



Sudan

Africa

Ease of doing Solar classification



Progressive

Electricity Consumption in kWh/capita (2020)

318.4

Average PVout in kWh/kWp/day (2020)

4.9

Cumulative Solar Capacity in MW (2021)

135.9

Getting Electricity Score (2020)

51.3

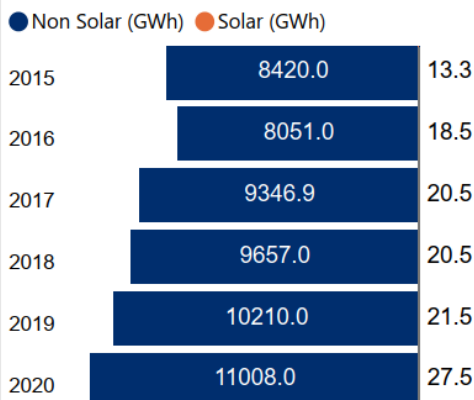
NDC Target by 2030 in MtCO₂e

10.2

Human Development Index (2021)

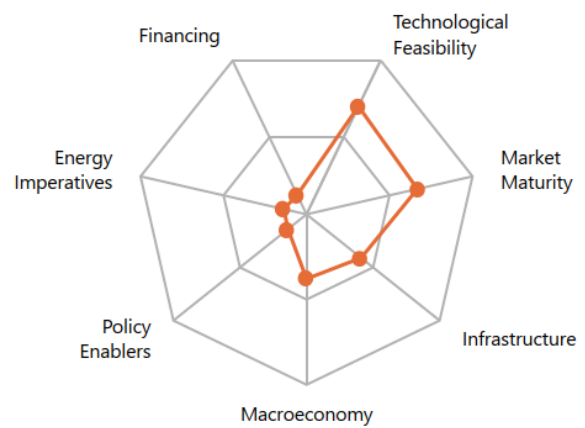
0.5

Renewable Energy Generation by Source

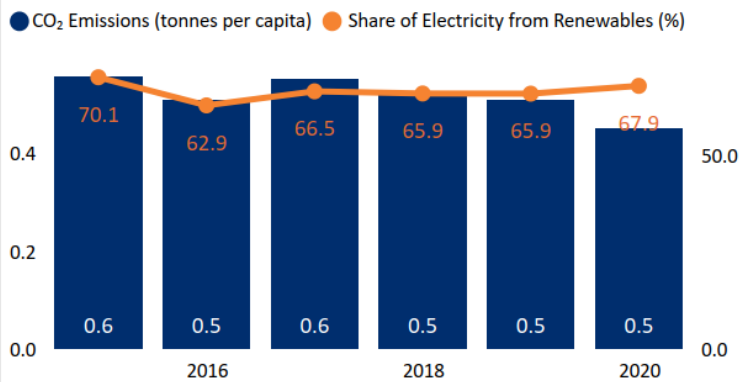


Non Solar RE includes Wind and Hydro;

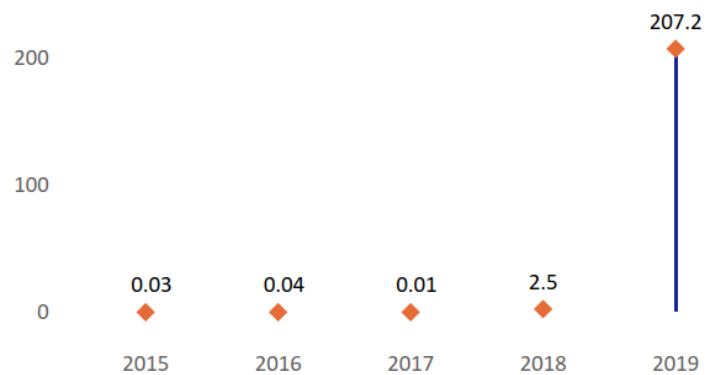
Performance against 7 Drivers



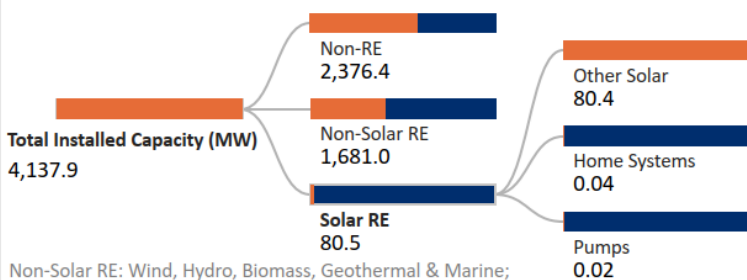
CO₂ Emissions vs Electricity share from Renewables



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?

No

Net metering/Gross metering policies and regulations?

No

Renewable Energy Certificates?

No

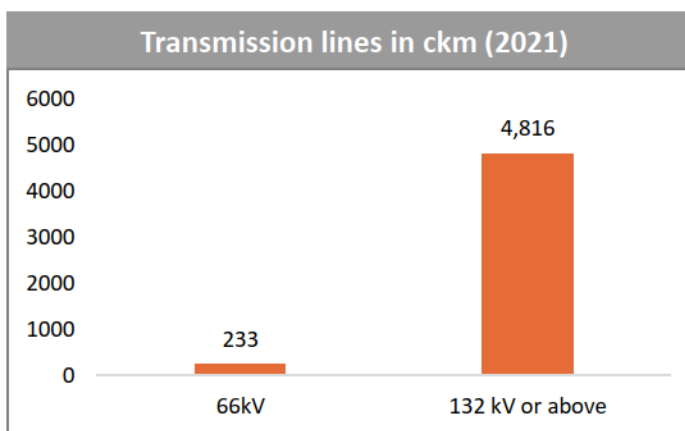
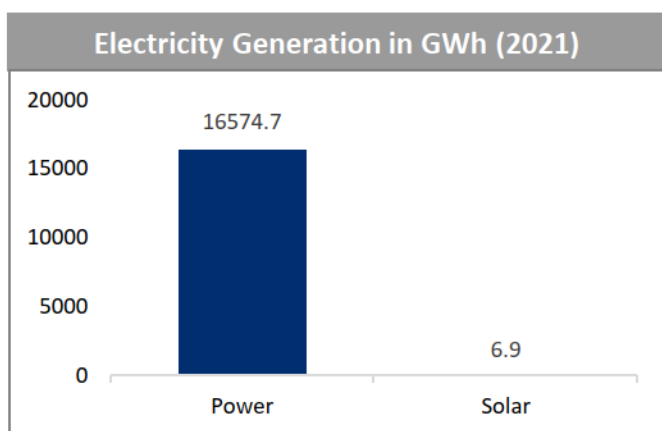
Renewable Purchase Obligation?

No

Peak Demand/Load in GW (2021)
13.3

Cheapest Source of Power (2021)
Hydro

Generation Cost for Hydro Power in USD/ kWh (2021)
0.035

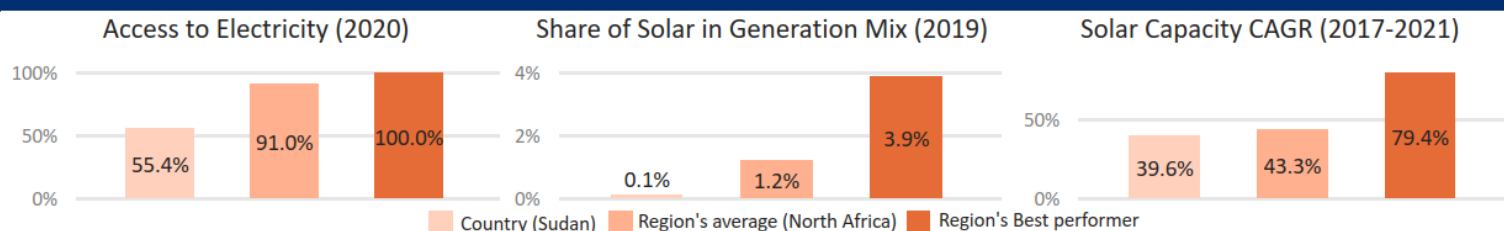


Financial Support Mechanisms (2021)	
Duty waivers to solar developers for importing/procuring material from foreign land	No
Tax waivers for manufacturers of raw materials (modules, off grid appliances, etc.)	No
Credit facilitation for solar energy from financial institutions (FIs)	No
Viability Gap Funding (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 management	Green Hydrogen
No	Yes	Yes	Yes	No	No	No	No	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)	No
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

Market Maturity
Technological Feasibility

Areas of Improvement

Energy Imperatives
Financing

Key Insights

Drivers

Insights



Macro-economy

- Sudan is a low-income country¹ with a GDP per capita (PPP) of USD 4,066 in 2021.²
- GDP (Real) grew at an annual rate of 0.5% in 2021 and it is estimated to grow by 0.3% in 2022.³
- The inflation rate in the country has drastically increased to 358.9% in 2021 from 163.3% levels in 2020.⁴
- The fiscal deficit in the country reduced to 4.5% of GDP in 2021 from 5.6% levels in 2020.⁴



Policy enablers

- Ministry of Water Resources, Irrigation and Electricity (MoWRIE) is responsible for approving policies and regulations for power generation, transmission, and distribution.⁵
- Sudan targets to increase the share of solar in the overall generation mix to about 15% by 2026.⁶
- According to Sudan's strategic plan (2021-2035), the targeted renewable energy installed capacity is slated to reach 4.405 GW by 2030.⁶
- In Sudan, the National PV Fund aims to finance 400 solar pumps and it is planned to scale up the financing further in the near future.⁷



Technological Feasibility

- Sudan receives very high levels of solar irradiation of 6.1 kWh/m²/day and a specific yield of 4.9 kWh/kWp/day indicating a very strong technical feasibility for solar in the country.⁸
- The country typically receives 9 hours of sunlight per day.⁶



Market Maturity

- 55.4% population in Sudan had access to electricity as of 2020.⁹
- Sudanese Electricity Transmission Company (SETCO) is responsible for the management, maintenance, and operation of the power transmission system and for supervising the construction of transmission infrastructure.⁵
- Sudanese Electricity Distribution Company (SEDC) is responsible for power distribution, managing the national distribution grid and some isolated grid systems.⁵
- Sudan is a member of the Eastern African Power Pool (EAPP) which aims to optimize the available energy resources and reduce electricity costs in the region.¹⁰



Infrastructure

- SETCO operates the transmission network of 33 kV Mono and Dual Circuit lines and Sub-Station of 33/11 kV.¹¹
- As of 2021, the transmission network in Sudan comprises of 922.7 of 110 kV lines, 4196 kms of 220 kV lines and 619 kms of 500 kV lines.⁶
- SEDC constructs and supervises the distribution networks of less than 1.5 MVA loads and distributes electricity at 33 kV, 11 kV, and 415 V voltage levels.¹¹
- As of 2019, Sudan is an active member of EAPP and has 200 MW of operational interconnections with Ethiopia at 220 kV and Eritrea at 66 kV levels.⁵



Financing

- In 2022, the African Development Fund approved a USD 5.5 Mn grant to initiate the flagship 'Desert to Power initiative' in Sudan.¹²
- The AfDB approved a USD 21.78 Mn grant to the government of Sudan to promote the adoption of solar-powered irrigation pumps in the country.¹³



Energy Imperatives

- In 2020, Sudan's per capita electricity consumption stood at 0.32 MWh, which is significantly lower in comparison to the global average of 3.31 MWh.¹⁵
- Out of the total electricity generation of 16,574 MUs, solar electricity generation contributed only 6.85 MU in 2021.⁶
- The total installed capacity of solar PV witnessed a CAGR of 39.6% reaching 135.86 MW in 2021 from 35.8 MW levels in 2017.¹⁴
- As of 2021, the installed capacity of solar mini grids in the country stood at 5 MW.⁶
- The average solar tariff in Sudan is 0.038 USD/kWh in 2021.⁶