AEROFLEX

Aerodynamic and Flexible Trucks for Next Generation of Long Distance Road Transport

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Publishable Executive Summary

The mission of the AEROFLEX project is to support vehicle manufacturers and the logistics industry to become prepared for future challenges in road transport. The main objective of the AEROFLEX project is to develop and demonstrate new technologies, concepts and architectures for complete vehicles that are energy-efficient, safe, comfortable, configurable and cost-effective.

The reduction of the carbon dioxide (CO_2) emissions in road freight transport in the next decades is a key issue. Focussing on this challenge, AEROFLEX WP1 analyses the impact of high-capacity road transport with longer and heavier-trucks (European Modular System: EMS examples see Figure 1-1) on mode choice and CO_2 emissions at the EU level. For assessing the impacts of these new vehicle types, aimed to increase efficiency up to 33 % in long distance road transport and logistics, this deliverable describes the several approaches that are used to determine the impact e.g. on transport logistics, on modal split on CO_2 emissions in road freight transport, and on combined transport.

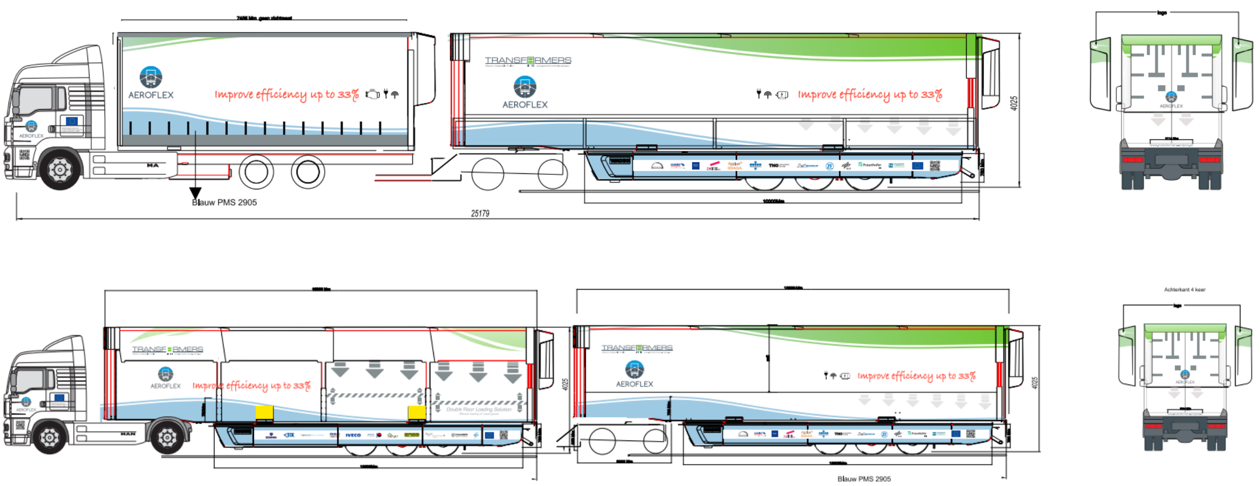


Figure 1-1: European Modular System; EMS1 (above) and EMS 2 (below)

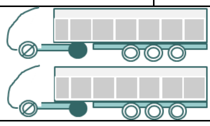
WP1 has the task to map and quantify load in EU and potential for configurable truck. The objectives of this deliverable are:

- to describe the benefits of AEROFLEX innovations for selected use cases that were based on expert interviews
- to calculate the impact of EMS on CO_2 emissions on the EU freight transport market
- to describe the potential for AEROFLEX innovations on the physical internet (PI) as one of the identified trends in future logistics
- to derive recommendations as input for a book of recommendations.

In addition, standard average loads by reference vehicles are compared to the maximum load for European Modular System to calculate average mean values and standard deviations of each KPI. These mean savings potentials in percentage values for different KPIs for the overall sample are displayed in **Fout! Verwijzingsbron niet gevonden.**.

EMS will have a positive impact on company logistics. There will be more optimisation opportunities in trip and route planning for long road haulage, as well as for pre- and post-haulage in combined transport, due to both the increase of load capacity and the flexibility of EMS. The use of EMS in hub and spoke concepts of logistics service providers, especially for good classes with high tonne-kilometres and growing market segments (e.g. food products, courier/parcel/express cargo and general cargo) in combination with long daily transport distances per truck, EMS will significantly reduce mileage, transport costs, and CO_2 emission.

Table 1-1: Mean saving potential for overall sample in % for different KPI. Standard deviation in parenthesis. Negative values indicate advantages for the Prime Candidates.

KPI	€/tkm	Cost/tour	CO_2 TTW	CO_2 WTW[1]
Standard average load	18.7 % (10.9)	19.0 % (11.2)	28.8% (17.0)	20.9 % (11.3)
(exemplary visualization)	 vs. 			
Maximum load for Prime Candidate	-28.2 % (16.4)	-28.1 % (16.5)	-16.9 % (14.4)	-25.8 % (33.7)
(exemplary visualization)	 vs. 			

Further, based on an impact assessment by a macroscopic freight model, we can conclude that the modal shift changes in scenarios by using EMS 1 and EMS 2 without compensation of the higher efficiency in road transport and derived cost reduction on road freight transport, lead to a slight increase of freight transport on road on the one hand, and a decrease of rail and IWW in the range up to 3 % on the other hand. If this shift to road transport should be avoided, transport policy regulation or the access policy for EMS 1 and EMS 2 should provide a level playing field for all transport modes and should be accompanied by measures to improve efficiency of rail and inland waterway transport.

Further, WP1 project partners could conclude that the deployment of EMS is expected to have a major impact on the CO_2 emissions of whole EU road freight transport, due to a decrease of mileage in road freight transport in a scenario which external transport costs are considered. An adjusted EU regulation for integration of EMS in freight transport should be aimed to avoid 'rebound effects' like shifting transport volume from rail and inland waterway transport to road transport.

Finally, we address that AEROFLEX road transport innovations can take a role in the physical internet that is similar to that of broadband wireless connections in the digital internet: ultra-flexible, capable of moving high volumes at high speeds, with the best possible coverage at much greater efficiency than past technologies.

[1] For TTW and WWT calculations emission factors from DSLV Guide on Calculating GHG emissions for freight forwarding and logistics services (2012) have been used.

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Project partners:

#	Partner	Partner Full Name
1	MAN	MAN TRUCK & BUS AG
2	DAF	DAF Trucks NV
3	IVECO	IVECO S.p.A
4	SCANIA	SCANIA CV AB
5	VOLVO	VOLVO TECHNOLOGY AB
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25	ZF	ZF CV Systems Hannover GmbH
26	VET	Van Eck Trailers

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