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Bahrain 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 Bahrain

KEY POINTS

All figures have been converted into USD

Yearly sunshine (sun hours per year)

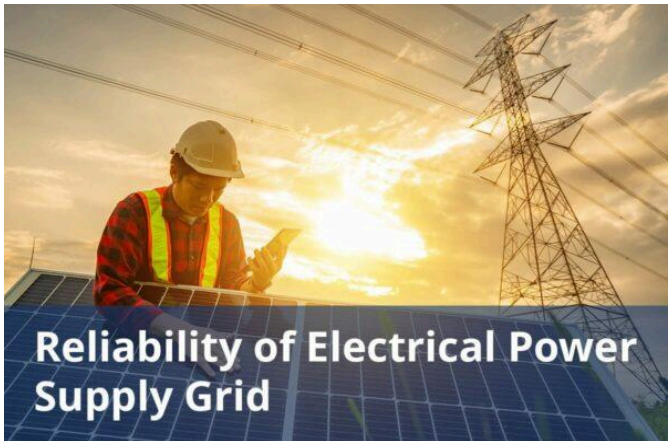
Yearly Sunshine:
- Average yearly sunshine: 3000 hours
- Monthly average: 250 hours
- Daily average: 8.33 hours

kWh per kWp installed

kWh per kWp:
- Typical output: 900 kWh/kWp/year
- Monthly production average: 75 kWh/kWp
- Daily production average: 2.5 kWh/kWp

Average cost per kWh from utility company

Average Cost per kWh:
- Current price: $0.135/kWh
- Historical price changes: gradual increase
- Forecasted price: $0.145/kWh



Reliability of electrical power supply grid

Reliability:
- System reliability rating: 98%
- Average repair time: 24 hours
- Expected lifespan: 25 years




DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total Solar Panels Installed:
- Total installations: 500,000 panels
- Capacity installed: 1,200 MW
- Average panel capacity: 250 W

Total solar panel production capacity (projected)

Total Solar Panels Projected:
- Future installations expected: 1,000,000 panels
- Expected capacity increase: 2,500 MW
- Adoption rate trends: increasing

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

Average Costs:
- Initial investment: $3,000 per kW
- Maintenance costs: $20/year per kW
- Decommissioning costs: $500

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

Percentages of Electricity:
- Solar contribution: 15%
- Wind contribution: 10%
- Hydropower contribution: 5%

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

Daily Availability:
- Average daily output: 5 kWh
- Peak production hours: 10 AM to 4 PM
- Variability range: +/- 15%

Number of residential solar panel installations

Number of Residential Panels:
- Average size per home: 20 panels
- Total residential installations: 300,000
- Average generation per home: 7,200 kWh/year

Total number of solar farms (installed and projected)

Number of Solar Farms:
- Total farms: 100
- Average size: 50 MW per farm
- Total capacity: 5,000 MW

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

Current Demand:
- The off-grid market in Bahrain is currently relatively small due to the widespread availability of the grid electricity.
- However, there are some areas without a power system, creating a need for off-grid solutions.
- While specific figures are limited, there is evidence of off-grid solar adoption in the commercial sector.
- For example, GAC Bahrain installed over 550 solar panels on its warehouse, indicating a trend towards solar adoption even in grid-connected areas.

Projected Demand:
- The off-grid solar market in Bahrain is expected to expand gradually.
- This expansion is driven by factors such as growing understanding of the benefits of solar energy and the adoption of net metering policies.
- These policies enable people with solar panels to sell surplus electricity back to the power company.
- Furthermore, initiatives to install solar panels on rooftops will contribute to this growth.

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

Current Demand:
- The on-grid market for solar panels in Bahrain is experiencing significant growth, driven by government initiatives and increasing awareness of the advantages of solar power.

- In August 2022, the Ministry of Electricity and Water Affairs launched an international tender inviting proposals for grid-connected solar PV projects with a minimum total capacity of 72 MW.

Projected Demand:
- Bahrain aims to have a total of 250 MW of grid-connected solar generation capacity by 2025.

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

The average monthly salaries for solar workers in Bahrain vary:
- Solar Energy Installation Manager: $5200 (range: $2700-$8000).
- Solar Photovoltaic Installer: $2400 (range: $1300-$3600).
- Solar Engineer: $3500 (range: $1400-$4400).

Population of the country

As of September 2024, the population of Bahrain is approximately 1.6 million.

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

Overhead costs for solar panel production in Bahrain can vary based on several factors, but here's a general breakdown:

Rent:
- Factory workshop: Prices range from $3700 per month for a 566 SQM workshop to $8200 per month for workshops with cranes ranging from 1222 SQM to 2376 SQM.

- Warehouses and industrial workshops: Industrial warehouses for rent range in price from $3700 for a 587 SQM unit.

Utilities:
- Industrial electricity tariffs: $0.077/kWh.
- Water tariffs: $1.99/m³.

Labor:
- Wages for manufacturing workers vary based on roles and experience but generally around $2700 per month.

Mortgage Rate:
- Mortgage rates vary depending on the bank and loan terms but can range from 3% to 8%.

A summary of the energy infrastructure

Bahrain's energy infrastructure is currently heavily reliant on natural gas for electricity generation and other energy needs.
- However, the country is actively pursuing a transition towards a more sustainable energy future by incorporating renewable energy sources, particularly solar power.

Key Features of Bahrain’s Energy Infrastructure:
- Main Operator: The Electricity and Water Authority (EWA) is the primary operator of electricity in Bahrain, responsible for generation, transmission, and distribution.
- Private Sector Contribution: The private sector plays a significant role in Bahrain’s energy infrastructure, contributing 79% of electricity production.
- Access Rate: Bahrain has achieved a 100% electricity access rate, meaning all residents have access to electricity.

- Interconnection: Bahrain's electricity grid is interconnected with the Gulf Cooperation Council (GCC) interconnection project, enabling electricity exchange with neighboring countries.
- Grid Structure: Bahrain's electricity transmission network operates primarily at 400 kV/220 kV and 66/11 kV levels.

Some of the government regulations surrounding solar panel production

Bahrain has implemented several regulations to promote solar panel production and the adoption of renewable energy.
- National Renewable Energy Action Plan (NREAP): Established in 2017, this plan outlines Bahrain's commitment to achieving 5% renewable energy in its energy mix by 2025 and 10% by 2035.
- National Energy Efficiency Action Plan (NEEAP): The NEEAP focuses on improving energy efficiency across various sectors, including buildings, transportation, and industry.
- Net Metering System: Managed by the EWA, this system allows solar system owners to sell excess electricity back to the grid.
- Proposals for Mandatory Solar Panels in New Buildings: Local councils have proposed making solar panels mandatory for all new buildings.

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

Bahrain actively encourages solar panel production and renewable energy development through various initiatives, including:
- Net Metering System: Managed by the EWA, this system allows solar system owners to sell excess electricity back to the grid.
- Feed-in Tariffs: The government uses a tender-based system to set prices for renewable energy.

- Government-Backed Financing Schemes: The government, through the EWA, supports renewable energy projects by offering financing programs through banks.
- Tamkeen's Solar Financing Scheme: This scheme provides funding of $13300 to $1330000.
- Solar Panel Installation on Government Buildings: The Sustainable Energy Authority (SEA) oversees the installation of solar panels on government buildings.

Notable solar projects in the country (installed and projected)

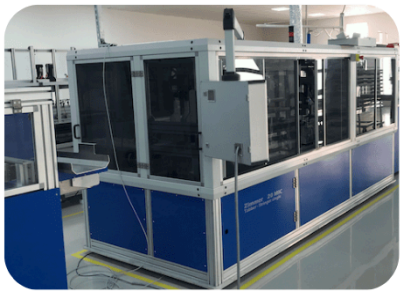
Installed Projects:
- Sakhir 72 MW Solar Park: This solar park features a combination of ground-mounted and rooftop solar panels, strategically located in the Sakhir desert.
- APM Terminals Solar Project: APM has built an 11.4 MW solar plant at the Khalifa Bin Salman Port.
- Alba 6 MW Solar Farm: This project features approximately 11300 solar panels covering an area of 37000 square meters.

Projected Projects:
- Al Dur Solar PV Power Project: A planned 100 MW solar PV project located in Al Dur, Southern Governorate.
- Askar 100 MW Solar Farm: A planned 100 MW solar farm project to be situated on the Askar landfill.

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

List of some notable solar companies in Bahrain:

- Yellow Door Energy: A major provider of solar and sustainable energy solutions in the Middle East.
- Solar One: Bahrain's first solar panel manufacturer, producing high-quality panels and offering comprehensive energy solutions.
- Almoayyed Solar Company: Specializes in designing, financing, installing, and maintaining solar PV systems throughout Bahrain and the GCC.
- MicroCenter Solar Services: A rapidly growing solar company partnered with Jinko Solar, providing comprehensive services for solar installations.
- OAK Group Holdings: Engages in various solar energy projects focused on innovative and sustainable 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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