



Den Danske Brint- og  
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*FC2Scale*

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# FC2Scale - Scalable fuel cell back-up power

Project period: 2012/09 til 2016/12    Budget: 12,7 mio.kr



# Project purpose and main targets

**Specific Challenge:** The FC stack in a back-up power system is by far the most expensive part. Developing a scalable unit will therefore be of utmost importance in order to reach the goals set both internally in Ballard Europe and in the national roadmap for LT-PEM.

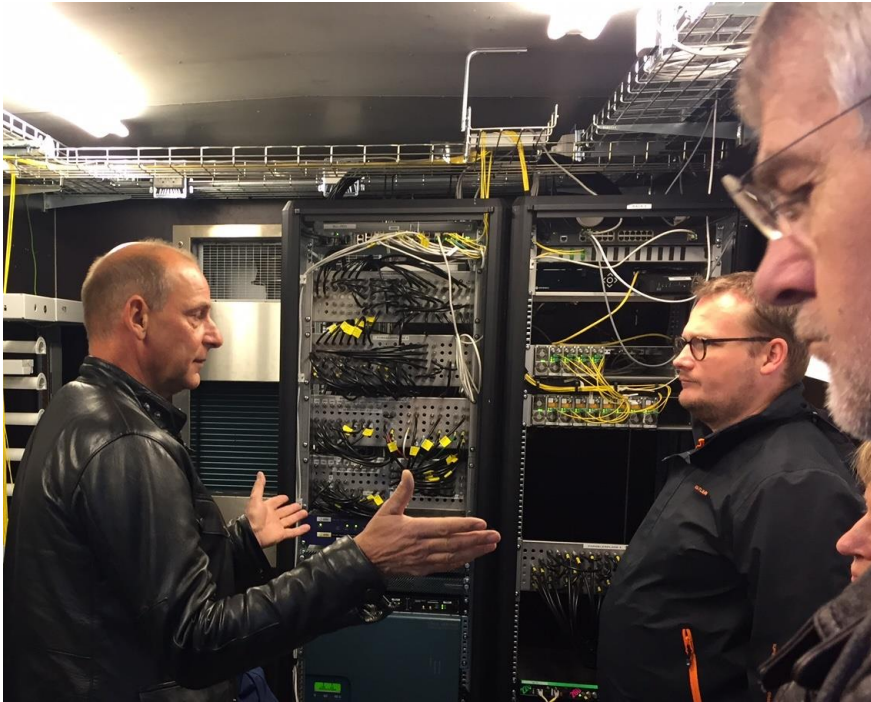
**Scope:** FC2Scale is about designing a backup power system platform, where the power output is scaled according to customer demand: when the customer needs 3 kW, the platform will allow us to produce a unit, where the expensive FC stack and DC/DC converter is geared to deliver 3 kW. Hence, the product will be scalable from 1 kW to 5 kW in 1 kW increments, offering a cost competitive solution.

**Target:** The project includes development of a platform for scalable FC core module, power conditioning, airflow/heat management, communication and mechanical interface, as well as activities related to technology integration and finally field tests and live demonstrations in Løgstør, Billund, Silkeborg and Horsens for different power requirements.



# Specific Customer Case: Stofa

## Customer Requirements



- Reliability !!!
- Scalability
- Maintenance cost
- Capital cost
- Flexibility (hybrid)

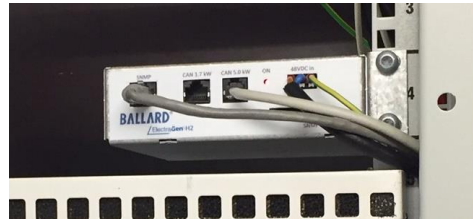


# FC2Scale - Results

Flexible & scalable  
fuel cell core module



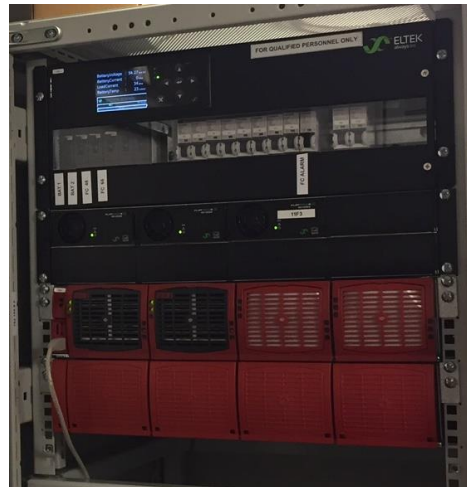
SNMP communication module



Main switch



Power management module



UPS batteries



# Next steps

- Finalize demonstration phase
- Collect monitoring data
- Evaluate system performance
- Evaluate end user business case
- Prepare final report to EUDP



# Conclusions and Perspectives

- **Technical Performance** – concept is validated, targets are met!
- **Economical Performance** – end user business case is validated! Scalability makes sense to the end user for systems over 5 kW. Below 5kW the initial investment is too big compared to the added value of scalability.
- **Perspective for FCsystem:** Scalable FC Power back-up is of relevance for all telecom customers, because the power consumption in the tele station is growing with increasing telecom and broadband demand.
- **Perspective for Power Management system:** The Power Management module opens perspectives for PV-hybrid solutions for all areas, where diesel power generation poses a challenge. Even bigger market potential outside DK.
- **Perspective for end user:** Supplementary technologies with complementary characteristics for redundant power back-up for extra high reliability demands.



The consortium would like to thank EUDP for making this project possible!!

Any questions?

