



**Making an impact on the clean energy transition**

**ENERGY**

# HOME-MADE HEAT AND POWER



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## Low-emission, big benefits

Fuel cell  $\mu$ CHP units enable energy to be generated at the point of consumption by transforming natural gas into hydrogen to power the fuel cells. They can achieve combined heat and power efficiencies as high as 95 %, whilst cutting overall CO<sub>2</sub> emissions by 30-80 % with a reduced impact on local air quality. However, until recently, the technology faced several limitations: the fuel cells were large, expensive and required regular maintenance.

The FCH JU has supported the development of fuel cell  $\mu$ CHPs suitable for any home connected to the gas network, while demonstrating the benefits of the technology to consumers and industry on a wider scale. The co-funded project ene.field installed over 1 000 residential fuel cell  $\mu$ CHPs in nine EU countries. Furthermore, the PACE initiative is bringing domestic fuel cells closer to mass commercialisation by installing 2 800 units, enabling manufacturers to scale up production and reduce costs. These activities are encouraging national initiatives, which are supporting wider adoption of the technology – for example, Germany is aiming to have hundreds of thousands of units installed by 2025.

## In-demand decentralised energy

The decarbonisation of heating in the building sector – an EU energy policy priority – coupled with the roll-out of financial incentives for decentralised energy generation solutions are building confidence in the market and driving additional private investment. Thanks to the FCH JU's early support for research, the domestic deployment of fuel cell  $\mu$ CHPs is now a reality. A solid EU-based industry has been established, and new business models are being implemented, offering consumers innovative home energy solutions and driving growing demand for fuel cell  $\mu$ CHPs from manufacturers.

**Fuel cell micro combined heat and power ( $\mu$ CHP) units enable homes to produce much of their own electricity, heat and hot water. The FCH JU has been instrumental in the development, testing and commercialisation of this cutting-edge clean and low-emission technology.**



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### DEVELOPING THE DOMESTIC FUEL CELL MARKET

The limitations of domestic fuel cell μCHP units are being tackled to build consumer confidence and drive down costs leading to the wider adoption of this clean and low-emission heat and power solution.

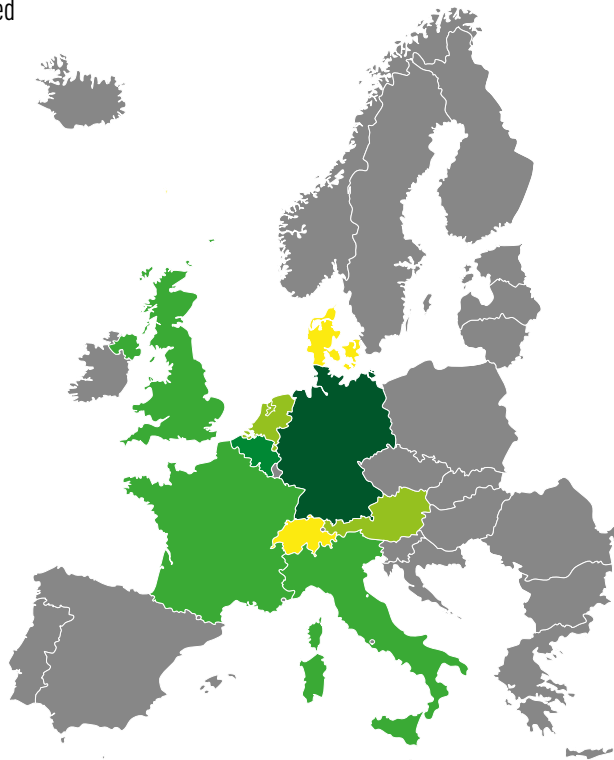
### BUILDING CONSUMER AND INDUSTRY CONFIDENCE

The FCH JU public-private partnership model allows SMEs to engage with key partners: utilities, energy services companies, house builders and local governments. This has enabled large-scale trials and demonstrations of domestic fuel cell μCHP technology. **The goal?** To address fuel cell μCHP cost, size and maintenance challenges, broadening the technology’s appeal and increasing consumer confidence. **Key results?** Thousands of fuel cell μCHPs deployed in homes across Europe, a 30 % reduction in manufacturing costs through the scale-up of production and the development of innovative business models to drive market demand.

### MICRO-CHP DEPLOYMENT GEOGRAPHY

Planned and deployed

- 3000+
- 400-3000
- 200-400
- 70-200
- 1-70



### KEY ACHIEVEMENTS

**95 %**  
heat and power combined efficiencies of fuel cell μCHPs

**60 %**  
electrical efficiencies of fuel cell μCHPs

**98 %**  
availability with low maintenance and minimal downtime in ene.field

**UP TO 15-YEAR LIFETIME**  
providing a secure supply of power and heat

**30 % REDUCTION IN FUEL CELL μCHPS CAPITAL COSTS**  
achieved within the PACE project

**600+ INSTALLERS TRAINED ACROSS EUROPE**  
preparing blue-collar workers for the energy transition

**EUR 149 MILLION**  
total budget of FCH JU fuel cell μCHP projects

### IMPACT

**30-80 % REDUCTION IN CO<sub>2</sub> EMISSIONS**  
compared to conventional boiler and grid power

**UP TO 40 % SAVINGS ON ENERGY BILLS**  
thanks to efficient on-site generation of heat and power

**10 000+ UNITS SOLD IN EUROPE**  
thanks to a combination of European and national initiatives

**ADDITIONAL INVESTMENT IN THE SECTOR**  
a single OEM secured EUR 40 million investment to expand its production capacities in Europe and leading European heating equipment suppliers are offering FCH JU fuel cell μCHP solutions

**700,000 UNITS COULD BE DEPLOYED IN EUROPE BY 2030**  
equivalent to EUR 400 M European production value

FIND OUT MORE



[www.fch.europa.eu/page/fch-ju-projects](http://www.fch.europa.eu/page/fch-ju-projects)  
<http://enefield.eu/>  
<http://www.pace-energy.eu/>

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FUEL CELLS AND HYDROGEN  
JOINT UNDERTAKING

A partnership dedicated to clean energy and transport in Europe