

Barcelona starts the pilot phase of the European ZeEUS Project, of electric buses

Presented today in Barcelona, the ZeEUS Project (Zero Emission Urban Bus System), funded by the European Union and coordinated by UITP, consists of a series of intensive tests, showing plug-in hybrids or pure **electric buses** from last generation in order to give fresh impetus to innovation in clean technologies of transport.

Transports Metropolitans de Barcelona (TMB) will lead testing in partnership with manufacturers Irizar and Solaris, and in co-operation with Endesa, Enide, the Polytechnic University of Catalonia, Idiada, and GMV.

A city's bid for the electric mobility

Barcelona is the first of the eight European cities selected for the project that starts experimenting with pure electric buses, which confirms the commitment of the city to move towards more sustainable mobility and using Smart technologies for the benefit of citizens. In the field of public transport, this approach will involve progressive electrification of the bus fleet, for better efficiency as well as for environmental reasons.

Barcelona's participation in the ZeEUS project is the introduction in TMB's regular service of the four zero-emission electric buses, which will test two different technologies. The tests will include two buses **i2e Irizar**, standard 12 m. model, equipped with batteries and overnight charging and two articulated 18 m. **Solaris Urbino 18e**, equipped with batteries that allow electric charging in line terminal during the day. The i2e Irizar buses are being presented today, whereas Solaris Urbino 18e are still in the process of construction.

The ZeEUS project, scheduled from November 2014 to April 2017, includes similar tests in other seven cities: London, Glasgow (UK); Stockholm (Sweden); Münster, Bonn (Germany); Plzen (Czech Republic) and Cagliari (Italy). In total, 35 plug-in hybrids or pure electric buses built by six European manufacturers will be tested by local operators. The project, co-funded through the European Commission's FP7 programme, has a budget of 22.5m EUR with 13.5m of EU funding.

Irizar i2e

The i2e is a standard bus, 12 meters long, made by the company Irizar in the Basque Country, designed for up to 73 passengers. This is one of the first 100% electric buses with a big range made in Europe. It is powered by a 180 kW engine, sodium-nickel batteries together with ultracapacitors and it gives a range of between 200 and 250 km, depending on operating conditions. The batteries are charged overnight in the TMB's depot of Triangle, but the bus is also able to store the energy recovered during braking.

The first unit began circulating with passengers along Barcelona bus lines on August 18th. The vehicle was assigned to the line 20 and will be also integrated in other bus lines at a later time. New routes with various characteristics (flat, hilly and combined), will allow to verify functionality, comfort and energy consumption for different conditions.

The second unit, identical to the first one, just joined the TMB fleet, and within a few days will also begin commercial service.

Solaris Urbino 18e

As for two Solaris Urbino, 18 m. long articulated buses, they will be powered by a 270 kW engine and associated with one station for opportunity charge at line terminals, during regulation time between trips. This system, promoted by the City Council, and designed and implemented by Endesa, supplies an electric charge of 400 kW CC to the bus battery through a retractable pantograph located on the roof. In 5 minutes the system can fill 70% of storage capacity. In this way, the bus can maintain good operation with smaller batteries, 120 kWh, and less weight, which contributes to energy efficiency.

These two high-capacity vehicles (about 120 passengers) are expected to join TMB fleet by summer of 2015, to start being tested immediately to begin data collection. The operating line is not yet defined, but, similarly to the routes for i2e Irizar buses, it is supposed combine different typologies.

Operational features

The four test buses within the ZeEUS project have been designed to meet the operational requirements of TMB: 16 hours per day of continuous running in heavy traffic conditions, air conditioning during summer period and a wide range of facilities, such as low floor, wheelchair access, information systems onboard etc.

In Barcelona, the tests of the four vehicles of ZeEUS project will coincide with the BYD K9. TMB has incorporated this unit for two years, in a leasing base, with a purchase option after the trial tests. This bus has been in regular service with passengers since last February.

TMB is currently a bus operator reference in environmental terms, because it has one of the cleanest and most advanced fleets: 411 CNG buses, more than 130 hybrid buses, and a high-performance exhaust filter system that drastically lowered emissions from the diesel buses. Overall, TMB transports annually 180 million passengers by bus, including Barcelona and 10 other municipalities in its metropolitan area.