Highway electrification for trucks has already started

VIDEO

available at www.siemens.com/eHighway
Development of the eHighway vehicle technology

**1. Generation**  
Proof of concept

**2. Generation**  
Swedish and US Demonstration projects

**3. Generation**  
Field trials

**2010**

- Operations up to 100 km/h possible
- Connection and disconnection to catenary in motion
- Recharging of onboard energy storage while driving
- No limitations for first and last mile

**2019**
Catenary electrification is compatible with and complementary to other alternative fuel technologies

The eHighway hybrid truck can be configured to suit specific applications

<table>
<thead>
<tr>
<th>Truck types</th>
<th>Drive system</th>
<th>On-board source of electricity</th>
<th>Combustion engine</th>
<th>Non-electrical source of energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tractor truck (2 axles)</td>
<td>Parallel-hybrid</td>
<td>Battery (small)</td>
<td>Engine (small)</td>
<td>Diesel</td>
</tr>
<tr>
<td>Tractor truck (3 axles)</td>
<td>Serial-hybrid</td>
<td>Battery (medium)</td>
<td>Engine (medium)</td>
<td>Bio-fuel</td>
</tr>
<tr>
<td>Rigid truck (2 axles)</td>
<td>Full electric</td>
<td>Battery (large)</td>
<td>Engine (large)</td>
<td>CNG/LNG</td>
</tr>
<tr>
<td>Rigid truck (3 axles)</td>
<td></td>
<td>Fuel cell</td>
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<td>H₂</td>
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<tr>
<td>Rigid truck (4 axles)</td>
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</tbody>
</table>
Commercialization of zero emission trucking starts with shuttles, which are then linked up to form a larger network

Shuttle applications (ca 20-100 km)

- The next steps should be pilot projects proving that zero-emission heavy road freight is both economical and practical\(^1\)
- Experts on highway trucking recommend local or regional catenary trucking projects “the most feasible approach for the zero-emission technologies”\(^2\)

CEO of Scania & CTO Volvo Group

Network roll-out

- The systemic transition to zero emission road freight requires breaking out from early shuttles to large scale network
- Possible important role of hybrids (driving a very high share on electricity) as users of partial infrastructure network
- Nearly completed network will facilitate transition to fully zero-emission mobility


→ Providing the right infrastructure is a necessary precondition for zero emission long-haul trucking
German Transport Ministry is supporting overhead contact line shuttles as part of their climate action plan

• The German federal transport ministry (BMVI) support was listed among recently announced measures for transport decarbonization.

• Road freight is the area where 1/3 of the CO$_2$ savings are expected to be achieved, making it biggest contributing segment to the overall reductions from transport.

<table>
<thead>
<tr>
<th>Nutzfahrzeuge</th>
<th>17-18 Mio. Tonnen</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO$_2$-arme Lkw auf die Straße bringen</td>
<td>CO$_2$-Flottenregulierung (auf EU-Ebene)</td>
</tr>
<tr>
<td>Kaufprämie für Nutzfahrzeuge mit alternativen Antrieben</td>
<td></td>
</tr>
<tr>
<td>CO$_2$-Differenzierung der Lkw-Maut</td>
<td></td>
</tr>
<tr>
<td>Tank- und Ladeinfrastruktur ausbauen</td>
<td>Infrastrukturaufbau und -förderung (z.B. Wasserstofftankstellen, Mega-Charger, Oberleitungen auf Pendelstrecken)</td>
</tr>
</tbody>
</table>

• German government’s climate action plan calls for 1/3 of truck traffic to be electric or using eFuels by 2030. Supporting this goal is an infrastructure plan including for catenary systems.

Source: [BMVI website](#) and [Government plans](#) (announced on Oct 09, 2019)