Paraguay

Latin America & Caribbean

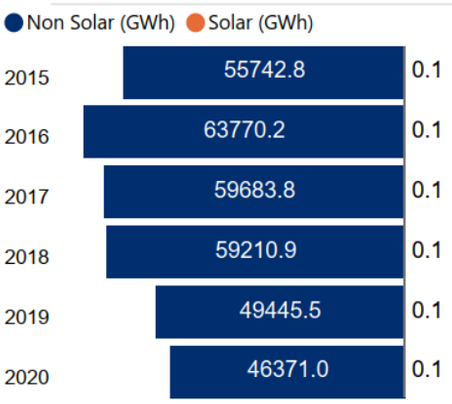
Ease of doing Solar classification

Influencer

Electricity Consumption in kWh/capita (2020)	Average PVout in kWh/ kWp/day (2020)	Cumulative Solar Capacity in MW (2021)
6917.6	4.3	0.1

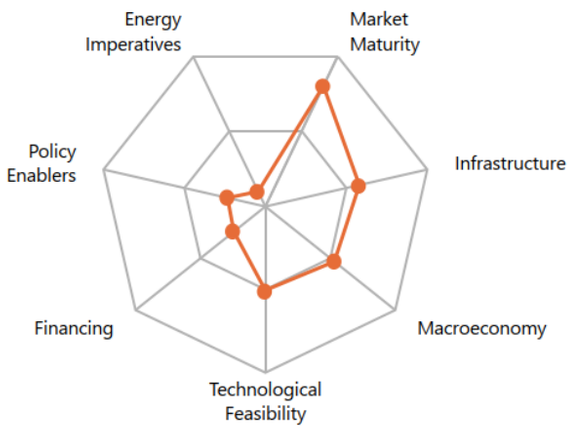
Getting Electricity Score (2020)	NDC Target by 2030 in %	Human Development Index (2021)
70.4	20.0	0.7

Renewable Energy Generation by Source

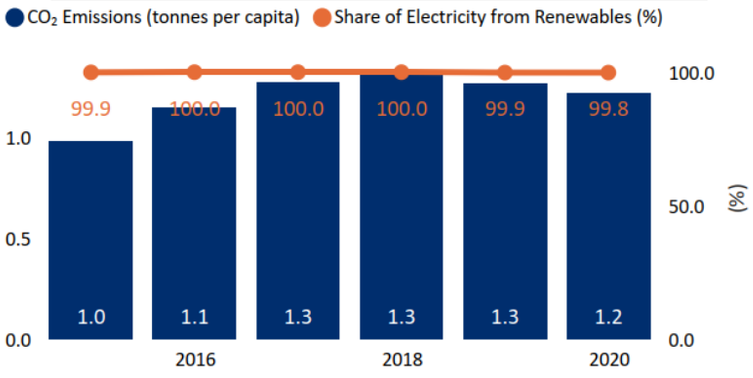


Non Solar RE includes Wind and Hydro;

Performance against 7 Drivers



CO_2 Emissions vs Electricity share from Renewables



Fiscal Incentives & Public Financing for Renewables (2020)

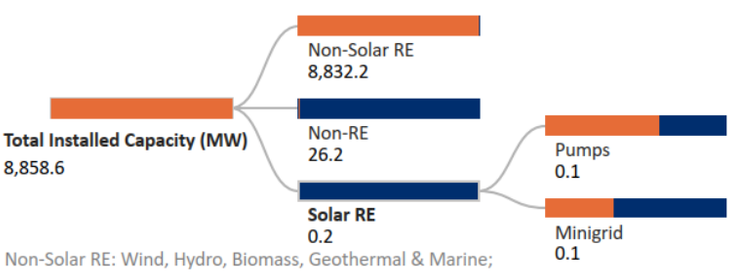
Investment or production tax credits?

No

Public investment, loans, grants, capital subsidies or rebates?

No

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?

No

Net metering/Gross metering policies and regulations?

No

Renewable Energy Certificates?

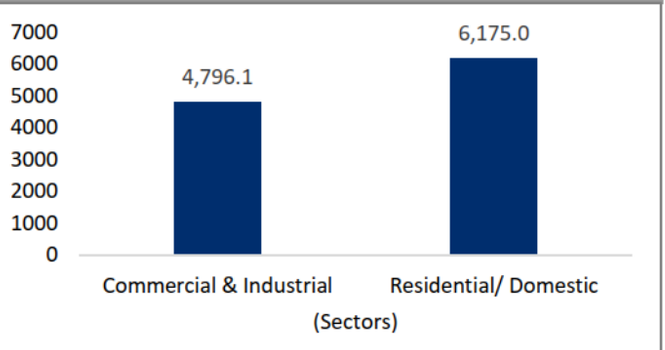
No

Renewable Purchase Obligation?

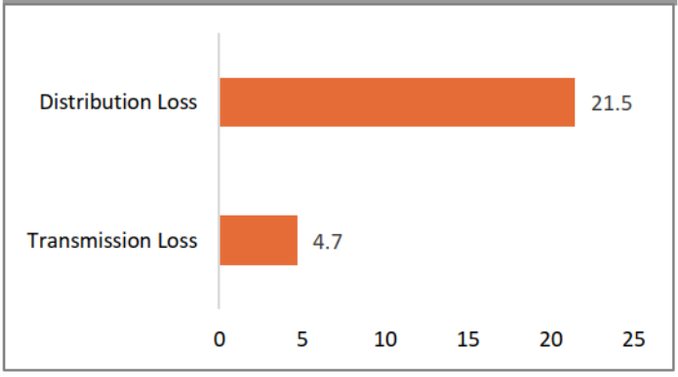
No

Peak Demand/Load in GW (2021)	Electricity Consumption CAGR in % (2022 - 2026)	Diesel based Electricity Generation in GWh (2021)
3.7	31.0	2.0

Electricity Consumption in GWh (2021)



Average T&D Loss Levels in % (2021)



Accessibility to Payment Mechanisms for purchase of Solar Products (2021)	
Mobile application based online transactions	Yes
Digital E-wallets	Yes
Cash-on-delivery	Yes

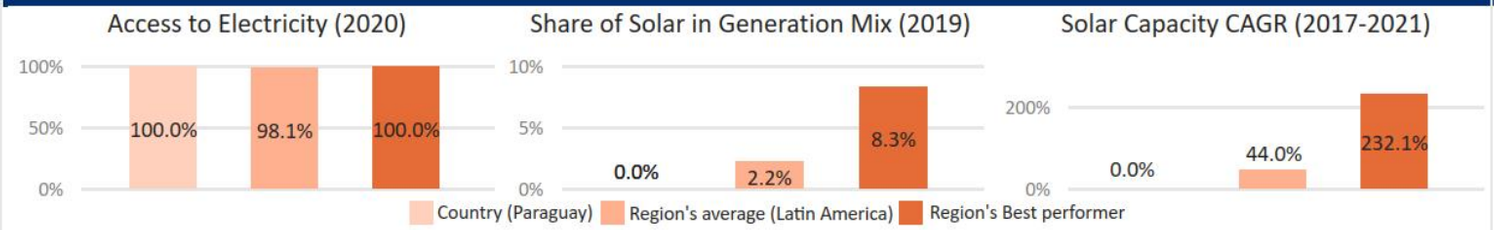
Financial Support Mechanisms (2021)	
Tax waivers for manufacturers of raw materials (modules, off grid appliances, etc.)	No
Viability Gap Funding (VGF) i.e. Grant to support RE projects that are economically justified but fall short of financial viability	No
Credit facilitation for solar energy from financial institutions (FIs)	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
No	No	No	No	No	No	No	No	Yes

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)	No
Emerging technologies - the next generation technologies (Example: Artificial Intelligence, Machine learning, Internet of Things, etc.)	No
E-mobility/Electric vehicles	Yes

Country's regional performance and characteristics



Areas of Strength → Infrastructure, Market Maturity

Areas of Improvement → Energy Imperatives, Policy Enablers

Key Insights

Drivers	Insights
Macro-economy	• Paraguay is an upper middle-income country with a GDP per capita (PPP) of USD 15,037 in 2021.[1,2] • Due to COVID-19 Pandemic, the GDP (Real) has contracted by 0.8% in 2020. However, in 2021, the GDP has bounced back with an annual growth rate of 4.2%.[1] • The inflation rate (CPI) of the country has increased to 4.8% in 2021 from 1.8% levels in 2020.[1] • The general government gross debt to GDP has reached 37.0% in 2021 from 36.9% levels in 2020.[1]
Policy enablers	• By 2030, the country aims to have a 5% share of solar energy in the generation mix.[6] • The Vice Ministry of Mines and Energy (VMME) has released a conceptual framework in 2021 outlining guidelines for encouraging green hydrogen development for the country's long-term socio-economic growth.[9] • Duty waivers for solar developers importing/purchasing material are available in the country to support the growth of solar projects.[6]
Technological Feasibility	• Paraguay receives high levels of solar irradiation (GHI) of 5.1 kWh/m^2/day and specific yield 4.3 kWh/kWp/day indicating a strong technical feasibility for solar in the country.[3] • In 2021, 100% of the country's power demand was met through RE sources.[4]
Market Maturity	• 100% of the population in Paraguay is having access to electricity since 2019.[4] • The energy mix of the Republic of Paraguay is dominated by clean energy sources, where hydropower accounts for the largest share of the country's power generation representing ~99.5% of the installed power capacity.[7] • The power sector is vertically integrated but lacks an independent regulator. The nation's street lighting and electricity generation, transmission, and distribution are all under the jurisdiction of National Electricity Administration (ANDE).[7]
Infrastructure	• Between 2022 and 2026, Paraguay plans to invest USD 2,940.63 Mn in the transmission and distribution sector for its upgradation to meet future demand and enhance quality of electricity supply.[6] • The nation has reported distribution losses of 21.48% and it intends to boost the distribution infrastructure by constructing additional feeders and increasing sub-station capacity to 1,752 MVA by 2025.[6,9] • The country's transmission network operates at voltage level of 66 kV and higher with installed line lengths totalling 6,901 ckm operating at loss levels of 4.72%.[6,7]
Financing	• The IDB approved a USD 260 Mn loan in March 2022 supporting Paraguay's National Development Plan 2030 by expanding the electrical transmission infrastructure thus enhancing the reliability and quality of electricity supply.[8] • Since 2017, the nation has received more than USD 1.12 Bn in grants and loans from numerous international lending institutions including JICA, IDB, CAF, UNDP, and GCF. [7]
Energy Imperatives	• In 2020, the per capita electricity consumption stood at 6.92 MWh, which is significantly higher in comparison to the global average of 3.31 MWh.[4] • The demand for electricity in the country has increased to 49.34 TWh in 2021 from 17.59 TWh levels in 2020.[4] • In 2021, the total installed capacity in the country stood at 8.86 GW with a significant share coming from hydro (99.4%) followed by fossil fuels (0.3%) and bioenergy (0.2%).[4]