Energy-saving technologies and solutions for heavy trucks

Carbon dioxide (CO2) emissions from heavy-duty vehicles (HDVs) rose by more than one third between 1990 and 2010. An EU initiative helped to reduce the carbon footprint by developing a novel fuel-saving technology for heavy trucks.

The truck manufacturing industry is under mounting pressure to improve fuel efficiency. To date, strategies have focused on the fuel efficiency of individual components of heavy vehicles. To achieve maximum energy efficiency, recent studies show that a strategy is needed for complete vehicle energy management. Mechanical, thermal, electric and chemical energy areas must be examined together and not independently.

To help achieve this, the EU-funded CONVENIENT (Complete vehicle energy-saving technologies for heavy-trucks) project adopted a holistic approach to fuel efficiency. To achieve its aims, the project proposed a holistic method to on-board energy management that takes into consideration the tractor, the semi-trailer, driver behaviour and the mission as a whole process.

Project partners developed and integrated innovative energy-efficient systems and
energy-harvesting devices, advanced active and passive aerodynamics devices, and energy management at vehicle level, as well as driver support to maximise the benefits of the energy-saving systems and strategies.

Researchers set different fuel-saving targets for the three prototype HDVs, ranging from 30% to 15%. For the final heavy-truck demonstrator vehicle to achieve the initial target of 30% reduction in fuel consumption, additional technologies need to be considered.

The CONVENIENT team investigated various factors or systems that influence vehicles’ overall energy efficiency. Findings showed that more efficient transport solutions with reduced environmental impact and reduced oil and energy consumption will mitigate environmental effects.

The European Commission has stated that without policy action, total HDV emissions will still be close to current levels in 2030 and 2050. CONVENIENT state-of-the-art technologies and solutions offer hope in achieving cost-effective reductions in CO2 emissions.

Keywords

Energy-saving technologies, heavy trucks, energy efficiency, energy management, CONVENIENT

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Closed project

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