



D2Service

Design of 2 Technologies and Applications to Service

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Project Coordinator**

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***Programme Review Days 2016
Brussels, 21-22 November***

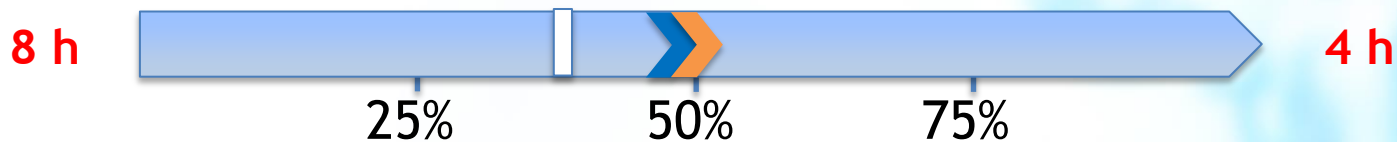
PROJECT OVERVIEW

Project Information

Call topic	FCH-02.9-2014
Grant agreement number	671473
Application area (FP7) or Pillar (Horizon 2020)	Horizon 2020 - Energy
Start date	01/09/2015
End date	31/08/2018
Total budget (€)	3,636,797.50
FCH JU contribution (€)	2,953,790.75
Stage of implementation	39% project months elapsed vs total project duration, at date of November 1, 2016
Partners	Ballard Power Systems; Bosal; British Gas; Energy Partner; NEXT ENERGY; SOLIDpower; ZBT GmbH

- Simplification and Standardization of Components of two CHP Systems for different Applications in the Power Range of 2 - 2.5 kW_{el}
 - Residential,
 - Small and Medium-sized Enterprises,
 - Supplemental Power
- Reduction of
 - Time on Machine
 - Costs
 - Maintenance
- Prolong Service Intervals
- Development of useful Manuals including
 - Recommendations for Operation as well as
 - Maintenance and
 - Installation Instructions
- Increasing the Distribution of Energy-efficient Technologies and Proof of Concept by installing both Units in Europe

 Achievement to-date
 % stage of implement.





Aspect addressed	Parameter (KPI)	Unit	SoA 2016	FCH JU Targets		
				Call topic	2017	2020
Down-time reduction	<u>SOLIDpower</u> : Service time – presence time of maintenance technician	h	> 8	< 4	< 4	
Presence time	<u>Ballard</u> : Service time – presence time of maintenance technician	h	> 8	< 4	< 4	

 Achievement to-date
 % stage of implement.

8 h

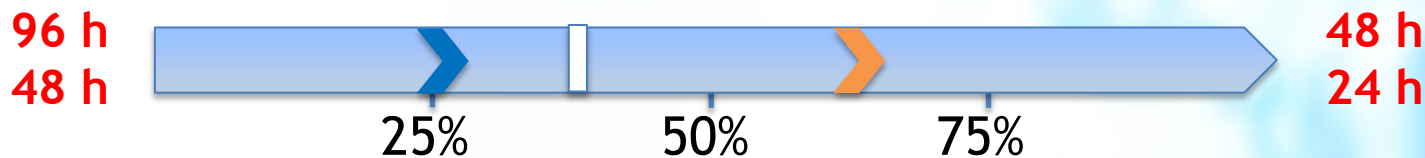




4 h

Aspect addressed	Parameter (KPI)	Future Steps
Down-time reduction 	<u>SOLIDpower</u> : Service time – presence time of maintenance technician	<ul style="list-style-type: none"> • Reduce complexity to ensure simple and accurate service • Using of standard tools or quick connector • Error-Matrix for fast fault detection • Manual to allow not highly specialised installers/technicians service and installation
Presence time 	<u>Ballard</u> : Service time – presence time of maintenance technician	

PROJECT PROGRESS/ACTIONS - Aspect 2

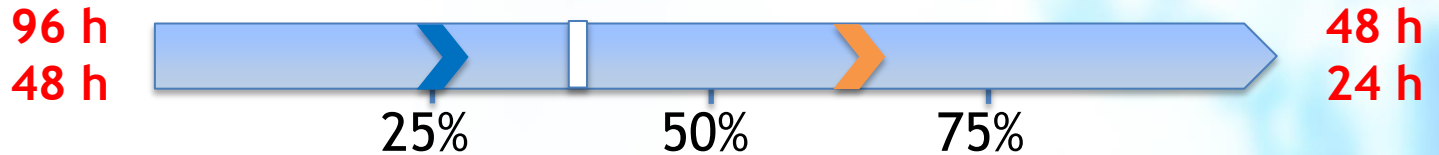
 Achievement to-date
 % stage of implement.







Aspect addressed	Parameter (KPI)	Unit	SoA 2016	FCH JU Targets		
				Call topic	2017	2020
Down-time reduction 	<u>SOLIDpower</u> : Total down-time of equipment for service	h	96	< 48	< 72	48
Equipment down-time 	<u>Ballard</u> : Total down-time of equipment for service	h	48	< 48	24	

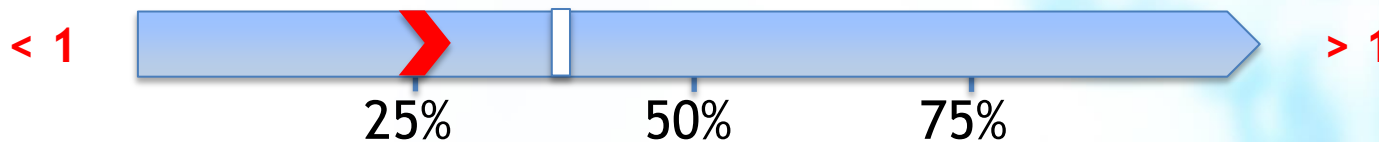
PROJECT PROGRESS/ACTIONS - Aspect 2

 Achievement to-date
 % stage of implement.



Aspect addressed	Parameter (KPI)	Depending on planned or unplanned and what kind of service:
Down-time reduction 	<u>SOLIDpower</u> : Total down-time of equipment for service	Shut down (1-2 d) and start up (1 d) procedure takes more time than servicing
Equipment down-time 	<u>Ballard</u> : Total down-time of equipment for service	Technologically shut down and start up time is much faster compared to high temperature systems

 Achievement to-date
 % stage of implement.




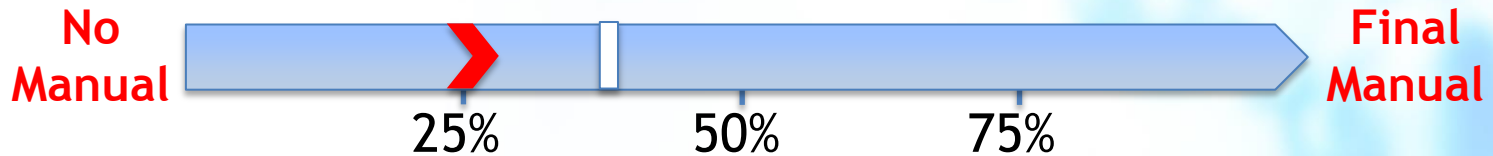
Aspect addressed	Parameter (KPI)	Unit	SoA 2016	FCH JU Targets		
				Call topic	2017	2020
Service Interval	Increase service interval time	a	< 1	> 1	> 1	

Future steps:

Prolong duration of

- *Water clean-up by optimized ion exchange resins and*
- *Desulphurisation by using HDS Material*

 Achievement to-date
 % stage of implement.



Aspect addressed	Parameter (KPI)	Explanation
Service Manual	provide guidelines for writing service manuals that are easily understandable for maintenance technicians	Development of a pictographical service manual including: <ul style="list-style-type: none"> • Installation recommendations • Error matrix • Maintenance: step by step • Considering country specifics

Future steps:

Implementation of test scenarios to find installation limitations, fault conditions and error states. Preparation of manual based on CAD data.

Installation at NEXT ENERGY

SOFC

PEM-FC



SOLIDpower
EnGen-2500

2.5 kW_{el}

2.0 kW_{th}

Ballard Power
Systems

2.0 kW_{el}

4.3 kW_{th}

SYNERGIES WITH OTHER PROJECTS AND PROGRAMMES

Interactions with projects funded under EU programmes

FCpoweredRBS

Lessons learned: Analysis of reliability, service cost, service time, spare part cost, typical failure modes etc. Ballard Power Systems is involved in this project

(ene.field)

Report should be considered but was published only afterwards

Interactions with national and international-level projects and initiatives

Callux

Official documents were used

Chrisalide

SOLIDpower is involved in this project

Danish Micro CHP

Ballard Power Systems is involved in this project

Public deliverables

- D1.1 Project website
- D1.2 Annual data reporting 2016
- D2.2 Report with proposals deducted from the fuel cell μ CHP field trials
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Conferences/Workshops

- 1. Hannover Fair 2016
- 2. World of Energy Solution 2016

Social media

Publications:

- Abstract submitted: DLR - 7th International Conference on Fundamentals and Development of Fuel Cells “Development of high-resolution reference load profiles for scientific evaluation of CHP systems in buildings”
- Abstract submitted: VDI - Energiemanagement 4.0 “Hochaufgelöste Referenzlastprofile zur techno-ökonomischen Analyse von Energietechnologien in Gebäuden”

Thank You!

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