

How to play the game as the bridge between two European power markets – the case of Western Denmark

By

Eirik S. Amundsen and Ole Jess Olsen

**Abstract submitted to the Tehran International Energy Conference,
25 –27 May, 2004**

During the 1990's major electricity markets reforms have been implemented in the Nordic countries, i.e. Denmark, Finland, Norway and Sweden. The reform process started in Norway in 1991, continued in Finland 1995 and Sweden 1996, and was completed by Denmark in 2000. At the same time the national electricity markets have been opened up for cross-border trade. As a result the Nordic countries form a multinational integrated electricity market with competition in generation and retailing and a common power pool (Nord Pool).

This paper deals with Western Denmark that was integrated in the Nordic power market in 1999. Western Denmark has several features that are rather special as compared to its neighbours and that make it an interesting subject for economic research. In particular, the area of Western Denmark

- constitutes a link between the now well integrated Nordic power market and the power markets of Germany and continental Europe
- has a significant amount of wind power capacity that makes a strong influence on the real time power provision
- has one dominant supplier, ELSAM, that occasionally can exercise market power
- has a part of the power provision (wind power and power from local CHP plants) exempt from competitive pricing through guaranteed fixed prices
- shows large price fluctuations as well as trade patterns that at times run counter to what is expected considering the price development in the neighbouring areas

In this paper we set out to explain the price and quantity fluctuations in Western Denmark during the winter season 2002-2003 that was a period with critical supply conditions in the Nordic area due to a shortage of hydro power. Several explanations are offered. These may work separately or act in concert. In particular we look at: the design and functioning of the special auction system of transmission capacity in the interface between Western Denmark and Germany; the role of the large capacity of volatile wind power, the role of the guaranteed fixed prices and the exercise of market power and gaming of the dominant power generator.

The paper seems to fit well into any of the following two proposed fundamental topics of the conference: *Electric Power Market Development* and *Regional Energy Issues and Prospects*

Eirik S. Amundsen

Address: Department of Economics, University of Bergen, Norway.
Fosswinckelsgt. 7, 5006 Bergen, Norway.
Telephone: + 47 55589205;
Fax: + 47 55589210;
e-mail: eirik.amundsen@econ.uib.no

CV: Present positions: a) Professor, Department of Economics, University of Bergen, "Economics of the Natural Resources" (1992-), b) Nordic Research Professor: The Nordic Energy Research Program, Energy and Society, The Nordic Council of Ministers (1996-), c) Scientific Advisor to SNF, d) Scientific Advisor to SNS, Sweden .

Education: Dr. ès-sc.-économique (Docteur d'Etat) avec distinction: *très honorable et Prix de l'Université*, Université de Paris II, Panthéon-Assas, Sorbonne, France (1988); Diploma, DEA Economie de l'Energie, Ecole Nationale Supérieure du Pétrole et des Moteurs, IFP, Paris, France (1984); Ph. D. course exams for Departmental Credit at Stanford University, USA (1979/80)

Scientific activities: Author of books and numerous refereed international journal papers within the field of energy-, resource-, and environmental economics.

Ole Jess Olsen

Address: Department of Environment, Technology and Social Studies, Roskilde University, P.O.Box 260, DK-4000 Roskilde, Denmark.
Telephone: +45 46742738
Fax: +45 46743041
e-mail: ojo@ruc.dk

CV: Present position: Professor in Public Planning, Department of Environment, Technology and Social Studies, Roskilde University (1995-), Member of Energy Appeal Tribunal (2000-), Member of scientific committee for Energy System Studies, Sweden.

Education: Dr.Scient.Adm. in Public Administration, Roskilde University (1993).

Scientific activities: Author of books and refereed international journal papers within the field of energy economics and public utility regulation.