

## CONVENIENT

### Complete Vehicle Energy-saving Technologies for Heavy-Trucks



#### MOTIVATION AND OBJECTIVES

Fuel efficiency is a first priority for customers of long-haul trucks, because of its major impact (about 30%) on the Total Operating Costs. The efficiency of heavy-duty vehicles can be improved in a relevant way by operating on both the tractor and the semi-trailer.

The main objective of the CONVENIENT project is the development of a novel long-distance heavy-truck archetype featuring a suite of technologies enabling a 30% fuel saving.

The project includes the development and integration of:

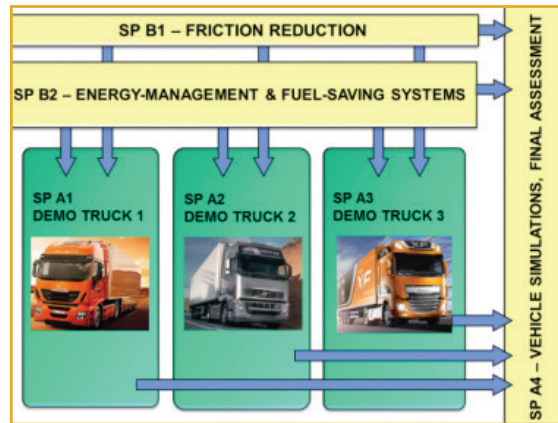
- innovative energy efficient systems and energy harvesting devices,
- advanced active and passive aerodynamics devices,
- energy management at vehicle level,
- driver support to maximise the benefits of the energy-saving systems and strategies.

#### PROJECT PLAN, MILESTONES AND DELIVERABLES

The figure summarises the project organisation and the main deliverables, i.e. the 3 demo trucks:

#### TECHNICAL APPROACH

- The CONVENIENT project aims to develop a novel long-distance heavy-truck prototype featuring a suite of technologies enabling a relevant reduction of fuel consumption.
- The plan is to adopt an holistic approach to on-board energy management, focusing on the tractor, the semi-trailer, the driver behaviour and the mission.
- The project includes the development and integration of innovative energy efficient systems and energy harvesting devices, advanced active and passive aerodynamics devices on the truck and on the semi-trailer; energy management system at vehicle level; driver support system to maximise the benefits of energy-saving devices.



#### ACHIEVEMENTS

##### SP A1 Demo truck 1 (IVECO)

- Electric Hybrid transmission coupled to a dual energy storage system
- Electrified auxiliaries vs. fuel economy optimisation (steering pump, brake/climate comp., etc.)
- Dual level cooling circuit and flat heat exchangers to improve the efficiency of the system
- Active and passive aerodynamics optimisation between the cabin and the trailer
- Holistic energy management at sub-systems level to improve the fuel economy of the vehicle

##### SP A2 Demo truck 2 (VOLVO)

- Predictive integrated Energy Buffer Control to minimise fuel consumption using road topology
- Driver coaching refining the communication between the driver and the cruise controller
- Controllable Electrified Auxiliaries as fans, radiator shutter, water pump, power steering servo

##### SP A3 Demo truck 3 (DAF)

- Hybrid Powertrain Technology for a downsized engine
- Programmable smart Electrified Auxiliaries for steering and air supply to reduce parasitic losses
- Driveline friction reduction in the rear axle by applying a differential with variable oil level and novel bearings in the wheel hubs
- Active vehicle aerodynamics on the tractor in combination with optimised aerodynamic hardware for the semi-trailer

<b>Budget</b>	16.6 M€	<b>Funding</b>	10 M€
<b>Duration</b>	36 months	<b>Start</b>	November 2012
<b>DG</b>	Research & Innovation (EGCI)	<b>Contract n°</b>	312314
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<b>Partners</b>	21 partners, among them IVECO, VOLVO, DAF, ZF, Continental, Magna ECS		
<b>Website</b>	www.convenient-project.eu		

