



Decarbonizing road freight transport in Denmark

English Summary

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English summary

The green transition has not yet manifested itself noticeably in the Danish road freight transport sector. Over 99 % of the 42,000 trucks in Denmark are still running on 93 % fossil diesel fuel. In total, they emit around 3 million tons of CO₂ per year, which equals 25 % of the transport sector, or 6 % of the total national greenhouse gas emissions. There is no indication that the curve is bending downwards anytime soon.

The heavier trucks and semitrailers from 26 t total weight and upwards, which make up 60 % of the truck fleet account for over 85 % of CO₂ emissions. This means that effective measures to decarbonize freight transport not least must focus on this segment.

High costs and other barriers are slowing the green transition in the road freight transport system.

This is reinforced by a marked lack of political attention and effective efforts in this area. New EU regulations will certainly help reduce the new trucks' CO₂ emissions by 2030, but overall the effect will be limited. New EU regulations on alternative fuels set up intricate rules that are unlikely to be of very great benefit to the climate overall. Nationally, no significant initiatives to promote sustainable freight transport have been taken at all.

Consequently, there is no immediate prospect for truck transport to contribute significantly to decarbonization in Denmark over the next 10 years.

However, there is a range of opportunities to reduce road freight transport emissions. This analysis has concentrated on four main tracks:

- Electrification including batteries, power lines and fuel cells
- Liquid fuels, including biofuels and electrofuels
- Gaseous fuels including especially biogas
- Improved efficiency through better capacity utilization

An indicative high-level assessment of the four tracks with regard to decarbonization potential and a number of other criteria defined in the study is seen in the table below.

The most promising track in terms of far-reaching and long-term decarbonization we find to be **electrification** with the combination of battery-powered trucks and an Electric Road System (ERS) with overhead lines over parts of the main road network.

Where battery vehicles will initially only be able to support local and partly regional transport, ERS systems will in particular be able to supply the long haul movements that dominate the CO₂ accounts, with more than 50% of road goods running on less than

2% of the road network. Together with the transition to CO₂-neutral electricity, electrification offers a potential for close to full decarbonization of road freight transport long before 2050, without a need to overcome fundamental technical-economic barriers.

Other benefits of electrification will include efficient utilization of energy, significantly reduced local environmental impact, high security of supply, low operating costs and - according to several new studies - also better overall economy, compared with continued diesel, perhaps already within 5 years.

However, electrification requires a total shift in technology where completely new truck types need replace the current ones. So far, the price of electric trucks is very high and the limited supply of cars and of charging options are significant barriers.

Getting electrification started and overcoming the many barriers uncovered in the analysis will require considerable political effort. Meanwhile, there is also a need to consider what role alternative solutions can play.

Moreover, it leaves a significant challenge unanswered, since none of the considered tracks immediately seems capable of delivering more than a maximum of maybe 10 - 15% reduction in emissions in 2030, i.e. only limited contributions to a target of 70% reduction in 2030 (corresponding to about 55% reduction compared to today).

This underlines the critical requirement for an overall ambitious strategy at this stage, one, which can release the most promising potentials that are already emerging, as well as start creating the conditions for a significantly more powerful approach in the near future.

The analysis recommends a combined effort with the following three main elements:

- Firstly, the establishment of an overall strategy to place decarbonization of freight transport on the political agenda at home and in the EU, which must be supported by cross-cutting initiatives in taxation, infrastructure policy and research and development
- Secondly, a targeted effort to support the electrification of freight transport in the areas where this is currently possible and makes sense in the long term, through suitable national and EU initiatives and cross-border cooperation with, in particular, Germany, Sweden and other Nordic countries.
- Thirdly, a complementary effort in other technological and organizational tracks, to strengthen efforts where electrification is not necessarily sufficient, and to limit or fence in possible negative climate and environmental impacts due to other road freight transport system developments or policies.

1. Decarbonization potentials	LOGISTICS	ELECTRIFICATION	ELECTRO-FUELS	BIOGAS
Reduction of CO ₂ at micro-level				
Full decarbonization in long term				
Strong and fast reduction by 2030				
2. Economy				
Energy efficiency w-t-w				
TCO at company level				
Infrastructure investments				
Rebound-effects				
3. Access and flexibility				
Technology Readiness Level				
Supply of vehicles and other components				
Vehicle accessibility and versatile use				
Energy supply accessibility				
Maintenance and spare parts				
Increased/reduced access to areas (e.g. city centers)				
4. Social concerns				
Environment and safety				
Security of supply				
Societal risks				
Growth and employment				

Color code	Interpretation
	Significant potentials and/or very favorable outlook
	Potentials and/or fairly good outlook with some reservations
	Limited potential and/or facing barriers or risks
	Severe challenges, limitations or risks

Cross cutting assessment of main alternatives in each track for road freight in Denmark



CONCITO is an independent climate policy think tank based in Copenhagen.

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