German Energy Economy under Transition: Nuclear Energy in Competition with Renewable Energy?

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At present, German energy economy faces three principal challenges:

- Globalisation increases competition among enterprises and leads to new entrepreneurial structures.
- The emerging EU energy market stimulates competition furthermore. National borders become less important for goals and success in the energy economy.
- National restrictions impose boundary conditions which are in conflict with the goal of deregulation and multinational operating enterprises.

Mitigation of climate change represents an ambitious supplementary boundary condition. Particularly, the German electricity sector is confronted with a political discussion on the future role of nuclear energy and renewable energy. For nuclear energy, a shut-down of nuclear power plants is under consideration. For renewable energy, legal initiatives aim at a doubling of the present share.

In 1998, electricity generated in Germany amounted to 552 TWh whereat nuclear energy represents a share of 30%, fossil fuels of 64% and renewable energy of 6%. The consequences of a complete retreat from nuclear energy and the role of renewable energy sources have been studied in detail using the IKARUS LP model. Cost-efficient strategies which are in accordance with the national and European goals of GHG mitigation have been identified. These results will be interpreted regarding the future role of the German energy economy in a European energy market.