



FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

HyLIFT-EUROPE

Large scale demonstration of fuel cell
powered material handling vehicles



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Programme Review Days 2018

Brussels, 14-15 November 2018

PROJECT OVERVIEW



- **Call year: 2011**
- **Call topic: SP1-JTI-FCH.2011.4.1: Demonstration of fuel cell-powered Material Handling Equipment vehicles including infrastructure**
- **Project dates: 01 JAN 2013 – 31 DEC 2018**
- **% stage of implementation 01 NOV 2018: 97%**
- **Total project budget: 15,680,960.20 €**
- **FCH JU max. contribution: 6,896,871.00 €; no other financial contribution**
- **Active partners: Ludwig-Bölkow-Systemtechnik, STILL, FAST/EHA, Air Liquide, Prelocentre**
- **Terminated partners: MULAG, Air Products, CHN, Element Energy, JRC, Heathrow Airport, H2 Logic, Dantherm Power**



PROJECT SUMMARY



The aim of HyLIFT-EUROPE is

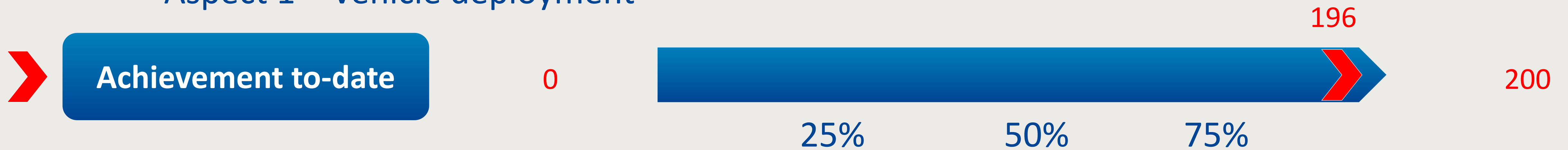
- to demonstrate more than 200 fuel cell materials handling vehicles and associated refuelling infrastructure at two sites (the initial plan foresaw 5-20 sites)
- to make it the largest European deployment of hydrogen powered fuel cell materials handling vehicles so far and to reach fleet sizes coming close to the ones in the USA
- to continue the efforts of previous FCH JU funded projects such as HyLIFT-DEMO & HAWL
- to demonstrate fuel cell systems in materials handling vehicles from the project partner STILL and from non-participating OEMs
- to demonstrate hydrogen refuelling equipment for materials handling vehicle operations from the project partner Air Liquide



PROJECT PROGRESS/ACTIONS



Aspect 1 – Vehicle deployment



Aspect addressed	Parameter (KPI)	Unit	SoA 2017	FCH JU Targets		
				Call topic	2017	2020
Vehicle deployment	Number of industrial and off-highway vehicles	[#]	n.a.	50	n.a.	n.a.

Future steps:

In the meantime sufficient customer contracts have been signed. The project has been extended by one year in order to achieve the target of demonstrating 200 FC materials handling vehicles and keep the demonstration going for at least for one complete year.



PROJECT PROGRESS/ACTIONS



Vehicles at Prelocentre



Source: Air Liquide / H.Lucas_S.Guillemain



Source: Air Liquide / H.Lucas_S.Guillemain



Prelocentre: > 40,000 fillings realised during the last 30 months

PROJECT PROGRESS/ACTIONS



Vehicles for second HyLIFT-EUROPE fuel cell vehicle user



Source: STILL GmbH



Source: STILL GmbH



PROJECT PROGRESS/ACTIONS



Aspect 2 – Hydrogen Refuelling Station deployment



Aspect addressed	Parameter (KPI)	Unit	SoA 2017	FCH JU Targets		
				Call topic	2017	2020
HRS deployment	Demonstration of supporting H ₂ infrastructure at demo sites	[#]	n.a.	≥1	n.a.	n.a.

Future steps:

Operation of the HRSs according to the needs of the vehicle fleet at customer sites



PROJECT PROGRESS/ACTIONS



Hydrogen refuelling – fuel supply and outdoor compressor station



Source: Ludwig-Bölkow-Systemtechnik GmbH



Source: Ludwig-Bölkow-Systemtechnik GmbH



PROJECT PROGRESS/ACTIONS



Hydrogen refuelling – indoor dispenser



Source: Air Liquide / H.Lucas_S.Guillemain



Source: Ludwig-Bölkow-Systemtechnik GmbH



Risks and Challenges



- There is still only one supplier of FC systems for materials handling vehicles who has supplied more than 100 units
 - ➔ STILL deploys FC systems from this supplier; activities with airport tow tractors have been terminated
- Trials and deployments of FC materials handling vehicles at airports are even more challenging due to their specific regulations and safety landscape
 - ➔ The focus of the project has been directed towards warehouse applications
- The project faced serious problems to identify sufficient and appropriate customers for the hydrogen powered fuel cell forklifts and warehouse trucks
 - ➔ By trying hard and flexibility from all parties involved the project finally managed to find customers for about 200 vehicles
 - ➔ *Recommendation: The customer(s) / vehicle users should be already onboard at the beginning of the project. Therefore, the financial support mechanisms need to be simplified or other instruments need to be found*



Communications Activities



- **Workshop at Prelocentre**

Prelocentre, one of the first locations in Europe to operate multiple hydrogen powered fuel cell forklift trucks and an Air Liquide hydrogen refuelling station offered an excellent location to perform the HyLIFT-EUROPE mid-term dissemination workshop on 07 JUN 2016. Representatives from relevant companies, local authorities and European institutions were attending

- **Final dissemination workshop at second HyLIFT-EUROPE fuel cell vehicle user**

- The target groups for this event are potential users, industrial stakeholders, authorities and press representatives
- The story to tell is about the positive experience with fuel cell materials handling vehicles so far, conveying the message that this customer is convinced by the performance of this solution and believes that this technology may play a significant role in their future materials handling vehicle fleets and is thereby contributing to a prosper development of the company



EXPLOITATION PLAN/EXPECTED IMPACT



Exploitation

- **STILL** participates in HyLIFT-EUROPE in order to expand the market base for its forklifts and warehouse trucks.
- For **Air Liquide**, provision of hydrogen fuel for materials handling vehicles can act as an important early market towards the use of hydrogen for the mass market of road vehicles

Impact

- The deployment of ~200 fuel cell systems in materials handling vehicles constitutes the largest fleet of these vehicles in Europe and therefore contributes to economies of scale
- All demonstration projects in this field contribute to improve the competitiveness of hydrogen applications as learnings will be transferred from one installation to the next one.





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