Mongolian Photovoltaic Module

Overview

Solar power, often believed to be an uneconomical alternative to fossil fuels, has seen massive reductions in cost per kWh.

Key Takeaways

Mongolia's photovoltaic (PV) modules are locally manufactured to withstand extreme climates, offering high efficiency and tailored solutions for residential, commercial, and industrial applications.Solar Potential in Mongolia

Mongolia receives over 250 days of sunshine annually, with solar irradiation levels ranging from 1,200 to 1,600 kWh/m²/year, making it one of the most promising regions globally for solar energy deployment . The country's vast open landscapes and high solar exposure provide ideal conditions for both small-scale and utility-scale PV projects.

Local PV Module Manufacturing

Local manufacturers, such as EK SOLAR, produce modules specifically designed for Mongolia's harsh environment, which includes temperature swings from -40°C to +40°C, high winds, dust, sand, and heavy snowfall . Key features of these modules include:

• Dual-glass (glass-glass) construction for enhanced mechanical strength and moisture resistance.

• Bifacial modules that capture sunlight from both sides, increasing energy yield by up to 22% in winter months .

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• Anti-soiling coatings and optimized tilt angles (around 15°) to reduce dust accumulation and maintain performance . These adaptations ensure durability and reliable energy production, particularly in remote areas and mining operations where imported standard modules may underperform.

Applications and Performance

Mongolian PV modules are used in a variety of applications:

• Residential and herder families: Portable solar kits can cover up to 80% of household energy needs, including refrigeration and device charging .

• Commercial and industrial projects: PV systems combined with battery storage provide energy independence, predictable costs, and operational stability, reducing reliance on diesel generators .

• Utility-scale projects: Large-scale solar farms, such as the Stable Solar Energy in Mongolia Project, plan to deploy 115 MW of PV capacity with 65 MW / 237 MWh battery storage, enhancing grid stability and renewable integration .

Market Trends and Opportunities

The Mongolian PV sector is experiencing rapid growth, with manufacturers achieving 35% higher year-on-year growth compared to conventional markets . Government incentives, including Feed-in Tariffs (FITs) and supportive renewable energy policies, encourage investment in solar PV and hybrid systems . Local production also reduces dependency on imports and ensures modules are optimized for Mongolia's extreme climate.

Technical Insights

Empirical studies in desert and arid regions, such as Inner Mongolia, show that bifacial (BC) modules outperform conventional TOPCon modules, achieving 2.45% higher electricity generation per kilowatt and 9.05% higher power output per unit area, demonstrating the potential for high-efficiency PV deployment in similar Mongolian environments .

Conclusion

Mongolia's PV module industry is not only expanding access to renewable energy but also tailoring technology to local environmental conditions, from portable kits for herders to large-scale solar farms with integrated storage. These locally manufactured modules are central to Mongolia's renewable energy transition, offering durability, efficiency, and energy independence under the country's “Eternal Blue Sky” .

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Mongolia Solar PV Cells and Modules Market is expected to grow during 2025-2031

Mongolia completes 10 MW solar farm

Mongolia has connected a 10 MW solar farm to the grid, as part of a plan to deploy 40.5 MW of solar and wind capacity

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