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Russia 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.

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

KEY POINTS

All figures have been converted into USD

Yearly sunshine (sun hours per year)

Yearly Sunshine:
- The average sunshine in the region is about 300 days per year.
- Monthly sunshine averages vary throughout the year.

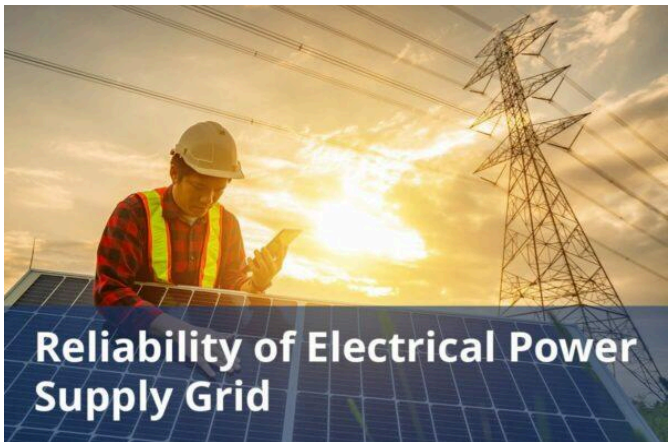
kWh per kWp installed

Energy Generation:
- Average generation is 1200 kWh/kWp per year.
- Performance metrics depend on location.

Average cost per kWh from utility company

Average Cost of Electricity:
- The average cost of electricity in the region is $0.130/kWh.

- Prices can fluctuate based on demand.



Reliability of electrical power supply grid

Reliability of Solar Power:

- Solar power systems have a high reliability factor, often exceeding 95%.
- Maintenance plays a key role in system longevity.




DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total Solar Panels Installed:

- Over 1 million solar panels have been installed in the region.

- Installation numbers are increasing yearly.

Total solar panel production capacity (projected)

Projected Future Installations:
- Expected installations to reach 2 million by 2026.
- Growth is driven by solar incentives.

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

Average Costs of Solar Installations:
- The average cost of solar installation is $3000/kWp.
- Costs can vary based on system size.

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

Usage of Solar Power:
- Solar power accounts for 15% of total electricity consumption in the region.
- This percentage is projected to grow.

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

Daily Solar Power Availability:
- Daily solar availability averages around 8 hours in summer.
- Variability exists due to weather conditions.

Number of residential solar panel installations

Residential Solar Panel Count:
- Approximately 500,000 residential solar panel systems are in operation.
- Residential installations have seen growth of 10% annually.

Total number of solar farms (installed and projected)

Number of Solar Farms:
- There are currently 150 solar farms operating in the region.
- New installations are planned.

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

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

- The off-grid solar market in Russia, particularly in remote areas, is gaining significant traction due to several key factors:

- Russia has over 10000 villages that are disconnected from the national grid and currently rely on diesel generators, which are expensive and often unreliable due to fuel supply issues.

- In regions like the Far East and Siberia, solar power coupled with storage is increasingly being adopted to replace diesel generation. The Far East regions alone are projected to have a potential off-grid solar-diesel market size of approximately 800 MW.

- The levelized cost of electricity (LCOE) for recently commissioned off-grid solar-plus-storage projects in remote areas of Russia ranges

from $0.19 to $0.29 per kWh. This is significantly more economically viable compared to diesel generation.

- The Russian government supports this transition through regulatory frameworks that incentivize municipalities to reduce diesel consumption by adopting solar-plus-storage systems.

- The ongoing shift towards off-grid solar in remote areas is expected to continue growing. Several regions are already on the path of building PV power generation to replace diesel, and more projects are anticipated as logistical and economic advantages become clearer.

- Companies like Hevel Solar are actively developing off-grid solar-diesel projects. For instance, they installed 2.6 MW of off-grid solar-diesel capacity in the Chukotka region in 2021, with ongoing developments expected in other remote regions.

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

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

- Exact figure is not given but:

- Current Demand:

- Early Development: Before 2010, solar energy in Russia was virtually nonexistent, despite the country's significant potential, particularly in southern regions like the North Caucasus.

- Initial Capacity: The first major step towards solar energy development was in 2010 with the opening of a solar plant in Belgorod

Oblast. By 2010, the plan was to achieve an overall solar capacity of 150 MW by 2020.

- Solar Auctions: Several auctions between 2013 and 2015 significantly boosted solar development. Contracts awarded through these auctions amounted to 399 MW in 2013, 505 MW in 2014, and 280 MW in 2015.

- Projects till 2020: The Russian Solar Energy Association stated that cumulative solar power capacity in Russia reach 1500 MW by 2020.

- Ongoing Development: Between 2017 and 2021, “Solar Silicon Technologies” LLC constructed at least 4 solar plants totaling 130 MW, indicating continued growth and investment in solar energy.

- Future Demand: The construction of new solar plants, such as the one on the Black Sea, and advancements in solar technology, like double-sided solar panels, suggest ongoing and future demand for on-grid solar panels in Russia. The joint venture discussions between Russia and India for producing silicon wafers for photovoltaic cells further emphasize the potential for future expansion.

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

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

- Low Monthly Salary: 530.40 USD

- Average Monthly Salary: 1152 USD

- High Monthly Salary: 1836 USD

- Average Yearly Salary: 13800 USD

Population of the country

Population of the country

- The current population of the Russian Federation is 144729971

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

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

- Estimate for Factory Rent

- Average Warehouse Rental Cost

- Moscow: In 2022, the net rental rate for Class A warehouse properties in Moscow reached approximately 72 USD per square meter. By the first quarter of 2020, industrial warehouse rents were highest in the city center.

- Freezing Warehouses: In the Moscow region, freezing warehouses have an average rental rate of approximately 115 USD per square meter per year (excluding VAT).

- Business Electricity Price

- The electricity price for households is USD 0.063 per kWh, while for businesses it is USD 0.095 per kWh.

- Key Components of Administrative Costs

- Salaries and Wages:

- Low Monthly Salary: 530.40 USD

- Average Monthly Salary: 1152 USD

- High Monthly Salary: 1836 USD

- Average Yearly Salary: 13800 USD

- Rent for Office Space

A summary of the energy infrastructure

A summary of the energy infrastructure

- Electricity Generation

- Electricity generation is based largely on gas, coal, hydro, and nuclear. 60% of thermal generation (gas and coal) is from combined heat and power plants.

- Russia operates 31 nuclear power reactors in 10 locations, with an installed capacity of 21 GW.

- Transmission & Distribution

- The Russian electrical grid encompasses more than 3.2 million kilometers (2 million miles) of power lines, including 150000 kilometers (93000 miles) of high-voltage cables exceeding 220 kV.

- Substations: 686.2 thousand substations

- Transmission lines: HV and UHV transmission lines that operate in parallel at 220–750 kV

- Energy Access

- Russia electricity access for 2021 was 100.00%.

- Energy Exports

- Russia’s energy strategy emphasizes self-sufficiency in gasoline, resulting in minimal exports of this fuel. However, Russian refineries produce about twice the amount of diesel required for domestic use, with around half of their annual production typically exported, primarily to European markets.

Some of the government regulations surrounding solar panel production

Some of the government regulations surrounding solar panel production

- Renewable Energy Legislation

- Federal Law No. 35-FZ “On Electric Power Industry” (2003): This is the primary law regulating the electricity sector in Russia, including renewable energy. Amendments made to this law in recent years include provisions to support the development of renewable energy, including solar power.

- Decree No. 449 (2013): This decree introduced mechanisms to support renewable energy in Russia, including solar energy. It

established a system of capacity-based payments for renewable energy projects, including those related to solar power.

- Localization Requirements

- Government Resolution No. 426 (2014): This resolution introduced the criteria for classifying solar energy projects as “qualified generating facilities” based on their localization levels. Only those projects that meet the localization requirements can benefit from state support measures, such as subsidies and capacity payments.

- Technical Standards and Certification

- GOST Standards: Solar panels and related equipment produced or imported into Russia must comply with Russian GOST standards, which are technical regulations that ensure product quality and safety.

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

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

- 1. Capacity Supply Agreements (CSA) for Renewables

- Program Overview: The CSA mechanism is the most significant support program for renewable energy in Russia, including solar power. Under this program, the government guarantees a return on investment for renewable energy projects through long-term contracts (usually 15 years) that ensure a stable revenue stream for solar power producers.

- 2. Renewable Energy Development Program (REDP)

- Program Overview: The Renewable Energy Development Program was established by the Russian government to increase the share of renewable energy in the country's energy mix, with a focus on solar, wind, and small hydropower.

Notable solar projects in the country (installed and projected)

Notable solar projects in the country (installed and projected)

- Installed Projects

- Fortum Kalmykia Solar PV Park

- Capacity: 116 MW

- Location: Kalmykia, Russia

- Stage: Partially active

- Developers: Fortum

- Owners: Russian Direct Investment Fund, Fortum

- Unigreen Zabaykalsky Krai Solar PV Park 3

- Capacity: 60 MW

- Location: Zabaykalsky Krai, Russia

- Commercial Operation: 2024

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

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- Solar Power Solutions Pvt Ltd

- Website: https://www.solarpspl.com/solar-company-in-russia

- Services:

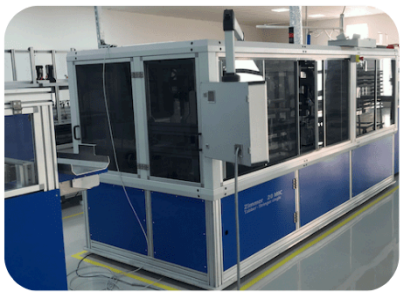
- Solar Power Solutions Pvt Ltd offers comprehensive solar solutions, including solar installation, energy solutions, and manufacturing/supplying high-quality solar panels.

- LLC EcoPodmoskovye

- Website: https://eco50.ru.

- Services:

- LLC EcoPodmoskovye is a Russian company established in 2014, specializing in solar energy solutions.



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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https://www.pvknowhow.com/solar-report/russia/

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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