Configurable and Adaptable Trucks and Trailers for Optimal Transport Efficiency

Full name: Configurable and Adaptable Trucks and Trailers for Optimal Transport Efficiency

Acronym: TRANSFORMERS

Duration: 42 months

Start date: 1 September 2013

Total budget: 7.9 M€

EC Funding: 5.2 M€

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Develop and demonstrate an innovative tractor-semitrailer with a configurable distributed electric Hybrid-on-Demand driveline in the (semi)trailer

Develop a pre-standard framework for the electric Hybrid-on-Demand driveline concept

Develop and first-time demonstration of a tractor semitrailer vehicle featuring a distributed hybrid driveline including an electrically driven semitrailers

Develop toolbox with aerodynamic devices / technologies including guideline for selecting options, and demonstrate devices as part of the total vehicle demonstrations

Develop toolbox with load – and loading efficiency devices / technologies including guideline for selecting options, and demonstrate devices as part of the total vehicle demonstrations

The overall aim of the TRANSFORMERS project is to develop and demonstrate innovative and energy efficient trucks and load carriers for long distance transport assignments with an improved load efficiency leading to an overall 25% less energy consumption on a ton.km basis, with the below split to achieve this:

- Fuel consumption reduction of 18%
- 8% by the Hybrid-on-Demand driveline
- 2% by the downsize of the engine
- 8% by the mission-based configurable aerodynamic toolbox
- Load efficiency of 10%

The resulting improvement on energy consumption $i_e$ (%) is calculated by:

$$i_e = 100 \left( 1 - \frac{100 - i_f}{100 + i_l} \right)$$

with $i_f$ the improvement on fuel consumption (%) and $i_l$ the improvement on load efficiency (%).

The relationship of reduced fuel consumption and increased load efficiency is shown in this figure.

Thus, by reducing the fuel consumption by 18% and simultaneously increasing the load efficiency by 10%, the outcome of TRANSFORMERS is estimated to achieve approx. 25.5% less energy consumption per ton.km compared to a state-of-the-art truck-(semi)trailer.

TRANSFORMERS focuses on achieving these key innovations within the existing European legal and regulatory framework in terms of dimensions, weight and loads.