

Utility-scale solar brazzaville

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2021 ATB data for utility-scale solar photovoltaics (PV) are shown above. The Base Year estimates rely on modeled capital expenditures (CAPEX) and operation and maintenance (O& M) cost estimates benchmarked with industry and historical data. Capacity factor is estimated for 10 resource classes, binned by mean global horizontal irradiance (GHI) in the United States. The 2021 ATB presents capacity factor estimates that encompass a range associated with advanced, moderate, and conservative technology innovation scenarios across the United States. Future year projections are derived from bottom-up benchmarking of PV CAPEX and bottom-up engineering analysis of O& M costs.

A detailed description of the scenarios is below.

The map below shows average annual GHI in the United States.

Utility-Scale PV Resource Classes

DOE's Solar Energy Technologies Office sets its PV cost targets for a location centered geographically within the continental U.S., in resource class 7, whereas the ATB benchmark is class 5, representing the national-average solar resource.

Summary of Technology Innovations by Scenario (2030)

Technology Description: Tariffs on PV modules expire, as scheduled, though some form of friction still remains, keeping U.S. panel pricing halfway between current U.S. and global pricing. Efficiency gains for panels are consistent with one standard deviation below that of the International Technology Roadmap for Photovoltaic (ITRPV--an annual report prepared by many leading international poly-Si producers, wafer suppliers, c-Si solar cell manufacturers, module manufacturers, PV equipment suppliers, and production material providers, as well as PV research institutes and consultants) to 2030, which is well below historical monofacial average gains and is below the leveling-off point to 21.5% by 2030, resulting in a price of \$0.32/WDC

Justification: This scenario represents the low end of industry expectations of average module efficiency in 2030 and additional friction despite the scheduled removal of the tariff.

Technology Description: Tariffs expire, as scheduled, and efficiency gains are consistent with median the ITRPV road map to 2030, which are well below historical monofacial average gains and are below the leveling-off point to 22.5% by 2030, which results in a price of \$0.19/WDC

Justification: This scenario represents manufacturers" expectations for 2030.



Technology Description: This scenario assumes medium-voltage power transmission or centralized power conversion center for inverters of \$0.04/WDC.

Justification: Industry is currently switching to this practice.

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