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Heavy-duty trucks and new engine technology: impact on fuel consumption, emissions and trip cost

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Abstract

Road transport offers important logistic benefits at a reasonable cost for producers and consumers, hence its large market share. But, its use of diesel or gas generates large volumes of Co2, nox and pm10 (among others). Higher emission standards and demand for greener transport call for alternatives. literature analysis, a simulated Dutch-german road trip and a partial financial analysis are used to compare different engine-fuel combinations. Electricity from green sources removes these emissions. To stimulate full electric trucks (FET) several issues need to be addressed. First is creation of a large charging network. The netherlands is much further with this than germany. Affordability is another one. operating and investment costs should at least equal those of non-FET to have comparable total cost of ownership (TCo) over the lifetime of a truck. with FET, investment costs are now much higher, which should be compensated by lower operating costs. The actual operating costs depend on many factors, but fuel costs and trip time are likely to rise if en-route recharging is needed. A more in-depth financial analysis is needed for more exact conclusions. Another issue is technical. practice tests are needed to enhance the results of the simulation study. Hybrid diesel-electric and FET are already used in urban and regional transport. Regulation should also become tighter. Zero emission should become the norm. if these issues are successfully death with, then electric drive will become the mainstream technology. Technically, 2025 or 2030 seem feasible for large-scale production, which also lowers investment costs. with more electricity needed for transport, the

supply of green electricity should grow strongly. Finally, the micro simulation is a modest example of the potential of the simulation model. modeling of other corridors is underway, using one truck or a fleet of FET.

Keywords

barriers, electric, emissions, energy, heavy-duty trucks, policy, trip costs