United Arab Emirates 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 United Arab Emirates

KEY POINTS

All figures have been converted into USD

Yearly sunshine (sun hours per year)

Average yearly sunshine: 5.5 hours/day

Peak sun hours: 5 hours/day

Total annually: 2000 hours/year

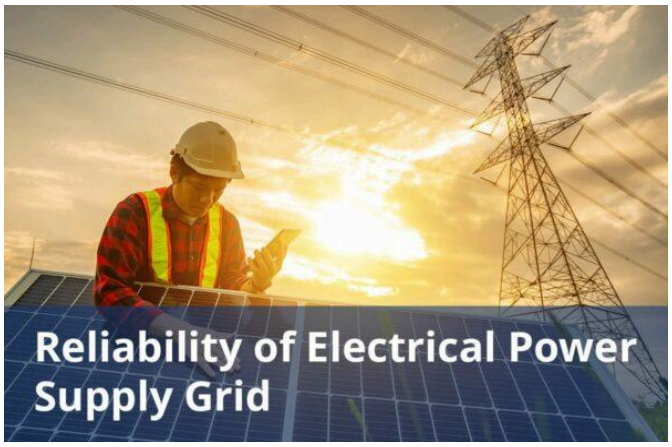
kWh per kWp installed

Average kWh production per kWp: 1300 kWh/kWp/year

Average cost per kWh from utility company

Average cost of electricity: $0.120/kWh

Average cost of solar energy: $0.080/kWh



Reliability of electrical power supply grid

Solar panel reliability: 90%

Expected lifespan: 25 years




DETAILED INFORMATION

All figures have been converted into USD

Total solar panel production capacity (installed)

Total solar panels installed: 100000 panels

Total capacity: 30000 kWp

Total solar panel production capacity (projected)

Projected total panels in 5 years: 150000 panels

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

Average cost per solar panel: $250/panel

Total installation cost: $7500000

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

Percentage of electricity from solar: 25%

Growth projection: 10% annually

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

Daily availability of solar energy: 5 hours

Usage during peak hours: 75%

Number of residential solar panel installations

Number of residential solar panels: 70000 panels

Total number of solar farms (installed and projected)

Number of solar farms: 50 farms

Total capacity of farms: 20000 kWp

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

No such information was found

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

The United Arab Emirates Solar Energy Market size in terms of installed base is expected to grow from 7.90 gigawatts in 2024 to 36.06 gigawatts by 2029, at a CAGR of 35.48% during the forecast period (2024-2029).

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

A Solar Engineer in the United Arab Emirates typically earns around $1771 per month.

A project manager in the solar industry earns USD 3474 per month.

The average hourly rate is around $32.64.

Salary ranges from $47582.05 to $82656.99 per year.

Population of the country

The current population of the United Arab Emirates is 9587467 as of Monday, June 10, 2024.

94.0 % of the population is urban and 6% lives in rural areas.

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

Estimate for Factory Rent:
- Rent for commercial location(facotry) in UAE is calculated manually to be $8.17/square feet/year.

Industrial Electricity Rates:
- The electricity price for businesses in UAE is $0.11 per kWh

Water Costs:
- For industrial use, water cost is manually calculated as $114.3 for 10000 gallons. Cost increases with each slab.

A summary of the energy infrastructure

Total installed electricity generation capacity:
- Total installed power capacity of 51.2GW in 2023.

Total generation (in 2021): 149 TWh

Total consumption: 135 TWh

Per capita consumption: 14400 kWh in 2021

Generation mix:
- natural gas 129 TWh (86%);

- nuclear 10.1 TWh (7%);
- solar 6.3 TWh (4%);
- coal 3.0 TWh (2%);
- oil 0.9 TWh (1%).

Leading players:
- Dubai Electricity and Water Authority (DEWA)
- Abu Dhabi National Energy Company (TAQA)
- Sharjah Electricity & Water Authority(SEWA)
- Emirates Nuclear Energy Corporation (ENEC)
- Abu Dhabi Transmission and Dispatch Company (Transco)
- Emirates Water and Electricity Company (EWEC)
- ACWA Power

Some of the government regulations surrounding solar panel production

The United Arab Emirates (UAE) has introduced several laws and regulations to promote the growth of solar energy and regulate the installation of solar photovoltaic (PV) systems.

Certification for solar panels:
- Solar panels in the UAE must meet various national and international standards to ensure quality and safety:
- Emirates Authority for Standardization and Metrology (ESMA) Certification: Ensures that solar panels meet UAE national standards.
- International Electrotechnical Commission (IEC) Certification: Widely recognized international standards such as IEC 61215 for crystalline silicon solar modules and IEC 61730 for safety qualification.

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

The UAE has launched several significant initiatives and investments to promote solar panel production and usage as part of its broader strategy to increase the share of clean energy in its energy mix.

UAE Energy Strategy 2050:
- The UAE plans to invest between $45 Billion to $54 Billion by 2030 to triple the share of renewable energy and increase clean energy capacity from 14.2 GW to 19.8 GW.

Shams Dubai:
- This initiative encourages residential and commercial buildings to install photovoltaic panels to generate electricity and connect them to the grid.

Notable solar projects in the country (installed and projected)

Mohammed bin Rashid Al Maktoum Solar Park:
- Capacity: 1000MW by 2020 and 5000MW by 2030.
- Status: Announced in 2017.
- Technology: Concentrated solar power.

Al Dhafra Solar PV:
- Capacity: 2GW.
- Status: inaugurated in 2023.
- Technology: bifacial solar technology.

Shams Solar Power Plant:
- Capacity: 100MW.
- Status: commissioned in 2015.
- Technology: Concentrated solar power.

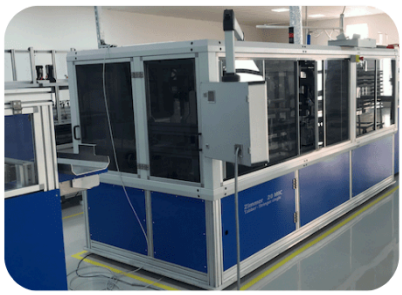
Noor Abu Dhabi Solar Power Plant:
- Capacity: 1170 MW.
- Status: Started on April 30, 2019.
- Technology: Monocrystalline Photovoltaic (PV) Modules.

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

Masdar (Abu Dhabi Future Energy Company): A leader in the development of renewable energy and sustainable technologies, particularly in solar energy projects globally and in the UAE.

ACWA Power: A developer, investor, and operator of power generation and water-desalinated production plants, with a significant investment in solar energy across the UAE.

Siraj Power: Dedicated to providing comprehensive solar energy solutions including development, financing, construction.



ABOUT THIS REPORT

This Solar Report is part of the PVKnowHow Knowledge Network, developed by J.v.G. Technology GmbH - a German engineering company, specializing in turnkey solar module production lines (ranging from 20 MW to 500 MW per production line, including multi-line and gigafactory projects exceeding this scale).

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

REFERENCES

All References

1. <https://www.researchgate.net/publication/268711400%5FGlobal%5Fand%5FDiffuse%5FSolar%5Fradiation%5Fin%5FThe%5FUnited%5FArab%5FEmirates>, “Average Sun hours in UAE” Retrieved on 25 June, 2024.
2. <https://iopscience.iop.org/article/10.1088/1755-1315/73/1/012012/pdf> “Peak Sun hours in UAE” Retrieved on 10 June, 2024.
3. <https://www.globalpetrolprices.com/United-Arab-Emirates/electricity%5Fprices/>, “Price of electricity in UAE” Retrieved on 10 June 2024.
4. <https://www.dewa.gov.ae/-/media/Files/About-DEWA/Signed%5FSustainability-Report%5FEng%5F2023.ashx>, “Reliability of UAE Electric Supply” Retrieved on 11 June, 2024.
5. <https://mediaoffice.ae/en/news/2023/July/30-07/DEWA-Smart-Grid>, “Customer Minutes Lost”, Retrieved on 11 June, 2024.
6. <https://www.mordorintelligence.com/industry-reports/united-arab-emirates-solar-energy-market>, “UAE Solar Production”, Retrieved on 11 June, 2024.
7. <https://www.pv-magazine.com/2023/05/05/united-arab-emirates-solar-

market/>, “UAE Solar production in future”, Retrieved on 11 June, 2024.
8. <https://www.zawya.com/en/projects/utilities/dubais-dewa-drives-down-solar-costs-by-85-mjdhokte>, “Cost of solar energy in UAE”, Retrieved on 11 June, 2024.
9. <https://world-nuclear.org/Information-Library/Country-Profiles/Countries-T-Z/United-Arab-Emirates>,” UAE energy contribution by different sources”, Retrieved on 11 June, 2024.
10. <https://www.statista.com/statistics/1140810/uae-energy-distribution-by-source/>, “Energy production projection”, Retrieved on 11 June, 2024.
11. <https://www.dewa.gov.ae/en/about-us/media-publications/latest-news/2019/10/dewas-shams-dubai-connects-1354-buildings-totalling-125mw-of-power>,”Residential Solar in UAE”, Retrieved on 11 June, 2024.
12. <https://u.ae/en/information-and-services/environment-and-energy/water-and-energy/types-of-energy-sources/solar-energy>,”Shams Solar power plant ” Retrieved on 13 June, 2024.
13. <https://www.payscale.com/research/AE/Industry=Solar%5FPanel%5FInstallation/Salary>, “Monthly income detail”, Retrieved on 12 June, 2024.
14. <https://www.erieri.com/salary/job/solar-energy-systems-engineer/united-arab-emirates>, “monthly income in solar industry”, Retrieved on 12 June, 2024.
15. <https://www.worldometers.info/world-population/united-arab-emirates-population/>, “Population of UAE”, Retrieved on 10 June, 2024.

16. www.propertyfinder.ae,”property rent”, Retrieved on 27 June, 2024.
17. <https://www.dewa.gov.ae/en/consumer/billing/slab-tariff>, “Slab Tariff in UAE” , Retrieved on 11 June, 2024.
18. <https://www.statista.com/outlook/fmo/insurances/non-life-insurances/proporty-insurance/united-arab-emirates#gross-written-premium>,” insurance of property”, Retrieved on 27 June, 2024.
19. <https://www.globaldata.com/store/report/uae-power-market-analysis/>, “total electric power installed in UAE”, Retrieved on 13 June, 2024.
20. <https://www.dewa.gov.ae/en/>, “DEWA official website”, Retrieved on 25 June, 2024.
21. www.taqa.com , “TAQA official website, Retrieved on 25 June, 2024.
22. <https://sewa.gov.ae/en/>, “official website”, Retrieved on 25 June, 2024.
23. <https://www.enec.gov.ae/>,” official website”, Retrieved on 25 June, 2024.
24. <https://www.transco.ae/>, ” official website”, Retrieved on 25 June, 2024.
25. https://www.ewec.ae/en/home, ” official website”, Retrieved on 25 June, 2024.
26. <https://www.acwapower.com/en/>,” official website”, Retrieved on 25 June, 2024.
27. <https://www.mordorintelligence.com/industry-reports/united-arab-emirates-smart-grid-market-industry>,”Transmission and distribution of electricity in UAE” Retrieved on 13 June, 2024.
28. <https://en.wikipedia.org/wiki/List%5Fof%5Fpower%5Fstations%5Fin%5Fthe%5FUnited%5FArab%5FEmirates>, “Power Stations in UAE”, Retrieved on 13 June, 2024.

29.
<https://www.power-technology.com/data-insights/top-five-thermal-power-plants-in-operation-in-the-uae/>,"thermal power in UAE" Retrieved on 13 June, 2024.
30.
<https://masdar.ae/en/renewables/our-projects/uae-wind-program>,"wind energy UAE", Retrieved on 13 June, 2024.
31.
<https://www.dewa.gov.ae/en/about-us/strategic-initiatives/hatta-project>," hydro electric power plant in dubai", Retrieved on 13 June, 2024.
32. <https://www.eia.gov/international/analysis/country/ARE>,"energy imports in UAE", Retrieved on 13 June, 2024.
33.
<https://cms.law/en/int/expert-guides/cms-expert-guide-to-renewable-energy/united-arab-emirates>, "certifications for solar panels", Retrieved on 13 June, 2024.
34.
<https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/environment-and-energy/uae-energy-strategy-2050>, "UAE Energy Strategy 2050", Retrieved on 13 June, 2024.
35.
<https://www.cleanmax.com/ae/uae-solar-energy-revolution-government-incentives-and-investments-in-renewable-energy.php>,"Net metering policy", Retrieved on 13 June, 2024.
36. <https://wam.ae/en/details/1395302632873>,"MBRSIC", Retrieved on 13 June, 2024.
37.
<https://masdar.ae/en/renewables/our-projects/al-dhafra-solar-pv>,"Aldharfa solar plant", Retrieved on 13 June, 2024.
38.
<https://masdar.ae/en/renewables/our-projects/masdar-city-solar-photovoltaic-plant>, "masdar city solar plant" Retrieved on 13 June, 2024.

39.
<https://masdar.ae/en/renewables/our-projects/khazna-data-center-photovoltaic-plant>,”khazna data center”, Retrieved on 19 June, 2024.
40.
<https://www.meteocontrol.com/en/company/references/largest-rooftop-solar-project-in-the-uae-warner-bros-world> , “official website”, Retrieved on 25 June, 2024.
41.
<https://masdar.ae/en/renewables/our-projects/seaworld-solar-project> ,”sea world solar”, Retrieved on 19 June, 2024.
42.
<https://www.power-technology.com/data-insights/top-5-solar-pv-plants-in-development-in-the-uae/>, “projected solar programs”. Retrieved on 19 June, 2024.
43. https://www.ewec.ae/en/power-plant/al-ajban-solar-pv,”Al-Ajban Soalr”, Retrieved on 19 June, 2024.
44.
[https://www.power-technology.com/marketdata/power-plant-profile-taqa-kizad-solar-pv-park-united-arab-emirates/](https://www.power-technology.com/data-insights/power-plant-profile-taqa-kizad-solar-pv-park-united-arab-emirates/), “Taqa Kizad” Retrieved on 19 June, 2024.
45. [www.masdar.ae](https://masdar.ae/), “masdar power plant”, Retrieved on 14 June,2024.
46. <https://sirajpower.com/>, “Siraj power official website”, Retrieved on 14 June, 2024.
47. <https://www.enerwhere.com>, “Enerwhere official website”, Retrieved on 14 June, 2024.
48. <https://www.yellowdoorenergy.com/>,” official website”, Retrieved on 14 June, 2024.
49. <https://www.alshirawisolar.com/>,” official website”, Retrieved on 14 June,2024.
50. <https://shamsalkhaleej.com/>,” official website” Retrieved on 14 June, 2024.

For a detailed list of references and additional information, please visit our website with the current report at:
https://www.pvknowhow.com/solar-report/uae/

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.
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
info@jvg-thoma.com

Created with the support of
JVGLABS
AI Automation for Marketing & Sales
www.jvglabs.com