



Pathway to a Competitive European
Fuel Cell micro-CHP Market

Fuel cells in micro-cogeneration mode: the technology explained

European-wide field trials for residential Fuel Cell micro-Cogeneration



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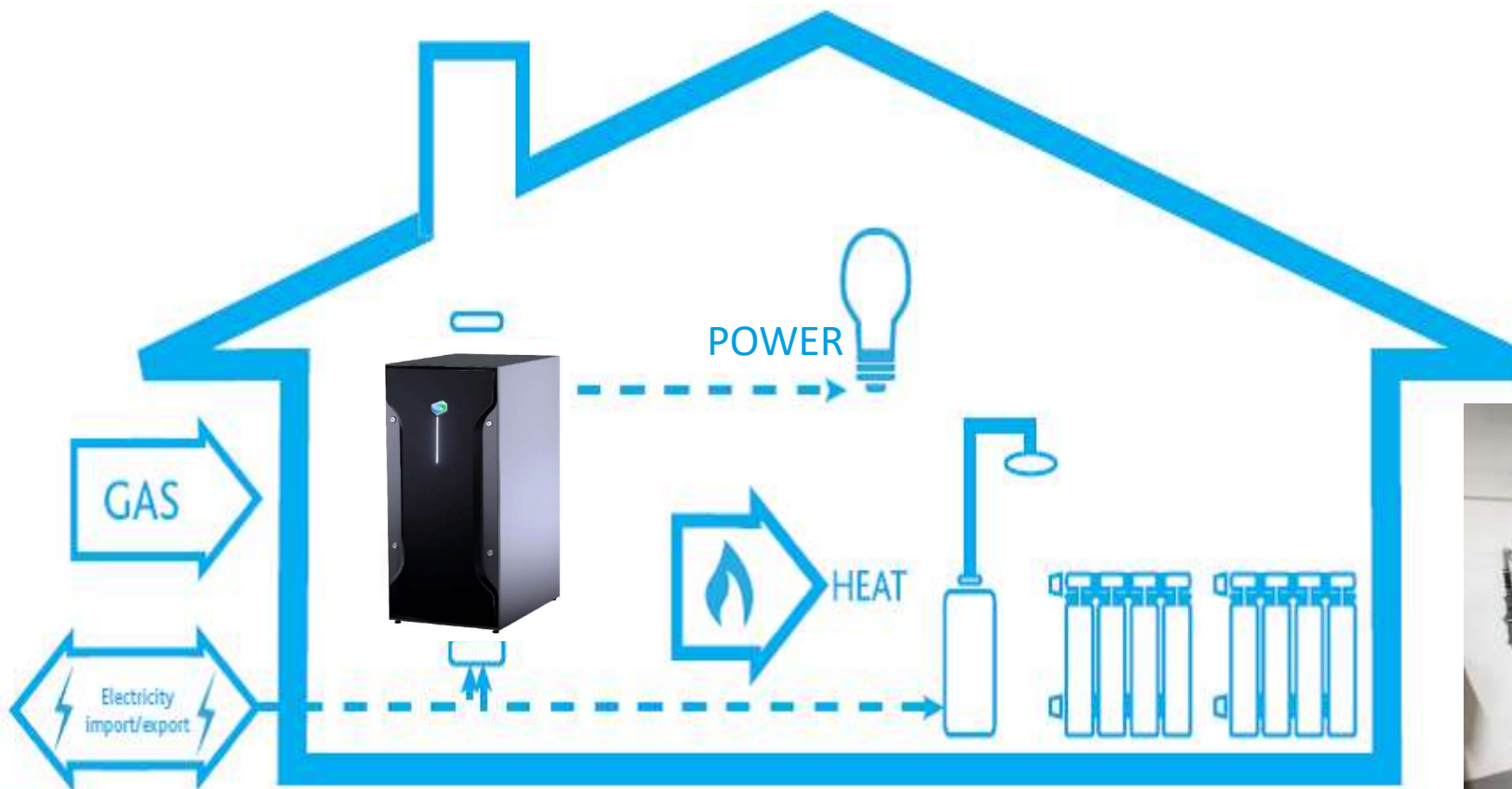
What is Fuel Cell micro-CHP ?

Combined Heat and Power generation

- **Fuel cells can be used as Energy plants for Buildings**
 - On-site energy solution to produce both electricity and heat.
 - Easy to install, silent, no rotating parts and little maintenance.
 - Flexible & modular with easy cascading for higher power demand
 - Cuts energy costs: High energy bill savings. As electricity prices rise, savings will increase.
 - Eligible for green subsidies in many EU countries.
- Reducing environmental footprint **potentially to zero Carbon**: much more efficient than power from the grid + a condensing boiler, it reduces CO₂ and eliminates local air pollution: no combustion so no NO_x, SO_x and particle emissions.
- **Future proof**: Gas from the grid (either conventional or renewable) is converted into **Hydrogen** and then used to produce **electricity and heat** inside the **Fuel Cell**



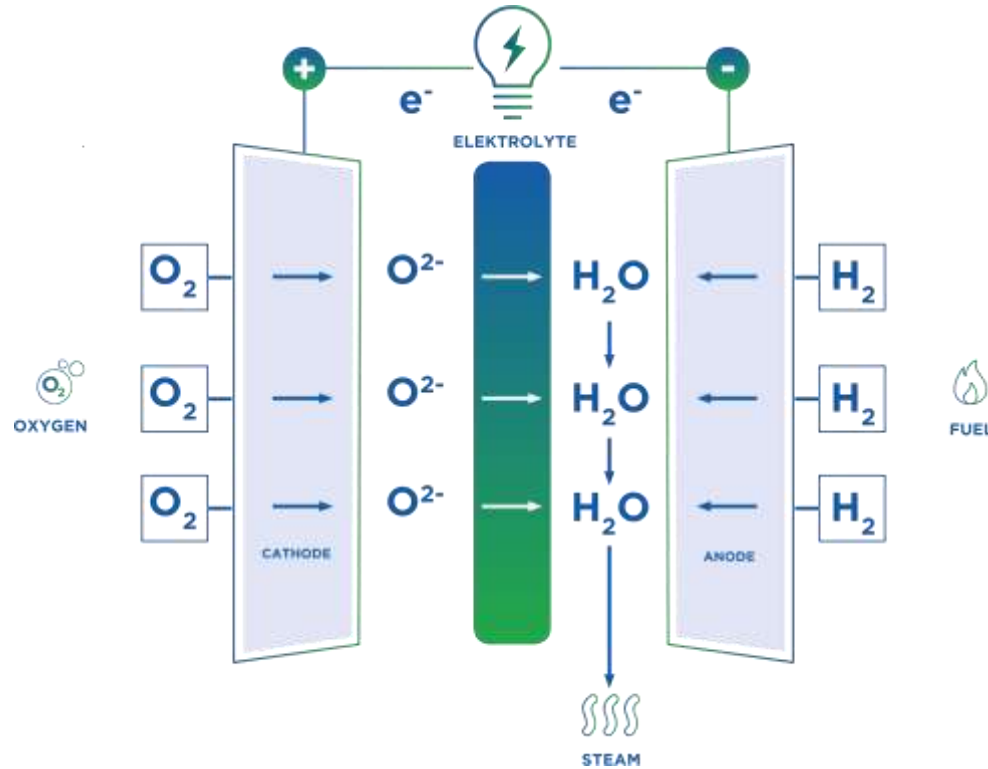
What is Fuel Cell micro-CHP ?



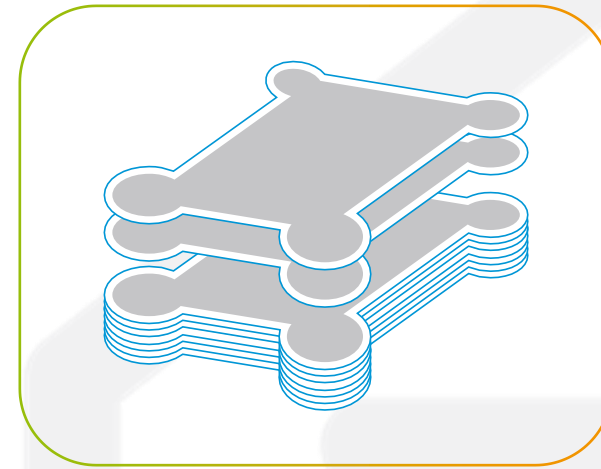
Easy cascading for
higher SME demand



Principle of a Fuel Cell

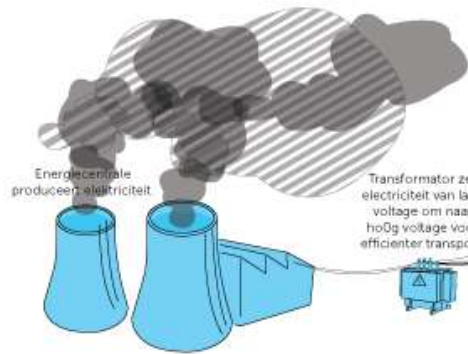


FUEL CELL STACK

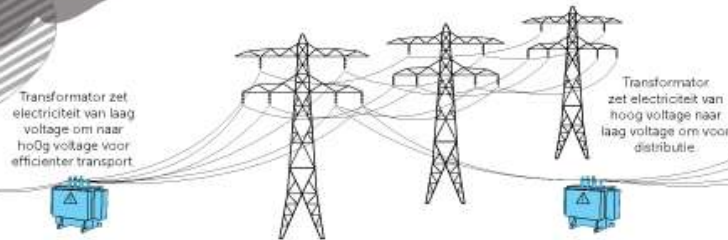


Current average situation in Europe: Centralized power production

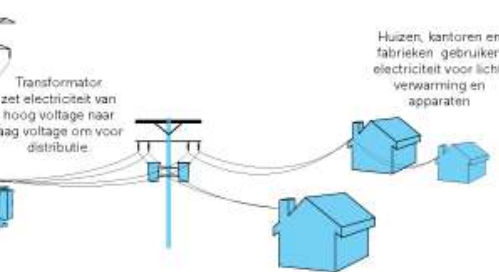
45-70% waste-heat



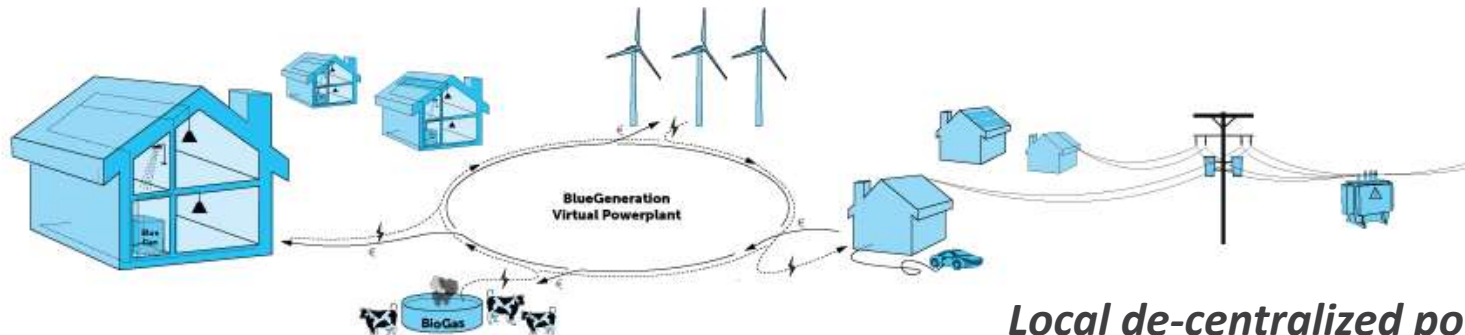
5-8% transportation losses



Only 25- 40% energy left for the building!



> 90% Energy @home with Fuel Cell mCHP = up to 3 times more efficient!



Local de-centralized power production

The future: Smart-grids and energy-storage in Hydrogen

Storage of renewable energy with – “Power to Gas”

