FP5 Project “Virtual Fuel Cell Power Plant”
RCS related activities

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Overview VFCPP Project, funded under FP5

The aim is to develop, install, test and demonstrate a Virtual Power Plant with decentralized fuel cell microCHP systems

- 11 European Partners form the Consortium
- Duration 40 months, start December 2001
- Total costs 8,6 mill. Euro
- Total EC grant 3,1 mill. Euro

Results

- Per Dec 2004 the fleet of Vaillant fuel cell microCHP systems achieved a total of
  - > 200.000 operating hours
  - > 600 MWh electrical energy production
- with 58 microCHP systems representing two design iterations.
- 4.5 kWel, electrical AC efficiency 28 - 31%
- Natural gas fuelled, grid parallel operation
- Systems are located in 7 European countries and installed in:
  - > Multi family houses
  - > Small commercial buildings

- Virtual Power Plant operation successfully demonstrated.

Certification approach of domestic fuel Cell microCHP

- based on the Gas Appliance Directive (GAD) 90/396/EEC, Low Voltage Directive and EMC Directive

- safety philosophies differ on international level:

Issue	UL solution	CE solution
Soundness of gas components	Air purge	Design requirements (soundness)
Explosion prevention	Prevent spark sources	Design requirements (soundness)

- But component standardization on international level is desirable (IEC TC 109)

- national installation requirements not yet harmonized on European level (not even for conventional heating appliances)

RCS related activities of the VFCPP consortium

- CE-Certification of 58 systems in two stages
  - single system certification (15 units, Euro1)
  - prototype certification (43 units, Euro2)

- The learning and experiences gathered were directly provided to different national and European groups working on standards for domestic cogeneration systems:

  - DVGW VP119 (Germany)
  - CEN/CENELEC Joint Working Group “Fuel Cell Gas Heating Appliances <70kW“
  - CENELEC TC8X “.. connection of micro generators in parallel with public low-voltage distribution networks“
  - VDI Working Group 2067 “Normnutzungsgrad für Brennstoffzellenheizgeräte”

Pre-normative research needs / gap analysis

- safety concepts
- cheap, reliable and failsafe gas sensors
- test gases, limit gases for catalytic reactors
- monitoring and supervision of catalytic burners, based on e.g.
  - catalyst temperature
  - exhaust gas composition
- use of plastics in gas circuits
- electrical grid connection and supervision
- testing methods for fuel cell microCHP appliances
- installation requirements (site preparation)

Recommendation for EC activities

- Support EU application standardization approach (CEN/CENELEC)
- Support IEC component standardization approach
- Funding of European and international standardization activities (like US / JP)
- Funding of pre-normative R&D projects (FP6 / FP7)
- Harmonization of EU installation requirements for microCHP