

Monocrystalline vs. Polycrystalline Solar Panels: 2022 Guide

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Average Cost

The manufacturing process has the biggest impact on [solar panel costs](#).

Monocrystalline panels have a complex production process and use higher-quality materials. Polycrystalline panels are produced with lower-quality silicon cells, some of which are recycled from the monocrystalline production process. These savings translate to lower costs. Additional components of the solar panel installation process, including the inverters and wiring, cost the same for both panel options.

Your selected panel type can also influence your system's payback period, typically six to 10 years. With more efficient mono panels, your system will convert more energy, leading to better solar power production for your home. Since solar power costs less than expensive fossil fuels, those savings could speed up your payback period. Polycrystalline panels don't offer those same long-term savings, so they won't decrease your payback period.

Efficiency Rating

An important difference between mono and poly panels is their efficiency rating. Solar panel efficiency expresses how much sunlight the panel can absorb and convert into electricity. For example, a solar panel with a 15% efficiency rating can absorb and convert 15% of the sunlight it receives. Polycrystalline panels have an average efficiency of 13% to 16%. Monocrystalline panels' efficiency ranges from 15% to 23%.

Panel Appearance

Many homeowners have a personal preference regarding their solar panels' appearance. If preserving your home's aesthetics is important to you, monocrystalline panels might be a better option. These panels are black and blend better with most roof types. Polycrystalline panels have a blue hue, making them more noticeable on rooftops.

Roof Space

Roof space is another key factor when choosing between mono and poly panels. Since mono solar panels are more efficient, they convert sunlight at a better rate. Thus, homeowners need fewer monocrystalline panels to power their homes effectively. These panels are a great choice for homes with less roof space.

The opposite is true for poly solar panels. Due to their lower efficiency rating, you'll need more panels to meet your home energy needs. You'll also need ample roof space to accommodate these additional panels.

Typical Life Span

Most crystalline solar panels have a life span of about 25 years. This corresponds with the length of a typical solar panel warranty. However, your panels can last longer than the manufacturer's 25-year warranty with regular maintenance. Polycrystalline panels can last 25 to 35 years, while monocrystalline panels can last up to 40 years.

Although panels can last for decades, they lose their efficiency over time. According to the [National Renewable Energy Laboratory](#) for the U.S. Department of Energy, solar panels have an average degradation rate of 0.5% per year. This is how much they drop in power output and wattage. High-efficiency panels have a higher wattage and efficiency, so a degradation drop isn't as impactful. A drop in performance can have a significant impact on lower-efficiency panels.

Temperature Coefficient

Manufacturers test solar panels' performance in Standard Test Conditions (STC) of 77 degrees Fahrenheit. The panels remain at peak efficiency between 59 degrees Fahrenheit and 95 degrees Fahrenheit, but anything outside of this range will cause a drop in efficiency.

The amount a panel will decrease power production when exposed to extreme temperatures is represented by its temperature coefficient. The higher the temperature coefficient, the worse a panel will perform in extreme weather. Monocrystalline panels have a low temperature coefficient and perform well under extreme temperatures. Polycrystalline panels have a higher temperature coefficient and typically decrease performance in hot climates.

