

# Power sector analyses

## Simulation of liberalized power markets



### Liberalization of the power markets

Development is closely linked to efficient energy supply and the power sector is an important part of the infrastructure in all industrial countries. The competition between power producers increases, and therefore investments in new power generation facilities have to be initiated on a more commercial basis.

At the same time, there is focus on environmental issues, especially the fulfilment of the Kyoto targets in 2008-2012 with respect to CO<sub>2</sub> and in relation to emissions of SO<sub>2</sub> and NO<sub>x</sub>. COWI has extensive experience in analysing large and complex power systems, especially focusing on the consequences of liberalization of power markets.

### Assistance for investors and authorities

COWI can assist power companies, investors, national authorities and decision makers in preparing technical/economic long-term analyses of power systems. The analyses can illustrate the consequences of liberal-

izing the power markets, and they can be used to evaluate the consequences of making physical changes in the power system, e.g. closure of existing power plants, establishment of new power plants and establishment of increased transmission capacity between regions or countries.

The analyses can also be used to evaluate the consequences of different types of regulations, e.g. the introduction of environmental taxes or quotas - or the introduction of a market for CO<sub>2</sub>-emission permits. The analyses are an important tool for the investors to evaluate the profitability of establishing new power generation facilities in the electricity market.

### Long-term analyses

The analyses can help answer the following questions, e.g. by analysing a future 20-year period, depending on different future settings/scenarios:

- How will the future production and transmission patterns be in the analysed region?
- How will the market prices of electricity develop?

- Which of the existing power plants will be able to make positive earnings?
- What type of new investments will be profitable?
- How will the emissions develop?
- What are the welfare-economic consequences for power producers, consumers and society?

For the last five years, COWI has carried out power sector analyses in the Nordic and Baltic countries as well as in Poland. In the Nordic countries, the power markets were liberalized around year 2000, and through the accession of the Baltic countries and Poland to the EU, these countries are now facing the challenges of fulfilling the EU electricity market directives. Russia, Kaliningrad, the South Eastern European countries and China are other regions/countries where it would be extremely relevant to prepare long-term analyses of the power sector.

### Selected references:

- Economic analyses of the electricity sector in Lithuania, 2002;
- Vilnius Power Plant in the new Electricity market, 2003;
- The CO<sub>2</sub>-emission allowance market and security of supply, 2003;
- Long-term challenges in the Nordic power system, 2004;
- Poland - Electricity and gas market development study, 2005;
- Power sector development in a common Baltic electricity market, 2005;
- Transmission cable between Norway and the Netherlands, 2005.