



Cost estimation of photovoltaic projects with energy storage

How much does a PV system cost?

Our operations and maintenance (O&M) analysis breaks costs into various categories and provides total annualized O&M costs. The MSP results for PV systems (in units of 2022 real USD/kWdc/yr) are \$28.78 (residential), \$39.83 (community solar), and \$16.12 (utility-scale).

How much does a PV system cost in 2022?

The current MSP benchmarks for PV systems in 2022 real USD are \$28.78/kWdc/yr(residential),\$39.83/kWdc/yr (community solar),and \$16.12/kWdc/yr (utility-scale,single-axis tracking). For MMP,the current benchmarks are \$30.36/kWdc/yr (residential),\$40.51/kWdc/yr (community solar),and \$16.58/kWdc/yr (utility-scale,single-axis tracking).

How efficient is a residential PV system in 2024?

The representative residential PV system (RPV) for 2024 has a rating of 8 kW dc (the sum of the system's module ratings). 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%.

What makes a PV system a market price?

Market prices can include items such as smaller-market-sharePV systems (e.g.,those with premium efficiency panels),atypical system configurations due to site irregularities (e.g.,additional land grading) or customer preferences (e.g.,pest traps),and specific project requirements (e.g.,unionized labor).

How do market analysts evaluate the cost of PV systems?

Market analysts routinely monitor and report the average costof PV systems and components,but more detail is needed to understand the impact of recent and future technology developments on cost. Consequently,benchmark systems in the utility-scale,commercial,and residential PV market sectors are evaluated each year.

How much would a PV system cost without a 45x credit?

Without the 45X credit eligible for domestically assembled modules,inverters,and battery packs the MMP of the residential PV and PV-plus-storage system would have been \$2.90/Wdcand \$4.93/Wdc,respectively.

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