWh)

The country has an installed capacity of about 2,600 MW, but the actual power generation capacity is about 1400 MW against a peak demand of about 1700MW, and winter peak maximum demand of about 2200MW thus, creating a shortfall of about 1000 MW during peak periods. According to the Zimbabwe Energy Regulatory Authority, in 2022, energy supply in Zimbabwe was a mix of hydropower (68.17%) coal and renewable energy sources (31.83%). The System Maximum Demand and Energy Sent Out Forecasts are presented below ;

Year	Energy (GWh)		Peak (MW)	
	Policy Scenario	Delayed Policy Scenario	Policy Scenario	Delayed Policy Scenario
2022	10,754	10,249	2,000	2,000
2023	14,382	13,694	2,288	2,224
2024	18,800	15,810	2,875	2,448
2025	22,298	17,776	3,327	2,672
2026	24,529	19,563	3,603	2,896
2027	26,463	21,313	3,829	3,120
2028	27,712	22,940	4,004	3,344
2029	28,820	24,423	4,183	3,568
2030	29,971	25,912	4,369	3,792
2031	31,177	26,714	4,563	3,917
2032	32,432	27,542	4,763	4,044
2033	33,738	28,397	4,971	4,176
2034	35,101	29,281	5,187	4,310
2035	36,522	30,195	5,412	4,450
2036	38,003	31,141	5,646	4,594
2037	39,551	32,120	5,889	4,742
2038	41,168	33,133	6,143	4,895
2039	42,858	34,183	6,407	5,054
2040	44,626	35,271	6,683	5,218

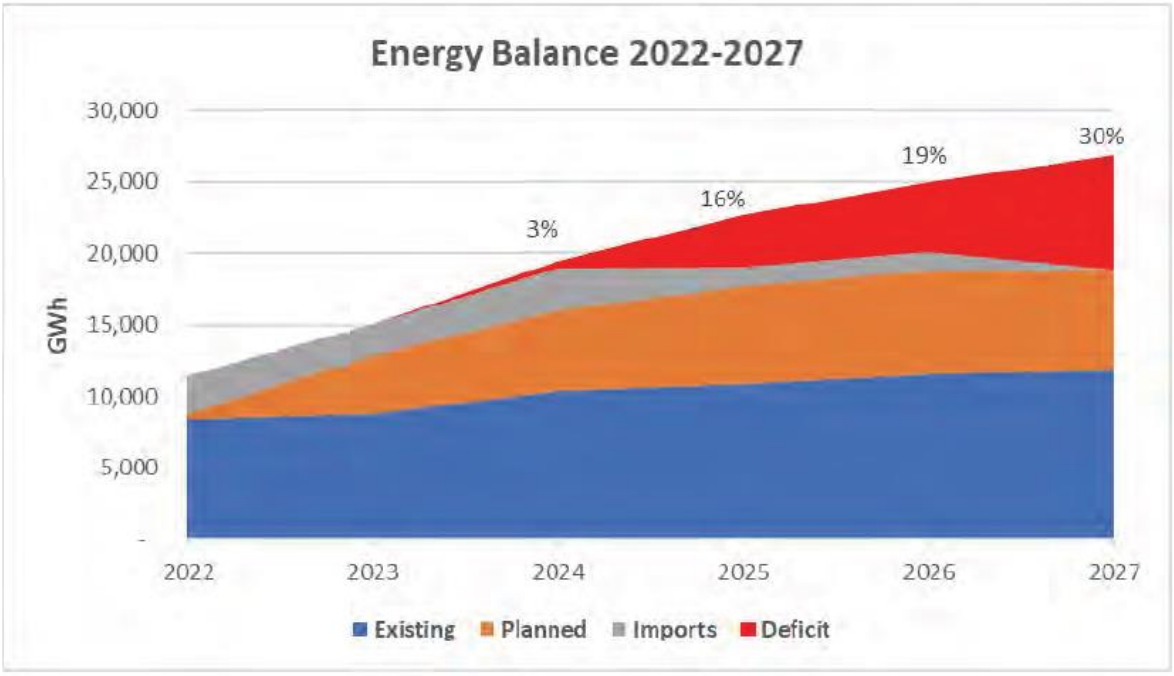
Source: Network Master Plan Final Report, Manitoba Hydro International-ZETDC, May 2023

The installed capacity of existing generation plants is as follows;

	Hydro		**Thermal** (coal)	**Renewable**	
	Kariba	Small Hydro			
Installation Capacity (MW)	1,050	32.5	**1,820*	23.5	18.3

Source: Network Master Plan Final Report, Manitoba Hydro International-ZETDC, May 2023

The energy balance with existing and commited power plants 2022 – 2027 is presented below.



Source: Network Master Plan Final Report, Manitoba Hydro International-ZETDC, May 2023

Renewable Energy Market Potential:

Zimbabwe has enormous RE resources that are currently underutilized and offer significant business potential. The primary renewable energy sources are solar, hydro, wind and biomass which includes bagasse (sugarcane based), sawmill waste, biogas and forestry waste.

- **Solar**: Solar potential of sixteen (16) to twenty (20) MJ/m2 /day in Zimbabwe is vastly unexploited and is present in several regions of the Country. In 2018, Zimbabwe had grid connected installed capacity of about five Mega Watts (5 MW) that is well short of the potential.
- **Small hydropower**: Significant small hydropower potential is present in the Eastern Highlands region and perennial rivers. Around one hundred and fifty Mega Watts (150 MW) of small hydropower potential is estimated in the country.
- **Biomass**: Based on International Renewable Energy Agency (IRENA) reports, Zimbabwe has a total potential of one thousand Mega Watts (1,000 MW) from biomass in the form of bagasse, agricultural and municipal waste, forest residue and other forms. Forest residue from commercial forests has been estimated at seventy thousand tonnes (70,000 tons) which has the potential to generate nearly one hundred and fifty Mega Watts (150 MW) power. Detailed energy resource assessments need

to be done to assess potential of biomass as a RE source.

- **Geothermal**: Zimbabwe also has geothermal energy potential of around fifty Mega Watts (50 MW) that has not been harnessed and presents scope for future exploitation. Detailed energy resource assessments need to be done to assess the potential of geothermal energy.
- **Wind**: Wind speeds of around 10 meters per second at hub heights of over 80m have been recorded in two sites in Zimbabwe and these prove significant for power generation. (Ministry of Energy and Power Development, 2022).

The location of existing (green pins); committed (black pins); and candidate (yellow pins) power plants is presented in the Figure below.

Source: Network Master Plan Final Report, Manitoba Hydro International-ZETDC, May 2023

The notable candidate solar, hydro and thermal power projects are presented in the Tables below

Plant	Total Installed Capacity (MW)	Fuel	Planned entry in operation	Plant Factor
Solar PV Plan Program	770	Sun (PV)	2024-2026	18%
Solar PV – Private Plants	327	Sun (PV)	2023-2024	18%
Solar PV – Middle Sabi Hub	100	Sun (PV)	2025	18%

Plant	Installed Capacity (MW)[6]	Fuel	Available from year
Batoka Gorge	1,200	Hydro	2032
Devil's Gorge	620	Hydro	2035
Cahora Bassa	500	Hydro	2032
Mphanda Nkuwa	1,000[7]	Hydro	2030

Plant	Installed Capacity (MW)	Fuel	Available from year
Xhongxin 2	270	Coal	2025
Generic Coal - Refurbished China Plant 1	600	Coal	2026
Thuli Coal	600	Coal	2027
Harare Replacement	120	Coal	2027
Gokwe North	1,400	Coal	2028

Source: Network Master Plan Final Report, Manitoba Hydro International-ZETDC, May 2023

The energy resource potential is summarized below

Resource	Quantity	Conversion	Energy Potential
Coal	11,900 Mt	25 MJ/kg	$2.975*10^{14}$ MJ or $2.975*10^{12}$ MJ per annum over 100 years
Coal Bed Methane	40 TCF	36 MJ/m^3	$4.0*10^{13}$MJ or $4.0*10^{11}$MJ/Annum over 100 years
Hydro-Zambezi	18,600 GWh	3.6 x 10^6 MJ/GWh	$6.86*10^{10}$ MJ p.a.
Hydro – inland dams	88.4 GWh	3.6 x 10^6 MJ/GWh	
Solar	20 MJ/m^2*day	365 days per year*390000km^2*0.0001	$2.847*10^{11}$ MJ p.a.
Fuel wood (Annual Yield)	4.67 MT/annum	18 MJ/kg	84.06 *10^9 MJ p.a.
Bagasse	1.5 MT/annum	7.5 MJ/kg	1.125 *10^{10} MJ p.a.
B/gas (Animal waste)	13.1 x 10^6 m^3/annum	0.2 kg B/gas per kg dung*16 MJ/kg	2.1 x 10^7 MJ p.a.

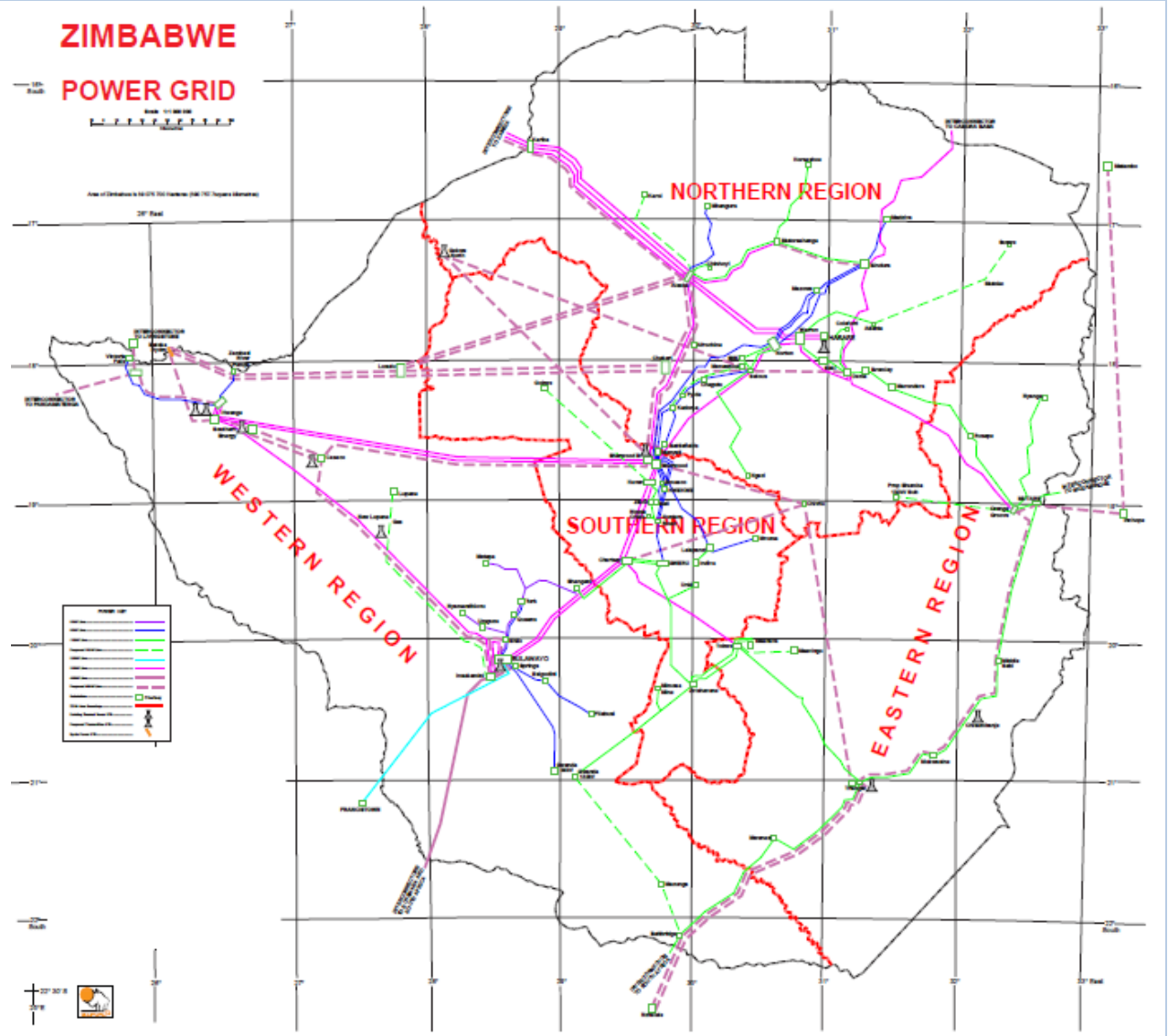
Energy Assessment Report, Zimbabwe, 2018

The renewable energy market potential in Zimbabwe is high considering the increasing number of organizations, institutions and households expressing willingness to go green as a mitigatory

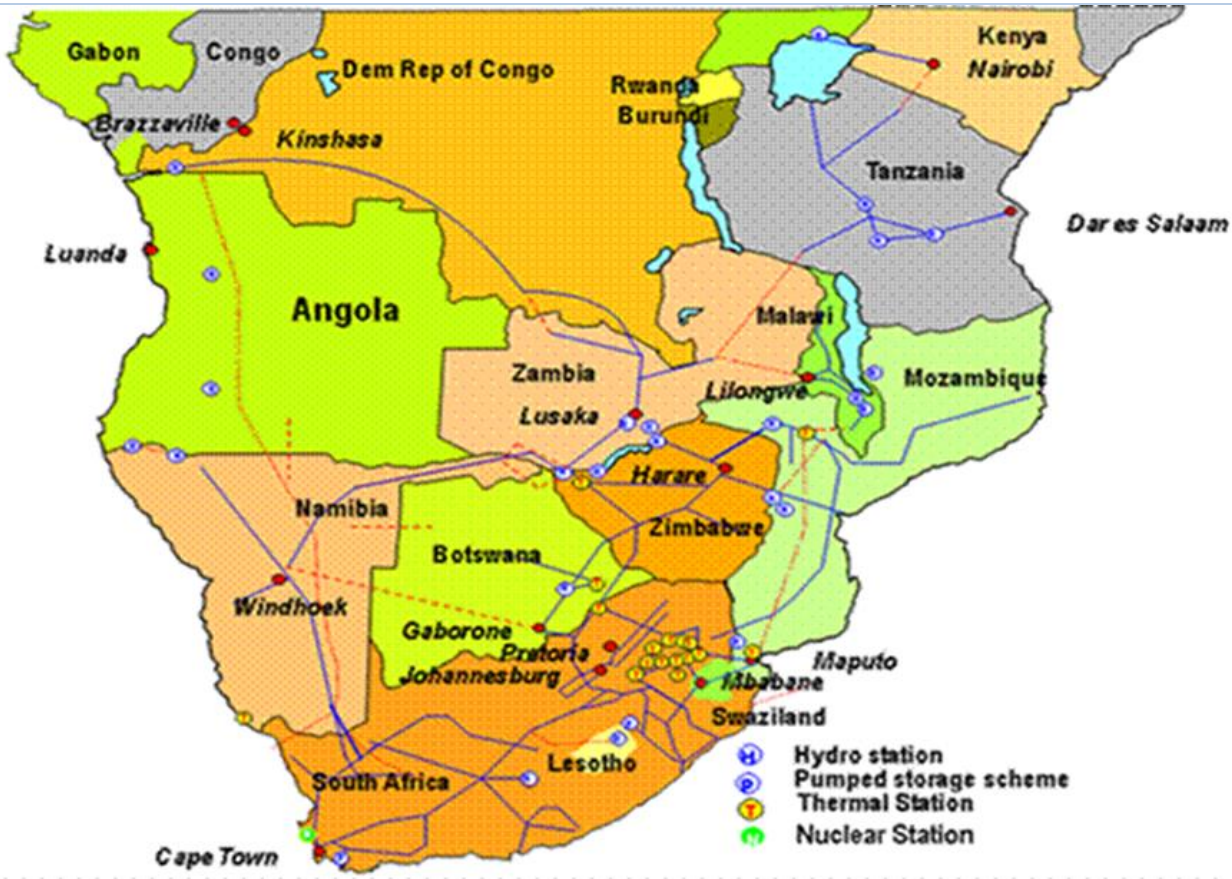
measure to climate change. This fact had a bearing in the setting of renewable energy targets for the country that have been set considering greenhouse gas (GHG) emission targets set in the NDC objectives, demand-supply projections, grid absorption capacity and ability of utilities to pay for such energy. Based on the NDC target of achieving GHG emissions reduction of 40% per capita below the projected "Business as Usual" level, clean energy sources need to generate energy of around two thousand four hundred Giga Watthours (2,400 GWh) by the year 2025 and around four thousand six hundred Giga Watt-hours (4,600 GWh) by the year 2030. These RE target are backed by a strong policy framework, regulations and institutional support to ensure that they are enforced.

Electrical interconnection and import/export:

Zimbabwe imports 50 MW firm power from HCB, Mozambique, and around 300 MW non-firm power from ESKOM, South Africa. Zimbabwe also exports around 80 MW of power to NamPower, Namibia, based on a commercial agreement between ZPC and NamPower. The grid interconnection map is presented below.



Zimbabwe is strategically positioned in the regional power pool (Southern African Power Pool-SAPP) as presented below.



Historical support or development of renewables in the country/region:

Zimbabwe has put in place a lot of incentives to support the development of renewable energy among Independent Power Producers, (IPPs). These include the National Project Status, Prescribed Asset Status and Tax Incentives to Renewable Energy Projects. Awarding National Project Status to the RE projects enables projects to be exempted from the customs and general excise regulations. This will allow the developers to import certain RE systems used in the generation plants at competitive rates. The incentives under national project status are guided by following legislation:

- ✓ Finance Act
- ✓ Income Tax Act
- ✓ Value Added Tax Act and Value Added Tax Regulations
- ✓ Customs and Excise Duty Act and Customs and Excise General Regulations.

Tax Holidays as stipulated in the amended Finance Act of 2018 as well as duty free status for solar projects as stipulated in SI 147 of 2010 and SI 6 of 2016 (with subsequent amendments) shall apply for renewable energy projects. In addition, accelerated and full tax-deductible depreciation allowance will be given for all solar equipment installed in a consuming or producing entity.

To sell power to third parties in Zimbabwe incentives listed below apply as a way of promoting third party grid access for sale of electricity from RE generators:

- ✓ Indiscriminative open access shall be granted to RE producers or beneficiaries.
- ✓ Priority dispatch shall be granted to RE producers.
- ✓ Energy banking facility shall be extended by the utility for solar and wind generators.
- ✓ Utility and the developers shall enter into a wheeling agreement. Utility to submit and get the model wheeling agreement approved by the Regulator within four months from the date of notification of the policy. The approved model wheeling agreement shall be used for execution.
- ✓ Net metering facility shall be extended to beneficiaries, namely the consumers availing net metering facility.

Reduced Licensing Fees and Requirements for Developers of RE Projects-Being a clean source of energy, RE projects shall be provided concessions in licensing fee and enjoy relaxations in other licensing requirements. Based on the values of the capacity factor and the ratio between the capacity factors of RE technologies to that of conventional power plant, the licensing fees shall be reduced for developing RE projects.

Electricity market structure:

The Ministry of Energy and Power Development is responsible for ensuring the provision of adequate and sustainable energy through formulating and implementing effective Policies and Regulatory Frameworks. The Zimbabwe Power Company (ZPC) a wholly owned subsidiary of the Zimbabwe Electricity Supply Authority (ZESA) is authorized to construct, own, operate and maintain power generation stations for the supply of electricity in Zimbabwe. ZPC currently operates four coal fired power stations (in Hwange, Bulawayo, Munyati and Harare) and one hydro power station (the Kariba South Power Station). The Zimbabwe Energy Regulatory Authority (ZERA) is a body corporate established in terms of the Energy Regulatory Authority Act [Chapter 13:23] of 2011 mandated to regulate the entire energy sector in Zimbabwe in a fair, transparent, efficient and cost-effective manner for the benefit of the consumers and energy suppliers. ZERA derives its mandate from the Energy Regulatory Authority Act [Chapter 13:23] of 2011 read together with the Electricity Act no 4 of 2002 [Chapter 13:19], the Petroleum Act [Chapter 13:22] of 2006 and subsequent amendments. Independent Power

Producers (IPPs) are also a significant group in the renewable energy space. These are licensed to generate electricity and the majority operate in the renewable energy space, issued with generations entitling them to generate electricity for their own use or for sale to ZETDC or other third parties.

Description of renewables support mechanism:

Utility scale projects are generally accorded National Project Status, which will enable them to import much of the equipment duty free. Due to high duties, an exemption from the payment of duties can make a huge difference to the profitability of a project. Power generation projects are also exempt from income tax for the first five years of commencing their operations. The income tax would be taxable at a lower rate of 15% for the next five years thereafter compared to the general tax of other companies at 25%.

Responsible government department: (include key contacts)

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Existing/Planned energy legislation: (is there a CPO)

The Government through the Ministry of energy and Power Development formulated the National Renewable Energy Policy (NREP) in 2019. This policy considered policy measures and commitments of the government to the international community on the need to reduce greenhouse gases. The NREP was based on the Nationally Determined Contributions (NDCs) intervention that the government committed itself to and submitted to the United Nations Framework Convention on Climate Change (UNFCCC). The NREP set the target of achieving

an installed renewable capacity of 1,100MW or 16.5% of the overall electricity supply in Zimbabwe by 2030. The NREP also aims to have 250 000 solar geysers by the year 2030 in new and old buildings, to increase the use of institutional and domestic biogas digesters, to deploy the use of solar mini grids, off grids. The Zimbabwe Energy Regulatory Authority (ZERA) is also developing a renewable energy feed in tariffs, which is designed to encourage and support greater private sector participation in power generation from renewable energy technologies, through the establishment of an appropriate regulatory framework.

Environmental legislation for Renewable Energy:

Zimbabwe's energy sector is currently governed by the following five Acts and five policies: Below is the list of the Acts.

(1) Electricity Act [Chapter 13:19] (2002)

Functions under this Act are performed by Zimbabwe Energy Regulatory Authority Board. The Functions detail the licensing and regulation for the generation, transmission, distribution and supply of electricity by the utility and IPPs. The Board shall perform all functions which, in terms of this Act, were performed by the Electricity Regulatory Commission established by section 3 of this Act before its substitution by the Energy Regulatory Authority Act [Chapter 13:23] (Act No. 3 of 2011), and references in this Act to the "Commission", a "Commissioner" or an inspector or employee of the Commission shall be construed as references to the "Board", a "member of the Board" and an inspector or employee of the Authority respectively**.**

(2) Rural Electrification Fund Act [Chapter 13:20] (2002)

The Rural Electrification Fund (REF) is a statutory body governed by the Rural Electrification Fund Act (Chapter 13:20). Its background is that Post-independence Zimbabwean Government gave high priority to rural infrastructure development programmes, which included the rural electrification programme.

(3) Environmental Management Act [Chapter 20:27] (2002)

The Act provide for the sustainable management natural resources and protection of the environment; the prevention of pollution and environmental degradation; the preparation of a National Environmental Plan and other plans for the management and protection of the environment.

(4) Petroleum Act [Chapter 13:22] (2006)

The Act focus is to provide for the establishment of the Petroleum Regulatory Authority and its functions and management; to provide for the licensing and regulation of the petroleum industry; and to provide for matters incidental to or connected with the foregoing.

(5) Energy Regulatory Authority Act [Chapter 13:23] (2011)

This Act establishes the Zimbabwe Energy Regulatory Authority (ZERA). The ZERA regulates the procurement, production, transport, transmission, distribution, importation and exportation of energy derived from any energy source. ZERA is responsible for promotion of renewable energy.

On the policy side, below are the policies governing the energy sector.

(1) National Energy Policy (2012)

Seeks to promote the optimal supply and utilization of energy, for socio-economic development in a safe, sustainable and environmentally friendly manner. It brings out the Government's objective to ensure that the energy sector's potential to drive economic growth and reduce poverty is fully harnessed.

(2) Zimbabwe's Intended Nationally Determined Contribution (2015)

To contribute to the global climate target and ensure that food production is not threatened by climate changes to enable economic development in a sustainable manner.

(3) National Renewable Energy Policy (2019)

This seeks to increase the share of renewable energy in the overall energy mix while addressing climate change issues.

(4) Zimbabwe's National Climate Change Response Strategy

Seeks to establish specific provisions for dealing with climate change issues, understanding the extent of the threat and putting in place specific actions to manage potential impacts.

(5) The Biofuels Policy of Zimbabwe

This guides long term sustainable development of the bio-fuel sector in Zimbabwe through provision of an enabling environment.

Existing/Planned energy certificate systems:

Zimbabwe currently has no REC or equivalent energy certification scheme.

Extent of engagement with government:

Since the inception of the idea to register Zimbabwe as an I-REC issuing country, there has been engagement on regular basis with the Government of Zimbabwe specifically the Ministry of Energy and Power Development. Issues discussed in the engagements pertains to the attribute tracking system and how the I-REC contributes for Zimbabwe to achieve its targets for NetZero.

Response from Government in relation to attribute tracking systems:

Government Ministries contacted includes, the Ministry of Environment, Tourism & Hospitality Management, Ministry of Energy and Power Development, and the Environment Management Agency of Zimbabwe. Officials from the said Ministries were aware of the REC schemes and the advantages it offers in meeting the environment objectives of the country. They welcome the idea of establishing the I-REC with the REC standard foundation in Zimbabwe.

Demand-side market potential or strategic nature of market development:

The current energy mix in the grid is not only enough, but to a certain extent is not dependable due to the frequency of load shedding. If IRECs would be available in Zimbabwe, there would be an extremely high demand with gradual increase as organisations and households are increasing becoming aware on the importance of the schemes in the context of climate change and the need to use clean energy. The Renewable Energy Targets for 2030 according to the National Renewable Energy Policy are as follows;

Technology	Target (MW)
Small Hydro	150
Grid Solar	1,575
Wind	100
Bagasse and other RE	275
Total RE target	**2,100**

Analysis of political disruptions or market risks:

Lack of a carbon trading platform for transactions to be conducted on, uneven accounting structure for carbon markets coupled with the challenges of doing business in Zimbabwe affects the country's standing in international carbon markets.

Analysis of regulatory risks including linkages with carbon markets and support systems:

Non coherence of some regulations and laws- with others having supremacy thus conflicting with strides that promote carbon trade projects.

Current environmental reporting in energy:

Environment reporting in Zimbabwe meets the framework of Global Reporting Initiatives, (GRI). The framework is standardised and designed to be universally applicable all organisations and sectors.

Mechanisms in place to support the reliable verification and issuance of I-RECs:

Most productive devices are connected to the grid, but public data from the grid operator to verify amount generated is not yet available. This is an issue which the grid operator is working on to make this data available to the public and the idea to have the country participating in I-REC schemes has become a catalyse to the grid operator to provide such data. The country has no national certificate scheme for renewable energy certificates, hence is a guarantee that there will be no double assurance.

Local organizations of importance and their opinion on local I-REC market development:

The following is a list of local organisations who are importance to I- REC market development in the country:

- Zimbabwe Electricity Supply Authority (ZESA)
- Zimbabwe Energy Regulation Authority (ZERA)
- Environment Management Agency (EMA) of Zimbabwe
- Ministry of Industry and Commerce
- Southern African Power Pool

The above listed organisations have been contacted and embraced the ideas for local I-REC development in the country as it presents a window of opportunity for the country to reach its goals and targets for Green House Gases emission and to reach net zero by 2050.

Any other relevant information:

Zimbabwe is a country making effort to achieve the climate goal of Net Zero by 2050. The existence of I-REC scheme in the country will be a significant catalyst towards this milestone.

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