

Transition to Renewable Energy until 2030 – 2050 in the EU and Denmark, INFORSE Vision

- ❖ Gunnar Boye Olesen, International Network for Sustainable Energy (INFORSE)
- ❖ Power & Place, Oct. 3, 2009,
Centre for Alternative Technology,
Wales

http://www.inforse.org/europe/seminar09_CAT.htm

INFORSE-EUROPE

International Network for Sustainable Energy - Europe

International Network for Sustainable Energy

- Network of 150 NGOs worldwide, 72 in Europe
- Publish Sustainable Energy News
- Develop & promote sustainable energy visions
- Members cooperate and exchange information
- Training with Distance Internet Education for RES
- Follow international processes: Climate, IRENA
- Follow EU Policies
- Supported by EC - DG ENV, Nordic Council & others

The INFORSE Vision

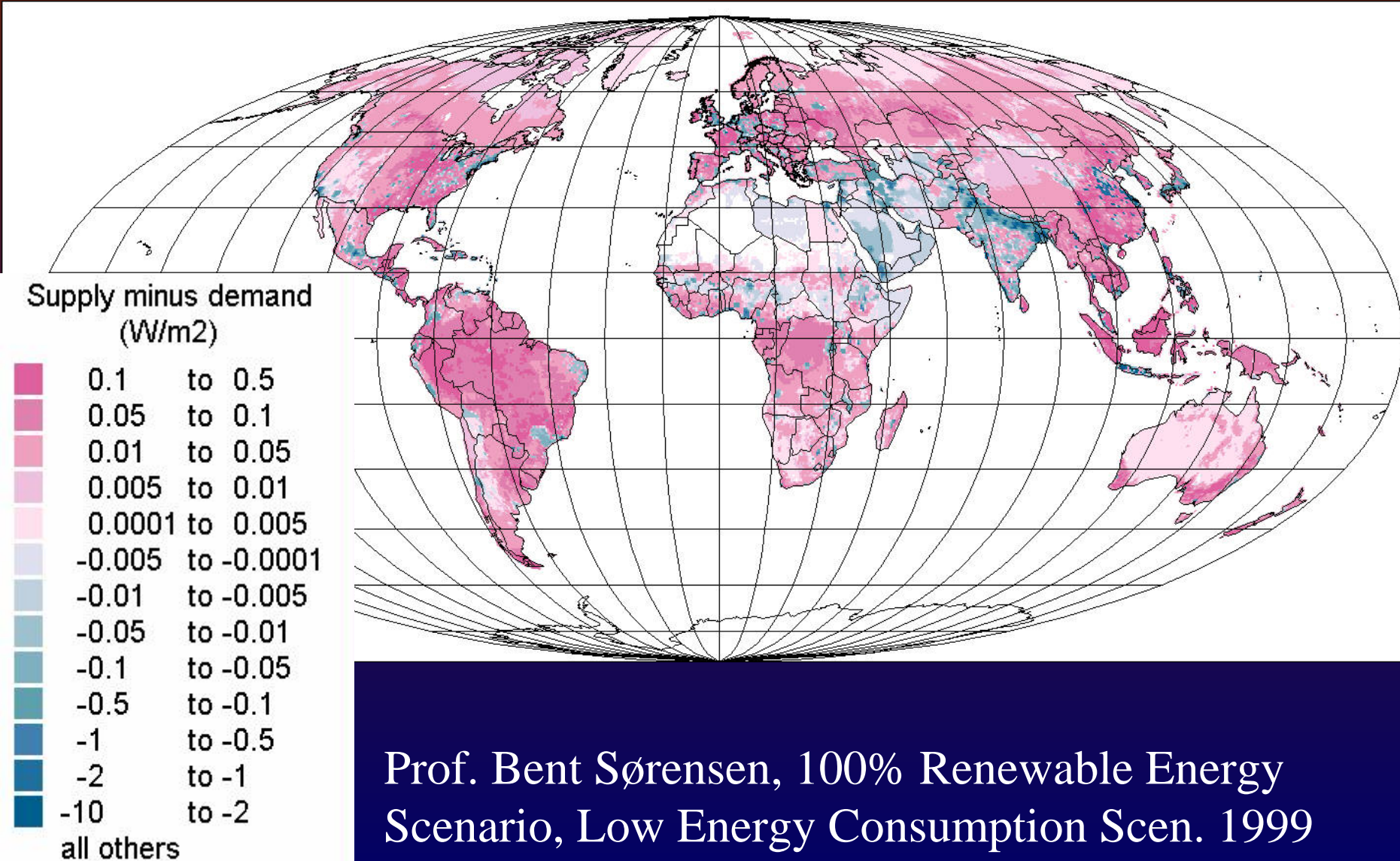
- Phase out fossil fuel and nuclear power
- Provide everybody with basic energy needs



INFORSE Sustainable Energy Visions

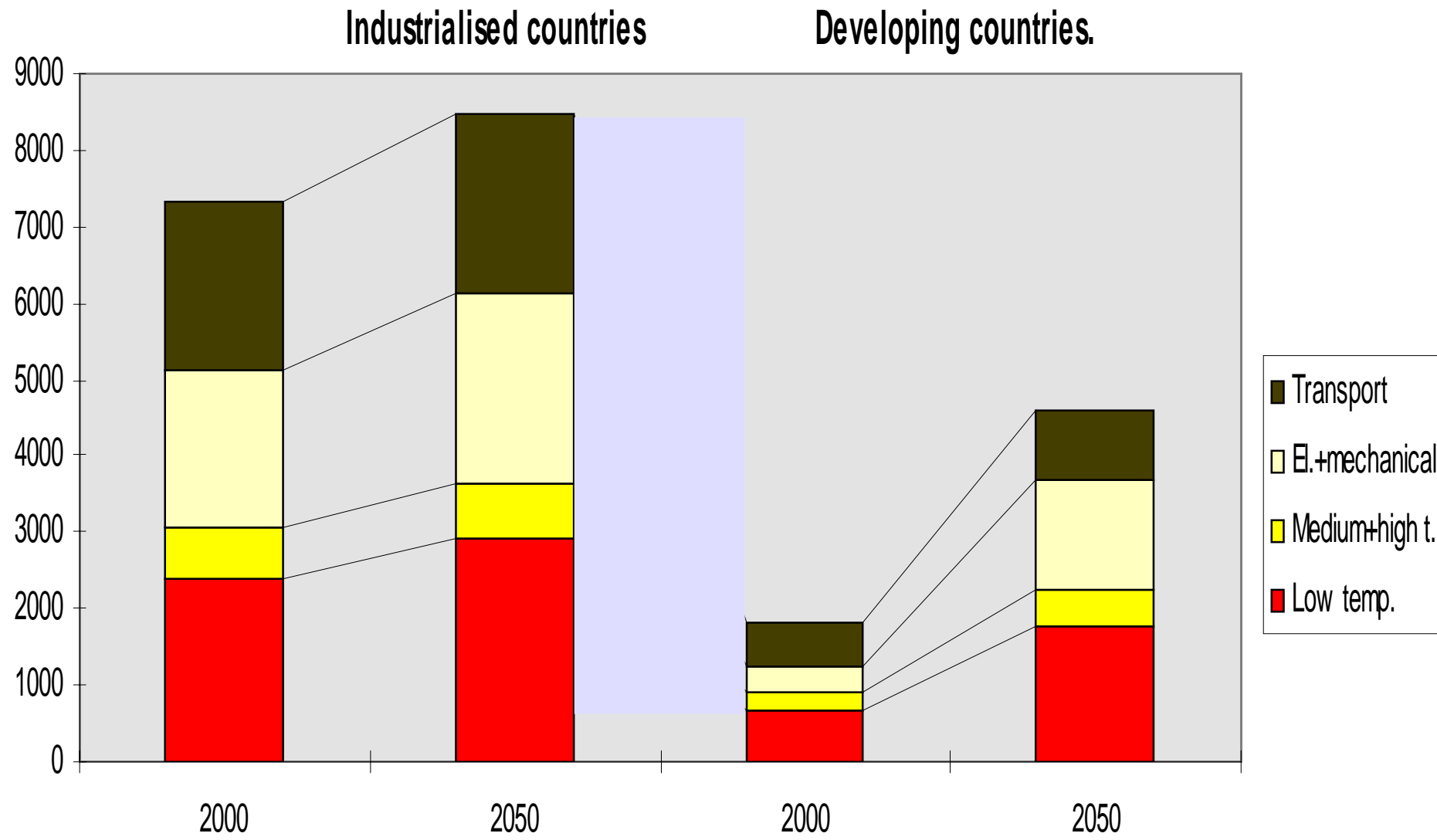
- Global Vision
- **Vision for EU-27**
 - Bulgaria
 - Denmark
 - Latvia
 - Lithuania
 - Romania
 - Slovakia
- UK Zero Carbon Britain
 - Belarus
 - Russia
 - Ukraine

The Global Vision



Prof. Bent Sørensen, 100% Renewable Energy
Scenario, Low Energy Consumption Scen. 1999

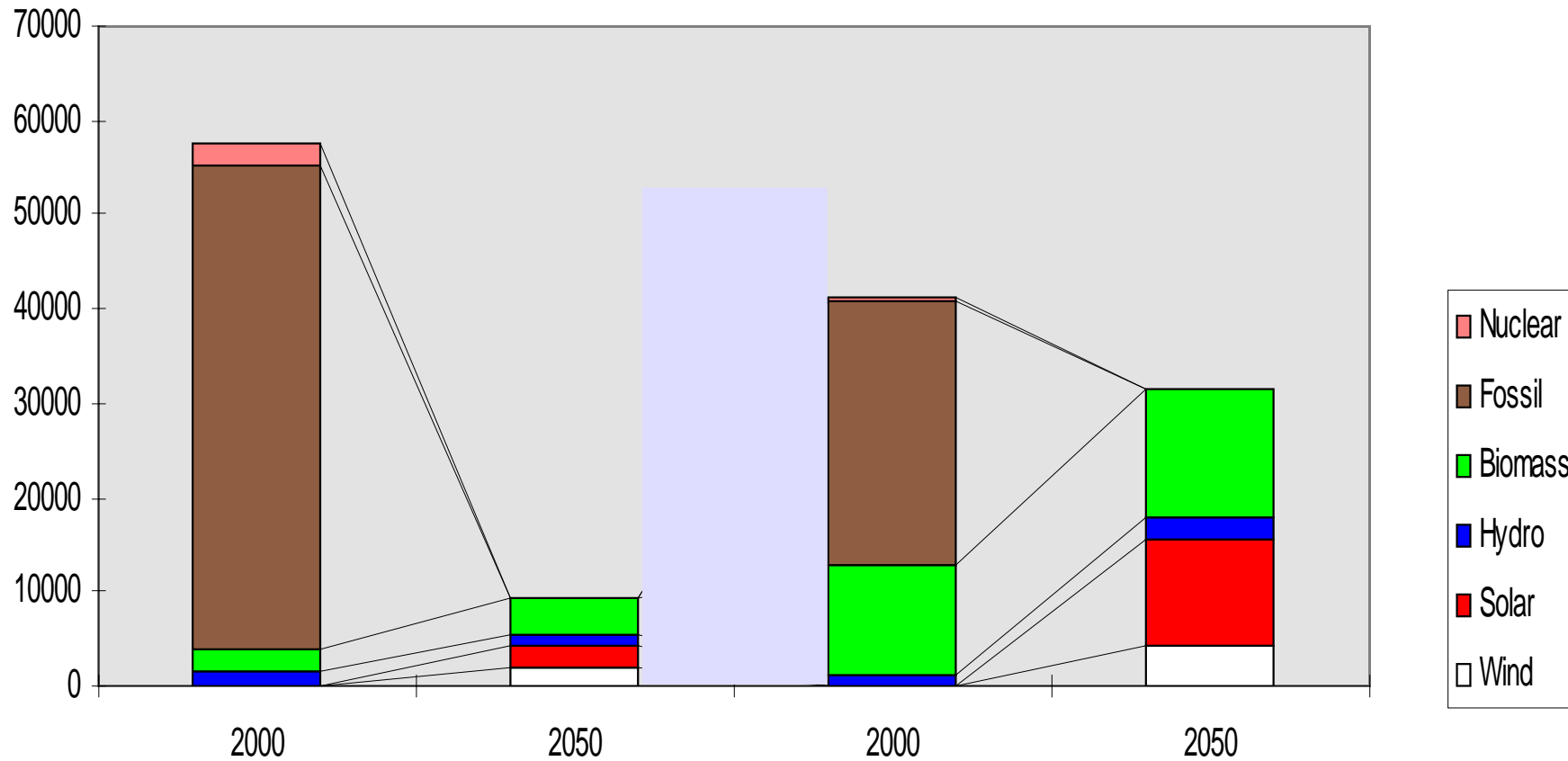
Energy Services per capita



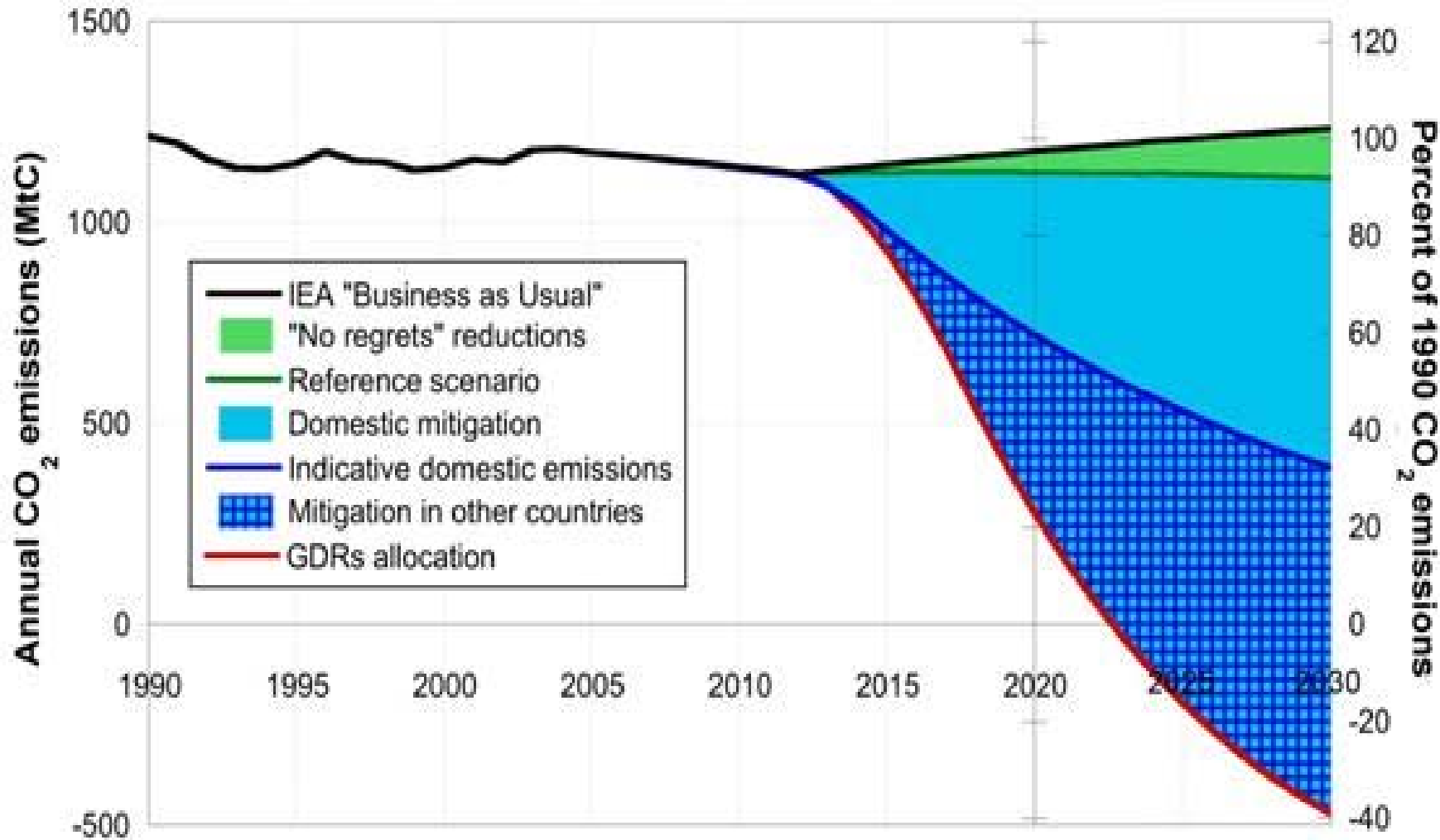
Primary Energy (TWh/y)

Industrialised countries

Developing countries



EU's Challenges in a Global Development Rights Framework



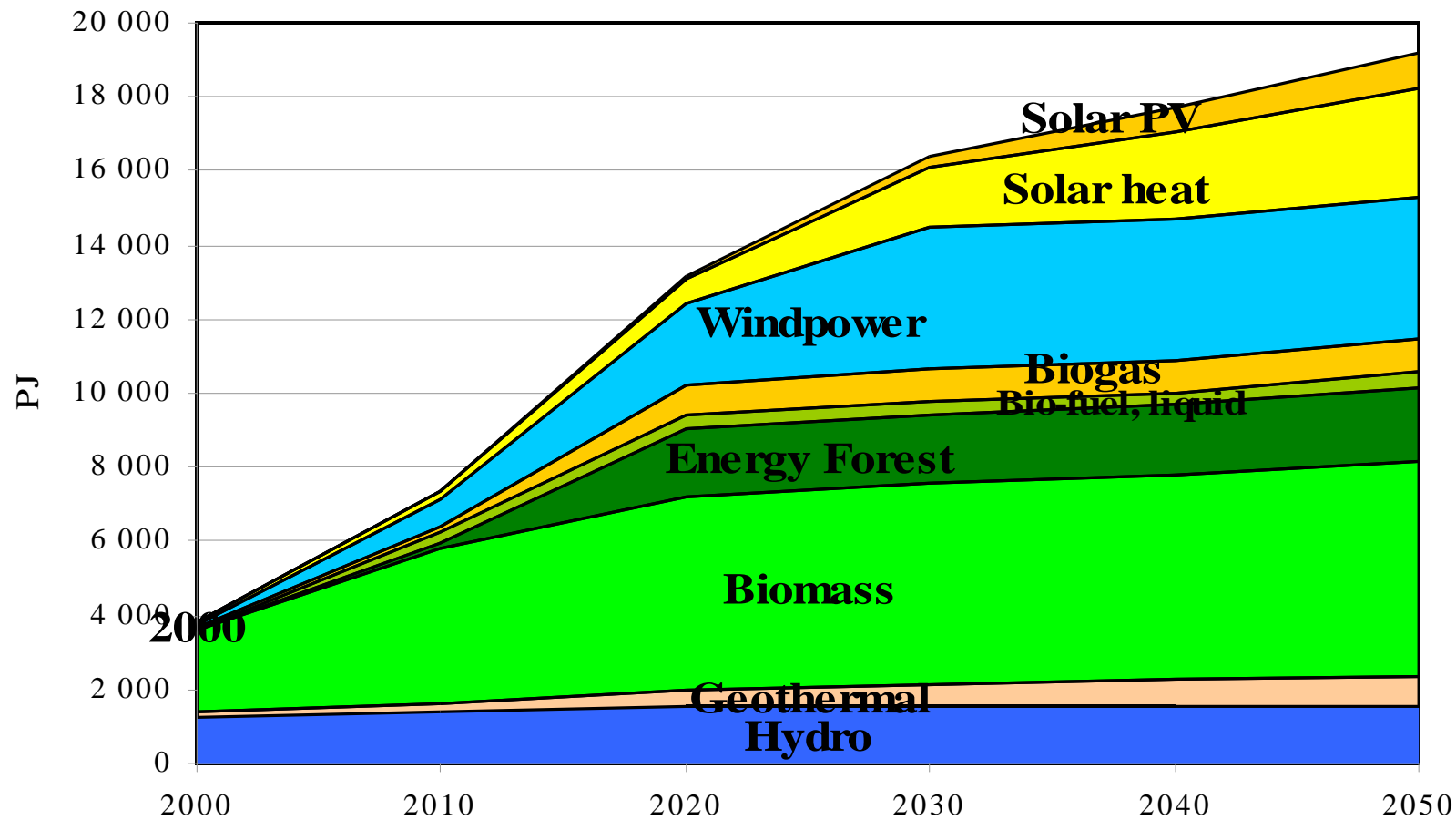
EU-27 Sustainable Energy Vision

Input:

- **Modest increase in energy services, less road transport**
- **Large increase in energy efficiency, factor 4 in end-use sectors when possible**
- **Efficient energy supply with combined heat and power, smarter and more efficient grids**
- **Rapid development of renewable energy**
- **Phase out of nuclear until 2025**

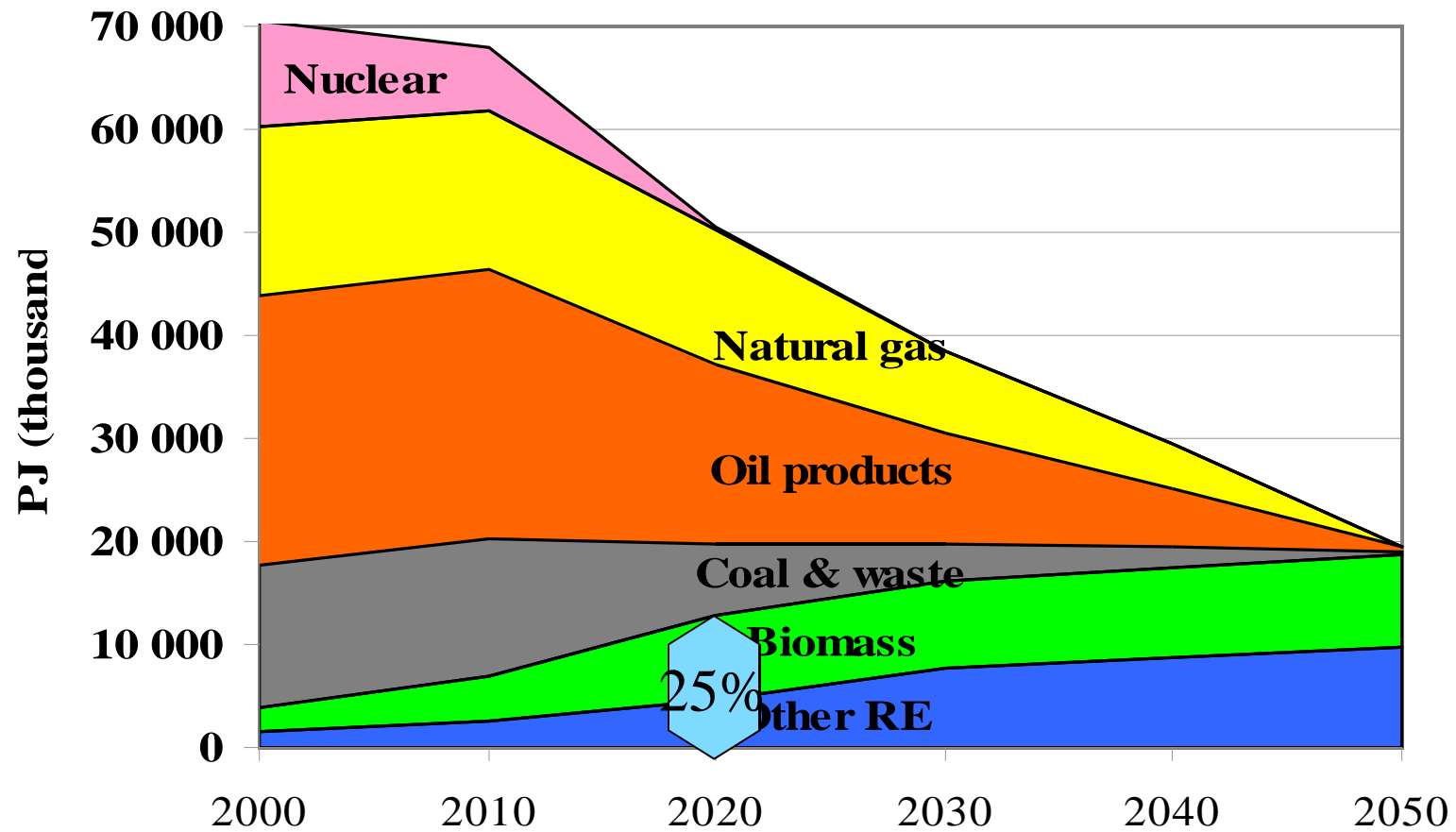
Renewable Energy Supply - EU27

Renewable Energy Supply, EU27



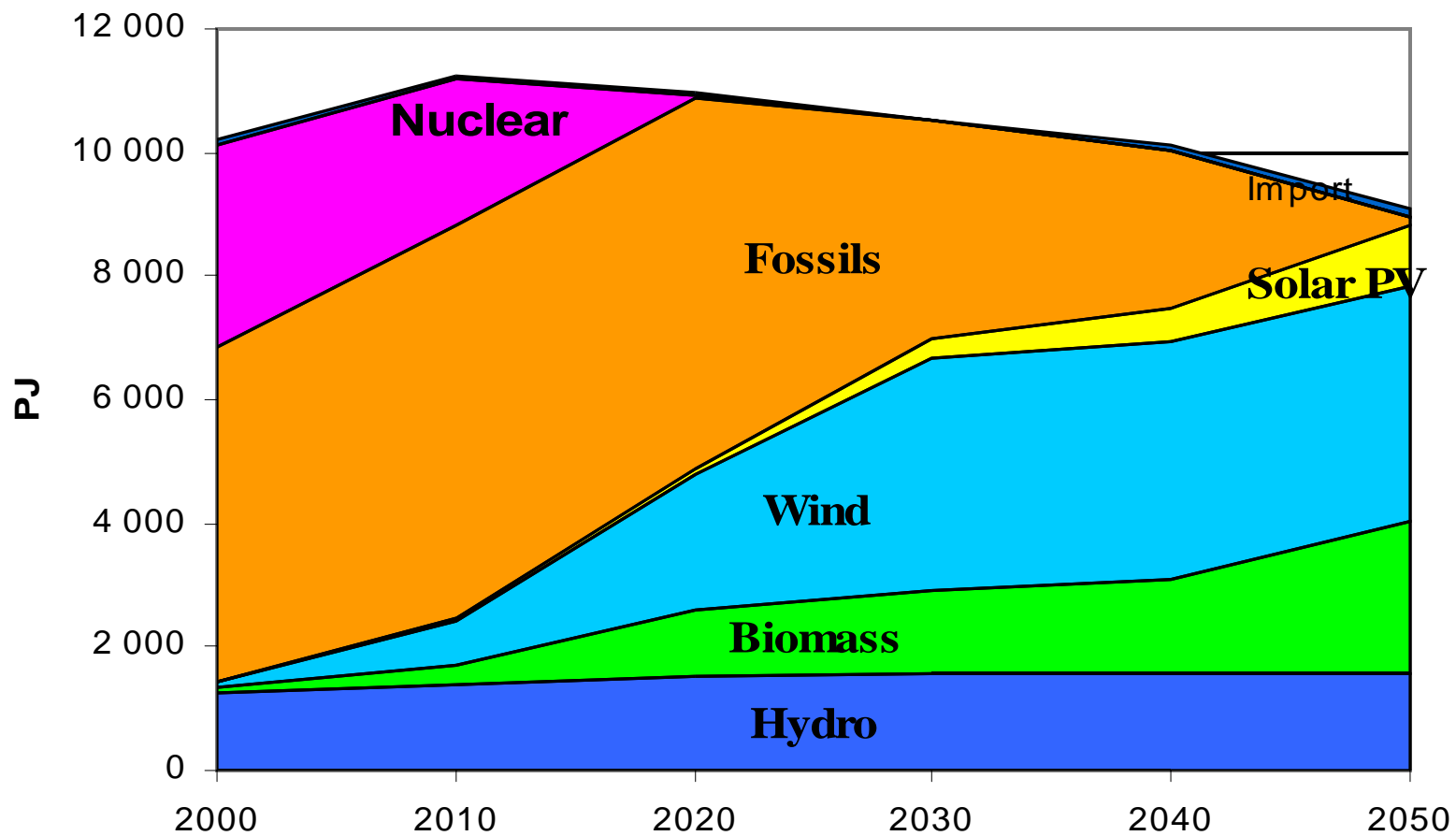
Primary Energy

Total Primary Energy Supply, EU-27



INFORSE's EU-27 Vision

Electricity Divided in Supply, EU-27



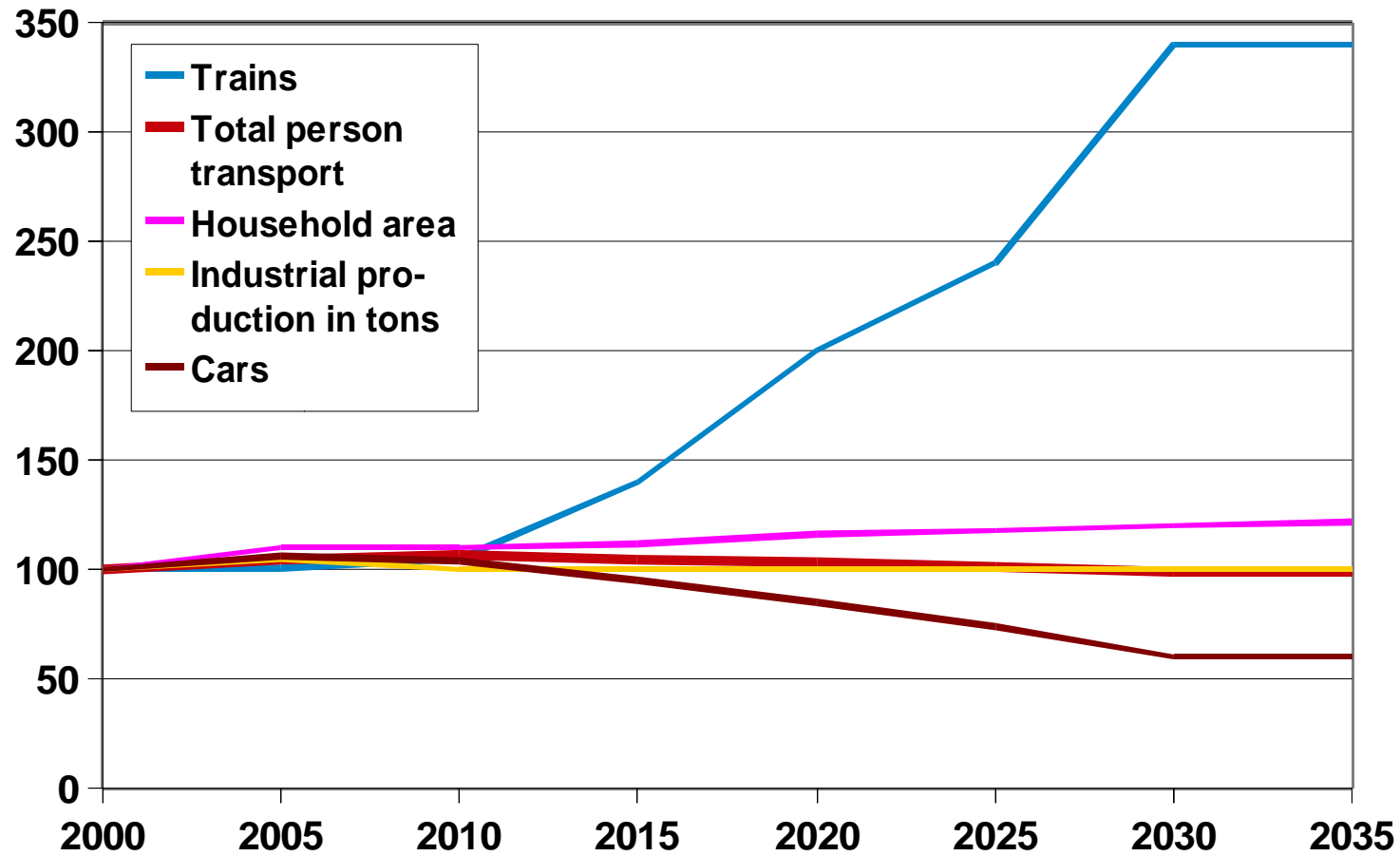
Vision for Denmark (OVE)

- ❖ Strong growth in windpower, sust. biomass
- ❖ Reduce specific building consumption 39% to '30
- ❖ Reduce specific electricity use, industry 42% to '30
- ❖ Flexible energy: district heating, heat pumps, electric cars and hydrogen
- ❖ Sustainable transport system, 75% more efficient
- ❖ No new international power lines

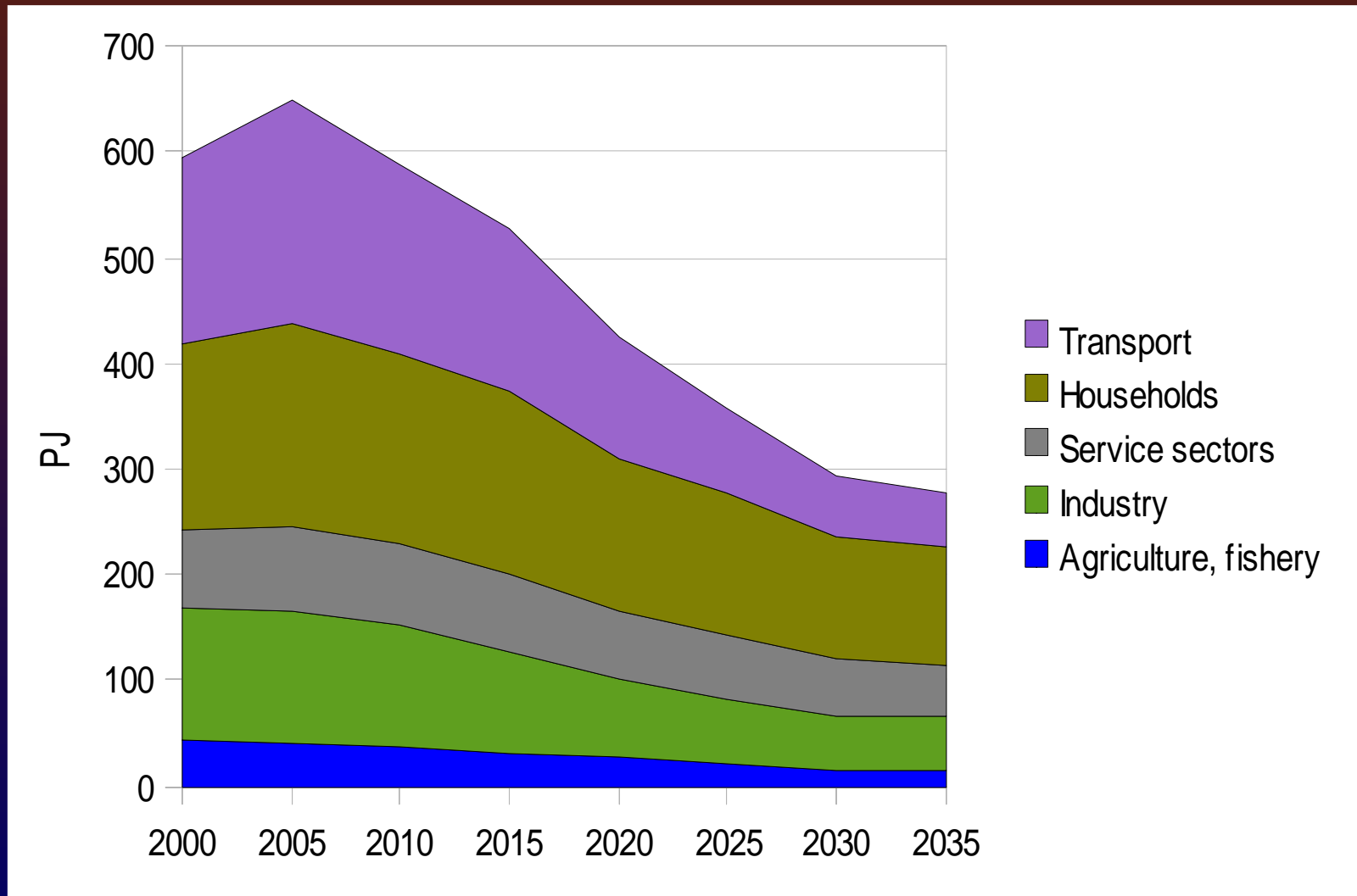


Development of activities, DK

Activity compared with 2000, selected sectors

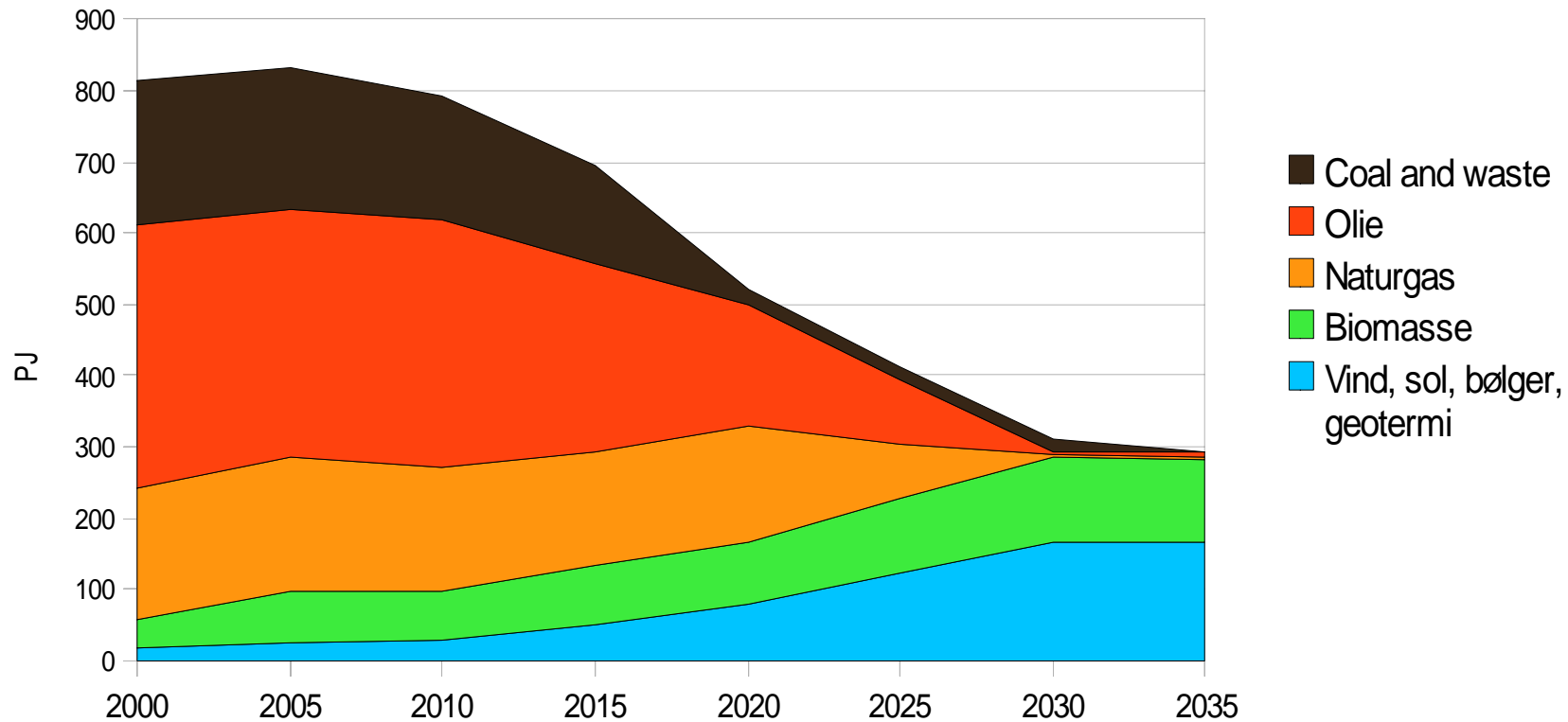


Final energy demand, all energies

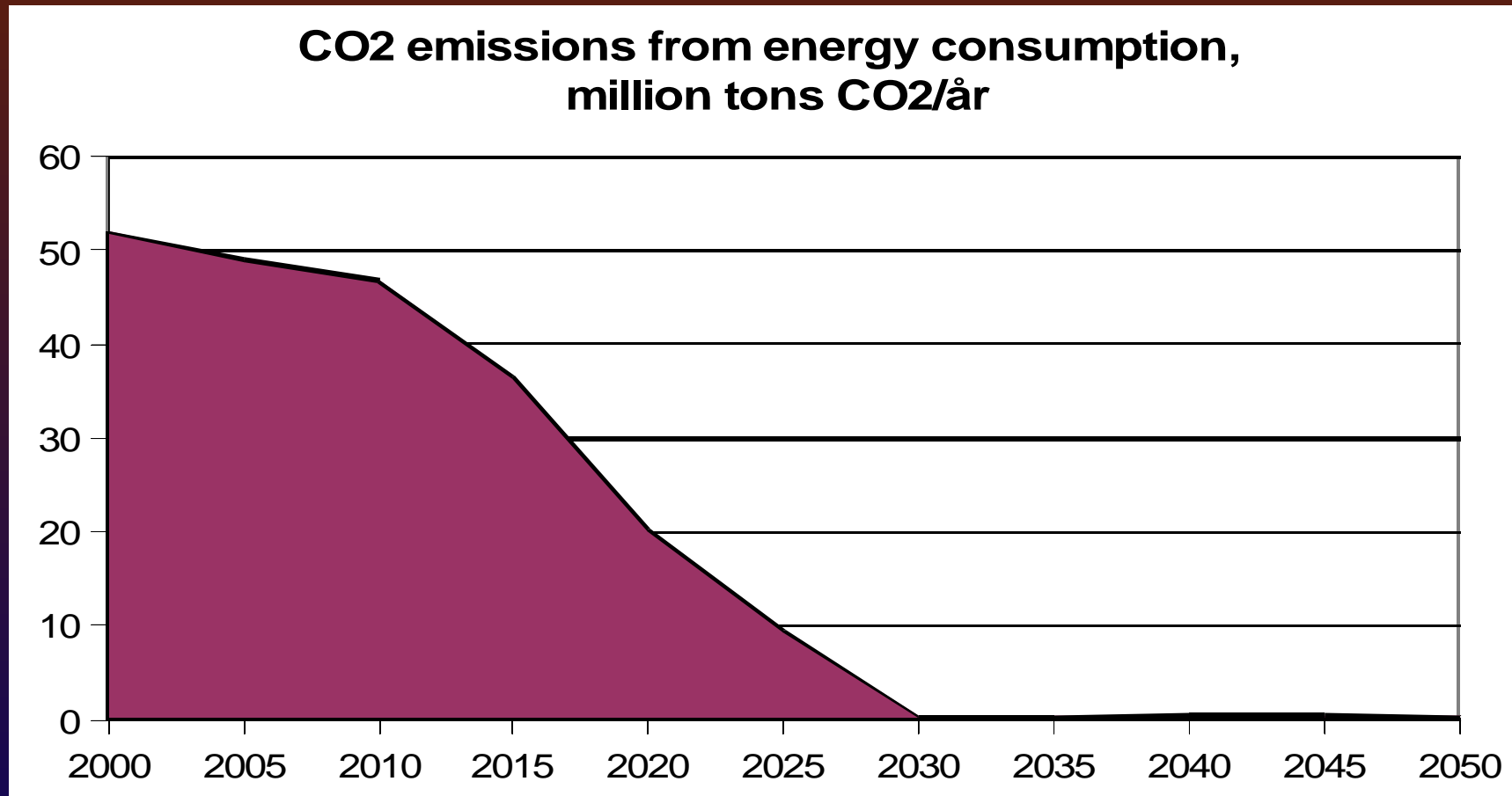


Danish Primary Energy Demand

Danish Primary Energy Supply



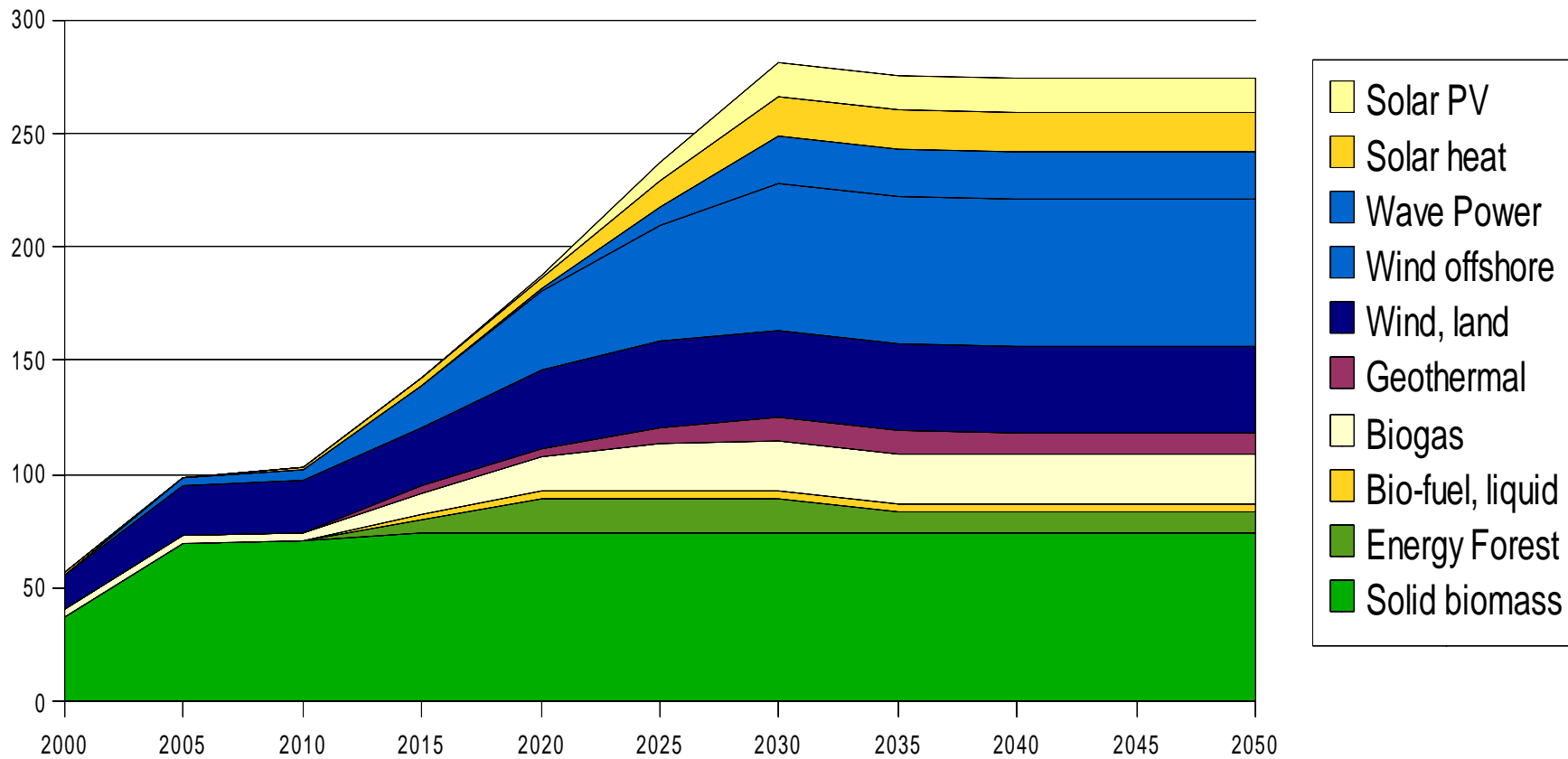
CO₂ emissions from energy



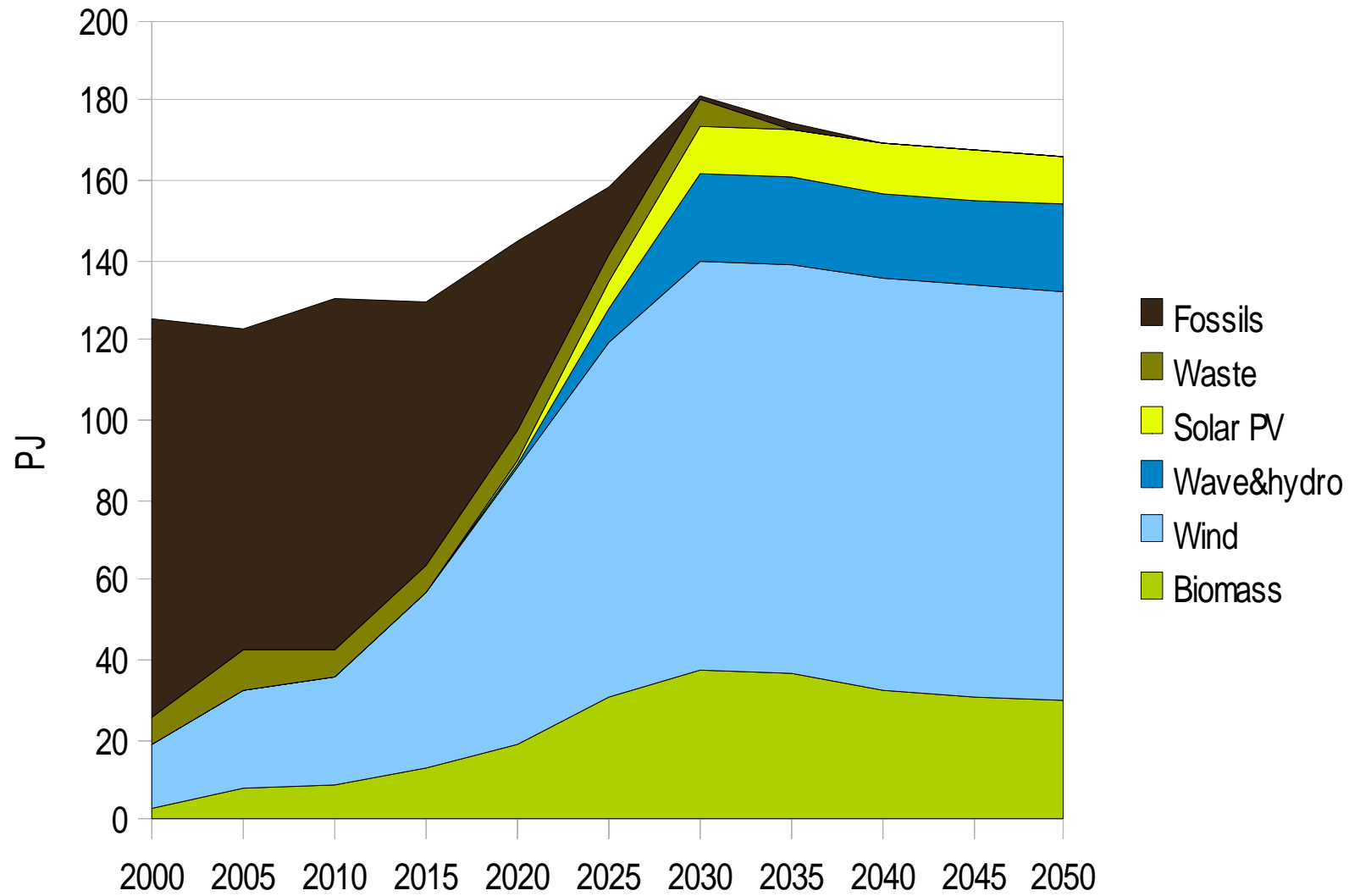
- In total 2 t/capita per year in average 2010 – 2049
= sustainable level

Danish Renewable Energy

Renewable Energy Supply (PJ)



Danish Power Supply



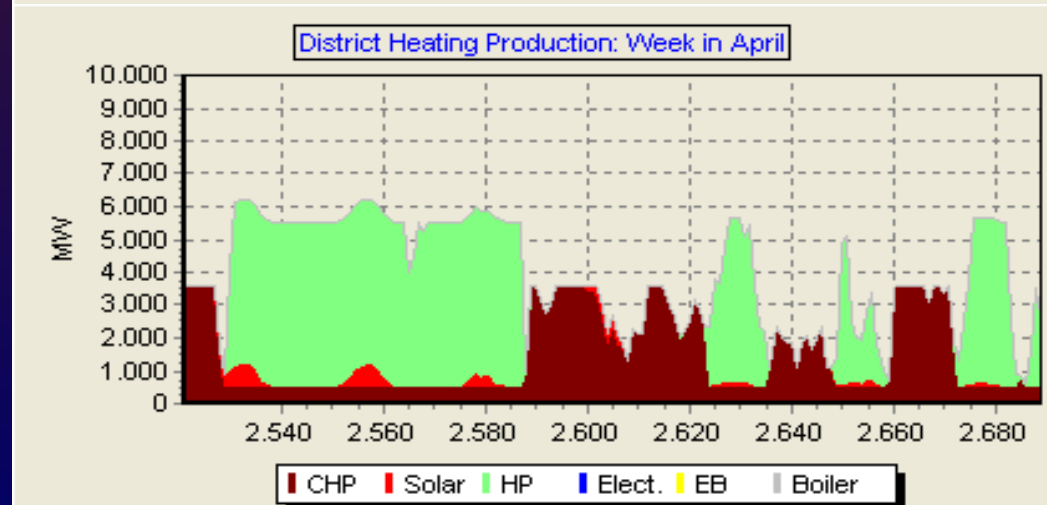
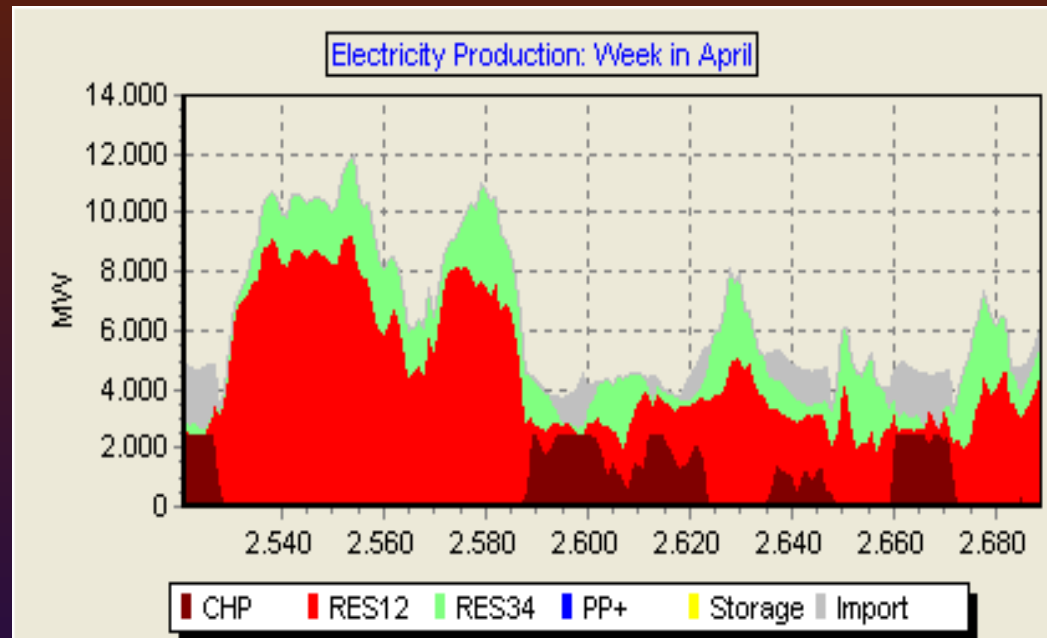
System in balance in 2030

- Hourly balances made with Energy Plan programme
- 1% unused windpower
- Existing import/export lines

RES12 = Wind

RE34 = wave+PV

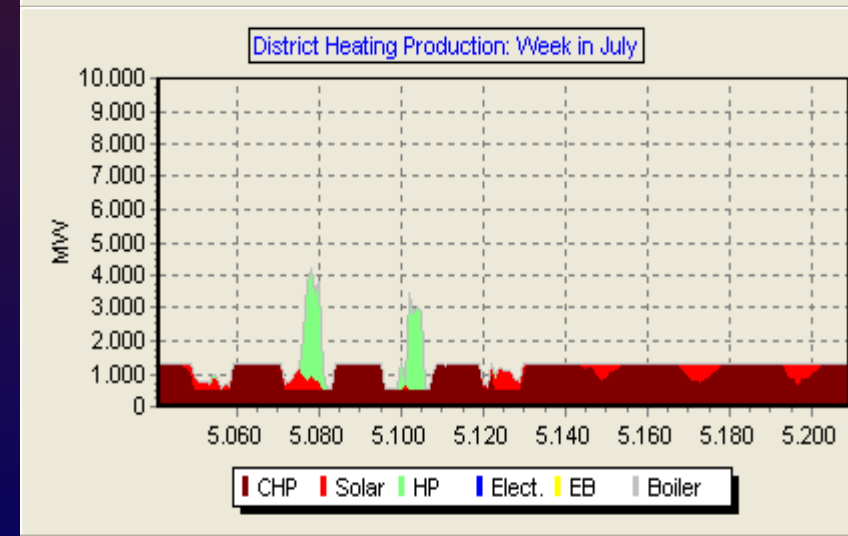
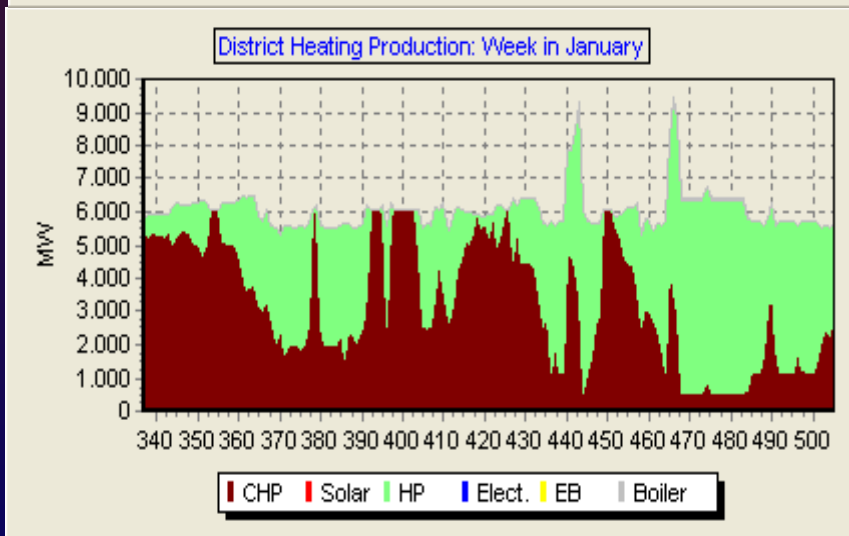
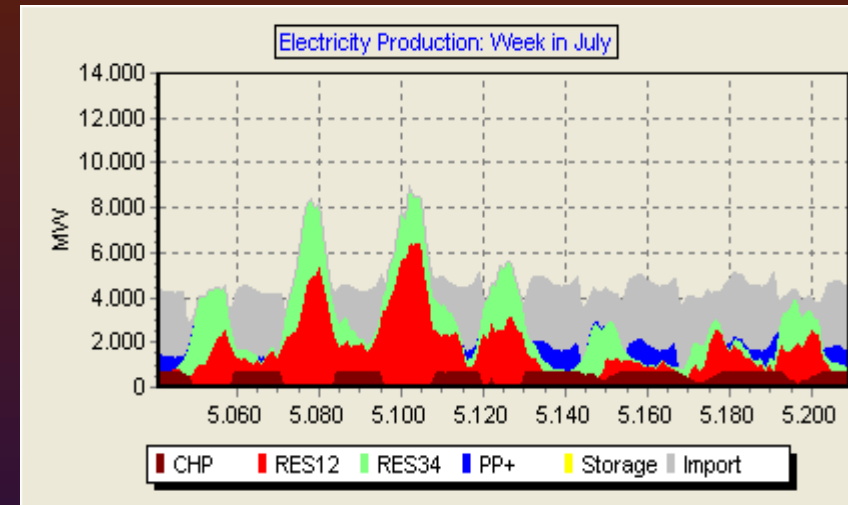
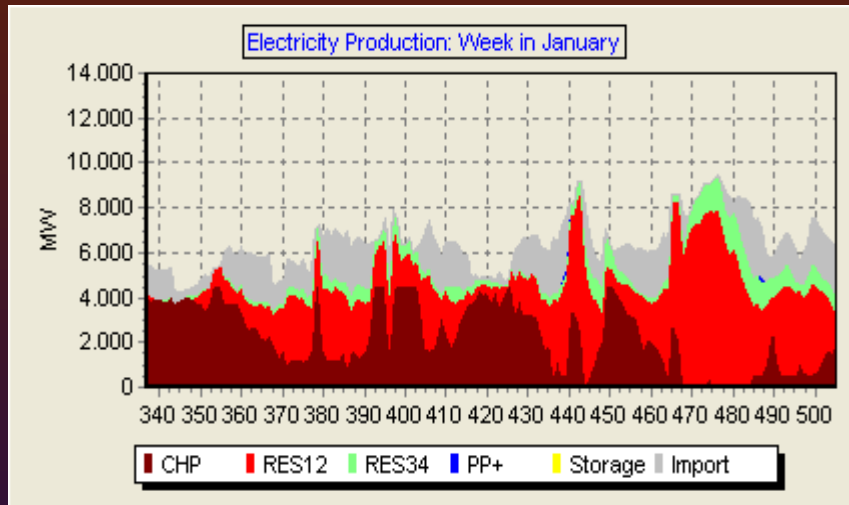
CHP incl. geothermal



Balance in all Seasons

January, calm

July, calm



Thank you

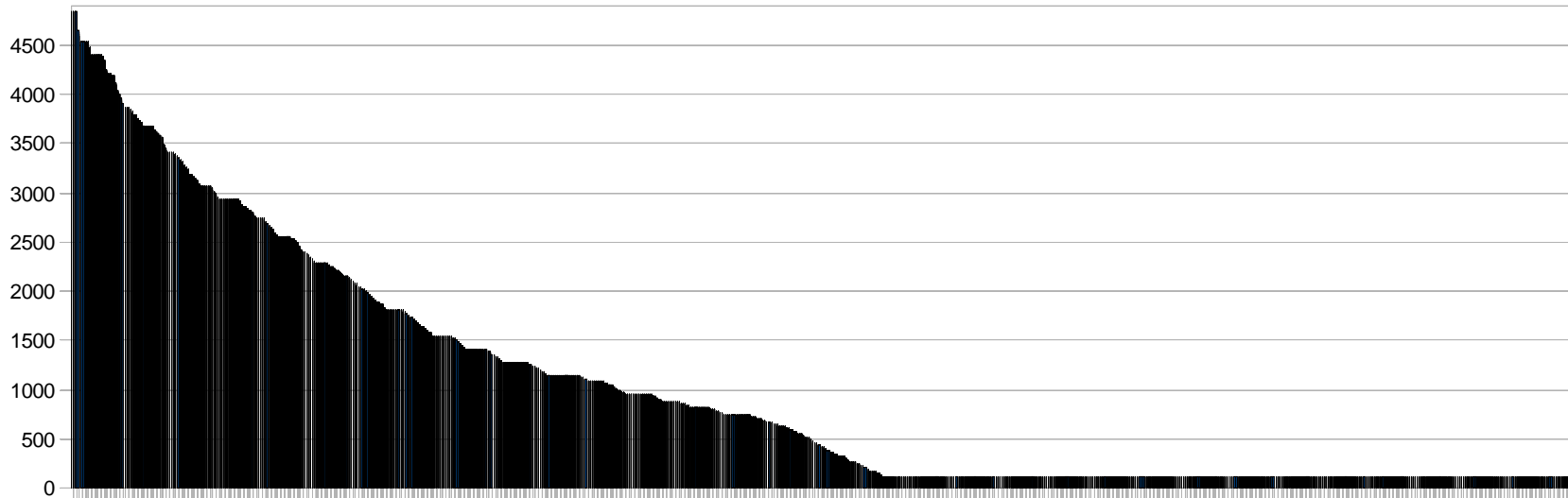


See
www.inforse.org/europe



Variations in Power Supply & Heat P.

Kraftvarmeværker, elproduktion 2030, varighedskurve - hele året (MW)



Kraftværker, elproduktion, varighedskurve - hele året (MW)



Varmepumper, elforbrug 2030, varighedskurve - hele året (MW)

