The role of the Transport sector as part of the Danish Energy Transition

Susanne Krawack

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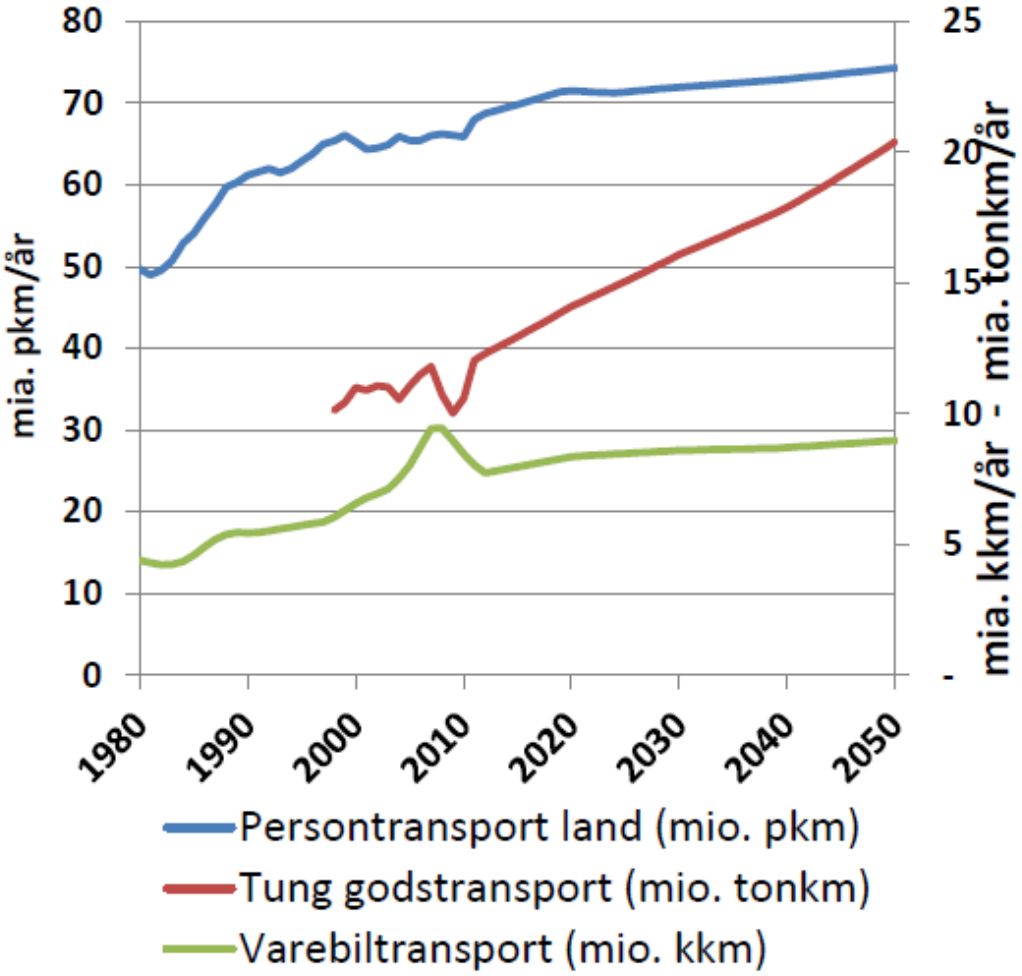
Danish Transport and Energy sector

I hope the previous speaker concluded:

- Denmark has a favorable position to exploit wind-power
- 2. generation biomass is a limited resource

➢ so the transition of the transport sector should be based on electrification and give priority to biomass where there are no alternatives

Danish Transport forecast



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Danish Transport sector

- Few and small cars

Taxation:

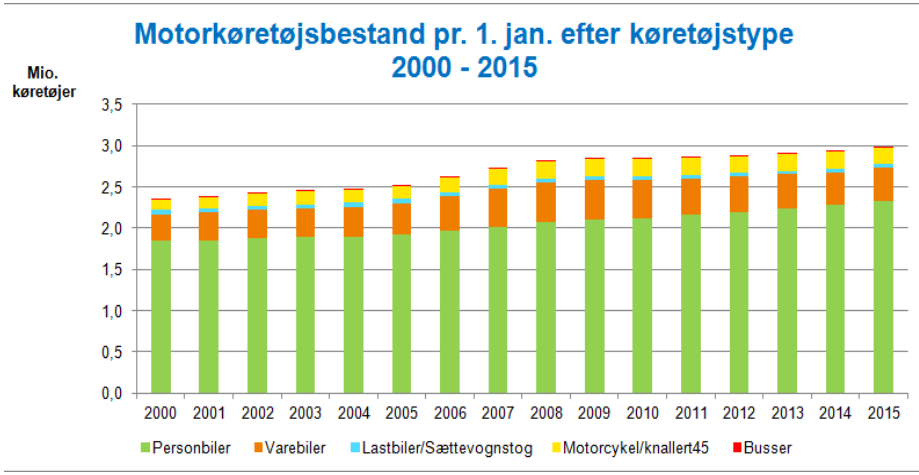
- Purchase tax:
  105/180% of carprice in tax
  minimum: 2.600 euro
  Depend on energy efficiency

- Annual tax
  80 euro/yr cars over 20 km/l
  21.600 euro/yr cars below 4,5 km/l

- Fuel tax – as Germany

Car ownership

Danmark	412	cars/1000 inhab.
Germany	539	-
Poland	486	-
Netherlands	472	-



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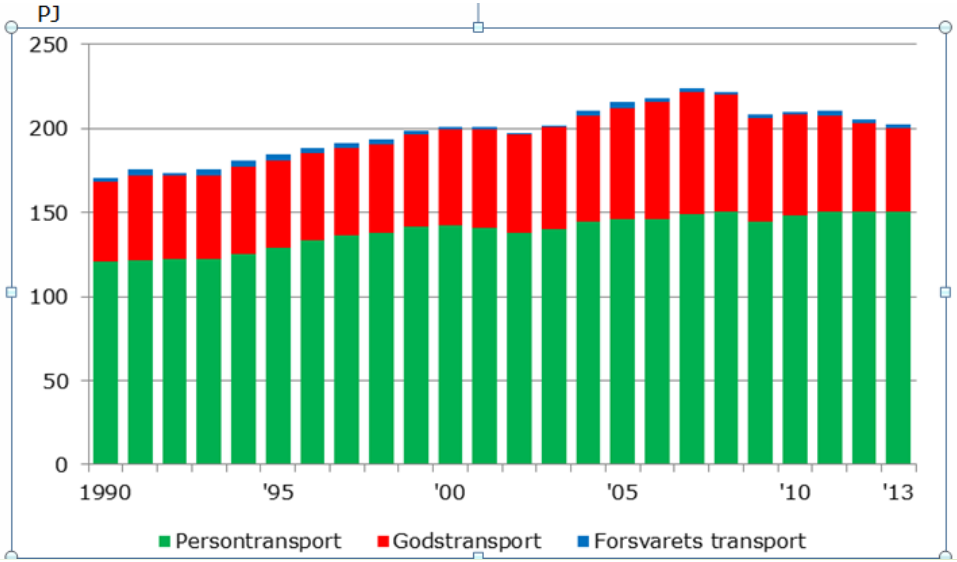
Green Transition in transport

- No clear sector targets – low carbon/fossil free in 2050
- A roadmap for the transition was ”nearly” decided
- The increase in transport CO2 emissions has stopped
- Tools:
  - EU regulation of CO2 emissions from passenger cars and vans
  - Tax reductions on low emission cars
  - Finansial crises – less freigh



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How to reduce CO2 emissions in transport?

As in all other sectors:

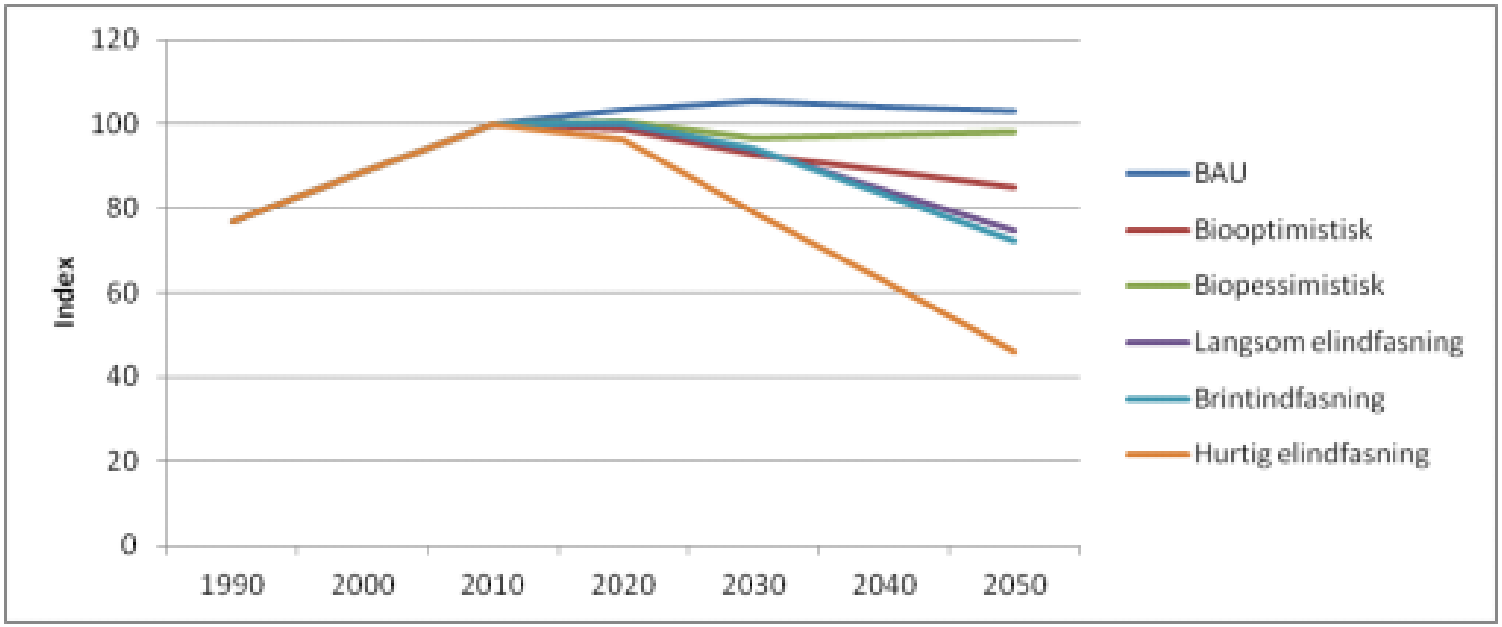
1. Shift to renewable energy:
   Renewable electricity, hydrogen, biofuels

2. Increase efficiency (technology)
   Lower g/km (conventional fuels)

3. Increase effeciency (use)
   more pass/carkm
   more freight/lorrykm
   more use of low carbon modes

4. Traffic measures (reduce mobility)

Shift to other fuels



Electric vehicles are efficient and with the Danish high share of wind power, Evs are the right solution

The challenge is how to make people buy EV's or HEV's

Biofuels hav a large loss when producing fuels

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Scenarios

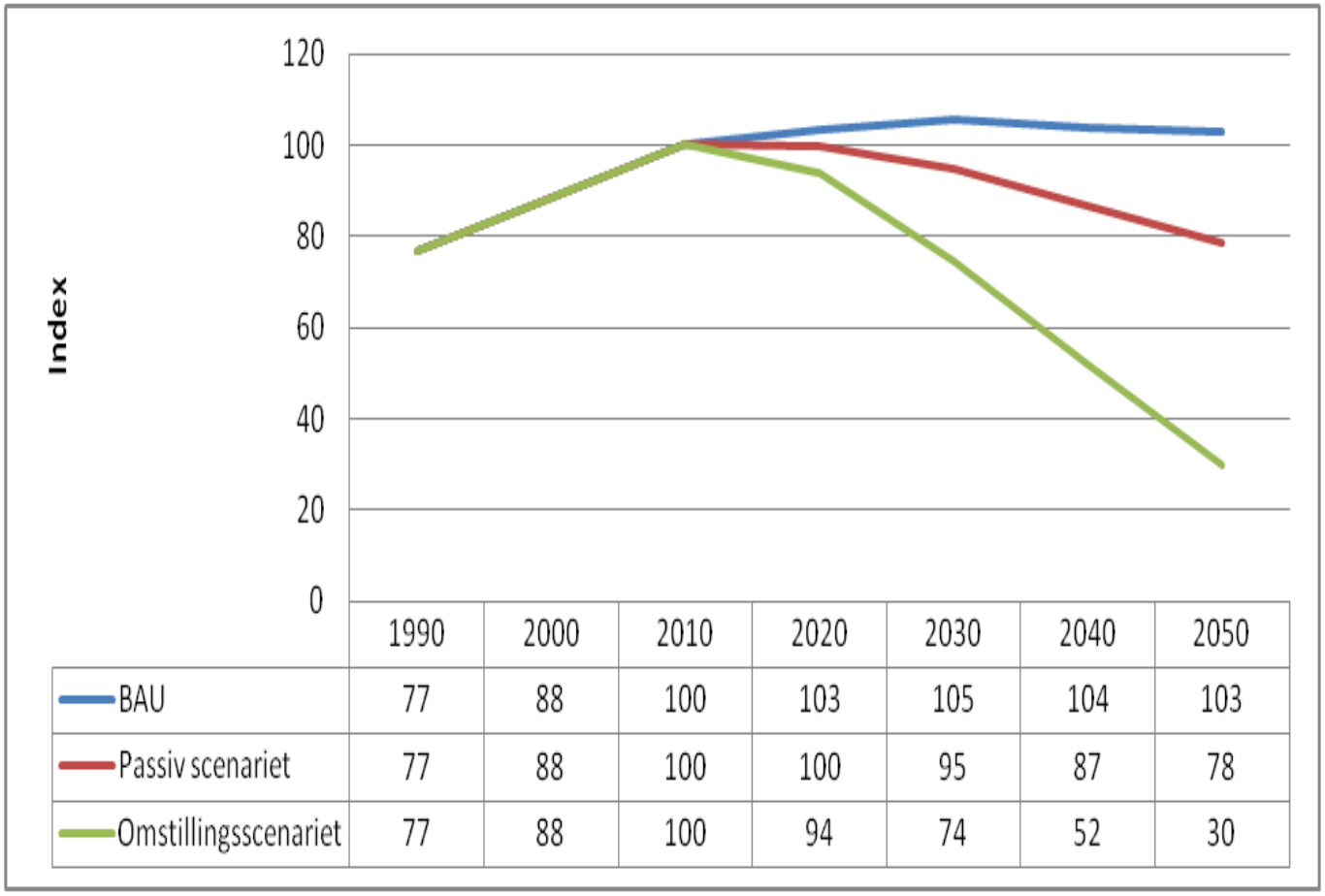
Transition: Both Danish and international policy focus on green transition:

- Fast introduction of EV and HEV
- Optimistic 2. g. bio fuel potential
- Hydrogen introduced after 2020
- Rest of freight transport on natural gas
- Rest of passenger transport on conventional fuels

Passive: Focus on climate and transport as today:

- Slower introduction of EV
- Pessimistic 2.g. biomass potential
- Rest of transport sector on conventional fuels

Scenarier

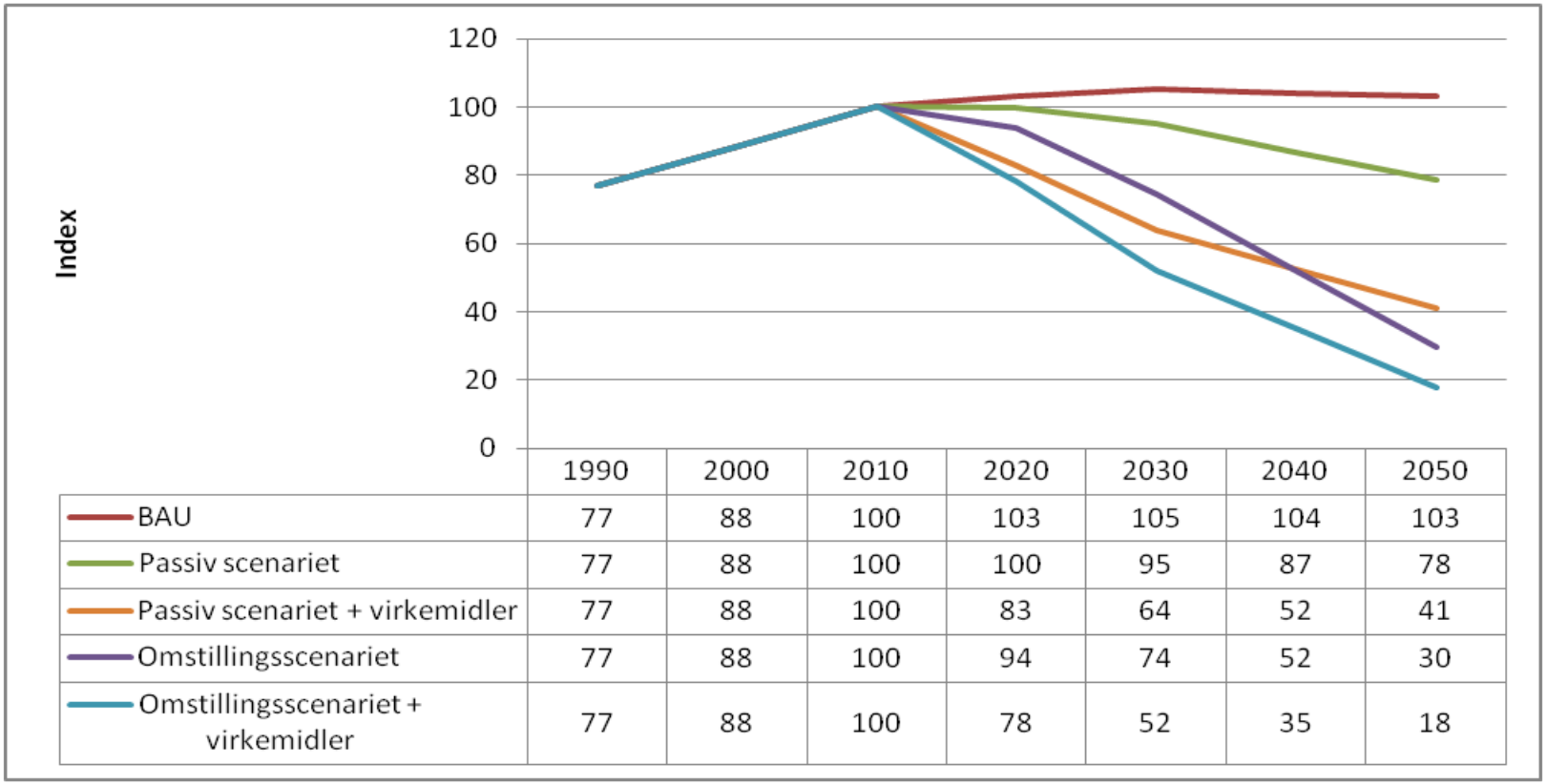


	1990	2000	2010	2020	2030	2040	2050
BAU	77	88	100	103	105	104	103
Passiv scenariet	77	88	100	100	95	87	78
Omstillingsscenariet	77	88	100	94	74	52	30

Traffic measures

Increased fuel price
Road pricing
No commuter tax benefits
Speed limit at 110 km/h om highways
Eco driving
Public policy to purchace green vehicles
Better bicycle- and public transport infrastructure
Land use planning
No tax incentives for compagny cars
Increase intermodality in freight transport

Scenarier med trafikale virkemidler



	1990	2000	2010	2020	2030	2040	2050
BAU	77	88	100	103	105	104	103
Passiv scenariet	77	88	100	100	95	87	78
Passiv scenariet + virkemidler	77	88	100	83	64	52	41
Omstillingsscenariet	77	88	100	94	74	52	30
Omstillingsscenariet + virkemidler	77	88	100	78	52	35	18

How to introduce EV's

Danish regulation:

- Extempt from purchase tax,
- no annual tax
- no tax on electricity for vehicles
- support to infrastructure and purchase of fleets

➢ less than 1% of new passengers cars are EVs

Norwegian regulation:

- Extemt from purchase tax and vat.
- No annual tax
- No tolls, free ferries, free parking
- Can drive in buslanes

➢ 12% of new passenger cars are EV's

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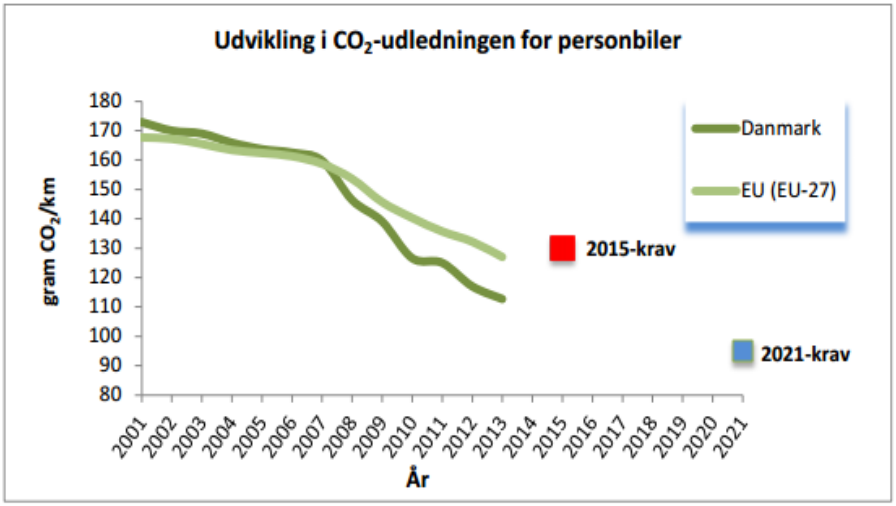
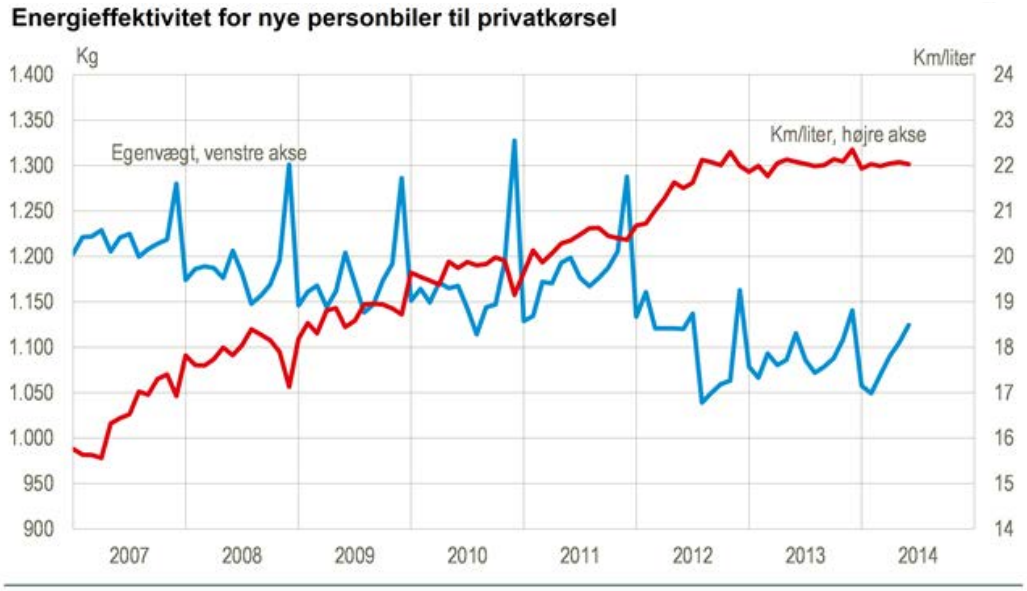
Increased efficiency (conventional)

Danish tax system supports energy efficiency





. Udviklingen i CO_2-udledning for nyregistrerede personbiler i Danmark og EU (Kilde: tyrelsen og EEA, European Environment Agency)

But the tax system is not adapted to the development

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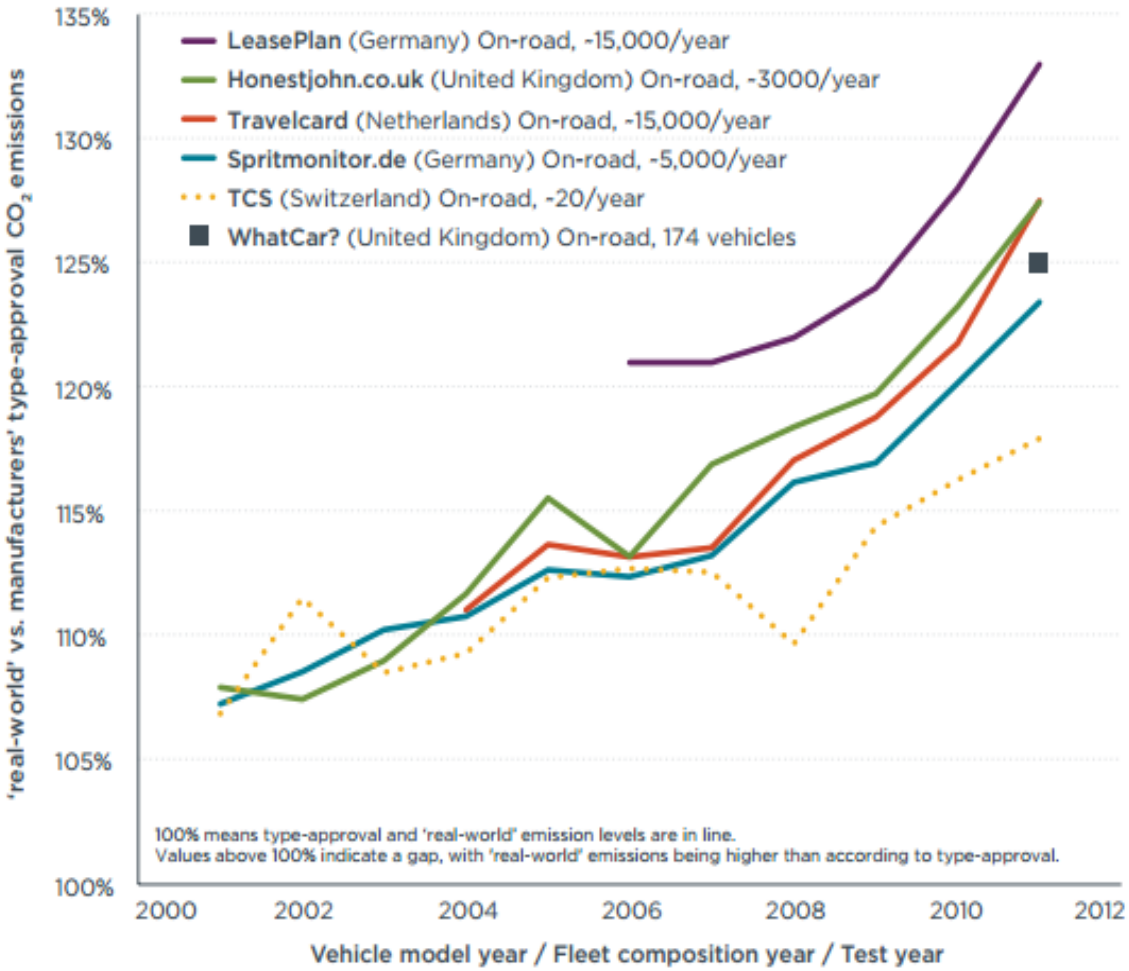
Increased efficiency



Divergence, real-world vs. manufacturers' type-approval CO_2 emissions for various on-road data sources.[1]

Can we trust the efficiency gains?

Volkswagen!

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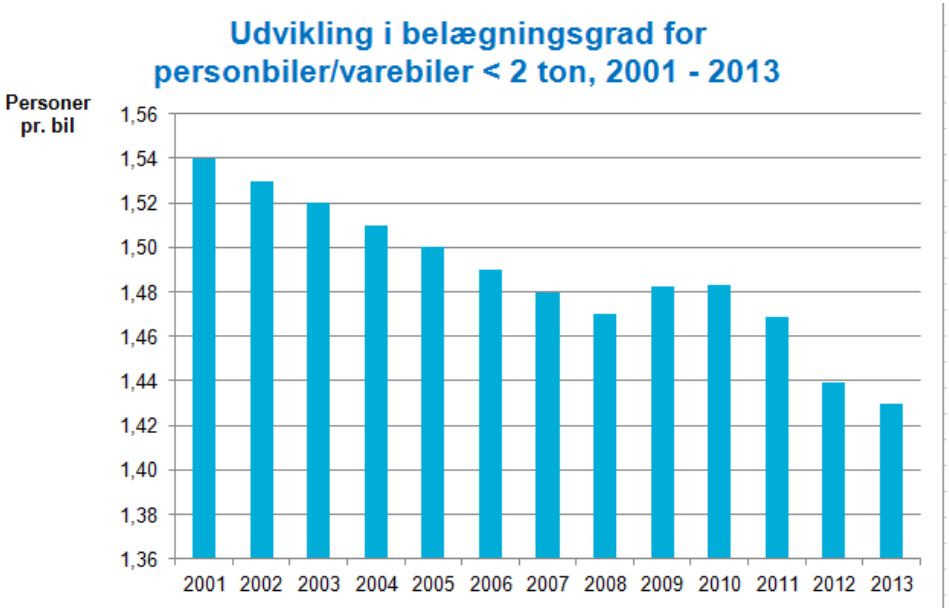
Increased efficiency

- There is a limit to the energy efficiency in conventional cars
- At least if they should be attractive to drive
- Are the car industry going towards a ’lock in’?

Increased efficiency in use (passenger)

Car pooling
- diamond lanes
- toll roads
- limited parking
- ITS systems

Car sharing
- should be attractive for Danes
- high parking fee for citizens



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Increased efficiency in use (freight)

Shippers see transport as a low cost - limited interest in reducing CO2 emissions from transport – but have the tools for low carbon transport

Forwarder has tools to optimize by packing, coordinating – and use rail and maritime. Can provide CO2 label on the transport

Transport company has a vital intrest in CO2 reduction - is directly bottom line: Eco driving, tyre pressure ..

Air transport and long distance freight

For a long time electrification is not the solution

With expected increase in air transport:
If biomass production is increased by 25%
50% of air transport use all domestic 2. g biomass
➢ we can import!

What to do with long distance haulage, maritime transport ?

To conclude

Electricity for as much transport as possible
at least all passenger cars, trains and local distribution and public transport

Biofuels should be reserved for air transport, long distance freight and maritime

Efficiency gains both technological and ‘in use’ are necessary – needs clear regulation

Tax systems are needed to introduce new vehicle technologies

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Thank you

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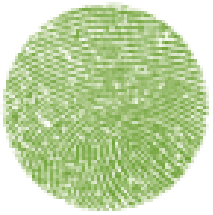

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