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With electricity prices continuing to rise across many parts of the country, solar power with the right inverter technology is an extremely smart long-term investment. However, the inverters that convert the panels’ DC output into usable AC power come in two main types – microinverters and string inverters.

Choosing the right option up front is crucial because inverters are expensive to replace later. Microinverters are best suited for small, complex, or shaded rooftops while string inverters perform well on larger, unshaded south-facing roofs.

Understanding these key distinctions will ensure your panels can operate at peak efficiency over their 25+ year lifetime. Read on to learn the detailed differences to determine which is better for your particular solar design.

Inverters convert the panels’ DC output into alternating current (AC) that can be used to run lights, outlets, and devices. They also regulate and synchronize the voltage to match your building"s electrical system.

Hopefully, this gives you a high-level sense of the comparative strengths and limitations of each approach. Next let’s get into more detail on how these differences apply specifically to small, average, and large solar arrays…

Homes with tight roof spaces under 6 kW (18 panels) are often better served by microinverters. Their module-level MPPT tracking and power optimization ensure maximum production from constrained areas.

Limitations like inter-row shading, low light levels on certain sections, and panel mismatches have minimal impact on string designs. Microinverters also simplify incrementally adding more panels over time.

As small roofs see the greatest variance in sunlight exposure based on angles and surroundings, the panel-specific flexibility of microinverters is extremely useful. It allows for greater customization of orientations to maximize total energy yield.

The downside is microinverters do cost more upfront. However, the benefit of greater solar harvesting, especially in complex or suboptimal installations, tends to make that premium money well spent over the system’s lifetime.

When moving into the 6 to 10 kW range (around 18 to 30 panels) suited to average-sized family homes, the decision between micro and string becomes less clear-cut. And there is a crossover point system-size-wise

where string inverters gain substantial advantages.

Here string inverters can provide better economies of scale thanks to their consolidated design. By converting a greater volume of DC watts at once, conversion efficiencies reach upwards of 98% versus 95-97% with microinverters. So while less optimization occurs at the individual panel level, significantly higher aggregate efficiency balances this out on suitable roofs.

South-facing panels without major shading allow string inverters to perform extremely well for typical suburban constructions. Their lower costs also make these mid-range installs more affordable while still meeting 100% of most households" power needs.

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