Luxembourg

Europe and others

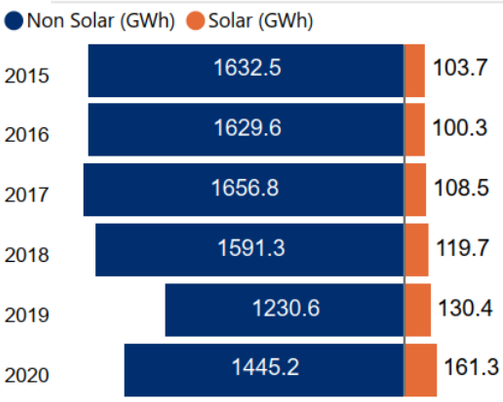
Ease of doing Solar classification

Influencer

Electricity Consumption in kWh/capita (2020)	Average PVout in kWh/ kWp/day (2020)	Cumulative Solar Capacity in MW (2021)
1958.4	**2.9**	**208.6**

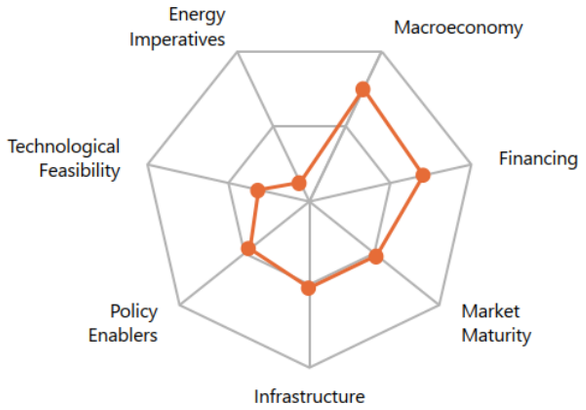
Getting Electricity Score (2020)	NDC Target by 2030 in % (base year 1990)	Human Development Index (2021)
84.3	**55.0**	**0.9**

Renewable Energy Generation by Source

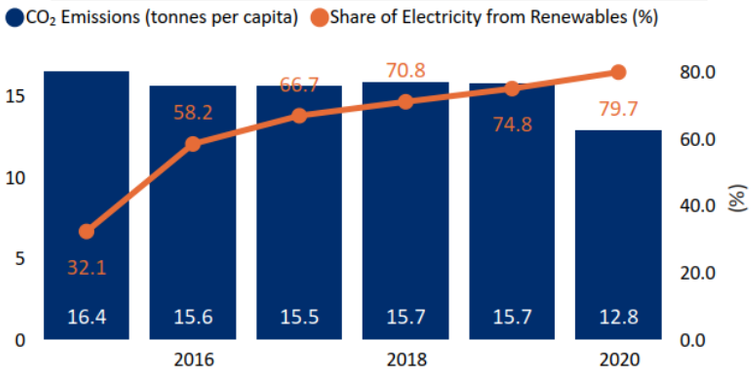


Non Solar RE includes Wind and Hydro;

Performance against 7 Drivers



CO_2 Emissions vs Electricity share from Renewables



Fiscal Incentives & Public Financing for Renewables (2020)

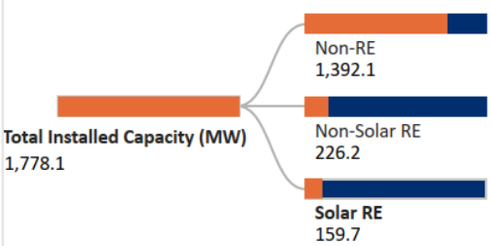
Investment or production tax credits?

No

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

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?

No

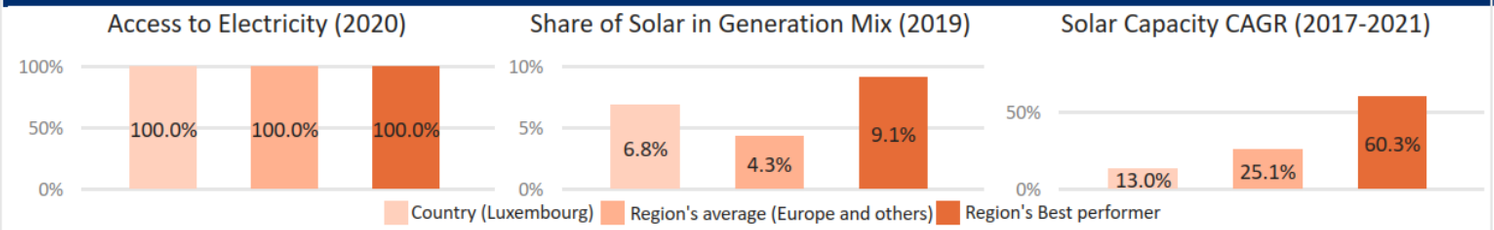
Renewable Energy Certificates?

No

Renewable Purchase Obligation?

No

Country's regional performance and characteristics



Areas of Strength → Financing, Macroeconomy

Areas of Improvement → Energy Imperatives, Technological Feasibility

Key Insights

Drivers	Insights
Macro-economy	• Luxembourg is a high-income country with a GDP per capita (PPP) of USD 133,330 in 2021. [1, 2] • Due to COVID-19 Pandemic, the GDP (Real) had declined by 1.8% in 2020. However, in 2021 GDP has bounced back by growing rate at 6.9%. [3] • The inflation rate (CPI) of Luxembourg has increased to 3.5% in 2021 from 0.1% levels in 2020.[4] • The general government gross debt to GDP has marginally decreased to 24.3% in 2021 from 24.8% levels in 2020. [5]
Policy enablers	• Luxembourg has set an ambitious target to reduce GHG emissions to 50-55% by 2030 from 2005 levels, and achieve a carbon neutral economy by 2050.[6] • Luxembourg has adopted a draft Grand-Ducal regulation extending the 'Clever fueren' financial aid scheme until March 2022 to promote e-vehicles, hydrogen fuel cells and hybrid vehicles.[7] • Luxembourg's National Energy and Climate Plan (NECP) has set an objective of achieving a 23-25% contribution from RE in the gross energy consumption by 2030.[8]
Technological Feasibility	• Luxembourg receives moderate solar irradiation (GHI) of 3.0 kWh/m^2/day and specific yield 2.9 kWh/kWp/day indicating a moderate technical feasibility for solar in the country.[9] • Firm ArcelorMittal Differdange has installed floating solar projects in Luxembourg capable of generating 3 GWh of electricity annually and catering the demand for about 3,200 people.[10] • Luxembourg had targeted to achieve 95% of electricity meters to be smart meters by the end of 2019 to allow consumers to become a prosumer.[11]
Market Maturity	• The Institut Luxembourgeois de Régula on (ILR) is Luxembourg's regulatory authority that regulates the transmission and distribution of electricity and natural gas.[13] • In Luxembourg EPEX SPOT is the leading exchange for providing a platform to buy, sell, trade electricity, secure transactions, and facilitate auction services.[14] • Luxembourg's Creos Luxembourg S.A. is the transmission system operator (TSO) and the largest distribution system operator (DSO) operating in the country.[15]
Infrastructure	• Luxembourg has a strong transmission network comprising a total length of 9,783 kms of transmission network with voltage levels (220 kV, 65 kV and 20 kV). [16] • Luxembourg has 2,657 transformer sub-stations capable of handling almost 5,132 GWh of energy for approximately 2,70,000 customers.[16] • Luxembourg has cross border electricity trading arrangements with Germany and Belgium.[16]
Financing	• Luxembourg Stock Exchange has 133 green bonds worth USD 62.9 Bn which are entirely dedicated to green, social, and sustainable financial instruments.[17] • Luxembourg government and the EIB have created new channels of private investments to provide financing for the climate and environmental emergency.[18]
Energy Imperatives	• In 2020, Luxembourg's per capita electricity consumption stood at 1.95 MWh, which is significantly lower in comparison to the global average of 3.31 MWh.[19] • In 2021, the total installed capacity in the country stood at 1.83 GW with a significant share coming from bioenergy (27.61%) followed by wind (25.37%), solar (17.91%), gas (14.93%), hydro (8.96%) and fossil fuel based electricity (5.22%). [21, 22] • The cost of electricity per kWh is US Cent 21.8 for households and US Cent 12.9 for business.[23]