

TRUCK MANUFACTURERS:

VOLVO

www.volvo.com
Sweden

DAF
A PACCAR COMPANY

www.daf.com
Netherlands

TRAILER MANUFACTURERS:

SCHMITZ CARGOBULL
The Trailer Company.

www.cargobull.com
Germany

ECK

www.vaneckgroup.nl
Netherlands

END USERS:

P&G

www.pg.com
Belgium

IRU Projects

www.iru.org
Belgium

SUPPLIER:

BOSCH
invented for life

www.bosch.com
Germany

RESEARCH INSTITUTES:

Fraunhofer IVI

www.fraunhofer.de
Germany

virtual vehicle

www.v2c2.at
Austria

IFSTTAR

www.ifsttar.fr
France

FEHRL

www.fehrl.org
Belgium

TNO

www.tno.nl
Netherlands

SERVICE SUPPLIER:

UNIRESEARCH

www.uniresearch.com
Netherlands

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€

CONTACT

Configurable and Adaptable
Trucks and Trailers for
Optimal Transport Efficiency

Technical Coordination:

VOLVO GTT
Lundbystrand M1:6, 405 08 Göteborg, Sweden

Contact person:

Paul Adams
E: paul.adams@volvo.com T: +46 31 3233982

Project Management:

Uniresearch
Elektronicaweg 16c, 2628 XG Delft, The Netherlands

Contact person:

Cor van der Zweep
E: c.vanderzweep@uniresearch.com T: +31 15 2754000

Flyer produced by Uniresearch / 1528



BACKGROUND

Today trucks and load carriers are designed and optimised towards a limited variance set of usage and for maximum payload.

In the future there will be an increasing need for optimised load efficiency for each mission of a truck, and for optimising the freight carried on a finite length of road.

Ideally, future trucks and load carriers are easily adaptable for each freight, load and mission.

And, in the operation phase, the vehicle combination automatically adjusts itself to the actual driving environment (i.e. traffic situation, topology, and payload).

This option has large potential to contribute to the achievement of the European Commission's targets for reducing the consumption of fossil energy resources, increasing transport- and fuel efficiency and reduction of greenhouse gas emissions.

TRANSFORMERS

OBJECTIVES

- 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

RESULT

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.

