CCS research in the Nordic countries

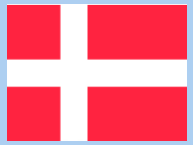
Nordic Energy Research
Nordic Council of Ministers

Svend Søyland, Stocholm 15th june. 2017

Ambitious Nordic climate targets 2050

Carbon neutral (with offsets)

No net emissions of greenhouse gases

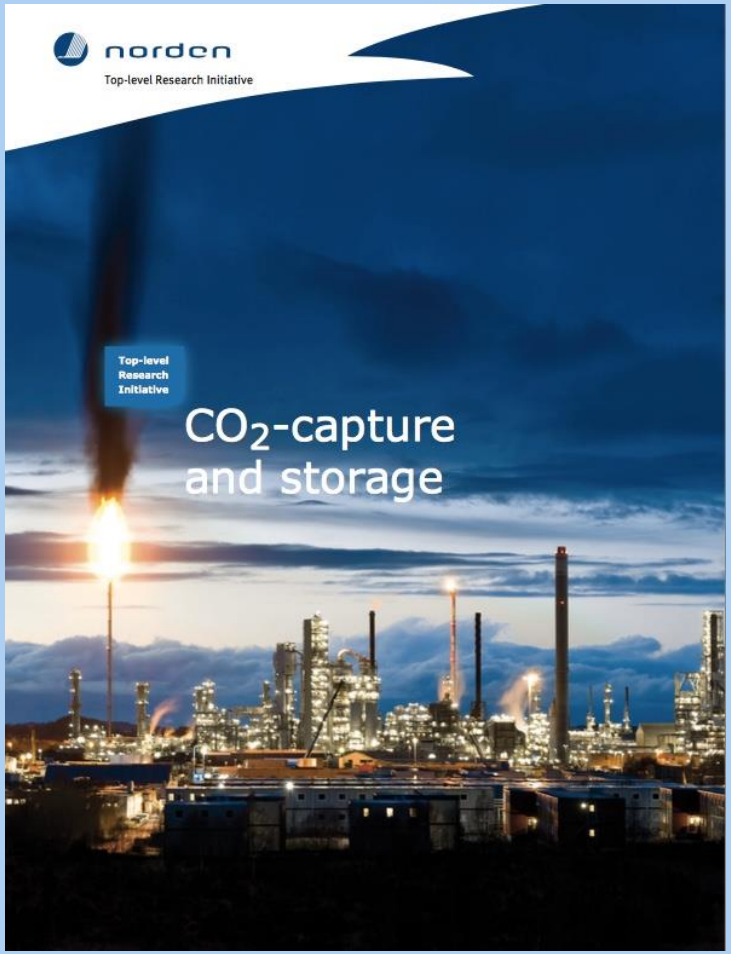


100 % renewables -> 75 % reduction of greenhouse gases

Emissions cut by at least 80 %

50-75 % cuts in greenhouse gas emissions

TRI – CO_2 Storage and NORDICCS (2011-2014)



CO_2 – capture and storage (CCS)»

- Facilitate co- operation between industry, researchers and policymakers.
- Overview of the technologies and applications required for CCS in the Nordic countries.
- The role of Nordic CCS in a renewable scenario.
- Nordic User-driven Competence Center for CCS.

NORDICCS

- Provide Nordic industry-driven leadership within CCS innovation and realization
- Demonstrate how CCS can contribute to the Nordic portfolio of climate change mitigation options.
- Enable the Nordic countries to become pioneers in large-scale implementation of CCS.
- Combining complementary capacities of the Nordic countries.

Annual Baltic CCS-forums

Three flagships

Shift

Sustainable Horizons in Future Transport

Flex4RES

Flexible Nordic Energy Systems

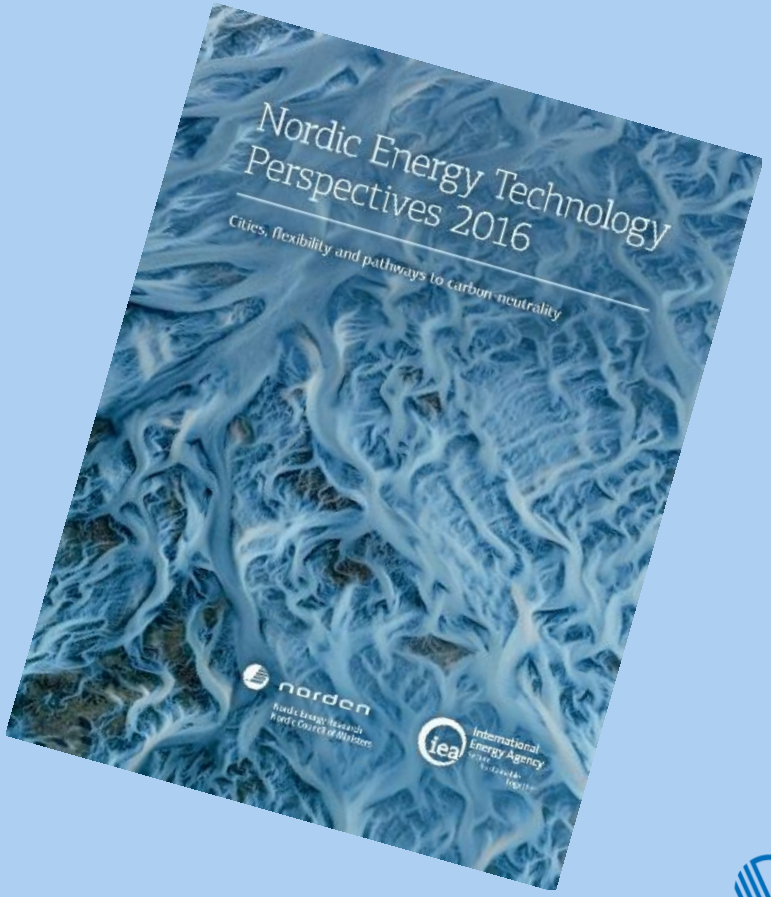
Negative CO_2

Negative CO_2 Emissions with Chemical-Looping Combustion of Biomass

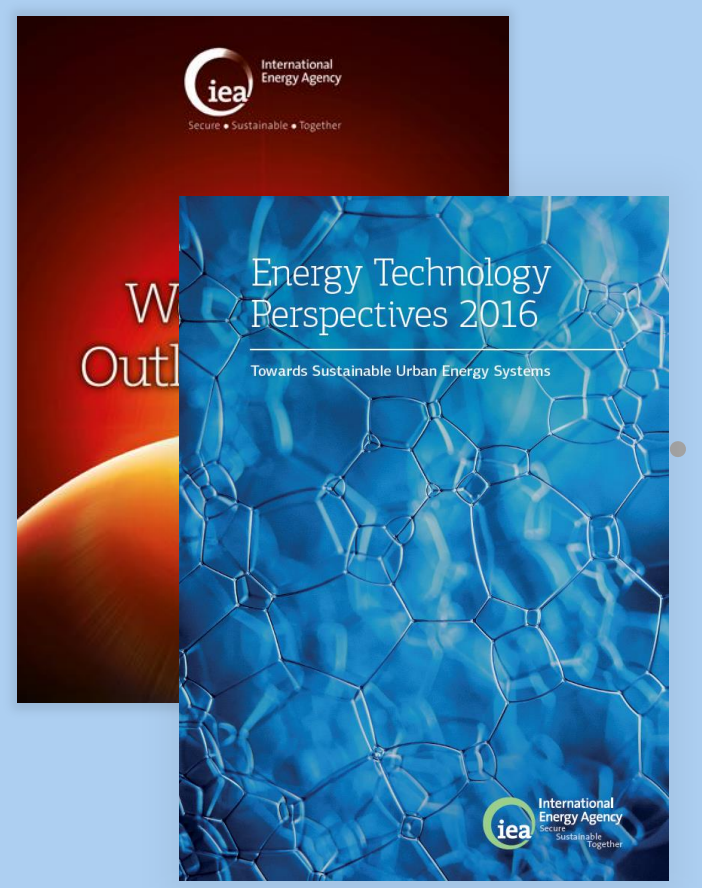
Nordic Cooperation

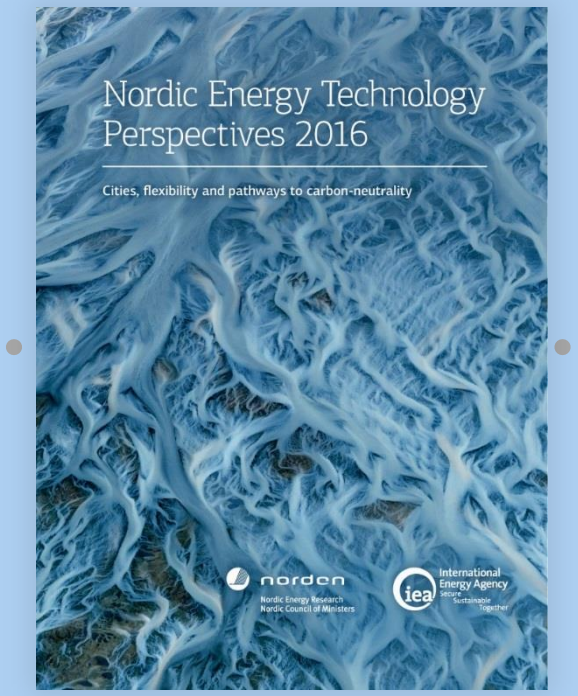
Nordic Green Growth

Research and Innovation Programme



NETP: Bridging global and national analyses





STATENS OFFENTLIGA UTREDNINGAR

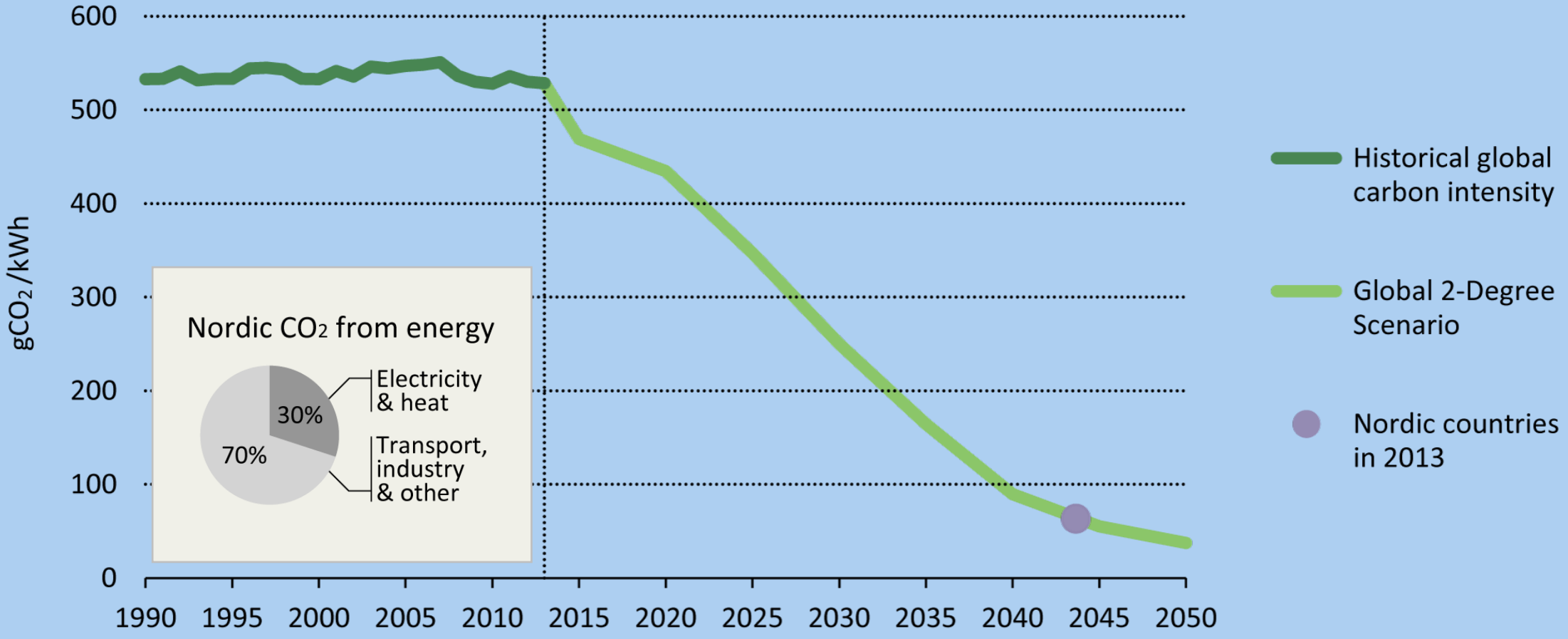
Energikommissionen

Three strategic actions

1. Incentivise and plan for a more distributed, interconnected and flexible energy system
2. Tap into the positive momentum of cities in transport and buildings
3. Ramp up decarbonisation of long-distance transport and the industrial sector

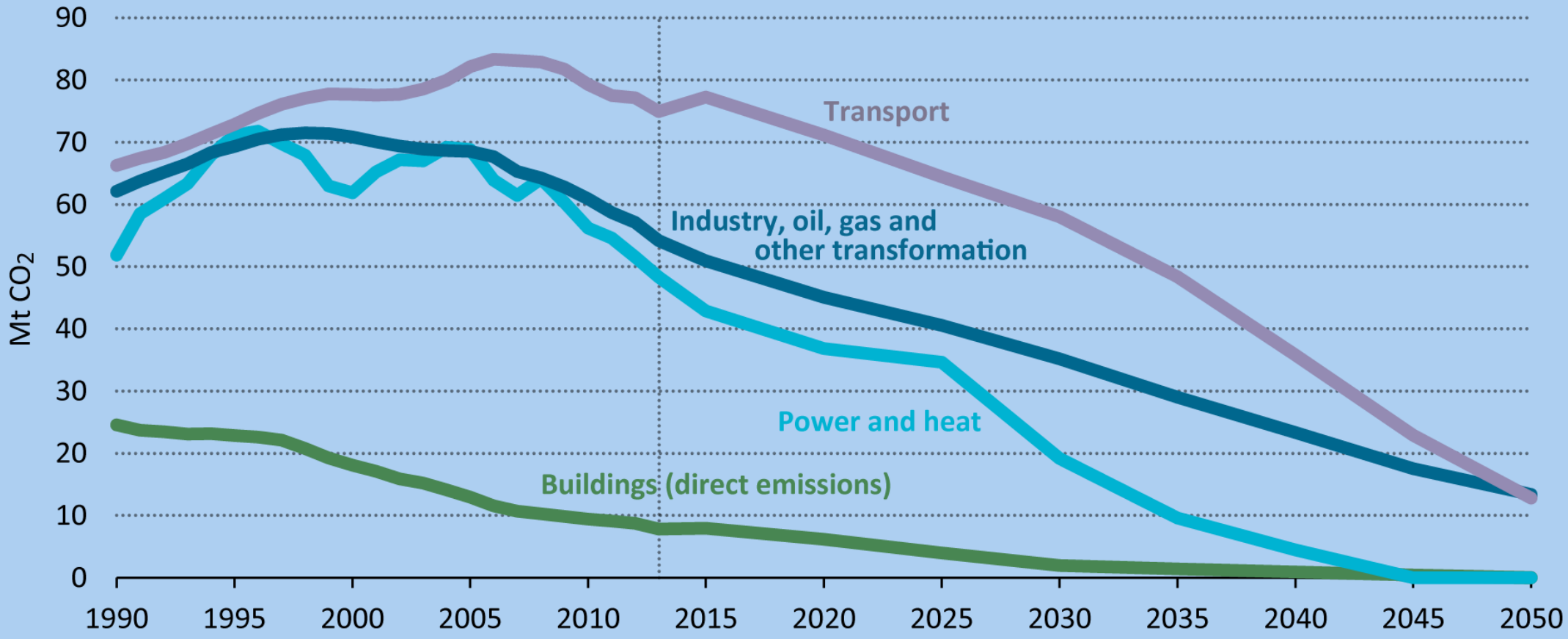
30 years ahead on electricity decarbonisation

Global carbon intensity of electricity (gCO_2/kWh)



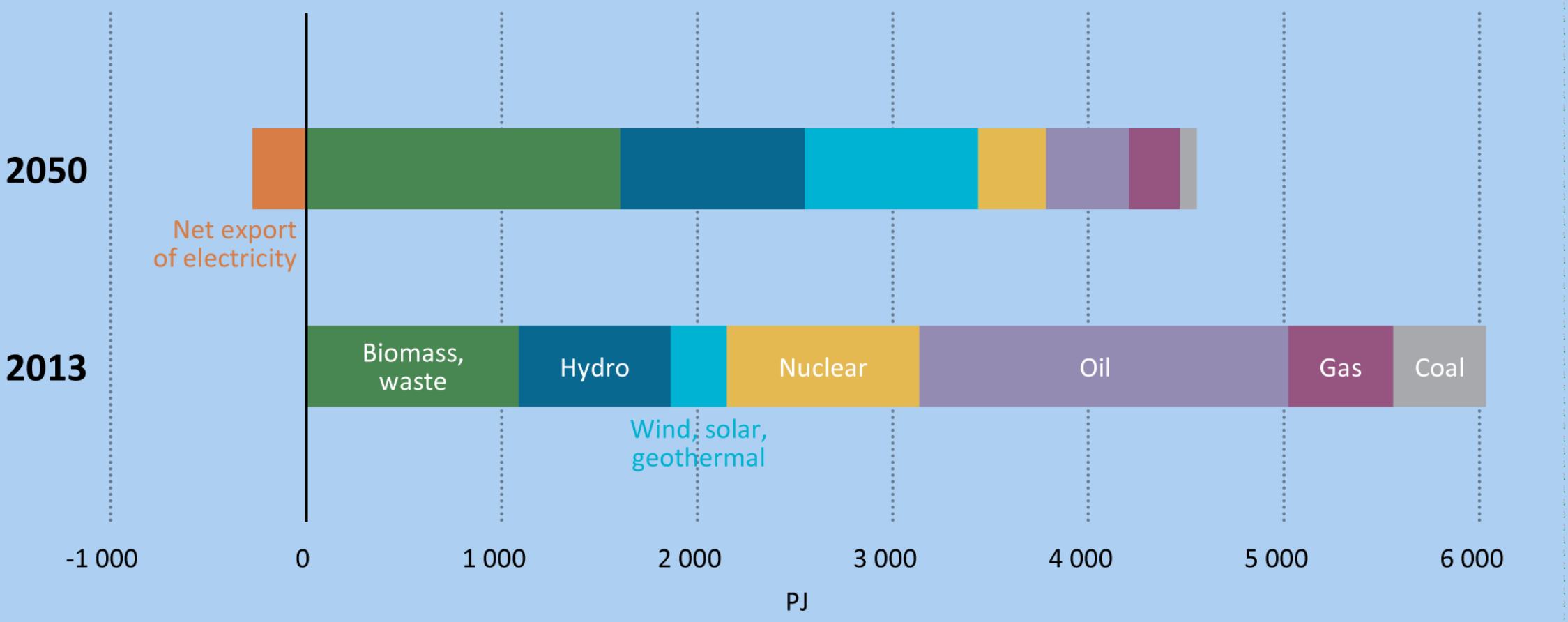
Demand sectors most challenging

Nordic CO_2 emissions in the Carbon Neutral Scenario



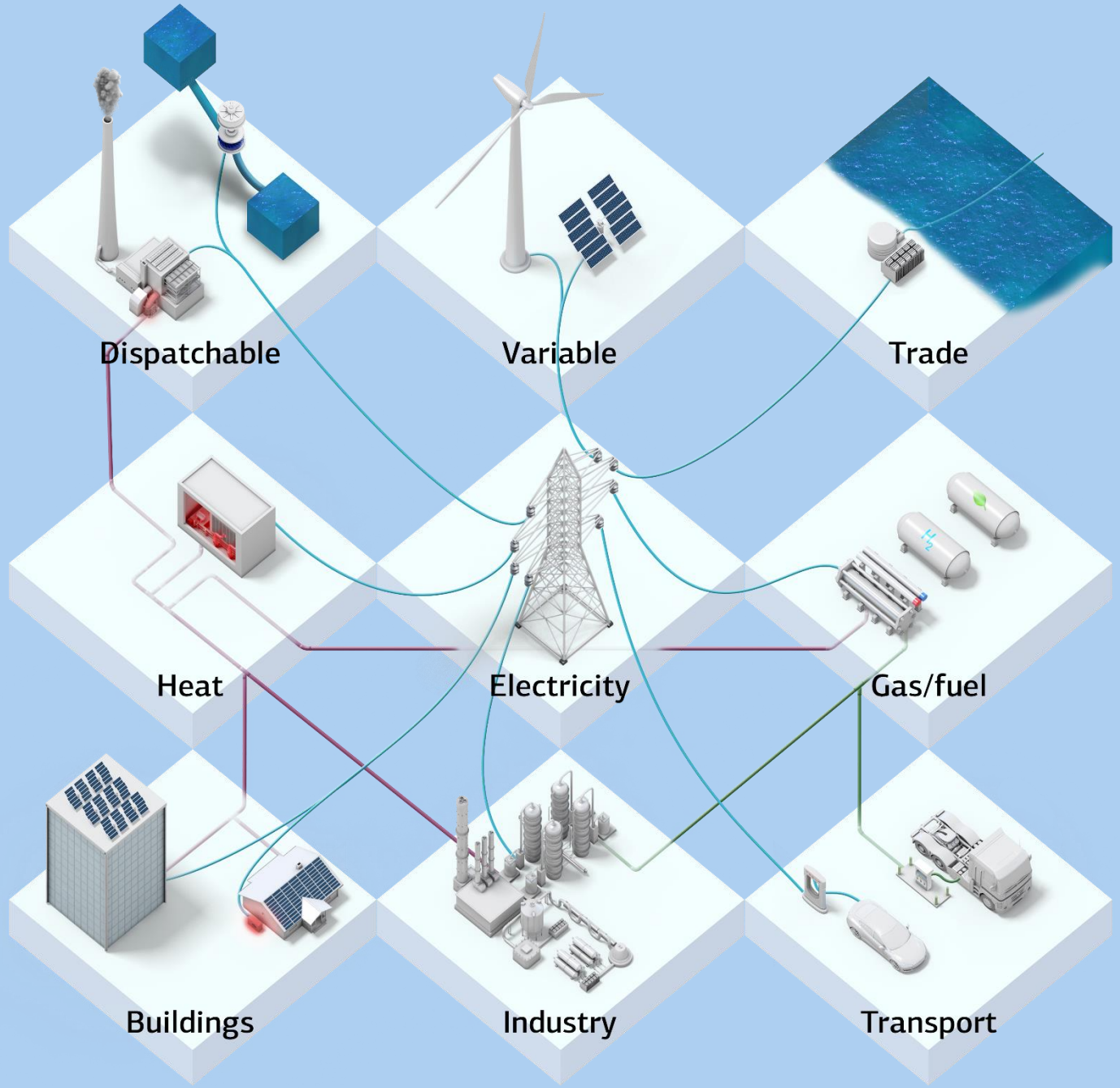
Transforming the energy system

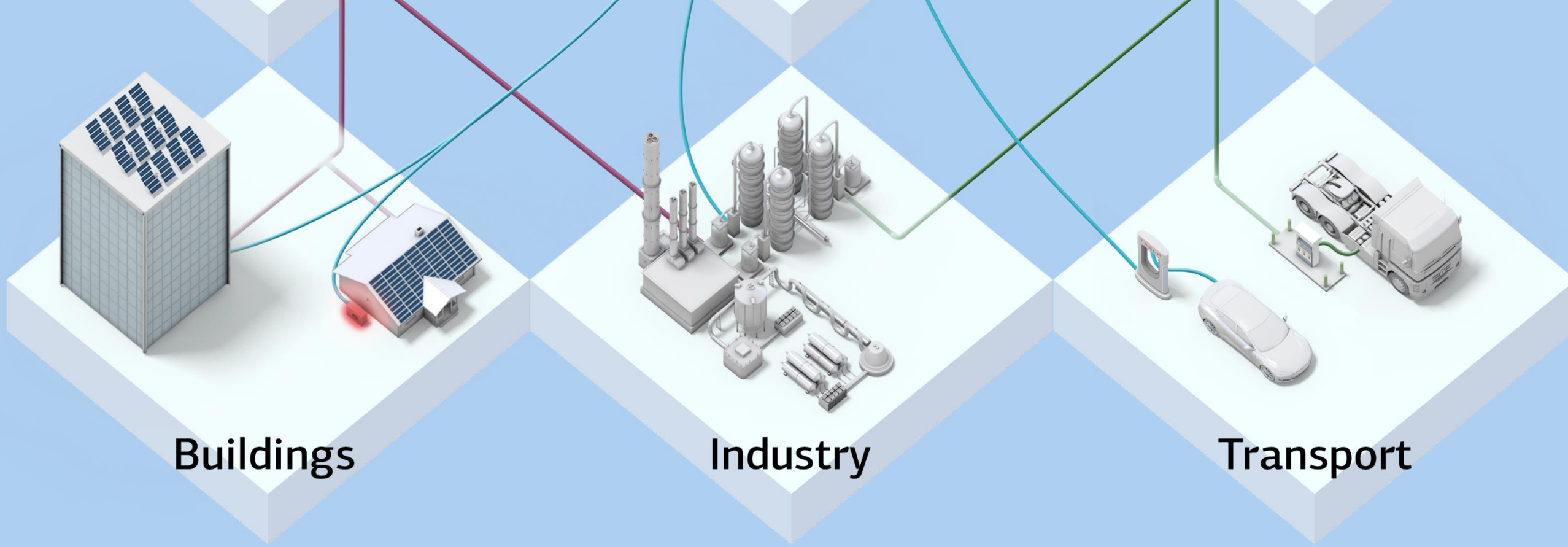
Nordic Total Primary Energy Supply



IEA workshop Calgary 2007:

"15 full-scale CCS plants by 2015"


Dispatchable
Variable
Trade
Heat
Electricity
Gas/fuel
Buildings
Industry
Transport



Buildings

5-6 GW

in 2050

Industry

5-6 GW

in 2050

Transport

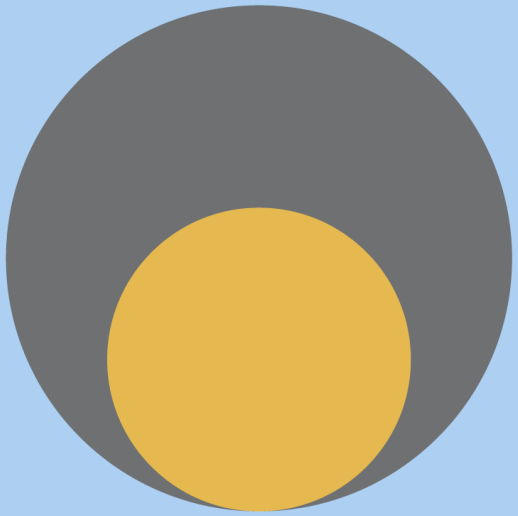
1-2 GW

in 2050

CCS critical in industry

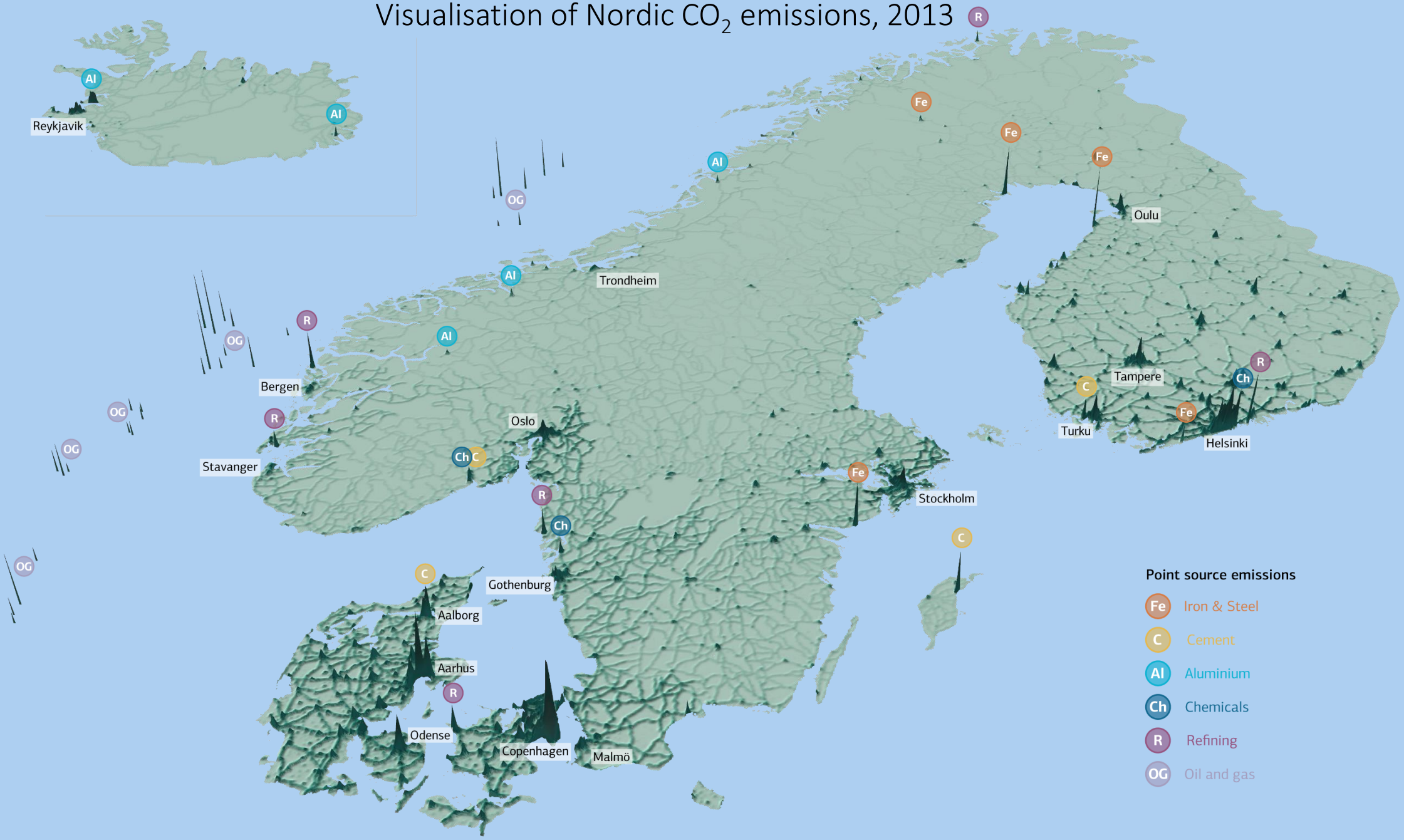
Nordic industrial emissions in 2050

Total
20 Mt CO_2

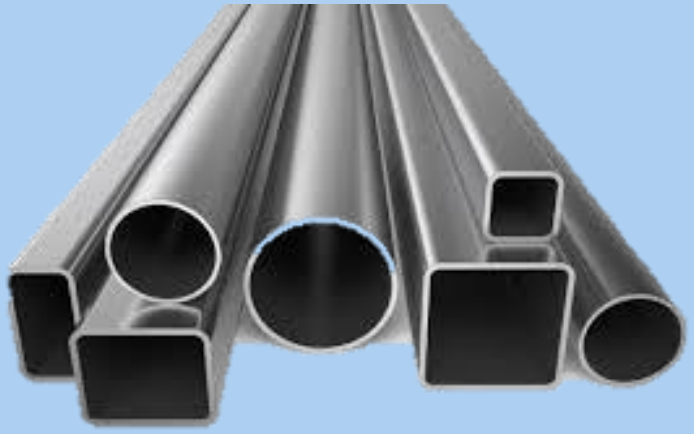


Captured
7 Mt CO_2

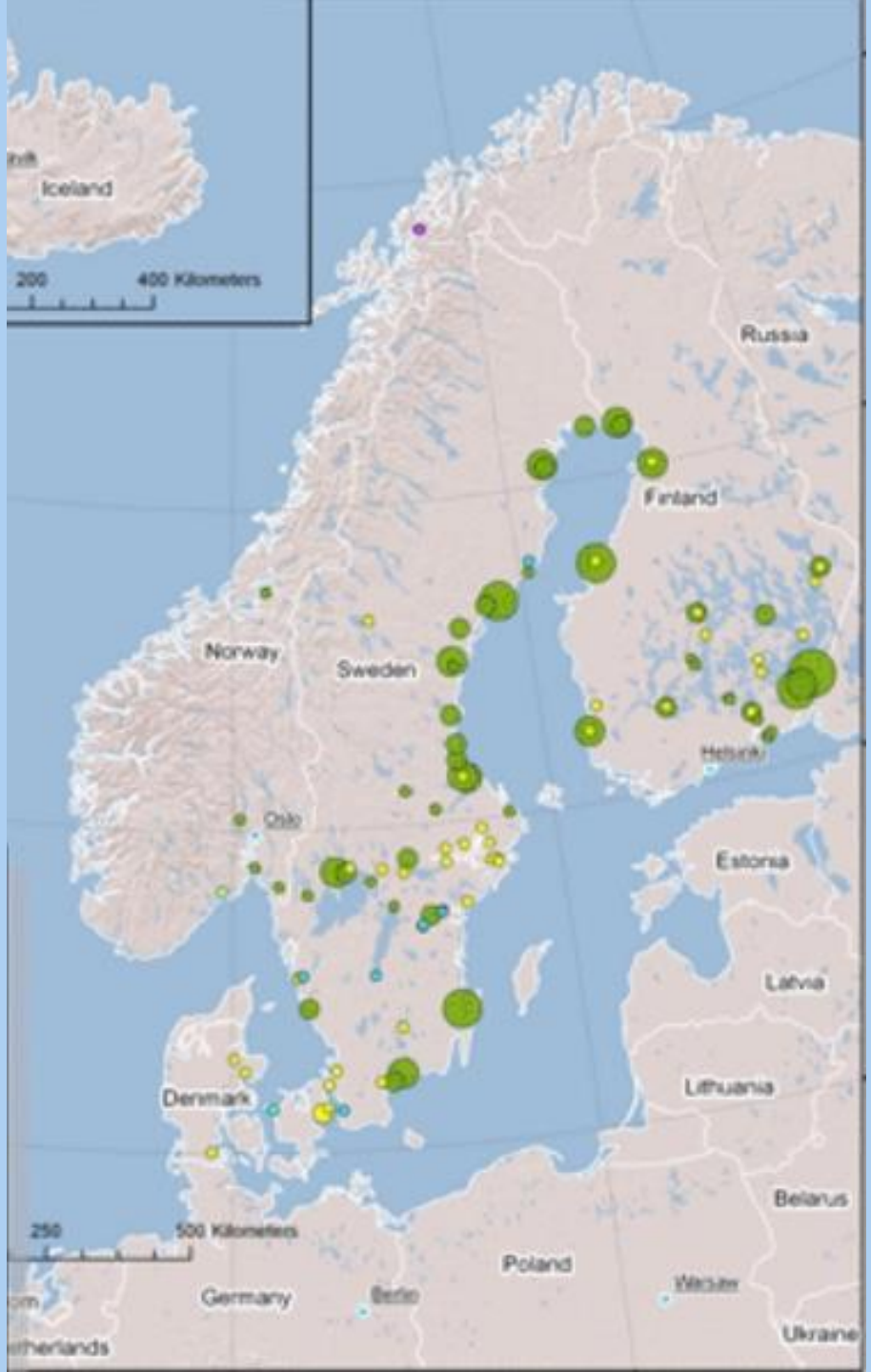
Visualisation of Nordic CO_2 emissions, 2013



Industrial CCS



Nordic stationary CO_2 emissions




BCCS

Thank you for your attention

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