SOFT-PACT
(278804)

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PROJECT OVERVIEW

- Solid Oxide Fuel Cell micro-CHP Field Trials
- Call topic: SP1-JTI-FCH.2010.3.5 -Field demonstration of stationary fuel cell systems
- Start date: July 2011, end date: July 2015
- Budget: €10.3M
- FCH JU contribution: €3.95M
- Consortium: e·on ideal Ceramic Fuel Cells HOMA
- Overall purpose of project:
- European demonstration of fuel cell microCHP systems
- Stage of implementation (75%)

PROJECT TARGETS AND ACHIEVEMENTS

Status before project	MAIP/AIP target	Project Target	Current status/achievementS	Expected final achievement
Deployment of Fuel Cell units in Trial	10 Units	Up to 100 units	65 units	65 units
FC System Electrical Efficiency (%) (HHV)	>40	>40	56-42 Over lifetime	56-42 Over lifetime
Cost Reduction (€/kWe)	€5000 /kWe	25% Reduction on BlueGen Cost	Achieved via Re-engineering & supply chain enhancements	25%
FC System Life Time (hrs)	(MAIP) >5,000	(MAIP) >10,000	Ongoing (test not finalized)	Ongoing

PROJECT TARGETS AND ACHIEVEMENTS

Year of implementation	Project milestone achieved (past years)
Year 1 (2011/12)	Milestone 1: Completion of EU Fuel Cell Market Opportunity Survey Report Milestone 2: Commissioning of Test Rig facility to aid knowledge transfer at Ideal HQ Milestone 3: Deploy & Monitor BlueGen Pathfinder Fuel Cell field trial units in Germany and UK Milestone 4: Specification of Integrated Fuel Cell Appliance
Year 2 (2012/13)	Milestone 5: Design of Integrated Fuel Cell Appliance Milestone 6: Perform cost down analysis on BlueGen and Optimise / Redesign components Milestone 7: Build & Test Prototypes SOFT-PACT Integrated Fuel Cell (SIFC)Appliances

PROJECT TARGETS AND ACHIEVEMENTS

Year of implementation	Project milestones achieved
Year 3 (2013/14)	Milestone 8: Build & Test Field Trial SOFT-PACT Integrated Fuel Cell (SIFC)Appliance Milestone 9: Training Installation Companies Milestone 10: Perform Life Cycle Analysis on BlueGen System Milestone 11: Deploy Integrated Fuel Cell (SIFC) Appliances in Germany, UK and Netherlands
Present situation (End 2014)	Milestone 12: Complete Deployment Integrated Fuel Cell (SIFC) Appliances Milestone 13: Monitor Integrated Fuel Cell (SIFC) Appliances
Year 4 (2014/15)	Milestone 14: Removal of Field Trial Appliances (BlueGen & SIFC) Milestone 15: Final Reports

RISKS AND MITIGATION

- **Specification of Integrated Fuel Cell Appliance**
  - Target:
    - Milestone Missed
  - Nature of bottleneck and risks to project:
    - Schedule Delay due perfecting design to meet requirements based on pathfinder data.
  - Remedial action taken:
    - Extend project to allow more time for integrated system field trial
  - Nature of revision of original targets
    - Field Trial to run over 2014/2015

RISKS AND MITIGATION

- **Deploy Integrated Fuel Cell (SIFC) Appliances in Germany, UK and Netherlands**
  - Target:
    - Milestone Missed
  - Nature of bottleneck and risks to project:
    - Complexity of development, build and testing of integrated system
    - Challenges with small quantity supply chain, prices changes
    - Deployment Challenges, loss of in house installers, Remedial action taken:
    - Parallel prototype and field trial build processes, parallel multi region deployment
    - Tendered for new installers and retrained
    - Budget shortfall risk
  - Nature of revision of original targets
    - Field Trial to run over 2014/2015 to obtain valid seasonal data
    - Deployed Units reduced to accommodate budget shortfall and provide ongoing fleet stabilisation

SYNERGIES WITH OTHER PROJECTS AND INITIATIVES

- Overview of support received via national programmes or other agencies: None
- Extent to which project builds on previous FCH JU/EU-funded projects: Utilises FC-Hyguide Project Member to produce the BlueGen LCA Report
- Description of any partnerships, joint activities formed with other FCH JU/EU projects: Discussions with ene.field on PM and monitoring assistance
- Interactions with any international-level projects or initiatives: None

HORIZONTAL ACTIVITIES

- Training activities organised by the project:
  - Training of Installation Orgainisations: E.ON Microgenneration Support Services, Forrest (UK), Lindorfer (Germany), UW Huismeester (Netherlands)
  - Training delivered to E.ON and Ideal technical group increasing awareness of Fuel Cell technology as applied to the heating / energy industries.
- Project work in safety, regulations, codes, standards, general public awareness:
  - The BlueGen became fully compliant as the project started and has verified CE, PAS67 (or equivalent) and G83/1 grid connection certificates
  - Ideal worked with the BSI to cover the safety testing of the integrated fuel cell.
  - The Vogue Boiler being integrated into the system is also CE approved and the BlueGen is now G83/2 approved
  - Integrated FC mCHP appliance has obtained interim CE approval from independent approvals test house.

DISSEMINATION ACTIVITIES

- Conferences, workshops organised/attended by project (with presentation)
  - We sponsored the 8th International FC Conference, NEC UK
  - Members of the consortium have shown the BlueGen at EOCBuild, Greenbuild, All Energy and CIH Conference.
  - A BlueGen was shown in a TV show 'Future Family' on UK's Channel 4 resulting in 300+ enquires. Case studies have been created by CFCL and placed on the bluegen.info website.
  - Having trained the only installation team in the UK, we installed a BlueGen into the AIMC4 – UK Government's DECC demonstration of a low carbon house with Crest Nicholson promoting the technology to house builders.
  - In Europe, we have had the BlueGen at ISH, Hanover fairs and others and promoted the technology in local press in Hamburg and Heinsberg and with all the E.ON regional units and share holders.
- Lobbying continues in all regions but already there has been UK FIT increase and a 250M Euro capital subsidy in NWR of Germany

DISSEMINATION ACTIVITIES

- Publications, patents arising out of project and its results
- Ideal's Adrian Waddington wrote an article for the Professional Engineering magazine which was published in November 2013.
- Patent search on unique thermal store design, as undertaken within SOFT PACT project, is currently being undertaken by independent Patent Attorney.

EXPLOITATION PLAN/EXPECTED IMPACT

- What has your project changed in the panorama of FCH technology development and/or commericalisation?
  - Identification of real world support and maintenance issues that will effecting future sales
  - Cost reduction activities have lowered the commercial cost of the BlueGen by 25%
  - Improved integrated system's joint reliability & reduced the overall cost and size of the appliance
  - Creation of a 'real life' Data Database
  - The development of specification for an industrialised appliance.
- How will the project's results be exploited? When? By whom?
  - Development of real-life data database from extensive monitoring programme will allow further modelling of the next generation of appliances, focus development for manufacturer and utility sales
- RTD projects:
  - Prolonged operational electrical efficiency above 42% prove that the project goes beyond state-of-the-art
  - Real world operational issues have caused modification to the system design to enhanced performance allowing the true cost of ownership to be determined
  - Real world Insights and learnings from the project should be reviewed by the industry regarding size, weight, ease of installation & maintenance and installer skill sets

EXPLOITATION PLAN/EXPECTED IMPACT

- Demonstration projects:
  - What are the next stages, after project ends to make commercial impact or achieve MAIP targets?
    - Development of supporting cloud based application's software (smart phone APP's, automated landlord billing & support, Virtual Power Station, Maintenance etc).
- Cross-cutting:
  - What are the main achievements going with TRL increase? (test standardisation, safety assessment etc.)
    - Installation Skillsets go far beyond the current Plumber and Electrician