

SolarInnovate Energy Solutions

Crystalline silicon solar cell cost per watt



Overview

How much does a c-Si solar system cost?

This report benchmarks three established, mass-produced PV technologies as well as two promising technologies that are currently under development or in pilot production. Crystalline silicon (c-Si) dominates the current PV market, and its MSPs are the lowest—\$0.25–\$0.27/watt across the c-Si technologies analyzed.

How much power does a monofacial solar module produce?

Each module has an area (with frame) of 1.9 m² and a rated power of 400 watts, corresponding to an efficiency of 21.1%. The monofacial modules were assembled in the United States in a plant producing 1.5 GW dc per year, using n-type crystalline silicon solar cells produced in Southeast Asia.

What is the difference between monocrystalline and polycrystalline solar panels?

Monocrystalline solar panels cost 0.90–1.20 per watt, offering 18–22% efficiency due to pure silicon, while polycrystalline panels are cheaper at 0.70–1.00 per watt but less efficient (15–17%). Monocrystalline lasts 25–30 years with 0.3–0.5% annual degradation, whereas polycrystalline degrades 0.5–0.8% yearly.

How efficient are bifacial solar modules?

Each module has an area (with frame) of 2.57 m² and a rated power of 530 watts, corresponding to an efficiency of 20.6%. The bifacial modules were produced in Southeast Asia in a plant producing 1.5 GW dc per year, using crystalline silicon solar cells also produced in Southeast Asia. In 2024Q1, these modules were not subject to import tariffs.

How much AC does a solar PV system produce?

The aluminum rails and module clamps are imported from China and subject

to 25% tariff. Each module is paired with a microinverter rated at 330 W ac, giving the PV system a rated AC power output of 6.6 kW ac, which corresponds to an inverter loading ratio of 1.22.

How is PV price calculated?

Specifically, the report calculates that price by using bottom-up manufacturing cost analysis and applying a gross margin of 15%. This report benchmarks three established, mass-produced PV technologies as well as two promising technologies that are currently under development or in pilot production.

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