

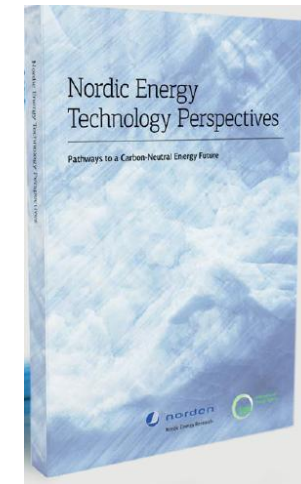
# Nordic and Finnish scenarios for a low carbon society

Mobility: Technology priorities and strategic urban planning, 22 May 2013, Espoo, Finland

Tiina Koljonen

## Two recent studies

1. Nordic Energy Technology Perspectives 2013 (NETP 2013)



[www.iea.org/etp/nordic](http://www.iea.org/etp/nordic)

[www.nordicenergy.org/project/nordic-energy-technology-perspectives/](http://www.nordicenergy.org/project/nordic-energy-technology-perspectives/)

2. Low Carbon Finland 2050 – VTT clean energy technology strategies for society

[www.vtt.fi/lowcfin](http://www.vtt.fi/lowcfin)



# Nordic study gathered large group of experts from different countries and organisations

Main responsible organisations:



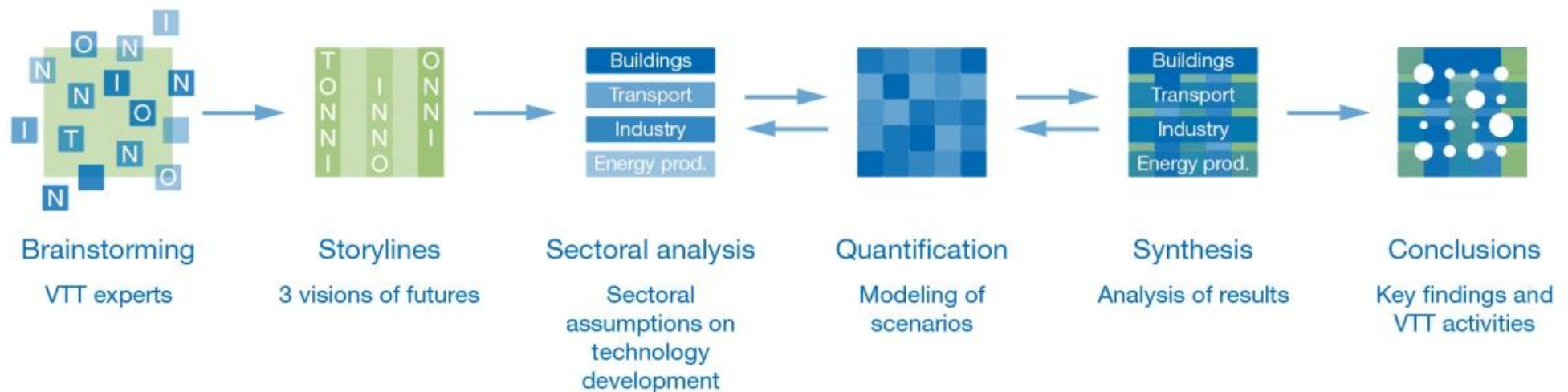
## Reference group

## Working group



# Low Carbon Finland 2050 gathered large group of VTT experts

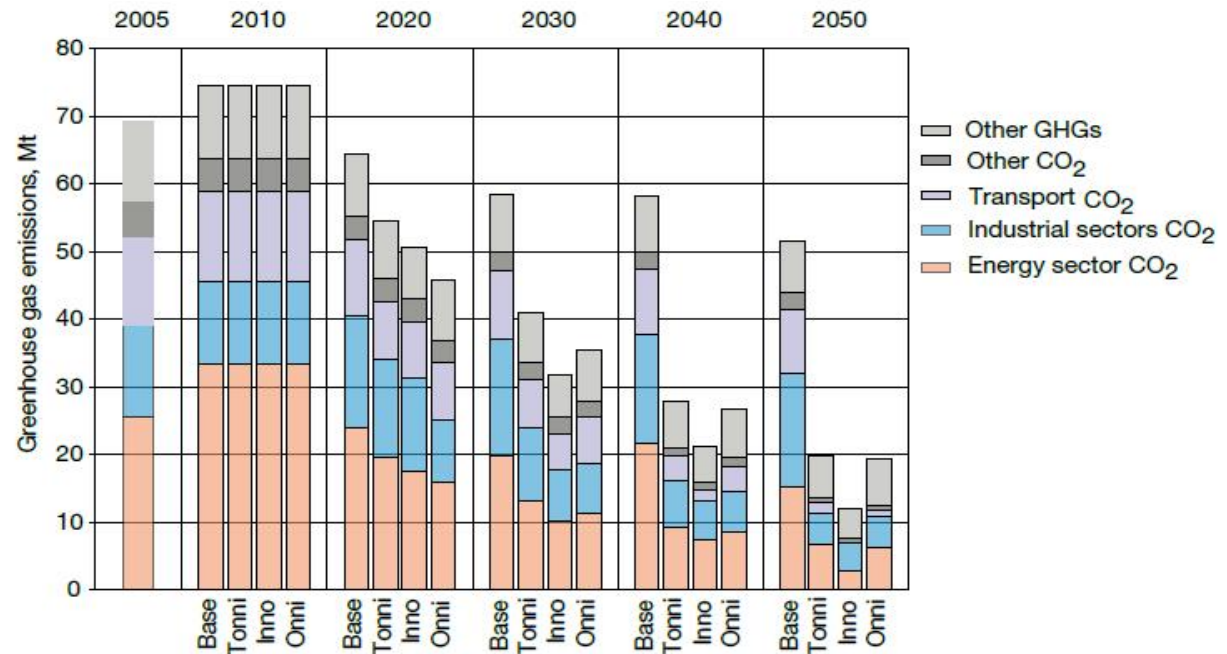
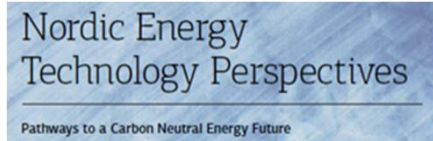
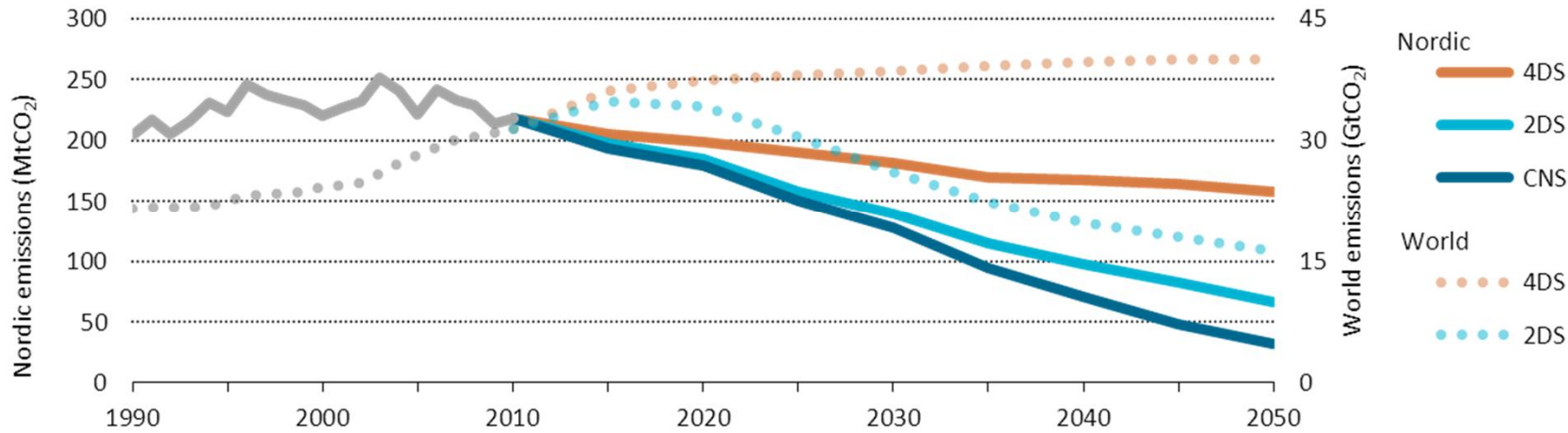
## Process of creating Low Carbon Finland 2050 scenarios



- About fifty VTT researchers contributed in the project
- Project duration from summer 2010 to November 2012
- Finland's economic structure and welfare by 2050 analysed in collaboration with the Government Institute for Economic Research (VATT)
- Scenario illustrations by Jutta Suksi

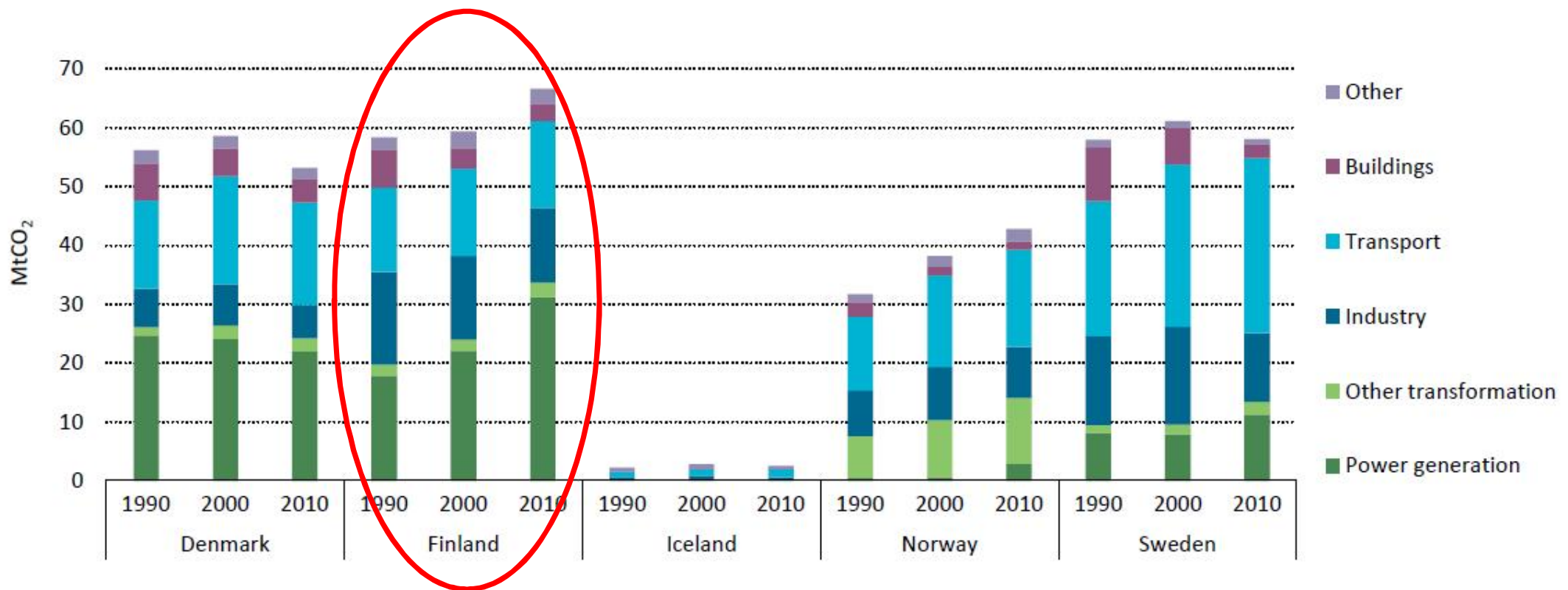


# At least 80% greenhouse gas mitigation by 2050 as a starting point in both of the studies (compared to 1990 level)



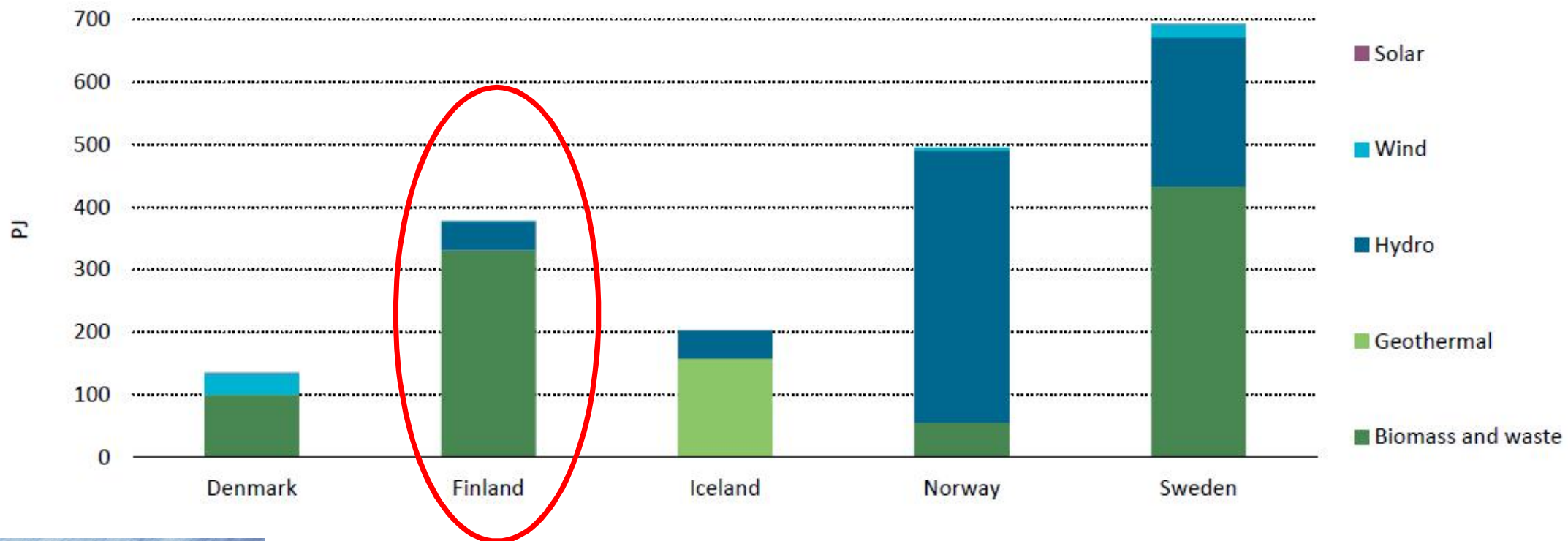
## NETP: Finland's challenges in the Nordic context

### Finland's CO<sub>2</sub> emissions are high compared with other Nordic countries



## NETP: Finland's opportunities in the Nordic context

### The renewable production in Finland is dominated by biomass



## The scenario set-ups were different

- NETP 2013:
  - Nordic scenarios were based on the global ETP 2012 definitions, i.e. 4DS and 2DS (6DS was left out)
  - In addition, carbon neutral scenario (CNS) was created for Nordic region with two variants, i.e. with higher bio (CBNS) and higher electricity (CENS)
  - The economy, community, industrial structures were assumed to be about the same as today but some moderate growths were assumed in transport and industrial volumes, building areas, etc.
- Low Carbon Finland 2050:
  - Three alternative low carbon scenarios were created with different assumptions on economy, industrial, and community structures.



# Tonni-Finland 2050 (comparable with NETP 2013 2DS)

No significant changes in industrial, regional or urban forms,  
moderate new technology RD&D







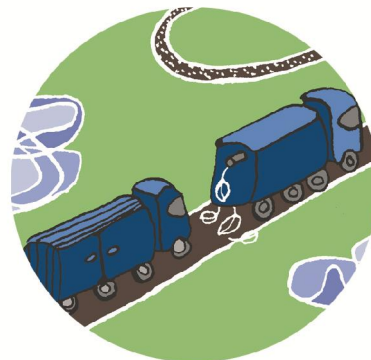
## Onni\*-Finland 2050

Less energy-intensive industries and more service enterprises, decentralized regional structure

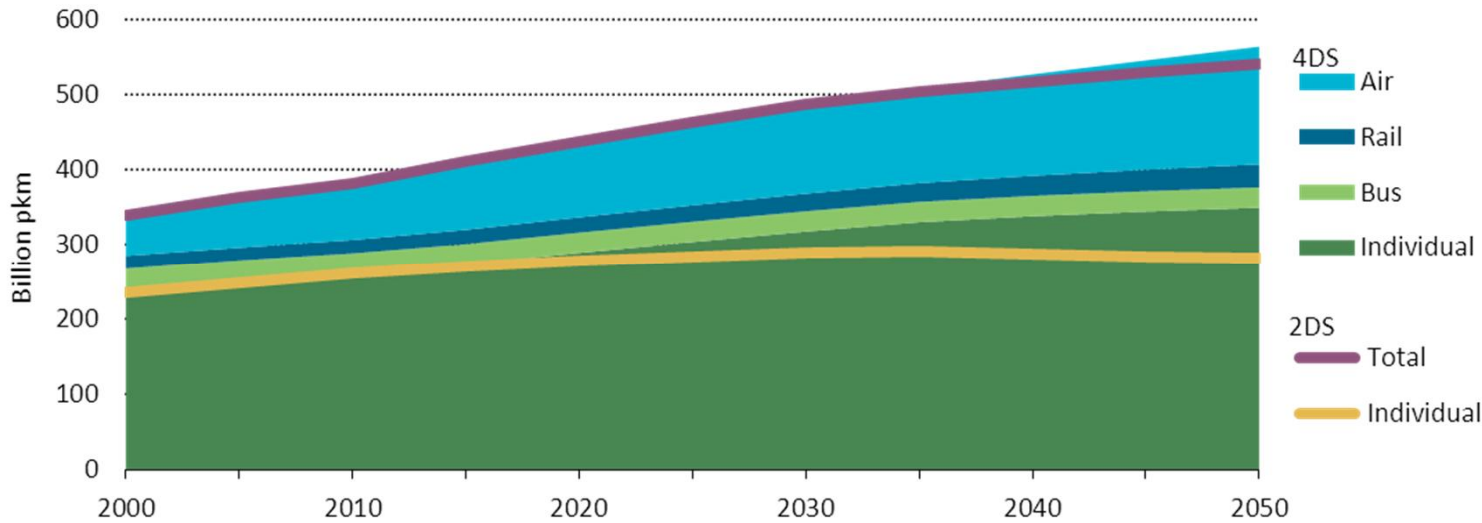


## How we live and move in low carbon Finland?

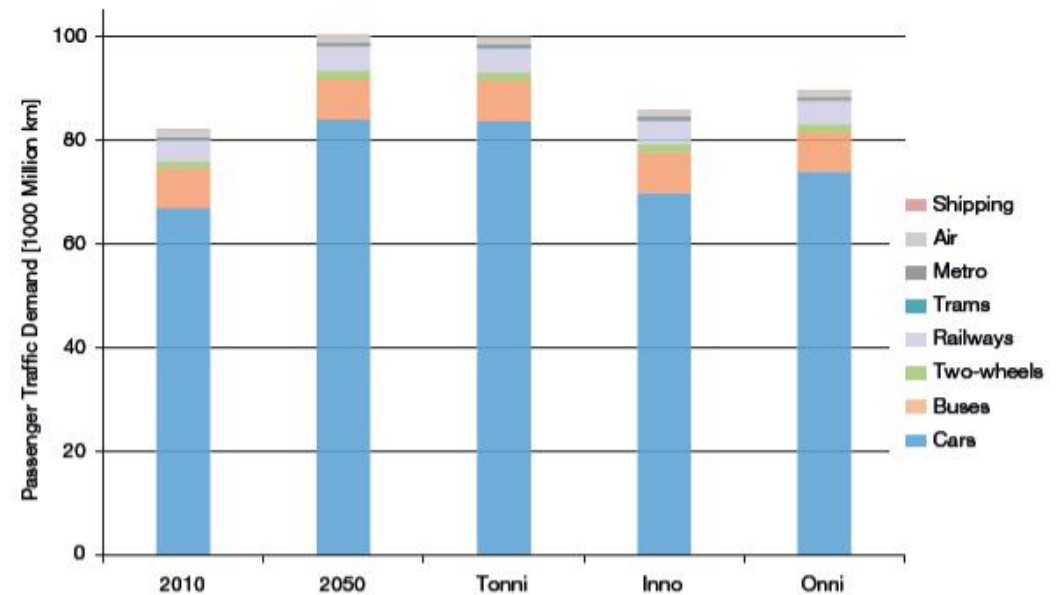
- In Tonni, Inno and Onni the building stock and transport demands follow the assumed economic and community structures
- Both urban and decentralized community structures feasible due to new technical solutions. Intelligent transport systems (ITS) and use of telecommunication services (ICT) reduces the need for and volume of transport.
- Challenge: buildings we construct now will be with us for 50-100 years, transport needs will be increasing due to increasing commerce and other services



# Passenger transport increases or stagnates after 2020



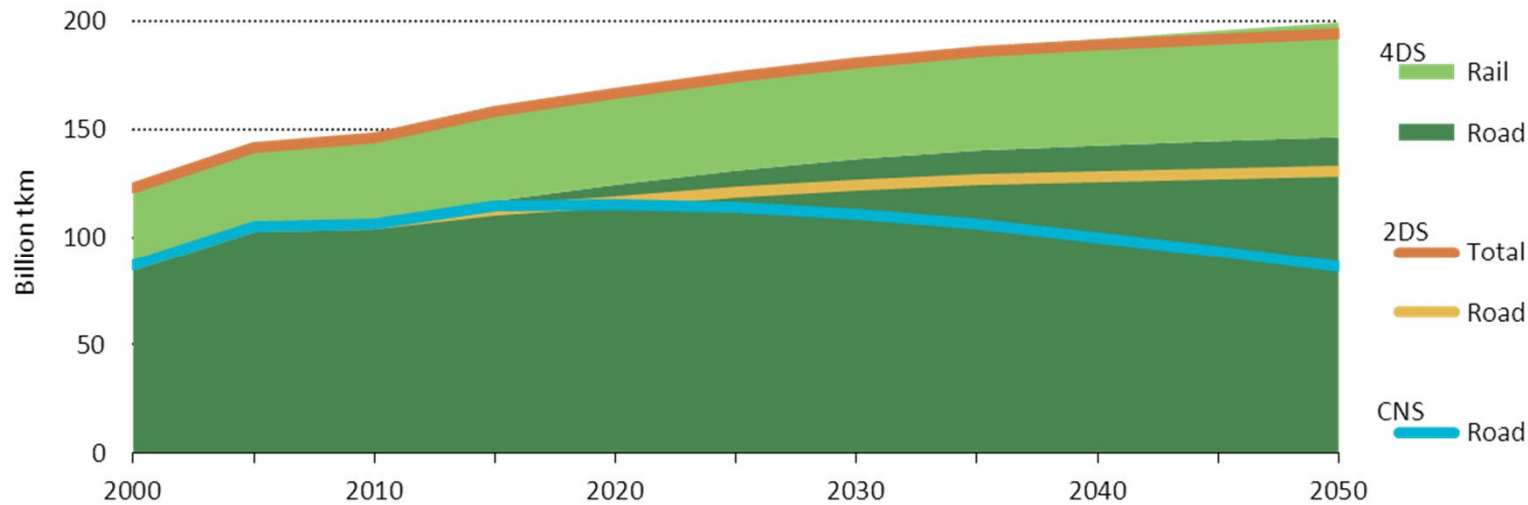
low carbon  
finland 2050



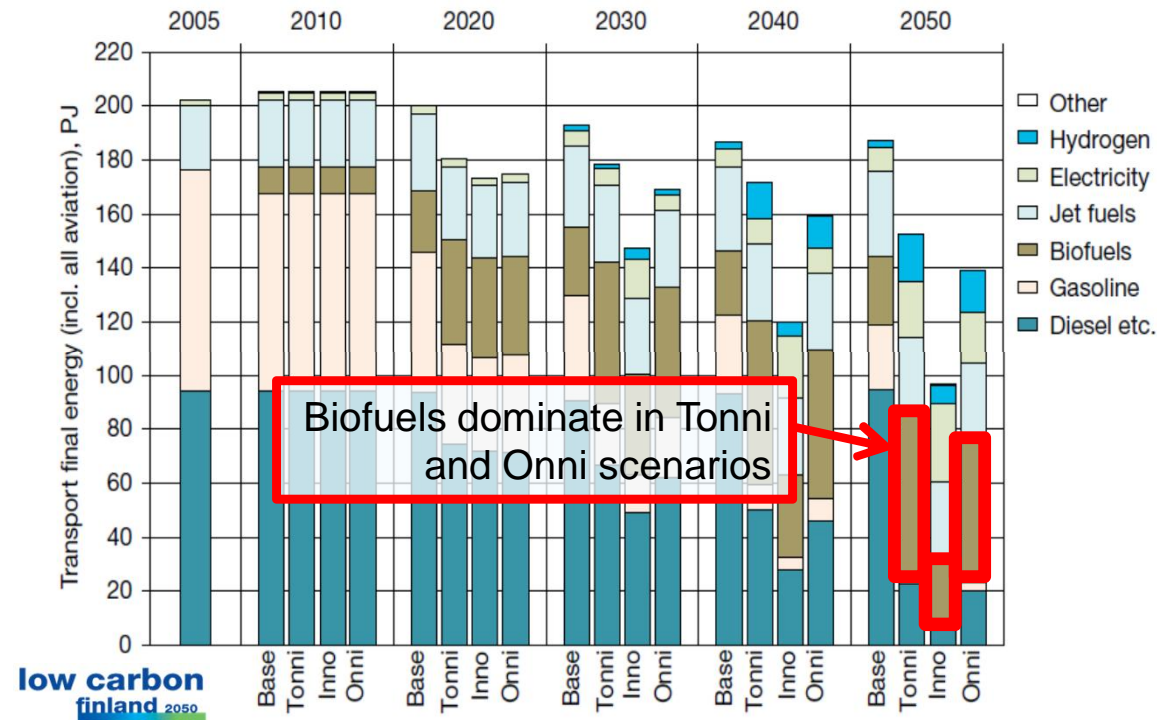
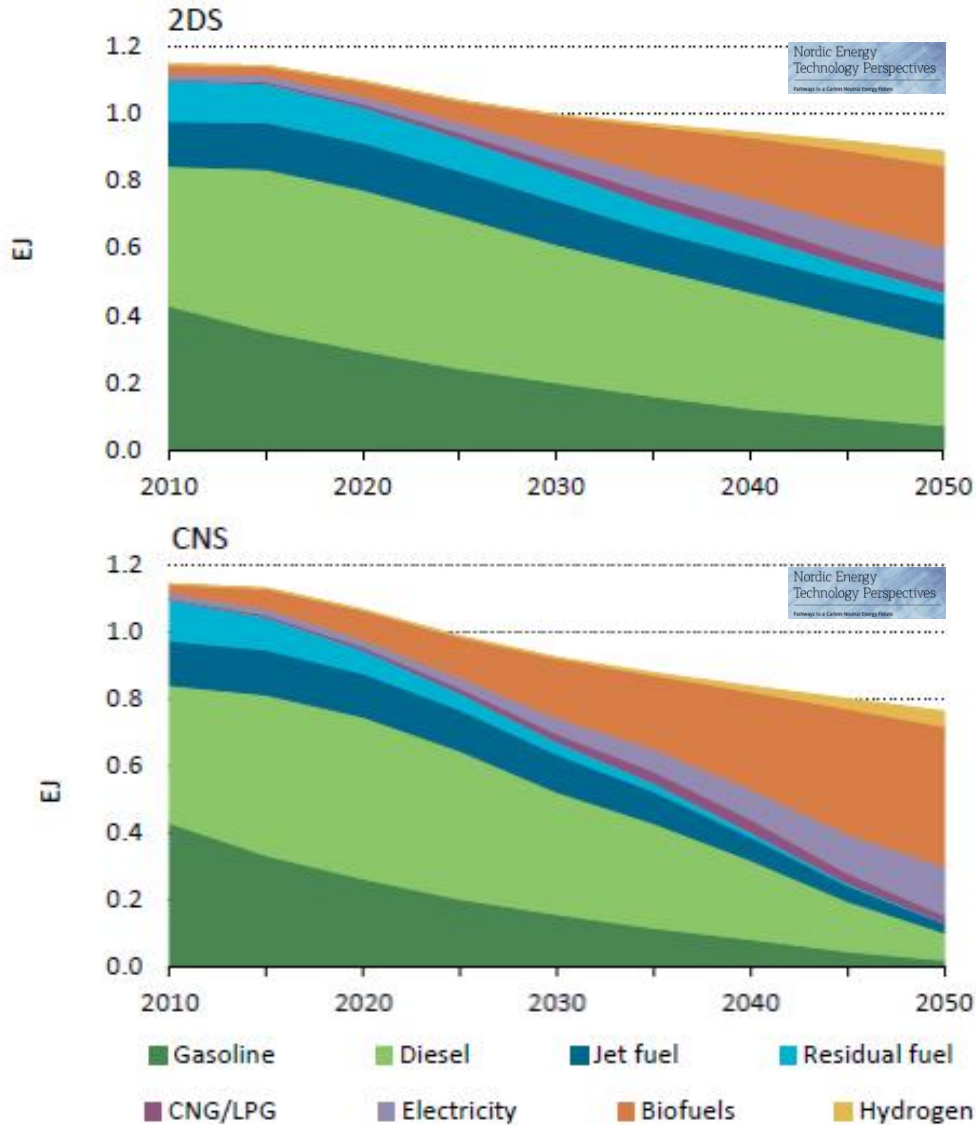


# Freight transport increases

## CNS also assumes strong modal shift from road to rail



# The future entails an increased variety of energy sources for the transport sector and increased energy efficiency



## Key findings

- The transport sector remains dependent on high-energy-dense liquid fuels but **biofuels** will play a significant role in the future transport sector.
- All Nordic countries have ambitious long-term targets to reduce ghg emissions from transport but current policies are insufficient to meet the low carbon target. However, policies are very different in each Nordic country.
- Transport and industry sectors seem to be the most difficult sectors to decarbonize
  - New technologies are needed
  - Behavioural changes are needed
  - International climate agreement is needed





**VTT creates business from  
technology**