Irizar S. Coop. | Zumarraga bidea, 8 | 20216 Ormaiztegi (Gipuzkoa) | Spain | T +34 943 80 91 00 | F +34 943 88 91 01 | irizar@irizar.com | www.irizar.com
S.A.T. | Ihurre - Karobi poligonoa | 20212 Olaberria (Gipuzkoa) Spain | T +34 943 80 53 80 | F +34 943 16 10 89

Barcelona to reduce auxiliary energy consumption by 20% on electric bus with EBSF_2 innovations

The Barcelona demonstration team, led by bus manufacturer Irizar, is testing and validating three EBSF_2 technological solutions, two of which in the field of energy management strategies and auxiliaries. The aim is to reduce auxiliary energy consumption by 20% with the combined tests.

To demonstrate the innovations, two 12 meters Irizar electric buses already running in the Barcelona city centre since August 2014 as part of the ZeEUS project (see: The first ZeEUS core demonstration in Barcelona) are being used.

The Barcelona EBSF_2 team (IRIZAR, TMB, HISPACOLD, DATIK, Fraunhofer IVI and DIGIMOBEE) is actively working to make the energy management of the two buses more "intelligent" by implementing a system that can anticipate energy demands of auxiliaries according to the driving conditions and introduce innovations to optimize thermal management mainly in warm conditions.

Since driving cycles of urban buses on specific routes are normally similar, they can successfully incorporate an intelligent and adaptive system, capable of learning and optimizing energy flows between the auxiliary systems and the energy storage unit. In fact, frequent loading and discharge of energy to and from the storage system increases the consumption and the energy demand for cooling.

A self-learning algorithm will feed the vehicle's auxiliaries control by transmitting parameters based on real time information such as the position and the driving situation of the full electric bus. This algorithm will lead to a more efficient operation of, among the others, the steering pump and air compressor.

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Additionally, the Irizar buses will test technological innovations to increase the efficiency of climate systems and thermal management for electric vehicles by 15-20%. These tests will take place in both controlled (heat-chamber) and real environment to allow reliability of results. The overall goal is to pass from basic operation modes for thermal management to strategies specifically designed to reduce power consuming.

"Through the innovations proposed in the Barcelona Demo the energy consumption of the auxiliaries will be reduced and thus the autonomy enhanced. This will have an important impact in the uptake of full electric buses as a clean option for urban mobility." said Hector Olabe, Electromobility Program Manager and EBSF_2 Barcelona Demonstration leader, Irizar.

The first data collection related to the tests happened in Barcelona in between August and September 2015. The next testing and data collection will take place from May 2016.

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