Europe launches the ZeEUS project

By Doug Jack

I wrote recently about the International Union of Public Transport (UITP) headquartered in Brussels, Belgium. UITP originally acted to liaise between the more important public transit providers and politicians and legislators. It has since expanded its activities and gained recognition as a facilitator of projects for the public transit industry.

Brussels is the headquarters of the European Commission and home to its many Directorates, including one for Mobility and Transport. UITP recently launched Zero Emission Urban bus System (ZeEUS), a major milestone for greener urban transport.

The European Commission has set tough targets to reduce carbon emissions in the European Union by 2020. Although buses are only a tiny fraction of the total number of vehicles in circulation, they often run in urban centers for up to 18 hours a day and are therefore seen as prime candidates for electric traction.

Solaris has built a few full-size electric buses.

UITP says developing large capacity electric vehicles and creating an adequate charging infrastructure will facilitate the market for electric buses in Europe, and is coordinating 40 partners in an innovative project to extend the fully electric solution to a wider community of European urban bus networks.

With a budget of just over $30 million, of which the European Union is contributing more than $18 million, this 42-month project began in November 2013 and will run through April 2017.

During the launch of ZeEUS, Deputy Director General of the Directorate Mobility and Transport of the European Commission Fotis Karamitsos said that Europe was far too dependent on oil, spending around $1.4 billion per day on imports, making electrification of transport necessary to reduce oil consumption and emissions. Curiously, there was no mention during the day about the source of that electricity. I would guess that more than half comes from fossil fuels.

“Electricity as a fuel source has been identified as one of the most promising alternative fuels for transport, and its application in urban buses is already gaining ground,” said Sir Peter Hendy, the current UITP president and commissioner of Transport for London. “As one of the largest electro-mobility projects ever funded by the European Commission, this project coordinated by UITP is significantly important to us and our members.”

He said public transport in the European Union carries 200 million people every day, of which electric vehicles such as trams, trains and trolleybuses account for approximately 90 million passengers per day. Buses remain the prime provider of public transport with 60 percent of total passenger movements. Hadley also noted that London would buy four electric double-decker buses as part of the ZeEUS project.

Umberto Guida, director of EU Projects at UITP, has been responsible for setting up the project and selecting participating organizations. He says a total of 35 vehicles built by six manufacturers will run in eight EU cities. Other members of the project include suppliers of systems and infrastructure, transit companies and transport authorities, electricity suppliers, universities, research institutes and consultants.

The overhead fast-charging system.

Guida revealed that the six OEMs are Alexander Dennis of the United Kingdom; Irizar of Spain; Skoda, a producer of electric traction systems in the Czech Republic; Solaris of Poland; VDL Bus of the Netherlands; and Volvo of Sweden.

The cities participating in the project are Barcelona, Spain; Bonn and Munster, Germany; Glasgow and London, United Kingdom; Plzen, Czech Republic; Stockholm, Sweden; and a city in Italy yet to be decided.

Another all-electric midibus by PVI of France.

Guida said of the many electric technologies available in Europe, trolleybuses have to be continuously connected to overhead wiring; a number of mini and midi battery buses run for limited distances; and the number of full size diesel-hybrid buses is increasing.

He said that the demonstrations should not use prototype models and that series or pre-series vehicles should be full-size. The number of demonstration vehicles had to be sufficient to perform a meaningful and statistically valid evaluation in different geographical, climatic, environmental and operational conditions. While the aim is to maximize the distance travelled on electricity alone, not all the vehicles will be totally electric. Some diesel buses may be used as back-up.

The Alexander Dennis single-deck bus will look like this.

The ZeEUS project had to consider cost elements, technical and operational aspects, feasibility, and environmental benefits.

Irizar has an electrical supplier in its group and has announced plans to build an all-electric bus for the cities of San Sebastian and Barcelona.

A Volvo plug-in hybrid in Gothenburg.

Alexander Dennis is in a consortium with the Glasgow transport authority, Scottish and Southern Electricity, a university and other parties to provide four single-deck buses that take fast electric charges from plates beneath the vehicle. Alexander Dennis is the favored supplier for four double-decker buses to London using a similar system, but that contract must go through tendering.

Volvo is currently involved in a trial of its proprietary parallel hybrid drive system in Gothenburg using plug-in technology to extend the range in all-electric mode. A connector on the roof of the bus takes a fast charge from an overhead gantry at each end of the route. Volvo will supply eight buses to Stockholm later this year.

After several months in service, Volvo was able to report that its plug-in hybrid buses were using 81 percent less fuel than the equivalent diesel bus. The overall energy consumption (including biodiesel and electricity) gave the plug-in hybrid an energy savings of 61 percent running on electric power for about 85 percent of the time.

The company is hoping to achieve all-electric operation with a diesel engine probably only fitted as a back-up.

VDL will supply its Citea Electric bus to Munster, Germany. Skoda will most likely supply buses to Plzen, Czechoslovakia. Skoda uses structures made by Solaris in Poland, and fits its own electrical equipment.

Solaris has already built all-electric midibuses and full size 40-foot models that use an overhead system for fast charging. Solaris will probably supply Bonn and the unnamed Italian city.

A panel session followed the presentation with different but important players in electro-mobility. A

member said the electricity industry needs to fully understand the implications of fast charging and also of supplying current to a large number of buses being charged overnight in a depot. The industry would have to think not only about regular and reliable supply, but also about the impact on existing users of the grid.

One delegate in the audience warned that if governments saw tax revenue from diesel declining, they might be strongly tempted to tax electricity used in road vehicles.

The ZeEUS project is very important because it will give Europe a large amount of practical working experience of all-electric buses. It will be able to set standards and advise operators on the introduction of these vehicles.