Transport electrification scenarios for Germany

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Oeko-Institut

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Reasons to electrify road (freight) transport

Urban areas
- improving air quality
- reducing noise levels

Climate protection
- cost-efficient / energy efficient climate protection option

Transport / logistics solutions
- new applications / new business concepts
Electric road freight transport applications (I) from heavy-duty trucks...
Electric road freight transport applications (II)

…and smaller delivery vehicles…
Electric road freight transport applications (III)
...to new autonomous concepts
Renewbility III: scenario “efficiency” electrifies road transport

- Electric car fleet penetration: 75%
- Fleet penetration of hybrid electric road system trucks: 80%

Renewbility III: electricity demand of transport sector becomes relevant for electricity generation

- Transport elec. demand in 2050 = approx. 20% of current electricity consumption

![Graph showing electricity demand in PJ over time with annotations for baseline, efficiency scenarios and synthetic fuels (PtX). Source: Öko-Institut et al. (2016): Renewbility III – Optionen einer Dekarbonisierung des Verkehrssektors.]
Energieversorgung des Verkehrs 2050: electric vehicles as cost-efficient option of GHG reduction

- Costs of transformation from fossil-based system to renewable transport system (example below: LDVs)

Conclusions

- High sustainability potential for electric road freight transport
  - urban areas (air quality, noise level)
  - cost-efficient GHG mitigation option
  - new applications / new business options
- Integration into electricity system as one of the main challenges
  - additional renewable electricity generation capacities required
  - grid integration as a main challenge
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