

# Civilian solar power generation costs



## Overview

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The average cost of solar panels ranges from \$2.50 per watt installed, with most homeowners paying between \$15,000 and \$35,000 for a complete system before incentives. Department of Energy (DOE) Solar Energy Technologies Office (SETO) and its national laboratory partners analyze cost data for U.S. solar photovoltaic (PV) systems to develop cost benchmarks. These benchmarks help measure progress toward goals for reducing solar electricity costs. NLR analyzes the total costs associated with installing photovoltaic (PV) systems for residential rooftop, commercial rooftop, and utility-scale ground-mount systems. Data source: IRENA (2025); Nemet (2009); Farmer and Lafond (2016) – Learn more about this data Note: Costs are expressed in constant 2024 US\$ per watt. 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. The latest cost analysis from IRENA shows that renewables continued to represent the most cost-competitive source of new electricity generation in 2024.

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### Solar photovoltaic panel prices

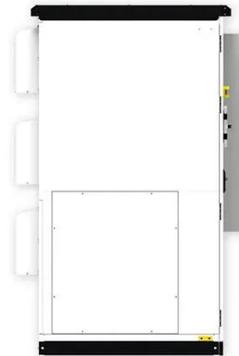


From 2010 onward, prices come from IRENA's Renewable Power Generation Costs report, based on pvXchange benchmarks for modules sold in Europe, using the 'Thin film a-Si/u-Si or Global Price Index ...

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### Renewable Power Generation Costs in 2024

In 2024, renewables helped avoid USD 467 billion in fossil fuel costs, reinforcing their role in enhancing energy security, economic resilience, and long-term affordability.



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### Solar Photovoltaic System Cost Benchmarks

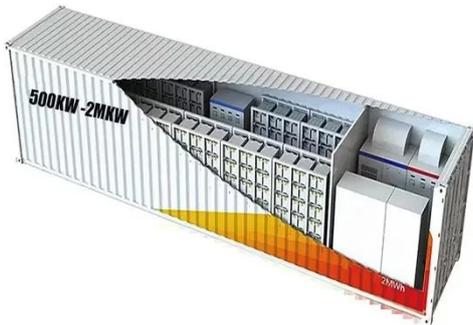
These benchmarks help measure progress toward goals for reducing solar electricity costs and guide SETO research and development programs. Read more to find out how these cost benchmarks are modeled and ...

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### Solar Installed System Cost Analysis

## , Solar Market Research & Analysis

NLR analyzes the total costs associated with installing photovoltaic (PV) systems for residential rooftop, commercial rooftop, and utility-scale ground-mount systems. This work has grown to include cost ...



## Solar Power Cost Guide 2025: Complete Pricing & Savings

A solar generation calculator is an essential tool for anyone considering solar panel installation, providing estimates of how much electricity your solar system could produce based on your location, roof ...

## Chart: The Cost of Energy , Statista

This chart shows the levelized cost of energy generation by source (in U.S. dollar per MWh).



## Cost of Electricity Generation by Source

As of 2023, solar is 14% cheaper than energy produced by gas. But if we look back to 2009, solar was 433% more



costly than energy generated by gas. Today, wind is the lowest cost energy source, ...

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### Utility-Scale PV , Electricity , 2024 , ATB , NLR

2024 ATB data for utility-scale solar photovoltaics (PV) are shown above, with a base year of 2022. The Base Year estimates rely on modeled capital expenditures (CAPEX) and operation and maintenance (O& M) cost ...



### What is the price of regular civilian solar energy? , NenPower

The price of regular civilian solar energy varies significantly based on multiple factors, including technology type, installation costs, location, and incentives.

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### Levelized Costs of New Generation Resources in the Annual Energy

This paper presents average values of levelized costs for new generation resources as represented in the National

Energy Modeling System (NEMS) for our Annual Energy Outlook 2025 (AEO2025) Reference case.



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