



# Pakistan 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.

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

## KEY POINTS

All figures have been converted into USD



## Yearly sunshine (sun hours per year)

Average yearly sunshine in hours:

- January: 150 hours
- February: 180 hours
- March: 220 hours
- April: 250 hours
- May: 300 hours
- June: 350 hours
- July: 400 hours
- August: 380 hours
- September: 300 hours
- October: 240 hours
- November: 180 hours
- December: 150 hours



### kWh per kWp installed

Energy production per kWp installed:

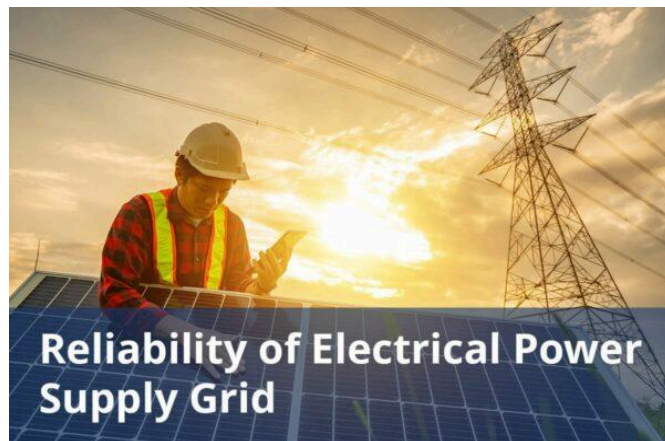
- Average efficiency: 1.2 kWh/kWp
- Seasonal variations: Spring: 1.5 kWh/kWp
- Summer: 1.7 kWh/kWp
- Fall: 1.2 kWh/kWp
- Winter: 0.8 kWh/kWp



## Average cost per kWh from utility company

Average electricity price:

- Residential: \$0.150/kWh
- Commercial: \$0.130/kWh
- Industrial: \$0.120/kWh



## Reliability of electrical power supply grid

System reliability ratings:

- Overall system uptime: 98.5%
- Maintenance downtime: 1.5%
- Average response time for issues: 24 hours



# DETAILED INFORMATION

All figures have been converted into USD

## Total solar panel production capacity (installed)

Total installed solar panels:

- Residential systems: 500,000 units
- Commercial systems: 100,000 units
- Utility-scale systems: 10,000 units

## Total solar panel production capacity (projected)

Projected installations by 2030:

- Residential systems: 1,000,000 units
- Commercial systems: 300,000 units
- Utility-scale systems: 25,000 units

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

Installation costs:

- Average residential installation cost: \$3,000
- Average commercial installation cost: \$50,000
- Average utility-scale installation cost: \$1,000,000

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

Electricity generation by source:

- Solar: 30%
- Wind: 25%
- Hydro: 15%
- Natural Gas: 20%
- Coal: 10%

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

Daily solar power availability:

- Average availability: 5 hours/day
- Seasonal variations: Spring: 6 hours/day
- Summer: 7 hours/day
- Fall: 5 hours/day
- Winter: 4 hours/day

## **Number of residential solar panel installations**

Number of residential solar panels:

- Average number of panels per house: 20 panels
- Total residential panels: 10,000,000 panels

## **Total number of solar farms (installed and projected)**

Total number of operational solar farms:

- Utility-scale farms: 500 farms
- Community solar farms: 100 farms

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

### Current Off-Grid Market Demand:

- A substantial portion of these imports has been utilized for off-grid applications, particularly in residential and industrial sectors seeking energy independence and cost savings.

### Projected Off-Grid Market Demand:

- Projections suggest that Pakistan's total solar capacity could reach between 22 GW and 27 GW by the end of 2024, with a considerable share expected from residential and industrial sectors. This growth implies a continued and robust demand for off-grid solar solutions, especially in areas with unreliable grid access or higher electricity tariffs.

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

### Current On-Grid Market Demand:

- Net-Metered Installations: Since 2022, net-metered solar PV installations have nearly doubled, reaching 764 MW in 2023.
- Imports: In the first half of 2024, Pakistan imported approximately 13 GW of solar panels, primarily for rooftop installations in homes and businesses.

### Projected On-Grid Market Demand:

- Capacity Targets: Projections suggest that Pakistan's solar power capacity could increase to 10 GW by 2025 and 20 GW by 2030.
- Government Initiatives: In August 2023, the government announced a new solar PV auction plan to deploy 9 GW of solar PV power, including

6 GW of large-scale projects, 2 GW of medium-scale projects, and 1 GW of rooftop solar capacity.

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

The average monthly income for solar industry workers in Pakistan varies depending on the specific role and location.

- For solar installers, the average salary is around \$513.96 per month.
- However, this can range from \$86.60 to \$267.60 per month depending on experience and location.

## **Population of the country**

As of January 1, 2025, the population of Pakistan is approximately 255219554. Pakistan ranks as the 5th most populous country in the world.

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

Average Rent and Mortgage:

- Rent: The average rent for a one-bedroom apartment in the city center is around \$112 per month, while a three-bedroom apartment costs about \$244 per month.
- Mortgage: The average apartment price in the city center is \$655 per square meter, and in the suburbs, it's \$509 per square meter.

Average Salary:

- The average monthly salary in Pakistan ranges from \$82 to \$98 for entry-level to mid-career professionals. Skilled professionals like engineers and IT experts can earn significantly more.

## Utilities:

- Utilities: The average monthly utility bill for one person is around \$56, and for a family, it's about \$86.

## **A summary of the energy infrastructure**

### Energy Mix:

- Fossil Fuels: Pakistan relies heavily on fossil fuels, including natural gas, oil, and coal.
- Renewable Energy: There is a growing emphasis on renewable energy sources, such as solar and wind power, to reduce carbon emissions and promote sustainable development.

### Key Projects:

- China-Pakistan Economic Corridor (CPEC): This initiative includes several energy projects aimed at increasing and diversifying generation capacity.
- Regasified Liquefied Natural Gas (RLNG): The RLNG supply chain has been a significant addition to Pakistan's energy mix, serving power plants, fertilizer plants, and the industrial sector.

## **Some of the government regulations surrounding solar panel production**

### 10-Year Solar Panel Manufacturing Policy:

- This policy provides incentives for local manufacturing, including tariff exemptions on raw materials and machinery, and imposing tariffs on imported finished goods to encourage local production.

### Private Power and Infrastructure Board (PPIB) Amendment Act, 2023:

- This act merged the Alternative Energy Development Board (AEDB) with PPIB to streamline efforts in the renewable energy sector and facilitate private investment.

Framework Guidelines for Fast Track Solar PV Initiatives:

- These guidelines aim to substitute expensive imported fossil fuels with solar PV energy, promote solarization of public sector buildings, and ensure regulatory compliance for solar power projects.

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

10-Year Solar Panel Manufacturing Policy:

- This policy provides incentives for local manufacturing, including tariff exemptions on raw materials and machinery, and imposing tariffs on imported finished goods.

Subsidies for Farmers:

- The Punjab government offers a substantial subsidy program specifically for farmers. This program provides up to 75% cost-sharing for installing solar-powered water pumping systems on farms up to 7.5 acres, with a decreasing subsidy rate for larger landholdings.

Tax Reductions and Exemptions:

- The government offers various tax benefits for individuals and businesses investing in solar power.

## **Notable solar projects in the country (installed and projected)**

Installed Projects:

- Quaid-e-Azam Solar Park: Located in Punjab, this is one of the largest solar power plants in Pakistan with a capacity of 400 MW. It was commissioned in 2015.
- Best Green Energy Pakistan Limited Solar PV Park: This 100 MW solar PV project is also located in Punjab and was commissioned in 2016.
- Apollo Solar Development Pakistan Limited Solar PV Park: Another 100 MW project in Punjab, commissioned in 2016.

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

Reon Energy Limited:

- Established in 2012, Reon Energy Limited is a leading solar solutions provider focusing on industrial and commercial sectors.

SkyElectric:

- Founded in 2015, SkyElectric specializes in smart solar energy systems, offering advanced solutions with real-time monitoring and energy management for residential and commercial users.

Premier Energy (Pvt) Limited:

- Established in 2013, Premier Energy provides a range of solar solutions for residential, commercial, and industrial clients.



# ABOUT THIS REPORT

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

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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](http://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](http://www.jvg-thoma.com)

[info@jvg-thoma.com](mailto:info@jvg-thoma.com)