Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

How to develop an ambitious but acceptable transport climate strategy?

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The Oeko-Institut – who we are

Oeko-Institut is a German non-profit research and consultancy institute working for a sustainable future.

- A non-profit association founded in 1977
- Offices in Freiburg, Darmstadt and Berlin
- Clients: European Union, national and state-level ministries, companies, foundations and non-governmental organizations

Focus of our research and consultancy

- Decarbonisation scenarios for the transport sector
- Evaluation of policies & measures
- E-mobility
- Assessment of alternative propulsion technologies and fuels
- Carsharing, alternative mobility concepts

Principles of scenario processes

Scenario planning

Scenario planning = strategic planning method

- Scenarios show a range of possible outcomes and help to inform structured decision-making – by establishing thinking about possible futures
- Scenario planning allows to combine quantitative modelling with qualitative (descriptive) aspects

Steps of a scenario process

1. Identify main „driving forces“ of future development
2. Bring drivers together in a viable framework (e.g. a model)
3. Develop scenarios

Design of a scenario process

Scenario planning is a method – before implementing a scenario process, it is helpful to set a clear goal in order to design the scenario process accordingly.

Typical goals of scenarios in the context of climate protection:

(1) Setting nation-wide and / or sectoral GHG emission targets

(2) Show and compare economic, social, environmental effects of alternative pathways (to reach targets) and draw conlusions e.g. on infrastructure requirements, time scales, etc…

(3) Discuss policy instruments and their GHG mitigation potential

Stakeholder involvement

Benefits of involving stakeholders in scenario processes:

- Design of the scenarios takes into account the points of view and interests of different groups and improves resilience of scenarios
- Involving stakeholders in the process (from the beginning) can thus create „ownership“ of the resulting scenarios
- Reality-check and/ or improvement of underlying assumptions and the feasibility of different pathways

Challenges of stakeholder involvement:

- Might result in high „work-load“ to take into account different points of view (=> large number of scenarios or „sensitvity analysis“)
- Very good process management necessary

Data requirements and modelling

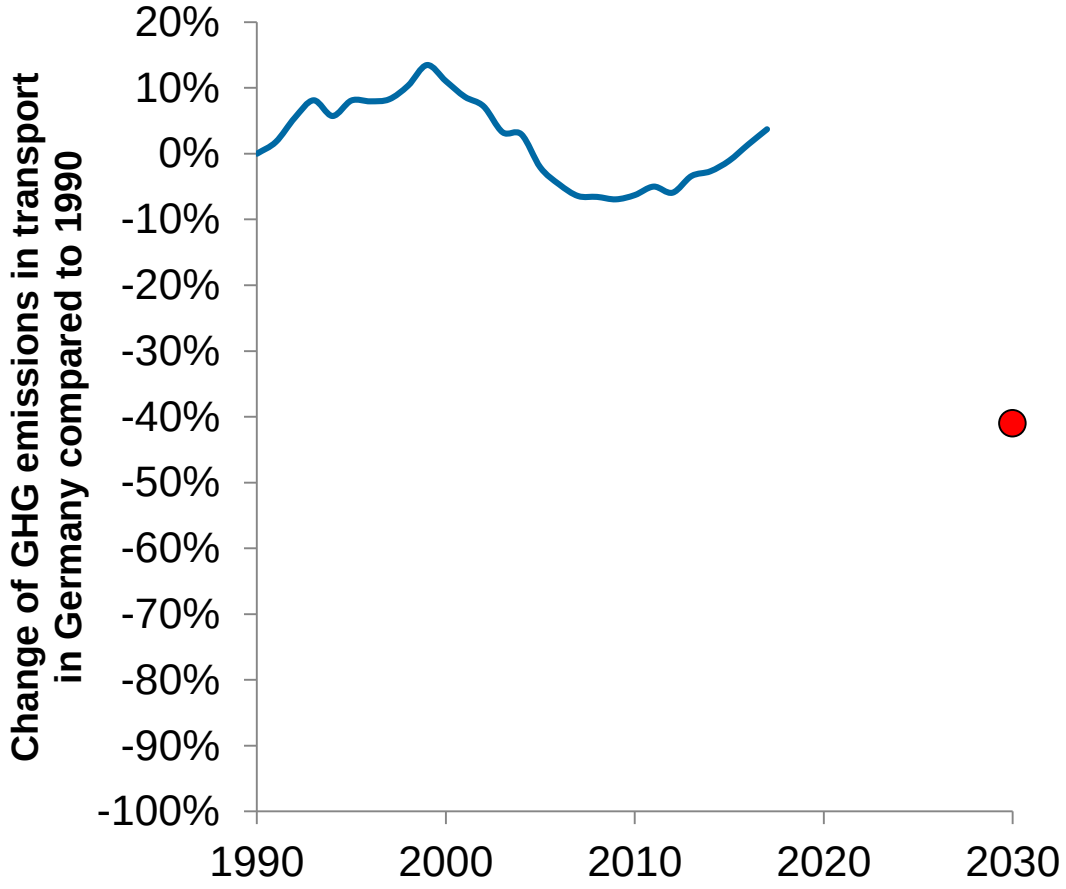
Quantitative results of scenarios depend on data quality and modelling framework

In case of limited data availability, it might be a good idea to „start small“ with existing datasets (and expert assumptions where necessary) – and continuously improve data and modelling framework

=> step-by-step improvement of underlying data and model!

Scenario processes for sectoral climate strategy planning in Germany

Background: GHG emissions in transport in Germany



- GHG emissions in transport haver not decreased, but increased over the last years
- Sectoral GHG reduction target for the transport sector (for 2030) was set in 2016 („Klimaschutzplan 2050“)

Strategies for low emission mobility

Main strategies for low emission mobility

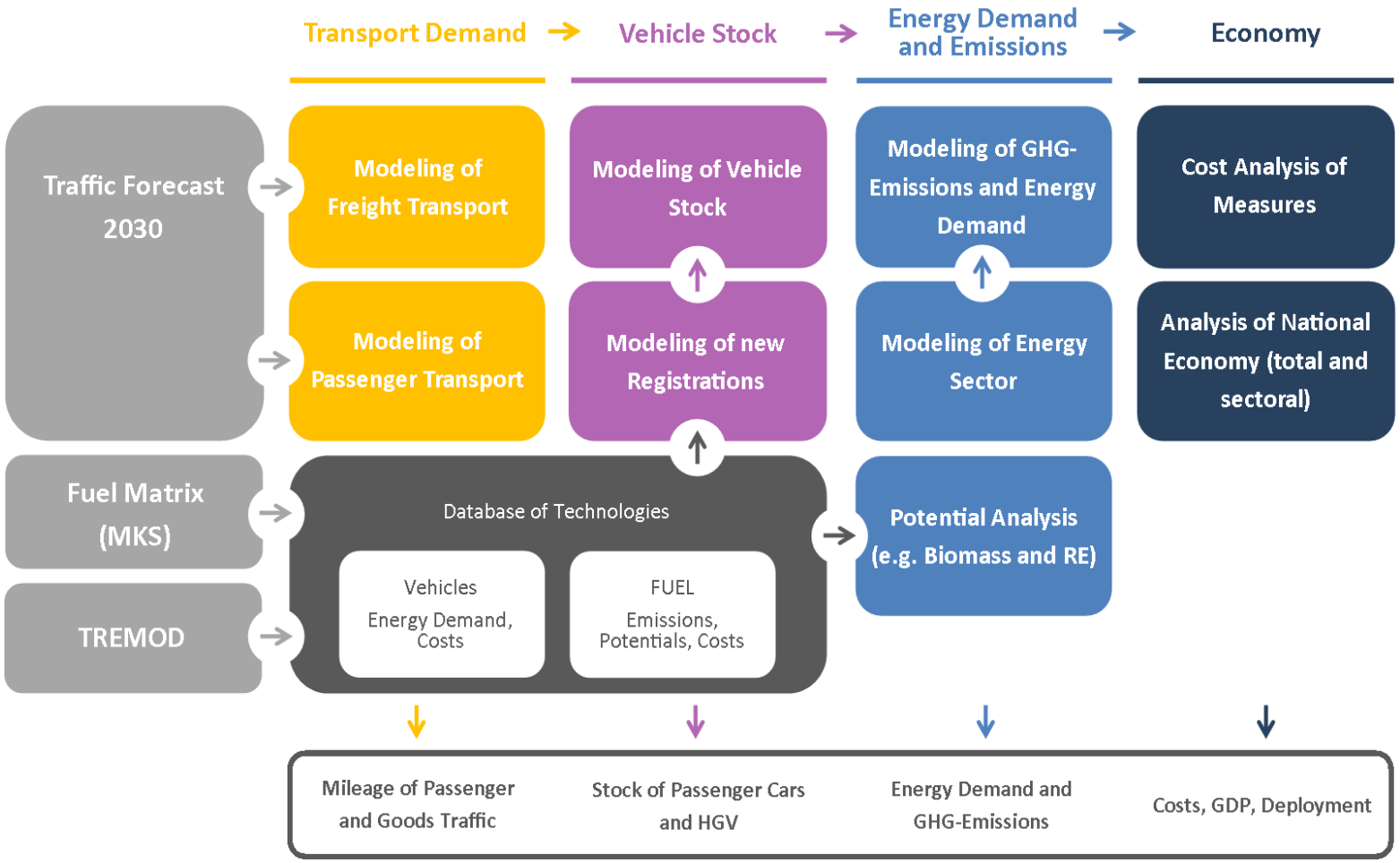
- Transport demand, modal split
- Vehicle technology & efficiency
- Fuels

In most mitigation scenarios (especially when based on global integrated assessment models), reductions are mostly achieved through fuel switching and further enhancements in energy efficiency – limiting demand growth by shifting to more efficient modes and reducing the distance traveled is less often cosidered in scenarios.

Example 1: The „Renewbility“ scenario process

- “Renewbility” started in 2005 as a project combining a stakeholder participation process with the scientific development of scenarios (funded by the German ministry for environment).
- Scientists: Öko-Institut and various partners (DLR, infras…)
- Scenario-group: composed of representatives of the automotive, train, energy and logistic industry as well as of environmental and consumer protection associations, complemented by bilateral interviews (no policymakers)
- In the first two phases of the project (2005-2012) scenarios up to 2030 were developed
- In the third phase (2014-2016) the scope was extended up to the year 2050.

The „Renewbility III“ modelling framework



„Renewbility III“ results: Transport demand 2050

Renewbility III“ results: Benefits for economy

Main conclusions of the Renewbility III project:

Decarbonisation of the transport sector offers an opportunity to achieve climate protection with a positive economic result.

Both electromobility and restructuring the transport system (modal shift, avoiding traffic) are necessary building blocks

Example 2: GHG projection report

- Every 2 years: GHG emission projection report (until 2035) – according to UNFCCC requirements
- Detailed bottom-up quantification of existing and planned policy instruments in 2 scenarios („WEM“ = with existing measures, „WAM“ = with additional measures)
- High involvement of policymakers from all ministries (environment, transport, finance….)

=> Informs policymakers on the outcome of policy instruments to reduce GHG emissions in transport and on the gap between targets and projections

GHG mitigation of policy instruments – Results from the 2017 projection report

Implemented policies	**Mt CO2 (2030)**
Extension of Highway toll for heavy duty vehicles	0,1
Strengthening public transport	0,2
Strengthening rail transport: hinterland traffic	0,1
Subsidies for electric mobility	0,2
Planned policies	**Mt CO2 (2030)**
Continuing the CO2 regulations for newly registered cars to 60g/vkm in 2030 and include trucks	11,4
Wider Extension of Highway toll for heavy duty vehicles	0,6
Energy efficient commercial vehicles	0,1

Real-world policies in transport scenarios: challenges

Modelling real-world policies can be a tough task…

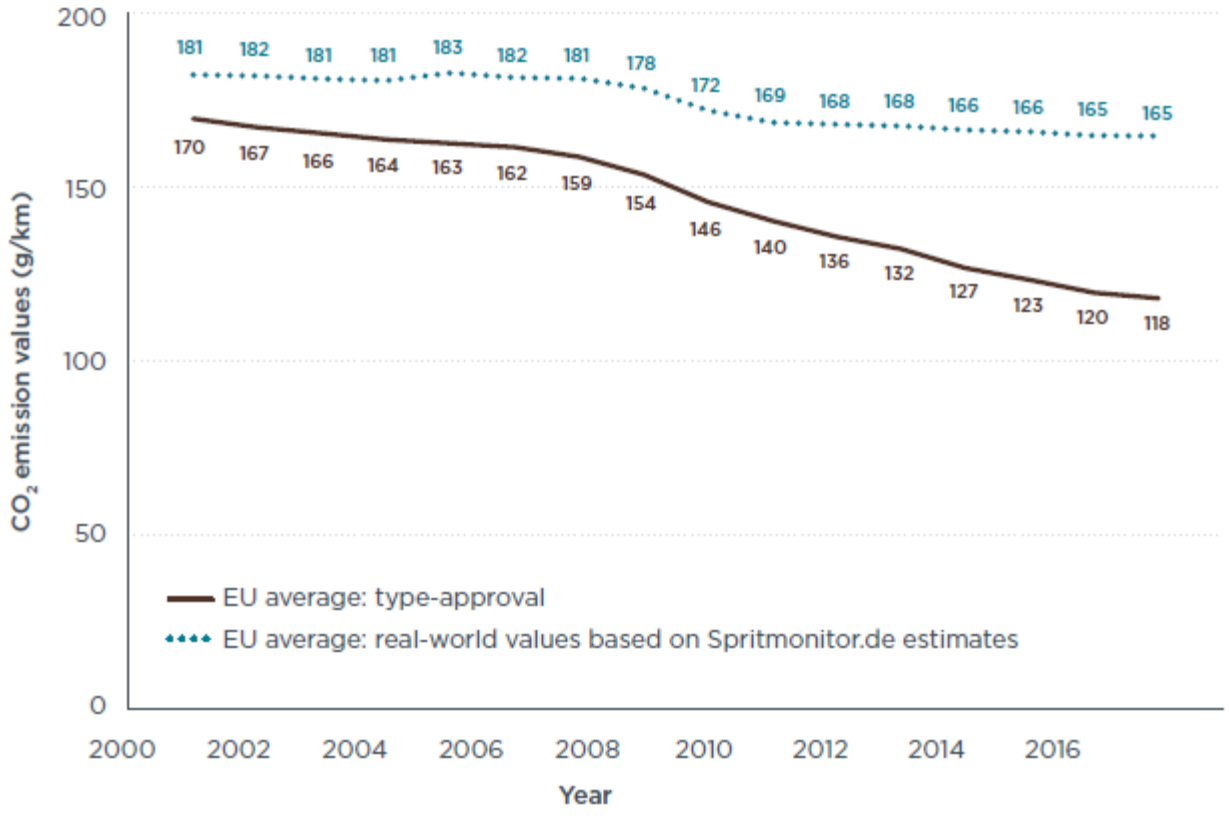
- Lack of detailed information on policies (especially true for ex-ante modelling), „Information gap“ between policy makers and science
- Translating real-world policies into modelling often needs a lot of assumptions – especially if the model was not designed for this purpose
- Real world interference: Unexpected user behaviour, loopholes, changes in underlying trends (e.g. oil price etc…)

But:

Modelling GHG reduction potential of policy instruments is very helpful to identify effective measures

Example: EU Regulation on CO2 emissions from cars

Ex-ante (expected) reduction was much higher than ex-post evaluation



=> continuous monitoring and evaluation is necessary to keep on track and to adjust policy instruments

Suggestions for modelling of policy instruments

- Policy instruments need to be specified as clearly as possible to avoid mis-interpretation of results
  - Example: „From 2020-2030, invest additional 10 Euro per capita and year into cycling infrastructure“ instead of „support cycling“
- Where assumptions are necessary, consider worst case and not only best case to avoid overestimating impact
  - Example: When modelling effect of CO2 regulation of cars, consider the possibility that real-world gap between test values and real-world driving may increase further
- Take uncertainties into account by giving a range of possible outcomes depending on uncertain parameters
  - Example: „GHG-reduction 2-3 Mt“ instead of „GHG-reduction 2,54 Mt“

Example 3: Different visions for future carbon-neutral transport

Individual transport with electric vehicles

High level of sharing

Multimodal + active mobility

How sustainable are these visions?

	Indicator	Individual transport	Sharing	Multimodal mobility
ecologic	GHG emissions			
	Energy consumption			
	power consumption			
	use of non-renewable resources			
	pollutants			
	noise			
eonomic	employment			
	user costs for mobility			
social	active mobility			
	access to public transport			
	quality of urban space			

Considering not only GHG emissions but a broader range of ecologic, economic and social indicators implies:

Reduction of car stock is important to achieve a high level of sustainability

Conclusions

How to develop an ambitious but acceptable transport climate strategy?

- Stakeholder involvement leads to improved assumptions on relevant scenario parameters and to much higher acceptance of results
- Careful design of scenario process and choice of tools (e.g. modelling framework) is necessary – depending on the relevant outcome / goals
- Sectoral targets may not always lead to an „economic optimum“, but can be very helpful to increase commitment and the pressure to act
- Scenarios are a tool to improve understanding of future developments and effects – but ultimately, it is necessary to implement effective (& efficient) policies in order to achieve GHG reductions

Further information

- www.oeko.de – our **website** with up-to-date information in both German and English
- www.twitter.com/oekoinstitut – follow Oeko-Institut on **Twitter**
- **eco@work** – our free e-paper with breaking news from the institute
- **Annual report** – provides the complete picture of Oeko-Institut