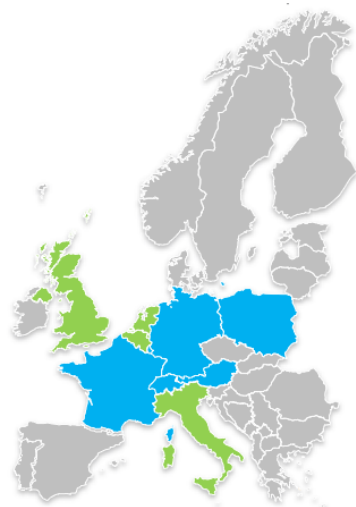


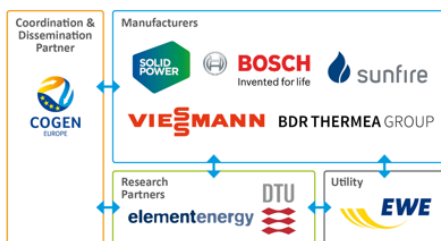
PACE at a glance

Promoting a successful transition to the large scale uptake of Fuel Cell micro-Cogeneration across Europe



- Field trial + installer training + targeted market & policy development activities
- Field trial + local installer training

9	> 2,500	>500	10	4	€90m
Partners	Fuel Cell micro-Cogeneration units	Systems per manufacturer	Countries	Countries	Total budget
Representing manufacturers, utilities & research community	To be deployed across Europe between 2016-2021	Established production capacity per manufacturer	Where the units will be installed	Selected for policy & market development (Belgium, Italy, Netherlands and UK)	Including €33.9m Horizon 2020 funding via FCH JU



>10,000
FC micro-cogeneration
units/year post 2020



Empowers consumers

Why Fuel Cell micro Cogeneration?

Fuel Cell micro-Cogeneration is a highly efficient home energy system that simultaneously produces heat and electricity



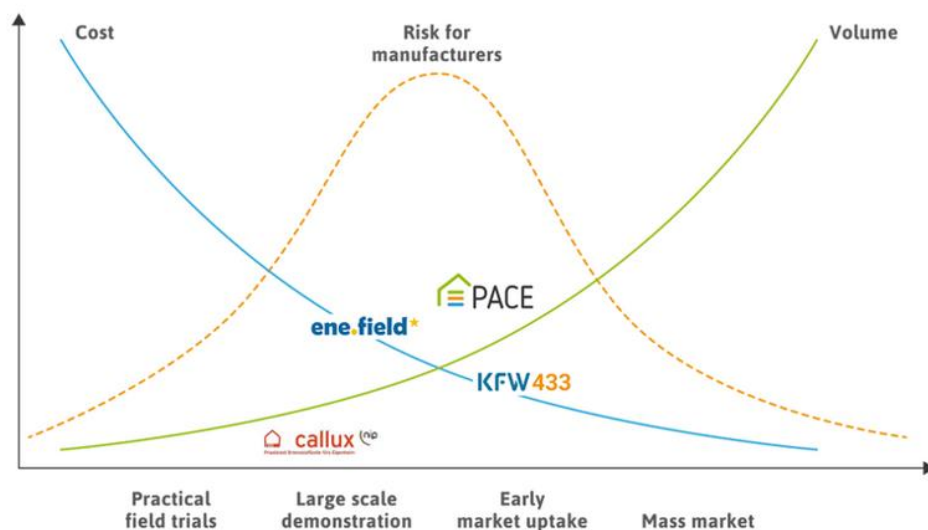
Supports the European energy transition



Provides greater flexibility for the energy system



Fosters innovation and high-value jobs



Fuel Cell micro-Cogeneration units have demonstrated initial technology readiness in previous European and national demonstration projects.

Now PACE is driving the Fuel Cell micro-Cogeneration sector closer to mass market uptake.

Main take-home messages

- Fuel cell micro-Cogeneration is reliable, it works and is now available in key European markets. Industry wide, large scale field trials like Callux and the EU co-funded ene.field project have demonstrated its reliability, environmental performance, efficient operation and market readiness. The ene.field project in particular has successfully installed and monitored more than 1,000 fuel cell micro-CHP units, operating reliably for more than 5.5 million hours. By understanding the practicalities of installing and supporting a fleet of fuel cells with real customers, ene.field has taken a decisive step towards commercial roll-out;
- Major European manufacturers, supported by the Fuel Cell & Hydrogen Joint Undertaking (FCH JU) at the EU level and key European national governments, are now committed to bringing the technology closer to mass market by increasing scale and achieving further product cost reductions. To this end, PACE will enable manufacturers to establish FC micro-CHP as a standard technology by installing more than 2,800 units across Europe (at least 500 units/manufacturer);
- Experience from Japan shows that significant cost reduction is possible, as fuel cell micro-CHP in Japan became 50% cheaper over the 7 years Ene-Farm programme (2009-2016);
- Environmental and economic assessments carried out under the ene.field project have highlighted clear benefits of Fuel Cell micro-Cogeneration for EU climate and energy objectives:
 - ✓ FC micro-CHP delivers important efficiency and decarbonisation benefits in the building sector. Close to 80 million heating appliances installed today in European homes are old and inefficient. Replacing up to a third of them with fuel cell micro-CHP by 2030 would deliver more than 32 million tons of CO₂ emission reductions, equivalent to Slovakia's projected emissions in 2030
 - ✓ It can also offer system wide benefits, as it can reduce infrastructure and operation cost, estimated at up to €2,500 for every additional kilowatt-electric of installed FC micro-CHP in distribution network cost reductions between 2020-2050
 - ✓ Up to 2050 fuel cell micro-CHP electricity will displace predominantly inefficient or more expensive gas capacity, complementing electric heating in an energy system with an increasing share of intermittent RES.

Policy recommendations

- Fully recognise and reward levels consumer and energy system benefits of micro-CHP systems at both EU and national. Regulations relating to building codes, energy labelling, carbon intensity of buildings should account for the right boundary conditions and the actual (marginal) electricity displaced by micro-CHP and not the average electricity mix, which is not representative for CHP systems;
- Create a level playing field where decarbonisation can be delivered at the lowest cost possible across different energy vectors (e.g. electricity, heat, gas) by a mix of renewable, efficient and flexible solutions working together and complementing each other;
- Promote a comprehensive approach to distributed generation, smart grids and flexibility, an area where micro-CHP systems can significantly contribute;
- Implement simplified administrative procedures to access the grid or support scheme should be introduced for the potential users or FC micro-CHP.

Relevant policy files:

Energy labelling/Ecodesign, Smart Readiness Indicator, Building codes, Electricity Market Design, Covenant of Mayors framework, Energy Savings Obligation