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
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

Supply minus demand (W/m²)

- 0.1 to 0.5
- 0.05 to 0.1
- 0.01 to 0.05
- 0.005 to 0.01
- 0.0001 to 0.005
- -0.005 to -0.0001
- -0.01 to -0.005
- -0.05 to -0.01
- -0.1 to -0.05
- -0.5 to -0.1
- -1 to -0.5
- -2 to -1
- -10 to -2

all others

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

Total Primary Energy Supply, EU-27

- Nuclear
- Natural gas
- Oil products
- Coal & waste
- Biomass
- Other RE

PJ (thousand)

2000 2010 2020 2030 2040 2050

25%
INFORSE's EU-27 Vision

Electricity Divided in Supply, EU-27

- Hydro
- Biomass
- Wind
- Solar PV
- Fossils
- Nuclear
- Import

Pj

2000 2010 2020 2030 2040 2050
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
Activity compared with 2000, selected sectors

- Trains
- Total person transport
- Household area
- Industrial production in tons
- Cars

Development of activities, DK
Final energy demand, all energies

- Transport
- Households
- Service sectors
- Industry
- Agriculture, fishery
Danish Primary Energy Demand

Danish Primary Energy Supply

- Coal and waste
- Olie
- Naturgas
- Biomasse
- Vind, sol, bølger, geotermi

PJ

CO$_2$ emissions from energy consumption, million tons CO2/år

- In total 2 t/capita per year in average 2010 – 2049 = sustainable level
System in balance in 2030

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

RES12 = Wind
RES34 = 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.