



Travelling light – on electric buses

Finnish-made, lightweight, energy efficient Linkker electric buses will be quietly and cleanly running in the streets of Helsinki from 2016, and in neighbouring Espoo from August 2015.

Helsinki Region Transport (HSL) has purchased 12 electric buses from Linkker. The first buses are being individually manufactured in Finland at Linkker's own production facility in Nastola and at Fortaco's plant in Sastamala. HSL will be able to use these electric buses to test and develop new services and fittings designed to benefit passengers.

Linkker was established in 2014 to utilise the knowledge base built up during the eBus project run by VTT Technical Research Centre of Finland. The eBus project and a parallel Electric Commercial Vehicles project both formed part of the Electric Vehicle Systems (EVE) programme run by Tekes – the Finnish Funding Agency for Innovation. The Tekes-funded eBus project is also closely linked to VTT's spearhead programme TransSmart.

Electric buses will soon be more reliable than diesel buses even in winter conditions.

- The new buses are totally made of aluminium, and their light weight also makes them very energy efficient," explains Linkker's CEO **Kimmo Erkkilä**.
- Our buses can be rapidly recharged at their route terminuses, and other advantages include the way they run with low noise levels and no emissions.

Erkkilä emphasises that interest and plans to electrify urban bus services also exist outside the Helsinki metropolitan area. Though preparations are most advanced in Espoo and Helsinki, the need to improve public transport is just as high in other Finnish cities.

- Electric buses can enhance passengers' experiences at lower total costs and with no local emissions, says Erkkilä. – We also expect that under winter conditions electric buses will soon perform better than conventional diesel buses in terms of reliability.

Erkkilä also sees considerable openings for Finnish electric buses elsewhere in Europe and around the world. International sales work is already under way.

The new buses will be delivered in phases, with their performance levels tested on VTT's chassis dynamometer. Their battery charge monitoring systems will also be studied and developed with the help of a real time monitoring and control system, since this is a vital issue for the functioning of electric buses.

Electric buses are also being developed in other countries including China. Though international competition is tough, Erkkilä is convinced that the Linkker buses are competitive on both costs and quality.



– Linkker's energy efficient solutions reduce the life cycle costs of electric buses, and we believe this improvement will be an important factor in purchasing decisions, he says.

Enjoyable and emission-free bus journeys

Procuring electric buses is an important part of Helsinki Region Transport's (HSL) four-year development project ePELLI, which aims to promote innovations related to emission-free and enjoyable bus transportation by adopting favourable new technologies and demonstrating the benefits of electric buses to bus operators. It is hoped that this platform for innovation will soon be extended to other cities and bus companies outside the capital region.

– At VTT we've been involved from the start in promoting the development of electric buses, and we're delighted that Finland will now have an international standard reference consisting of a functioning electric bus system, says TransSmart Programme Manager **Nils-Olof Nylund** from VTT.



HSL aims to reduce carbon dioxide emissions and other harmful local emissions from its bus system by more than 90% by 2025. To reach this goal many more electric buses will have to be taken into use, as well as new low-emission diesel-driven vehicles and biofuels.

A new purchasing model for bus operators

Helsinki Region Transport's (HSL) ePELLI project is testing a new model for bus acquisitions. The idea is to enable local bus operators to try out technically innovative buses with no major financial commitment before making their final purchasing decisions. For this purpose HSL has acquired 12 electric buses on a leasing basis.

HSL hopes that by 2025 about a third of the region's buses will run on electricity. Electric buses' benefits include the lack of local emissions, high energy efficiency, and low noise levels. If buses run on electricity generated from sustainable sources their carbon dioxide emissions will only be a fraction of those emitted by conventional buses. The buses leased by HSL will be tested in Espoo and Helsinki over the next four years. The project's budget will total at most 6 million euros.

The TransSmart research programme is publicised by Motiva Oy. Text and graphic design: Motiva Oy – Pictures: VTT Oy and Gorilla – Translation: Fran Weaver

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