ANALYSIS DATA CENTERS U.S. MARKET

How Turboden uses heat to make gas generation more efficient

Waste-heat-to-power tech has struggled to scale in the U.S. — but could load growth and a behind-the-meter push change things?

BIANCA GIACOBONE MARCH 17, 2026

Photo credit: Turboden

In about one year, energy infrastructure company Tallgrass plans to increase the generation capacity of some of its gas compressor stations in rural Ohio and Indiana by approximately 30 megawatts. That's without spinning more gas turbines or extending the existing pipeline — but by installing three waste-heat-to-power plants directly onto its existing infrastructure.

The plants — each occupying roughly 22,600 square feet and producing 10 MW — will be built by Turboden, an Italian firm owned by Mitsubishi Heavy Industries, according to a recent announcement. And they will integrate with an existing Turboden system commissioned by Tallgrass in Ohio in 2024,

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The project is an iteration of a tried-and-true technology, the organic rankine cycle, or ORC for short. ORC squeezes extra electricity from existing generation sources — such as gas or geothermal plants — by capturing the heat they produce that would otherwise go to waste.

Turboden itself has been around for over four decades, having been founded in 1980. But it was only in late 2024 that the company expanded into the U.S., attracted by the historic surge in electricity demand that is reshaping the power landscape. U.S. electricity demand rose by over 2% in 2025, and is expected to continue increasing by about 2% annually through 2030; that's more than twice the average annual increase over the last decade, according to the latest forecasts by the International Energy Agency. This increase in demand, driven in large part by the baseload power requirements of AI data centers, is encouraging the buildout of more gas, as well as new interest in both conventional and next-generation geothermal.

In the U.S., waste-heat-to-power technology has historically struggled to scale due to low natural gas prices, interconnection hurdles for behind-the-meter generation, and a lack of financial incentives. However, the current surge in electricity demand, combined with tax credits from the Inflation Reduction Act, are shifting Turboden's perspective. According to Dan Nadav, who leads business development for the company, it is creating a unique opportunity for approaches that optimize existing infrastructure.

"We're talking about utilizing existing energy infrastructure in a smarter way, both the gas used in gas turbines and the gas turbines themselves," Nadav said, noting that simple-cycle turbines and engines typically convert only about 30% of their fuel into electricity. By adding an ORC system to capture and recycle the heat that would otherwise be wasted, the total efficiency can be boosted to around 50%.

Turboden currently has over 15 units either operational or under development across the U.S. Besides its waste-heat-to-power deployments, it is also in a partnership with Fervo Energy for its Cape Station enhanced geothermal plant, where the ORC technology will serve as the primary generation method, with a planned capacity of 300 MW. Meanwhile, Turboden's global presence is much bigger, with more than 450 units across Europe, South America, and Asia.

A 'tremendous' shift to behind-the-meter

The ORC process works by installing a heat exchanger on a facility's existing chimney to capture waste heat from exhaust gases. This heat evaporates a fluid — the company has 10 fluid options that it selects from based on a project's specific heat

waste-heat-to-power technologies, and requires less maintenance.

According to Marco Vettori, vice president of Turboden's U.S. branch, the company's modular units — ranging from one to 40 MW — are "already designed according to U.S. standards" as an "off-the-shelf solution," which makes them quick to install. And because they're tacking onto existing infrastructure, they only require minimal permitting, and can therefore sidestep one of the main things that's been slowing down new generation in the U.S.

"From the purchase order to the delivery of the equipment at the site, it requires less than one year. Once the equipment is delivered, the total installation requires about five months," Vettori said. "So, in one year and a half, the plant is fully operational."

Plus, because these plants generate electricity by recycling waste heat rather than burning new fuel, their output is insulated from the volatility of the energy market and they have a stable levelized cost of electricity of around $40 per megawatt-hour, according to Nadav. For reference, the LCOE for unsubsidized utility-scale solar, which is one of the cheapest generation sources available, ranges between $38 and $78 per megawatt-hour, according to a June 2025 report from Lazard.

All these features — its speed-to-power and ability to be operated in remote locations without requiring too much maintenance, especially — have the potential to make Turboden's tech an ideal choice for the emerging trend of gas-powered, off-grid data centers, according to Nadav. He says the "shift into behind-the-meter" is "tremendous."

"Data centers are not in a position to operate power plants as the grid does — they're looking for light operation power

"[With] simple cycle turbines, engines, and fuel cells, when they use gas, only 30% of that is actually converted into electricity," Nadav said. "We can take it from 30% to around 50%."

While the concept of the off-grid, gas-powered data center is rapidly gaining momentum, they're still niche, with only a select number of operational projects across the U.S. And for Turboden to become a primary technology provider in the space, several things outside of its control must happen: waste-heat-to-power will need enduring policy support, turbine and other equipment bottlenecks must resolve or at least loosen, and gas prices must stay relatively high.

But, at least for now, the outlook is better than it's ever been — hence, Turboden's plans to expand in a country that has at least 80 GW of new gas fired projects planned by 2030. "The country needs more power to sustain the growth of data centers, and we can definitely play a role here," Nadav said.

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