# DENMARK

Throughout the last few decades, Danish energy policy has been strongly influenced by environmental policy objectives. Until November 2001, one minister was responsible for both energy and environmental policy. Denmark also has many policy goals that are inspired by both energy and environmental considerations. The country promotes energy efficiency, renewables and combined heat and power production (CHP). It has set itself the target of producing 20% of its electricity from renewables. Denmark also has several greenhouse gas targets. Among them there is the Kyoto commitment to reduce greenhouse gas emissions (six gases) by 21% in the first budget period 2008-2012, compared to 1990. There is also the stringent national commitment to reduce $CO_2$ emissions by 20% by 2005, compared to 1988. Denmark's Parliament approved ratification of the Kyoto Protocol on 30 May 2001.

If these energy policies are measured against their objectives, Denmark has been very successful. Denmark has the highest share of electricity generated in combined heat and power plants in the world, as well as with one of the largest district heating systems. In 2000, 12.6% of electricity generation was from wind turbines, also the highest of any nation. According to government forecasts, Denmark will come very close to meeting its multiple $CO_2$ and greenhouse gas emissions commitments, provided a national system of tradable $CO_2$ quotas for power plants remains in place. The system was introduced on 1 January 2001 to render climate change abatement in the power industry market-compatible. The quota system will be in force provisionally until full retail competition becomes effective in 2003. Should the quota system lapse without replacement, electricity exports could soar after 2003, and national $CO_2$ emissions could fall short of the Kyoto target by more than 19%. The report recommends that a decision about the future of the quota system should be taken as soon as possible. The new government has announced its intention to extend the $CO_2$ quota system beyond 2003.

The decisive step towards full liberalisation of the Danish power industry was taken in 1999, when the Electricity Supply Act was adopted. Since 1 April 2000, final customers of 10 GWh or more per year have been eligible to choose their electricity supplier in the free market. On 1 January 2001 the threshold was lowered to 1 GWh. On 1 January 2003, all final consumers will become eligible. Electricity generation, ownership of the transmission grid, operation of the grid, distribution and electricity supply must each be organised in separate legal entities. Electricity market reform in Denmark goes beyond the requirements of the EU directive.

## Disclaimer

The review visit on which this report is based took place in October 2001, before the new Danish government took office in November 2001. Most of the drafting of this report was completed before the details of the new government's policy were known. For this reason, the report reviews exclusively the policies of the previous government. Where policy changes became known before the publication, they are mentioned briefly in the body of the report.

However, the government requires CHP and wind energy to be given priority in dispatching. Therefore, only about 60% to 65% of the power market is governed by competitive price signals. This "priority" dispatch requirement causes excess generation during certain periods, a situation which may lead to losses for utilities. The Danish government should encourage more trade, competition and interconnection, and adapt environmental policies to the realities of the power market.

In the gas market, Denmark has opted for more restrictive provisions, in line with the minimum requirements of the EU Gas Directive. Since 10 August 2000, 30% of the market has been open to competition. This will increase to 38% in 2003 and 43% in 2008. The Danish government also reserves the right to deny access of some potential competitors to the gas grid if such access would cause serious financial difficulties for the state-owned natural gas pipeline company DONG. This right is permitted under a derogation in the directive. Originally, the Natural Gas Supply Act of 2000 provided for negotiated third party access, but this was changed to regulated third party access in October 2001. From 2003 onwards, network operation and gas trading activities will have to be separated.

Between July 1999 and July 2000, DONG acquired two of the five Danish gas distribution and supply companies, and also the right to supply the largest customers of two others. This consolidation was carried out partly in response to the high indebtedness of the Danish gas sector. But it means that DONG now directly controls nearly 95% of the Danish gas market. The Danish Competition Authority has taken note of this strong dominant position. The government should prevent DONG from becoming a monopoly supplier along the entire gas chain. It should create incentives for new suppliers, foreign and domestic, to enter the Danish market. The new government has decided that the gas market should be fully competitive by 2004 and that DONG should be privatised at a time to be determined in the future.

# RECOMMENDATIONS

The Government of Denmark should:

## Energy Market and Energy Policy

☐ Review the existing policy measures with a view to developing more cost-effective policies. Government interventions should be analysed on a continuing basis for cost-effectiveness and should be prioritised accordingly. Market-oriented approaches should receive priority.

☐ Ensure that both domestic and international policies are adequately assessed in order to meet environmental objectives cost-effectively.

☐ Further review the tax and subsidy system with a view to reducing its complexity and administrative costs.

☐ Work to reconcile free market rules and environmental policies to send the right investment signals to the market; in particular, develop as soon as possible a market-based successor mechanism to the $CO_2$ quota system for the period after 2003.

## Energy and the Environment

☐ Finish the assessment of the economic implications of basing climate change policy almost exclusively on domestic mitigation strategies. In particular, consider the advantages that the Kyoto mechanisms and the expansion of the quota/trading system to other sectors may offer in closing the remaining emissions gap.

☐ Decide urgently the fate of the $CO_2$ quota system for the electricity sector beyond 2003; determine the quota levels; reassess the low penalty for non-compliance; and determine whether international trading and credits can be incorporated.

☐ Make further adjustments to the car registration fee and pursue road pricing and other cost-effective policy instruments in the transport sector.

## Energy Efficiency and Renewables

☐ Continue to review the performance of existing energy efficiency programmes with a view to developing market-based and more cost-effective policies. Loan payback schemes could substitute for outright subsidies in some cases.

☐ Continue to place time limits on subsidy schemes, particularly on those to boost market penetration of new energy-efficient technologies.

☐ Improve the transparency of the costs and trade implications of the various renewables support measures, in particular "priority" production.

☐ Investigate the consequences of greater penetration of imported biomass in terms of $CO_2$-neutrality, cost, and Denmark's security of supply objectives.

☐ Take steps to move to market-based policies as soon as possible, including the introduction of the green certificates programme, or some other instrument to offset the costs of current subsidies for renewable energy. In the transitory period, subsidies need to be reduced further to reflect current market conditions for wind energy and CHP.

## Fossil Fuels

☐ Review the hydrocarbon tax to eliminate distortions in upstream investment and to establish a clear and simple upstream taxation system.

☐ Facilitate effective competition in the Danish gas market by preventing DONG from becoming a monopoly supplier along the entire gas chain. The Competition Authority should monitor DONG's behaviour closely.

☐ Creates incentives for new suppliers to enter the Danish market.

## Electricity and Heat

☐ Strive to increase competition by:
- Working towards further opening of Denmark's interconnection with other countries for competitive power trade, especially spot purchases.
- Encouraging the removal of internal bottlenecks in the transmission system and striving for a similar approach in Nordel.
- Encouraging more market-oriented behaviour among power companies, and especially among small distribution and supply companies.
- Encouraging the transformation of consumer co-operatives into commercial companies, and facilitating the privatisation of municipal utilities.

☐ Through the Competition Authority, monitor the electricity market and deal with abuses rapidly.

☐ Continue to adapt the environmental policies aimed at the power industry to the realities of competition.

## Energy Research and Development

☐ Complete a comprehensive energy research strategy covering the full spectrum of innovation, and domestic and international programming.

☐ Clarify responsibilities and improve the co-ordination between the Danish Energy Agency and the electricity system operators that administer the Public Service Obligation. This also applies to the electricity end-use R&D requirement.