

Status on CEESA - WP2 and reference transport demands

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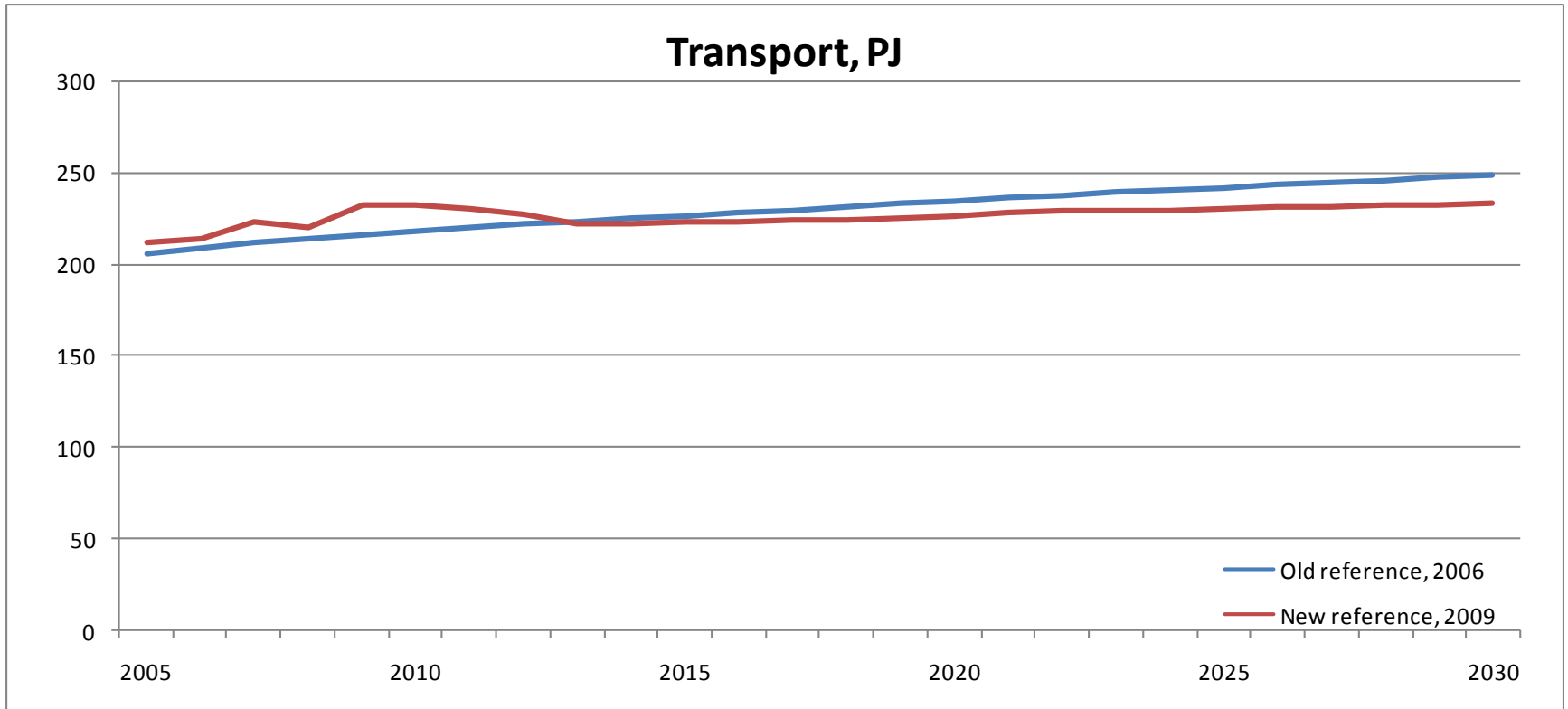


Data for reference transport and energy consumption - status

- Originally from the transport and energy demands in "Energy Strategy 2025" from the Danish Energy Authority was used
- Mainly based upon a background dataset from the Danish Road Directorate from 2002
- No projection updated datasets are as comprehensive as the on from 2002 (until now)
- The key preconditions are adopted agreements and economic development until then
- The dataset includes annual transport demands, energy consumption, load factors and emissions.

Data for reference transport and energy consumption - status

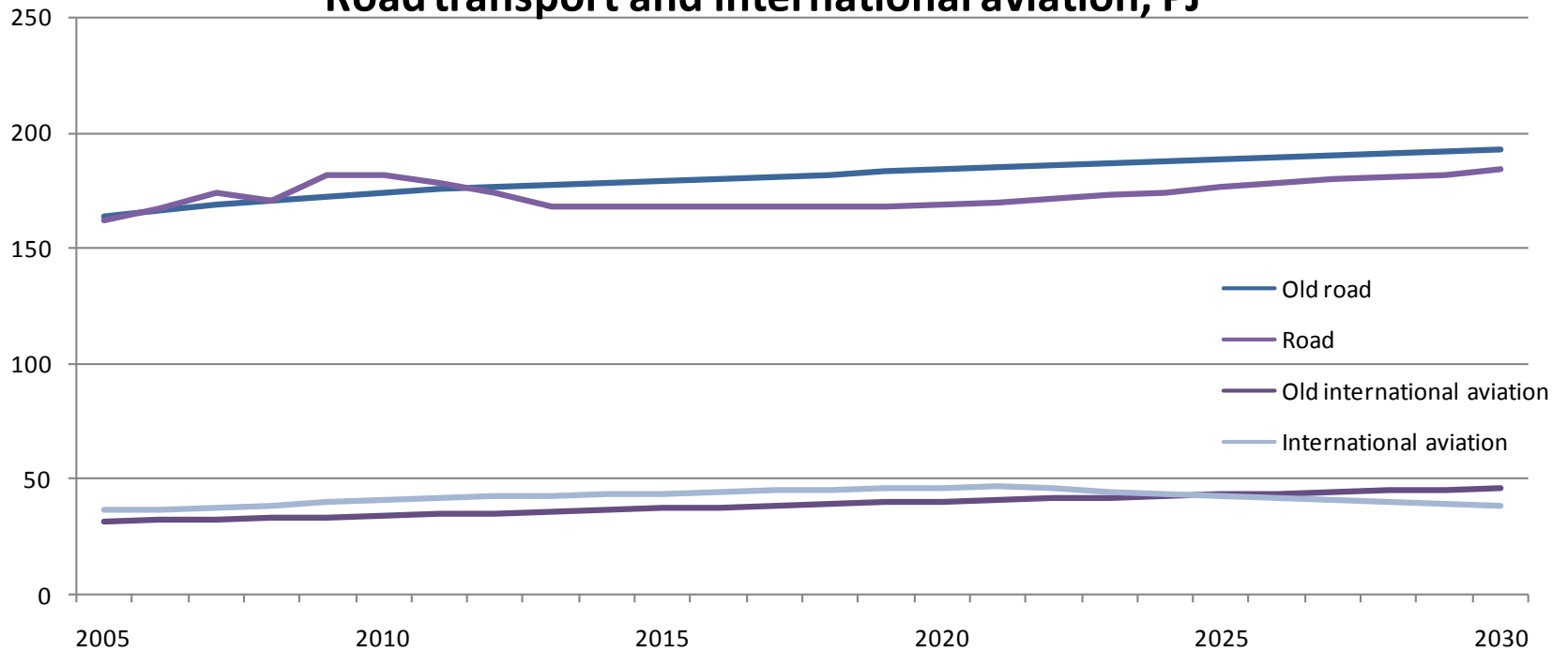
- In 2008 the transport demand was changed by the Danish Energy Authority from 0.7 % increase to 1% increase, but not in detail.
- In April 2009 the reference system was changed again. The transport demand is the same, however the efficiency of vehicles is increased by 0,4% annually, aviation is more efficient and there is slightly more railroad
 - Is likely to be used by the Climate Commission
 - Takes into account the latest political agreements
 - Takes into account the expected development as a result of the international financial crises.
 - Takes into account the latest changes in energy taxation

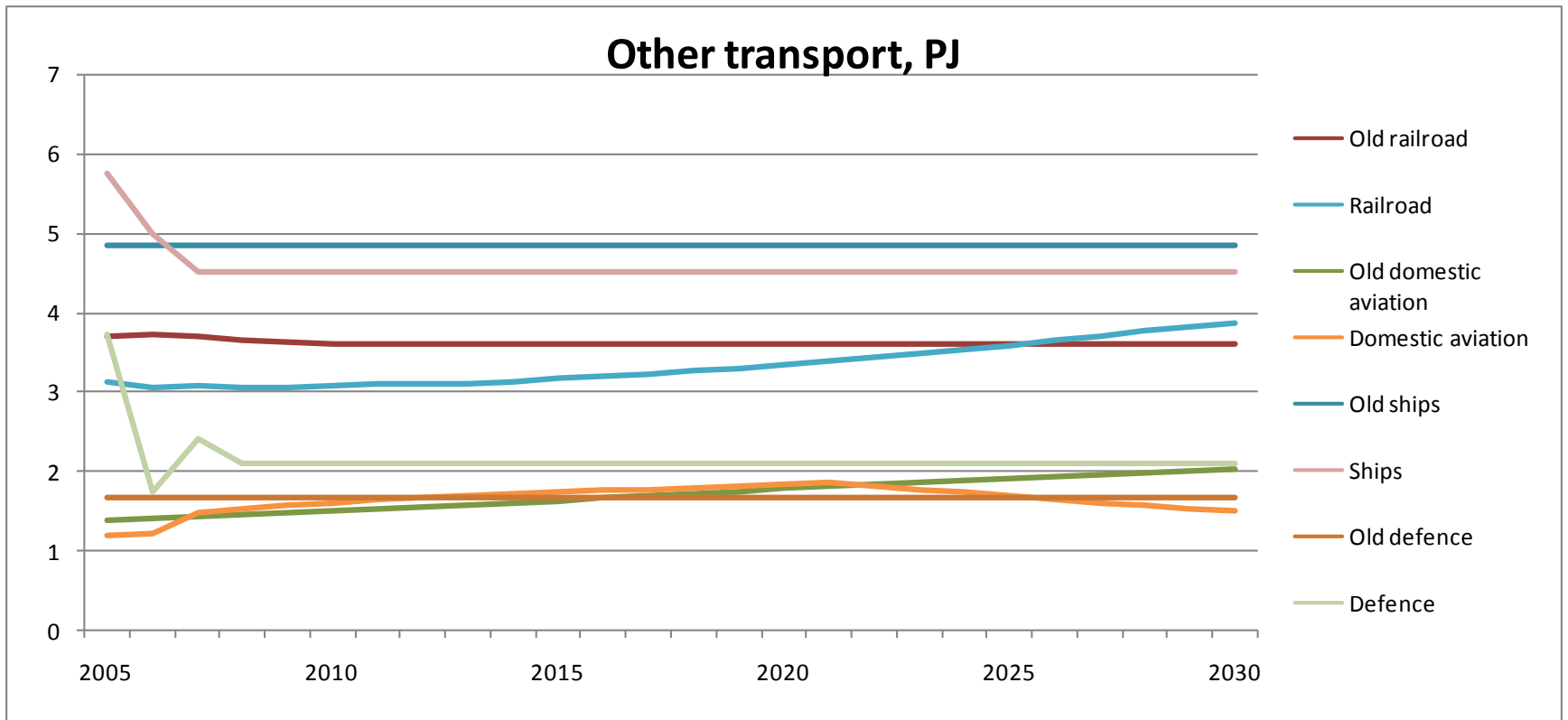


Transport

- Lower fuel for road transport (6%)
- Lower fuel demand in aviation (21%)
- Total decrease 7%

Road transport and international aviation, PJ





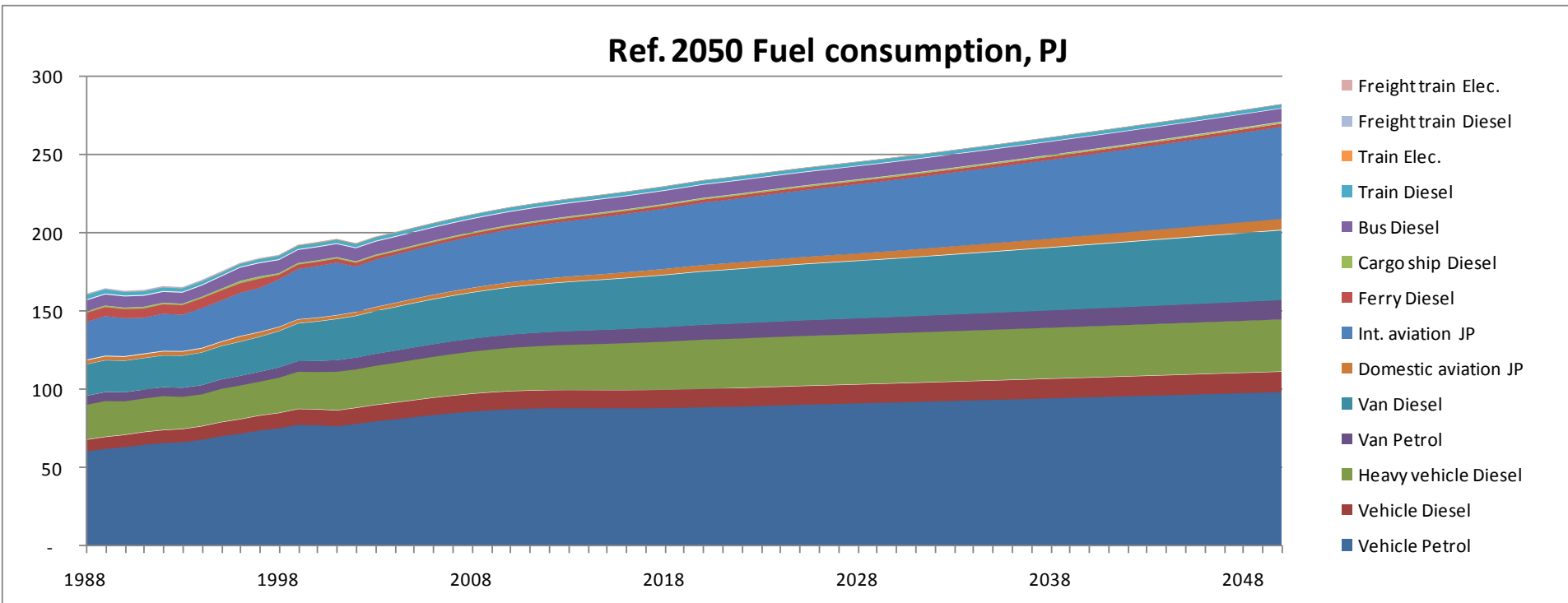
Reference transport demand from 2030 until 2050

- No official (or unofficial) projections are available after 2030
- Using the same method as the Danish Road Directorate a conservative projection is to use the years with the lowest increase in the projection period i.e. 2020-2030
- The efficiency of the modes of transport in the reference can be calculated and included into the projection

Data for reference transport and energy consumption (in 2002)

- Traffic work (km)
- Passenger transport work (person km)
- Fright transport work (ton km)
- Load factors (persons or tons pr. vehicle km)
- Emission data (NO_x, CO, HC, particles, SO₂, CO₂)
- Energy consumption pr. mode of transport divided into fuels
 - Vehicle petrol (all under 2 ton)
 - Vehicle diesel (all under 2 ton)
 - Van petrol (between 2 and 6 ton)
 - Van diesel (between 2 and 6 ton)
 - Heavy vehicle diesel (all above 6 ton)
 - Domestic aviation
 - International aviation
 - Ferry diesel
 - Cargo ship diesel
 - Bus diesel
 - Train diesel
 - Train electricity
 - Fright train diesel
 - Fright train electricity

Reference transport energy demand from 2030 until 2050 in WP2 currently

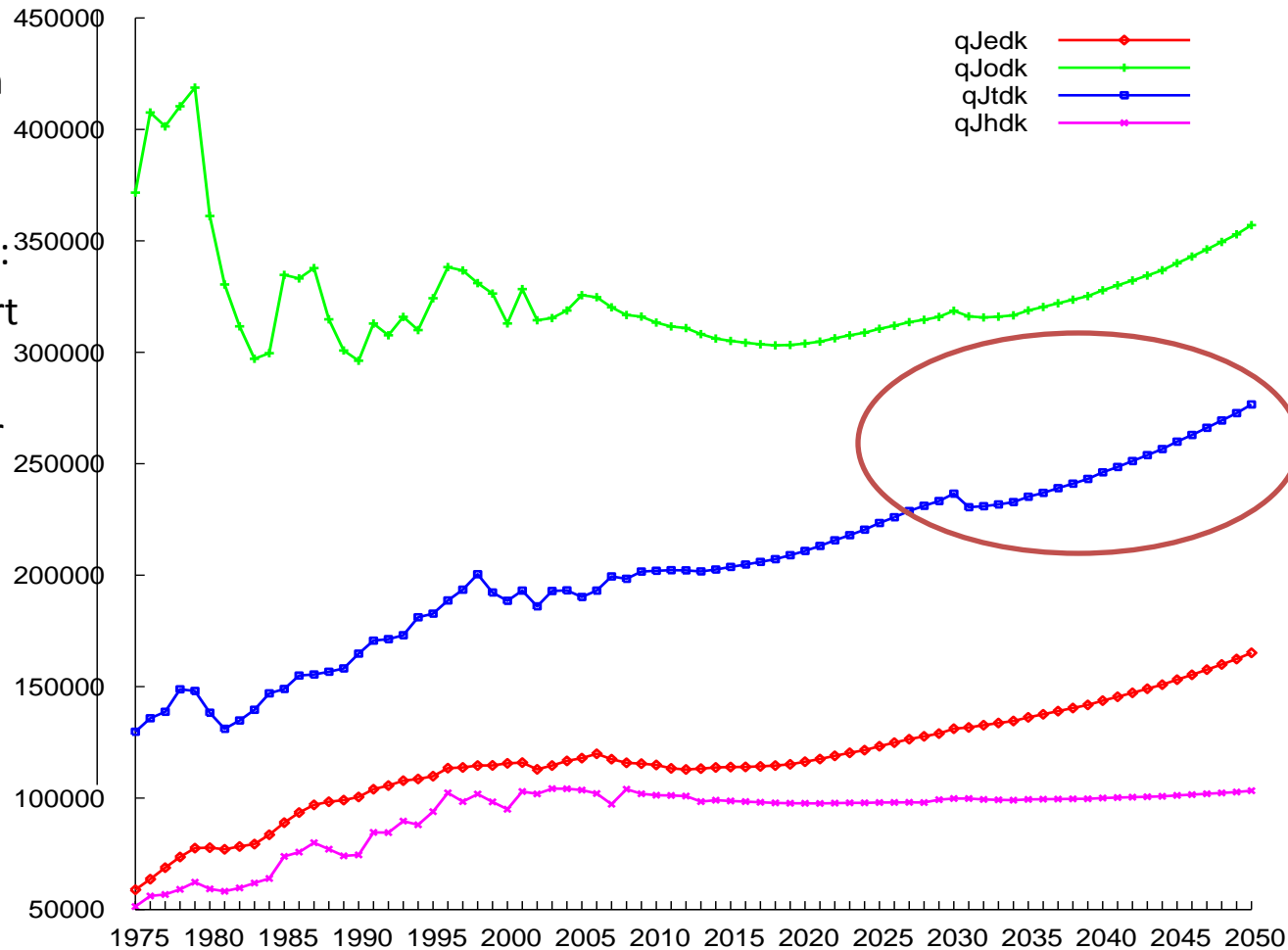


New reference for 2050 from Risø-DTU

Projections follows the methodology of the Danish Energy Authority

Changes from 2030 to 2050:

- 20% increase in transport
- In the same range as our previous projection!



Problem areas in the projections

- Future investments in infrastructure not included (no traffic leaps, no changes in perceived distances)
- Expected distance pr. vehicle pr. year is a key parameter and hard to determine. It influences the official records of efficiencies and the future transport demands.
- According to the Ministry of Transport and Energy the rate of increase in the domestic aviation is too large – now corrected
- EU agreement has not had the effect hoped for, thus new vehicles have lower efficiencies than expected in the future – now corrected
- The main efforts from the Danish Road Directorate is focused on roads based modes of transport – no real projections are done for busses and trains – thus it is not made clear which preconditions might effect the transport demand in busses and trains

Problem areas in the projections

- Consequences for the energy demands:
 - transport demands for personal vehicles are too high
 - projections are not based on human behaviour but on connections between the number of vehicles, economic development, low fuel prices and efficiencies. No real projections of busses and rail transport
 - The projection may be self-fulfilling because they are used for infrastructure investments but not based on sound knowledge about transport demands

Invitation from the Ministry of Transport and Energy to collaborate/follow the development of a new modelling tool for easier and better development of alternative scenarios, incl. energy and socio-economy.

Scenarios

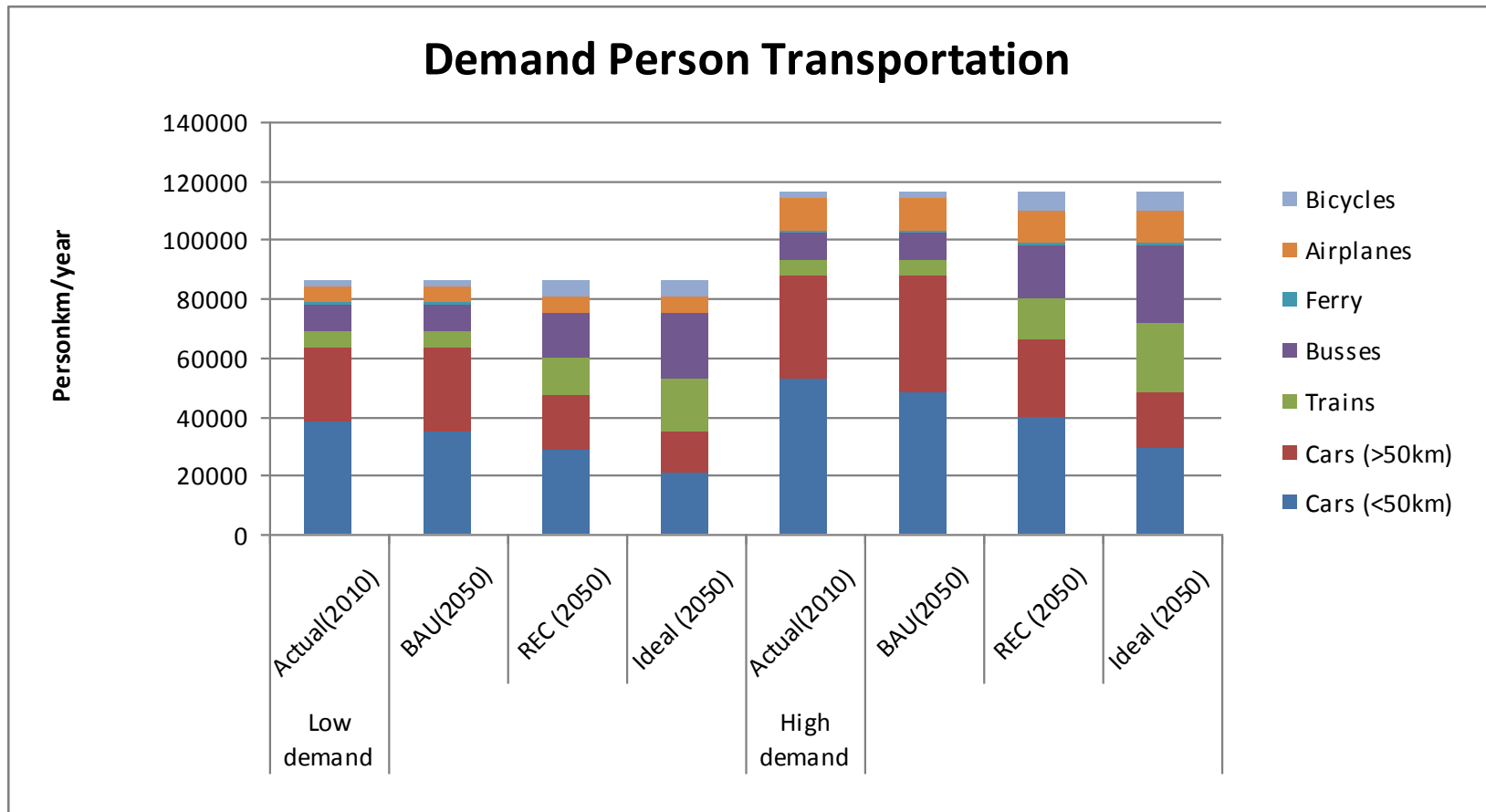
- Actual 2010
- Possible 2010
- BAU (Business As Usual) 2050
- Ideal 2050
- Recommendable 2050 (CEESA scenario)

Prioritisation

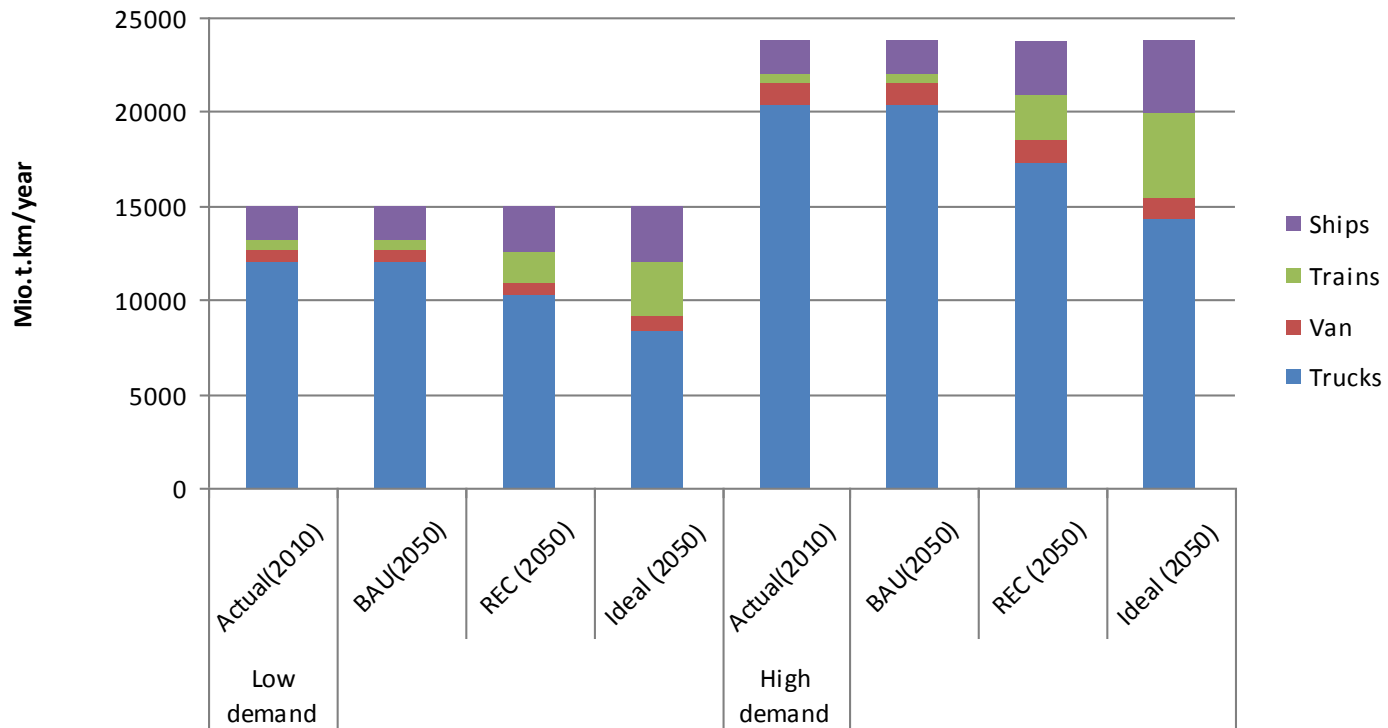
- High priority to electric vehicles,
low priority to biomass

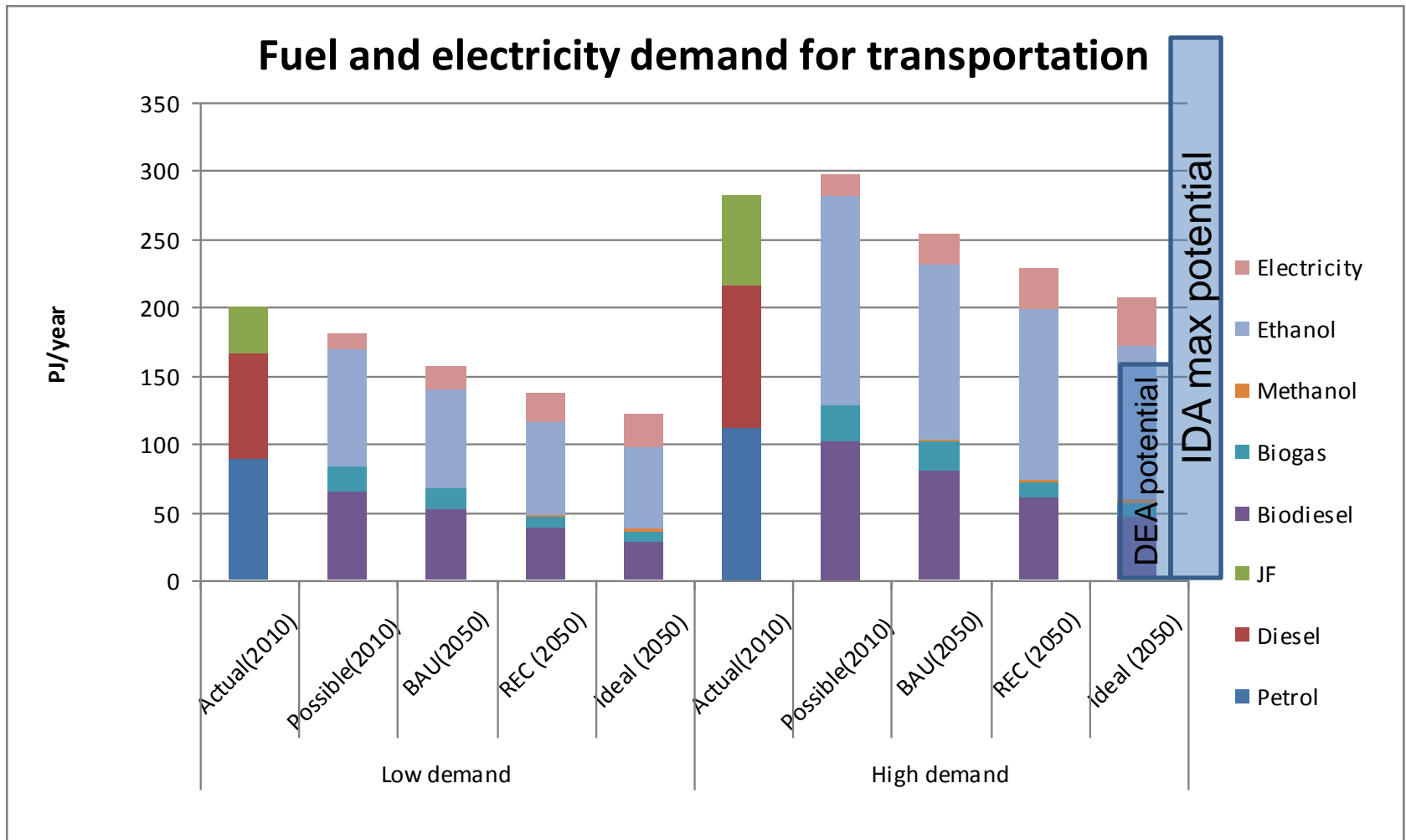
- Within biomass:
 - 1. Biogas
 - 2. Bio-methanol
 - 3. Bio-ethonal
 - 4. Bio-Diesel

Results (so far..!)

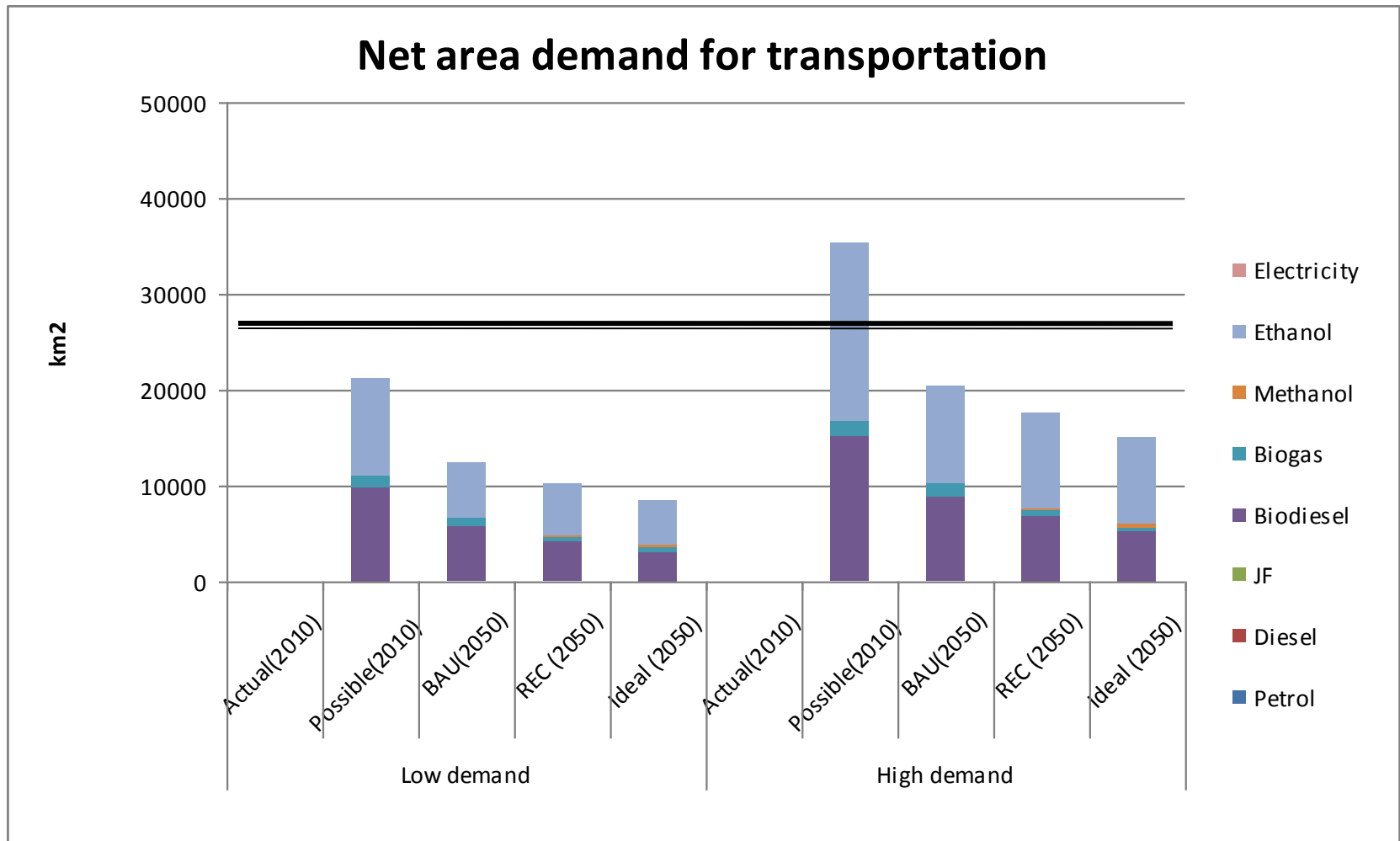


Demand Goods Transportation





Residual biomass potential in Denmark 165 – 400 PJ in IDAs Energyplan 2030



Farm land usage in Denmark in 2008 26,830 km² (60%)

Further work in WP2 transport scenarios

- Final decision on reference transport scenario –
1 main scenario and 1 with larger transport demand for sensitivity and justification of choices
- Better inputs for shift between modes of transport
- Improvement of data for identifying area usage of different crops and renewable energy sources
- Improvement biomass conversion technologies
- Improvement of data on transport technologies
- Implementation of new input in transport-scenario-excel model
- Problem areas:
 - hydrogen, methanol or DME etc.?
 - Other fuels for aviation than biomass based?

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