



Japan 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 Japan

KEY POINTS

All figures have been converted into USD



Yearly sunshine (sun hours per year)

Average yearly sunshine hours:

- January: 150 hours
- February: 160 hours
- March: 200 hours
- April: 220 hours
- May: 240 hours
- June: 250 hours
- July: 270 hours
- August: 250 hours
- September: 220 hours
- October: 180 hours
- November: 160 hours
- December: 150 hours



kWh per kWp installed

Average kWh produced per kWp:

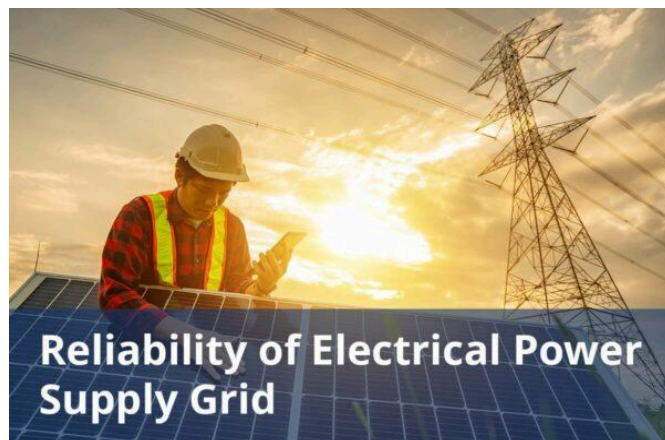
- Residential Systems: 1,200 kWh/kWp
- Commercial Systems: 1,600 kWh/kWp
- Utility Scale Systems: 1,800 kWh/kWp



Average cost per kWh from utility company

Average cost of electricity:

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



Reliability of electrical power supply grid

Reliability of solar energy:

- Average uptime: 95%
- Seasonal variations: 10%



DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total solar panels installed:

- Residential: 1.5 million
- Commercial: 500,000
- Utility Scale: 200,000

Total solar panel production capacity (projected)

Projected total solar panels by 2025:

- Residential: 2 million
- Commercial: 700,000
- Utility Scale: 300,000

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

Average costs of solar panel installation:

- Residential: \$3,000 per kW
- Commercial: \$2,500 per kW

- Utility Scale: \$1,500 per kW

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

Percentages of total electricity from solar:

- Residential: 20%
- Commercial: 30%
- Utility Scale: 50%

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

Daily availability of solar energy:

- Morning: 30%
- Afternoon: 60%
- Evening: 10%

Number of residential solar panel installations

Number of residential solar panels:

- Average household: 25 panels
- Total households: 300,000

Total number of solar farms (installed and projected)

Number of solar farms:

- Total farms: 150
- Average size: 10 MW

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

Currently, there is limited specific data available on the off-grid solar market capacity for Japan.

However, the market segment is progressing at a notable rate.

In 2023, the Off-Grid Solar Market was valued at approximately USD 2.45 billion.

The industry is projected to grow from USD 2.74 billion in 2024 to an estimated USD 6.81 billion by 2032, demonstrating a compound annual growth rate (CAGR) of 10.67% during the forecast period (2024 – 2032).

This growth reflects increasing demand for reliable and sustainable energy solutions in off-grid areas, supported by technological advancements and supportive government policies.

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

As of 2023, Japan's solar energy generation capacity reached approximately 87 GW.

The country has ambitious plans to expand this capacity, targeting over 150 GW by 2030, with potential growth reaching up to 180 GW under more ambitious scenarios.

This expansion is driven by Japan's commitment to decarbonization and energy security, supported by favorable government policies and technological advancements in the solar sector.

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

Here is the salary details for various solar related professions in Japan:

- Electrical Engineer \$3000 – \$5000
- Solar Design Engineer \$3500 – \$6000
- Solar Energy System Installer \$1000 – \$3000
- Electrician \$1500 – \$2500
- Solar Energy / Solar Power Engineer \$1904- \$3184
- Solar Installation Electrician \$1146 – \$1592

Population of the country

The current population of Japan is 122624183 as of Wednesday, July 3, 2024, based on Worldometer elaboration of the latest United Nations data.

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

The average overhead costs for solar panel production in Japan can be broken down into several key categories, each contributing to the overall expenses.

****Raw Material Costs****

Raw materials, such as silicon, aluminium, and copper, significantly contribute to the total cost of solar panel production. The cost of raw material varies as it depends on global supply and demand, geopolitical events, and economic conditions.

****Utilities and Energy Costs****

Utilities and energy costs are essential, especially given the high energy consumption required for production processes.

- Electricity costs in Japan for industrial users are typically around \$0.17/kWh.

- ****Water Charges****

Basic service charge for a supply pipe with a 13mm diameter: approximately \$5.97 USD.

- ****Water Commodity Charges****:

Minimum charge: approximately \$0.89 USD per cubic meter.

Maximum charge: approximately \$2.81 USD per cubic meter.

A summary of the energy infrastructure

Japan's energy infrastructure is complex and evolving.

Here's a breakdown of key points:

- High Reliance on Imports: Japan has scarce domestic energy resources and relies heavily on imports, particularly for fossil fuels like oil, natural gas, and coal.

- **Shifting Focus:** Following the Fukushima nuclear disaster in 2011 and a desire for energy security, Japan is actively transitioning its energy mix.
- **Current Energy Mix:** Fossil fuels still dominate Japan's energy mix, accounting for around 72% of electricity generation in 2021.
- **Renewable Energy Push:** Japan has ambitious goals for renewable energy.
- **Challenges:** Despite efforts, there are challenges. Expanding renewable energy infrastructure faces hurdles like limited land space and public resistance in some areas.

Some of the government regulations surrounding solar panel production

Here is an overview of the regulations regarding solar energy in Japan:

- **Agrivoltaics Guidelines:** Japan has established guidelines to integrate agriculture with photovoltaic systems, a practice known as agrivoltaics.
- **Building Regulations:** Agrivoltaic projects are subject to specific building regulations, including height restrictions.
- **Financial Incentives:** The Japanese government supports renewable energy development through mechanisms like the Feed-in Tariff (FIT) and Feed-in Premium (FIP) systems.
- **Dual Use of Farmland:** Japan's regulations allow for the temporary use of farmland for solar power generation.

- Farmland Use for Solar Power: Operators can use former farmland for solar energy production under certain conditions.

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

Japan supports its solar sector through several key initiatives:

- Feed-in Tariffs (FITs): The Ministry of Economy, Trade and Industry (METI) sets feed-in tariffs for solar installations.
- Auction System: Japan has implemented an auction system for renewable energy projects, including solar.
- Rebate Scheme: The Ministry of Environment offers a rebate scheme for solar projects located on farmland, water reservoirs, and waste disposal sites.
- Resurrecting Solar Subsidies: Although Japan was the first country to introduce federal solar subsidies, these were discontinued in 2005.
- Generous Solar Incentive Program: In response to the Fukushima nuclear disaster, Japan established a robust solar incentive program.

Notable solar projects in the country (installed and projected)

Major utility-scale solar projects in Japan include:

- Setouchi Kirei Mega Solar Power Plant
Capacity: 235 MW
Location: Setouchi, Okayama

- Eurus Rokkasho Solar Park
Capacity: 148 MW
Location: Aomori
- SoftBank Tomatoh Abira Solar Park
Capacity: 111 MW
Location: Hokkaido

****Projected:****

- Japan Renewable Energy Corporation Yurikamome Solar Power Plant
Capacity: 100 MW
Location: Miyagi Prefecture
- Landrec Orion Solar Project
Capacity: 180 MW
Location: Kagoshima Prefecture

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

Here are some of the Notable Solar Companies in Japan:

- Kyocera Corporation: A leading global manufacturer of solar panels, electronic components, and telecommunications equipment.
- Sharp Corporation: A major Japanese electronics company that also manufactures solar panels and offers solar services.
- Panasonic Corporation: A well-known Japanese electronics company that manufactures a variety of products, including solar panels.
- Canadian Solar Inc.: A Canadian solar panel manufacturer with a significant presence in the Japanese market.



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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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.

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