Scenario analyses for the technoeconomical evaluation of the market diffusion of future commercial vehicle concepts

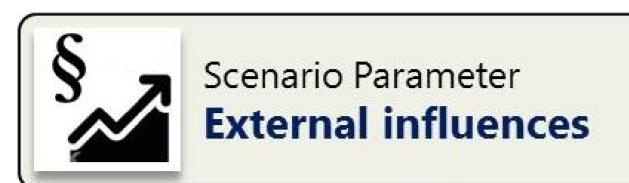


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Methodology

Tombined bottom-up, agent-based and discrete choice modelling approach



- Recharging and refueling infrastructure
- Synergy effects
- Technological developments
- Energy price development
- Regulatory framework



Vehicle characterization

- Vehicle size
- Driving resistance parameter
- Powertrain technology
- Powertrain configuration

Vehicle characteristics

- Payload
- Effective volume
- Range
- CO₂-emissions (TtW & WtW)
- Technology portfolio
- Purchase price Operating costs

New registration scenarios GER 2015-2040 **Vehicle market** Choice of transport task Urban distribution Regional distribution

Long-distance transport

Generation of a technology efficiency package

Based on single technology options

Requirements comparison & purchase decision

 Minimum Relevant Cost of Ownership over life cycle

Market analysis

- Development of market, costs, emissions, energy consumption, ...
- Synergy effect impacts
- Identification of niche markets



Customer type

- Innovator
- Early adopter
- Conservative laggards
- Doubter

Basic requirements

- Payload
- Effective volume
- Daily range Payback period
- Relevant Cost of Ownership

Driving characteristics

- Yearly mileage
- Application/Driving profile

Figure: Approach of the road haulage vehicle technology market model

Results

- Market potential identified for HEV in the LCV market and for CNG vehicles in the HCV market
- BEV and FCEV vehicle concepts are not competitive under the given framework

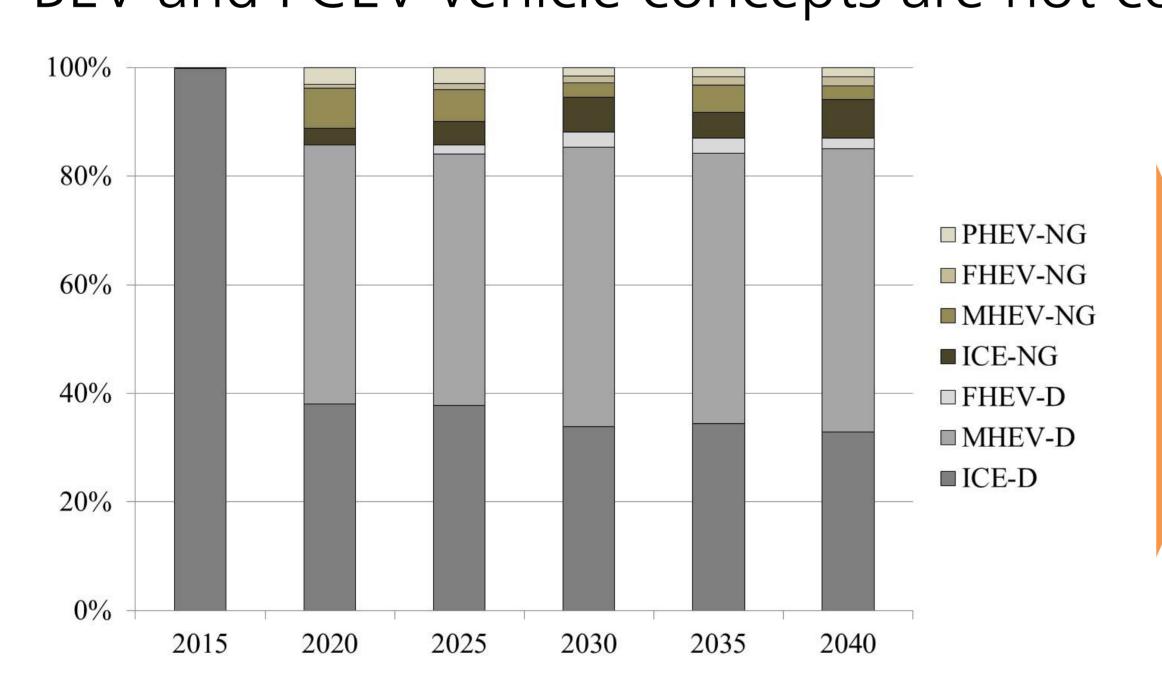
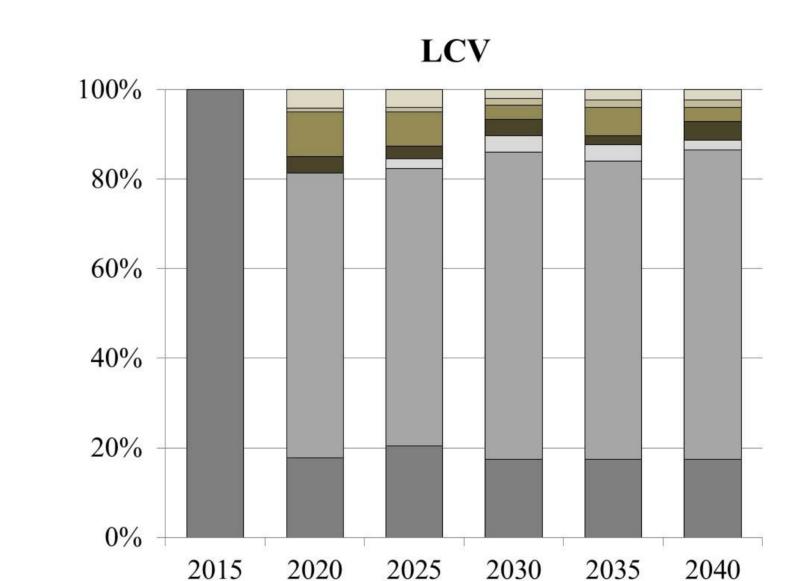


Figure: Results of the reference scenario for the German road haulage market of new light and heavy commercial vehicle registrations



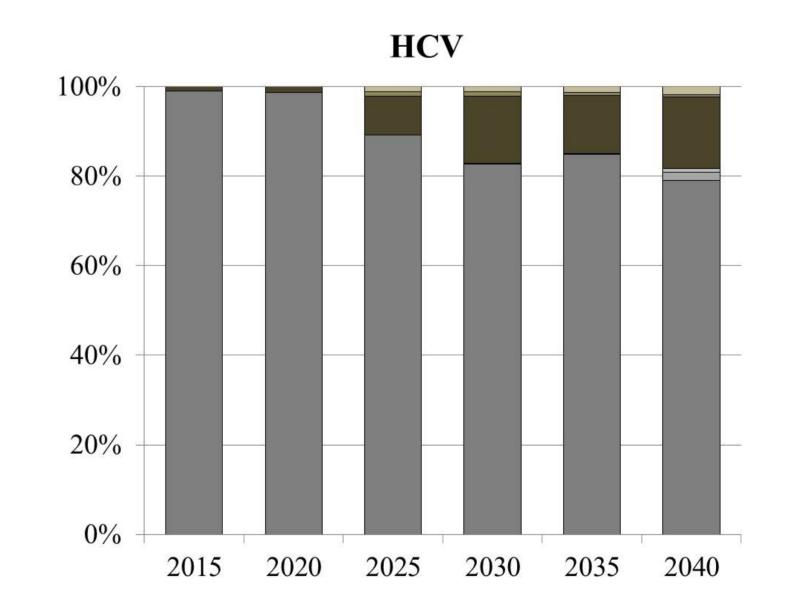


Figure: Results of the reference scenario for the German road haulage market separated into new light commercial vehicle registrations (on the left) and heavy commercial vehicle registrations (on the right)

Conclusion

> Significant market shares for electrified powertrains only when CO₂ regulations are in place



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