



# The proportion of photovoltaic panel components in cost





## Overview

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Panel costs depend on their type—monocrystalline panels are typically more expensive but more efficient, while polycrystalline panels are more affordable with slightly reduced efficiency. On average, panels account for 45-60% of total system costs. Market analysts routinely monitor and report the average cost of 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. NLR analyzes the total costs associated with installing photovoltaic (PV) systems for residential rooftop, commercial rooftop, and utility-scale ground-mount systems. NLR's PV cost benchmarking work uses a bottom-up. What is the impact of increasing commodity and energy prices on solar PV, wind and biofuels?

IEA analysis, based on NREL (2020); IRENA (2020); BNEF (2021c). Other includes costs of project development, management and financing. 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. Global estimates are used before 2010; European market. The NREL provides a detailed breakdown of solar PV system costs by market segment: residential, commercial, and utility. These manufacturing cost analyses focus on specific PV and energy storage technologies—including crystalline silicon, cadmium telluride, copper indium.



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### Solar Photovoltaic System Cost Benchmarks

Market analysts routinely monitor and report the average cost of PV systems and components, but more detail is needed to understand the impact of recent and future technology developments on cost.

### Utility-scale PV investment cost structure by component and by

Utility-scale PV investment cost structure by component and by commodity breakdown - Chart and data by the International Energy Agency.



### The cost percentage of PV module components (A) Cost percentage of PV

Results in Figure 6 show that 68% of the PV module price is allocated to input materials, while production costs are responsible for 11% and other costs for the remaining 21%.

## Solar Installed System Cost 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 ...



### [Ultimate Guide to BOS Cost Breakdown under NEC/IEC](#)

Understanding the BOS cost breakdown is critical for accurate budgeting and maximizing your return on investment. These costs are heavily influenced by regional standards, primarily the ...

### [Solar Manufacturing Cost Analysis , Solar Market Research](#)

The Detailed Costs Analysis Model (DCAM) on Open EI is a cloud-based tool for calculating the costs to manufacture components and install energy systems. DCAM underpins many ...



### [Breakdown of Solar Pv System Costs by Market Segment](#)

As the size of a solar array increases, photovoltaic modules represent a higher percentage of total costs, while the percentage of soft costs decreases. This is also why large projects are more sensitive to ...



### [What is the Cost Breakdown of a Solar Power System? Complete ...](#)



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### **Solar photovoltaic panel prices**

Solar photovoltaic module prices refer to the cost of the solar panel itself, and do not include installation or other system components. Prices are compiled from three sources: Nemet ...



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