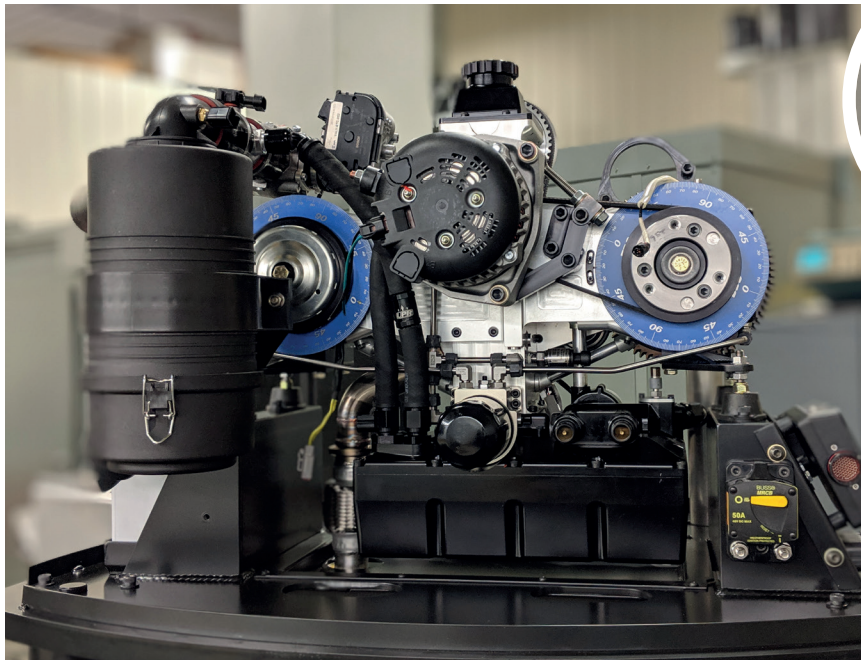


# Power generator engine

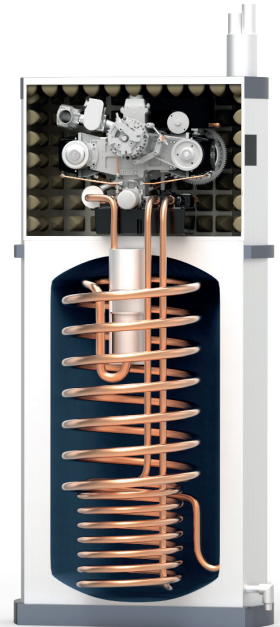
Advanced four-stroke engine technology is enabling highly efficient heat and power generation in combination with notably low noise and vibration levels



Left: Engenuity's heat and power generation system combines an inwardly-opposed piston layout with a four-stroke cycle

Right: Vibration reduction was a major focus during development as the hot-water tank and engine are part of a single unit

Below left: To enable mobile demonstration of the operational system, the US company bought a Volvo D16 Showhauler



▶ Engenuity Power Systems has developed a new generator engine. Designed for individual homes and small businesses, the quiet, ultra-efficient heat and power generation system has a 500cc capacity and is fully capable of developing 8.2kW. Combining inwardly-opposed-piston efficiency with a four-stroke cycle, the engine is virtually vibration-free – a major benefit when the engine and a hot-water tank are built as a single system unit.

Jim Warren, CTO at Engenuity, explains, "You can actually put your



hand on the engine and have a hard time telling if it's running or not, and that's important because water heaters are inherently fragile. The vibrations from a conventional engine would drastically reduce their life expectancy."

According to Warren, Engenuity's motivation to develop new private generation systems stems from the fact that energy distribution grids are now straining to keep up with demand. "As all sorts of new businesses, homes, and data centers come on-line, we're starting to see more frequent brown-outs, especially on the West Coast."

For grid resilience, large energy consumers are now frequently turning to combined heat and power (private generation) to help take some of the load off the overburdened distribution system. Essentially private generation can bring the utility on-site; it can also help achieve 262% greater efficiency

than more conventional grid power generation systems.

The vast majority of these private generation systems are very large generators from either Caterpillar or General Electric, which can easily cost up to US\$1m each. That's often fine for large organizations, but it leaves ordinary consumers with no financially viable way to reach comparable savings levels.

Engenuity's private generation commercial prototype is designed to simply replace the home or small-business gas water heater. During development, the main focus was noise and vibration. "We were shooting for Bosch dishwasher decibel levels," adds Warren, "We wanted you to need a status light to see if it was on."

At the current stage of R&D, the company is close to that benchmark. And following more refinement, production versions of the engine are expected to make about the

same amount of noise and vibration as a gas-fired water heater.

To demonstrate the system, the company opted to purchase a Volvo D16 Showhauler – rather than using a static display – installing the new system in the back.

For Steve Niswander, president at Engenuity, having the company's private generation system mobile and operational will accommodate all the manufacturers and utilities who all want to see the system.

"Trying to arrange site visits for interested parties to see Engenuity's manufacturing facility had become so time consuming that the D16 Showhauler became necessary," explains Niswander. "Plus, it looks cool when we roll into shows." 🚚

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