

How to get there? The Danish model

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How did we get here?

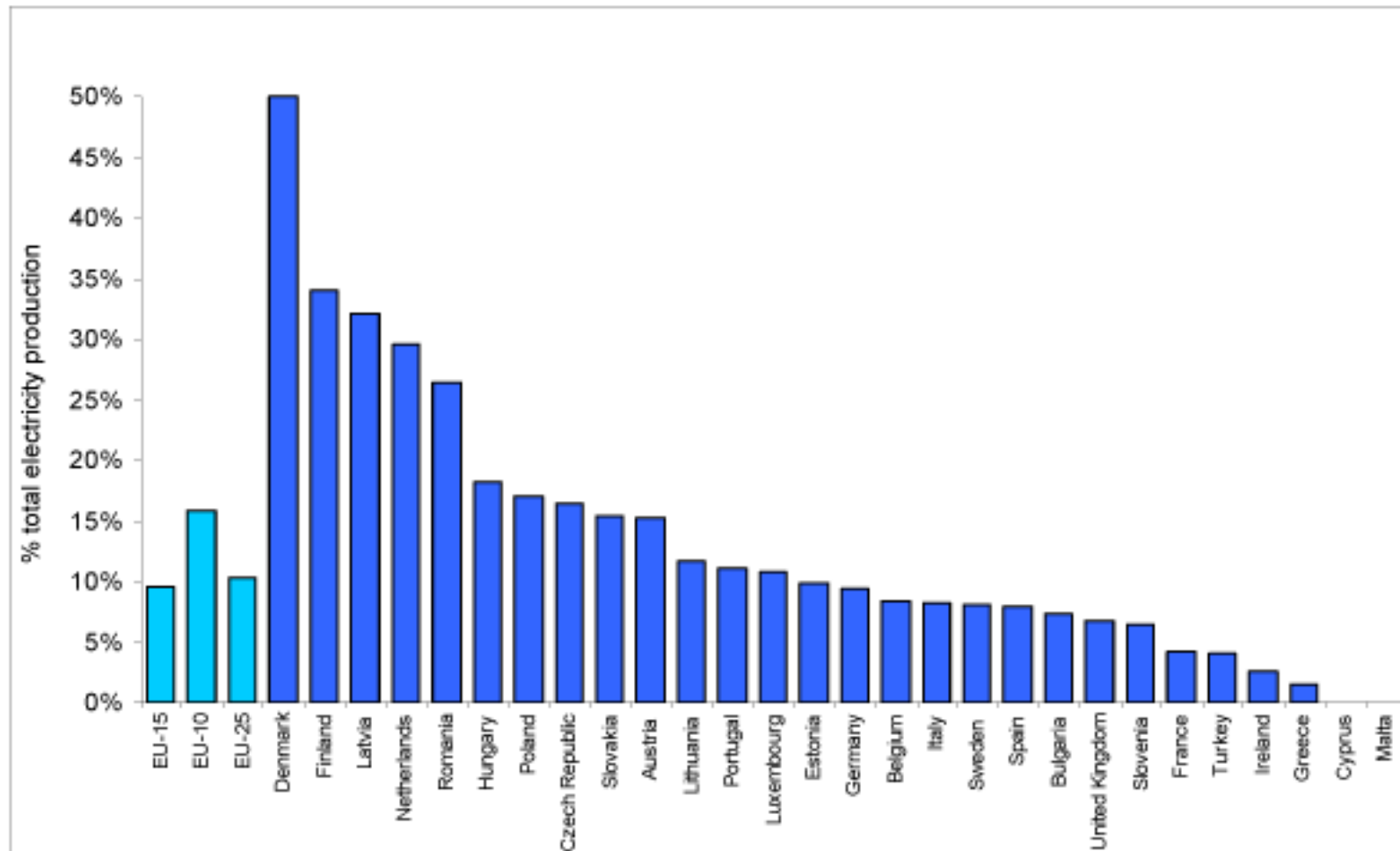


Illustration: European Environment Centre, Data: Eurostat

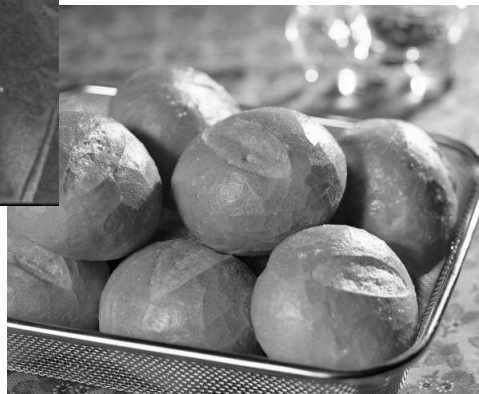
- Lots of thermal electricity production
- Municipal/cooperative energy sector (historically)
- Regulation by agreement
- Independent DH sector
- "Principle of '56" on CHP allocation
 - Heat marginal
 - CHP-benefit split 50/50
 - Electricity side contribution to heat grid

“I’m the biggest fool in Denmark!”



“Yes, I really am! I’m one of those Sunday drivers from the other day. You know, those that hadn’t figured out, that you should WALK to the bakery for bread rolls. That’s why I’ve kept the four rolls. They are the most expensive rolls in Denmark!”

Alfred Meyer, Ringkøbing after his €200 fine for driving in spite of ban on driving on Sundays.



Source:
Billed-Bladet no. 49,
7. December 1973
Photo and text: Steen Friis

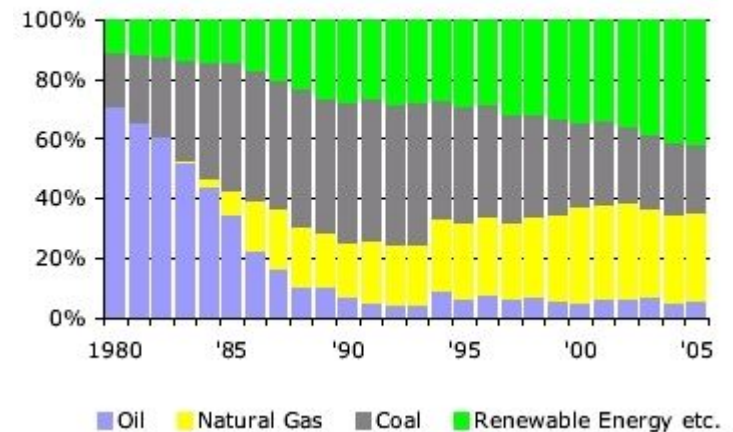
- High energy prices
- Insecurity of oil supply (>90 % dependent)
- General inflation
- Balance of payments deficit
- Unemployment



- Reductions in consumptions
- Development of internal resources
- "Energy plan '76"
 - Fuel switching (coal)
 - Energy conservation measures
- Heat plan committee
- Subsidies for increased use of CHP
- Energy taxation

- Heat law ('79)
 - Identification of heat sources and heat loads
 - Regional and local planning on heat supply
 - Separation of gas and DH grids
 - Compulsory connection to DH local option
 - No new electrical heating
 - Price regulation

Composition of Fuels for District Heating Production



- New capacity (total 1.000 MW)
 - large, centralised CHP units
 - 230 DH-systems to convert to decentralised (localised) CHP units, 450 MW before '95, using indigenous fuels (based on 80-100 MW research and demonstration programme)
- No oil and coal in DH

- Feed-in tariff (Triple tariff)
 - Purchase obligation CHP electricity
 - All consumers through TSO until 2004
 - Now production on market
 - Support for localised CHP
 - 0,015 €/kWh from 1992
 - 0,0095 €/kWh from 1997 except smallest
 - From 2003 further adjustments
(Economic cushion for small CHP – sunk costs)
- More details on www.ens.dk*
- Energy taxation

- No support above 25 MW
- Below 25 MW
 - Existing plants over 5 MW non-production related subsidy corresponding to that received in the period 2001-2003, 20 years from the date of the grid connection and for at least 15 years as from 1 January 2004.
 - Plants under 5 MW subsidy depending on when electricity production takes place. Combined with the market price gives three-tier tariff.
 - Financed through PSO

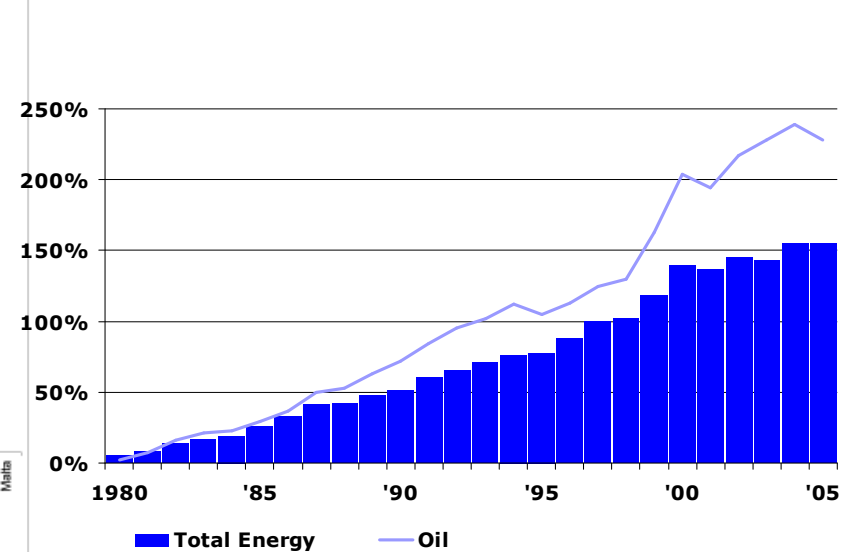
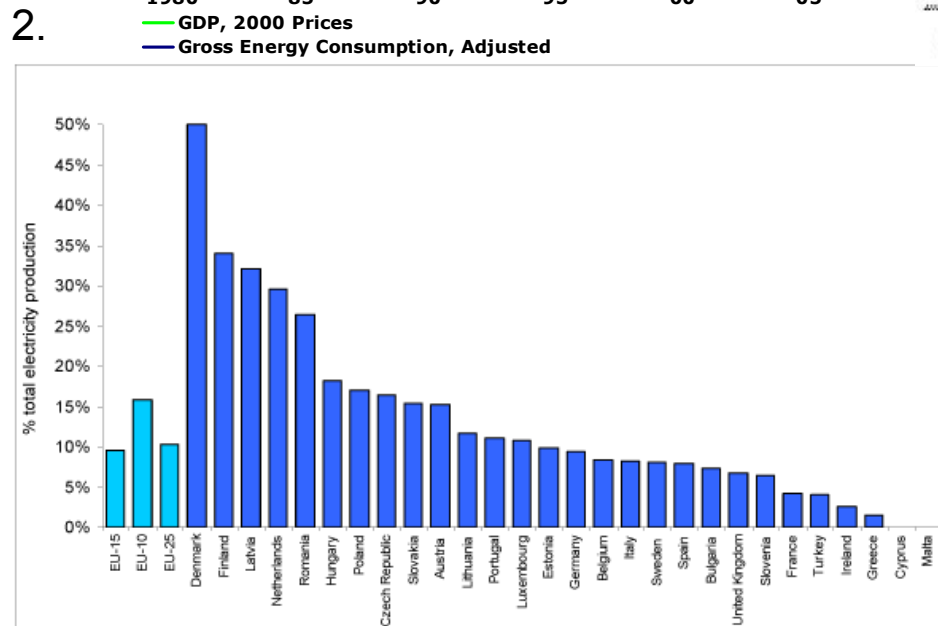
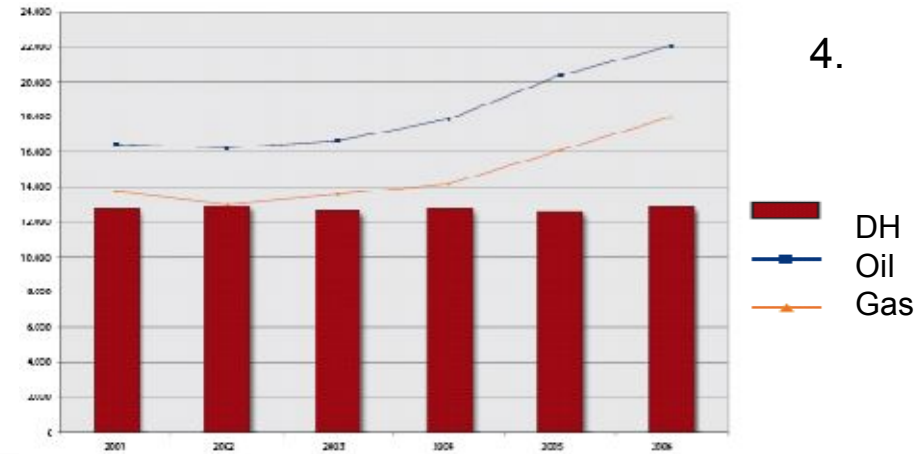
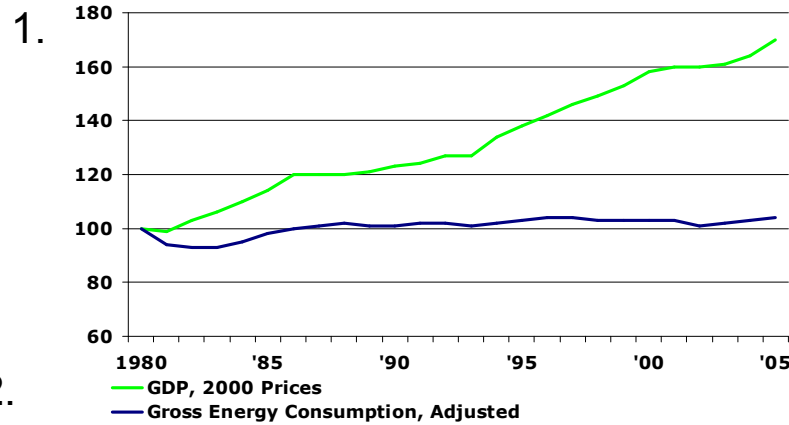
More details on www.ens.dk

- Very useful to have heat grid in place!
- DH can shift heat source quickly
- Doubtful if market will provide
- Very useful to have heat grid now and in future!

What did it take?

- A burning platform
- Political determination
- Comprehensive policy
- 30+ years
- Patience

What did it bring?



1-3: Danish Energy Authority, 4: Danish District Heating Association

- Focussing on electricity production efficiency and providing heat load was our solution
- Can requirements on electricity production efficiency alone provide the same?
- Market vs. planning