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NATIONAL ENERGY COMPACT FOR BOTSWANA

Preamble

The Government of Botswana (GoB) is committed to ensuring that all citizens have access to reliable, affordable, and sustainable energy. This National Energy Compact (hereafter referred to as 'Compact') serves as a strategic framework to accelerate progress towards achieving universal energy access by 2030, aligning with Botswana's economic diversification agenda and climate commitment.

As of 2024/2025, Botswana has increased overall electricity access to 76.6 percent. However, significant challenges remain in achieving universal access, including for the remaining 24 percent of unelectrified population, of which 7 percent located in remote rural areas. 33.9 percent of households remain dependent on traditional biomass for cooking. The GoB is determined to reach universal access to electricity and 90 percent access rate of clean cooking by 2030. This Compact outlines actionable commitments to address these challenges and achieve transformative energy outcomes.

Botswana has had a functional vertically integrated energy sector for a long time, aligned with the times of the country's rapid economic development in the past decades. However, challenges in recent years have exposed structural vulnerabilities that threaten Botswana's development aspirations and energy security. Three interlinked challenges have converged to putting pressure on the energy system and reflected through interruptions of supply.

First, electricity access has stalled at 75 percent. The grid-based electrification remains an important element of Botswana's strategy in peri-urban and accessible rural areas. However, the majority of the remote unelectrified villages require a different electrification approach, likely through off-grid DRE solutions tailored to sparsely populated rural areas, while still ensuring affordable and sustainable supply.

Second, Botswana's power supply is becoming increasingly unreliable. About 97 percent of the country's electricity is generated from coal, and the main 600 MW coal-fired power plant continues to underperform. This heavy dependence on a single fossil fuel makes the energy system fragile and vulnerable. As a result, Botswana is forced to rely more on costly electricity imports, which are further constrained by limited regional supply and weak transmission interconnections..

Third, these sectoral weaknesses are compounded by external and macroeconomic stress, reducing the government's capacity to subsidize power supply costs or maintain existing grid assets and finance new grid infrastructure. This consequently exacerbates the weak financial situation of BPC and threatens the financial sustainability of the sector.

At the same time, the rapidly evolving regional landscape presents opportunities. Being endowed with exceptional renewable energy potential, particularly in solar and wind resources, Botswana could become a clean energy exporter if it strengthens its planning, regulatory, and operational fundamentals. The country is committed to diversifying its energy mix by increasing the share of renewable energy from the current 7 percent to 50 percent by 2030 to meet the growing domestic demand. Furthermore, the Government is proactively pursuing export opportunities that, if successful, may facilitate further expansion of its generation capacity achieving even greater share of renewables in the energy mix. The pace and approach of reaching the targets will need to be supported by a suite of key actions and reforms identified under this Compact to address the binding constraints across the energy value chain.

Botswana continues to make strides in closing its gender gaps. The 2024 Global Gender Gap Index shows the country is among countries that have closed at least 73 percent of its gender gaps. However, gender gaps in the energy sector continue to persist as the sector is male dominated. As such the government of Botswana has included in its energy policy statements (Policy statement #16) the promotion of gender mainstreaming in the energy sector and ensure alignment of gender concerns with appropriate health, safety and environmental standards[1]. Through the compact, the proposed sector reforms with respect to gender mainstreaming will include review of policy to include women in the energy sector through employment and entrepreneurship especially in the distributed renewable energy sector. These interventions will ensure inclusive environment for women in the energy sector both on the demand and supply side of the energy sector.

This Compact was developed through extensive engagements and consultations with various stakeholders, including development partners, private sector, and civil society, to foster partnerships crucial for achieving the Compact's ambitious goals. Recognizing that success requires capacity building and considerable collective efforts, the GoB calls upon development

[1] https://www.bera.co.bw/downloads/National%20Energy%20Policy%20Final%20April%202021.pdf

partners, philanthropies, the private sector, and civil society to join this transformative journey. Together, the Botswanan government aims to accelerate the pace of energy access and renewable energy development. Meeting the targets of this Compact is estimated to cost between US$2.06 and 2.98 billion, with US$646 to 1,570 million expected from the private sector.

Contents

1

Declaration of Commitment

The Government of Botswana (GoB) is committed to ensuring reliable, affordable, sustainable, inclusive, and clean energy for all citizens. To this end, the GoB intends to undertake the following:

- Accelerating the pace towards universal access to electricity: Targeting universal access to electricity from 76.6 percent to 100 percent by 2030, with a focus on peri-urban and accessible rural areas through grid electrification and remote rural through off-grid solutions, expanding electricity access to an additional 220,000 households.
- Advancing access to clean cooking solutions: Enhancing clean cooking access from the current 66.6 percent to 90 percent by 2030, significantly improving the quality of life for women and marginalized communities by promoting alternative fuels and clean cooking technologies, benefiting additional households. This would require providing clean cooking technologies to 260,000 new households by 2030.
- Enhancing energy security by scaling up renewable energy: Expanding the share of renewable energy in the domestic energy mix from the current 8 percent to 50 percent by 2030, through investments in solar and wind, while strengthening and modernizing the transmission and distribution infrastructure. Botswana will also focus on regional integration by building interconnectors with neighbouring grids, contributing to the regional energy transition.
- Facilitating private sector participation: Creating an enabling environment for private sector participation in the energy sector with the goal of mobilizing a total of US$650 million to US$1.5 billion in private investments to support Botswana's energy transition and development goals by 2030.

To achieve the targets outlined in the Compact, the GoB commits to addressing critical bottlenecks across the energy value chain as outlined in the Compact's Action Plan. In particular, the GoB commits to:

PILLAR I
LAST MILE ACCESS

- **Accelerate electrification to reach universal access through coordinated grid and off-grid expansion:** The GoB will pursue an accelerated electrification drive to achieve 220,000 new household connections by 2030, including 159,000 through the grid and the remaining 61,000 via off-grid solutions, representing a twofold increase in the current annual connection rate.
- **Develop, approve and implement a comprehensive national Action Plan**, which sets out clear electrification targets, prioritizes regions and technologies based on the geospatial analysis, outlines delivery mechanisms, investment needs and defines institutional roles and timelines, by 2026.
- **Operationalize the Off-Grid Solar Fund:** Implement the Off-Grid Solar Fund (OGSF) to optimize and diversify funding sources and establish a financing mechanism to support access initiatives under the OGSF by 2026. This includes mobilizing the necessary budget and grants to ensure affordability, sustainability and access targets by 2030.
- **Establish a dedicated unit for energy access programs**: Create a unit to manage the energy access program, inclusive of clean cooking initiatives, to streamline efforts and enhance program effectiveness.
- **Implement national technical standards, policies and framework**: Develop and adopt enforceable minimal technical standards for mini-grids and SHSs, ensuring safety, quality, and long-term reliability across all installations. Introduce mandatory installation standards, technician certification, and O&M protocols to improve consumer protection and service longevity.

PILLAR II
CAPACITY EXPANSION AND COST REDUCTION

- **Integrated planning:** Update, approve and adopt a comprehensive least cost generation and transmission expansion plan by 2026. This will be supported by a collaborative process led by MME with technical inputs from the national utility to be developed. An iter-active update will be required every two to three years.
- **Revise the renewable energy generation program based on the updated least-cost generation expansion plan** so that the new generation capacity is implemented in a robust and phased approach based on the key enablers such as the grid integration needs, transmission infrastructure, progress in securing regional offtakes etc.
- **Strengthened capacity on competitive procurement for private sector investment** Enhance capacity of PEDU team to conduct future procurement of generation capacity through competitive process in adherence to the updated least cost generation expansion plan/IRP.
- **Access to international carbon markets** Develop and implement carbon market framework to access concessional climate/carbon finance for renewable energy deployment.

PILLAR III
REGIONAL INTEGRATION AND POWER TRADE

- **Enhance policy and enabling environment.** Adopt and enforce new SAPP transmission pricing methodology by 2026. Develop grid access and wheeling agreements to allow local IPPs to export power directly to SAPP.
- **Complete Feasibility Study of Botswana – South Africa Interconnector (Isang – Mahikeng (watershed) 400kV line to be updated by 2026.**
- **Botswana – Zimbabwe (Pandamatenga – Victoria Falls 330/400kV line) as 2 of 3 ZiZaBoNa components by 2028. (feasibility study has been completed)**
- **Northwest Transmission Grid Connection Project (NWTGC) phase 2.**
- **Conduct capacity building** in transmission planning (domestic and cross-border) to facilitate power trade as required.

PILLAR IV
PRIVATE SECTOR PARTICIPATION

- **Support innovative consumer financing models,** such as PAYGo, microfinance, and instalment payment plans, to increase affordability and allow low-income households to access solar solutions.
- **Strengthen legal and regulatory frameworks for attracting and supporting investments across the energy sector value chain**, including assessing funding models such as green bonds, partial risk guarantees and blended finance, to improve access to capital for energy projects. Optimize risk-sharing structures between public and private stakeholders and explore credit enhancement tools on Sovereign obligations to attract private investment.
- **Conduct a Market Structure Study** to inform future sector institutional reform by 2026.
- **Strengthen capacity in RE management** - BPC to conduct a skills gap analysis in renewable energy technologies and project management, aligning training programs with industry needs to strengthen local expertise and build long term institutional capacity.
- **Access to international carbon markets** Establish carbon market framework with clear eligibility requirements, transparent processes, and support the enabling environment for unlocking access to carbon finance opportunities, including for the clean cooking sector.

PILLAR V
FINANCIALLY VIABLE AND OPERATIONALLY COMPETENT UTILITIES

- **Establish and implement tariff methodology and a performance-based multi-year tariff regime to ensure** electricity tariffs reflect the identified cost recovery rates with periodic adjustments.
- **Strengthen capacity of sector regulator.** Define and put in place a plan for institutional development and capacity building of BERA.
- **Develop and adopt a smart grid roadmap** with a primary focus on implementation of BPC's Network Infrastructure Maintenance & Upgrade Plan, incorporating digital technologies for protection and control system.
- **Implement digital upgrades of network control and customer services** to enable monitoring of loads and improve operation efficiency, maintenance and planning.
- **Implement Revenue Protection initiatives** to optimize revenue generation and management.
- **Develop and adopt pilot design for AMI and smart mini-grids.**

The GoB understands the need for transparent monitoring of the Compact through a structured monitoring and evaluation (M&E) framework supported by MME and other stakeholders. Data collection and feedback mechanisms will guide policy adjustments and track progress in achieving universal energy access. Monitoring efforts will be integrated into a new and dedicated Project Implementation Unit (PIU) at MME, adequately staffed, with sufficient authority and mandate to liaise among different ministries and agencies towards implementing the compact action plan. The PIU will be chaired by Deputy Permanent Secretary (DPS) Energy, Ministry of Minerals and Energy who has the authority to mobilize support from various parts of the government for implementation of the Compact.

The PIU will oversee the implementation of the Compact and ensure progress towards achieving its targets while tracking the progress of the energy implementation plan of MME between 2025 and 2030. The PIU will proactively facilitate inter-agency coordination and ensure fast response to emerging challenges. This dedicated unit will be supported by the Government's budget as well as by development partners for the implementation of its work plan and monitoring activities. As part of the Compact, GoB aims to reduce gender gaps in the energy sector. Additionally, it seeks to maximize the socio-economic benefits of access to electricity and clean cooking solutions by creating more job opportunities both within and outside of the energy sector, ultimately enhancing the livelihood of Botswanans.

Call for Partnerships

The GoB invites development partners, philanthropies, and private sector stakeholders to support Botswana's journey toward universal access to affordable, reliable, sustainable, inclusive, and clean energy. These efforts will foster economic growth, create income generating opportunities, jobs and contribute to the country's development goals.

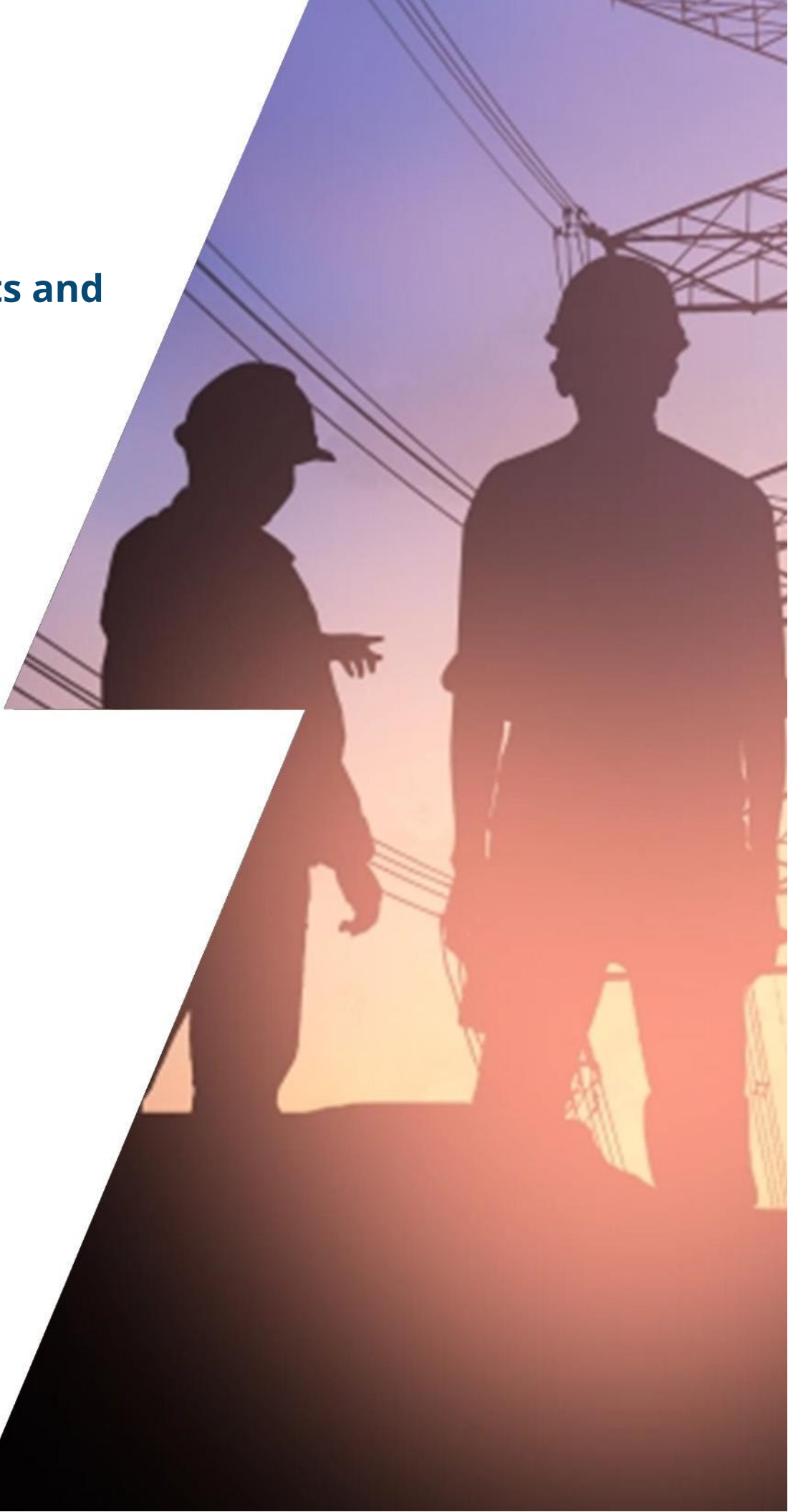
Table 1: Funding needs from the public and private sectors by 2030 [US$ Million]

	Generation	Transmission (66kV and above)	Distribution (33kV and below)	on-grid electrification	Off-grid electrification	Clean cooking	Technical Assistance	Total
Public	10[2]	880	79	260	100	55	30	1,414
Private	386 – 1,310[3]	0	0	0	60	200	0	646 – 1,570
Total	396 -- 1,320	880	79	260	160	255	30	2,060 – 2,984

[2] Investment in decommissioning and repurposing of Morupule A plant.
[3] The range reflects the differentiated RE targets in the estimated realistic scenario and ambitious scenario which will be informed by the updated IRP.

2

Compact Targets and Action Plan



This Energy Compact presents high-level commitment actions, with specific targets and timelines to drive progress towards the achievement of universal access to energy in a reliable, affordable, and sustainable manner.

Indicator	Current Annual Pace Between 2010 and 2024	Targeted pace between 2025 and 2030
Increase Electricity Access Rate	3.1% p.a. (The access rate is 76.6% as of March 2025)	4.8% p.a. (To achieve 100% of access to electricity by 2030)
Increase Access to Clean Cooking	2.4% p.a. (Access to clean cooking was 66.6% in 2022)	5% p.a. (to achieve 90% access by 2030)

Indicator	Current Share Renewable Energy in Generation Mix	Target by 2030
Increase share of Renewable Energy	8.2% (74.6 MW[4] of 913 MW installed capacity in July 2025)	50% (475 MW RE of 950 MW of domestic demand by 2030) 58% (1,850 MW[5] RE of installed capacity by 2030, subject to securing regional offtakes)

	Baseline	Target by 2030
Amount of Private Capital Mobilized	US$ 54.3 Million	US$ 646 – 1,570 Million

[4] 50MW utility-scale PV solar, 4MW small scale PV projects and 18MW roof-top solar.
[5] Wind 100MW; CBM 100MW; Utility-scale Solar PV 1650MW

Action Plan

Achieving the above overarching trajectory targets will require critical reform actions to be taken across the energy sector value chain. The most critical of which are included in the action plan below:

Pillar	Indicator	Baseline Data (2024)	Detailing the action needed to achieve goal	Target Year
I: Last Mile Access	National Electrification Action Plan adopted	No	• Finalize a nationwide geospatial analysis to identify least-cost electrification pathways (on-grid, mini-grid, and off-grid), serving as the technical foundation for rural electrification planning. • Develop and adopt a comprehensive Action Plan, to set clear electrification targets, prioritizes regions and technologies based on the geospatial analysis, outlines delivery mechanisms, investment needs and defines institutional roles and timelines, by 2026	October 2025 December 2025
	Monitoring & evaluation program adopted to track the multi-tier framework for access to electricity and clean cooking	No	• Department of Energy to revise a Unified Monitoring and Evaluation (M&E) Framework to track progress toward its universal access goal by 2025. • Establish annual data collection and review cycles, enabling adaptive program design and timely policy interventions. • Develop digital data platforms to enhance transparent and timely public reporting.	Sept.2025 January 2026 June 2026
	National clean cooking strategy in place	No	Adopt a national clean cooking strategy that will establish targets for clean cooking solutions and identify the business model for rolling out clean cooking solutions by the private sector.	April 2026

	Technical, policy and regulatory framework	No	• Develop and adopt enforceable minimal technical standards for mini-grids and SHSs, ensuring safety, quality, and long-term reliability across all installations, aligned with international best practices (Lighting Global/Vera Sol). • Introduce mandatory installation standards, technician certification, and O&M protocols to improve consumer protection and service longevity. • Implement targeted consumer awareness campaigns to build trust in DRE solutions. • Develop a national gender and energy policy and strategy that addresses women's energy access needs, supports the deployment of productive use technology in phases, and promotes women's employment and entrepreneurship in the sector.	December 2025 September 2026 April 2026 June 2026
	Operationalize Off-Grid Solar Fund	No	• Review the Off-grid Solar Guidelines 2022 to include design and roll out Off-Grid Solar Fund (OGSF) program, leveraging concessional finance, results-based financing (RBF), and private sector investment, and establishing a sustainable and structured fund management mechanism. • Develop a Productive Use Program with financing and business development support for rural entrepreneurs.	December 2025 June 2026
	Enhance investment in electricity and clean cooking	No	• Scale up a pilot energy access project, with focus on on-grid and off-grid electrification to achieve universal access to electricity by 2030 and clean cooking, including Productive Uses of Energy (PUE) linked to on-grid, mini-grids and off-grid systems.	April 2026
	Establish a dedicated project Team (as part of the PIU)	No	• Establish a dedicated project unit by 2025 – Provide overall leadership and define annual electrification targets, including clean cooking. – Develop and implement a comprehensive Monitoring and Evaluation (M&E) framework. – Coordinate grid and off-grid investments. – Lead stakeholder coordination, including utility, MME and off-grid providers. – Use a geospatial platform to manage, visualize, and support communication of annual targets. • Customize M&E to enable public-facing reporting and adaptive planning.	December 2025
II: Capacity Expansion and Cost Reduction	Integrated Least Cost Power System Planning adopted, incorporating regional resources	Yes	Update and approve a least cost generation and transmission expansion plan under leadership of MME, by 2026, taking into account amongst other findings of regional market study and e-mobility study. Revisit the generation expansion targets and procurement plan based on the updated IRP.	June 2026 June 2026 June 2027

			Define and put in place arrangements for systematic update (every 2 years) of the least cost generation and transmission expansion plan, including public consultation by 2027. MME to publish semi-annual/annual report confirming new capacity procurement is in line with the updated IRP. Decommissioning and repurposing of Morupule A coal-fired power plant	June 2026 December 2027
	Competitive procurement policy and framework in place for private sector investment in power projects	Yes	• Conduct future procurement of generation capacity through competitive process in adherence to the updated generation expansion plan/IRP. • Transaction advisory/capacity building of IPP project office under MME, coupled with hands-on support and knowledge transfer from BPC, on legal, technical and financial aspects. • Access to international markets for renewable energy and carbon trade – Establishment of regulatory framework to access international Renewable Energy Certificates. – Development and implementation of Carbon market framework to access concessional climate/carbon finance for renewable energy deployment	January 2027 December 2025 June 2026 June 2026
	Enable private investment in transmission sub-sector	No	• MME to develop and approve a roadmap to bring private investment in transmission, covering transmission and wheeling regulations, transaction support and offtake arrangement. • Develop a pilot IPT project for implementation and a project pipeline for private sector participation.	April 2026 June 2026
III: Regional Integration and Power Trade	Enhance Readiness for Regional Interconnection & Power Trade	No	• Enhance policy and enabling environment – Development of grid access and wheeling agreements to allow local IPPs to export power directly to SAPP. – Adopt and enforce new SAPP transmission pricing methodology by 2026 • Feasibility Study of Botswana – South Africa Interconnector (Isang – Mahikeng (watershed) 400kV line to be updated by 2026 • Botswana – Zambia Interconnector • Botswana – Namibia Interconnector • Botswana – Zimbabwe (Pandamatenga – Victoria Falls 330/400kV line) as 2 of 3 ZiZaBoNa components by 2028. (feasibility study has been completed) • Northwest Transmission Grid Connection Project (NWTGC) phase 2.	June 2026 December 2026 2026 2028 2028 December 2027
IV: Private Sector Participation	Financial support to distributed renewable energy and clean cooking operators	No	• MME to explore the deployment of the Results-Based Financing (RBF) facility under OGSF program. • Support innovative consumer financing models, such as PAYGo and microfinance, to allow low-income households to access solar solutions.	September 2026

	ensures affordability and viability			September 2026
	Strengthen legal and regulatory frameworks for attracting and supporting investments across the energy sector value chain	No	• BERA to specify adjustment approach of the PPA tariff between the bidding date and the date the PPA is signed (or ideally, at financial close) to account for changes in FX and macroeconomic assumptions. • MME to assess funding models, including green bonds, partial risk guarantees and blended finance, to improve access to capital for energy projects. Optimize risk-sharing structures between public and private stakeholders, and explore credit enhancement tools on Sovereign obligations to attract private investment. • MME to conduct a skills gap analysis in renewable energy technologies and project management, aligning training programs with industry needs to strengthen local expertise and build long term institutional capacity • BERA to conduct a Market Structure Study to inform future sector institutional reform by 2026.	June 2026 June 2026 June 2026 December 2026
V: Financially Viable and Operationally Competent Utilities	Audited annual financial statements of utilities published	Yes	• Audited annual financial statement for the Financial Year ending March 2024 to be disclosed. • Audited annual financial statement for the Financial Year ending March 2025 to be disclosed, with timely disclosure of annual financial statements each year thereafter within 9 months of Financial Year end	September 2025 December 2025
	Utilities achieving at least 100 percent operational cost recovery		• Establish and implement tariff methodology and a performance-based multi-year tariff regime – BERA to complete and implement Cost of Service Study to determine cost recovery rate for provision of electricity services – Develop a transition plan to implement a methodology for adjusting electricity tariffs to the identified cost recovery rates with multi-year adjustments, including but not limited to: – Application of cost-reflective rates for charges in all categories of consumers who can pay those rates. – Subsidization of poor and vulnerable consumers through a "social tariff" applied exclusively to them, with rate based on affordability and other features6 to be defined by GoB; and – The GoB approves a trajectory for gradual elimination of subsidies to all consumers able to pay cost-reflective tariff rates (including tariff cross-subsidies among those categories).	December 2026 December 2025 March 2026 March 2026 (end of BPC fiscal year)

[6] beneficiaries, amounts of subsidies, sources of funds, procedures to manage subsidization

		• GoB to cover tariff shortfalls until a cost-reflective tariff is in place. (difference between approved revenue requirements and tariff revenues).	June 2026
		• Capacity building of BERA for systematic performance oversight of BPC.	June 2026
		• Define and put in place a plan for institutional development and capacity building of BERA.	December 2027
		• BPC to implement digital upgrades of network control and customer services to enable monitoring of loads and improve operation efficiency, maintenance and planning, including upgrade of SCADA, mini-distribution control centers (MDCC) and Meter Data Management System (MDMS), by 2027.	December 2026
		BPC to implement Revenue Protection initiatives to optimize revenue generation and management.	
Utility-specific plan to improve service quality approved by regulator	No	• Development and adoption of smart grid roadmap with a primary focus on implementation of BPC's Network Infrastructure Maintenance & Upgrade Plan, incorporating digital technologies for protection and control system.	December 2026
		• Development and adoption of pilot design for AMI and smart mini-grids.	December 2026

3

Country and Sector Overview

Botswana's economy has reached upper middle-income status, owing to well-managed natural resources, strategic investments, and political stability. Botswana is a sparsely populated, land-locked country. Between 1966 and late 1990s, its Gross Domestic Product (GDP) grew by 10% annually and per capita by 7%, respectively. Its significant mineral wealth, prudent macroeconomic policies and strong institutions helped Botswana become an Upper-middle-Income Country (UMIC) in 2004, with aspirations to be a high-income country by 2036.2 Botswana has maintained stability and repeatedly ranked among Africa's best governed countries. The economy has rebounded strongly after the 2020 recession, growing by 11.8 percent in 2021 and 5.5 percent in 2022, driven by favorable global demand for diamonds. Diamond revenues have paid for investment in infrastructure and human capital. Water and electricity access rose from 68% and 10% in the 1980s, to 92% and 72% by 2020.3 Similarly universal primary education was achieved by 1997, ahead of many African countries4, contributing to better life expectancy, lower mortality rates and improved nutrition.

Despite the strong growth record, a diamond market contraction in 2023 and 2024 exposed the structural limitations of Botswana's growth model. Increased competition from artificial diamonds has led to a weaker demand and a sharp increase in inventories of diamonds. The contraction in the diamond sector led GDP growth to fall to -3.0 percent in 2024, from 3.2 percent in 2023 and 5.5 percent in 2022. The public sector is exposed to fluctuations in diamond-related revenues, while its spending is largely rigid. As a result, the sequential shocks of COVID and the ongoing diamond market contraction have led to high public deficits ballooned and depletion of fiscal buffers. While debt levels are still relatively low and below the debt ceiling of 40% of GDP, that limit may soon be breached due to the combination of high public deficits and low economic growth.

Past efforts to diversify the economy have been insufficient and ineffective. Export diversification remains low and the economy continues to be heavily reliant on diamonds. The mining share of GDP shrunk from 53% in 1989 to 13.6% in 2019, yet diamonds still dominate exports. Private sector job creation has been limited, while the large public sector exhibits low productivity and acts as an employer of last resort. The failure to develop competitive non-mining industries has led to low job creation, which particularly affects the youth.

The financial sector remains sound and stable despite the economic slowdown, but credit to the private sector has been anemic. Banks maintain strong profitability with returns on average assets and equity at 3.0% and 30.1% percent, respectively, at the end of December 2024. The banking sector is mainly domestically funded with a stable capital adequacy ratio of 19.7% as of December 2024 and has been relatively stable over the last three years. Banks' statutory liquid assets remain well above the 10% prudential requirement and nonperforming loans remain low, at 3.2 percent of total loans as of December 2024. However, private sector credit has contracted in real terms in a context of crowding-out due to the high public deficits and increased supply of government bonds.

Botswana remains among the top ten most unequal countries in the world. Socio-economic inequalities remain high and structural constraints continue to impede job creation. Progress in reducing inequality has been slow, making Botswana one of the most unequal countries globally. Both unemployment rate (27.6 percent in Q1 2024) and inequality (Gini: 53.3) are among the world's highest. Despite significant declines in poverty under the UMIC poverty line (US$6.85 per person per day) since 2002/03, poverty rebounded from 60.4% to 63.5% between 2009/10 and 2015/16.6 In 2024, poverty is estimated at 13.7 percent under the USD 2.15 per day International Poverty Line (IPL), and 61% under the higher threshold, indicating a marginal reduction from 63.5 percent in 2015/16.

Reducing poverty and inequality requires much higher rates of formal and informal employment. The economy needs to create jobs at least as quickly as the labor force grows, but this remains a challenge. Most employment is in services while employment growth is insufficient to absorb the young and growing labor force. Unemployment, which has long been high, is on an upward trend: the unemployment rate increased from about 17.6 percent in 2015 to 27.6 percent in 2024. Young and educated people were most affected by higher unemployment. Job creation is limited by bottlenecks in the demand for labor, and labor supply constraints result in skills mismatches. A sustained reduction in both poverty and inequality requires economic diversification, a focused intervention on private-sector job creation through support for productive firms and businesses to grow, increase of human capital base by building a labor force with enhanced and market-responsive skills, and better targeted social interventions to the most vulnerable members of society.

Botswana has placed a strong emphasis on socioeconomic aspects through its Citizen Economic Empowerment (CEE) Policy which has strong relevance for the energy sector. The CEE policy approach in Botswana refers to a set of initiatives aimed at enabling Batswana (citizens of Botswana) to actively participate in and benefit from the country's economic growth. This involves strengthening citizens' capacity to own, manage, and control resources, ultimately leading to increased income and wealth generation. Key aspects include poverty alleviation, human capital development, and ensuring equal economic opportunities for all citizens. For example, in the energy sector attention is paid to key metrics around subcontracting (Construction works only) in terms of local firm citizen ownership percentages and contract terms in terms of localization overall. Under employment, energy institutions must track employment of Botswana Citizens and can allocate and request key positions and roles to Botswana Citizens to enhance skills transfer. Focus is placed on local versus expat roles, job type (e.g. Artisan/tradesman, unskilled, plant and equipment operators, administrative and office staff and trainees and juniors) and job type, including value spend on a total and monthly basis on these roles. Other areas include skills development for staff and Botswana Citizens (e.g. with focus on training of personnel, skilled/unskilled workers, laborers and training and development of Engineers Registration level with Engineering Registration Board etc.) with cross-cutting focus on gender, age and disability including value spend on a total and monthly basis on skills development. Another focus and priority is the procurement of goods and services from Botswana (e.g. supply of goods and services, social development in communities, investment in Government socio-economic projects etc.).

Gender equality and women's empowerment in Botswana have improved over the past 20 years but inequality remains a pressing concern. Botswana has made significant legal strides towards equal treatment of women and ranked 64 out of 146 in the 2023 Global Gender Gap Index closing at least 70 percent of its gender gaps7. The 2021 Mastercard Index of Women Entrepreneurs (MIWE) has, for the third consecutive year, ranked Botswana (38.5 percent) as the country with the most women business owners globally.9 However, gender gaps persist, including low levels of women's political representation in the National Assembly (only 11 percent of seats held by women), a labor force participation gap (56.5% women vs 63.3 %men), and high Gender-Based Violence (GBV) rates (37% of women). Girls lag behind boys in Science, Technology, Engineering and Mathematics (STEM) subjects in secondary education and are underrepresented at tertiary level limiting opportunities to enter dynamic sectors like energy.8 The share of young women (15-34) not in education, employment, or training is significantly higher (43 percent) than among young men (36 percent).

While Botswana has low Green House Gas (GHG) emissions, it is highly vulnerable to the impacts of climate change. Its semi-arid climate and erratic rainfall drive cyclic droughts, river and urban floods, water scarcity, and wildfires.10 Botswana ranks among the top three countries in Sub-Saharan Africa expected to see a temperature rise of 2.9 to 3.8 degrees Celsius by 2100, which makes the country highly vulnerable.11 Infrastructure assets, including electricity transmission and distribution networks, can be vulnerable to both chronic and acute climate hazards. Increased temperatures may reduce the cooling capacities of power generating stations with potential to impact generation and transmission. Botswana's per capita emissions are about 2.27 mtCO2e and below the global average of 4.47 tCO2e per person12. The energy sector accounts for 87 percent of total Green House Gas (GHG) emissions (excluding land use, land use change, and forestry).

Domestic power generation is predominantly indigenous coal based but poor operational performance of the coal-based power plants resulted in unreliable supply and increasing reliance on high-cost electricity imports. Currently, 97 percent of Botswana's electricity comes from coal. The country has 892 MW of installed capacity against peak demand of 678 MW (2024), with most generation coming from two coal-fired stations: the 132 MW Morupule A and the 600 MW Morupule B. Additional capacity comes from diesel plants (90 MW Orapa and 70 MW Matshelagabedi) for peak demand support. While installed capacity is adequate to cover peak demand, available capacity is inadequate to meet demand given continued operational challenges at Morupule B since its commissioning in 2012. The rolling 5-year average (2018-2022) of domestic generation only accounted for about 62 percent of total power supply.18 Since 2025, the 600MW Morupule B plant is facing frequent breakdowns and is currently under maintenance, leading Botswana to rely on costly imports amid tightening fiscal constraints and a regional power generation deficit.19 In March 2025, an external supplier limited electricity supply due to arrears by BPC, leading to load-shedding in peak hours of morning and evening in major economic centers of the country.

To address the generation challenge, the GoB envisions an energy mix of coal meeting base load demand, while renewables scaling up to 50 percent by 2030 to enhance supply security. In this context, one new coal-fired power plant (600MW in two phases) has

been procured with a selected Independent Power Producer (IPP) and the first 300MW phase is currently under construction. This comes as Morupule A (132MW) is set for decommissioning in 2027 and Morupule B (600MW) continues to face operational challenges despite various remediation measures. Once the ongoing generation projects are completed, electricity production from the new plants will assist the country to meet domestic demand while surplus is expected to be exported to the region. With limited domestic demand and uncertain coal-export prospects, the new coal capacity poses operational risks of excess power, as well as financial risks partly depending on the contractual terms. If the export arrangements do not materialize, it could also restrict further RE expansion, limiting opportunities for energy diversification and economic growth. As domestic and regional mining industry and manufacturing are increasingly seeking green electricity supply to protect their export revenues from increasing carbon taxation, it could diminish Botswana's competitiveness. The regional market study currently under development will shed light on more accurate export potential, which will be fed into the integrated resource plan to inform the future capacity expansion plan for the country.

Botswana is in the early stage of integrating its vast untapped Renewable Energy (RE) resources into the energy mix. With excellent solar and wind resources as a promising source of clean and affordable electricity, the country aims to diversify its domestic electricity production as outlined in Botswana's Vision 2036 and the National Energy Policy13 (2021). More recently, the GoB announced the goal to expedite the pace of increasing the RE share in its generation mix to 50 percent by 2030, from the current base of approximately 2 percent, alongside becoming a net exporter by 2027. The GoB plans to install 1.5 GW of solar capacity by 2030, supported by Battery Energy Storage Systems (BESS) to facilitate the integration of variable renewable energy (VRE) for domestic needs and export. The first pipeline of 335 MW solar IPPs is well advanced with projects at different stage of implementation with commercial operation expected between 2025 and 202614. Grid integration efforts are also underway to support this expansion. Based on the outcome of the recently launched 1.5GW solar tender, and informed by the updated IRP (expected by June 2026), GoB plans to launch future tenders with transaction advisory support with appropriate risk mitigation instruments to ensure successful outcome of the tender process securing competitive prices.

The GoB has adopted a regulatory framework to support private sector RE generation. Private generation is procured through IPP projects by the utility and the Projects Energy Development Unit (PEDU) within the Ministry of Minerals and Energy (MME) which acts as the 'IPP Office' for energy projects. Small scale private generation is also allowed under the rooftop solar program and the self-generation scheme. The GoB is considering authorizing the mining companies to procure power directly through IPPs directly (within a set cap) under a new market structure, reducing reliance on a single buyer model. This move helps in transitioning to green energy adoption and protect their export revenues as high carbon product risks facing increasing carbon taxation. The unbundling of the utility Botswana Power Corporation (BPC) is also being considered to facilitate the private generation and strengthening transmission services. A Market Structure Study is planned to inform the sector structure and future role of BPC.

The dispersion of population settlements and poor economic conditions of the population without access to electricity calls for off-grid solutions to reach universal coverage. At about 75 percent, Botswana's national electrification is low by global standards and relative to its per capita income status. Electricity access has increased on average by 3 percent in the past 5 years of 2020 -2024 and the GoB has intensified efforts towards universal electrification by 2030. To improve access, in 2010, the National Electricity Standard Connection Cost (NESC) was introduced to subsidize grid connections and address affordability issues.23 Despite the initiative, affordability remains a challenge. Many low-income households struggle not only with the connection but also can't afford wiring and electric devices. In response, the government announced a zero-cost connection policy in April 2024.

A coherent and effective policy framework and supporting mechanism backed by high quality data is essential for achieving universal electricity access at the lowest cost. A major challenge the country faces in electricity access is the lack of a coherent and comprehensive electricity access plan with clear government targets. The World Bank is in dialogue with the government to develop a geospatial least-cost electrification assessment to optimize expansion through 2030. This initiative will integrate technical, financing, and implementation planning paving the way to design and implementation of effective access programs and to raise decision makers' awareness on digital transformation and its role in expanding access.

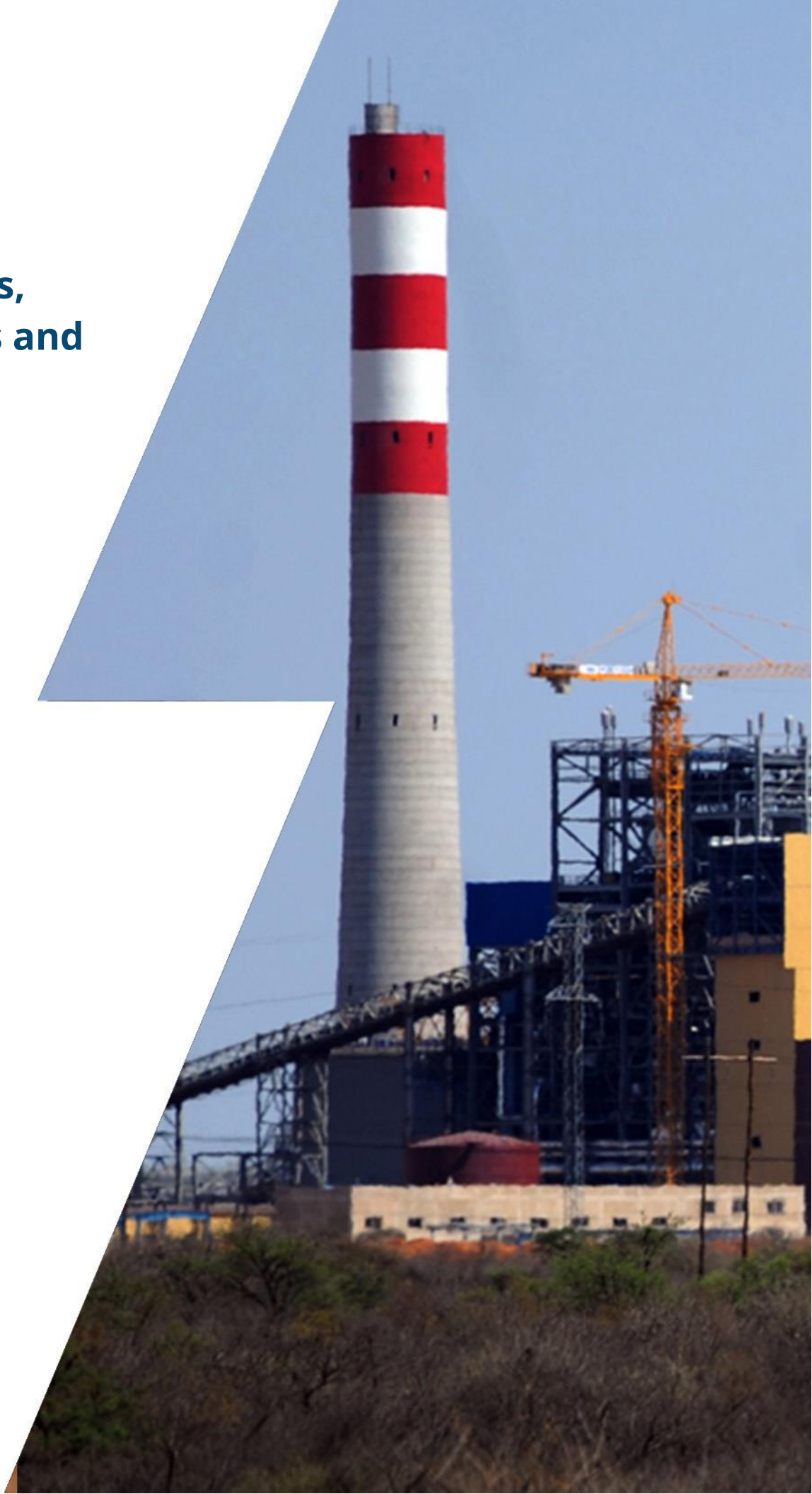
Botswana has made significant progress toward expanding access to clean cooking solutions, a critical component for achieving Sustainable Development Goal (SDG). As of 2022, 66% of the population had access to clean cooking fuels and technologies, up from 44% in 2000. This makes Botswana one of the few African nations to surpass the 50% threshold for clean cooking access. According to the 2022/23 National Energy Use Survey, Botswana's main cooking fuels are LPG, firewood, and electricity. LPG and electricity are more common in cities and towns, while firewood dominates in rural villages. A national clean cooking strategy is planned to establish the timeline and modality for reaching the remaining population with clean cooking solutions (who are predominantly in remote rural areas with poor socio-economic conditions).

The GoB is accelerating efforts in transmission and distribution (T&D) infrastructure rehabilitation, including villages along the South African borders previously supplied by Eskom. The BPC's long-distance network results in T&D losses averaging 14.51 percent as of 2023.20 Scheduled load shedding in South Africa has caused service disruption affecting border villages which have traditionally relied on cross-border supply. The rural Borolong villages have been particularly affected, with BPC estimating daily outages of about two hours, mainly during peak evening hours. Since 2019, BPC has initiated programs to improve T&D reliability, network security, quality of supply and capacity to cope with the growing demand. However, power delivery challenges remain with several load shedding incidents in 2024 linked to the supply shortages in the South African grid.

Transforming Botswana's power system and improving BPC's operational efficiency are critical to address challenges in electricity access and decarbonization and strengthening grid resilience. The GoB prioritizing investments in smarter and more resilient grids, while BPC has started to plan its digital transformation strategy to enhance efficiency across all grid domains, from generation to transmission and distribution to end-use. Digital technologies designed for BPC system will be instrumental to integrate high shares of VRE and in optimizing system-wide connectivity and data management. However, unlocking these digital opportunities requires adequate planning, strategic investment, and policy action.

4

Current Status, Opportunities and Challenges



PILLAR VI

CLEAN AND AFFORDABLE LAST MILE ACCESS

Achieving universal access to electricity by 2030 remains a central commitment of the GoB, aligned with Botswana's Sustainable Development Goal (SDG) 7 and the National Energy Policy. As of 2024/2025, national electricity access in Botswana stood at 76.6%, with significant disparities between urban and rural areas. Urban areas, including Gaborone and Jwaneng, report coverage rates exceeding 90%, while rural communities remain relatively unchanged over the past decade, with many rural households—particularly those in lower income segments—remaining unconnected. Grid-based electrification remains the cornerstone of Botswana's strategy to achieve universal access, especially in peri-urban and accessible rural areas. Over the past decade, the rural electrification program (REP) under Botswana Power Corporation (BPC), under the direction of the Ministry of Minerals and Energy (MME), has led a major grid expansion and densification effort. The REP achieved electrification in approximately 484 out of 565 gazetted villages, representing 86% coverage. The remaining 81 villages are targeted for electrification through DRE solutions by 2030, given their remote distances from the existing grid infrastructure.

Population dynamics plays a critical role in shaping electrification strategies. According to the 2011 Population and Housing Census, Botswana's population stood at approximately 2.02 million7. By 2022, this had grown to 2.36 million8, reflecting an annual growth rate of about 1.4%9. Urbanization has increased markedly: the urban share rose from 57% in 2011 to 64% in 2022, while the rural share declined from 43% to 35.9%10. Based on current trends, the population is projected to reach approximately 2.72 million by 2030. These shifts underscore the need for differentiated electrification approaches tailored to both high-density urban growth and sparsely populated rural areas.

The National Energy Use Survey (2023) and the 2022 Census confirm that affordability is a key determinant of access. Households earning between BWP 1,001 and BWP 3,000 show the highest grid connection rates (26.9%), while those in the lowest income bracket remain largely unconnected. In response, the Government introduced a zero-cost connection policy in April 2024, in addition to the ongoing National Electricity Standard Connection Cost (NESC) program, to alleviate affordability constraints through providing free last-mile on-grid connections and internal wiring to the low-income households within the proximity of the existing grid.

Off-grid technologies, including solar lanterns and small solar home systems, have partially filled the gap, especially in remote communities. Usage remains limited to basic lighting and charging functions due to system capacity and affordability constraints. Electrification of public institutions is progressing, with a particular focus on health facilities and schools. However, additional investments and targeted programs are needed to ensure full coverage, especially in remote areas where grid expansion is not viable.

Solar Home Systems (SHS) have emerged as a viable option for remote and low-income households. However, the market is still at an early stage, with limited uptake through an informal market. Botswana's off-grid electrification efforts are gaining momentum, particularly in remote regions where grid extension is not cost-effective. The Government has launched the off-grid solar fund program (OGSF) to address the affordability issue of low-income rural households. The deployment model of OGSF will be designed according to the best international practice to ensure affordability and sustainability.

Mini-grids are best suited for clustered, off-grid communities where electricity demand is beyond the capability of SHS but below grid extension thresholds. The Government has identified six villages through 4 mini-grid pilot projects, currently under procurement, to test deployment models and derive lessons. Challenges include the absence of a clear regulatory framework for mini-grids, lack of clarity on licensing and tariff setting, and no defined grid arrival policy. Additionally, there is limited clarity on the entity responsible for long-term oversight of mini-grid development. The mini-grid roll-out plan and portfolio planning will be informed by the recommendations of ongoing geospatial least cost electrification planning, which is expected to complete by 2025.

Botswana has made notable progress in expanding access to clean cooking fuels and technologies, positioning itself among the few African nations with over 50% penetration. However, disparities persist between urban and rural areas, and progress remains uneven. As of 2021, 66.6% of Botswana's population had access to clean cooking fuels and technologies, up from 44% in 2000. Urban areas have significantly higher access (86.9%) compared to rural areas (25.3%). According to the 2022/23 National Energy Use Survey, Botswana's main cooking fuels are LPG (42.7%), firewood (32.8%), and electricity (24.4%). LPG and

[7] Botswana Population and Housing Census 2022, Statistics Botswana.
[8] Botswana Population and Housing Census 2022, Statistics Botswana.
[9] Botswana Population and Housing Census 2022, Statistics Botswana.
[10] *Botswana Population and Housing Census 2022*, Statistics Botswana.

electricity are more common in cities and towns, while firewood dominates in rural villages—used by 69% (140,460) of rural households. Nationally, out of 630,718 households, 269,234 use LPG, 206,795 use firewood, and 153,667 use electricity. In mining towns like Orapa and Jwaneng, LPG use exceeds 70% due to it being provided as an employee benefit, whereas in regions like Ngamiland West, LPG use is just 5.7%.

A number of challenges are identified in accelerating the pace of access to clean cooking in Botswana.

- **Limited Policy and Institutional Support:** Botswana lacks a dedicated clean cooking policy with measurable targets, financing incentives, and an actionable roadmap. Historically, energy policies have prioritized rural electrification, with clean cooking remaining a secondary goal. The 2021 National Energy Policy (NEP) promotes efficient wood fuel use but does not outline a comprehensive strategy for transitioning to modern cooking solutions. Furthermore, institutional capacity to coordinate and drive clean cooking initiatives remains weak.

- **Financial Barriers:** High costs of clean cooking technologies (e.g., LPG cylinders, stoves) make adoption difficult for low-income households. Price fluctuations in modern fuels, particularly LPG, limit consistent access. Affordability challenges are compounded by a lack of fiscal incentives for suppliers, which discourages investment in clean cooking appliances, fuel distribution, and related infrastructure.

- **Rural-Urban Disparities:** Rural areas remain heavily reliant on traditional biomass, with 72.9% of households relying on firewood due to affordability and limited access to modern alternatives. The penetration of LPG, while dominant nationally, is significantly lower in rural areas because of affordability constraints and inadequate supplier incentives. Infrastructural limitations, such as insufficient LPG and electricity infrastructure in rural areas, restrict access to cleaner fuels. These disparities exacerbate negative health outcomes, particularly for women and children exposed to indoor air pollution.

- **Limited Private Sector Engagement:** There is a notable lack of local cookstove manufacturing capacity and a limited supply chain to support widespread adoption of clean cooking technologies. Few manufacturers and suppliers exist for improved cookstoves, and distribution networks remain underdeveloped. In addition, there is minimal investment in awareness campaigns and limited research on efficient cooking appliances suited to local preferences. These structural challenges constrain private sector engagement and slow the growth of a robust clean cooking market.

- **Weak Consumer Awareness and Cultural Barriers:** Many households continue to use traditional fuels like firewood alongside modern options due to deeply rooted cultural cooking preferences. Limited awareness of the health and environmental benefits of clean cooking, along with distrust in the quality and durability of improved cookstoves, further hinders widespread adoption.

PILLAR VII
GENERATION EXPANSION AND INVESTMENT IN INFRASTRUCTURE AT COMPETITIVE COSTS

State of generation capacity

As of March 2025, 97 percent of Botswana's electricity is generated from coal. The total installed capacity in the country is 892 MW against peak demand of 678MW in 2024. The majority of the power generation is concentrated in two coal-fired stations: the 132 MW Morupule A and the 600 MW Morupule B. Botswana also has diesel plants – 90 MW Orapa and 70 MW Matshelagabedi to support peaking power. In addition, a number of solar PV plants including 3MW Bobonong, 1MW Shakawe, 15 MW rooftop solar and 50MW Mmadinare have been commissioned. Continued operational challenges at Morupule B since its commissioning in 2012 have led to the plant operating below its capacity. The rolling 5-year average (2019-2023) of domestic generation only accounted for about 62 percent of total power supply. The performance of Morupule B power station is critical to the profitability of the utility BPC as it reduces power import expenditure. Operational performance of Morupule B power station was improved during 2023 with energy availability factor increasing from 36 percent in 2022 to 63 percent in 2023. However, the improvement was not sustained in year 2024 and the plant experienced significant decrease in production from 3,328 GWh in 2022/2023 to 2,674 GWh in 2024/2025. Because of the concentrated and unreliable power supply at Morupule B, Botswana has been importing electricity from the other utilities in the region at a premium price on account of the regional power generation deficit, which has led to a recent load shedding in the country.

In line with the original IRP target of 30 percent renewable energy contribution by 2030, Government of Botswana has approved and is implementing energy projects with a total installed capacity of 1,475 MW required to meet the growing energy demand at least cost whilst also reducing the country's carbon footprint. This includes: 835 MW Solar, 100MW wind, 140MW BESS, 300MW coal, and 100MW CBM. Furthermore, the newly announced GoB RE ambition of 50-50 in energy mix by 2030 will be driven primarily by solar photovoltaic installations, expected to reach 1.5GW by 2030. Meanwhile, coal power generation is still considered to provide baseload power to the grid. A new coal-fired power plant (600MW in two phases) that has been procured with a selected Independent Power Producer (IPP) and phase 1 of 300MW is currently under construction. Botswana is projected to experience a substantial increase in its installed capacity by 2030, on both fossil fuel and renewables. The implementation of the new generation capacity including RE targets will take

a robust and pragmatic approach in phases, with adjustments to be made based on the outcomes of the updated least-cost power system planning, which will incorporate changes in key enablers, i.e. evolution of electricity demand in the country including distributed generation and e-mobility, eventual firm supply commitment to SAPP region, and technology developments and changes in prices of equipment.

Status of Least Cost Power System Planning

As input to the 2021 IRP, an energy supply and demand analysis was coordinated by MME to establish the basis for national generation, transmission and distribution expansion planning for the entire planning period till 2040. The electricity demand is expected to increase from 4.038 TWh in 2020 to 7.738 TWh in 2040. Comprehensive experience in emerging countries worldwide shows that systematic update and approval of Power System Master Planning/IRP is instrumental to achieve least-cost generation and energy balance in the system. For the purpose of the Compact, the new generation capacity expansion targets, including RE, are reflected as a range for domestic needs and export between meeting domestic demand (at 950MW with 50% of RE), and ambitious one (with 1,850MW of RE representing 58 percent generation mix) subject to securing regional offtake to be informed by the updated VRE integration study and least-cost generation expansion plan.

Status of Procurement Policy for Renewable Energy

Competitive and transparent procurement process are critical to ensure cost effective development of RE projects. The GoB has adopted a regulatory framework under Public Procurement Regulator Act (PPRA) to support private sector generation and it is now be procured through IPP projects by the Projects Energy Development Unit (PEDU) within the Ministry of Minerals and Energy (MME) which acts as the 'IPP Office' for energy projects. The procurement process for IPP projects currently involves both solicited and unsolicited models. In the past years, BPC has successfully run the competitive and open-solicited procurement for first few solar IPPs (both utility-scale and small-scale) and four 50MW solar PV at Mmadinare and Jwaneng have reached financial closure, with first 50MW Mmadinare Solar PV is already commissioned. On the other hand, unsolicited deals are allowed under certain circumstances such as failed attempt in open and solicited process. In the case of ongoing tendering for the 1.5 GW solar, it has advanced to RfP stage and PEDU team is proceeding with the procurement incorporating lessons learnt from previous open tenders and hands-on support from BPC. However, in the absence of sufficient preparatory work and identified demand guided by the least cost generation and transmission expansion plan adequate participation of high-quality bidders is uncertain.

There is an urgent need to enhance the planning, procurement and project management capabilities of PEDU as one of the mitigation measures of bankability risks that have been a barrier to investors, financiers, and off-takers, among others.

Status of transmission and distribution infrastructure

BPC is the sole provider of transmission and distribution services, operating network infrastructure (substations and lines) running at different voltage levels. BPC operates and maintains all transmission network infrastructure (≥132kV), which comprises; 400 kV (1027 km), 220 kV (1784.5 km) and 132 kV (1833.10 km). For the distribution network, BPC operates medium-voltage distribution lines at 66kV, 33kV, 11kV and 0.4kV.

Transmission power overhead lines

As of March 2025, Botswana's electricity transmission network comprises over 4,000 km of overhead power lines, forming the backbone of the country's power supply infrastructure. The high-voltage (HV) transmission system is primarily 400kV, 220kV and 132kV lines, connecting key generation sites at Morupule to demand centers across the country. However, despite investments in transmission expansion, network bottlenecks and limited redundancy continue to constrain power reliability, particularly in rapidly growing urban centers and mining regions.

A significant milestone in strengthening the national grid was the implementation of key transmission projects, including the Northwest Transmission Grid Connection (NWTGC) Phase 1, which was completed in 2020. This project extended transmission lines to Maun, Ghanzi, and Shakawe, reducing the country's reliance on imported electricity from Namibia.

Since 2020, several other critical projects have been implemented, such as the Mochudi – Phakalane 132kV line, Mochudi 132/33kV substation, Ramotswa 132/33/11kV substation, and Tlokweng 132/11kV substation. These projects have significantly enhanced the reliability and security of power supply across the country. Notably, NWTGC Phase 1 played a key role in unlocking economic potential by enabling power supply to Large power users such as Khoemacau Copper Mine and Tshukudu Metals.

The country remains committed to further reinforcing its transmission network, as demonstrated by several mega projects approved for implementation. Among them is NWTGC Phase 2, which will extend a 400kV line from

Phokoje to Dukwi and Pandamatenga, along with 220kV lines from Pandamatenga to Kazungula. The project also includes the construction of new substations at Dukwi (400/132kV), Nata (132/33kV), Pandamatenga (400/220kV), Agro-commercial (220/33kV), and Kazungula (220/66/11kV). However, its progress has been impacted by funding constraints, scope changes (to facilitate interconnection with Zambia), and land acquisition challenges. This project is crucial for stabilizing power supply in the northern region, supporting agricultural commercialization and water transfer schemes, and creating a power trade corridor within the SADC region.

Additional projects in the implementation pipeline include:

- Government Enclave substation (132/11kV)
- Charles Hill substation (132/33kV)
- New Sua Pan substation (132/33kV)
- Maun substation (132/11kV)
- Grid extension to Kgalagadi South, featuring a 220kV transmission line exceeding 500km, with multiple substations planned for major villages along the route.

These ongoing efforts highlight Botswana's commitment to expanding and modernizing its power infrastructure, ensuring greater energy security, industrial growth, and regional power trade integration.

System losses in transmission and distribution stand at approximately 14.35% of total electricity dispatched, which is modest compared to other Sub-Saharan African economies. The losses stem primarily from technical factors, such as long-distance transmission and aging infrastructure, though non-technical losses (e.g., energy theft, meter inaccuracies) have not been reported. Grid modernization and investments in smart metering could further optimize loss reduction efforts.

Status of distribution infrastructure

BPC is expanding its distribution network to support urbanization, industrial growth, and rural electrification efforts. The capacity and resilience of the distribution system remain key challenges, particularly in rapidly expanding commercial and industrial zones, where demand growth is outpacing network reinforcement. Distribution network reinforcement has progressed, with key projects such as the Mochudi 132/11kV substation (status to confirm) and the Tlokweng 132/11kV substation (status to confirm). Additionally, refurbishment efforts under Phase 2 projects (92.64% complete) and Phase 3 (status to confirm) are ongoing, though import delays for critical equipment have impacted timelines.

A review of system performance (BPC Annual Report, 2023) suggests that voltage fluctuations and service disruptions in urban and industrial areas remain a concern, highlighting the importance of continued reinforcement of substations, transformers, and feeder lines. Reported data indicates that fault resolution times for high-voltage (HV) incidents averaged 179 minutes, exceeding the target of 120 minutes, while low-voltage (LV) response times improved to 74 minutes, nearing the 130-minute target. Additionally, customer service response times, with call center service levels at 65% against a target of 75%, suggest room for improvement in outage management efficiency.

Ongoing grid modernization efforts include the deployment of SCADA (Supervisory Control and Data Acquisition) for real-time monitoring, with integration into the Distribution Maintenance System (DMS) still in progress. Reports indicate that DMS is expected to be operational by September 2027, a development anticipated to enhance outage response, predictive maintenance, and overall grid efficiency.

Proposed interventions for transmission and distribution

Botswana's power grid needs to keep up with its ambitious generation expansion plan. Ensuring grid readiness for reliable power evacuation and VRE integration is crucial for private sector confidence. Botswana's generation expansion plans are substantial, requiring significant investments in generation, transmission, and distribution infrastructure. While these planned generation capacity additions look impressive, their viability depends on timely grid integration and power evacuation strategies. Several transmission projects, including the Northwest Transmission Grid Connection (NWTGC) and the 400kV Phokoje-Pandamatenga Transmission Line, are expected to strengthen the national grid and improve supply reliability.

This large-scale infrastructure expansion requires equally significant investments in transmission and power networks to effectively evacuate and integrate the generated power including VRE. Without parallel investment in evacuation infrastructure, transmission constraints could become a systemic bottleneck, preventing Botswana from fully realizing its generation targets.

Annex 1 summarizes the priority projects for transmission and distribution under consideration.

PILLAR III:
INCREASED REGIONAL INTEGRATION

Botswana has historically relied on regional electricity imports to meet its domestic demand, leveraging interconnections with Namibia, South Africa, and Zimbabwe. From Q4 2023 to Q3 2024, the country imported 1,373 TWh of electricity, accounting for approximately 30% of total electricity distribution. Zambia's ZESCO was the largest supplier, contributing 46% of imports, followed by South Africa's Eskom at 30%, while Southern African Power Pool (SAPP) market transactions constituted 5%. In addition, in 2023, BPC recorded increased electricity exports through the Southern African Power Pool (SAPP), generating P122 million, compared to only P11 million in 2022. Accordingly, Botswana's National Energy Policy (NEP) promotes regional energy trade and international cooperation.

Currently, the BPC network is connected to the SAPP network through the following operational interconnectors:

- Francistown (Botswana) – Marvel (Zimbabwe) 220 kV line.
- Segoditshane (Botswana) – Spitskop (South Africa) 3 x 132 kV lines.
- Phokoje (Botswana) – Insukamini (Zimbabwe) 400 kV line.
- Phokoje (Botswana) – Matimba (South Africa) 400 kV line.

Botswana has significant opportunities to reshape its role in regional energy trade. Despite its current reliance on fossil fuels and negligible electricity exports, effective utilization of renewables could potentially enable Botswana to become an exporter of clean energy. Solar and wind generation could complement hydropower from neighboring countries such as Zambia, Angola, and Zimbabwe, fostering greater regional energy stability. Additionally, Botswana's central geographical location within the SAPP network positions it as a potential energy trading hub.

Botswana is set to strengthen its net exporter trend in the initial years, primarily driven by capacity additions, with Zimbabwe being the main destination for its energy exports. By 2030, while maintaining high export levels, the importance of South Africa as a recipient of this energy will notably increase. Furthermore, between 2034 and 2036, Botswana will facilitate the wheeling of energy through Zimbabwe from Mozambique and Zambia to South Africa.

Exports to South Africa are particularly high during solar generation periods, reaching an average power output of 1,000 MW. During off-peak and early morning hours, the export balance for 2030 remains close to zero, while in 2035, it increases to an average of 400 MW. This upward trend is attributed to South Africa's evolving role as a primary off-taker of Botswana's surplus generation, complemented by wheeled electricity imports from Zimbabwe.

For Zimbabwe, exports from Botswana primarily occur during periods of high solar generation, but there are also imports observed during the early morning and evening peak hours. In 2035, these net imports from Zimbabwe are further intensified and extended into the nighttime hours. Considering Botswana remains a net exporter, imports from Zimbabwe are predominantly wheeled through to South Africa, indicating the importance of an operative interconnection infrastructure linking Botswana to South Africa.

Botswana employs a de facto single buyer model, where BPC serves as the sole purchaser of electricity generated, including that from IPPs. Government has indicated that generation will be separated into a separate company, which will in turn necessitate the development of a transmission access and wheeling framework to ensure equitable access by IPPs. Foreseen that BPC will remain single buyer within Botswana but that IPPs able to either sell to BPC or to export directly in agreement with BPC negotiated network access and use terms.

PILLAR VIII
INCENTIVIZE PRIVATE SECTOR PARTICIPATION TO UNLOCK ADDITIONAL RESOURCES

Botswana's Strong macro-economic stability and political signaling makes a compelling case for investment diversification for energy sector. Botswana can leverage its financial stability to create an enabling investment environment and provides a strong platform for expanding private sector participation in renewable energy space. Botswana has long been recognized for its macroeconomic stability, prudent fiscal policies, and stable governance, as highlighted by low public debt and consistent credit ratings. The country has maintained low public debt (24.5% of GDP in 2024, WB), well below the 40% statutory cap, along with strategic resource management and solid credit ratings. In March 2024, S&P Global Ratings affirmed Botswana's long-term sovereign credit rating at 'BBB+' with a stable outlook. Similarly, in October 2024, Moody's Investors Service maintained Botswana's rating at 'A3' with a stable outlook.

However, this fiscal stability has been primarily driven by diamond revenues, which account for approximately 70% of total exports and 28.5% of government revenue. The over-reliance on diamonds exposes Botswana to external

shocks, as fluctuations in global demand and competition from synthetic diamonds pose long-term risks. However, the country's foreign exchange reserves, which reached P66.1 billion in mid-2023 before declining to P53.62 billion by November 2024, still provide a buffer against external shocks and provides a strong foundation for investments in energy sector. The key challenge, however, is diversifying beyond mining, as other sectors remain underdeveloped.

A strong macroeconomic foundation alone is not enough. Botswana intends to create a transparent, cost-competitive energy market, structured regulatory incentives, predictable off-takers, investment risk guarantees, investor-friendly enabling environment to unlock the full potential for private sector participation in the energy sector.

As the primary buyer of electricity, BPC manages both domestic generation and imports. BPC's weak financial performance has significant impacts on the predictability and bankability of Power Purchase Agreements (PPAs) for Independent Power Producers (IPPs), particularly in securing financing from capital markets.

Procurement challenges, poor planning, and lenders' lengthy due diligence process have led to project cancellations and delays. This can be a red flag for private investor confidence in a market yet to fully develop. Botswana's Public Procurement and Asset Disposal Board (PPADB) is a responsible authority for government-led procurement, including for parastatal utilities like BPC. Moving forward, the Ministry of Minerals and Energy (MME), with assistance from PPADB, is expected to take the lead in future IPP procurements. Delays/inefficiency may emerge unless the transition is carefully managed. There is urgent needs to capacitate PEDU procurement capacity coupled with hands-on assistance and knowledge transfer by BPC.

Botswana has an estimated renewable energy project pipeline of 1.5 GW by 2030. The development of these projects requires a more structured approach to procurement, investment planning, and grid readiness giving investment confidence in market stability. Regular, scheduled tenders (every 12- 24 month) rather than unpredictable and rushed procurement cycles can be potential intervention to create market confidence and ensure steady investment flows. Appropriate planning will increase IPPs and investors' confidence. Timely update of least-cost generation and transmission planning and VRE integration study is important to ensure supply and demand balance, grid readiness for large-scale VRE integration, and to identify domestic and regional demand.

There is no preferential lending mechanisms or credit exposure requirements for local banks financing renewables. To bridge this gap, the government or other bilateral or multilateral DFIs or TA partners can introduce risk-sharing facilities, guarantees, and concessional finance programs to de-risk lending and attract private capital. Additionally, green bonds, tax incentives for energy investments, and tailored credit enhancement tools can as well provide cost-competitive financing options for local IPPs. With Botswana targeting 50% renewable energy by 2036, mobilizing local financing through structured incentives and financial market reforms is a good opportunity at home to leverage local capital market to accelerate the country's clean energy transition.

Botswana has an informal off-grid market with limited private sector participation. While bank interest rates in Botswana are among the lowest in the region, off-grid companies struggle to attract financing due to lack of investor readiness and limited access to tailored financial instruments. Many businesses face challenges in demonstrating bankability, operational efficiency, and scalability, restricting their ability to secure investments.

Competitive procurement in uncovered areas of the Country can be considered. Independent of which specific areas might currently be unserved, a competitive procurement process could be employed for areas not connected to the main grid. Areas not served by BPC can resort to this approach, with adherence to the principle of exclusivity: mini-grids could be the most economical avenue for catering to certain zones. It has been observed that competitive procurement for mini-grids, encompassing both distribution and supply licenses in off-grid areas, has the potential to attract private investors.

PILLAR IX
WORK TOWARDS FINANCIALLY VIABLE UTILITIES THAT PROVIDE RELIABLE SERVICE

Botswana is an upper-middle-income country like Botswana with access to financing from development partners (IFIs) for investments in the electricity sector and moderate average ability to pay of electricity consumers. In this context, financial sustainability means setting and periodically adjusting tariff revenues collectable by licensee (BPC) to ensure permanent recovery of Revenue Requirement (RR) set by BERA comprising operating (Opex) and investment (Capex) costs incurred for efficient service delivery, with financing arrangements for investments contemplated in the regulatory determination of the Weighted Average Cost of Capital (WACC).

However, non-cost reflective tariffs, low availability of Morupule B Power Station and the increasing cost of imported power have led BPC to recurring financial losses. BPC's weak financial performance has posed a significant challenge to provide reliable power supply in Botswana, which has consequently limited investments, grid expansion, and overall power-sector growth. Consequently, the Government of Botswana continues to subsidize the Corporation to cushion the impact of non-cost reflective electricity tariffs.

BPC has requested multiple tariff increases over a period of five years. A 22 percent upward adjustment of electricity tariffs took place in 2020/2021, followed by another 3 percent increase in 2021/2022, applying to all categories of users. Subsequent asks were made for 2023 and 2024 however the increases were rejected.

The average electricity selling price in 2023 stood at 127 Thebe/kWh, while the cost of generation and imports was 159 Thebe/kWh. This reflects a continued cost-recovery gap that necessitates ongoing government subsidies to the utility. These subsidies, however, have generally not been sufficient in recent years to close the gap between revenues and operating costs (Table [x]). Taking financing and foreign exchange costs into account would further widen the gap between costs and revenues.

Table [x]: BPC Operating Deficit (2020 – 2024)

Revenues vs. operating costs (P million)	**2020**	**2021**	**2022**	**2023**	**2024**
Revenue	3,399	4,023	4,336	4,531	
Other income (B)	129	325	72	172	
C. Government subsidy (C)	600	500	500	600	
D. Total operating income (A+B+C)	**4,128**	**4,848**	**4,908**	**5,303**	
E. Operating expenses (D)	(4,840)	(4,379)	(5,317)	(5,361)	
F. Operating Surplus/(Deficit) after subsidies (D+E)	**-712**	**469**	**-409**	**-58**	

BPC has resorted to several short-term strategies to manage this operating deficit. For one, it maintains large and growing outstanding balances to suppliers. BPC's trade payables grew by over 50% from an already high level of P1.9 billion in 2021 (equivalent to almost 6 months of operating costs) to P3.1 billion in 2023 (equivalent to more than 8 months of operating cost), raising concerns about relationships with suppliers and the impact these might have on the sustainability of BPC's operations. For another, BPC's bank overdraft also grew fourfold from P37 million in 2021 to P158 million in 2023. As a result, BPC's short-term liabilities far exceed its liquid assets. Its current ratio (the ratio of current assets to current liabilities) stood at 0.3 in 2023, and short-term liabilities have consistently exceeded revenues, suggesting that the company is not able to reliably meet its financial obligations.

In addition to operating subsidies, GoB has provided regular capital injections, though these still do not appear to have been sufficient to meet BPC's full financing needs. Despite GoB providing equity contributions of P404 Million and P802 Million in 2021 and 2020 towards transmission projects, BPC's cash position has deteriorated from P1.5 billion at the start of 2020 to P304 million at the end of 2023. These cash constraints also appear to have limited BPC's ability to make necessary capital investments, as capital expenditure dropped sharply from P1.9 billion in 2021 to P661 and P484 million in 2022 and 2023 respectively. These values are below depreciation, suggesting that BPC may be struggling to adequately replace or maintain its aging infrastructure.

Beyond government capital injections, BPC has limited access to long-term financing. Nearly all its debt consists of an $825 million loan from the Industrial and Commercial Bank of China (ICBC), with the rest funded by the Botswana government through the Nordic Development Fund. Apart from an overdraft, BPC carries no commercial financing on its balance sheet. Despite using currency and interest rate swaps to manage risk on foreign-currency debt, the company incurred significant foreign exchange losses—P710 million in 2023, up from P138 million in 2022—due to a 12% Pula depreciation in 2023 and 10% in 2022, further straining its financial position.

BPC's annual reports include financial statements that adhere to international reporting standards and provide detailed insights into financial performance, operations, and strategy. Auditor opinions from 2020 to 2023 were unqualified, confirming the accuracy of the statements. The reports also cover key metrics such as operational efficiency, energy production, and capital expenditure.

However, as of March 2025, the 2024 report had not been published, raising concerns about timeliness.

BPC has made operating losses for years due to high import costs, non-performing assets and operational inefficiencies, making it reliant on government subsidies to stay afloat.

System losses are in a moderate range of 14% to 15%. For 2022/2023, 642,002 MWh was lost, which constituted 15% of the total power dispatched. This figure shows only marginal variations with prior years, and is on par with the target of 15%. Revenue leakages are largely at Distribution level and are estimated to be minimal, at around 1%. BPC has a revenue protection arm which undertook revenue protection initiatives during the year under review, resulting in a total revenue leakage charge of P9 million. The recovered amount was P2,6 million which constituted 29% of the total amount charged.

BERA Act of 2016 in conjunction with the Electricity Supply Act and the Botswana Power Corporation Act governs the electricity in Botswana, covering generation, transmission, distribution and electricity tariff. BERA is responsible for ensuring compliance of the relevant sections of the Acts.

BERA conducts tariff reviews on an annual basis, following the Rate of Return (RoR) regulation, and submits tariff proposals to the Ministry of Minerals and Energy for approval. MME will approve the final tariff, with a proposal to Cabinet on the level of government budget required to fill the gap partially or fully. It is important to stipulate in the BERA Act, ensuring that remaining deficits between granted tariffs and efficient revenue requirement are fully covered by subsidies, including for capital and financing costs.

BERA is currently reviewing the methodology for setting the cost-reflective tariff, under the Cost-Of-Service study funded by AfdB, including revising the lifeline threshold level, to reflect basic consumption needs of residential consumers. In addition, it is also important to ensure reconciliation process takes place to cover the supplementary portion between estimates and actuals, with automatic adjustments made to tariff charges based on factors like incremental import expenditures, inflation and exchange rates.

ANNEX I

Intervention	Description	Expected Intervention Year(s)
Expansion of Transmission Grid (NWTGC Phase 2)	The project involves expanding the 400kV and 220kV transmission grid to the northernmost part of the country. It includes two links of 230km Phokoje-Dukwi and 290km Dukwi-Pandamatenga 400kV lines respectively, two parallel 70km Pandamatenga-Kazungula 220kV lines and a 30km line from Pandamatenga to the commercial agricultural farms. Additionally, the project will establish the Dukwi 400/132kV, Pandamatenga 400/220kV, Agro Commercial 220/33kV, and Kazungula 220/66/33/11kV substations. This expansion aims to strengthen supply, enable cross-border trade, and support the development of the ZIZABONA interconnector project involving Zimbabwe, Zambia, Botswana, and Namibia.	2027
Southern Region Grid Reinforcement	Expansion of 132kV infrastructure in Mochudi, Tlokweng, and Ramotswa to meet demand growth	Completed
SCADA & Distribution Management System (DMS) Rollout	Full integration of SCADA with DMS to improve grid monitoring and response	2025 – 2027
Loss Reduction & Metering Efficiency	Deployment of smart meters and anti-fraud measures to curb revenue losses	Ongoing
Renewable Energy Grid Integration	Integration of 236MW solar PV plants under development into the grid	2024-2027
Upgrade of Substations & Transformers	Upgrading old substations and transformers to enhance transmission capacity and reduce outages	2024-2026
Expansion of Distribution Network for Rural Electrification	Extending the medium and low-voltage distribution network to support increased electricity access	2023-2030
Development of Smart Grid Infrastructure	Deploying digital grid technology, automation, and AI-driven analytics for better power flow control	2025-2030
Implementation of Advanced Asset Management & Predictive Maintenance	Adopting predictive maintenance using IoT and AI to optimize grid reliability and reduce failures	2024-2028
Enhancement of Cross-Border Power Interconnections	Strengthening power exchange corridors with Namibia, Zambia, and South Africa for energy security	2026-2035

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