

Deliverable Summary

DELIVERABLE KEY INFORMATION	
Document Code	D.1.1.2
Title of Document	Report on new fuelled buses realization and testing
Reference Workpackage	WP1
Reference Measure	1.1
Contractual Date of Delivery	June 2012
Actual Date of Delivery	July 2012
Dissemination Level	PU
Date of Preparation	June 2012
Author(s)	TPER spa – Andrea Bottazzi TPER spa – Francesco Camera TPER spa – Mirco Armandi
Editor(s)	TPER spa - Daniela Cocchi
Project Coordinator	Manuela Marsano Piazza Maggiore, 6 40124 Bologna Tel +39 051 219 5162 manuela.marsano@comune.bologna.it

Context and Purpose

The activity started with the feasibility study of low emission buses (Deliverable 1.1.1) that allowed to identify the best economical/technical solution to develop innovative clean vehicles in Bologna scenario. The feasibility study indicated buses with hybrid engines as the best solution.

This deliverable presents the two 12-meter Van Hool A330 Hyb EEV hybrid buses developed within the measure in real service in Bologna urban area from April 2012.

Summary Contents

The results of the feasibility study have been the input for the realization of the technical specification for a call for tender for the supply of hybrid vehicles with innovative characteristics.

The selected buses are equipped with innovative super capacitors that replace conventional electric batteries. Compared to traditional hybrid vehicles, they offer a considerable reduction in fuel consumption through lower exhausted gas emissions. Maintenance costs are also reduced, as they do not need the deployment of battery charging stations at the bus depots, nor the periodical substitution of the conventional costly batteries, known to wear out quickly.

Super capacitors can stand a significantly higher number of charge-discharge cycles and last longer than conventional batteries, making both the super capacitor and vehicle more environmentally friendly. Additionally, as super capacitors are not as restrained by low battery charge levels, these new buses make for a more reliable, constant and long serving bus service.

The two Van Hool vehicles are equipped with an electric generator powered by an endothermic diesel engine. The generated energy is stored by the super capacitors and released by the electric drive engine during the acceleration phases, to support the endothermic diesel engine, thus reducing fuel consumption and improving the performance.

During the braking and decelerating phases the energy produced by the generator is driven to the super capacitors to be stored. In other words, the super capacitors work like a type of super condenser, which can very rapidly store and give back energy in great quantities.

The hybrid buses procured by TPER can take 24 seated passengers and 56 standing. It also has a reserved area for one wheelchair and a buggy, and a manually folding access platform for disabled passengers (located at the central door).



Fig. 1 – the hybrid bus VAN HOOL A330 Hyb

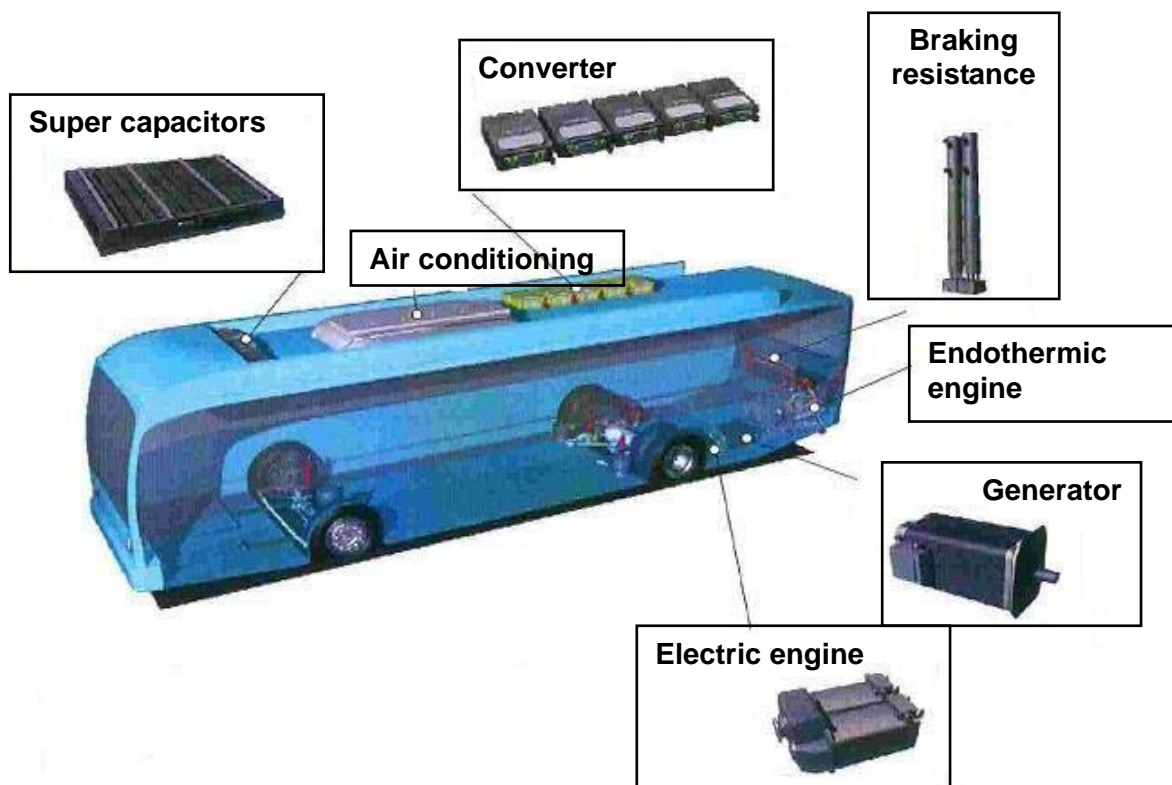


Fig. 2 – layout of components on the bus

From April 2012 the 2 hybrid buses are operating in Bologna urban area: from Monday to Friday they cover varied urban lines to test the performances on different routes.

On Saturdays and Sundays the vehicles operate on the new shuttle line “T” recently created to connect the city centre to the parking area Sant’Orsola during the “T-days”. During T-days the circulation on the main three streets of the city centre is allowed only to pedestrians and bicycles.

The service data collected and the feedback from drivers are very positive:

- the vehicles demonstrated reliability during the service
- fuel consumption are good: about 2,5 km/l with the air conditioning system working (both for drivers and passengers compartments)
- the vehicles have a noiseless engine appreciated from drivers and passengers

Functional Use

This deliverable describes the vehicles developed presenting main innovative characteristics; this document is the input for the realization of the final evaluation activities.

Lessons learned

The innovative technology chosen has demonstrated its validity and its correspondence to the needs of a transport company.

For a transport company it's important to improve the bus fleet with innovative buses with low environmental impact; at the same time it's fundamental that the innovative technology chosen is a "mature" technology that allows to have buses in real service in the city every day and not only prototypes parked in a depot.

Attachment

Extended version of the deliverable in Italian.

Contacts

Mirco Armandi

TPER spa

Via Saliceto n. 3

Bologna

Tel. +39.051.350502

mirco.armandi@tper.it