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Fuel Strategies for short and long Distance Transport

Agenda

- Worldwide Challenges and Trends
- Technologies to reach Climate and Energy goals
- Detailed view on Biofuels
- Implementation of sustainable Bio Fuels
- Summary and conclusions

Agenda

- Worldwide Challenges and Trends
- Technologies to reach climate and energy goals
  - Efficiency
  - Alternative Fuels/Bio Fuels
  - Electromobility
- Detailed view on Biofuels
  - Criteria for evaluation
  - Potential
  - Options
  - Research
- Implementation of sustainable Bio Fuels
  - Fuel Specification
  - Infrastructure
  - Customer acceptance
  - Incentives
- Summary and conclusions

Worldwide Challenges and Trends in the Traffic Sector

Global Warming

Limited Reserves of fossil Fuels

Megacities

Technical Progress

Industrie Politics

Customer Demand

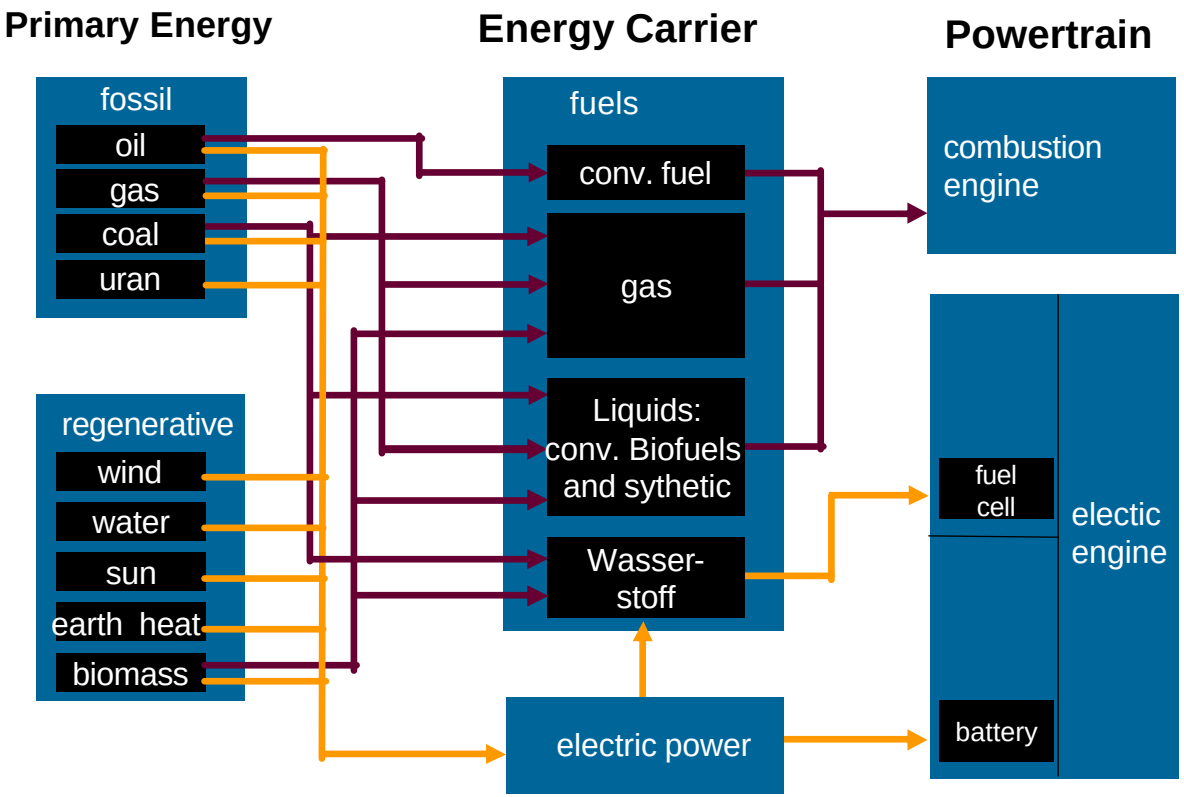
Worldwide Challenges and Trends in the Traffic Sector

Global Warming	Decrease of CO_2 –Emissions until 2050 over 80% necessary to realise 2°C goal	
Limited Reserves of fossil Fuels	Reserves for 30 - 40 years – located mainly in political critical Regions	
Megacities	customer needs are changing Emission regulations extremly important	
Technical Progress	New technologies become available for commercial use	
Industrie Politics	Incentivation of engine technologies in China, USA and EU Agricultoral incentivation in SAM, Asia	
Customer demand	Significant number of "Early Adopters„	

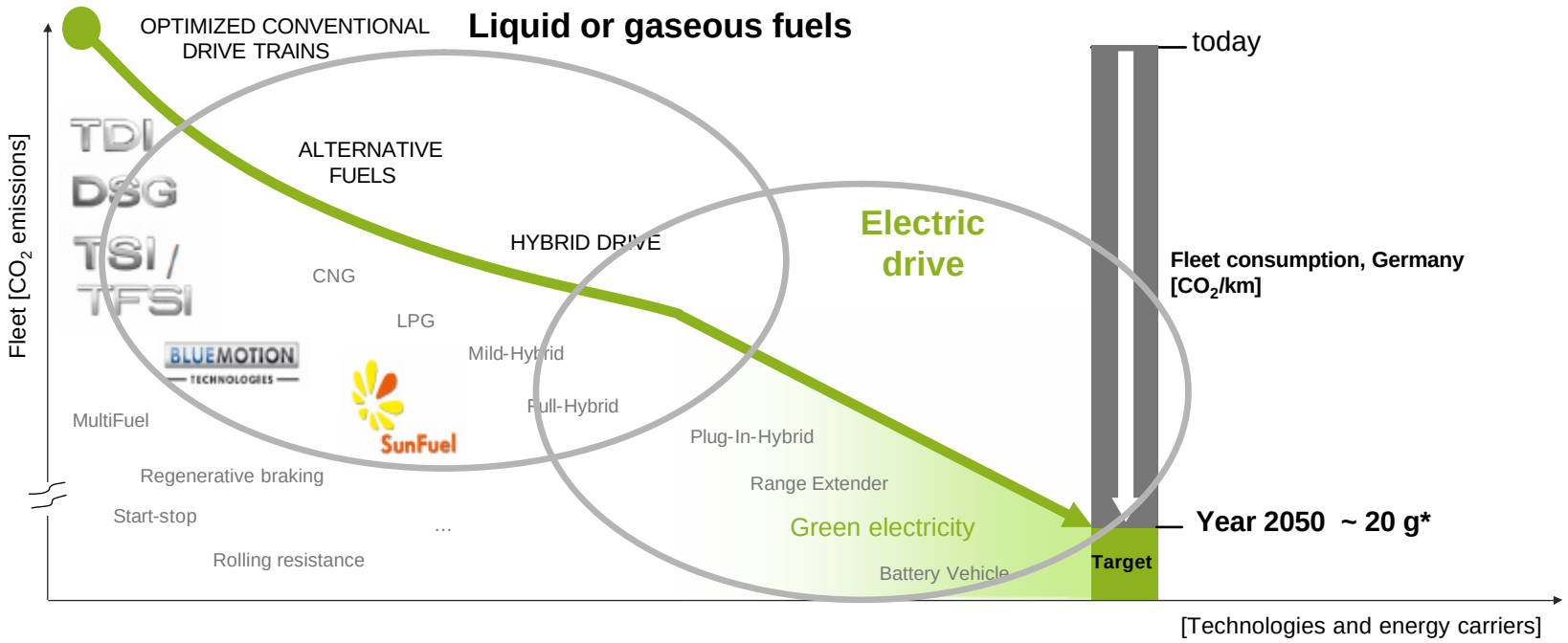
Goals of a Sustainable Mobility Strategy

- Increase of efficiency
- Decarbonisation of Fuels
- lowest emission engines
- Economic solution
- Optimization of „system Mobility“

Pathways and Basic decisions

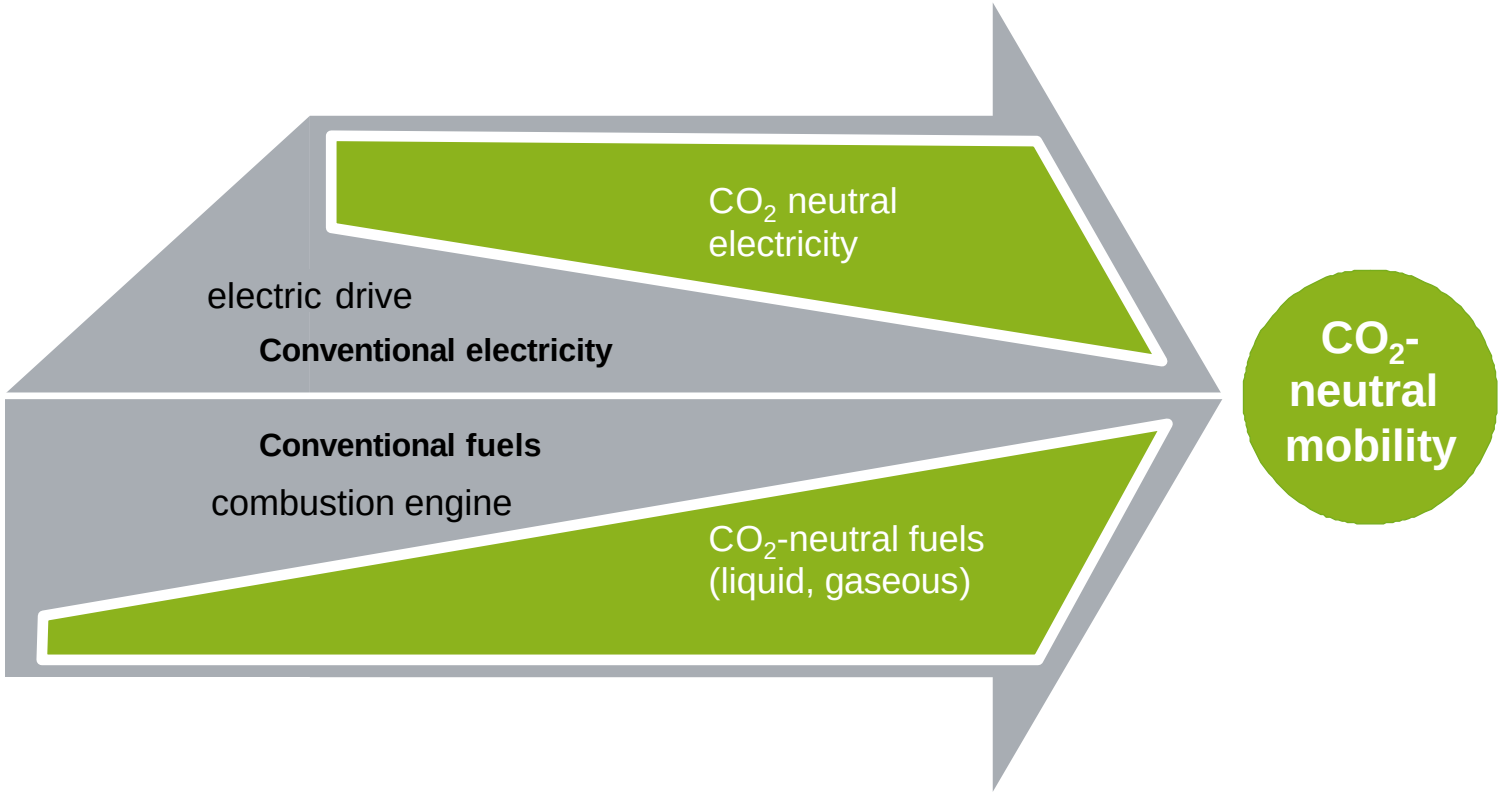


Technologies to reach the ambicious 2°C Target



*derived from the political objective (EU and G8+5 countries, part of the Copenhagen Accord 2009) to limit global warming to 2 °C by 2050
(Data based on: IPCC Fourth Assessment Report: Climate Change 2007, partly McKinsey & Company)

Decarbonisation of On Road Traffic



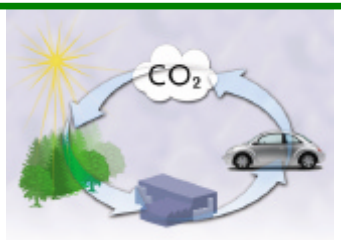
Alternative Fuels with enough Feedstock are needed!

Detailed View on Biofuels and biofuelled Vehicles

Life Cycle Analysis

Chances and risks of the use of biomass

Chances

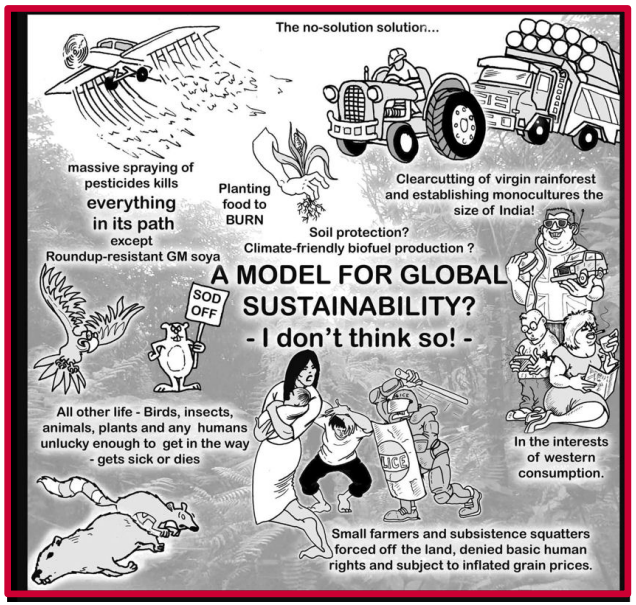


wellfare

reculturing

waste

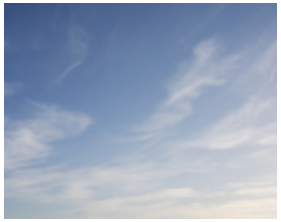
Risiks

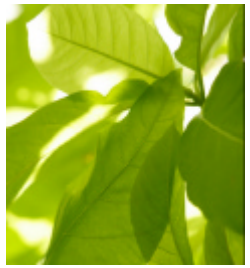


Sustainability criteria have to be defined

Sustainability Criteria

- Green House Gas Emissions
- Use of Recources
- Food competition
- Water an Land Use
- Social aspects





Detailed View on Biofuels and biofuelled Vehicles

Life Cycle Analysis

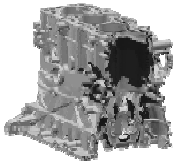
The Fuel has got influence on ….

… combustion

… exhaust aftertreatement

… service

… component



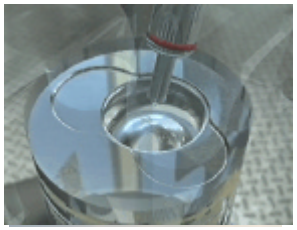
… long term stability

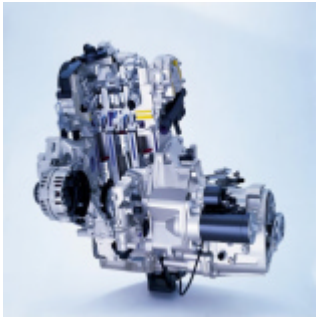
… materials

Technical criteria have to be defined

Technical criteria

- compatibility with existing vehicle technology
- blending with mineral based fuels
- heating value
- emissions
- safety
- efficiency in the car
- efficiency influence on driving with other fuels
- fuel and vehicle cost

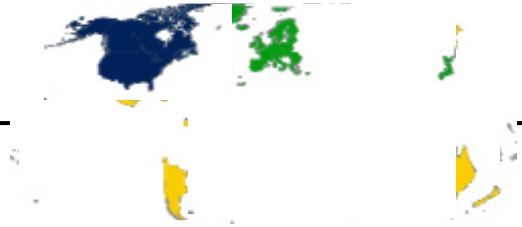


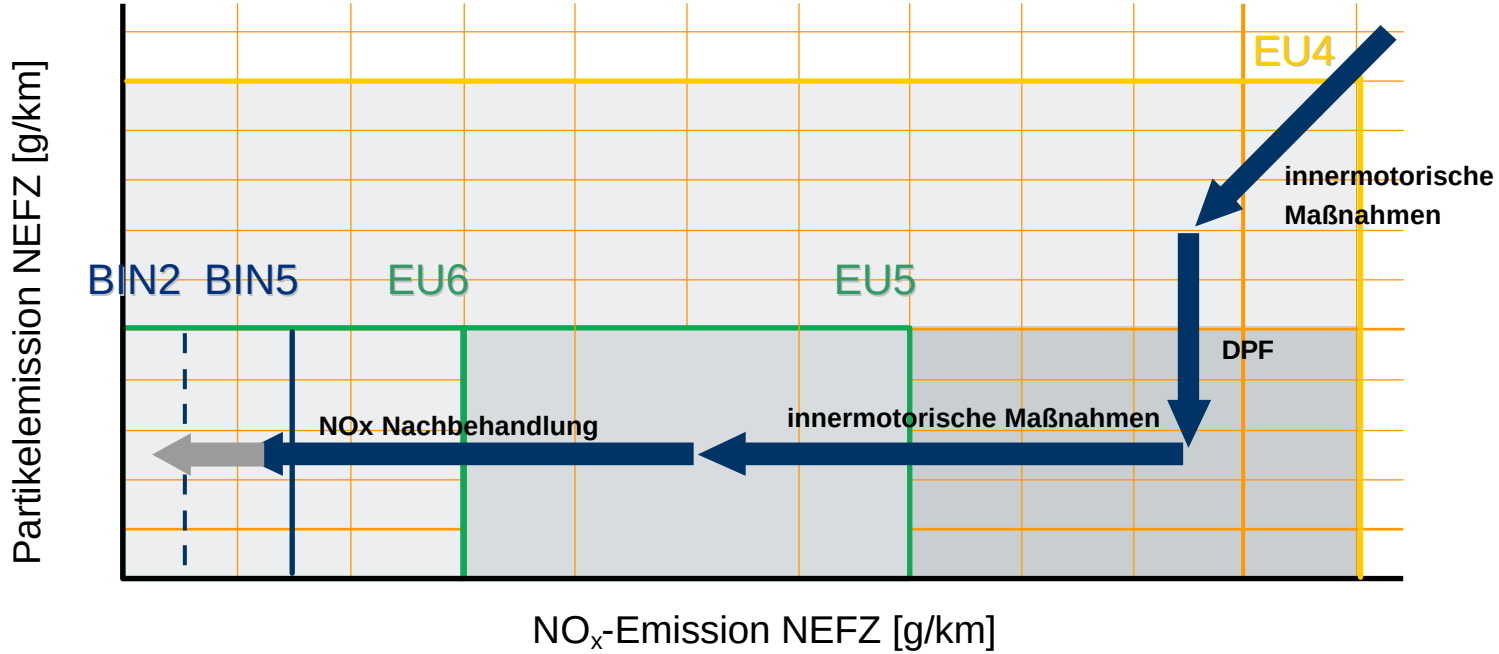


Evaluation of selected BioFuels

	Biodiesel	Ethanol	Biogas
Potential Availability	Small percentage Diesel Pool	10% - 30% increasing by lignocellulose	High percentages in actually small markets
Sustainability	Open questions	Food vs tank discussion Solution: lignocellulose	Different organic sources, use of waste biomass possible
Technical evaluation	Slightly worse than diesel; material incompatibilities better than Diesel	Slightly worse than gasoline; material incompatibilities	Slightly better than CNG
Market situation	EU: 7% (100%/20% in niches)	E 10 in Europe Customer still has open questions	Introduced, 0 – 100% (by certificate)

Emissionsziele

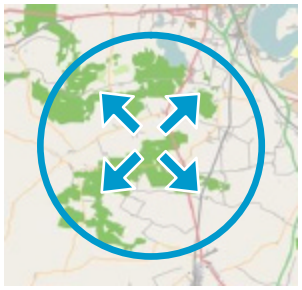




Implementation of new Fuels

What does the customer expect?

Advantages



infrastructure

Easy Fuelling

Clear understanding

Best Quality

Economic reasonable

Fulfilling Customers Needs

- Ongoing R + D
- Standardisation
- Cooperation of stakeholders
- Information

The customer must know about new fuels

Actual Fleet test: Diesel regenerativ in Coburg

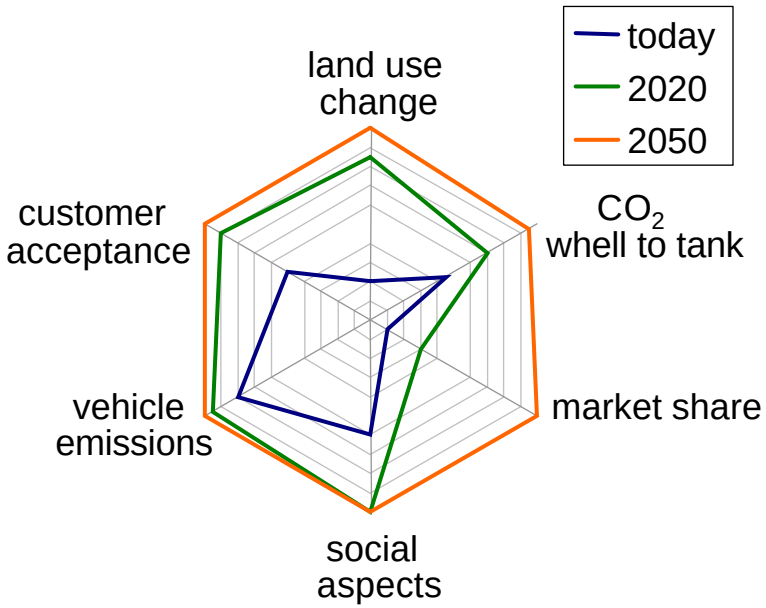
- optimized Fuel (B7 + 93)
- maximum quality
- lower emissions
- customer advantages

Summary

- The pilows of a global CO_2 and Energy Strategy are Efficieny, Biofuels and Electrification
- On the mid term, most on – road applications need liquid or gaseous fuels
- For these Fuels sustainability criteria have to be defined especially for the production of biomass
- Engine and Fuel have to fit together, so the development of both has to go hand in hand
- The customer must get an offer which is attractive - more attractive than solutions based only on fossil fuels
- The conditions for introduction and use of biofuels must be created: infrastructure, quality, customer acceptance

Status Evaluation and Conclusions

necessary progress



to acchieve by

- Research and Development
- Lessons learned
- Demonstrator projects
- Cooperation of all stakeholders
- Public support


Thank you!

Backup

Three Mobility Megatrends

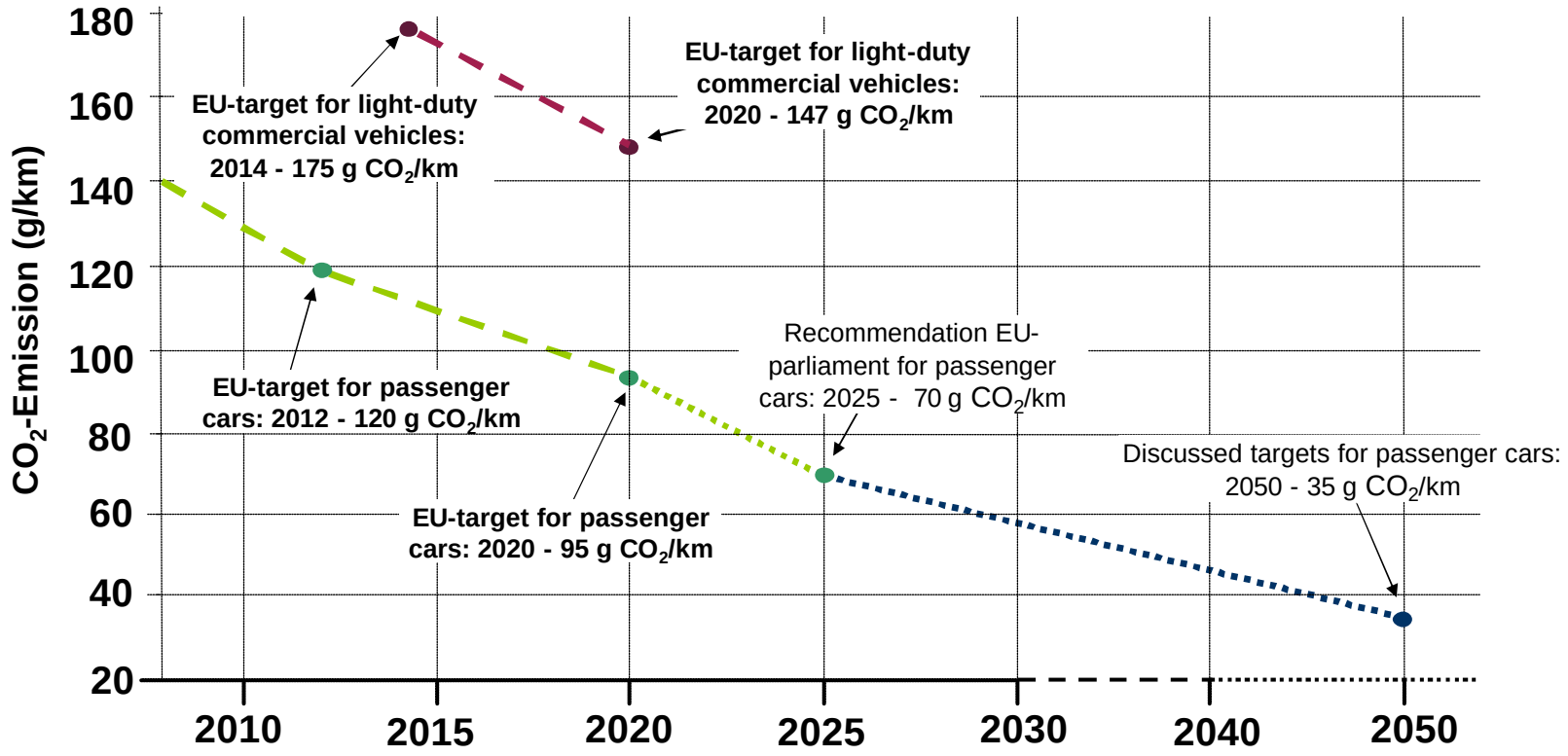
Reduction of emissions

Imminent gridlock in megacities

Finite nature of fossil fuels

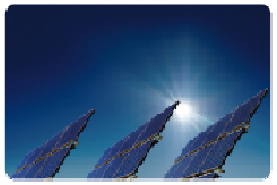
Long-term CO_2-Emission reduction targets of the EU until 2050

Average target CO_2-Emission EU-New Vehicle Fleet for passenger cars and light-duty commercial vehicles



Mobilität der Zukunft

Zukünftige Mobilität
nutzt erneuerbare Energien



Das Auto als Teil der vernetzten Welt

Intelligente Energienutzung

Optimaler Verkehrsfluss

Vernetzte Welt