Benin

Africa

Ease of doing Solar classification

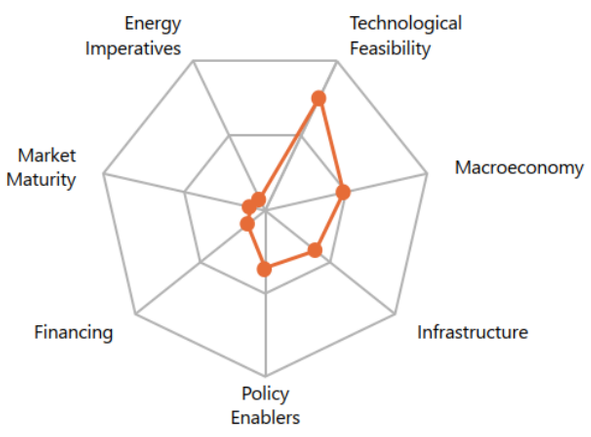
Progressive

Electricity Consumption in kWh/capita (2020)	Average PVout in kWh/kWp/day (2020)	Cumulative Solar Capacity in MW (2021)
19.0	**4.2**	**2.9**

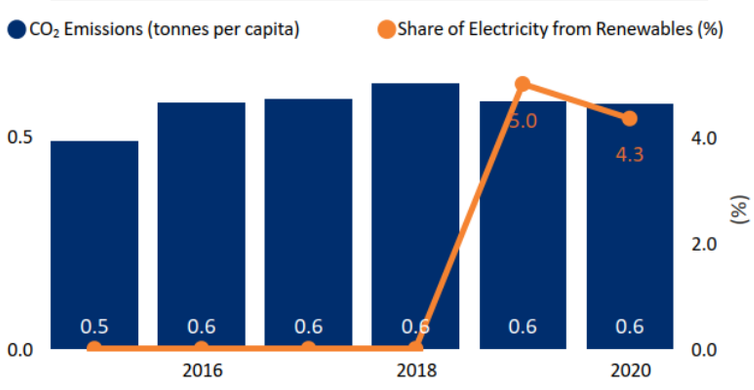
Getting Electricity Score (2020)	NDC Target by 2030 in % (base year 2005)	Human Development Index (2021)
33.8	**16.2**	**0.5**

Renewable Energy Generation by Source

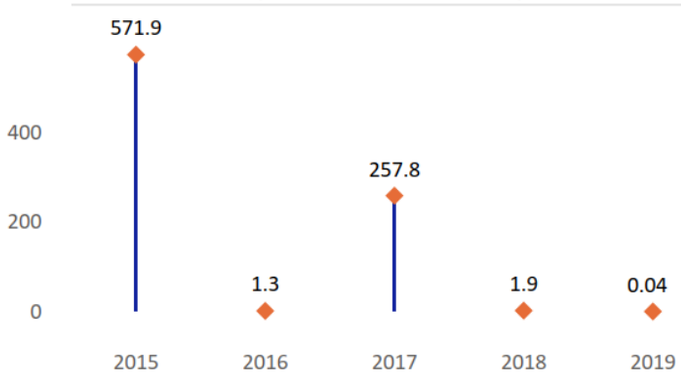
Performance against 7 Drivers



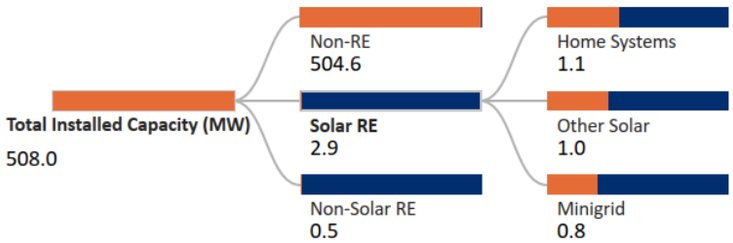
CO_2 Emissions vs Electricity share from Renewables



International Finance received for Clean Energy (Million US Dollars)



Installed Capacity by Source (2019)



Non-Solar RE: Wind, Hydro, Biomass, Geothermal & Marine;
Non-RE: Coal, Natural Gas, Nuclear, Oil, etc.;
Other Solar: Utility Scale Solar, Rooftop etc.;
Data not available for other Solar RE segments;

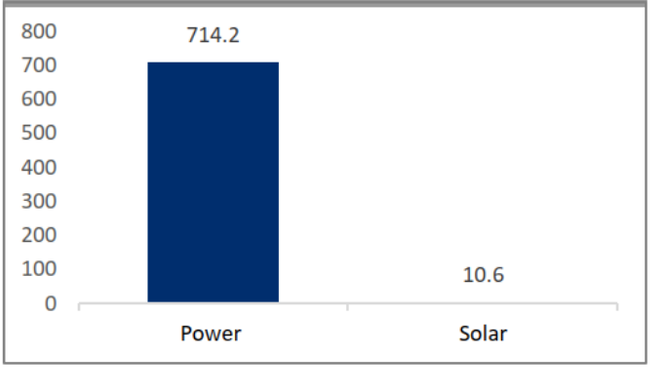
Support for Renewables (2020)

Feed-in-Tariffs for renewable energy supply to the grid?	Net metering/Gross metering policies and regulations?
No	**Yes**

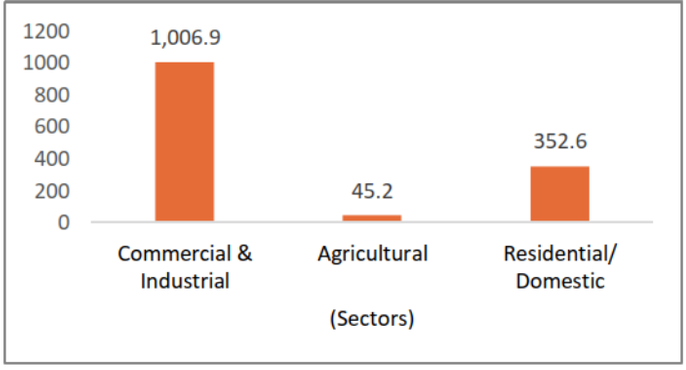
Renewable Energy Certificates?	Renewable Purchase Obligation?
No	**No**

Peak Demand in MW (2022)	Electricity Consumption CAGR in % (2022 - 2026)	Threshold for licensing Solar in MW (2018)
310.0	1.4	0.5

Electricity Generation in GWh (2022)



Electricity Consumption in GWh (2022)

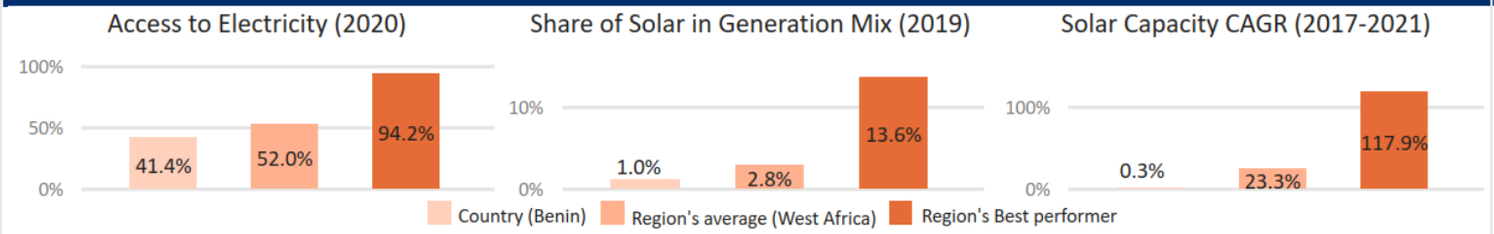


Financial Support Mechanisms (2021)	
Duty waivers to solar developers for importing/procuring material from foreign land	Yes
Tax waivers for manufacturers of raw materials (modules, off grid appliances, etc.)	No
Credit facilitation for solar energy from financial institutions (FIs)	Yes
Viability Gap Funding (VGF) i.e. Grant to support RE projects that are economically justified but fall short of financial viability	No
Accelerated Depreciation benefit for Industrial/commercial users of Solar Power	No

Policies/Schemes for Solar Segments (2021)								
Rooftop Solar	Solar Mini Grids	Standalone solar systems	Utility scale solar	Solar Parks	Floating Solar	Solar heating and cooling system	Battery waste manage ment	Green Hydrogen
Yes	Yes	Yes	Yes	No	No	Yes	Yes	No

Emerging Technologies/Innovative Models (2021)	
Hybrid technologies - combination of two or more technologies to achieve efficient systems (Example: wind + solar PV hybrid systems, solar + storage systems)	Yes
Emerging technologies - the next generation technologies (Example: Artificial Intelligence, Machine learning, Internet of Things, etc.)	Yes
E-mobility/Electric vehicles	Yes

Country's regional performance and characteristics



Areas of Strength: Macroeconomy; Technological Feasibility

Areas of Improvement: Energy Imperatives; Market Maturity

Key Insights

Drivers	Insights
Macro-economy	•Benin is a lower middle-income country[1] having GDP per capita (PPP) of USD 3,649 as of 2021[2] with agriculture (27.1% of GDP) and service sector (48% of GDP) as the dominant contributors to the economy.[3] •GDP (Real) grew at an annual rate of 6.6% in 2021 and it is estimated to grow by 5.9% in 2022.[4] •Total public debt in the country increased to 47.2% of GDP in 2021 from 46.1% levels in 2020.[5] •Inflation rate in the country decreased to 1.7% in 2021 from 3% levels in 2020.[6]
Policy enablers	•Ministry of Energy is responsible for formulating and implementing national energy policy and regulations.[7] •Benin aims to reduce its GHG emissions to 16.17% over the period 2021 to 2030.[24] •The Interprofessional Association for Renewable Energy Specialists (AISER) is an association mandated with development of RE in Benin.[8] •Benin targets to increase the share of solar to 35% of the energy mix by 2030.[24] •The National Fund for Environment and Climate (FNEC) is a funding mechanism for promoting sustainable development in Benin.[9]
Technological Feasibility	•The country receives high levels of solar irradiation of 5.3 kWh/m²/day and specific yield of 4.2 kWh/kWp/day indicating a high technical for solar in the country.[10] •The country typically receives 7 hours of sunlight per day.[24] •Engie Energy access operation aims at facilitating energy access for households and micro-entrepreneurs by financing the design, production, distribution, installation, and payment plans for 107,000 solar home systems in 2022.[11]
Market Maturity	•Electricity Community of Benin (CEB) handles production, distribution, and importation of electricity in both Togo and Benin.[13] •Benin Agency for Rural Electrification and Energy Control (ABERME) is the energy regulator and is responsible for rural energy supply across Benin.[13] •The Benin National Electrification Strategy (SNE) aims to achieve universal access to electricity by 2030.[14]
Infrastructure	•The distribution network consists of 13 substations of 30/6.6 kV, 7,627 km of MV lines (at 6.6 kV and 30 kV), 6,761 km of low voltage lines and 3,511 MV/LV substations.[15] •Benin imports electricity from Nigeria, Cote d'Ivoire, and Ghana through the Benin Electricity Community (CEB).[16] •The country's average distribution loss levels in power sector is 21% in 2021.[24] •Benin's expected investment in the Transmission & Distribution Infrastructure over next 5 years (2022-2026) is USD 15.74 Mn.[24]
Financing	•In 2022, the EIB has agreed to provide a EUR 10 Mn loan to support the deployment of 107,000 high-quality solar home systems to Benin.[17] •The International Development Association (IDA) supported the Government of Benin with a credit of $ 52.7 Mn. Also, Global Environment Facility (GEF) granted $ 1.8 Mn under the Increased Access to Modern Energy Project (IAME).[18] •In 2021, the World Bank approved $100 Mn investment to support the Government of Benin for improving access to reliable and sustainable energy and improve fiscal and debt management.[19]
Energy Imperatives	•The total installed capacity in the country was 508 MW in 2019.[20] •In 2020, the per capita electricity consumption stood at 0.019 MWh which is significantly lower in comparison to the global average of 3.31 MWh.[22] •The price of electricity in the country is 19.6 US Cents/kWh as of 2019.[23]