



Libya Solar Report

Prepared by J.v.G. Technology GmbH

J.v.G. Technology GmbH is a German engineering company specializing in turnkey solar module production lines and manufacturing consulting, with project experience ranging from 20 MW to 500 MW per production line, including multi-line and gigafactory projects exceeding this scale.

This Solar Report is part of the **PVKnowHow** Knowledge Network.
The data, analysis, and conclusions in this document are based on real research, consulting insights, and international solar market data.

Disclaimer: This document represents an independent market and manufacturing analysis. It is provided for informational and educational purposes only and does not constitute a commercial offer, binding proposal, or contractual commitment.

Gain comprehensive insights into the statistics and metrics surrounding the solar production industry in Libya

KEY POINTS

All figures have been converted into USD



Yearly sunshine (sun hours per year)

Yearly Sunshine:

- Average annual sunshine hours: 3000 hours
- Peak sun hours: 5 hours/day



kWh per kWp installed

kWh per kWp:

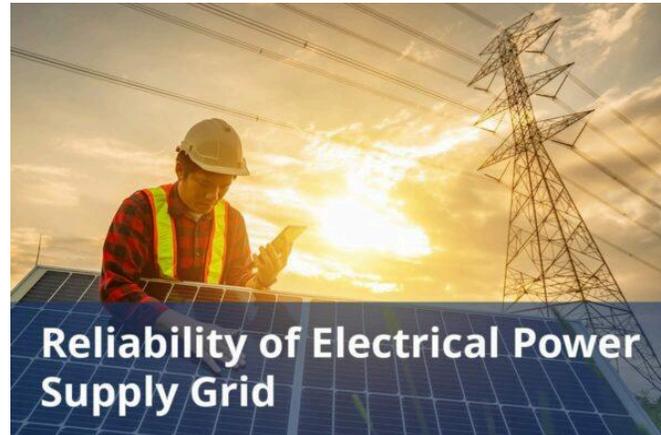
- Standard expected yield: 1200 kWh/kWp/year



Average cost per kWh from utility company

Average Cost Per kWh:

- Residential electricity price: \$0.135/kWh
- Commercial electricity price: \$0.120/kWh
- Industrial electricity price: \$0.100/kWh



Reliability of electrical power supply grid

Reliability:

- System reliability: 99%
- Expected lifespan of solar panels: 25 years



DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total Solar Panels Installed:

- Total panels in 2022: 1 million
- Total capacity: 10 GW

Total solar panel production capacity (projected)

Total Solar Panels Projected:

- Expected installations by 2025: 1.5 million
- Expected capacity: 15 GW

Average costs of various electricity generation sources (coal, natural gas, solar, etc)

Average Costs:

- Average installation cost: \$3000/kW
- Maintenance cost: \$20/year per kW

Percentages of various electricity generation sources (coal, natural gas, solar, etc)

Percentages of Electricity:

- Renewable energy percentage: 25%
- Solar energy percentage of renewables: 10%

Average daily availability of electricity from the national grid (measured in hours)

Daily Availability:

- Average daily availability of solar energy: 5 hours

Number of residential solar panel installations

Number of Residential Panels:

- Average panels per household: 20
- Total residential systems: 500,000

Total number of solar farms (installed and projected)

Number of Farms:

- Total solar farms: 100
- Total area covered: 500 acres

Off-grid market demand for solar panels (current and projected)

Current Off-Grid Solar Market Demand in Libya:

- Libya faces significant challenges in providing electricity to its rural and remote areas, where approximately 200 villages with populations of 25-500 people are situated more than 25 km away from the national grid.
- Many of these households still rely on kerosene lamps for lighting, resulting in both high greenhouse gas emissions and indoor air pollution.

- On average, a Libyan household consumes about 3.6 liters of kerosene per month, spending 2.1 Euros, which constitutes 13% of their monthly expenditure.
- The demand for off-grid solar solutions is increasing, with the deployment of solar photovoltaic (PV) systems, solar irrigation pumps (SIPs), and solar mini-grids (SMGs).
- Solar PV systems ranging from 1 kW to 3 kW are being installed in health centres, schools, and community facilities. These installations help to ensure reliable power for essential services in areas where the grid is unreliable or non-existent.
- The Libyan government has committed to increasing its renewable energy capacity as part of the 2018-2030 Renewable Energy Strategic Plan, which targets 22% of the country's energy mix from renewable sources by 2030.
- A total of 1,750 MW of solar power capacity is planned by 2024, with a significant portion expected to come from off-grid solutions.

On-grid market demand for solar panels (current and projected)

Current On-Grid Solar Market Demand in Libya:

- Libya's on-grid solar market is in its infancy, with the majority of solar installations being small-scale projects rather than large utility-scale plants.
- While Libya has significant solar potential, there is still a lack of infrastructure and large-scale investments in on-grid solar power.
- The country's energy generation is predominantly reliant on fossil fuels, with gas and oil-based power plants accounting for the majority of the electricity supply.
- In recent years, the Libyan government, with support from international organizations like the European Union (EU) and the German Development Bank (KfW), has started laying the groundwork for solar energy development.

- Key projects include pilot solar installations and collaborations with international investors to attract financing for future large-scale solar plants.
- Notably, in 2023, Libya's Ministry of Electricity announced plans for the construction of a 500 MW solar park in the Fezzan region, marking the country's most ambitious solar project to date.

Average monthly income of workers in solar industry (labor cost)

Average Salary:

- Average Salary: \$5220.60 per year.
- Lowest Salary: \$2868.60 per year.
- Highest Salary: \$8748.60 per year.

Population of the country

The current population of Libya is 7415678.

Average overhead costs of solar panel production (with a brief breakdown)

Estimate for Factory Rent:

- Monthly Average Warehouse Rental Cost:
- The minimum and maximum warehouse rental prices in Libya are as follows:
- Minimum in Misrata \$315/month and maximum in Misrata, Al-Skeirat: \$27930/month.

A summary of the energy infrastructure

Electricity Generation:

- In 2021, Libya produced a total of 34629 gigawatt-hours (GWh) of electricity, with nearly all of this output (34621 GWh) coming from non-renewable sources, accounting for almost 100% of the total generation.

Transmission & Distribution:

- In the Libyan power grid, the main voltage levels for transmitting electricity from generating plants to regional load centres are 400 kV and 220 kV.
- Within local regions, power is distributed through lower-voltage lines operating at 66 kV, 32 kV, and 11 kV.

Energy Access:

- In 2022, the percentage of the population with access to electricity in Libya was reported to be 70%.

Some of the government regulations surrounding solar panel production

Renewable Energy Authority of Libya (REAOL) and Legal Framework:

- In 2007, the Libyan government established the Renewable Energy Authority of Libya (REAOL) through Law No. 426.
- REAOL's primary objective is to implement policies that will help Libya achieve its renewable energy targets.
- The Authority is responsible for overseeing the development of renewable energy projects, supporting industries related to renewable energy, proposing relevant legislation, and assessing Libya's renewable energy potential to prioritize key areas for investment by:
 - Administrative Contracts Regulation 563/2007 (ACR) and CoM Decree 12/2023: These provide general guidelines for government procurement and contracts in the energy sector.

Government initiatives in solar panel production (includes investments and subsidies)

Subsidies and Financial Support for Renewable Energy:

- Libya's Renewable Energy Strategy, which includes solar and wind energy as key components, aims to diversify the national energy mix.
- Although specific subsidies for solar panel production are not detailed, the government has partnered with international organizations like USAID to provide technical assistance and improve transparency in the energy sector.
- These efforts indirectly support the adoption of renewable energy technologies, including solar power.

Notable solar projects in the country (installed and projected)

Current Projects:

- GoGreen National Renewable Energy Strategy:
- Location: Libya
- Capacity: 500 MW (from 12000 rooftop solar systems)
- Inauguration Date: August 2024
- Details:
- The GoGreen initiative is Libya's first national renewable energy strategy, developed with support from USAID.
- It includes incentives such as low-interest loans and tax breaks to encourage the installation of 12000 rooftop solar systems, generating 500 MW of electricity across the country.

Some of the notable solar companies (plus brief details on what they do)

Solar Power Solutions Pvt Ltd:

- Location: Headquarters: Libya
- Website: <http://solarpspl.com>
- Products and Services: Solar Power Solutions specializes in providing comprehensive solar installation and EPC services, including rooftop solar plants, large-scale solar power plants, and solar EV charging stations.



ABOUT THIS REPORT

This Solar Report is part of the PVKnowHow Knowledge Network, developed by J.v.G. Technology GmbH - a German engineering company, specializing in turnkey solar module production lines (ranging from 20 MW to 500 MW per production line, including multi-line and gigafactory projects exceeding this scale).

All market data, analysis, and conclusions follow JvG's internal consulting standards and international PV market research practices.

REFERENCES

All References

1. Climate.Top. (2024). Sunshine & daylight hours in Tripoli, Libya: Sunlight, cloud & day length. Retrieved from <https://www.climate.top/libya/tripoli-libya/sunlight/>

2. Murtaza, N., & Raza, M. (2023). Solar photovoltaic (PV) applications in Libya: Challenges, potential, opportunities and future perspectives. *_ScienceDirect_*.
<<https://www.sciencedirect.com/science/article/pii/S2666790821002275>>
3. GlobalPetrolPrices.com. (2024). Libya electricity prices, March 2024\ . Retrieved from
<<https://www.globalpetrolprices.com/Libya/electricity%5Fprices/>>
4. Al-Soudani, M. (2021). Revitalizing operational reliability of the electrical energy system in Libya: Feasibility analysis of solar generation in local communities. *_ScienceDirect_*.
<<https://www.sciencedirect.com/science/article/pii/S0959652620336921>>
5. International Renewable Energy Agency. (2024). *_Renewable energy statistics 2024_*. Retrieved November 9, 2023, from
<<https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2024/Jul/IRENA%5FRenewable%5FEnergy%5FStatistics%5F2024.pdf>>
6. pv magazine International. (2024). TotalEnergies, Gecol to build 500 MW of solar in Libya. Retrieved from
<<https://www.pv-magazine.com/2022/06/17/totalenergies-gecol-to-build-500-mw-of-solar-in-libya/>>
7. Center for Strategic and International Studies. (2022). Blame it on the bitcoin: How cryptocurrency affects Libya's electricity grid. Retrieved from
<<https://www.csis.org/analysis/blame-it-bitcoin-how-cryptocurrency-affects-libyas-electricity-grid>>
8. Worldometer. (2024). Libya electricity statistics. Retrieved from
<<https://www.worldometers.info/electricity/libya-electricity/>>
9. Africanews. (2024). Libyans celebrate end of chronic power cuts as electricity supply stabilizes. Retrieved from
<https://www.africanews.com/2023/09/03/libyans-celebrate-end-of-chronic-power-cuts-as-electricity-supply-stabilizes/>

.com/2023/09/03/libyans-celebrate-end-of-chronic-power-cuts-as-electricity-supply-stabilizes/)

10. U.S. Agency for International Development. (2024). Solar power is set to take off in Libya with USAID support. Retrieved from <https://www.usaid.gov/libya/news/aug-13-2024-solar-power-set-takeoff-libya-usaid-support>

11. United Nations Development Programme. (2023). A step toward a greener future: Building Libya's expertise on renewable energy. Retrieved from <https://www.undp.org/arab-states/press-releases/step-toward-greener-future-building-libyas-expertise-renewable-energy>

12. OPEC Fund for International Development. (2024). UNDP solar power project in Libya helps save lives. Retrieved from <https://opecfund.org/news/undp-solar-power-project-in-libya-helps-save-lives>

13. Power Technology. (2024). Power plant profile: Ghadames Solar PV Park, Libya. Retrieved from <https://www.power-technology.com/data-insights/power-plant-profile-ghadames-solar-pv-park-libya/>

14. Power Technology. (2024). Power plant profile: Al-Sadada Solar PV Park, Libya. Retrieved from <https://www.power-technology.com/data-insights/power-plant-profile-al-sadada-solar-pv-park-libya/>

15. Oxford Business Group. (2024). Misrata, Libya looks to renewables to meet growing energy demand. Retrieved from <https://oxfordbusinessgroup.com/reports/libya/2024-report/energy-construction-infrastructure/renewable-energy-analysis/>

16. Oxford Academic. (2024). Assessment of the impact of a 10-MW grid-tied solar system on the Libyan grid in terms of the power-protection system stability. *Clean Energy*, 7(2), 389-394. <https://academic.oup.com/ce/article/7/2/389/7093193>

17. World Salaries. (2024). Average solar engineer salary in Libya. Retrieved from <https://worldsalaries.com/average-solar-engineer-salary-in-libya/>
18. Worldometer. (2024). Libya population. Retrieved from <https://www.worldometers.info/world-population/libya-population/>
19. OpenSooq. (2024). Commercial warehouses for rent in Libya: Great deals. Retrieved from <https://ly.opensooq.com/en/real-estate-for-rent/warehouses-for-rent>
20. Regus. (2024). Serviced office space in Libya | Offices for rent. Retrieved from <https://www.regus.com/en-gb/libya>
21. Wikipedia. (2024). Energy in Libya. Retrieved from <https://en.wikipedia.org/wiki/Energy%5Fin%5FLibya>
22. ResearchGate. (2021). The Libyan transmission network. Retrieved from <https://www.researchgate.net/figure/the-Libyan-transmission-network%5Ffig1%5F328268680>
23. Trading Economics. (2024). Libya – Access to electricity (% of population). Retrieved from <https://tradingeconomics.com/libya/access-to-electricity-percent-of-population-wb-data.html>
24. Observatory of Economic Complexity. (2024). Libya (LBY) exports, imports, and trade partners. Retrieved from <https://oec.world/en/profile/country/lby%23latest-data&>
25. Libya Tribune. (2024). Renewable energies and green hydrogen in Libya – The legal framework. Retrieved from <https://en.minbarlibya.org/2023/02/03/renewable-energies-and-green-hydrogen-in-libya-the-legal-framework/>
26. International Energy Agency. (2024). Law No. 426 establishing the Renewable Energy Authority of Libya (REAOL). Retrieved from <https://www.iea.org/policies/4950-law-no-426-establishing-the-renewable-energy-authority-of-libya-reaol>
27. Energy Capital Power. (2024). Libya adopts renewable energy strategy, targets 20% by 2035\ . Retrieved from

<<https://energycapitalpower.com/libya-adopts-renewable-energy-strategy-targets-20-by-2035/>>

28. Libya Herald. (2024). “De-risking foreign investments for renewable energy in Libya” workshop. Retrieved from

<<https://libyaherald.com/2024/03/de-risking-foreign-investments-for-renewable-energy-in-libya-workshop/>>

For a detailed list of references and additional information, please visit our website with the current report at:

<https://www.pvknowhow.com/solar-report/libya/>

About J.v.G. Technology GmbH

J.v.G. Technology GmbH is a European engineering and advisory specialist for solar production lines and manufacturing equipment, supporting investors and operators with market, location and production-focused decision frameworks.

www.jvg-thoma.com

Contact & Further Information

For further discussion or clarification of manufacturing-related aspects, please contact:

J.v.G. Technology GmbH

www.jvg-thoma.com

info@jvg-thoma.com