1.4 The case in Denmark

- Ministry of Trade ”Danish Energy Policy 1976”:
  - Wind Power, Solar Energy and Geothermal Energy will not have any influence on the total energy production before Y2K.

- Energy-plan 81 from 1980:
  - Renewable Energy may by special efforts be covering 10% of the total danish energy consumption by means of 60.000 small wind turbines and 5000 biogas systems.

- Energy-plan 2000 from 1990:
  - 1500 MW installed wind turbines power in Y2K are expected equal to 10% electrical energy used.
1.4 The case in Denmark

- "Energy 21” is a plan from 1996:
  - Year 2005: 20% reduction of CO2 emission compared to 1988-level.
  - Year 2005: 12-14% should be covered by renewables.
  - Year 2005: 1500 MW installed wind turbine power (12% of the consumption).
  - Year 2030: 50% reduction of CO2 emission compared to 1988-level.
  - Year 2030: 35% should be covered by renewables.
  - Year 2030: 5500 MW installed wind turbine power (4000 MW offshore).
1.4 The case in Denmark

- Status and prognosis to fulfil "Energi 21"- plan (wind turbines):
1.4 The case in Denmark

Goals for reduction of CO₂
- 20% reduction of CO₂ emission from 1988 to 2005
- 50% reduction of CO₂ emission before 2030

Goals for Wind Power
- 1500 MW wind power in 2005 (200 MW off-shore) 12% of electricity consumption
- 5500 MW wind power in 2030 (4000 MW off-shore) 50% of electricity consumption
- http://www.ens.dk/e21uk
1.4 The case in Denmark

- Status for ”Energi 21” plan in respect to offshore windfarms are:
  - Offshore windfarm at Rødsand: 160 MW – running 2004
  - Offshore windfarm at Læsø: 150 MW – planned 2004 (preliminary stopped)
  - Offshore windfarm at Omø: 150 MW – planned 2005 (preliminary stopped)
  - Offshore windfarm at Gedser Rev: 150 MW – planned 2008 (preliminary stopped)
1.4 The case in Denmark

Production capacity in Denmark 2001

- Central power plants: 8033 MW
- Decentral power plants: 2063 MW
  - Owned by power plants: 723 MW
  - Not owned by power plants: 1340 MW
- Wind turbines: 2556 MW
  - Owned by power plants: 363 MW
  - Not owned by power plants: 2193 MW
- Hydro power plants: 11 MW
  - Owned by power plants: 9 MW
  - Not owned by power plants: 2 MW
- Others primary industry: 418 MW
- Total: 13.081 MW
1.4 The case in Denmark

- The capacity of dispersed productions units owned by the power plants
1.4 The case in Denmark

- Production capacity and the production in Eltra area ultimo 2002

  - Central power plants: 3.196 MW/12.928 GWh
  - Decentral power plants: 1.547 MW/6.723 GWh
  - Wind power: 2.315 MW/3.825 GWh
  - Consumption: 20.858 GWh
  - Export: 2.618 GWh
1.4 The case in Denmark

- Import export and max and minimum load
  - Max load 3685 MW
  - Min load 1189 MW
  - Central power plants 3196 MW
  - Decentral power plants 1547 MW
  - Wind power 2315 MW