



United States of America

Ease of doing Solar classification



Achiever

Europe and others

Electricity Consumption
in kWh/capita (2020)

12904.1

Average PVout in kWh/
kWp/day (2020)

4.4

Cumulative Solar Capacity in MW
(2021)

93713.0

Getting Electricity Score (2020)

82.2

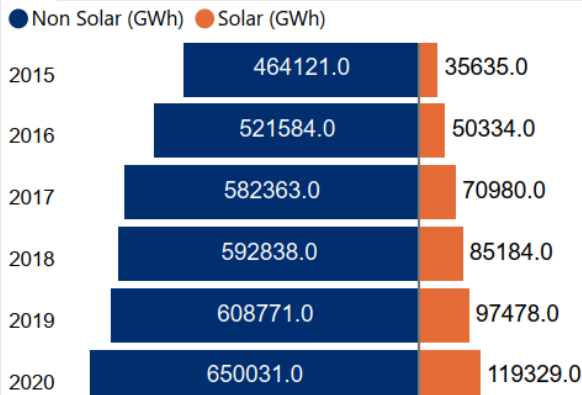
NDC Target by 2030 in %
(base year 2005)

50.0 to 52.0

Human Development Index (2021)

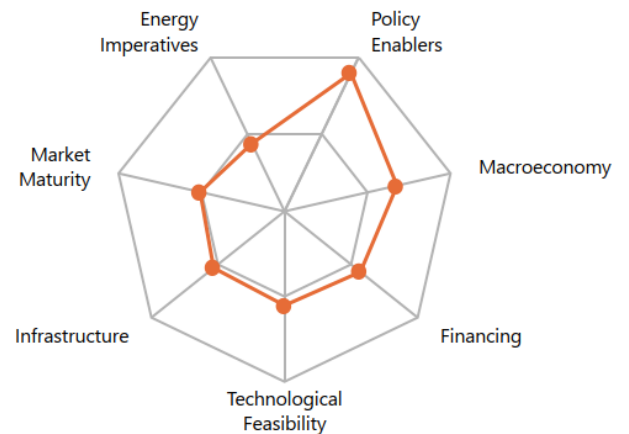
0.9

Renewable Energy Generation by Source

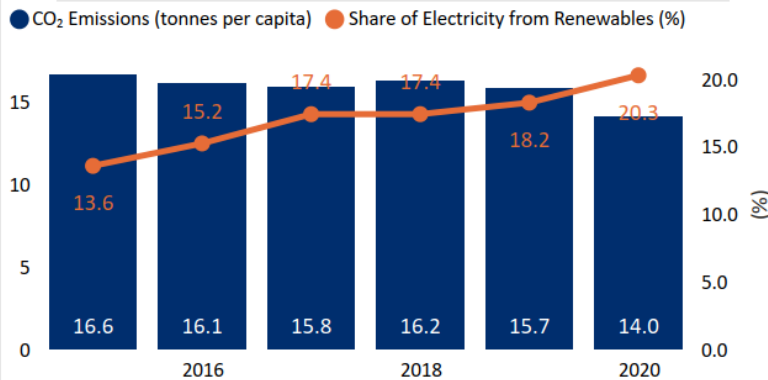


Non Solar RE includes Wind and Hydro;

Performance against 7 Drivers



CO₂ Emissions vs Electricity share from Renewables



Fiscal Incentives & Public Financing for Renewables (2020)

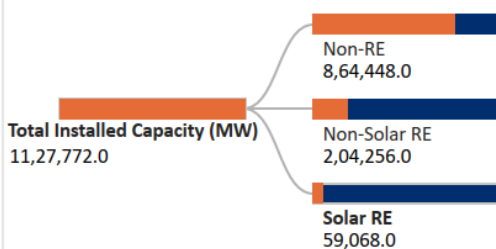
Investment or production tax credits?

Yes

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

Yes

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?

Yes

Net metering/Gross metering
policies and regulations?

Yes

Renewable Energy Certificates?

Yes

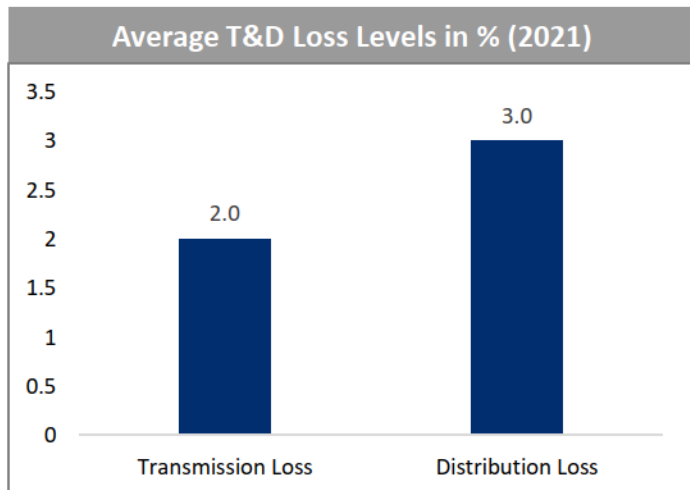
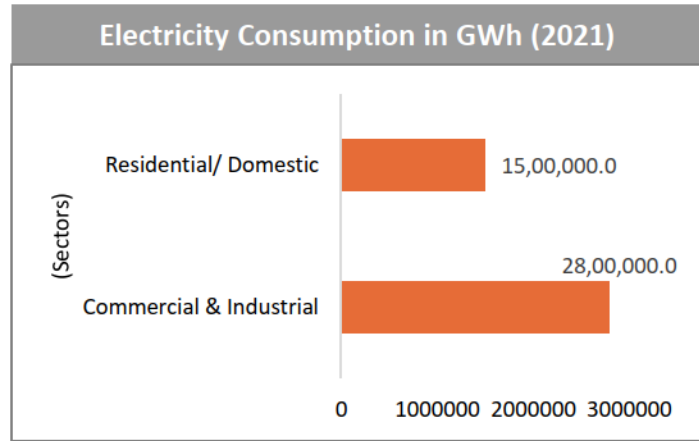
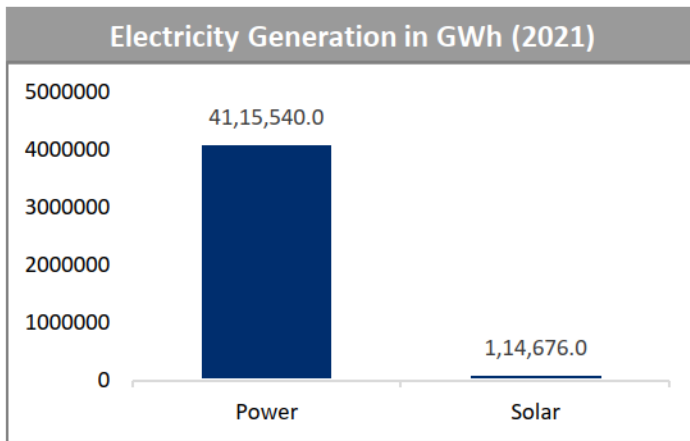
Renewable Purchase Obligation?

Yes

Peak Demand/Load in TW (2021)
1.1

Cost of Electricity Storage in USD/kWh (2021)
500.0

Electricity Consumption CAGR in % (2022 - 2026)
2.0



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.)	Yes
Viability Gap Funding (VGF) i.e. Grant to support RE projects that are economically justified but fall short of financial viability	Yes
Generation based incentives for Renewable energy generation	Yes

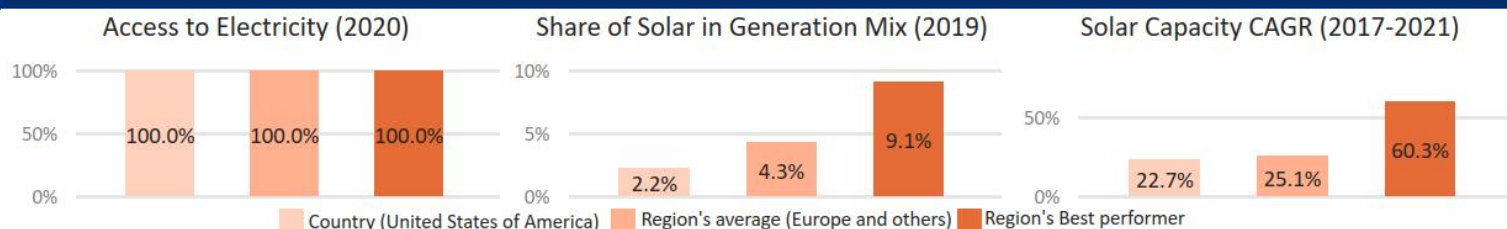
Policies/Schemes for Solar Segments (2021)

Rooftop Solar	Solar Mini Grids	Standalone solar systems	Utility scale solar	Solar Parks	Floating Solar	Solar heating and cooling system	Battery waste management	Green Hydrogen
Yes	No	No	Yes	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)	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

Policy Enablers

Areas of Improvement

Energy Imperatives

Market Maturity

Key Insights

Drivers

Insights



Macroeconomy

- The United States of America (USA) is a high-income country ¹ with a GDP per capita (PPP) of USD 69,288 in 2021.²
- Due to COVID-19 Pandemic, the GDP (Real) had declined by 3.4% in 2020. However, in 2021, it has bounced back growing at a rate of 5.7%.³
- The inflation rate (CPI) of the USA has increased to 4.7% in 2021 from 1.2% levels in 2020.⁴
- The general government gross debt to GDP has slightly reduced to 128.1% in 2021 from 134.5% levels in 2020.⁵



Policy enablers

- The country has targeted to cut its carbon emissions by 50-52%, below 2005 levels, by 2030.⁶
- The country has set an ambitious target to install an average of 30 GW of solar capacity per year between 2022 and 2025 and 60 GW per year from 2025-2030.⁷
- The country has arrangements for feed-in-tariff policy in place to encourage deployment of RE sources.⁸
- USA also has policy on rebates for purchasing RE equipment, and tax incentives for RE sources.⁸



Technological Feasibility

- USA receives high solar irradiation (GHI) of 4.5 kWh/m²/day and a specific yield 4.4 kWh/kWp/day indicating a high technical feasibility for solar in the country.⁹
- The country typically receives 12 hours of sunlight per day.¹²
- USA has a Battery energy storage system (BESS) capacity of 4.6 GW mostly used for services like arbitrage, load management, and reducing power losses from curtailment.¹⁰
- In Nov. 2021, Doral Renewables announced USA's largest solar park in Indiana spreading across 13,000 acres with a capacity of ~1.3 GW which is planned to be operational by 2024.^{11, 28}



Market Maturity

- The Federal Energy Regulatory Commission (FERC), that has been empowered by the Federal Power Act, regulates interstate transmission of electricity, natural gas, and oil, and regulates hydropower projects and natural gas terminals.¹⁴
- FERC had issued an order 2000 which calls for power utilities to form Regional Transmission Organization (RTO) to manage and operate the country's power transmission system.¹⁶



Infrastructure

- USA's transmission network increased from 601,031 ckms to 672,898 ckms over the decade and it is expected to reach 706,044 ckms by 2025.¹⁸
- USA's transmission system operates at 600 kV, 400-599 kV, 300-399 kV, 200-299 kV and 100-199 kV voltage levels.¹⁸
- USA's distribution network spread has increased from 9,381,835 ckms to 10,830,658 ckm over the decade and it is expected to reach 11,962,156 ckm by 2025.¹⁸
- USA has cross border trading of electric power from Canada and Mexico.¹⁹



Financing

- The U.S. Department of Energy (DOE) and Solar Energy Technologies Office (SETO) supports funding opportunities on photovoltaics, concentrated solar-thermal power, systems integration, technology to market, and solar costs projects.²⁰
- In 2021, the USA government has passed a USD 550 Bn fund for Clean Energy Investment.²¹
- USA's Energy Efficiency & Renewable Energy (EERE) has a dedicated investment to support decarbonization across all sectors.²²
- In 2021, the USA invested USD 8 Bn to support the development of clean hydrogen.²³



Energy Imperatives

- In 2020, the per capita electricity consumption stood at 12.90 MWh in USA, which is significantly higher in comparison to the global average of 3.31 MWh.²⁴
- The peak demand for electricity in the country stood at 4149.86 TWh in 2021 and 4,009.27 TWh in 2020.²⁷
- In 2021, the total installed capacity in the country stood at 1229 GW with a significant share coming from gas (43%) followed by coal (18.35%), wind (10.80%), nuclear (8.12%), hydro (6.50%) and solar (7.74%).^{27, 26}