

Heat & Water Recovery

Combined Heat, Power & Water

Turning fuel cell byproducts into usable energy and water - combined heat-and-power efficiency up to ~85% - pure water recovered on site

Overview

Every EH Energy fuel cell system produces three things from hydrogen: **electricity, heat and water**. Unlike combustion generators, both the heat and the water come out clean and controllable - heat in a liquid coolant loop at temperatures ideal for buildings and industry, and water as pure, deionized condensate.

Recovering them turns a power system into a **combined heat, power and water** asset: electrical efficiency of ~50–57% rises to a **combined heat-and-power (CHP) efficiency of up to ~85%**. Both are simply connections to a system that already produces them - no redesign, no combustion, no exhaust stack.

How it works

Heat

Each fuel cell system incorporates integrated liquid-to-liquid heat exchangers. The client interfaces these with an external thermal-management or building-heating circuit; no modification of the fuel cell system is required. If heat recovery is not used, excess thermal energy is rejected to ambient via a standalone air-cooled heat exchanger solution - so the same product serves both configurations.

Water

The electrochemical reaction combines hydrogen with oxygen from the air to produce water. Each module has an **integrated water separator** that collects excess condensed product water from the cathode exhaust and routes it to a drain connection. The recovered water is **deionized (DI) quality** and can be captured, stored and reused on site (subject to local regulations and any polishing the end use requires).

KEY FIGURES	
Recoverable heat	Most of the heat produced by the system can be recovered as usable heat
Coolant temperature	65–70 °C supply to stack, with an 8–10 °C rise across the stack
Efficiency uplift	+20–30% on top of electrical efficiency
Combined CHP efficiency	Up to ~85% (electrical + thermal)
Water recovered	Condensed product water recovered continuously from every module (scales with module count)
Water quality	Deionized (DI) condensate

KEY FIGURES (Continued)	
Interface	Integrated liquid-liquid heat exchangers and a product-water drain; client-side connection to heating / thermal-management and water systems
Coolant	Deionized water + ethylene glycol mixture (cooling solutions specifically designed for fuel cell applications)
Available on	(250 kW), 3 MW containers and multi-MW plants

Where the heat goes

Buildings & district heating

Space heating and hot water for multi-family homes and commercial buildings - EH Energy has delivered CHP stacks and systems to clients across Europe, including projects combining fuel cell heating with long-duration energy storage.

Data centers & microgrids

Recovered heat supports facility heating or adjacent heat networks, improving site-level energy economics - demonstrated in microgrid installations with building heat integration.

Marine

Cooling-loop heat can feed shipboard heat-recovery systems, including the warming of liquid hydrogen fuel. Or dumped outside.

Where the water goes

Data centers

On-site DI-quality water offsets make-up water for evaporative cooling - directly addressing the water consumption that increasingly constrains data-center siting and permitting.

Marine

Product water is routed to the vessel's onboard water systems, per the installation P&ID.

Industry & facilities

Recovered water can serve process, wash-down or irrigation duties, or be polished to higher grades for reuse where the application demands it.

Why EH Energy Heat & Water Recovery?

Built in, not bolted on.

Heat exchangers and a water separator are integrated in every system as standard - recovery is a connection, not a redesign.

Clean heat and clean water.

No combustion, no exhaust-gas heat exchangers, no NOx or particulates - simplifying permits and indoor/urban installation, and yielding DI-quality water rather than contaminated condensate.

Quality temperature band.

Return water is warm enough to suit hydronic heating systems directly, often without heat pumps or boosters.

More value per kg of hydrogen.

Capturing the thermal output can raise total fuel utilization from ~50% to ~85%, while the water output improves the economics and sustainability case - materially strengthening projects where heat or water demand exists.

Why EH Energy Heat & Water Recovery? (Continued)

A differentiator where water is scarce.

For data centers and water-stressed regions, on-site water recovery converts a cost and a constraint into an asset.

Proven.

CHP and heat-recovery integration delivered across stationary and mobility applications in Europe.