

Market Barriers to Increased Efficiency in the European Onroad Freight Sector

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▶ Outline

- Background and objective
- Methodology
- Sample selection
- Main results

▶ Background and objective

- EU Transport White Paper 2011
 - Aim to decrease transport emissions by 60% in 2050 relative to 1990
 - HGV emissions contribute to this goal
 - CLIMA working on HGV strategy
- Several studies show that some technical measures have negative net costs (AEA 2011, TIAX 2011)
- Many of these are not universally implemented
- *What are the barriers to the implementation of fuel efficiency improving technologies in the European road freight transport sector?*

▶ Methodology

1. Identify cost-effective technologies
2. Review literature on barriers in HGV sector and other sectors
3. Online survey and in-depth interviews on the implementation of measures
 - Transport companies
 - OEMs: trucks and trailers
 - Shippers
 - 3PLs
 - Financial institutions and leasing companies

▶ Cost-effective technologies

- Cost-effectiveness depends on investment, discount rate, fuel savings, mileage, etc.
- CE Delft MACH model
 - Analyse net costs of different technologies



Trailer rear end taper



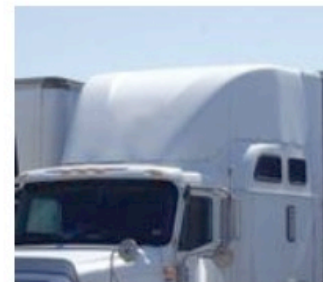
Boat tail



Trailer skirts



Cab side extenders



Full gap fairing



Roof deflector

▶ Cost-effective technologies

- Investments, mileage and fuel savings from TIAX (2011) and AEA (2011)
- Fuel price range EUR 1 - EUR 2
- Discount rates 10% - 16%
- Write down periods 4 - 8 years (long haul), 9 - 19 years (urban delivery)

Cost-effectiveness of long haul vehicle technologies in different scenarios

Technology	Cost effective in <i>all of our</i> scenarios	Cost effective in <i>some of our</i> scenarios	Cost effective in <i>none of our</i> scenarios
Low resistance tires	X		
Predictive cruise control	X		
Transmission friction reduction	X		
Training & Feedback	X		
Boat tail	X		
Auto. tire inflation trailer	X		
Full gap fairing	X		
Advanced 11-15 l engine	X		
Route man.		X	
Full skirts		X	
Material substitution		X	
(Generation II) Dual hybrid		X	
Auto. tire inflation vehicle			X

▶ Survey and interviews

- Four steps
 1. Online survey and interviews (53 questionnaires)
 2. Initial analysis and draft conclusions
 3. In-depth follow up interviews to test draft conclusions (13)
 4. Finalise analysis and conclusions

▶ Survey and interviews

- Contacts from
 - CE Delft's and TRT's network
 - IRU
 - Phonebook
- Initial survey (53)
 - 41 transport companies
 - 3 OEMs
 - 6 shippers
 - 3 3PLs
- Follow up interviews (13)
 - 3 transport companies
 - 3 OEMs
 - 3 body builders
 - 3 leasing companies
 - 1 technology supplier

▶ Survey and interviews

- Sample: transport companies
 - 12 countries, good coverage of Europe, relatively more from north-western Europe
 - More large transport companies than small ones
 - More long haul and regional than urban delivery
 - Biased towards transport companies that are environmentally aware
- OEMs
 - Good coverage of major truck manufacturers
 - Small sample of trailer body builders
- Shippers, 3PLs, financial institutions
 - Small sample

▶ Survey and interviews

- Conclusions could be representative of companies that:
 - are probably more aware of the fuel saving options
 - have probably implemented a larger share of fuel-saving options
 - are less affected by the barriers
- Barriers in this sample are likely to apply to most transport companies
- Barriers not found in this sample may still be relevant to other companies or specific market segments

▶ Main Findings

- Commonly held belief that large efficiency improvements result primarily from operational improvements
 - Most transport companies have implemented some operational measures (driver training, tyre pressure, etc)
 - All transport companies in our sample monitor operational fuel efficiency
 - Most OEMs offer packages of fuel-efficiency options which include monitoring systems of operational efficiency
- Commonly held belief that technical improvements are costly (high investment costs, forgone revenues, low benefits)
- Little market pressure to improve fuel-efficiency

▶ Main Findings

- Most transport companies are aware of fuel saving technologies
 - Few think they are cost-effective
 - Lack of information about potential to improve fuel-efficiency

Technology	Not aware	Aware	Planned/ Implemented
Aerodynamics			
Trailer rear end taper	18%	82%	27%
Boat tail	56%	44%	11%
Box skirts	33%	67%	11%
Cab side extension or gap fairings	27%	73%	55%
Full gap fairing	25%	75%	33%
Full skirts	30%	70%	10%
Roof deflector	17%	83%	67%
Material substitution			
Light-weighting	18%	82%	45%
Tires and Wheels			
Tire Pressure Monitoring System (TPMS)	8%	92%	42%
Automatic tire inflation on truck or trailer	45%	55%	9%
Low rolling resistance tires	9%	91%	55%
Tire management	11%	89%	56%
Engine efficiency			
Improved diesel engine	8%	92%	83%
Hybridisation			
Dual-mode hybrid	56%	44%	0%
Parallel hybrid	67%	33%	0%
Other			
Speed limiters	9%	91%	64%

▶ Main Findings

- Supply of fuel-saving technologies from OEMs is limited
 - Standard trucks are offered without fuel-saving technologies
 - Most OEMs offer packages that include a subset of the available technologies
- Supply of fuel-saving technologies from body builders is very limited
 - No standard offers, only when customers ask for it specifically

	Not offered	Optional	Standard
Aerodynamics			
Trailer rear end taper	67%	33%	0%
Boat tail	100%	0%	0%
Box skirts	0%	100%	0%
Cab side extension or gap fairings	0%	100%	0%
Full gap fairing	33%	67%	0%
Full skirts	0%	100%	0%
Roof deflector	0%	100%	0%
Material substitution			
Light-weighting (truck)	0%	100%	0%
Light-weighting (trailer)	0%	100%	0%
Tires and Wheels			
Automatic tire inflation (truck)	33%	67%	0%
Automatic tire inflation (trailer)	0%	100%	0%
Low rolling resistance tires (truck)	0%	33%	67%
Low rolling resistance tires (trailer)	0%	67%	33%
Transmission and driveline			
Transmission friction reduction	100%	0%	0%
Engine efficiency			
Improved diesel engine	0%	0%	100%
Hybridisation			
Hybrid engine	33%	67%	0%
Management			
Training and feedback	0%	67%	33%
Predictive cruise control	0%	100%	0%

▶ Main Findings

- Transport companies are interested in technical options when buying a new truck
 - Are able to evaluate packages, not individual measures
 - Lack of information persists
- Transport companies are not much interested in technical options on trailers

▶ Main findings

- Financial institutions do not take fuel-efficiency into account when deciding on a loan
 - Loans primarily based on financial health of transport company
- Split incentive is not a major issue
 - Unless when acting under an open-book contract, transport companies benefit from having more fuel-efficient HGVs
 - Most companies in our sample did pay attention to operational measures to improve fuel-efficiency
 - Can be relevant for trailers, which are sometimes owned by shippers

Operational Measures	Not Aware	Aware	Planned/ implemented
Predictive cruise control	56%	44%	22%
Route management	17%	83%	83%
Training and feedback	8%	92%	92%
Manual tire pressure monitoring	11%	89%	78%
Front wheel alignment	11%	89%	78%
Axle alignment	11%	89%	78%
Driver fuel efficiency control	22%	78%	78%
Registration of fuel consumption	10%	90%	80%

▶ Recommendations

- Lack of information
 - Joint industry and government effort to raise awareness, especially with regards to trailer options
 - Independent testing of technical measures could improve credibility of fuel saving claims
 - Better understanding of fuel efficiency in relation to operational profiles would allow transport companies to make better informed decisions
- Vehicle labelling could improve market transparency
- For one technology (boat tail) there is a regulatory barrier