



No emissions: an e-truck on the new test track.

Electrified roads: goods transport on the eHighway

Goods transport using electric railways is rightly considered a particularly productive, energy-efficient and environmentally friendly solution. The eHighway, developed by Siemens, brings these benefits to the road network.

Shifting more goods onto the rail network is not always possible. This creates a need for reliable and environmentally friendly road transport solutions. Since electric vehicles offer the most potential in terms of ecological and economic benefits, in 2011 Siemens developed the eHighway, an integrated concept for electric-powered trucks, as part of the ENUBA research project funded by Germany's Federal Environment Ministry. The principle is for e-trucks equipped with hybrid drive systems and intelligent pantographs to draw power from overhead lines while driving, like trolley buses, then complete their local journey without causing emissions (see como 8/2012). The infrastructure and vehicles were tested on a specially built test track in Groß Dölln in the German state of Brandenburg. The system was assessed in terms of economic feasibility and CO₂ reduction potential.

The current follow-up project, which runs from 2012 to 2014, focuses on optimally integrating the drive technology and pantographs into the vehicles and providing the necessary traffic control systems. Here Siemens is working in partnership with the commercial vehicle manufacturer Scania, while Dresden University of Technology and other institutions are carrying out accompanying research. The goal is to develop the eHighway as a complete system that can

be deployed on public roads, which means solving all the related technical, legal and economic issues. As such, it is entirely in keeping with the German government's current Mobility and Fuel Strategy, which describes drive system and fuel options for an energy transition in transport up to the year 2050.

For this second research project a new, extended test track was commissioned in Groß Dölln. It is tailored to mirror real operating conditions. A bend was added to the track, along with a newly developed contact wire that is adjusted to the shape of the bend and allows vehicles to keep traveling at speeds of up to 90 km/h. Two more features found on most highways were also installed: a gantry and a road sign supported by a cantilever. Since the contact wire has to remain a safe distance beneath the road signs, the catenaries and carrying cable were lowered so that the pantograph can remain in constant contact, even when traveling at full speed.

The eHighway concept is particularly beneficial to the environment and the economy on highly frequented long-distance routes and shuttle routes, for instance between ports and factory sites and logistics centers, or between mines and transshipment centers. The initial pilot projects are already at the implementation stage.

In Sweden the central authority for transport, Trafikverket, has opened a tender for pilot routes for heavy electric goods vehicles with a continuous electricity supply. The goal is to compare and evaluate various systems before deciding which technology Sweden will incorporate into its national transport planning. If an eHighway pilot project goes ahead, it could be the first application of this system on public roads worldwide and help Sweden to achieve its goal of bringing about a transport sector that no longer depends on fossil fuels by 2030. Among other industries, Swedish iron ore mines such as the Kaunisvaara project in Pajala, near the Finnish border, could derive a huge sustainable benefit from an eHighway system. Rather than using diesel trucks to carry the crude ore around 150 kilometers to the iron ore railway line, this journey could be made by environmentally friendly e-trucks.

In California Siemens has teamed up with the automaker Volvo and local truck retrofitters in order to carry out a pilot project with the South Coast Air Quality Management District (SCAQMD). This involves demonstrating how various truck configurations work with the eHighway infrastructure in the area around the Ports of Los Angeles and Long Beach. The plan is to set up a zero-emission corridor on Interstate Highway 710, between the two sea ports and the inland railway hubs around 30 kilometers away, where shuttle transport using e-trucks will relieve the burden on this smog-plagued region. Project planning is already underway.