Enphase Energy Announces Development of IQ Solid-State Transformer for AI Data Centers

Distributed, semiconductor- and software-defined power platform brings Enphase's proven system architecture to 800 VDC (±400 VDC) data center infrastructure

FREMONT, Calif., April 28, 2026 (GLOBE NEWSWIRE) -- Enphase Energy, Inc. (NASDAQ: ENPH), a global energy technology company, today announced the development of the IQ® Solid-State Transformer (IQ® SST), a distributed solid-state transformer platform purpose-built for AI data centers as the industry moves toward higher-density DC power architectures.

IQ SST is designed to replace traditional centralized power conversion with a distributed "supercluster" architecture. Each 1.25 MW IQ SST rack will combine 342 intelligent, semiconductor- and software-defined power modules operating in a coordinated series/parallel configuration. The system is expected to deliver 98.5% efficiency and 99.999% availability through built-in redundancy, enabling continued operation with only 90% of the power modules participating.

The IQ SST platform is designed without internal batteries and is intended to reduce or eliminate the need for rack-level battery sidecars and traditional uninterruptible power supply (UPS) systems in supported data center configurations. For data center operators, that means less power infrastructure, less floor space consumed by electrical equipment, and more space available for GPUs. In an industry where power density and floor space are increasingly constrained, returning space to compute infrastructure can be a meaningful economic advantage. Read the supporting presentation to learn more.

"AI is changing how power must be delivered to compute infrastructure," said Badri Kothandaraman, president and CEO of Enphase Energy. "For two decades, Enphase has built distributed, semiconductor- and software-defined power conversion systems at scale. As AI racks move toward 800 VDC (±400 VDC) architectures and megawatt-scale densities, we believe that distributed architecture is well suited to this transition, and it is what we are building."

AI workloads are pushing data center rack power from hundreds of kilowatts toward megawatt-scale densities, with loads that can swing from idle to full power and back several times per second. Legacy 48 VDC and multi-stage conversion architectures were not designed for this level of density, speed, or efficiency. IQ SST will convert medium-voltage AC, including 35 kV and 15 kV interconnection classes, directly into regulated DC power in a single conversion stage. The platform is designed to support both 800 VDC and ±400 VDC rack configurations defined by emerging AI data center standards, with sub-millisecond response to dynamic AI loads.

The IQ SST power module is derived from Enphase's microinverter platform, now in its ninth generation. At the heart of every unit is Enphase's fifth-generation control ASIC ("Kestrel"), a custom 22-nanometer chip designed to enable fast, coordinated response across hundreds of distributed power modules. The power module will use gallium nitride (GaN) power-switching technology proven in Enphase's IQ9™ Microinverters. GaN enables fast, compact, and highly efficient power conversion at the power module level, while Enphase's distributed architecture and proprietary controls coordinate hundreds of power modules into a single megawatt-scale power platform.

Enphase expects to manufacture IQ SST on the same automated platform it has used to ship approximately 87.8 million microinverters. IQ SST power modules are designed to be built from standard high-volume semiconductor components and supplied from manufacturing facilities in the United States, leveraging Enphase's existing diversified supply chain. This gives customers a domestic alternative to offshore, custom-built power systems.

"When we started Enphase twenty years ago, we made a founding bet that distributed architectures would outperform centralized architectures in power electronics," said Raghu Belur, co-founder and chief product officer at Enphase Energy. "We proved it in solar. We are proving it again with batteries. Now we are bringing that same conviction to AI power. A single-stage, semiconductor- and software-defined, distributed design is how we intend to deliver the performance, reliability, and economics that AI data centers need. Everything we have built over the last two decades has led to this moment."

Enphase expects the initial annual U.S. addressable opportunity for IQ SST in AI data centers to exceed 11 GW by 2031. AI data centers are the first target application for the platform, driven by increasing rack power densities, faster-changing AI workloads, and the industry's move toward 800 VDC and ±400 VDC power architectures. Over time, Enphase sees a path to extend the same distributed, semiconductor- and software-defined power conversion architecture into larger adjacent high-power markets. Full system demonstrations of the IQ SST platform are expected late this year, with customer pilots in 2027 and volume shipments expected in 2028.

To learn more about the Enphase solid-state transformer solution, visit the Enphase website.

About Enphase Energy, Inc.

Enphase Energy, a global energy technology company based in Fremont, CA, is the world's leading supplier of microinverter-based solar and battery systems, EV chargers, home energy management systems, and virtual power plant (VPP) solutions. Enphase products enable people to harness the sun to make, use, save, and sell their own power, all controlled through the Enphase App. The company revolutionized the solar industry with its microinverter-based technology and has shipped approximately 87.8 million microinverters, with more than 5.2 million Enphase-based systems deployed in over 165 countries. For more information, visit https://enphase.com/.

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Forward-Looking Statements

This press release may contain forward-looking statements, including statements related to the expected capabilities, features, architecture, functionality, benefits, reliability and performance of the IQ Solid-State Transformer (IQ SST), including its expected power output, conversion efficiency, response time, system availability, redundancy, and ability to reduce or eliminate rack-level battery sidecars and traditional UPS systems; Enphase Energy's expectations regarding the suitability of IQ SST for AI data centers and other large adjacent power markets; expectations regarding the timing of initial full system demonstrations, customer pilots, and volume shipments of the IQ SST; expectations regarding the scalability of Enphase's manufacturing platform and supply chain for IQ SST, including U.S.-based final assembly and sourcing; and Enphase Energy's views on the size and growth of the addressable market for solid-state transformer-based systems. These forward-looking statements are based on Enphase Energy's current expectations and assumptions and inherently involve significant risks and uncertainties. Actual results and the timing of events could differ materially from those contemplated by these forward-looking statements as a result of such risks and uncertainties. Such risks include, but are not limited to, technological development and validation risks; the ability to achieve targeted performance, efficiency, and availability metrics at scale; customer acceptance and adoption of new power architectures; changes in AI data center design standards and infrastructure requirements; market demand; competitive dynamics; supply chain availability and costs; regulatory and interconnection requirements; execution risks related to new market entry; and other factors discussed in Enphase Energy's filings with the Securities and Exchange Commission, including those risks described in more detail in Enphase Energy's most recently filed Annual Report on Form 10 K and other filings made from time to time with the Securities and Exchange Commission. Enphase Energy undertakes no duty or obligation to update any forward-looking statements contained in this release as a result of new information, future events, or changes in its expectations, except as required by law.

Contact:

Enphase Energy
press@enphaseenergy.com

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