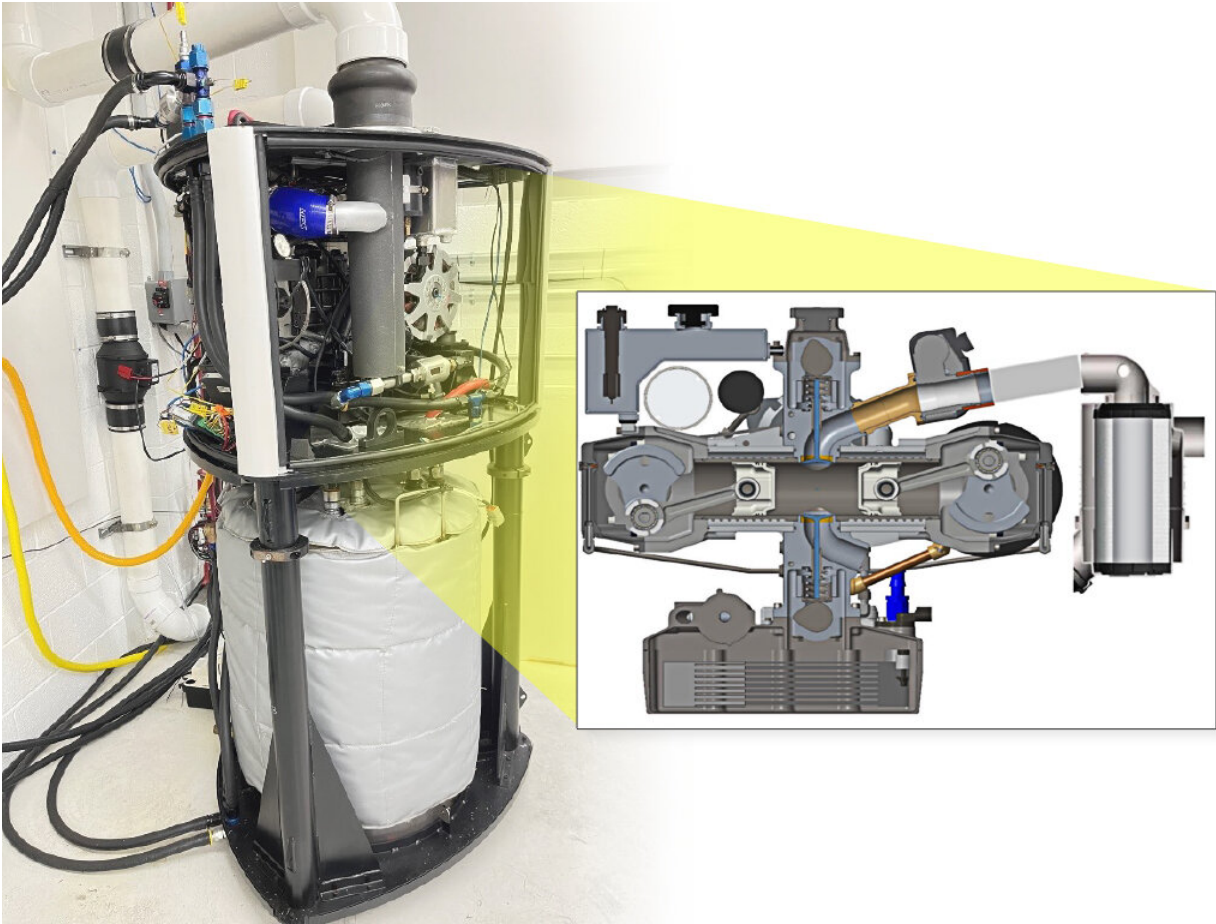


Research team develops power prototype to boost energy efficiency

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ORNL and Enginuity researchers proved that a micro combined heat and power prototype, or mCHP, with an opposed piston engine can achieve more than 93% overall energy efficiency. The environmentally friendly mCHP can replace a backup generator or traditional hot water heater. Credit: ORNL, U.S. Dept. of Energy

Oak Ridge National Laboratory researchers, in collaboration with Enginuity Power Systems, have demonstrated that a micro-combined heat and power prototype (mCHP) with a piston engine can achieve an overall energy efficiency greater than 93%.

Designed to replace a backup generator or traditional gas hot water heater, the mCHP switches between [natural gas](#), hydrogen and biogas, and combines battery storage and solar energy.

Researchers evaluated an mCHP that uses a four-stroke opposed piston engine. It's environmentally friendly and cost-effective because heat that would otherwise be wasted is captured and reused to provide [thermal energy](#) at a small scale for a building in a single process. This allows for a higher efficiency compared to conventional single-functional equipment.

"Results exceeded expectations," said ORNL's Zhiming Gao. "Even without providing heat, in lean burn mode, this mCHP showed more than 35% electrical energy efficiency."

This innovation could accelerate use in small residential and [commercial buildings](#) for remote and underserved communities.

More information: Zhiming Gao et al, Development and testing of residential micro-CHP powered by opposed piston engine, (2023). [DOI: 10.2172/1963144](#) , www.osti.gov/biblio/1963144

Provided by Oak Ridge National Laboratory

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