



Hvordan kan vi omstille  
transportsektoren i Norge?

Asgeir Tomasgard  
- Professor NTNU  
- Direktør FME NTRANS



### Decarbonization of transport

En felles position paper fra FME MoZEES  
og FME CenSES

Short version of a position paper prepared by FME MoZEES and FME CenSES



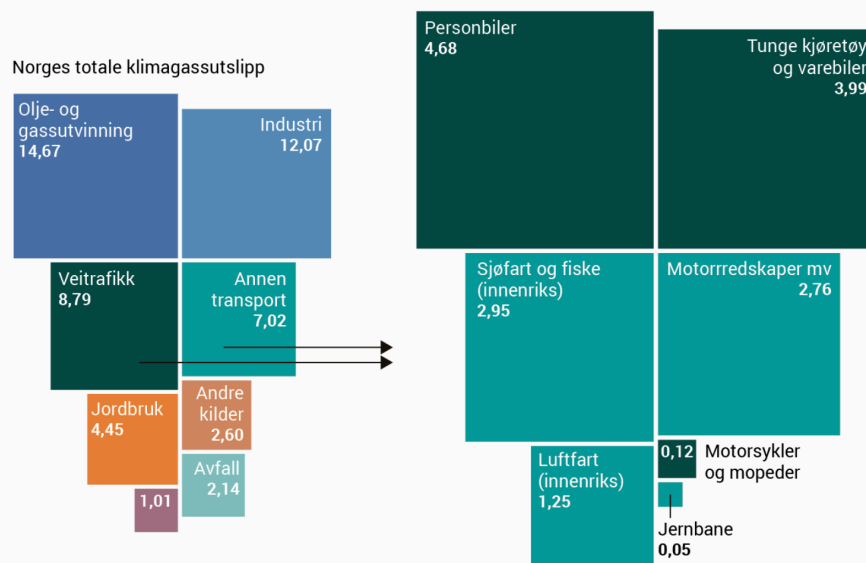
# Current ambition

- For emission sources outside the EU ETS, like fossil-fuelled means of transport, the national targets will be decided by negotiation, based on the respective countries' resources and capabilities.
- For Norway, the expected target is a 40% reduction compared to 2005.



## Utslipp av klimagasser fra transport i 2017

Utslipp til luft (millioner tonn CO<sub>2</sub>-ekvivalenter)



■ Oppvarming av bygg

Kilde: Miljødirektoratet og Statistisk sentralbyrå 2018/Miljøstatus.no

## 5 Strategies to reduce emissions from transport



Reduced economic activity (GDP) and standard of living, resulting in reduced



Reduced mobility of people and goods at all income levels



Transfer of travel and freight to less carbon intensive modes



Improved energy efficiency of vehicles, vessels and craft



Transition to less carbon intensive energy carriers

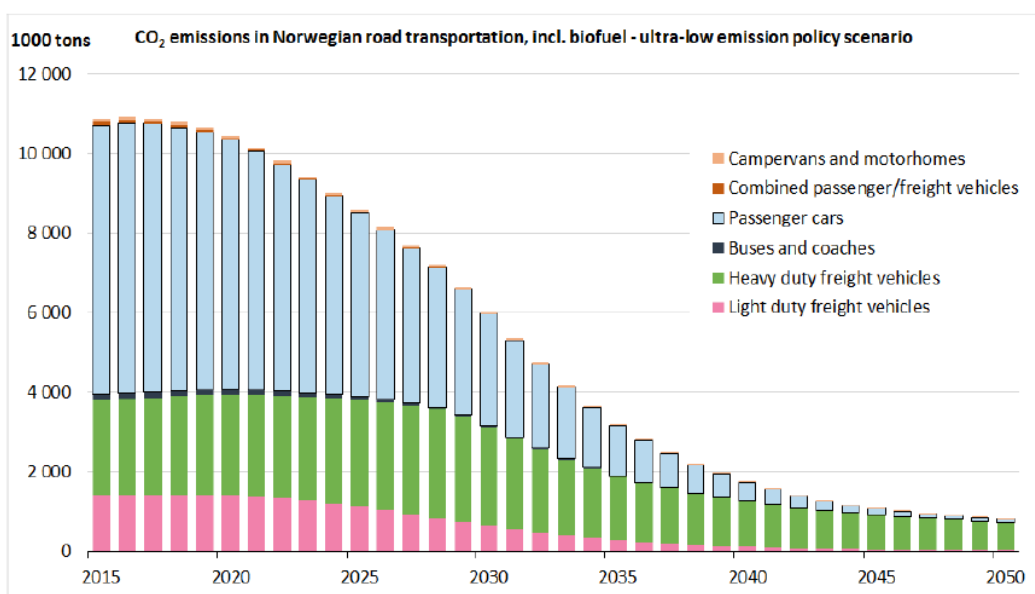


Fig. 6.1. Projected metric tons of annual CO<sub>2</sub> emissions from Norwegian road transport under ultra-low emission scenario, by vehicle category. Emissions from biofuel combustion are included. Source: Fridstrøm & Østli (2016).

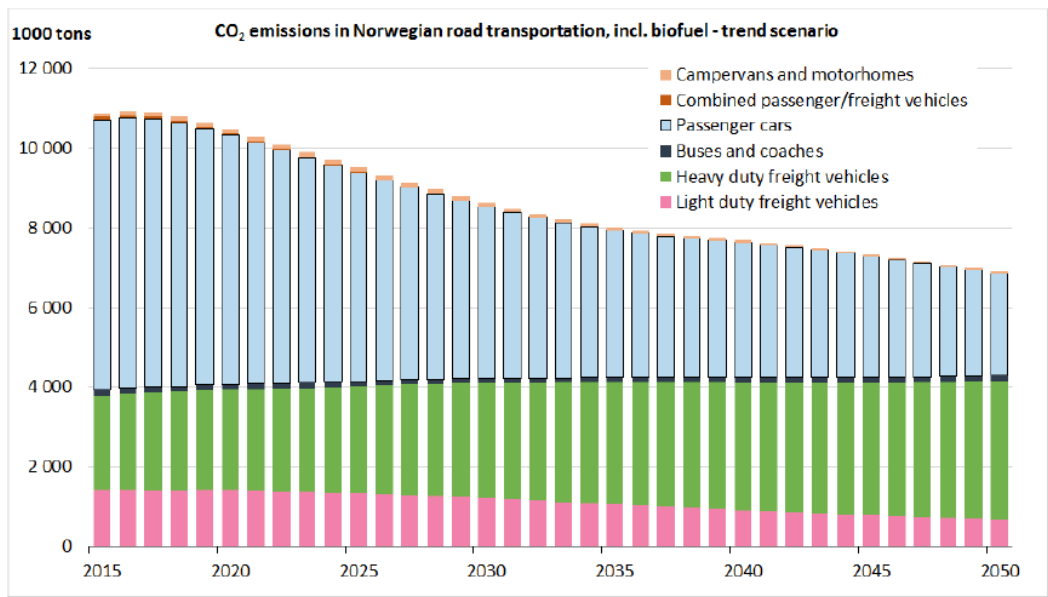
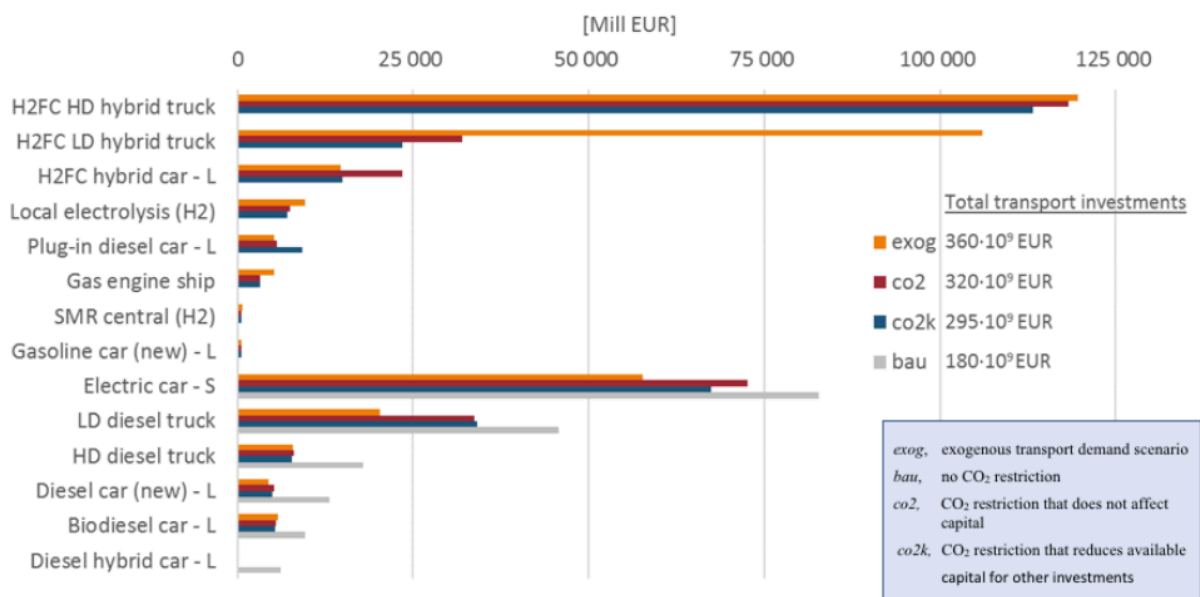
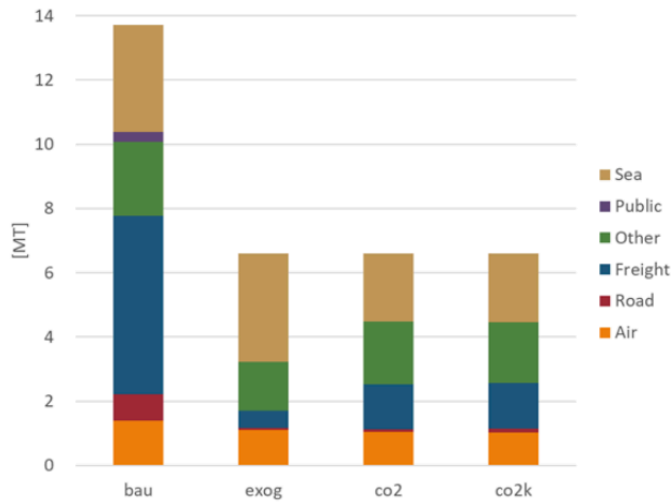


Fig. 6.2. Projected metric tons of annual CO<sub>2</sub> emissions from Norwegian road transport under trend scenario, by vehicle category. Emissions from biofuel combustion are included. Source: Fridstrøm & Østli (2016).

### REMES/TIMES scenarios – investments towards 2050 50% emission reduction



# REMES/TIMES scenarios: CO<sub>2</sub> emissions in 203



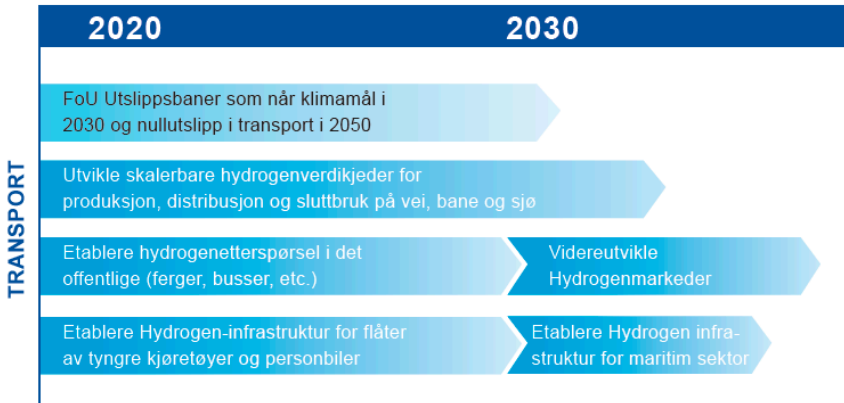
Observation: 50% reduction is possible

- Road transport emissions from person cars are almost zero
- Freight emissions reduced to 1.5 mill tons

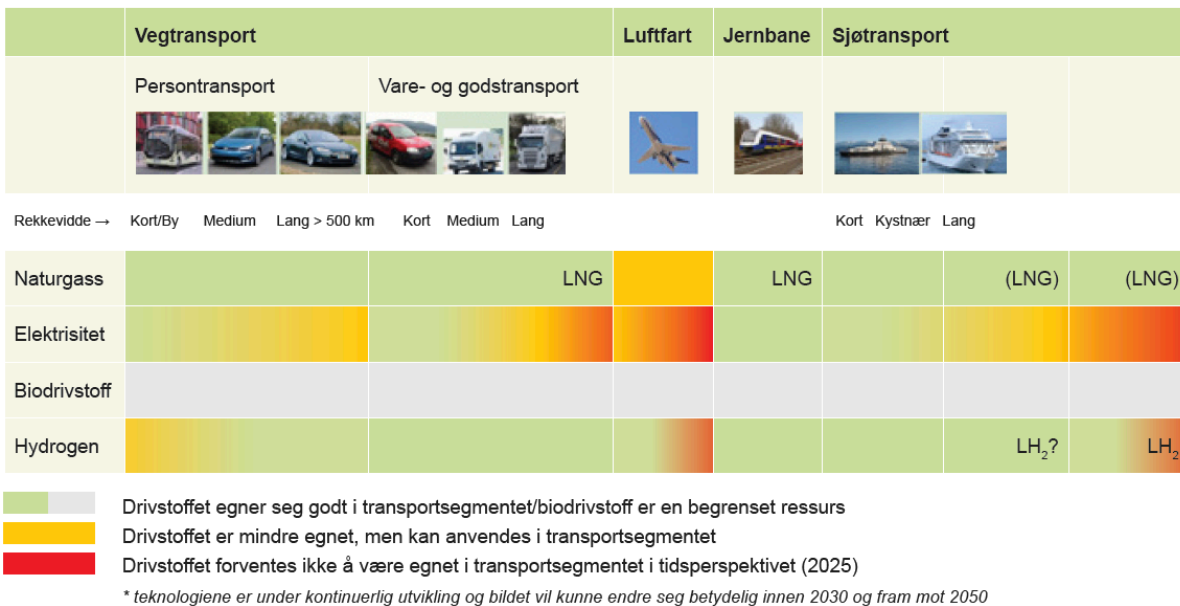
## Hyd

NTNU SINTEF IFE Institut for energiteknikk CEN/SES M@ZEEs

Hydrogen i fremtidens lavkarbonsamfunn



# Teknologier



## Support for hydrogen in transport

- Investment support:
  - Needed because volumes are too low to cover investment costs
  - Should be organized as a tender or reverse auction.
- Operational support:
  - The first stage of operational support should cover the disadvantage of having to recover fixed costs at a time when volumes and revenues are modest.
  - The next stage of operational support should cover the fixed operating costs.
  - These are relevant in a period after the volumes have increased to the extent that the utilization of each hydrogen station is at a sufficient level, but operating costs are still too high to defend profitability.

## Conclusions and recommendations

Transfer of travel and freight to less carbon intensive modes will not be sufficient to achieve the ambitious target of 50% emission reduction in the Norwegian transport sector by 2030.

Hence, it is important to continue and strengthen current policies towards:

- Improved energy efficiency of vehicles, vessels and craft
- Transition to less carbon intensive energy carriers

## Conclusions and recommendations

- The CO<sub>2</sub>-graduated purchase tax for passenger cars, with its exemption for zero emission vehicles, is effective. As is the corresponding VAT exemption. **We recommend** to further support transition to BEVs and FCEVs by favouring them using fiscal tools, adjusting rates as necessary.
- **We recommend** regulation to ensure that necessary biofuels are produced sustainably.
- **We recommend** local government to play a major role in the transition, enhanced by national policies, taking account of the interaction with their local environmental priorities (low emissions zones, ambitious policies for public procurement and public investment in the transport sector).
- **We recommend** the government to formulate strong GHG mitigation objectives for Avinor, in line with those set for other government transportation agencies.
- In sea freight, **we recommend** a strategy distinguishing coastal from deep sea shipping, where the former allows more radical approaches (like zero-emission ferries)
- **We recommend** efforts towards a system for satellite based general road pricing (from the *present* tolls, fuel taxes and annual circulation taxes).
- Finally, to minimize the risk run by early movers in the technology transition, and hence encourage their initiatives, predictability is key. **We recommend** policy makers to be consistent in their signals to the market, announcing changes in the policy framework with a maximum possible lead.