Fuel cells and hydrogen Joint undertaking

FITUP

(Grant Agreement 256766)

Fuel cell field test demonstration of economic and environmental viability for portable generators, backup and UPS power system applications



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http://www.fch-ju.eu/

Project & Partnership description

Starting Date:	01/11/2010
Duration:	36 months + 6 month extension
Budget:	€ 5.289.900
Funding:	€ 2.475.825
Partners:	11 consortium partners +
	1 additional final user
Countries:	Italy, Switzerland, Turkey,
	Germany, Netherlands

R&D Centres



Lucerne University of Applied Sciences and Arts

HOCHSCHULE

Technik & Architektur





İstanbul Bilgi Üniversitesi

LAUREATE INTERNATIONAL UNIVERSITIES

EUROPEAN COMMISSION

JRC



Certification





- FITUP aims to demonstrate the technical viability and economic maturity of backup power systems based on fuel cell technology
- 13 market ready systems from 2 suppliers are installed and being tested at selected real application sites across Europe for field trials.
- ➢ 6 systems are being testing at R&D centres for benchmarking.
- Technology is under demonstration at various ambient conditions in real-life telecommunication applications while the data are collected and analysed.

Technical Targets

Technical Targets:

- Reliability of greater than **95%**
- Durability of more than **1500 hours**
- More than **1000 cycles**
- Uniform certification procedures for installation and testing of fuel cell backup power systems in selected countries will be developed.
- Lessons learnt in regards to installation and operation will be shared to avoid obstacles for upcoming projects and activities.

Site in Switzerland – Davos – Swisscom (2200 m, cable railway)

Sites in Italy - WIND

Site in Switzerland -Polycom

Site in Switzerland -

Swisscom

Benchmarking -JRC

Sites in Turkey - Bursa – Turkcell

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Test strategy

- Split up into benchmark testing within labs and field testing at actual customer sites.
- Three different test classes representing different outage times within grid:
 - short term grid failures (A type) 15 min. operation
 - medium and long term grid failures (B type) 240 min. operation
 - catastrophic grid failures (C type) 4320 min. operation
- Within the labs the test are performed with different power levels (50%; 75% and 100%).
- Different off periods between cycles (1 min. vs. 60 min.).
- Testing under real life climate operating conditions on field and simulated within climate chamber.

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\succ	Test	Progress
		1081032

	Location	End-user	Cycles	Cycles	%	Hours	Hours	%	reliabilit
			done	targeted	Progress	done	targeted	Progress	y%
1	Lucerne, Horw	Swisscom	484	438	111%	140,50	114,5	123%	<mark>98,14%</mark>
2	Lucerne	Swisscom	377	438	86%	77,5	114,5	68%	99,73%
3	Zizers	Swisscom	323	438	74%	82,5	114,5	72%	97,52%
4	Davos	Swisscom	385	438	88%	88,8	114,5	78%	100,00%
5	Chur	Swisscom	410	438	94%	96,3	114,5	84%	100,00%
6	Ennetbürgen	BKPNW	472	438	108%	113,7	114,5	99%	100,00%
7	Dallenwil	BKPNW	467	432	108%	109,9	154,5	71%	99,36%
8	Alpnach	BKPNW	442	432	102%	154,6	154,5	100%	100,00%
9	Settimo Milanese	WIND	167	572	29%	87	338	26%	tbc
10	Milano	WIND	223	572	39%	97	338	29%	tbc
11	Pavia	WIND	47	572	8%	19	338	6%	tbc
12	Bursa	Turkcell	118	572	21%	89,5	338	26%	97,46%
13	Bursa	Turkcell	175	572	31%	86,9	338	26%	100,00%
14	Turin (Benchmark)	EP	248	1001	25%	172	1509	11%	100,00%
15	Istanbul -> D	Future-E	552	1001	55%	760	1509	50%	100,00%
16	Petten	JRC	34	1001	3%	37,75	1509	3%	tbc
17	Petten	JRC	0	TBD			TBD		
18	Petten	JRC	1087	1001	109%	1543	1509	102%	99,72%
19	Petten	JRC	0	TBD			TBD		



achievements



SWISSCOM05 - CHWE - Chur West



Expected output AIP Topic: 4.2 Call: 2009		Objectives Project	Current status
Number of FC back-up systems	5-10	19	19
Reliability	100%	>95%	99,4% so far
Response time of less than	5 ms	< 5 ms	Satisfied so far
Lifetimes greater than	5 years	>1500 h	1500 operating hours are demonstrated
Number of start-stop cycles	1000	1000	1000 start-stop cycles are demonstrated
Target system cost	5 k€/kW	5 k€/kW	5,5 k€/kW (including hydrogen generators)

2. Relationship to earlier and other current projects

<u>FCTESQA</u>

•Fuel Cell Systems Testing, Safety & Quality Assurance (FCTESQA) led by JRC is a Specific Targeted Research project co-financed within FP6.

•Test protocol developed in FITUP will be shared and a common standardization procedure will be sought.

FC-HyGuide

•Life Cycle Assessment Guidance for Fuel Cells and H2-Technologies is a project funded by FCH-JU.

•Outputs of FC-HyGuide are being used to carry out LCA in FITUP project.

FC Powered RBS

•There will be a collaboration shought between the two projects for disseminating common objectives (e.g. non technical barriers, certification etc.)

3. Cross-cutting issues

> Test architecture and test protocols developed in this project will be standardized.

Certification procedures will be developed and/or amended for installation of fuel cell UPS systems. TUV Sud will supervise these activities.

> Potentially interested industries will be aware of the technology by disseminating project results in conferences, fairs and trade shows.

LUASA presented a technical paper at EFCF 2013 in Lucerne, July 2013

> EPS/FutureE/LUASA presented the project In Tutorial Fuel cells at INTELEC 2013, in Hamburg, October 2013.

Bilgi presented the project as success story in Horizon 2020 information days in Istanbul, October 2013

> A workshop is planned in Istanbul in March 2014 for dissemination of the project results to the parties from related industry and academia.

> Public awareness at large will be maintained with newsletters, internet and published material (3 press releases done). Project website is up and updated.

>At the end of the project a report on technical results and on non-technical barriers will be published.

4. Exploitation /Recommendation towards the Programme

Technical viability and reliability of back-up fuel cell system is proven

≻ Follow up of the project:

Help market adoption of fuel cell systems as a back-up solution

- FCH-JU projects are not so attractive for back-up final users: (too much burocracy, administrative tasks)
- Public incentives/ tax rebate for mass adoption of fuel cell back-up systems

U.S. Tax Incentives: Federal and State

The U.S. Congress passed an expansion and extension to the 2005 fuel cell tax credits to be available for purchases of fuel cells beginning January 2009 and going through December 2016. These credits amount to \$3,000 per kilowatt or 30% of the system cost, whichever is less, and entitle the taxpayer to subtract the amount of the credit (dollar-for-dollar) from its total federal tax liability.

• up to now only US, not EU, FC UPS /back-up systems manufacturers sold thousands of systems!



Thank you for your attention!

For more information: http://fitup.engr.bilgi.edu.tr

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