

High V.LO City

Contract 278192

Flip Bamelis

Van Hool

www.highvlocity.eu

www.aberdeeninvestlivevisit.co.uk/hydrogen

HyTransit



Contract 303467

Hamish Nichol

BOC - Linde



PROJECT OVERVIEW

		
Call topic	SP1-JTI-FCH.2010.1.1	SP1-JTI-FCH.2011.1.1
	Large scale demonstration of road vehicles and refuelling infrastructures	
Application area	Transportation and refuelling infrastructures	
Start date	1/1/2012	1/1/2013
End date	31/12/2018	31/12/2018
Budget		
-total	29.243.442,40€	16.321.165,57€
-FCH JU contribution	13.491.724,00€	6.999.999,00€
-external	15.751.718,40€	9.321.166,57€
# partners	13	8

Consortium overview: partners



HIGHVLOCITY



SOLVAY



LUN



Ballast Nedam



WaterstofNet



REGIONE LIGURIA



FT CONSULTING



UNIVERSITÀ DEGLI STUDI DI GENOVA



C|N|G Net



ABERDEEN
CITY COUNCIL



Dantherm[®]
Power



vanHool



HyER



HyTransit



PLANET
GbR



BOC

A Member of The Linde Group



elementenergy



Stagecoach bus.com
greener smarter travel

Project abstracts - High V.LO City

The **overall objective** of High V.LO City is to facilitate rapid deployment of the last generation FCH buses in public transport operations, by addressing key environmental and operational concerns that transport authorities are facing today.

- 3 demonstration pilots
- Creation of Clean Hydrogen Bus Centers of Excellence



	FC Bus	H2 production
Aberdeen (UK)	4	Sustainable production
Liguria (Italy)	5	Sustainable production
Antwerp (Belgium)	5	Industrial by product

Project abstract - HyTransit

The overall project objective is to prove that a hybrid fuel cell bus is capable of meeting the operational performance of an equivalent diesel bus on demanding UK routes (including urban and inter-urban driving), whilst considerably exceeding its environmental performance.



UK's largest on site production H2 station in Aberdeen




- Up to 360kg/H2 per day

- Refuel the buses in less than 10 mins


- Designed for maximum station availability

- Six Van Hool A330 fuel cell buses deployed onto existing passenger routes.

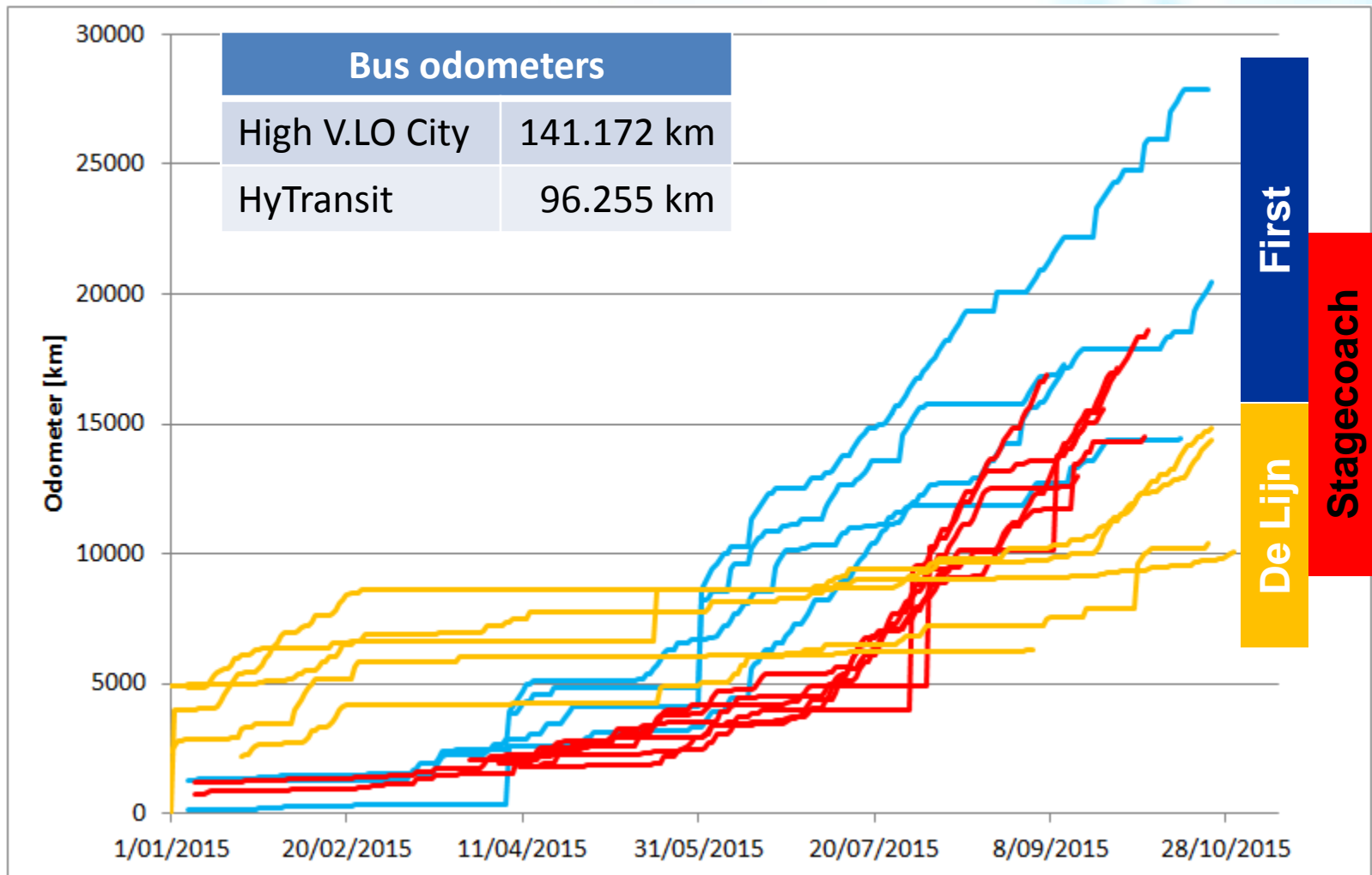
TARGETS AND ACHIEVEMENTS

AIP target	Project Target	Current status/ achievements	Expected final achievement
<p>Placing Europe at the forefront of FC technology to enable market breakthrough <i>(2010 target)</i></p>	<p>High V.LO City aims to facilitate a fast market introduction of FC technology</p>	<p>Aberdeen and Antwerp sites are in operations, Sanremo will follow in May-June 2016</p>	<p>100% - no risk for final achievement</p> 
<p>Speed up development of hydrogen supply and FC technologies <i>(2010 target)</i></p>	<p>Projects generated knowledge will be spread through a wiki-based Fuel Cell bus website and local Centers of Excellence</p>	<p>Website is in preparation – will be launched soon</p>	<p>100% - no risk for final achievement</p> 
<p>Fuel Station Availability <i>(2011)</i></p>	<p>The refuelling station must prove an availability of 98% or over</p>	<p>After 8 months of operation station is at 100% availability</p>	<p>≥99% - Station is designed with redundancy</p> 

TARGETS AND ACHIEVEMENTS

MAIP target	Project Target	Status
		
2015 – 500 FC Buses at 10 sites	20 FC Buses at 3 new sites	All buses are delivered on site – 15 are in service
Durability over 5.000 hours	15.000h warranty	Warranty is provided by FC supplier, still to be proven in real life operations
Roadmap for the establishment of commercial HRI	Demonstration of 3 functional HRI's and compliance with project KPI's	Antwerp site: in operations Aberdeen site: in operations Sanremo site: in preparation
10-20% of H ₂ demand should be produced carbon lean	75% of H ₂ is produced sustainable	Antwerp site: in operations Aberdeen site: in operations Sanremo site: in preparation

ACHIEVEMENTS



The Aberdeen Site



First Bus

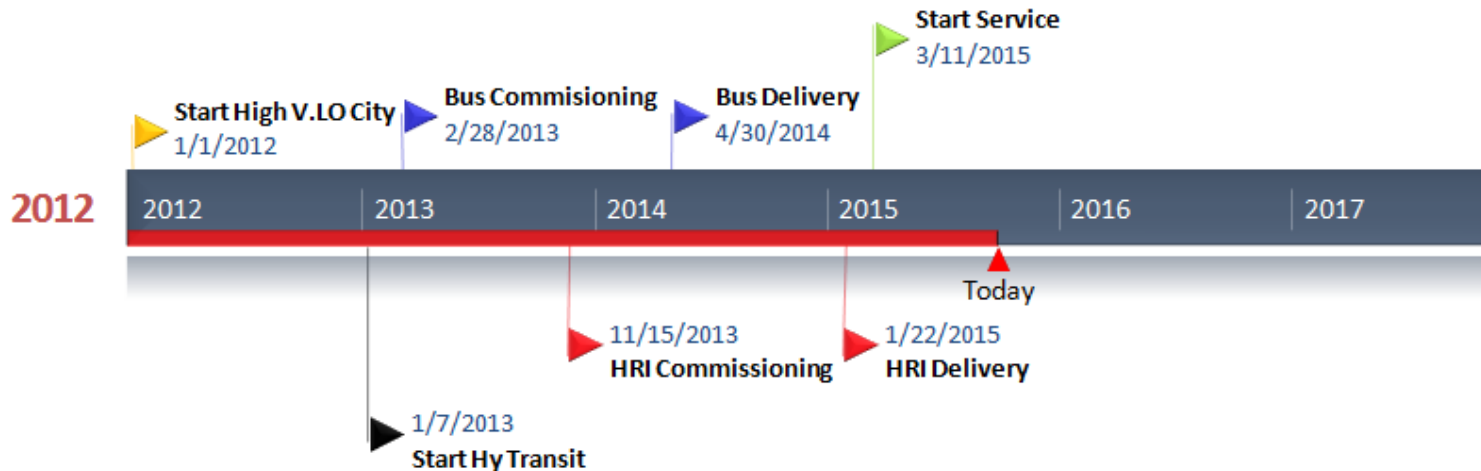
Bus	Current Mileage [km]
65805	27.907
65806	22.207
65807	20.449
65808	14.416
84.979km	

As of 10th November since 3rd March 2015:

- 21,500 kg H2 dispensed
- 1,000 refuels
- 100% station availability

Stagecoach bus.com
greener smarter travel

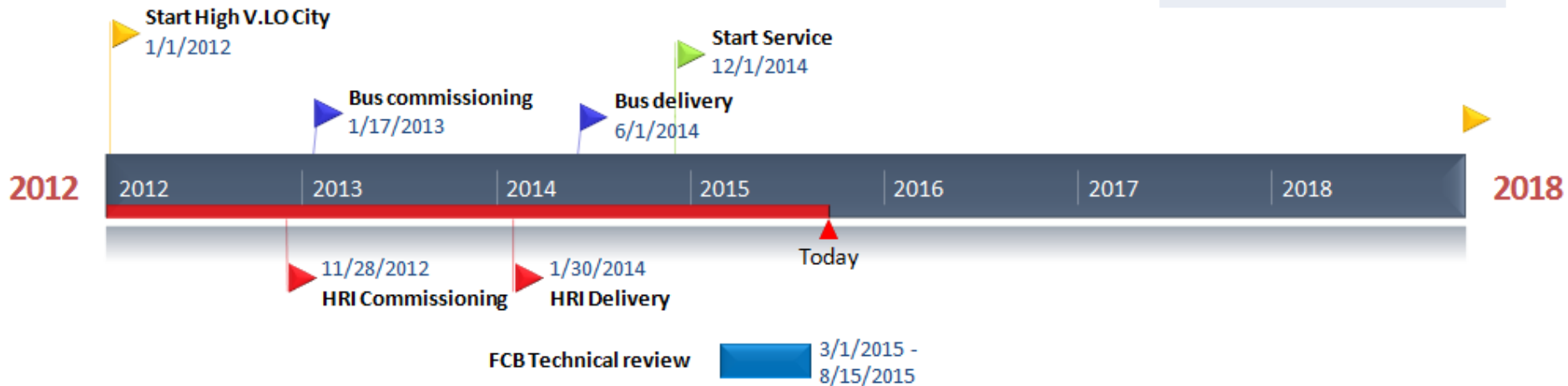
Bus	Current Mileage [km]
65809	15.829
65810	17.291
65811	14.511
65812	13.115
65813	16.860
65814	18.649
96.255km	



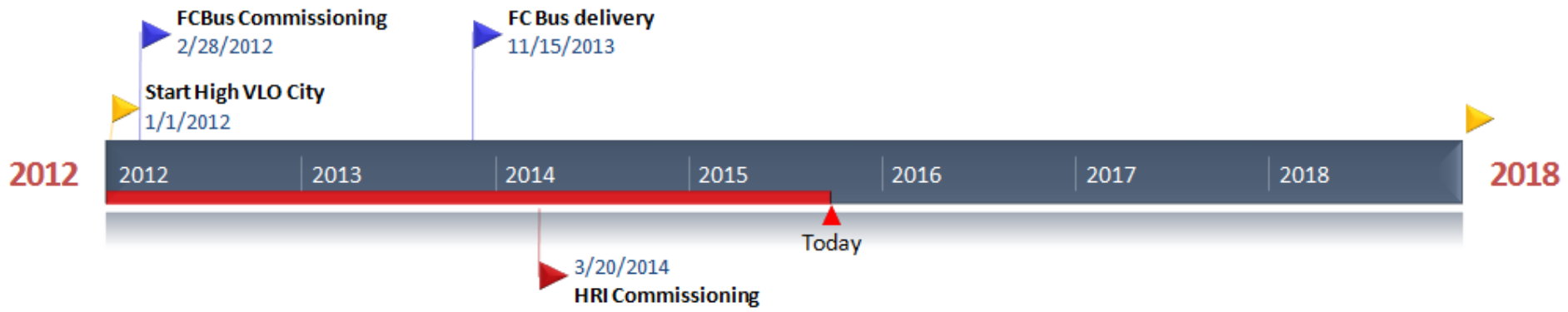
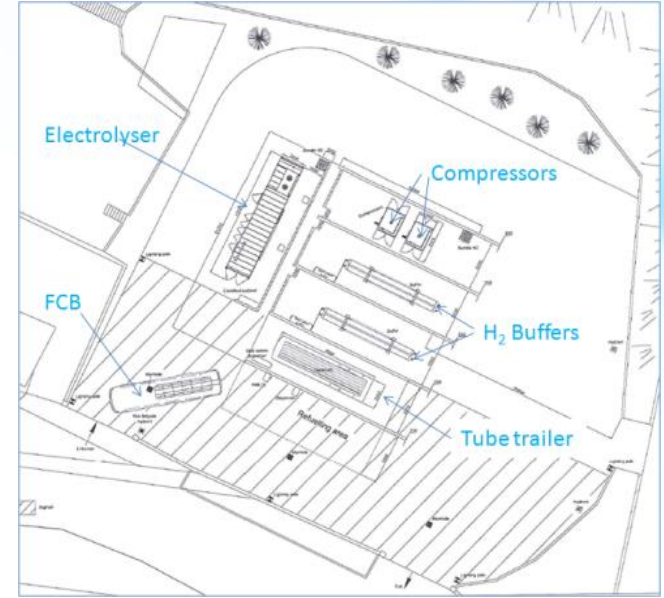
The Antwerp Site



Bus	Current Mileage [km]
65848	14.806
65849	14.404
65850	10.104
65851	10.597
65852	6.282
56.153km	



The Sanremo Site



THE NEXT STEPS

Objectives	Approach
Launch Sanremo site	The Sanremos site will be downscaled from 5 to 3 buses. The 2 remaining buses will be transferred towards a new site. High V.LO City will have 14 buses in operations in 4 sites.
Move HRI Antwerp site	Distance HRI-depot: 21km It is aimed to remove the HRI from the Solvay plant towards the depot of DeLijn.
Further increase technical availability	Technical availability of the vehicles should be further increased. Technical reviews and continuous training are to be organised.

Objectives	Approach
Disseminate project results	With the sites in operations now, results become available. These results will be used to disseminate.

- Cofinances provided by local authorities of Scotland, Flanders and Liguria.
- High V.LO City builds further on CHIC results and is the starting base for 3EMOTION.
- Aberdeen site is present in both High V.LO City and HyTransit (FCH JU projects)



HORIZONTAL ACTIVITIES



For all modi operandi of the vehicles, best practise rules were developed based on detailed risk analyses.

These modi operandi were used to train technicians, drivers, local emergency brigades.

When required, local authorities were inducted.

- High V.LO City is an in-depth evaluation of the FC Bus technology that intends to create a wide acceptance of this technology and to indicate the still existing hurdles on the road.
- The projects' results will be exploited by all involved stakeholders in the deployment of new/additional fleets.
- Next stages:
 - Continued demonstration
 - Initiate new local hydrogen bus projects
 - Further enlarge existing fleets
- Cross-cutting:
 - SORT1 and 2 tests for hydrogen consumption
 - HAZOP analysis with measures
 - Risk analysis for workshop operations

Thanks for your attention!



The largest FC Bus fleet in Europe: Aberdeens' 10 buses