



Hybalance

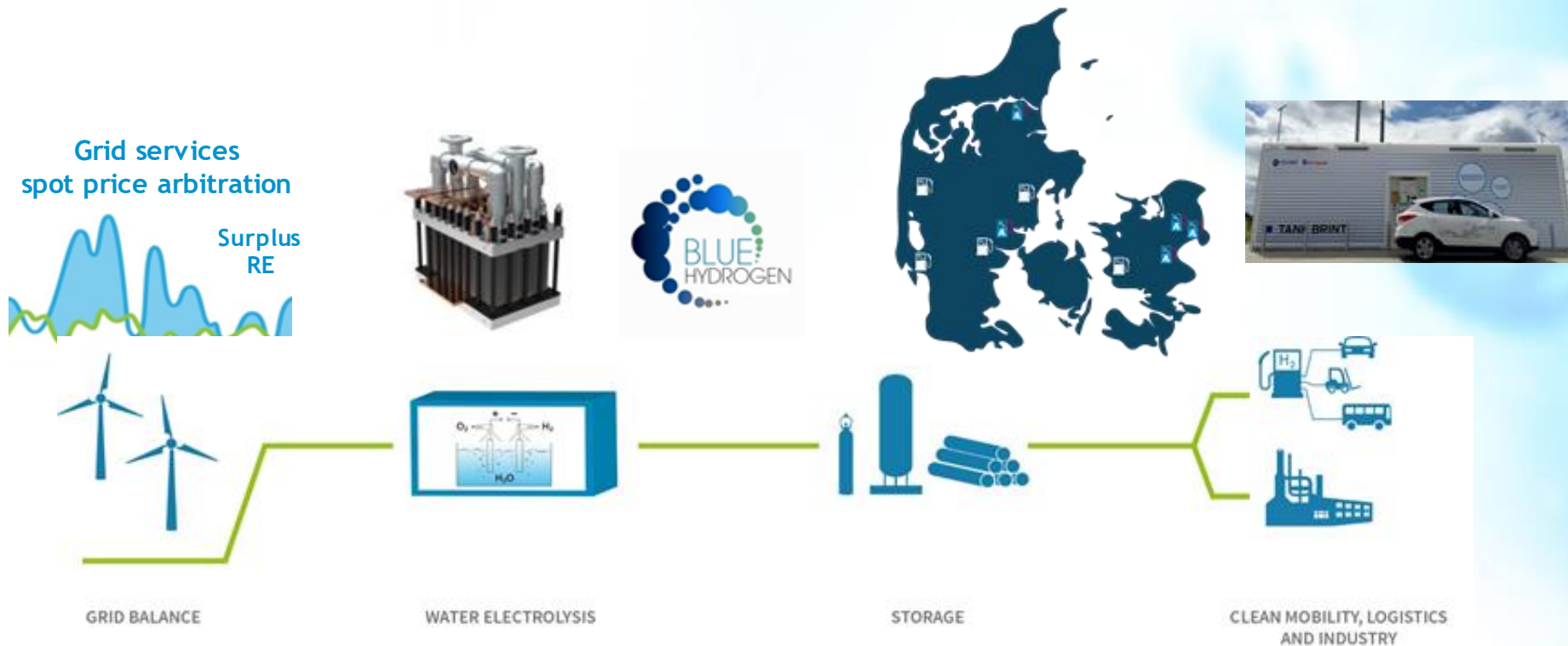
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Programme Review Days 2017
Brussels, 23-24 November

PROJECT SUMMARY

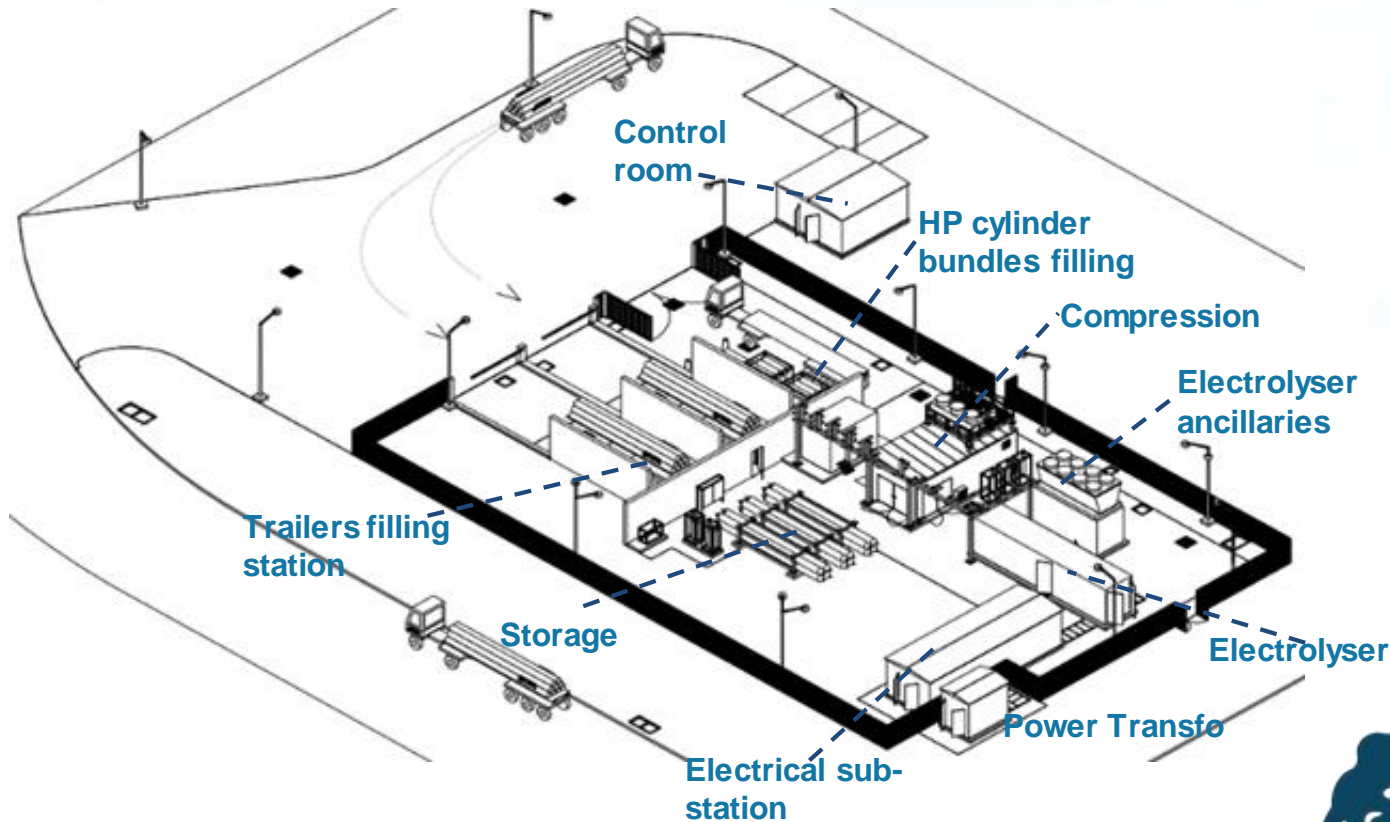
HyBalance



- Demonstration of production and supply chain of decarbonized H₂ from renewable sources in an industrial environment
- PEM Electrolysis, 1.25 MW
- Compression facility 200bar to 700bar for multiple usages: Industry & Transport

PROJECT SUMMARY

HyBalance



- Hybalance is located in Hobro
- Active region for H2: Hydrogen Valley
- Renewable source of electricity: wind power



- Call year: **2014**
- Call topic : **H2020-JTI-FCH-2014-1**
- Project dates: **Oct 2015 - Sept. 2020**
- % stage of implementation (duration) 01/11/2017: **42 %**
- Total project budget: **15 M€**
- FCH JU max. contribution: **8 M€**
- Other financial contribution: **2,6 M€**
- Partners:




PROJECT PROGRESS/ACTIONS

Cost goal

HyBalance



Aspect addressed	Parameter (KPI)	Unit	SoA 2017	FCH JU Targets
				Call topic
Cost Goal	 Electrolyser Cost (50kWh/kg @ stack)	€/kW	1810	1570

Note:

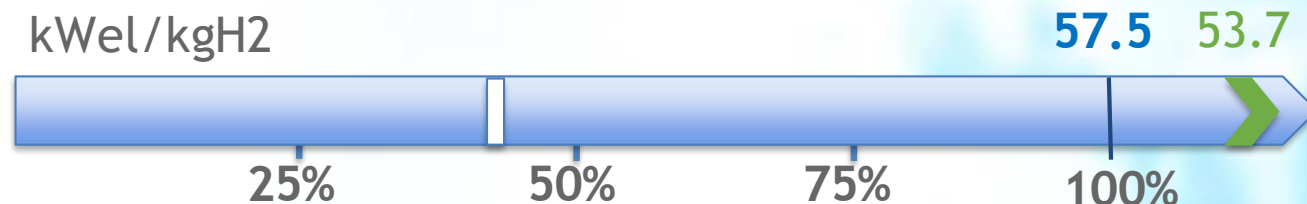
1000€/kW can be achieved for Hydrogenics installations from **3 MW** onwards

PROJECT PROGRESS/ACTIONS

Energy Efficiency

HyBalance

➤ Achievement to-date
| % stage of implement.



Aspect addressed	Parameter (KPI)	Unit	SoA 2017	FCH JU Targets
				Call topic
Energy Efficiency	➤ Unit	kWhel/kgH2	53.7	57.50

PROJECT PROGRESS/ACTIONS

Durability

HyBalance



Achievement
to-date
% stage of
implement.





25%

50%

75%

20 000

1

Aspect addressed	Parameter (KPI)	Unit	SoA 2017	FCH JU Targets
				Call topic
Durability	 Lifetime	h	N/A	20 000
	 Degradation	μV/h	N/A	1

Future steps:

- Unit is designed for 20 000 hrs of full capacity at acceptable consumption
- Plant not started yet, lifetime and degradation will be assessed later

Project progress

HyBalance

- Operational team ready
- Site start-up: December 2017
- Inauguration event: Q1 2018
- 5 years FCHJU project
- 15 years of operation planned



CONSTRUCTION & TESTING

COMMERCIAL OPERATIONS (15 years)

HyBalance-DK – ForskEL

Dec. 2017

HyBalance – FCHJU

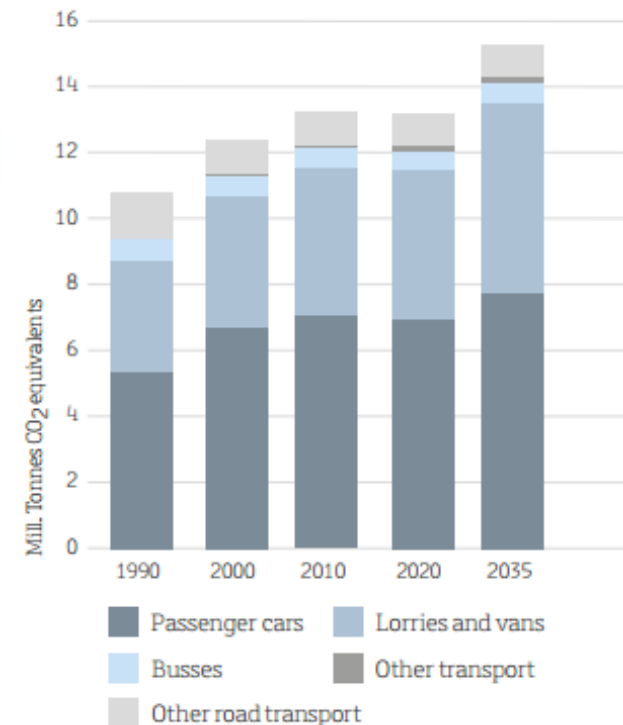
Sept. 2020

Contribution to transport GHG ↘

HyBalance



- Projections are showing a continuous growth of the emissions in the transport sector
- In the period 2010 to 2020, the passenger cars represent around **7 Mio tons CO2 equivalent**
- HyBalance is capable of a **fleet of more than 1 200 FCEV**
 - assuming 1kg/100km & 12 500kms/ y per FCEV
- From green electricity to H2 cars via HyBalance, **145 g CO2 / km** can be avoided
- It represents:
 - 2 175 tons / year of CO2 avoided
 - 0,03% CO2 reduction of the overall GHG emissions from passenger cars



Source: The Danish Climate Policy Plan
August 2013

- **Interactions with projects funded under EU programmes**

- Don Quichote

Demonstration Of New Qualitative Innovative Concept of Hydrogen Out of Wind Turbine Electricity - Hydrogenics electrolyser for grid balancing managed by NEAS for forklift market



- 3Emotion - Discussion on-going for 3 buses in Aalborg and supply of hydrogen from Hybalance site.

- HRS in Denmark



- **Interactions with projects funded under national programme (Forskel):**

- Biocat:

Power-to-gas project with Hydrogenics and Neas.



Public deliverables

- D8.1 Linkedin project page, website
- D8.2 Communication plan
- D8.3 Brochure, poster, ppt presentation
- D8.4 Media opportunities in DK, Scandinavia and Europe mapped
- D8.5, D8.7, D8.8 - Short video, time-lapsed video and project presentation video



Conferences/Workshops - Participation to 7 events

6 April 2016
Danish minister cut first sod



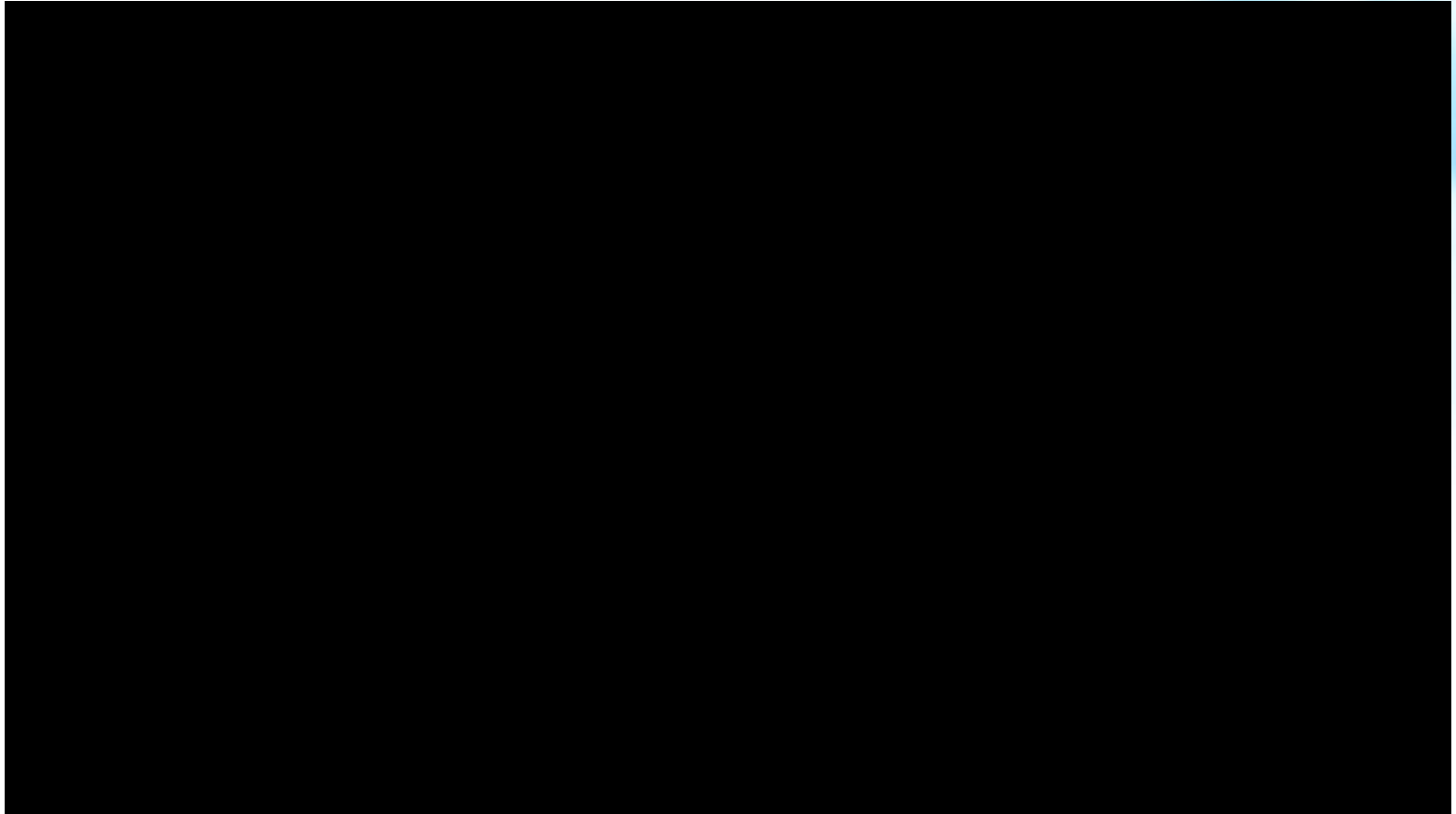
13 June 2016
21st World Hydrogen
Energy Conference 2016



13 February 2017
Hybalance electrolyser
inauguration



Video - Electrolyser is craned in place - June 14, 2017



PICTURES

HyBalance

Some pictures of the Hybalance site





Thank You!

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