

Can you afford the risk of total system failure?

▶ DC optimizer vendors like to position their approach to power conversion as a combination of the best aspects of microinverters and central inverters. **The fact is, DC optimizer systems are complex and still rely on a central inverter**, which is a single point of failure for the system.

Furthermore, DC optimizer systems are reliant on communications between the inverter and the optimizers in order to supply power, which means an additional single point of failure.

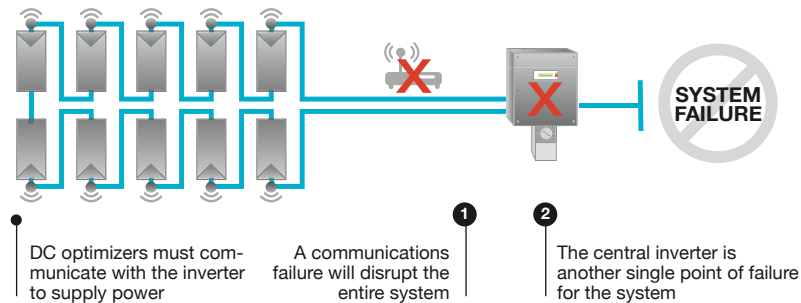
In contrast, the Enphase Microinverter System, by nature of its distributed architecture, has no single point of system failure and is not reliant

on communications between devices in order to supply power.

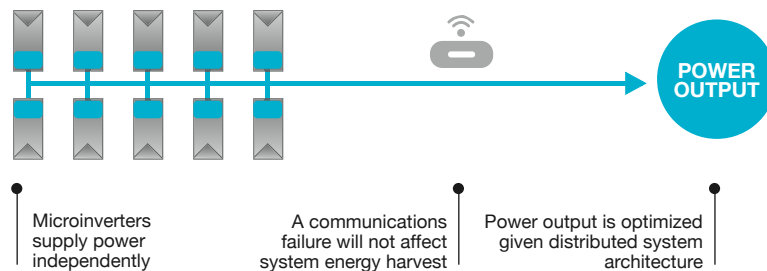
In the unlikely event that a single microinverter does go down, the rest of the system is unaffected and the impact on total energy harvest is minimal.

DC OPTIMIZERS	ENPHASE MICROINVERTERS
⊖ Lower system availability due to multiple single points of failure	⊕ Superior system availability with no single point of failure
⊖ System power output is dependent on reliable communications	⊕ Communications outage does not impact power output
⊖ Additional design and installation costs and complexity	⊕ Lowest complexity in design and installation

DC optimizer systems have two central points of system failure



The Enphase Microinverter System has no central point of system failure



To learn more about the Enphase Microinverter System, visit enphase.com

Higher uptime translates into real savings.

► The Enphase Microinverter System, by nature of its distributed system architecture, delivers higher system uptime and a lower total system cost than a DC optimizer system.

Additionally, a DC optimizer system requires a central inverter, which generally carry only a standard 5- or 10- or 12-year warranty, and will most likely need to be replaced at least once during the system's life.

Enphase's 25-year warranty, on the other hand, matches your system's module warranty, which eliminates unexpected future costs. Additionally, for a DC optimizer system, multiple power conversion stages and the number of optimizers are a drag on efficiency and impact performance (as illustrated in the figure above). All else being equal, there is a significant long-term total system cost advantage for the Enphase Microinverter System.

OVERALL SYSTEM PERFORMANCE					
DC Optimizer System			Enphase Microinverter System		
	Efficiency	Uptime		Efficiency	Uptime
Optimizers	98.0%	99.5%	Enphase Microinverters	96.0%	99.8%
Communications	99.5%	98.0%	—	—	—
String Inverter	96.0%	97.0%	—	—	—
AC Wiring	99.0%	100.0%	AC Wiring	99.0%	100.0%
Total	92.7%	94.6%	Total	95.0%	99.8%
DC Optimizer Overall System Performance		87.7%	Enphase Overall System Performance		94.8%

Factoring in central inverter replacement cost and overall system efficiency, Enphase delivers a significant total system cost advantage.*

*Internal Enphase analysis using best available estimates for DC optimizer system costs assuming equal energy harvest for both systems and incorporating central inverter replacement costs for the DC optimizer system.

Enphase Microinverter System Total Cost Advantage

\$0.25 / Watt*

THE HIDDEN COSTS OF DC OPTIMIZERS

Both solar installers and vendors acknowledge the shortcomings of DC optimizer systems.

“The overall look and feel of the [DC optimizer system] monitoring software is cluttered and not intuitive.”

– Installer quote

“The number of optimizers in a string is another factor affecting efficiency.”

– SolarEdge product documentation

“Power optimizers must be able to communicate with the inverter in order to produce power.”

– SolarEdge product documentation

“[DC optimizer systems are a] more complex installation than a conventional central inverter or an Enphase system. It's not for new, inexperienced electricians.”

– Installer quote

“Some DC optimizers are designed for use with their own line of inverters. If a third-party inverter is used, the system requires a Safety and Monitoring Interface (SMI) which must be connected at the end of each string of modules and also to the internet.”

– Installer quote

To learn more about the Enphase Microinverter System, visit enphase.com