Ene.field

"European-wide field trials for residential fuel cell micro-CHP"

(303462)

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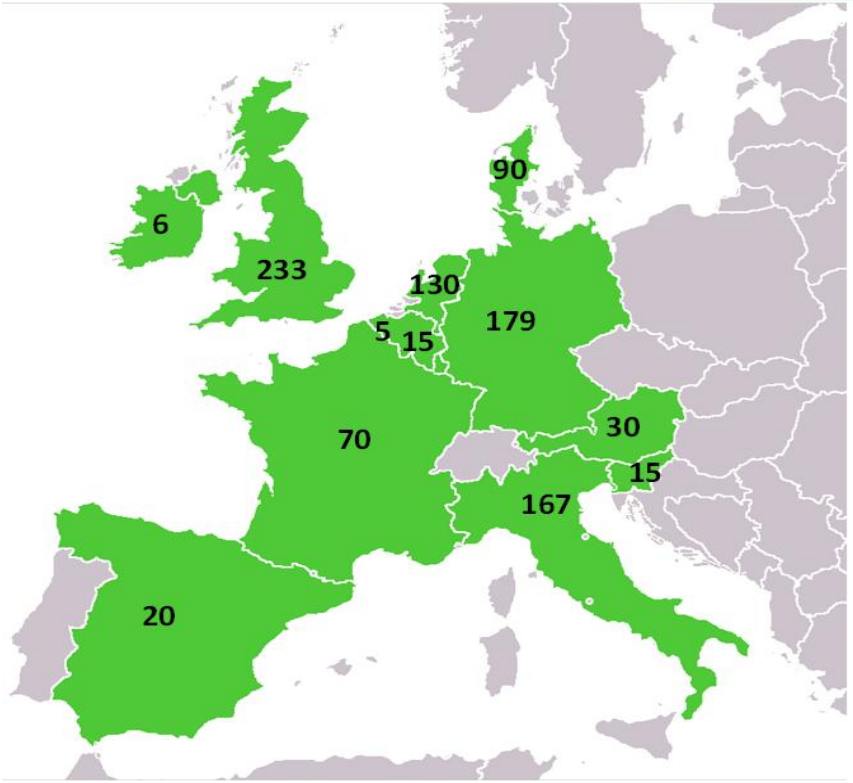
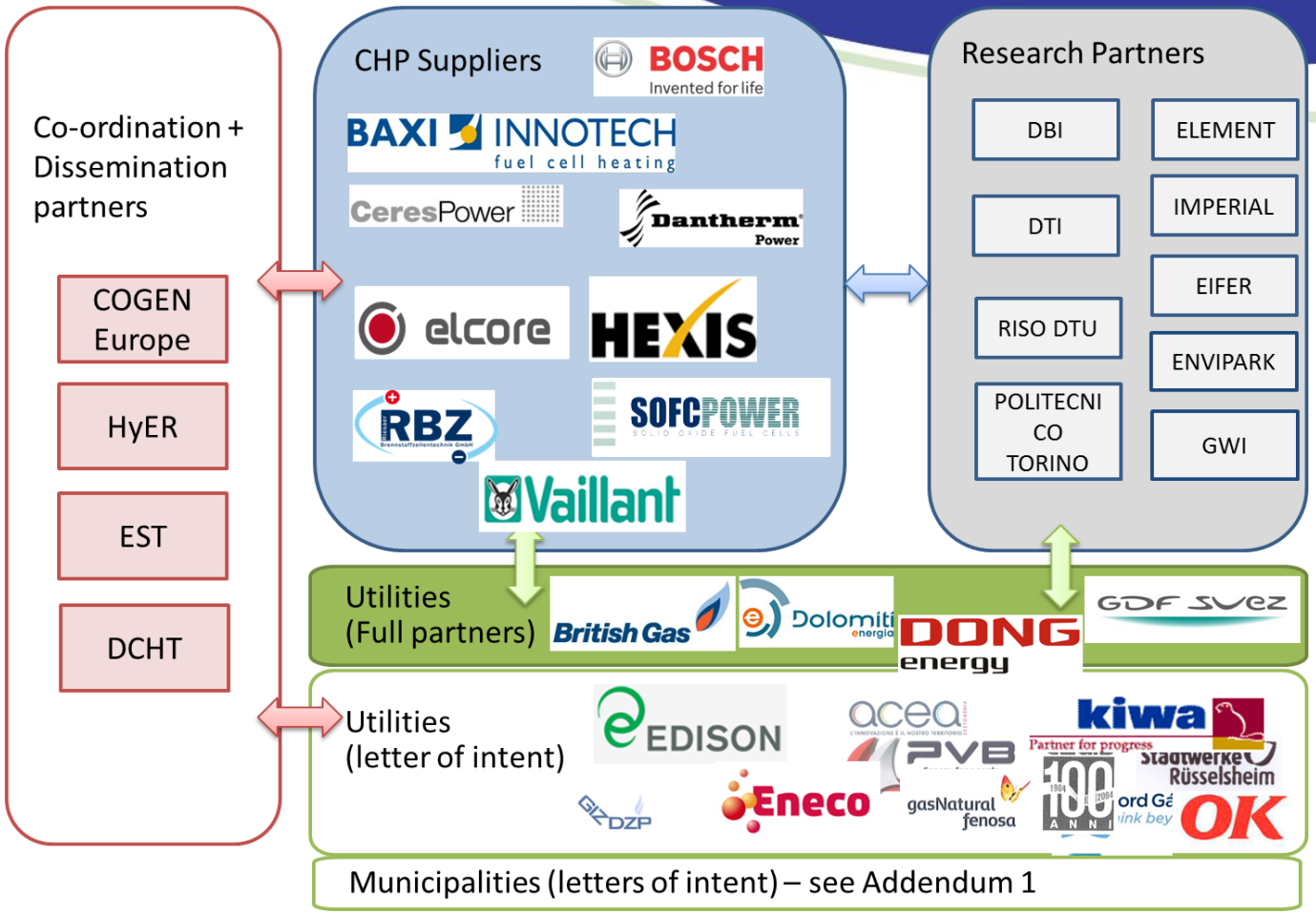
Project Overview

- 26 partners including manufacturers, utilities, research institutes, universities.
- Project over 5 years
- Demonstration over 3 years in each case
- Lifecycle cost assessment, Barriers report, Commercialisation framework
- Jointly funded by the JU_FCH and the partners.



Ene.field project



Objectives

	Strategic objectives -FCH JU	Ene.field project objectives
Demonstration	Proven systems deployed in a real end-user environment Establish installation, operation and maintenance services. market capacity building	• **deploy up to 1,000 residential fuel cell CHP units** across 12 EU states • **establish well-developed supply chains and support networks** to prepare for commercial deployment
Analysis	Evaluate energy, environment and economic sustainability	• **evaluate the performance of mCHP technologies in the field** including LCA and LCC • Assess **socio-economic barriers** to deployment**.**
Dissemination	Promote public awareness and understanding Outreach to new routes to market	• provide clear **position papers and advice for policy makers** to encourage the take up of fuel cell mCHP • **validate new routes to market** and expand existing routes through utilities to a broader base
Strategy	EU at forefront of FC and H2 technologies Move technology towards commercialisation	• Move towards **market ready FC mCHP systems** from each of the 9 manufacturers • **Stimulate cost reduction** of the technology by moving towards serial volume production

Technical Targets

State of the art technical targets and ene.field performance

	JTI Target	Current State of the Art**	ene.field expected performance
Technical targets for FC CHP	Efficiency minimum of 35% (electrical)	30%	The products will meet and exceed the targets with a range of 35–50% electrical efficiency
	Overall efficiency >85% (LHV)	70–85%	Up to 90%
	Lifetimes of 8-10 years	3 years	Up to 8 years
	Cost below 20,000 €/ unit (Assumed to refer to the capital cost of the system per kWe)	50.000 €/kW	13,000- 27,000 €/kW for the trial – excludes 300W outlier Potential for < 10 000 €/kW after the trial.
	Cost reduction to meet targets in the MAIP including a 2015 target cost of 4,000- 5,000 €kW for micro CHP.	Manufacture, hand made	Pre-serial to serial production

Year 1 Milestones

Milestone number	Milestone name	Month
M1.2	Installation of first unit	6
M2.1	Data collecting and reporting training	6
M3.3	Establishment of RCS working group	1
M3.4	Establishment Utility working group	7
M4.1	Project dissemination plan	6
M6.1	Annual consortium meetings and 6 monthly core partner meetings	6

A demonstration project

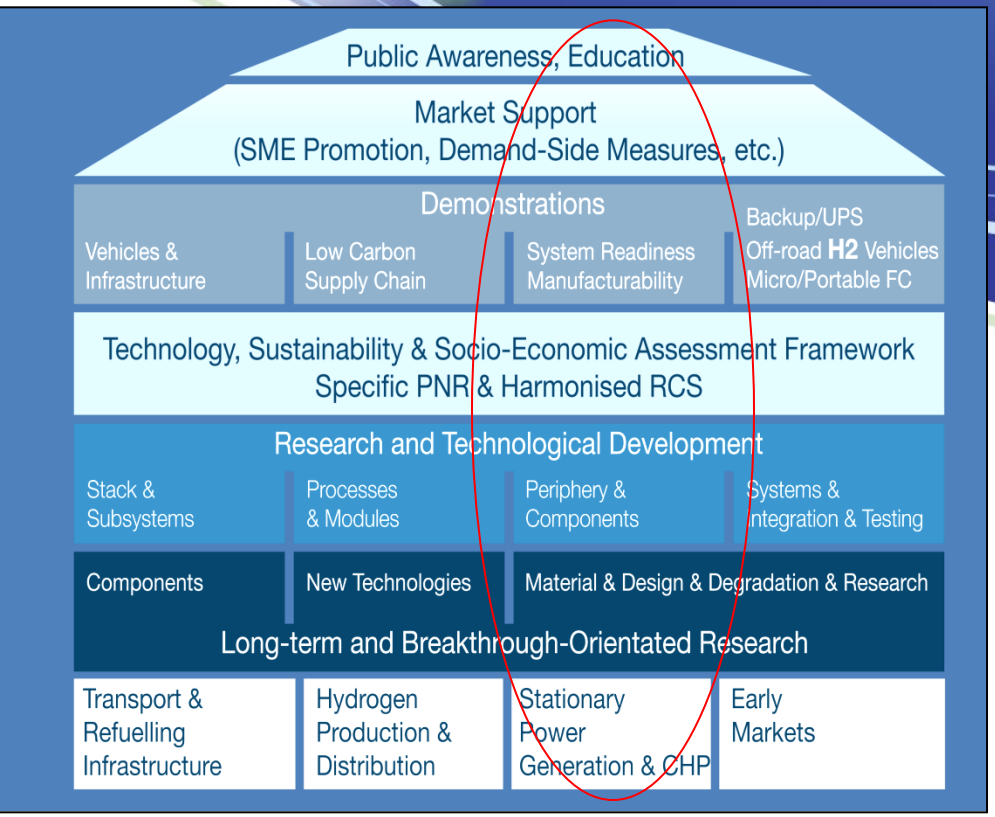
- **Real world learning -** demonstration of market potential, segmentation, cost and environmental benefits of micro FC-CHP
- **Developed market focused-product** specifications and harmonised codes and standards
- A **more mature supply chain**, readied for deployment of micro FC-CHP in 12 member states.
- **An evidence base on cost and environmental performance**, that can be used to accelerate policy support from governments, and adoption by channels to market**.**

Approach

- Manufacturer lead field trials organised according to market model and covering range of member states
- Clean room for data collection and processing. Actual performance assessment
- Support of field trials with information and feedback from end users
- Outreach and dissemination through established channels
- Analysis of the wider influences on market success: lifecycle cost, policy structures,socio –economic barriers

Application Area	Market application	2010 baseline	2015 mid-term	2020 long-term	Enefield objective 2015
AA3 – Stationary	***Micro-CHP (residential), natural gas based***		1,000 units / 10,000 € per system (1kWe + household heat) Assuming supported deployment from 2013+	50,000 units / 5,000 € per system (1kWe + household heat) Anticipating commercial introduction beyond 2020	960 units /10,000EU+ Supported deployment from 2013

Multi-Annual Implementation Plan 2008-2013/2017



Adopted in May 2009 and update targets in Nov 2011

		Volume & cost		
Application Area	Market application	2010 baseline	2015 mid-term	2020 long-term
AA3 – Stationary	Micro-CHP (residential), natural gas based		1,000 units / 10,000 € per system (1kWe + household heat) Assuming supported deployment from 2013+	50,000 units / 5,000 € per system (1kWe + household heat) Anticipating commercial introduction beyond 2020
	Industrial/commercial, H2 based	1 MW / 4,500 €/kW	>5 MW / 3,000 €/kW Assuming supported deployment from 2013+	>50 MW / 1,500 €/kW Anticipating commercial introduction beyond 2018
	Industrial/commercial, natural gas based		>5 MW / 4,000 €/kW Assuming supported deployment from 2013+	>100 MW / 2,000 €/kW Anticipating commercial introduction beyond 2018

Crosscutting issues

- Training and Education: developing installer training for local installers in field trial states.
- Safety, Regulations, Codes and Standards: as the largest field trial of fuel cell micro CHP any relevant information will be fed back to the appropriate committees through the manufacturer representatives.
- Dissemination & public awareness : end users are specifically targetted with information packs and outreach initiatives. End users will be featured in the overall promotion of the project results. Regional and national workshops (4) are planned, with news flashes (6 monthly) and targeted information for industry, policymakers, utilities and end users.

Ene.field interacts/interfaces/coordinates with other institutions and projects

	Ene-farm	CALLUX and NIP	Ene.field
Timescales	2010-2015	2008-2015	2012-2017
Countries involved	Japan	Germany	UK, Germany, France, Netherlands, Denmark, Italy , Spain, Austria, Luxemburg, Belgium, Slovenia
Electrical efficiencies	30-35%	30-34%	> 35% by end of trial
System efficiencies	60-80%	80-95%	>85% (LHV)
No. units	>9,000 to date	800 + 1400	960
Unit capacity			0.3-5kW
Type	Integrated system consisting of fuel cell subsystem, peak heater and hot water storage tank. Designed to produce electricity and hot water	Integrated system with fuel cell and peak heater to produce electricity, tap water and supply heat to the home. Storage is a supplementary part of the system	Combination of integrated and separate systems. Storage is a supplementary part of the system.
Technology	PEM and SOFC	PEM and SOFC	HT SOFC, IT SOFC, HT PEM and LT PEM
Further information	Floor standing, outdoor installation.	Integration in various German heating systems. Floor standing, wall hung. Indoor installation.	Integration in various European heating systems. Floor standing, wall hung. In home installation or in separate installation cabinets.
Supply chain	Supply Asia, Europe by 2014	Expansion in Germany	Expansion across Europe

Future perspectives

- Opportunities for increasing cooperation at Member States and Regional level with range of participants in the supply chain to the customer.