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Kyrgyzstan 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 Kyrgyzstan

KEY POINTS

All figures have been converted into USD

Yearly sunshine (sun hours per year)

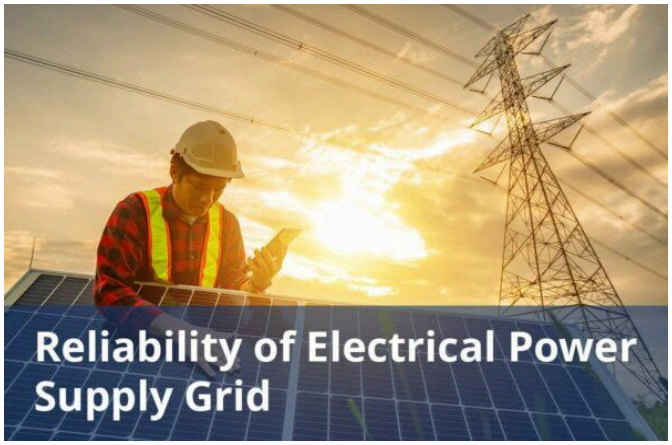
Average yearly sunshine:
- Region A: 2000 hours
- Region B: 2500 hours
- Region C: 2100 hours

kWh per kWp installed

Average kWh produced per kW:
- Residential Systems: 1200 kWh/kWp
- Commercial Systems: 1500 kWh/kWp
- Utility-Scale Systems: 1800 kWh/kWp

Average cost per kWh from utility company

Average cost of electricity:
- Residential: $0.135/kWh
- Commercial: $0.120/kWh
- Industrial: $0.100/kWh



Reliability of electrical power supply grid

System reliability:
- Solar energy systems: 95%
- Backup generators: 99%




DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total solar panels installed:
- Year 2020: 500000 panels
- Year 2021: 600000 panels
- Year 2022: 700000 panels

Total solar panel production capacity (projected)

Projected solar panels by 2025:
- Total: 3000000 panels

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

Average costs of solar installation:
- Small residential: $15000
- Medium residential: $25000
- Large residential: $35000

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

Percentage of electricity from solar:
- Year 2020: 5%
- Year 2021: 7%
- Year 2022: 10%

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

Daily solar energy availability:
- Summer: 8 hours
- Winter: 4 hours

Number of residential solar panel installations

Number of residential solar panels:
- Total in 2022: 1000000 panels

Total number of solar farms (installed and projected)

Number of solar farms:
- Active farms: 150
- Closed farms: 5

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

Current Off-Grid Market Demand in Kyrgyzstan:
- The current off-grid solar market demand in Kyrgyzstan is modest and primarily driven by small enterprises, households, and pilot projects aimed at improving energy access in rural areas.

- These include initiatives like solar installations in health facilities, kindergartens, and schools. For example, solar systems ranging from 1.5 kW to 3 kW have been implemented in 19 rural health facilities under UN-supported projects to ensure reliable medical services.
- Commercial installations of off-grid PV systems, solar water heaters, and biogas plants occur at a small scale, with around 10-20 systems installed annually. Demand is supported by international organizations like UNDP, which has facilitated renewable energy projects for community infrastructure, such as heat pumps and solar water heaters in educational and health institutions.

Future Off-Grid Market Demand in Kyrgyzstan:
- The future off-grid solar market in Kyrgyzstan is expected to grow significantly as the country aims to diversify its energy mix and address rural energy access challenges.
- A key driver is the planned construction of a 1,000 MW solar power plant in Issyk-Kul, supported by Chinese investment, signaling increasing interest in large-scale solar initiatives.
- Pilot solar district heating projects and community-focused renewable energy systems are also paving the way for expanded adoption.
- Government-backed projects, combined with international donor efforts, are expected to stimulate market growth, creating opportunities for deploying solar solutions in underserved areas.
- As technology becomes more affordable and demand for sustainable energy rises, off-grid solar systems are likely to play a critical role in supporting Kyrgyzstan’s energy transition and rural development goals.

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

Current On-Grid Solar Market Demand in Kyrgyzstan:
- The on-grid solar market in Kyrgyzstan is still in its infancy, with no utility-scale solar PV installations currently operational.

- However, declining costs of renewable energy technologies have made solar PV increasingly competitive, with the global average levelized cost of energy (LCOE) for utility-scale solar PV dropping to 0.057 USD/kWh by 2020.
- This cost advantage, coupled with the country's abundant solar potential, especially in the Osh and Issyk-Kul regions, highlights significant opportunities for grid-connected solar projects.
- Growing energy demand, which has risen by 75% since 2010, and reliance on expensive energy imports underscore the need for clean and sustainable solutions.
- The modular nature and short construction timelines of solar PV systems further bolster their appeal for addressing rising domestic demand efficiently and sustainably.

Future On-Grid Solar Market Demand in Kyrgyzstan:
- The future on-grid solar market in Kyrgyzstan is poised for significant growth, driven by plans for large-scale installations, including a proposed 1,000 MW solar power plant in the Issyk-Kul region.
- Government strategies to diversify the energy mix and reduce reliance on imported fossil fuels will likely accelerate the development of utility-scale solar projects.
- Renewable energy's competitiveness relative to coal and gas imports strengthens the case for solar PV integration into the national grid.
- As technology costs continue to decline and funding opportunities increase, on-grid solar projects are expected to play a critical role in meeting Kyrgyzstan's growing energy needs while enhancing energy security and sustainability.
- The seasonal variability in hydropower generation, particularly during winter, also creates a compelling case for solar PV as a complementary energy source to stabilize the grid.

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

A Solar Photovoltaic Installer working in Kyrgyzstan typically earns approximately $1670 USD/yr. The salary can range from the lowest average of about $880 USD/yr to the highest average $2500 USD/yr.

Population of the country

The current population of Kyrgyzstan is 7229885.

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

Estimate for Factory Rent:
- Monthly Average Warehouse Rental Cost:
- The average warehouse rent in Kyrgyzstan is approximately $114 per square meter per year.

Key Components of Administrative Costs:
- Salaries and Wages:
- A Solar Photovoltaic Installer working in Kyrgyzstan typically earns approximately $1670 USD/yr. The salary can range from the lowest average of about $880 USD/yr to the highest average $2500 USD/yr.

Commercial Electricity Prices:
- The electricity price for businesses is USD 0.037 per kWh.

Monthly Rents for Office Space:
- In Bishkek, coworking space costs range from approximately $70 to $140 per month, while private office rentals range between $240 and $400 per month, depending on location and amenities.

A summary of the energy infrastructure

Electricity Generation:
- Kyrgyzstan's electricity generation is predominantly from hydropower, which accounts for around 90% of its total output, with seven large and 12 smaller hydropower plants located on the Naryn River. The country plans to expand its hydropower capacity by 4.6 GW.
- Fossil fuels, mainly coal, contribute a small portion, while net imports make up nearly 15% of the electricity generation.

Transmission & Distribution:
- The power transmission and distribution system in Kyrgyzstan faces significant challenges due to aging infrastructure, with about 45% of generation capacity and 40% of underground cables in urgent need of replacement.
- This has led to reliability issues, particularly in winter when demand exceeds capacity. Financial constraints caused by low retail tariffs, which are among the world's lowest, result in underinvestment and maintenance neglect.
- While reforms have aimed to address these issues, subsidies for small residential consumers and affordability concerns have limited progress.

Energy Access:
- Recent data shows that Kyrgyzstan has near-universal electricity access, with approximately 99.7% of the population connected, positioning it as a country with high energy access.

Some of the government regulations surrounding solar panel production

Sustainable Development Strategy (SDS) and National Development Program (NDP):

- The government's long-term Sustainable Development Strategy for 2018-2040 and medium-term National Development Program until 2026 aim to increase the share of renewable energy, including solar, to 10% of the energy mix.
- These policies promote solar as a complementary energy source to reduce dependence on hydro and hydrocarbon-based power, which are susceptible to seasonal fluctuations.

Law "On Energy Industry" (1996):
- Establishes the regulatory framework for the fuel and energy complex, focusing on economic efficiency and the protection of consumer and manufacturer interests.

Law "On Electrical Energy Industry" (1997):
- Ensures reliable, safe, and continuous energy supply, while promoting private sector involvement and energy saving. It also sets penalties for energy theft.

Law "On Renewable Energy Sources" (2008):
- Promotes the development of renewable energy sources, including solar, and introduces financial incentives such as customs duty exemptions for RES plants and equipment.
- Solar energy projects are incentivized with a tariff multiplier of 6.0 for solar energy.

Key Provisions for Solar Energy:
- Solar energy producers are entitled to a tariff multiplier of 6.0, ensuring returns on investment within a maximum payback period of 8 years.
- Energy distribution companies must purchase all electricity generated by RES plants, including solar, that is not consumed by the producer.

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

Small-Scale Solar Subsidies:
- The Kyrgyz government provides subsidies for small-scale solar installations, particularly for households and businesses in rural areas.
- These subsidies cover up to 30% of installation costs for solar systems, making solar power more affordable for households, especially in regions with unreliable grid access.

UNDP Solar Energy Program:
- The United Nations Development Programme (UNDP), in collaboration with the Kyrgyz government, launched a program to promote solar energy in remote regions.
- This initiative has provided over 3000 solar-powered water pumps and off-grid solar systems for rural communities, benefiting approximately 15000 people in remote areas.

World Bank Renewable Energy Projects:
- The World Bank has financed renewable energy projects in Kyrgyzstan, including the development of small solar parks.
- In 2020, the World Bank approved a $25 million loan for renewable energy projects, including solar power plants, to enhance energy access and infrastructure.

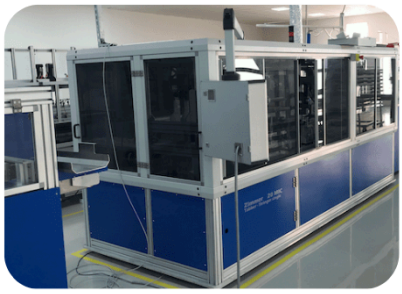
Notable solar projects in the country (installed and projected)

Current Projects:
Kyrgyz Solar 2:
- Location: Kyrgyz Republic
- Capacity: Up to 300 MW (Phase 2); Total up to 500 MW (full project)

- Project Start Date: July 1, 2024 (Estimated)
- Project Status: Active
- Clients: Ministry of Economy of the Kyrgyz Republic and Ministry of Energy and Industry of the Kyrgyz Republic.
- Project Overview:
- The Kyrgyz Solar 2 project, facilitated by IFC's Advisory Services, aims to attract private sector participation in Kyrgyzstan's power sector through public-private partnerships (PPP).
- The project involves the design, construction, financing, and operation of up to two solar PV plants with a combined capacity of up to 300 MW under Phase 2, ultimately contributing to a total project capacity of 500 MW.

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

Solar Power Solutions Pvt Ltd:
- Location: The company operates in multiple cities across Kyrgyzstan, including Bishkek, Osh, Jalal-Abad, Karakol, Tokmok, Kara-Balta, and Naryn.
- Website: https://www.solarpspl.com/solar-company-in-kyrgyzstan
- Product and Services:
- Solar Power Solutions Pvt Ltd offers a wide range of products and services, including the manufacturing and supply of high-quality solar panels known for their durability and efficiency.
- The company specializes in solar installations, catering to diverse energy needs with solutions like rooftop solar plants, large-scale solar power plants, solar water heaters, solar pumps, solar lights, and solar EV charging stations.



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.

REFERENCES

All References

1. Climate Top. (2024). _Bishkek climate by month: A year-round guide._ Retrieved November 8, 2024, from <https://weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,bishkek-kg,Kyrgyzstan>
2. ProfileSolar.com. (2024). _Solar PV analysis of Bishkek, Kyrgyzstan._ Retrieved November 8, 2024, from <https://profilesolar.com/locations/Kyrgyzstan/Bishkek/>
3. GlobalPetrolPrices.com. (2024). _Kyrgyzstan electricity prices, March 2024._ Retrieved November 8, 2024, from <https://www.globalpetrolprices.com/Kyrgyzstan/electricity%5Fprices/>

4. International Energy Agency (IEA). (2024). _Executive summary – Kyrgyzstan 2022 – Analysis._ Retrieved November 8, 2024, from <https://www.iea.org/reports/kyrgyzstan-2022/executive-summary>
5. International Renewable Energy Agency (IRENA). (2024). _Renewable energy statistics 2024._ Retrieved November 9, 2024, from <https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2024/Jul/IRENA%5FRenewable%5FEnergy%5FStatistics%5F2024.pdf>
6. PVKnowHow.com. (2024). _Solar energy project in Kyrgyzstan advances with IFC._ Retrieved November 8, 2024, from <https://www.pvknowhow.com/solar-energy-project-in-kyrgyzstan/>
7. United Nations Development Programme (UNDP). (2012). _Renewable energy snapshot: Kyrgyzstan._ Retrieved November 8, 2024, from <https://www.undp.org/sites/g/files/zskgke326/files/migration/eurasia/Kyrgyzstan.pdf>
8. International Energy Agency (IEA). (2024). _Kyrgyzstan – Countries & regions._ Retrieved November 8, 2024, from <https://www.iea.org/countries/kyrgyzstan/electricity>
9. 24.KG. (2024). _Power outages suspended in Kyrgyzstan._ Retrieved November 9, 2024, from <https://24.kg/english/288621%5FPower%5Foutages%5Fsuspended%5Fin%5FKyrgyzstan/>
10. Journal NEO. (2024). _Renewables in Kyrgyzstan: The green future of Central Asia._ Retrieved November 9, 2024, from <https://journal-neo.su/2024/06/03/renewables-in-kyrgyzstan-the-green-future-of-central-asia/>
11. International Renewable Energy Agency (IRENA). (2023). _Renewable readiness assessment: Kyrgyz Republic 2022._ Retrieved November 8, 2024, from <https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Dec/IRENA%5FRRA%5FKyrgyz%5FRepublic%5F2022.pdf>

12. World Salaries. (2024). _Average solar photovoltaic installer salary in Kyrgyzstan._ Retrieved November 9, 2024, from <https://worldsalaries.com/average-solar-photovoltaic-installer-salary-in-kyrgyzstan/>
13. Worldometer. (2024). _Kyrgyzstan population (2024)._ Retrieved November 9, 2024, from <https://www.worldometers.info/world-population/kyrgyzstan-population/>
14. Eurasianet. (2024). _Shortage keeping warehousing costs high in Central Asia._ Retrieved November 8, 2024, from <https://eurasianet.org/shortage-keeping-warehousing-costs-high-in-central-asia>
15. Coworker.com. (2024). _See all coworking spaces in Bishkek, Kyrgyzstan._ Retrieved November 8, 2024, from <https://www.coworker.com/kyrgyzstan/bishkek?view=list>
16. International Energy Agency (IEA). (2024). _Kyrgyzstan's power system security policy context._ Retrieved November 8, 2024, from <https://www.iea.org/reports/strengthening-power-system-security-in-kyrgyzstan-a-roadmap/kyrgyzstan-s-power-system-security-policy-context>
17. Trading Economics. (2024). _Kyrgyzstan – Access to electricity (% of population)._ Retrieved November 9, 2024, from <https://tradingeconomics.com/kyrgyzstan/access-to-electricity-percent-of-population-wb-data.html>
18. Observatory of Economic Complexity (OEC). (2024). _Kyrgyzstan (KGZ) exports, imports, and trade partners._ Retrieved November 9, 2024, from <https://oec.world/en/profile/country/kgz>
19. United Nations Economic Commission for Europe (UNECE). (2019). _Draft national sustainable energy action plan of the Kyrgyz Republic._ Retrieved November 9, 2024, from <https://unece.org/fileadmin/DAM/project-monitoring/unda/16%5F17X/E2%5FA2.3/NSEAP%5FKyrgyzstan%5FENG.pdf>

20. PV Magazine. (2024). _Eurasian Development Bank to finance 300 MW of solar in Kyrgyzstan._ Retrieved November 8, 2024, from <https://www.pv-magazine.com/2024/05/27/eurasian-development-bank-to-finance-300-mw-of-solar-in-kyrgyzstan/>
21. Power Technology. (2024). _Power plant profile: Masdar Kyrgyzstan Solar PV Park, Kyrgyzstan._ Retrieved November 8, 2024, from <https://www.power-technology.com/data-insights/power-plant-profile-masdar-kyrgyzstan-solar-pv-park-kyrgyzstan/>
22. International Finance Corporation (IFC). (2024). _Disclosure – Kyrgyz Solar 2._ Retrieved November 8, 2024, from <https://disclosures.ifc.org/project-detail/AS/608895/kyrgyz-solar-2>

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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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