

ENERGY POLICY AND WIND POWER

- Energy policy and promotional schemes in the EU.
- Quotas with different but overlapping goals.
- Importance of energy policy rather than wind potential.
- Controversy concerning harmonisation.
- Danish energy policy as a case study.
- Greening of the Nordic energy system.
- Conclusions.

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ENERGY POLICY AND WIND POTENTIAL

- Wind capacity in Europe at the end of 2004 dependent on energy policy rather than on wind potential:
in Germany (16,629 MW) and in the UK (888 MW).
- Yearly growth in Danish wind capacity has been strongly fluctuating dependent on national energy policy (see later).
- National energy policy has been the decisive factor in the first phase of modern wind power development.

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LIBERALISED ENERGY MARKETS

- EU Directive confirmed in December 1996.
- Goal: Higher efficiency and lower consumer prices through market competition.
- No distinct concern of environmental consequences, e.g. by support of energy conservation and RES.
- Several problems are appearing: resource exhaustion, supply security, cost-effective investments in sustainable energy systems.
- Commercial markets have short time horizons.
- Few general, critical papers of the liberalisation.

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RENEWABLES DIRECTIVE

- The EU Renewables Directive from 2001 specifies indicative targets of RES-E for each Member State.
- The EU Commission shall evaluate the support schemes in different Member States by October 2005 and publish a summary report with policy conclusions.
- A draft will be discussed in the first meeting of the Sustainable Energy Forum in Amsterdam on 13 October 2005 arranged by the EU Commission (TREN)

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MAIN SUPPORT MODELS

- **FIXED PRICE SYSTEMS:** investment subsidies, fixed feed-in tariffs, fixed premium systems (and tax credits).
- **FIXED QUANTITY SYSTEMS:** tradable green certificates with quota obligation (Portfolio Standard) and obligated tendering.
- Several Member States use combinations of these schemes.
- Internalisation of externalities (much talk, little action).
- **CONTROVERSIAL QUESTION:** Should EU harmonise the different support schemes on EU level?

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OTHER CRITERIA FOR PROMOTION OF RES-E

- Well designed payment mechanisms.
- Grid access and sufficient grid capacity.
- Efficient administrative procedures.
- Public acceptance.
- Clarification and co-ordination between quota systems and RES systems: CO₂ quotas ("black quotas"), conservation quotas ("white quotas") versus Fixed Price and Fixed Quantity Systems for RES.
- These systems overlap but do not have identical goals.

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PROMOTIONAL SCHEMES

- Fixed Feed-in Tariff (FIT) and Fixed Premium System (FPS) with long-term guaranteed and favourable tariffs. Three European countries with these schemes comprise 82% of wind capacity by the end of 2004 (Germany, Spain and Denmark).
- Tradable Green Certificates (TGC) driven by national quotas for RES-E. Producers are paid the market price plus sales price for green certificates. Sparse experience with TGC (Italy, UK, Sweden). Problems with fluctuating prices of certificates and investor uncertainty.
- Tender Schemes: in combination with FIT and FPS.

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MARKET CONFORMITY

- First analyses by Hvelplund (2001):
- Tradable Green Certificates (TGC): quantity of RES-E is determined by obligated quotas, price by the market.
- Fixed Feed-in Tariff (FIT) and Fixed Premium System (FPS): price is (fully or partly) determined by the state, while the quantity is determined by the market.
- Neither model is fully conform with market principles.
- FPS may be considered more market conform than FIT.

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DISTRIBUTION OF EU SUPPORT SCHEMES

- Distribution in the EU: 15 member states are using the FIT or the FPS: Austria, Cyprus, Estonia, Finland, France, Germany, Greece, Hungary, Ireland (April 2005), Latvia, Luxembourg, Netherlands, Portugal, Slovenia and Spain.
- 5 member states are using the TGC: Belgium, Italy, Poland, Sweden and the UK.
- Denmark has a mixed support scheme and a few others have no support scheme.
- Norway is planning to introduce the TGC from 2007.

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REGIONAL HARMONISATION?

- It has been proposed to harmonise support schemes between clusters of European nations, e.g.
 - cluster 1: Germany, France, Spain and Portugal
 - cluster 2: Sweden, Norway and Denmark.
- Negotiations are taking place concerning a joint TGC market between Norway and Sweden.
- This will require inter-governmental agreement about national quotas and the detailed rules of the game.

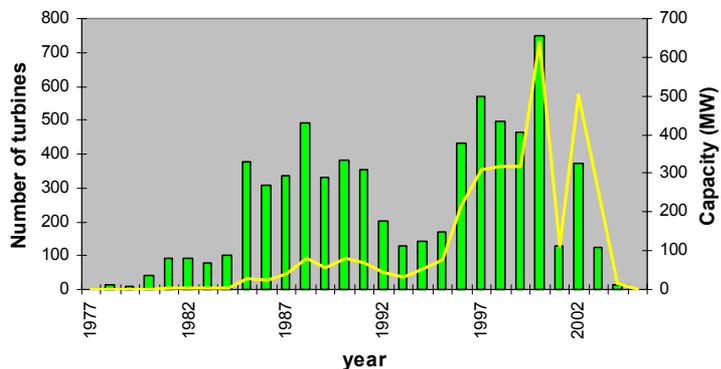
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DANISH ENERGY POLICY

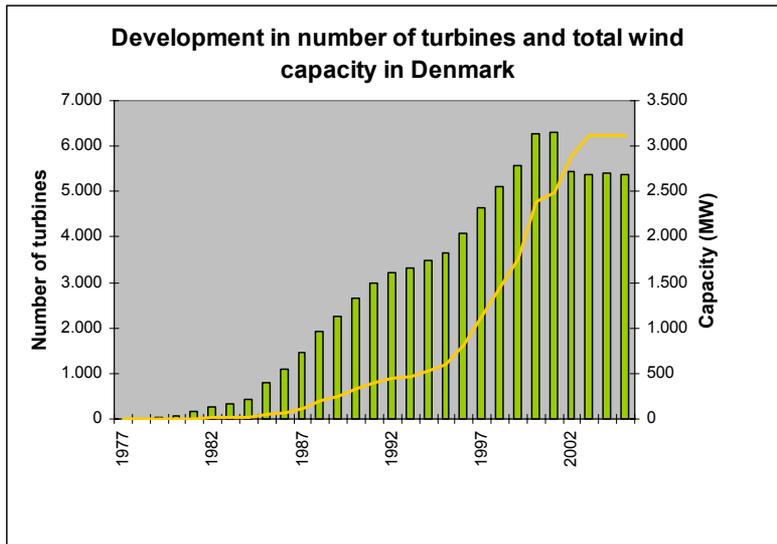
- Official energy plans from 1990 and 1996 with the goal: "sustainable energy development".
- Goal of wind capacity in 2005: 1,500 MW. Actual capacity by the end of 2003: 3,100 MW (15.8% in 2003, 18.5% in 2004). Better wind year in 2004.
- Favourable feed-in tariff of about 8 eurocents/kWh.
- Goal of wind capacity by 2030: 5,500 MW (50% of electricity) with 4,000 MW offshore.
- Strong Growth of wind penetration discontinued after liberalisation and Danish energy reform in 1999, followed by change of government in 2001.

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Yearly growth in number of turbines and capacity in Denmark



Number of turbines (columns)
Wind power capacity (curve)



Number of turbines (columns)

Wind power capacity (curve)

DANISH ENERGY PLAN, JUNE 2005 (1)

- New transmission across the Great Belt.
- Demand Side Management.
- New committee for alternative transportation fuels – biofuels and hydrogen. New EU directive.
- Differentiated taxation of cars.
- Renewable energy: updating of offshore wind farms and RandD for RES. No specific commitments.
- Analysis of supply security, including possible new regulations of utilities. No specific commitments.

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DANISH ENERGY PLAN, JUNE 2005 (2)

- Updating of present plan for energy conservation.
- Analysis of CO₂ taxation and caps for more sectors (e.g. transportation). No specific commitment.
- Analysis of electricity overflow from wind and its possible application for heat purposes, including heat pumps.

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GREEN NORDIC ENERGY SYSTEM

- Combination of Nordic hydro, biomass energy, wind and solar can result in a secure and efficient supply system.
- Requires co-ordination, planning and regulation at Nordic government level, including favourable feed-in schemes.
- Closer co-operation between Nordic system operators – e.g. establishment of a joint Nordic system operators function.

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CONCLUSIONS 1

- Too early to harmonize support schemes at EU level.
- Externalities should be internalised (pollution taxes).
- Why set up special TGC markets (large transaction costs) for a short transition period when FIT, FPS and tender systems can do the job?
- According to opinion poll by EU project (RE-Xpansion) the FIT has the highest score of the support schemes among Member States.

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CONCLUSIONS 2

- National energy policy has been decisive during the first phase of modern wind power development (FIT and FPS).
- Wind potential of less importance in this phase (Germany).
- Liberalisation of energy markets has created a number of problems in relation to RES-E, supply security, cost-effective long range planning and transition to a sustainable energy development.
- Alternative: reintroduction of societal regulation in relation to energy supply investments and support schemes.

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