



Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 23-Sep-2020 | Report No: PIDC29220



BASIC INFORMATION

A. Basic Project Data

Country Benin	Project ID P173749	Parent Project ID (if any)	Project Name Benin Electricity Access Scale-up (BEAS) Project (P173749)
Region AFRICA WEST	Estimated Appraisal Date May 17, 2021	Estimated Board Date Jul 29, 2021	Practice Area (Lead) Energy & Extractives
Financing Instrument Investment Project Financing	Borrower(s) Republic of Benin	Implementing Agency SBEE, ABERME	

Proposed Development Objective(s)

The PDO is to increase access to electricity services for households, enterprises, and selected public facilities in Benin.

PROJECT FINANCING DATA (US\$, Millions)

SUMMARY

Total Project Cost	200.00
Total Financing	200.00
of which IBRD/IDA	200.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	200.00
IDA Credit	200.00

Environmental and Social Risk Classification
Moderate

Concept Review Decision
Track II-The review did authorize the preparation to continue



B. Introduction and Context

Country Context

- 1. Bordered by Togo, Nigeria, Burkina Faso, and Niger, Benin has a 121-kilometer-long coastline on the Gulf of Guinea and a population of close to 11.5 million (2018) spread over 114,760 km² of land.** Despite being the 4th fastest growing economy in Sub-Saharan Africa (SSA) with growth averaging 6.7% in 2017-2019, poverty remains high at 46% in 2018. A high population growth rate (3.5% per year over the previous decade) is an added challenge in increasing GDP and reducing the poverty rate, but in 2020 Benin reached low middle-income status in the first time in its history.¹ However, the economic shock of the COVID-19 pandemic is likely to result in a regression to low income status.
- 2. The Government of Benin (GoB) has oriented its development strategy toward the acceleration of structural transformation for sustained and inclusive high growth.** Benin's structural transformation process is constrained by an unproductive agriculture sector, a small manufacturing sector and an informal services sector. Aiming to reverse these trends and achieve the Sustainable Development Goals (SDGs) by 2030, government policies have put renewed emphasis on enabling private sector investment. Initial reforms focused on improving the business climate, strengthening governance and fiscal management, and enhancing social service delivery. More recently, GoB has turned its attention to supporting investments in the development of productivity-enhancing infrastructure.
- 3. Prior to the COVID-19 outbreak, economic growth in Benin was buoyant.** In 2019, real GDP growth reached 6.4% despite Nigeria's unilateral border closure that weighed down on growth. This acceleration was mainly driven by a booming cotton production, and strong construction and port activity following a series of reforms that improved port management and facilitated trade. As the two economies are closely linked, Nigeria's decision to unilaterally close the shared border in August 2019² reduced the annual real GDP growth by 0.3% in Benin, but this was cushioned by the better-than-expected performance in the first half of the year. In 2019, the fiscal deficit declined due to continued effort on domestic revenue mobilization and debt-to-GDP stabilized for the first time in five years.
- 4. Despite steady, robust economic growth over the past two decades, poverty in Benin remains widespread owing to limited growth in per capita terms (only 1.6% on average during 2006–16).** While the poverty levels remain high, the overall level is declining. World Bank estimates suggest that US\$1.9 a day (2011 PPP) poverty declined from 50% in 2015 to 46% in 2018. Non-monetary poverty indicators have improved over this period as well. Inequality is estimated to be moderate based on consumption aggregates, with a Gini index of 48% in 2015. Female-headed households experience lower levels of poverty (28% compared to 38% for male-headed ones) but comprise only 23% of all households and generally women suffer from a lack of economic opportunity and are under-represented in high-level decision-making positions. The education and health sectors account for a significant share of public expenditure (23% and 7%, respectively, on average). Greater public spending efficiency and a more equitable geographical distribution of resources would pave the way for lower poverty rates and more inclusive growth.

¹ World Bank Data, 2020, <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

² Nigeria, one of Benin's main economic partners (40 percent of total exports in 2018), closed its land border in August 2019 severely impacting informal trade (including re-export) and tax revenue collection.



5. **Since early 2020, the COVID-19 pandemic has significantly changed Benin's economic outlook.** The pandemic is creating unprecedented threats to the social and economic progress recently achieved in SSA. The region is expected to face its deepest recession on record.³ Financial markets have been extremely volatile, reflecting exceptionally high uncertainty and the worsening outlook. Flight-to-safety led to a sharp tightening of global and Emerging Markets and Developing Economies (EMDEs) financial conditions. External economic effects have already started to transmit to West Africa and Benin. Growth is slowing while fiscal and external deficits are increasing. Further, the global pandemic is threatening to overwhelm weak healthcare systems. The first COVID-19 case was discovered in Benin on March 16, 2020. The number of cases has been growing rapidly in June after a slow take up, reaching 1,199 as of July 5th, 2020. Close to 300,000 cases have been confirmed across 48 countries in SSA. Countries in the region have responded with strict confinement and mitigation measures to protect lives, despite important risks to livelihoods. Benin's capacity to respond is restricted due to limited fiscal buffers and underdeveloped social safety nets and health care capacity. The large informal sector employing almost 90% of workers and traditional porous borders create a great challenge for the policy response.

6. **As the COVID-19 crisis unfolds, recent economic and social gains are at risk.** Although Benin's growth potential remains high,⁴ economic activity is projected to decelerate strongly as a result of the COVID-19 pandemic and the border closure with Nigeria. Real GDP growth will more than halve from pre-COVID-19 projections to 2.2% in 2020 as the country is hit by lower external demand and commodity prices as well as tighter financing conditions. Containment and mitigation measures are impacting commerce, transport, and hospitality-related activities, adding to the external pressure and reducing domestic demand. Poverty reduction is expected to stall as real GDP per capita shrinks (-0.5%). The crisis exposes and aggravates some vulnerabilities of Benin's growth model. Despite the recent progress, structural transformation remains limited. The economic plans to diversify are hampered by the economic reliance on Nigeria and the concentration of exports in traditional products like cotton and cashew nuts. Ninety percent of the labor force is estimated to work in the informal economy with limited social safety nets, exposed to the whims of economic fluctuations.

7. **Benin is vulnerable to additional exogenous shocks that present development challenges.** Adverse weather conditions and the decline in international commodity prices could negatively affect exports and adversely affect the income of the poor. Rising socio-political uncertainty across the region could also threaten market confidence and tighten regional financing conditions.

8. **The Government Action Plan (GAP), 'Revealing Benin', for 2016-2021 establishes GoB priorities for economic and social development.** The GAP guides government action and is used to define ministries' activities and allocate the national budget through its three pillars, which are themselves split into seven key priorities. The second pillar, structural economic change, has a key priority of improving economic growth. The energy sector is considered a strategy sector for achieving this priority. Accordingly, the GAP establishes an objective of developing a largely independent and competitive energy system and providing reliable and high-quality electricity to homes, small and medium enterprises and agricultural across Benin. The electricity sector action plan is based around four flagship projects that have been estimated to require approximately US\$1.3bn in financing with an estimated benefit of creating 9,100 new jobs.

9. **As the COVID-19 global and domestic crisis dissipate, growth is currently projected to rebound over the medium term, averaging 6.5 percent.** A pickup of the investment program of the GAP should further support the rebound and expanding energy access will be a critical component of this. Electrification is a key driver of long-term economic transformation and human development. Short-run impacts include social benefits, such as lighting for reading and

³ Economic activity in the region is on course to contract by 2.8 percent in 2020, the deepest on record. The economy of Nigeria is expected to shrink by 3.2 percent in 2020, given the collapse in prices for oil. South Africa's output is forecast to contract 7.1 percent in 2020, the deepest contraction in a century, as stringent but necessary containment measures curtail economic activity. Global Economic Prospects, June 2020.

⁴ Potential growth rate is estimated at 6.7 percent (IMF 2019 Article IV Report).



enhanced security. With electrification business opportunities become available for micro, small, and medium-sized enterprises. Impacts rise in the medium term as complementary factors are introduced and households and businesses adjust to electricity's potential. Education and health outcomes may improve through the electrification of schools and clinics. Economic impacts grow as electricity becomes increasingly available as a strategic input for industries and services. Delaying electrification has a high opportunity cost because the lack of electricity impedes modern technology adoption and lowers the quality of delivery of services such as health care, education, and other public services. Electrification is central to ensuring Benin's economic recovery is inclusive and supports the objective of economic structural transformation.

10. **The relationship between the electricity sector and the country's economic competitiveness can be seen in two key World Bank indexes.** The *Regulatory Indicators for Sustainable Energy* (RISE) report measures countries' policy and regulatory framework for reaching SDG 7 of universal access to affordable and clean energy. On the RISE access to electricity pillar Benin scores 63%, placing it in the moderate range for access-deficit countries. The energy access sub-indicators that Benin scores low on include the scope of the officially approved electrification plan, framework for grid electrification, consumer affordability of electricity, and utility transparency and monitoring. The high cost of getting electricity in Benin is further reflected in the *Doing Business* report (2019), which identifies the cost of getting electricity as one of the main barriers to an efficient investment climate in Benin. Benin ranked very low (178 out of 190) with respect to the cost of getting electricity, significantly hindering the competitiveness of the private sector. The cost of getting electricity in Benin is high compared to its regional peers.⁵ Currently, households are required to make an upfront payment of CFAF 85,000⁶ (US\$ 142 equivalent) to get connected to the grid. The proposed Benin Electricity Access Scale-up Project (BEAS, P173749) project will allow the GoB to subsidize partly or entirely the connection fees (for rural households and urban and peri-urban poor households) or to pre-finance them (for urban households) and ask newly connected consumers to pay in installments, all based on the households' willingness to pay.⁷ In addition, electricity retail tariffs in Benin are above global averages, even though they are set below cost-recovery levels, mainly due to high technical and commercial losses.

Sectoral and Institutional Context

11. **Access to electricity is critical to achieving the GAP's objectives.** One of the four flagship projects for the electricity sector under the GAP is restructuring and modernizing the national operator (Société Béninoise d'Énergie Électrique, SBEE) and its grid, with an objective of providing all Benin citizens with permanent access to quality electricity. In 2018, 42% of Benin's population has access to electricity,⁸ which is a lower rate than the SSA average of 47% (Figure 1). The national electrification rate masks a stark disparity between urban and rural areas. Seventy-three percent of the urban population has access to electricity, with the highest access rate in the coastal cities, such as Cotonou, and lower rates in medium urban centers where considerable proportions remain unconnected. Less than 17% of the rural population has access to electricity (Figure 2).

Figure 1: Benin's national access rate was 42% in 2018, below the average for SSA

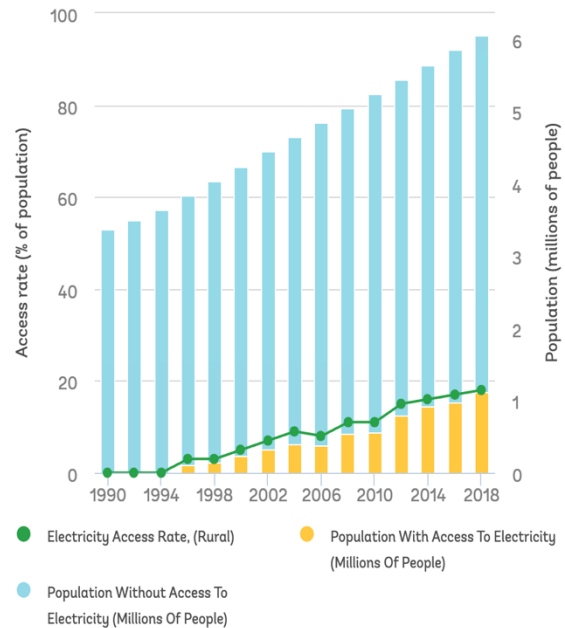
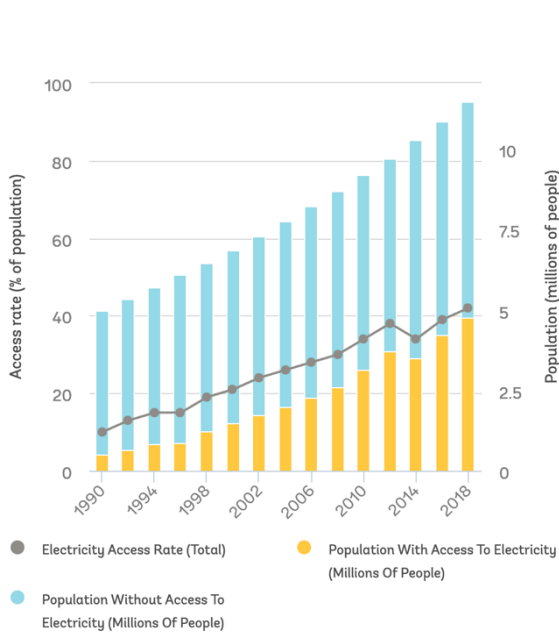
Figure 2: Benin's rural access rate was only 17% in 2018

⁵ Cost of getting electricity is 5, 4 and 3 times lower in Cote d'Ivoire, Ghana, and Togo respectively. Source: DB Index. SBEE reduced by about 30% the connections fees in June 2020.

⁶ CFAF 85,000 is the cost for single phase connection (1-6 kVA; 5-30 Amp) as stated in the Note de service 228-20/SBEE/DG/SG/DCC

⁷ Studies funded by MCC in 2015 include willingness to pay

⁸ All electrification data is from SE4all SDG7 tracker, 2018, <https://trackingsdg7.esmap.org/country/benin>



Source: SE4all SDG7 tracker, 2018, <https://trackingsdg7.esmap.org/country/benin>

12. **Efforts to expand electricity access in Benin have struggled to match population growth due to underinvestment in the sector.** Benin has expanded electricity access by 1.7m people between 2010 and 2018, increasing the electrified population from 3.1m Beninoise. However, in the same time period the total unelectrified population has also risen; in 2010 6.1m Beninoise lacked access to electricity, but in 2018 this figure had grown to 6.7m due to population growth. SBEE has been unable to provide electricity connection to a long list of potential customers who have been waiting for an electricity connection due to a lack of an operating budget. At the same time, demand for electricity continues to increase due to increasing household consumption and population growth. Illegal and unsafe electricity connections are common but decreasing in high-density peri-urban areas of major urban centers—such as Cotonou, Porto-Novo, Abomey-Calavi, Parakou, and Natitingou. The ongoing Bank-funded ESIP is addressing part of the illegal connections and the BEAS will build on this work. Benin’s electricity access deficit is especially acute in the northern region, which has the country’s high levels of poverty. Poverty incidence in Benin tends to increase from south to north, and the three northern departments all have a poverty incidence of over 60%. This tracks with the provision of basic services, such as electricity.⁹ Supporting grid connections is the most efficient way to contribute to achieving the forthcoming National Electrification Strategy (NES); previous GIS work suggests that the upper range for grid electrification is approximately 80% of the population.¹⁰

13.

14. **In order to better support the GAP’s objective of electrification, the GoB has prepared the Benin-PROSPERE report (Programme Spécial d’Extension et de Renforcement des Réseaux Electriques du Bénin).** Benin-PROSPERE notes that with the key institutions in the energy sector facing budget deficits, the required investments for maintenance and growth of the distribution network have not materialized. The GoB therefore considers concessional finance to be necessary to reach their GAP objectives and the Benin-PROSPERE report provides an overview of current energy access

⁹ More accurate data on this will be available following the GIS least-cost electrification expansion plan that is underway and funded through the ESMAP-funded Geospatial Electrification Planning in the Africa Region project

¹⁰ Based on a previous GIS-least-cost study (KTH, Electrification Pathways for Benin, 2018). This figure will be updated with a more accurate figure when the NES is completed (October 2020) based on a more granular model but is expected to be in a similar range. This considers populations less than 7km from the existing grid as receiving grid connections

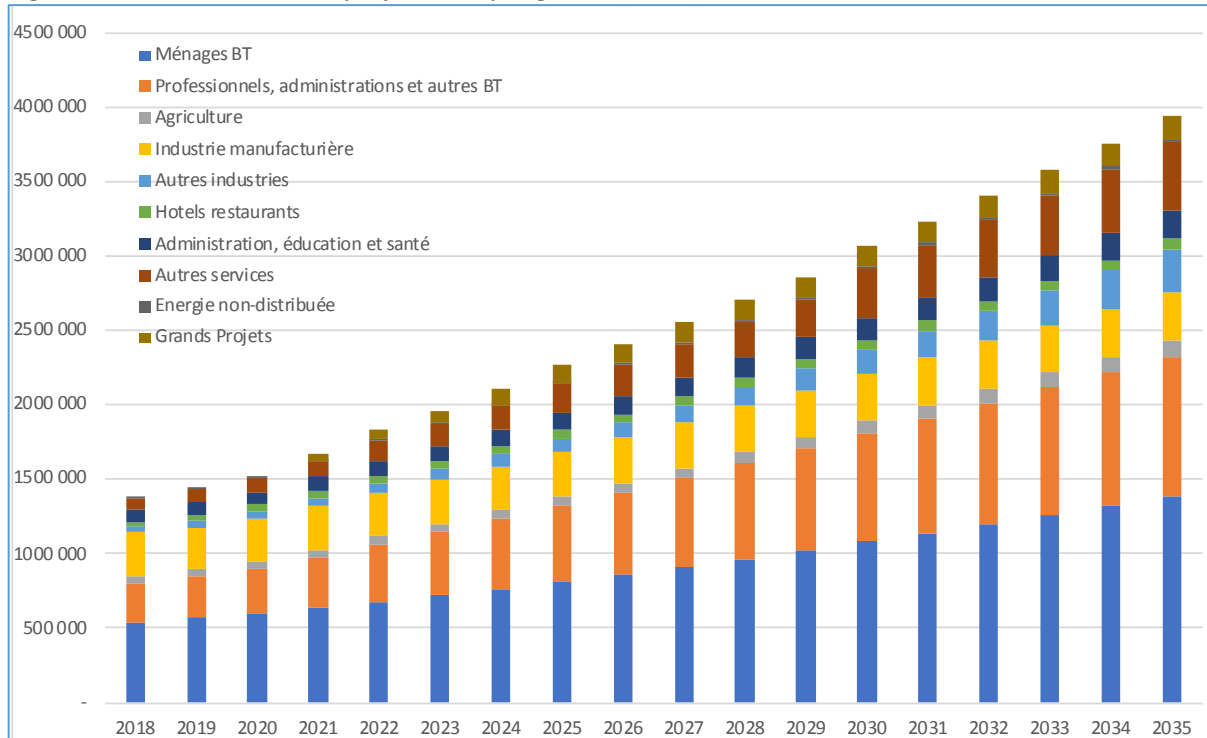


activities among DPs and provides planning for future investments. Benin-PROSPERE does not include an in-depth GIS-based study for planning investments and is not a comprehensive NES.

15. **Benin is facing rapidly increasing demand for electricity.** The baseline projection for annual demand growth is 6.3%. All segments of the Benin electricity sector are projected have increasing demand up to 2035, but household and commercial consumption comprise the largest and fastest growing segments (Figure 3). The baseline growth scenario projects peak demand increasing from 256 MW in 2018 to 429 MW in 2025 and to 773 MW in 2035.¹¹

16.

17. Figure 3: base case demand projection by segment (MWh)



18.

19. Source: RECASEB

20.

21.

22. **Benin has been developing its generation supply capacity to meet the growing demand and reduce its dependence on electricity imports.** The GAP action plan for the electricity sector has so far been primarily supported through increasing domestic generation capacity and improving the performance of the power distribution sub-sector. The Benin power sector has added about 450MW of domestic generation, which has included (i) the commissioning in July 2019 of a 120MW public plant financed by the Islamic Development Bank initially to operate on HFO until gas becomes available; (ii) a 146MW IPP with private investment and smaller plants of 50MW, located at Maria Gléta 2 to operate on gas; and (iii) solar generation through independent power producers (IPPs). Support for solar generation is materializing with MCC and Agence française de développement (AFD) committing to invest in 85 MW of solar PV with public finance. SBEE has also contracted 100MW with an IPP based in Nigeria and carried over a transmission line with a capacity constraint of 600MW. Capacity additions at this site could be made if required. The remaining gap in demand will be

¹¹ Benin demand study, *Assistance Technique dans le cadre de l'appui institutionnel et du renforcement des capacités des acteurs du secteur de l'énergie au Bénin (RECASEB)*, October 2019



supplied through imports from Nigeria and Ghana (via the Togo-Beninese energy importing and transporting company Communauté Electrique du Bénin, CEB). Overall, there will be sufficient capacity to cover the rising demand for electricity.

23.

24. **Since the beginning of the GAP in 2016, a comprehensive and integrated energy strategy emerged with the support of development partners (DPs).** In 2015 the GoB signed a US\$375 million Compact in the form of a grant for the power sector with the Millennium Challenge Corporation (MCC). The majority of MCC funds are committed to modernizing the electricity distribution network by increasing reliability and lowering losses. MCC is also involved in developing the off-grid regulatory framework and financing program. The MCA aims to strengthen SBEE, attract private sector investment, and fund infrastructure investments in electricity distribution as well as off-grid electrification for poor and unserved households. MCA currently has four projects under implementation: i) a policy reform and institutional strengthening project; ii) an electricity distribution project, which is financing an electricity dispatch and control center, as well as 50 miles of new underground cabling and the rehabilitation of over 530 miles of overhead power lines; iii) an electricity generation project, which is financing the 50MW solar IPP in Benin's north and has released solicitations to pre-qualified bidders in December 2019; iv) the off-grid electricity access project, which is supporting policy reforms and infrastructure financing for off-grid solutions (for more details in MCC's off grid activities see Section D, Rationale for World Bank Engagement).

25.

26. **The AFD recently completed (on December 31, 2019) a five-year EUR 20 million project to reinforce and modernize the SBEE distribution network in Benin with the objective of increasing urban and rural electrification and improving SBEE's finances.** The project focused its activities in the Atlantic region, with electricity grid densification activities in the city of Abomey-Calavi and off-grid activities in the rural parts of the region. The AFD is also supporting the expansion of Benin's generation supply through the DEFISSOL project, a EUR 60.5 million project (including co-financing from the EU of EUR 10 million) that includes a financing of a 25MW solar PV power plant in Onigbolo.

27.

28. **The African Development Bank has been supporting the Benin's energy sector through multiple projects. The SBEE sub-Transmission and Distribution System Restructuring and Extensions Project (PRESREDI) entered implementation in April 2018.** PRESREDI is supporting the consolidation and expansion of SBEE's medium- and low-voltage distribution networks in the cities of Cotonou, Porto-Novo, Abomey, Bohicon and Lokossa, with an objective of electrifying 40,000 new households. The project is financed by the AfDB (EUR 15.2 million) as well as the AFD (EUR 15.2 million). The World Bank team will continue to coordinate closely with AfDB and AFD to ensure BEAS is building on their work and to discuss collaboration on BEAS financing.

29. **The Energizing Development (EnDev) partnership is actively supporting local markets in Benin with the objective of increasing the use of solar systems from micro to medium-sized PV systems and solar thermal energy, connection to the national grid, small hydropower plant, biogas and energy-efficient cooking stoves.** EnDev is led by the German Corporation for International Cooperation (GIZ), but it is a partnership that includes the Directorate-General for International Cooperation of the Ministry of Foreign Affairs of the Netherlands (DGIS), the Norwegian Agency for Development Cooperation (NORAD), the UK Department for International Development (DFID), the Swiss Agency for Development and Cooperation (DEZA) and the Swedish International Development Cooperation Agency (SIDA).

30. **Within the World Bank Group (WBG), IDA and IFC teams are collaborating to support sector development with an emphasis on increasing private participation.** Preliminary discussions on solar project in Benin have been held with IFC. The World Bank team is conducting due diligence to determine the utility's financial viability whether the criteria for a partial risk guarantee can be met.



31. **Past unreliability of electricity supply in Benin which was due to the financial stress and poor performance of its utility distribution company and that of CEB12 is being resolved.** Several actions have been taken to address the issues, namely: the implementation of a Revenue Protection Program for large consumers pursuant to the World Bank's ESIP project (P161015), the signing of a management performance contract¹³ for SBEE in November 2019 (with MCC financing), and sector reforms on the financial viability of the sector pursuant to the Benin First Fiscal Management and Structural Transformation WB Development Project Finance (P168668). In addition, based on analytical work by the Bank, reforms were introduced to CEB in January 2019 to transform it into a transmission systems operator, thus enabling the two national distribution utilities, SBEE and CEET (La Compagnie d'Énergie Electrique du Togo), to be responsible for the power importation for their respective countries. Other reforms included the payment of arrears by SBEE to CEB and the introduction of a wheeling charges of CFAF 10 per kWh that CEB collects on the amount of energy transmitted to the distribution networks of Benin and Togo to finance its operational and maintenance costs.

32. **Reducing energy poverty and inequality in the provision of energy services will reduce vulnerability to natural disasters and climate change and has important links to the climate change actions and policies in Benin's Nationally Determined Commitment (NDC).** Benin is highly vulnerable to the effects of climate change and ranks 156 out of 181 countries on measures of vulnerability and readiness (making it the 17th most vulnerable country and the 42nd least ready country).¹⁴ Energy poverty and inequality in access make it more difficult for countries to achieve socio-economic targets in health and education, and to realize the full potential of human capital, and it increases their vulnerability to climate change¹⁵, natural disasters and pandemics, as energy is an important input for water, sanitation, broadband, as well as economic activity. In addition, women and girls, especially in rural areas, bear a significant burden as a result of the lack of energy access. Time spent on household chores, such as collecting firewood and water for drinking and burning high-polluting charcoal and kerosene for cooking and lighting, prevents their full and active participation in educational and economic activities. In addition, Benin's NDC recognizes the role of increasing energy access, as part of specific measures to reduce emissions by 21.4 % by 2030. This includes energy sub-sector targets on: i) developing electric power generation using renewable energy, including adding 95MWc of solar PV; and ii) increasing household's access to electric lighting in place of kerosene lighting, including electrification of an additional 300 localities by 2030 and procurement of 212,000 electrical connection kits for households. This activity will help advance the latter activity through technical support for the expansion of grid electricity connections.

Relationship to CPF

33. **The proposed Program directly contributes to the Objective 2 of the World Bank Group (WBG) Country Partnership Framework for Benin (CPF) for the period FY19-2316.** This Objective aims to "improve the quality of infrastructure" by addressing the many challenges identified as barriers to rapid economic growth faced by Benin, including electricity infrastructure and access. About 42% of Benin's households have access to electricity. This low rate, which is below Sub-Saharan Africa's average electrification rate of 47%, is compounded by deficiencies in quality of service. The proposed operation will support the Government's aspirations to scale-up electricity access by 2030. By meeting energy needs for agriculture and household user purposes, this project could improve socio-economic outcomes of rural areas in a profound manner.

¹² The CEB is the regional (Togo-Beninese) company that has been in charge of importing energy and distributing it to Benin and Togo utility companies from neighboring countries.

¹³ With Manitoba Hydro International

¹⁴ Notre Dame Global Adaptation Initiative Country Index, <https://gain.nd.edu/our-work/country-index/>

¹⁵ World Bank, 2018. Lifelines, the Resilient Infrastructure Opportunity, Global Facility for Disaster Reduction and Recovery (GFDRR)

¹⁶ Report Number 123031-BJ; July 5, 2018.



34. **The project would support the WBG COVID-19 policy response.** Increased access to electricity service would facilitate the delivering of digital/online education, and the mainstreaming of digital technologies during the recovery phase. It would also facilitate effective response to COVID-19 pandemic and future shocks. In addition, the project would help the Government to increase public expenditures toward electricity service.

35. **This program will also help meet the WBG twin goals of poverty reduction and shared prosperity, and it is aligned with the proposed LEAP program, which proposes that the Bank lead a global effort to ensure that Sub-Saharan African countries are on track to meet SDG7 and Sustainable Energy for All (SE4ALL) objective of universal access to reliable affordable and modern energy services.** Providing electricity connections will increase access to energy services for poor households in rural and urban areas enabling opportunities to study and work, contributing to raising the quality of life and improving agricultural activity and economic interaction. Increased access to reliable electricity supply will not only lower costs and improve the profitability of business enterprises but is also key to enabling the set-up of new private sector-led enterprises, which stimulates GDP growth.

C. Proposed Development Objective(s)

The PDO is to increase access to electricity services for households, enterprises, and selected public facilities in Benin.

Key Results (From PCN)

36. The following indicators have been selected to measure progress toward the PDO:
- PDO Indicator 1: people provided with access to electricity under the Program by household connections (number);
 - PDO Indicator 2: small and medium enterprises provided with new or improved electricity services (number) implemented under the Program (number);
 - PDO Indicator 3: public institutions (clinics, and/or schools, and/or administrative centers) provided with new or improved electricity service (Number).

D. Concept Description

37. The Benin PROSPERE study is currently the most elaborate GoB plan for grid extension and reinforcement. It has been developed based on existing data of Benin's population and SBEE's network, but it is not a GIS least-cost electrification plan or NES, which will replace it as the flagship document for electrification upon completion. The PROSPERE report nevertheless provides some insights on electrification priorities, which are likely to be reflected in the NES. Benin PROSPERE finds that there are 1,846 localities, 73 city districts, and 1,376 hamlets (areas with more than 200 households) that are still unelectrified, while accounting for projects currently under implementation. The PROSPERE plan has prioritized localities for electrification based on the following criteria: i) the distance of the locality to the existing SBEE grid (for those within 2km of the MV network); and ii) for the localities between 2km and 7km radius from the network, it has applied a formula that assesses the localities socio-economic potential based on a human development index (HDI). The HDI takes into account the health, education, and economic potential (the village's population and access to major



roads). Based on this criteria, it has identified 753 rural localities to prioritize for connection (547 villages and 206 hamlets of more than 200 people). In total, the program aims to electrify 1,122 localities, 753 rural and 369 localities urban and peri-urban. This will electrify around 142,000 households and 20,500 SMEs.

38. Geospatial least-cost planning tools have become best practice in electrification planning following their successful implementation in Kenya, Nigeria, and Rwanda. GIS least-cost plans provide a powerful tool to policy makers to balance efficiency in the use of limited public resources with the objective of providing equal opportunities to those living in areas far away from the existing grid. At the same time, geospatial plans allow for identifying communities that may require pre-electrification solutions in the short- to mid-term while waiting for higher service standard connections. The NES will provide a least-cost electrification model that includes: spatial characterization of population settlement concentrations, nucleation patterns, and indicative capex per new connections; least-cost options for grid-based densification and extension; least-cost options for isolated networks (mini-grids) and standalone systems; and a sensitivity analysis to demonstrate the robustness of these options. Based on these outputs, the Project will prioritize the areas based on the lowest cost per connection, taking into account other possible government priorities identified in PROSPERE such as electrifying specific health clinics.

39. The Project will support three components that aims at electrifying households, micro, small and medium enterprises, and selected public facilities located within 7km radius from the existing networks based on a sustainable electrification schemes that incorporates best practices, technical assistance and capacity reinforcement.

Component 1: On-grid electrification (US\$ 180 million IDA)

40. This component will finance the design, procurement of materials and construction works required to electrify all participating households and businesses in the project target areas with high population density, located close to existing electricity networks (in urban, peri-urban and rural areas). The northern regions of Benin, which face the highest energy access deficit in the country, will be one of the targeted areas for electrification. The northern regions are a strong candidate for electrification not only due to their clear needs, but also because recent and planned investments serve as a foundation for expanding the regions' distribution network. The final selection of the sites will be confirmed by the geospatial electrification tool (currently under development) based on a least cost approach. Between 175,000 and 200,000 households and businesses are estimated to be connected to be confirmed during project preparation phase. Two (2) approaches will be used:

- i. Grid densification investments: these are connections to households, enterprises, or public institutions that are near the existing network infrastructure of the SBEE. These connections mostly require short low voltage (LV) expansion, service drops, and meters and/or ready boards for households. The densification of the existing grid under this component will contribute to the monetization of the existing capital assets of SBEE.
- ii. Grid extension investments: connections for new customers who are located within 717km radius from the existing grids. These connections will require both medium voltage (MV) and LV extensions. Detailed network design for grid expansion will be informed by completion of the comprehensive geospatial least-cost rollout plan (under development). Least-cost technologies allowing to reach applicable levels on quality of service and safety in each type of area (urban, peri-urban, medium and low density rural) will be adopted to the largest possible extent to minimize life cycle cost of electrification projects.

¹⁷ This number is to be confirmed by the ongoing GIS/NES



41. The component will emphasize procurement of main equipment (transformers, cables and conductors, poles, meters and accessories, etc.) in bulk and independent contracts for project design and for construction and installation works following WB IPF procurement procedures to optimize effectiveness in the allocation of resources available by minimizing investment costs and, thus, maximizing the number of connections per dollar invested. The average total investment cost per connection would be less than US\$1200 based on the experience from similar World Bank-funded projects in the region.

Component 2: Policy, regulatory and operational strengthening actions to implement the national electrification strategy and related investment programs (US\$ 10 million IDA)

42. This component will support the implementation of key reforms necessary for the sustainability of electrification strategy and related investment programs. In addition, it will facilitate the development of the gender aspect in the energy sector.

43. On the policy area, support will be provided by Government to: (i) strengthening sector Ministry to define and lead implementation of electrification programs and plans defined by Government within the framework of the national electrification strategy; (ii) adopting a clear definition of “obligation to serve” areas where SBEE must attend requests for service connection and recover investment costs through tariff revenues; (iii) defining sources of funds for financing investments in new distribution networks and service connections which should be included in any electrification investment project and covering gaps between costs of efficient service delivery and ability to pay of connected users (increasingly important as electrification moves to areas where most of the population face significant affordability constraints); and (iv) establishing a policy for “connection charges or fees” to be paid by new users to ensure that those charges do not become barriers to electrification programs (households should be connected first and start paying affordable charges) and that amounts collected are (transferred to electrification fund or equivalent to be used to accelerate electrification..

44. On the regulatory area, the component would support the update of the electricity distribution code to: (i) set quality of service levels (acceptable values of SAIDI, SAIFI, etc.) in urban, peri-urban and rural areas, both for grid connected and off-grid supply; (ii) regulatory procedures for systematic measurement, monitoring and enforcement of quality of service levels to ensure sustainability of service delivery (extremely important in all cases but crucial to ensure sustainability of supply in rural areas with off-grid options); (iii) define optimum technical standards for electricity distribution networks in urban, peri-urban and rural areas (low cost technologies) to meet quality of service levels; (iv) metering arrangements for different categories of consumers; etc.

45. On the operational capacity area, the component will support the strengthening of the organizational structure of SBEE and ABERME to carry out investments in electrification programs. A strong Electrification Department within SBEE directly reporting to Managing Director, fully separate from units in charge of day to day operations to serve existing customers, should be created. Definition and implementation by Commercial Department of efficient processes to massively register connected households and businesses as customers has also paramount importance.

46. The Bank will discuss with the Government and other stakeholders during project preparation to determine appropriate Disbursement linked Indicators (DLIs) that will be used to incentivize the implementation of policy, regulatory and operational actions in the scope of this component.



Component 3: Technical Assistance and Implementation Support (US\$10 million IDA)

47. This component will finance technical assistance (TA) and capacity building activities and implementation support to ME, SBEE, ABERME, and ARE to ensure project sustainability and to facilitate the monitoring of the achievement of targeted results. The Bank will coordinate with other DPs to ensure complementarity on the activities to be supported under this component. Preliminary areas of support, to be confirmed during project preparation, include:

- a. Support for an effective implementation of the Geospatial planning tool with capacity building. In line with the ongoing geospatial electrification planning tool, organizational arrangements and capacity strengthening needs will be identified and addressed to maintain a comprehensive and updated national GIS database for a geospatial electrification planning in the future;
- b. Consumer awareness campaign and customer satisfactory survey: this subcomponent will finance the design and implementation of consumer education campaign and satisfactory survey for the provision of on-grid electricity services, safety measures and the efficient use of electricity.
- c. Support to project implementation through the hiring of specialized consultants to support implementing agencies in main procurement processes and supervision of construction works, undertake project external audit, to prepare environmental and safeguards instruments for the investments and supervise their implementation, including health and safety measures during construction. In addition, this support will include the hiring of technical experts to support the project management.
- d. Acquisition of vehicles necessary for the supervision of works and of implementation of the project safeguard measures and purchase of office equipment. Financing incremental operating costs for the PIU.

48. **Gender.** Energy is known to improve quality of life, promote gender equality, create employment and business opportunities for women. During preparation, a gender analysis will be carried out and drawn from various existing data sources. This analysis will form the basis of designing actions (e.g. soft financing for connection fees) and indicators to track gender equality and ensuring that poor households obtain access to energy services under the Program. In addition, the Program will build on the gender actions outlined under the existing Bank-financed projects related to strengthening the institutional capacity, enhanced access to finance for female beneficiaries to purchase energy technologies, gender-aware consumer education and awareness and the collection of sex-disaggregated information as part of the results tracking and monitoring system.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No
Summary of Screening of Environmental and Social Risks and Impacts	



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