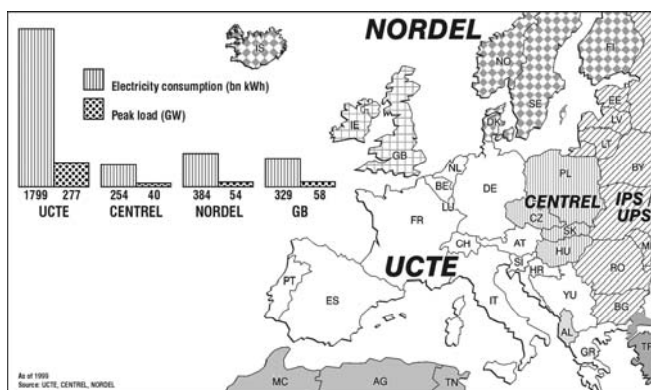
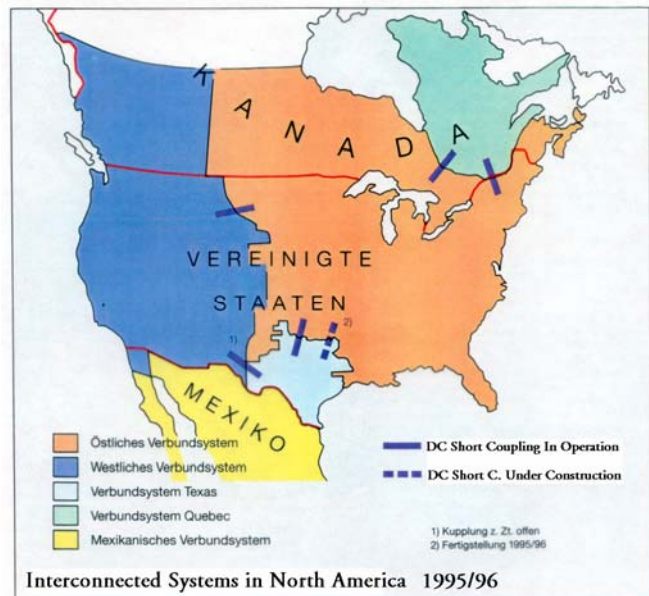
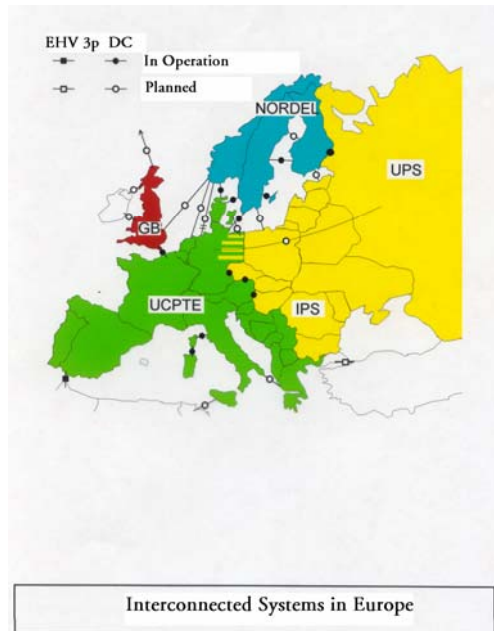


Interconnected Systems

Europe
USA and Canada
Japan
Russia



1.4 Situation in Germany

Policy:

- General law concerning the electric energy industry
 - to be lead together with the state/government in an homogeneous way because of its importance as basis for economical and social life
 - economical use of energy resources
 - to ensure the public influence
 - to avoid bad effects on the competition

- to offer electric energy as safe and cheap as possible
- the obligation to supply all consumers/customers as far as it is no unreasonable demand
- Law about the scale of charges/tariffs
 - low voltage tariffs had to be approved until 1998; now free choice of supplier
 - rational and economical use of electricity
 - treatment of the energy resources with care
 - pollution as low as possible; protection of the environment
 - orientation of the charges at the real costs
 - different charges for households, trade, agriculture possible, if the consumption behaviour justifies them
 - extra allowance for the network can be brought to customers account.
- * Decree concerning concession contribution
 - The utility pays for the permission of the community to supply the customers with electricity (gas & water) in the area of the community, using public roads for installing and operating the distribution networks.
 - The concession contribution depends of the number of inhabitants of a community and the electrical energy sold there.
- * Demarcation contract between utilities

To avoid competition in demarcated supply areas with double installed networks. This is cancelled with the new energy law of 1998.
- * Law about buy-obligation from private energy producers.

Small hydro power plants, bio-mass, wind mills, ... (0,1 .. 0,17 €/kWh)
Solar energy (~ 0,5 €/kWh)
Governmental promotion programs as incentives for investors.
- * **EU energy liberalisation law (since 1996)**
 - Producers and grid owners are not allowed to distribute electricity.
 - The customers can choose the supplier.
 - Third party access to the networks.
 - Description of the procedure how to reach the target
- * Common influences/restrictions in Germany, increasing the kWh-price in comparison to neighbored countries
 - Subvention of national coal industry (common tax finished since 1996; subvention of coal production until 2008 by county government)
 - strict conditions for the protection of the environment
 - high interests
 - lengthy procedures for getting the licences concerning construction of power plants, lines or substations; comments are requested from all organisations responsible for public concern.

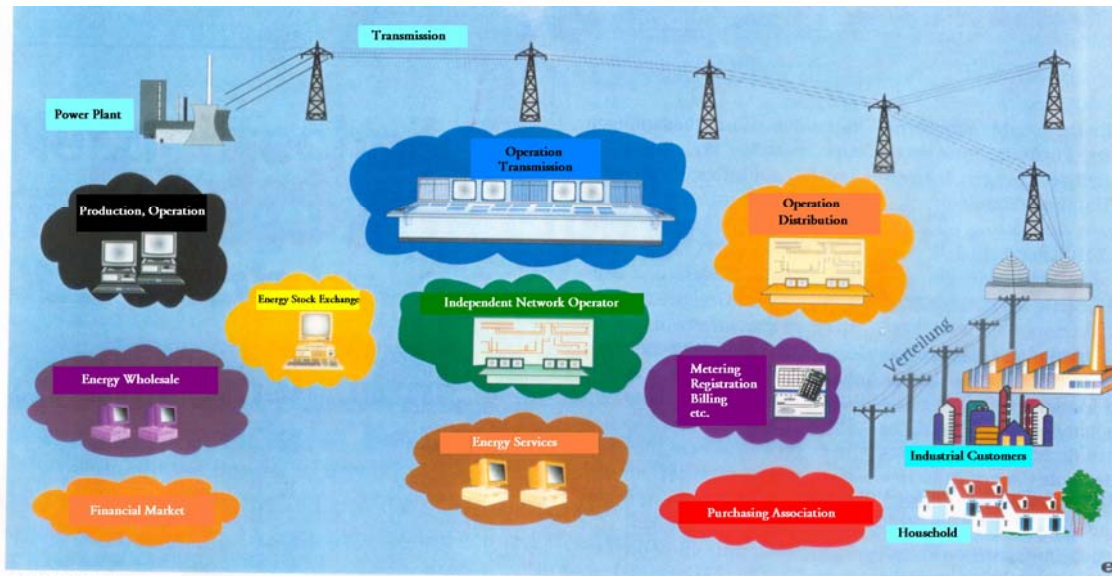


Bild 1. Teilnehmer am liberalisierten Energiemarkt (ABB)

- taxes & duties about 12 billion € in 2007 (1998 → 40 %)
 - electricity tax 6,6 billion €
 - renewal energy tax 2,7 billion €
 - liberalisation → household (– 10 %); industry (– 17 %) without additional Taxes & duties

1.5 Electricity supply in Germany - characteristic figures

520 billion kWh total (2000)
 20 billion kWh losses
 500 billion kWh net

87% produced by public utilities
 12% produced by industrial plants
 1 % produced by railway plants

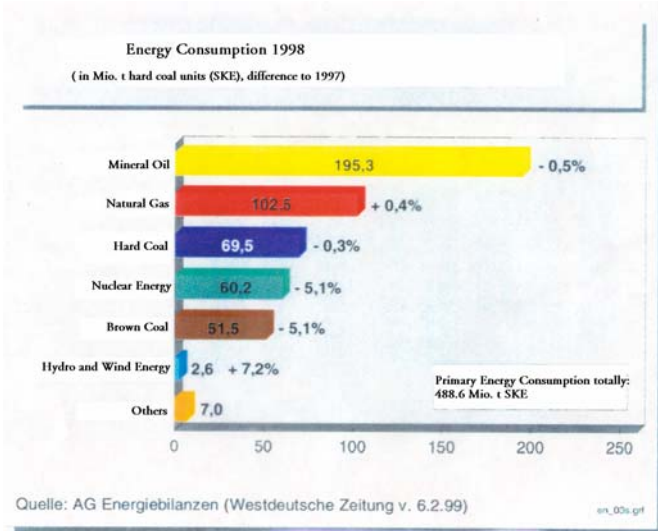
Import: 45 billion kWh (9%)
 Export: 43 billion kWh (8%)

Industry: 48 % (0,08 .. 0,12 €/kWh)
 Household: 27 % (~ 0,2 €/kWh)
 Small consumers: 22 %
 Traffic: 3 %

Nuclear power: 36 %
 Hard coal: 25 %
 Lignite: 27 %
 Natural gas: 6 %
 Oil: 1 %
 Hydraulic: 4 %
 Others: 1 %

Average proceeds: ~ 0,15 €/kWh

Average consumption: 5,690 kWh/capita
 Peak load: ~ 85 000 MW
 Maximum capacity: ~ 115 000 MW



German Interconnected Grid

380 kV circuit length 18.200 km
 220 kV circuit length 22.500 km

Maximum Load Winter 1997/98 72.300 MW

