Study on ‘Enhanced regional energy cooperation in the Baltic Sea Region’

Multi-client study

- Nordic Council of Minister
- Baltic Sea Parliamentary Committee
- Baltic Development Forum
- Fabrikant Mads Clausens Fond, Danfoss

BDF Summit, 2 December 2008

Anders Kofoed-Wiuff,
Ea Energy Analyses

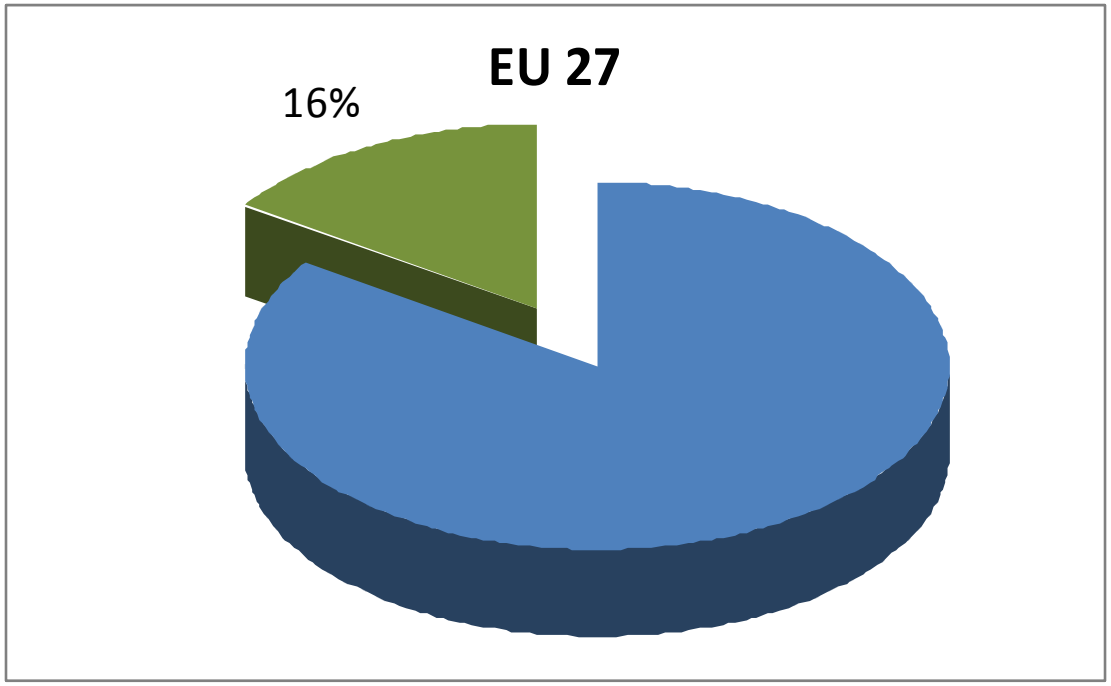
Scope of the study

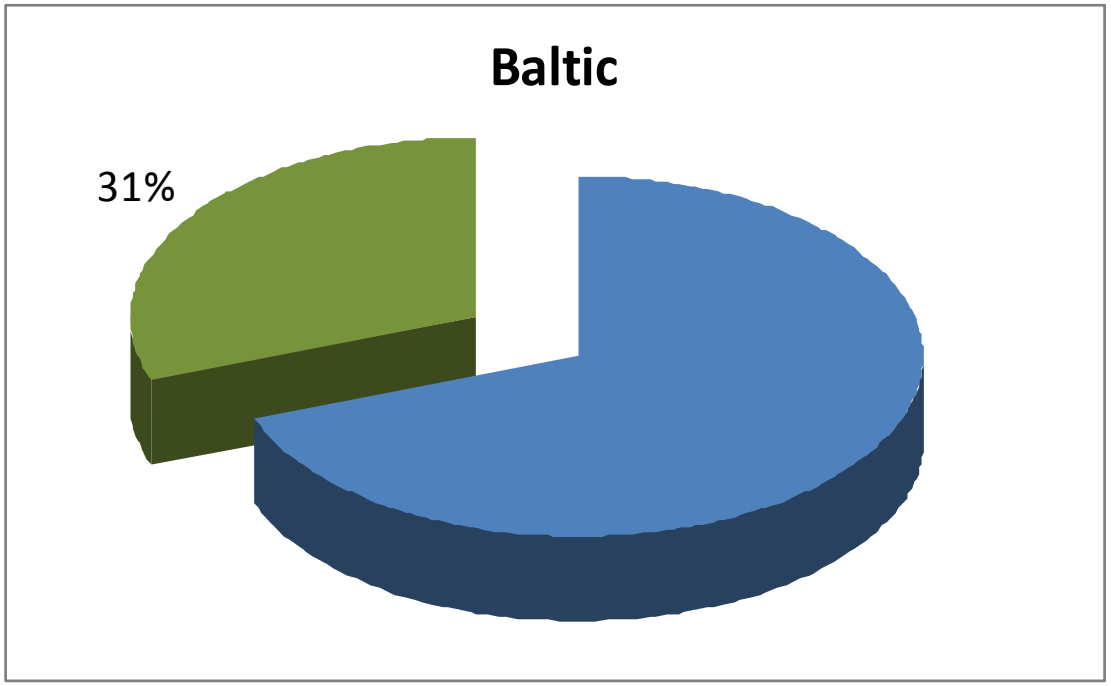
- Overview of current energy situation and scenarios for the future regional energy system
- Prioritized list of regional projects to promote the region as a sustainable region
- Outline the possibilities for the industry to be frontrunners in the development of new energy technologies
- Ideas for further development of regional knowledge sharing in the field of sustainable energy


GAS
OIL
Hydro
Hydro
Nuclear
Bio
Nuclear
Bio
Hydro
Gas
Coal
Oilshale
Coal
Gas
Wind
Hydro
GAS
OIL
Coal
Nuclear
Wind
Expected high economic growth

Bioenergy

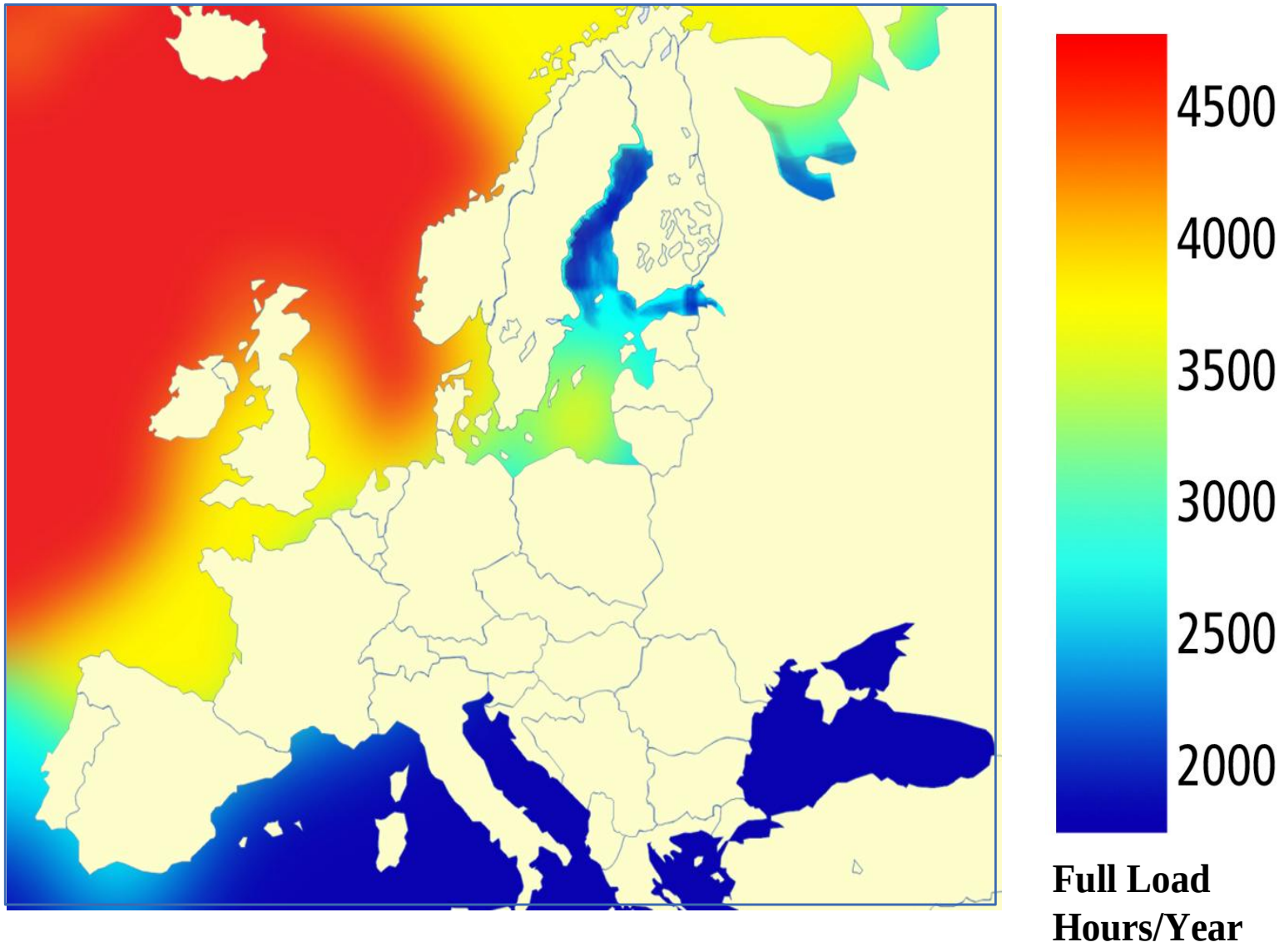
- Potential as share of gross energy demand



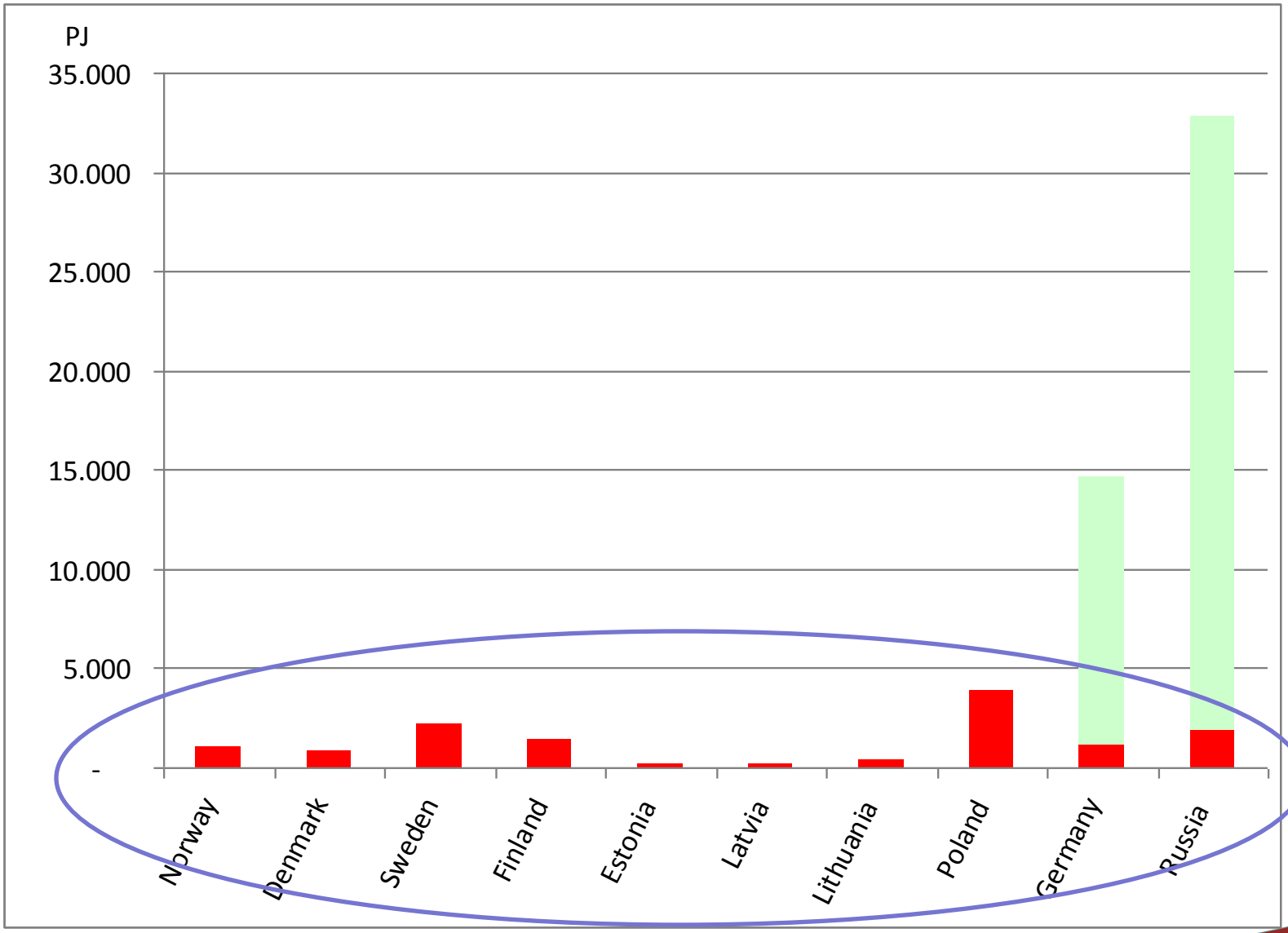


Calculation based on stats from DG TREN and EEA

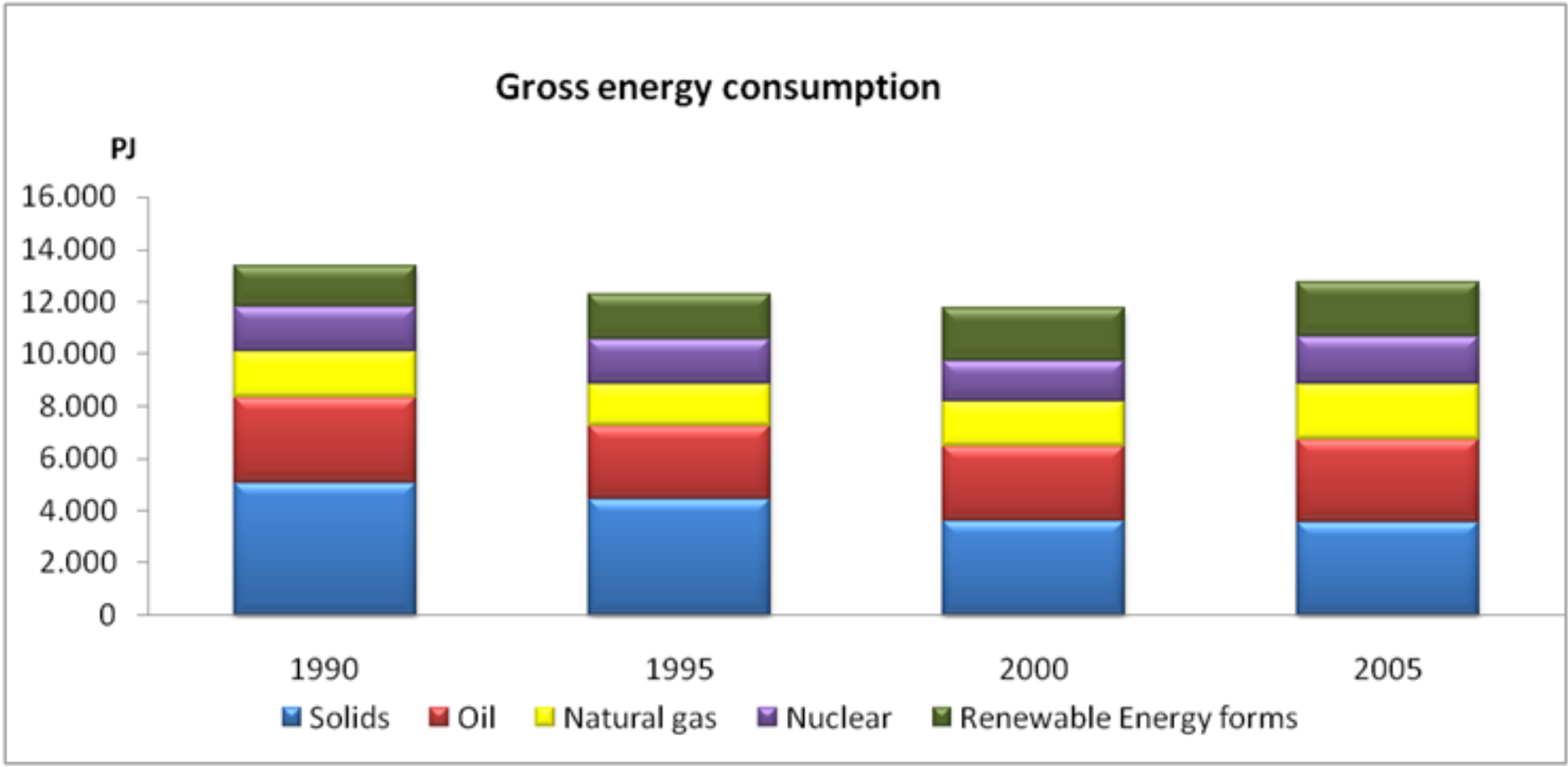
Wind energy resource



Baltic Sea Region
Gross energy consumption



Characteristics of the region



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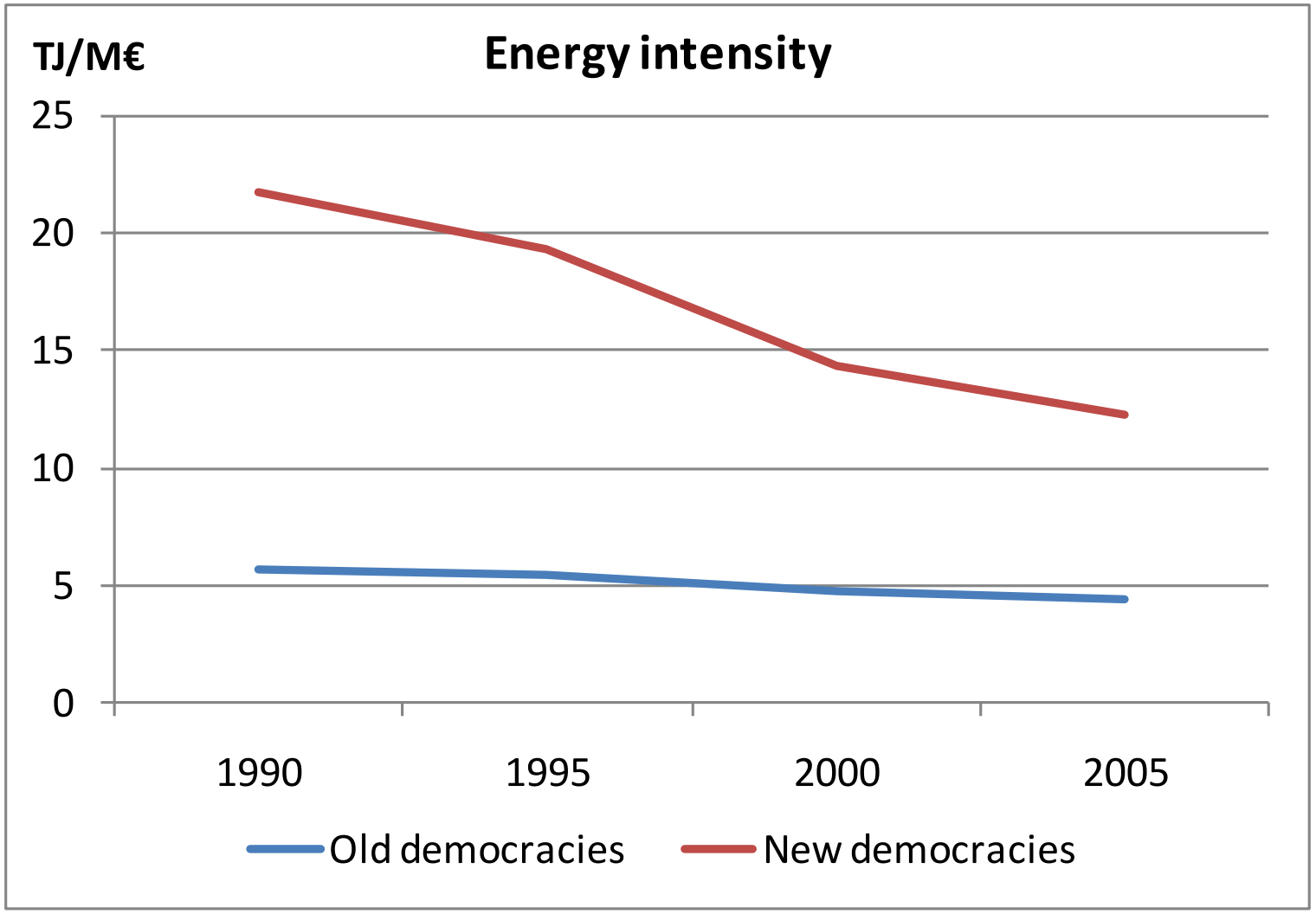
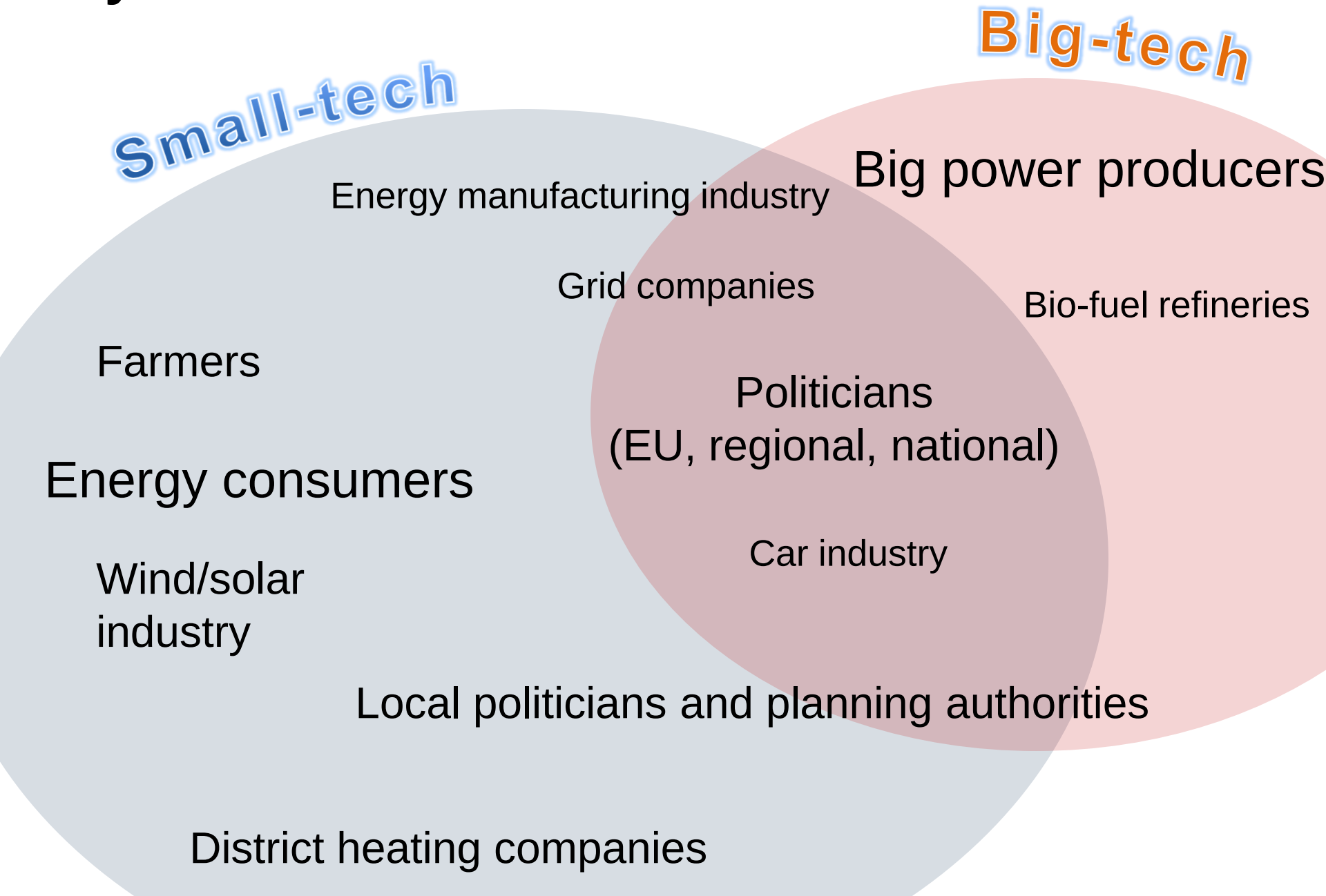


Two scenarios for 2030

	Small-tech	Big-tech
Energy	• Energy savings • District heating - CHP • Biomass • Wind, wave, solar	• Carbon Capture & Storage • Nuclear power • Biomass
Transport	• Improved fuel economy • Electric vehicles • Modal-change • ICT	• Improved fuel economy • Electric vehicles • Biofuels

…or perhaps a combination

Key decision makers



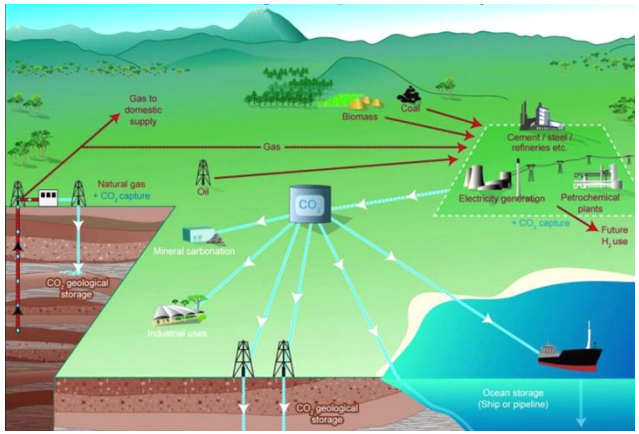
Nuclear power

- **Today**
  - **21 GW**
- **Big-tech**
  - **28 GW**
  - **No phase-out in Sweden, Germany and Russia. New nuclear in Poland, Lithuania and 6th reactor in Finland**
- **Small-tech**
  - **9 GW**
  - **Phase-out in Germany, 50 % phase-out in Sweden and Russia**
  - **No nuclear in Lithuania**

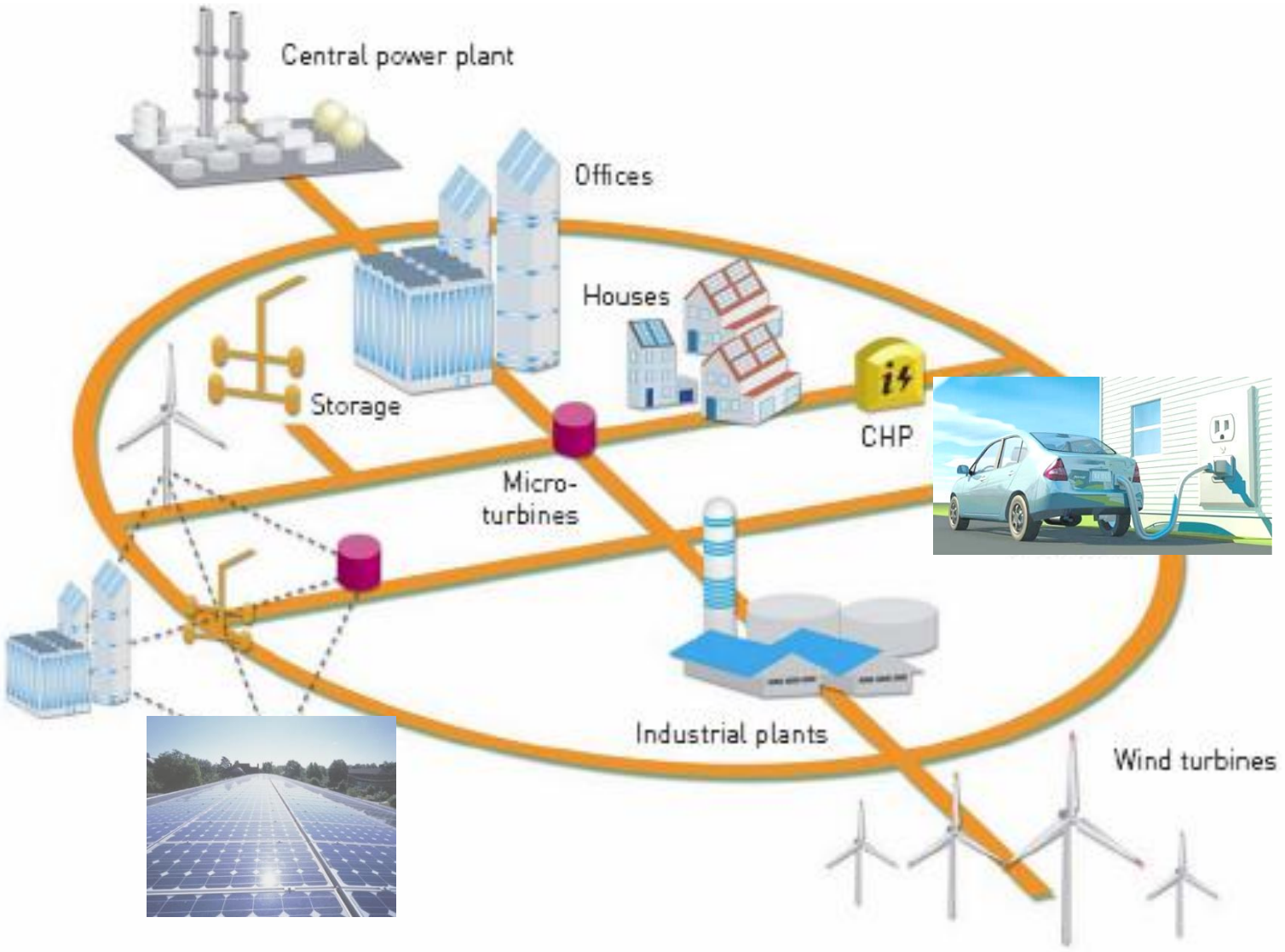
Carbon Capture and Storage

- Key measure in Big-tech
  - 30 GW power capacity equipped with CCS supplying 20 % of overall electricity demand
  - all large thermal power plants commissioned beyond 2020 with CCS. Coal power plants commissioned in the period 2010-2020 are prepared for CCS

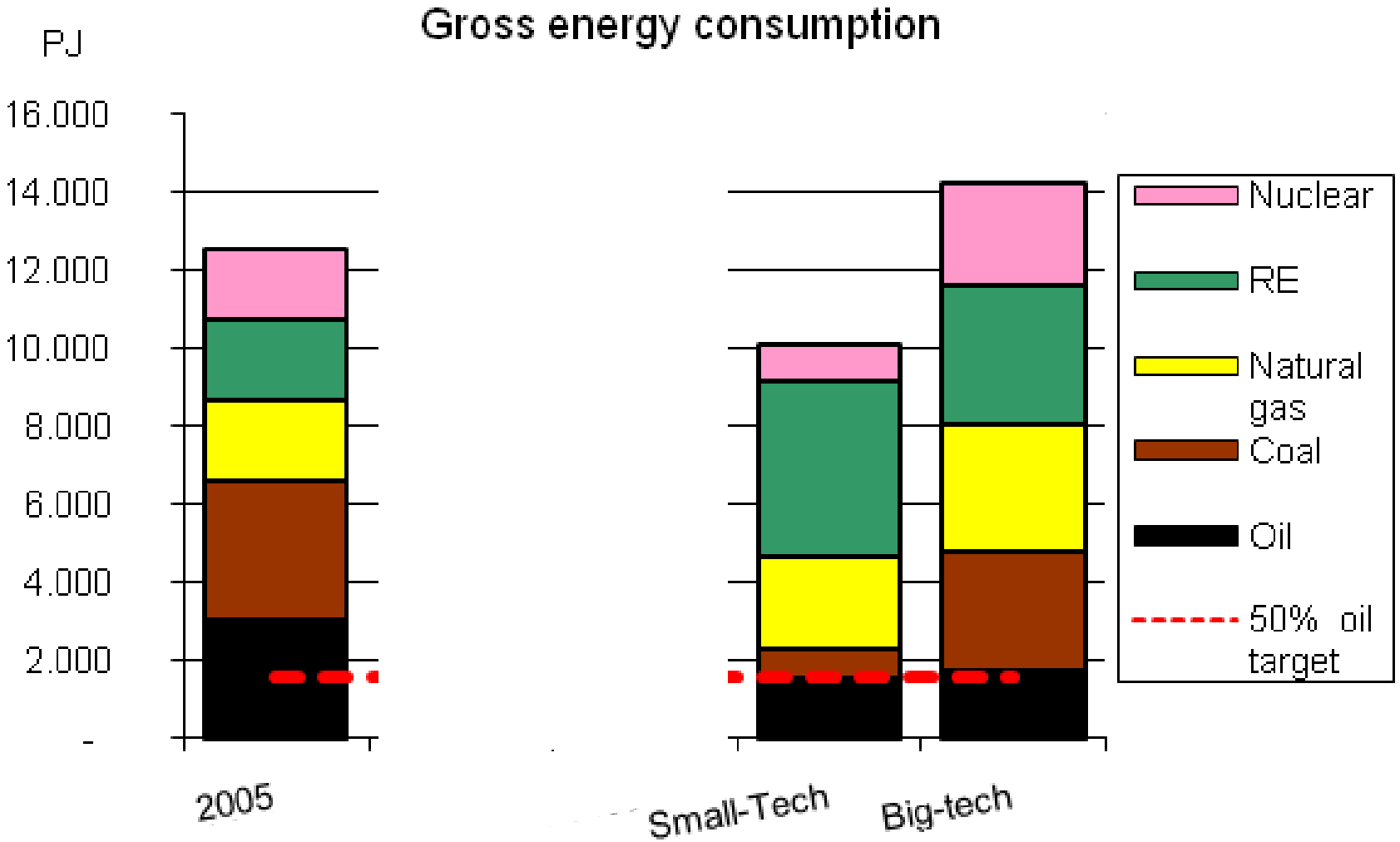
- Assuming
  - 90 % cleaning eff.
  - 10 %-point electric efficiency loss



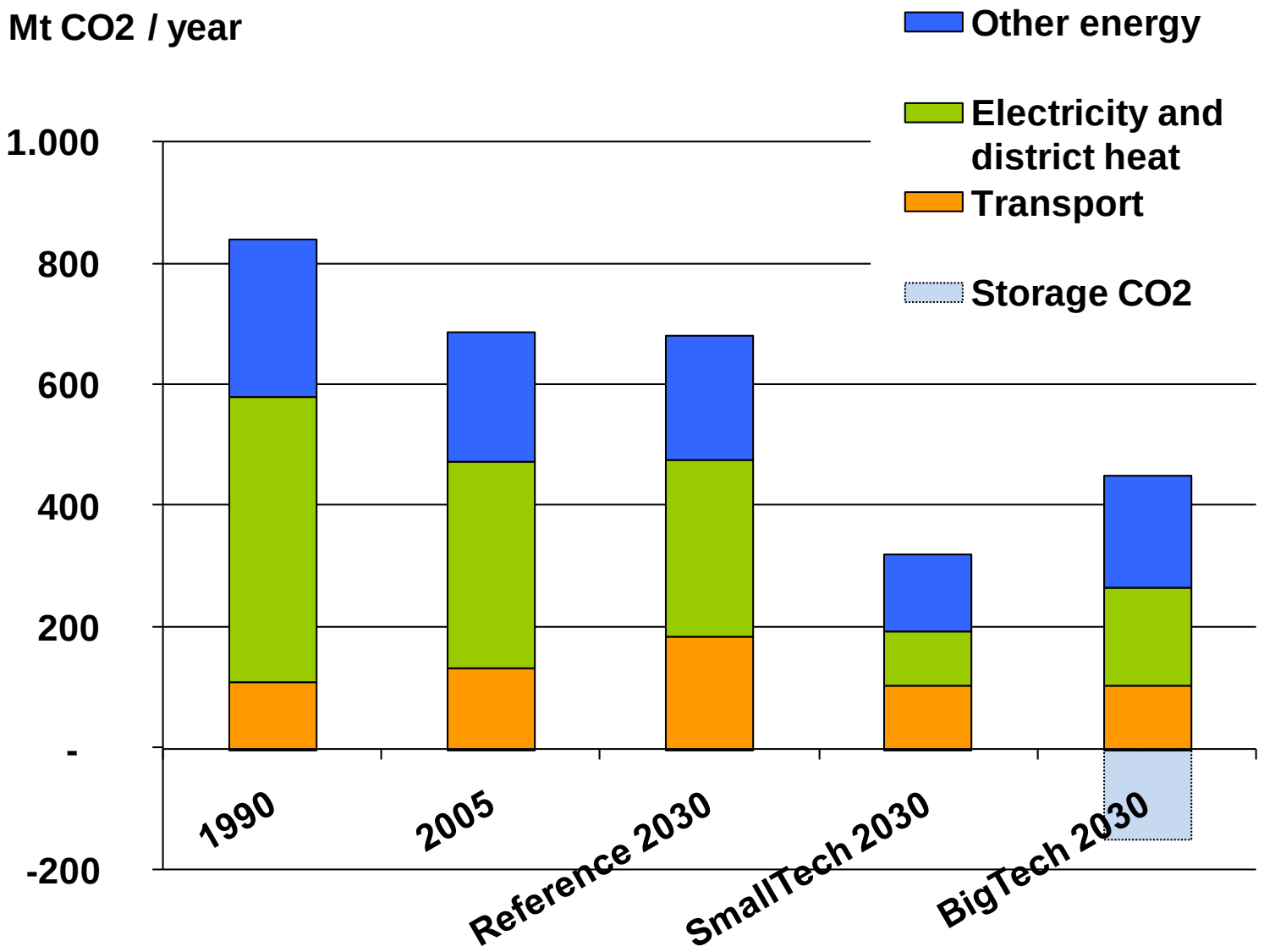
Small-tech calls for smart grids and ICT



Results

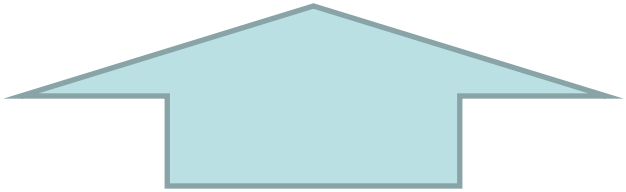

Gross energy consumption
PJ
16.000
14.000
12.000
10.000
8.000
6.000
4.000
2.000
-
2005
Small-Tech
Big-tech
Nuclear
RE
Natural gas
Coal
Oil
50% oil target

Results


Mt CO2 / year
Other energy
Electricity and district heat
Transport
Storage CO2
1.000
800
600
400
200
-
-200
1990
2005
Reference 2030
SmallTech 2030
BigTech 2030

Renewed focus on the region

- EU strategy for the Baltic Sea Region
  - by June 2009
- Baltic Interconnection Plan
- European coordinators
  - Connection to offshore wind power in Northern Europe
  - “Poland-Lithuania link”



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Key issues

- How should the energy systems in the region develop?
  - Big-tech, Small-tech – or perhaps a combination?

- How to ensure a coordinated planning for off-shore wind and new infrastructure project?
- How to develop the energy markets?
  - Electricity and gas - biomass?
- How to promote best-practice policies on district heating and CHP, energy savings, sustainable transport systems?
- How to cooperate on the demonstration of CCS?
- How to promote industry cooperation on developing and marketing energy efficient appliances?

Questions for discussion?

- What are the skills and the complimentarities of the region?
- Which kind of vision could we have for the Baltic region?
- Which objectives could we set for the next 20-30 years?
- Which existing and new frameworks and initiatives do we need for enhanced regional cooperation?