

Finnish energy policy is characterised by three commendable traits. One, Finland employs a holistic approach to energy. Its energy policy strives to simultaneously pursue the three E's – Energy security, Economic development and Environmental sustainability. This approach is apparent in the effective communication on energy policy issues between the various ministries and energy programmes which pursue numerous policy goals in tandem and act in concert rather than in conflict with one another.

Two, Finnish energy policy successfully employs international trade to lower energy costs and enhance energy security. Finland's lack of substantial domestic energy resources requires significant imports. Efforts to import fuels and electricity from a variety of countries provide Finland with a diverse energy supply, which lowers costs and enhances energy security. As part of the Nordic Power Market (Nordpool), Finland has successfully integrated its electricity market with those of the Scandinavian countries.

Three, Finland applies a light-handed approach to energy regulation. Its electricity sector is one of the least regulated in the world, with companies free to build power plants as they wish and all customers free to choose their supplier. Most of the regulation is done *ex post*, meaning that companies that own and operate assets still considered to fall under regulatory review, such as electricity networks and district heating suppliers, have significant leeway to set their own tariff structures. While this approach has been successful overall for Finland, this in-depth review identifies a few selected areas where regulatory authority could be expanded.

The most important energy development since the last in-depth review four years ago is the development of a new nuclear power plant, scheduled to come on line in 2009. While Finland already has two such facilities – providing 30% of the country's power generation with four reactors – the new plant would be the first nuclear facility built in a liberalised electricity sector. In May 2002, the Parliament ratified the government's earlier decision-in-principle in favour of the plant. While this decision implied neither state guarantees for the plant nor a specific endorsement of the project, it did allow the development of the project to proceed.

This new nuclear facility could help Finland meet its need for new generating capacity without producing new greenhouse gases (GHG). However, nuclear facilities worldwide have in the past faced cost overruns and delays, so the government is encouraged to closely monitor the progress of the plant and be prepared to provide alternatives for both electricity capacity and GHG mitigation should delays or other obstacles arise.

Under the Kyoto Protocol, Finland has agreed to keep its GHG emissions at 1990 levels during the 2008-2012 target period. Initial assessments indicate that emissions were 9% above 1990 levels in 2002. This anomalously high figure could be the consequence of low availability of hydroelectricity during the year. Nevertheless, measures will have to be implemented to address this issue given that business-as-usual projections by the government indicate further increases in GHG, reaching 15% above 1990 levels during the first target window.

In June 2001, the Parliament passed the National Climate Strategy (NCS) to curb GHG emissions. The NCS focuses on domestic measures as the best way to reduce Finland's GHG emissions, and includes an impressive array of programmes in all emission-producing sectors. While domestic emissions cutting measures do present a number of advantages, Finland should also rigorously explore the use of international mechanisms, especially emissions trading. This is particularly true given the high variability of Finland's emissions owing to climatic reasons, such as hydro availability and heating needs in the winter. If emissions are higher than predicted during the Kyoto window, it will be too late to employ domestic measures, which take years to implement. Consequently, international mechanisms will be essential and their optimal utilisation should be implemented in a timely manner. Large emissions cuts are expected to come from the proposed nuclear plant coming on line in 2009. However, if the plant is delayed, Finland will need to rapidly cut substantial emissions, and international mechanisms are well suited for this purpose. International mechanisms may also provide Finland with a lower-cost alternative to cutting emissions than the exclusive use of domestic measures.

Energy security is particularly important for Finland. On the supply side, the country lacks substantial domestic fossil fuels and its geographical position limits the amount of energy interconnections it can feasibly construct. While imported fuels do not necessarily imply greater risk than domestic fuels, high import levels do require monitoring. On the demand side, the country's cold climate and the significance of its energy-intensive industry make the reliable supply of energy particularly important.

Finland has responded well to its energy security challenges. It has emergency stocks of imported fuels corresponding to five months' average consumption (or import) based on the Security of Supply Act, which is far beyond the IEA stock obligation in terms of volume and coverage. Finland has a diverse mix of primary energy supplies, with five different fuels contributing at least 10% to the country's total primary energy supply (TPES). Finland relies on market mechanisms to ensure that sufficient electricity capacity is available. The electricity market will be tested in the coming years as new capacity will be required. The government should monitor this situation and respond if the market is incapable of adding the needed plant. The extensive use of fuel-switching for natural gas also enhances energy security. While all natural gas

is imported from just one source (Russia), extensive fuel-switching capabilities and the compulsory oil stocks to replace natural gas in the event of disruption help to mitigate this exposure.

Renewable resources give Finland substantial emission-free domestic energy sources. Biomass and hydroelectricity account for 20% and 3% respectively of the country's TPES. The government is using a number of support programmes with the objective to increase the use of renewable energy by 30% by 2010. While this can benefit Finland, the support schemes could be rendered more effective, and perhaps less costly, through a more market-based approach. This is particularly the case for the investment subsidies the government spends to encourage specific types of renewable energy.

## RECOMMENDATIONS

*The government of Finland should:*

### **Energy Market and Energy Policy**

- ▶ *Continue the country's holistic approach to energy policy, including the strategy of pursuing numerous goals in tandem and with successful co-ordination between relevant ministries.*
- ▶ *Continue to expand the international approach to reaching energy policy goals, particularly regarding interconnections and the most cost-effective means of meeting climate change obligations.*
- ▶ *Enhance the energy regulator's role through expansion of staff and budget, especially for electricity transmission and distribution and for district heating, in order to further improve the efficiencies of these sectors.*
- ▶ *Continue to augment the country's energy security of supply through emergency preparedness, market mechanisms in the electricity sector, fuel diversity and fuel-switching capabilities.*

### **Energy and the Environment**

- ▶ *Proceed with the implementation of the energy efficiency and renewable energy elements of the NCS in order to effect the needed changes by the time of the first Kyoto commitment window.*

- ▶ *Continue to undertake energy supply-demand and CO<sub>2</sub> emissions projections, evaluate the progress of the NCS and update it as required to achieve the Kyoto target in the most cost-effective manner.*
- ▶ *Closely follow the development of the fifth nuclear power reactor and consider alternative emissions reduction plans in the event that the planned nuclear facility does not come on line in the expected time frame.*
- ▶ *Review the package of measures on the supplementary role that emissions trading can play, particularly regarding potential overlaps with domestic measures.*
- ▶ *Determine a framework for allocation of emissions allowances in the relevant sectors as soon as possible.*
- ▶ *Assess the advantages, particularly in terms of cost-effectiveness, of the application of joint implementation and clean development mechanisms.*

## **Energy Efficiency**

- ▶ *Study the issue of cross-subsidies between district heating and electricity operations, and evaluate possibilities to improve transparency and competition in the district heating sector, starting with large heating networks. Consider the possibility of extending Energy Market Authority jurisdiction over the district heating sector.*
- ▶ *Expand the analysis of the energy efficiency aspects of heating choices in new residences.*
- ▶ *Examine the legal, economic and technical possibilities for developing heat metering in individual apartments that are currently billed according to static indicators on consumption, often with a flat fee.*
- ▶ *Review the use of voluntary agreements for industry in light of the European Union directive on emissions trading. Consider more stringent energy conservation targets in the agreements.*
- ▶ *Consider introducing more sophisticated economic signals that would favour a more fuel-efficient private car fleet, for example through an annual circulation tax or taxes on acquisition.*
- ▶ *Continue to encourage combined heat and power (CHP) production and new investment, especially for plants fuelled with renewable energy.*

## **Renewable Energy**

- ▶ *Evaluate the existing support scheme for renewables with the aim of developing a market-based system that will achieve emissions reductions at a minimal cost and give incentives to reduce production costs from renewables.*

- ▶ *Take measures to simplify and accelerate licensing and appeal procedures of wind and small hydropower plants.*
- ▶ *Explore measures to increase the economic supply of biomass.*

### **Fossil Fuels and Peat**

- ▶ *Continue to value peat for its energy security advantages, while taking into account its costs and environmental implications.*
- ▶ *Continue the policy of non-interference in the oil markets, combined with effective anti-trust oversight.*
- ▶ *Explore the use of different methodologies to establish natural gas tariffs.*
- ▶ *Examine opportunities to expand the unregulated secondary gas market as a means of gaining more experience with competition in the sector and promoting, where possible, greater efficiency in gas use by customers.*
- ▶ *Continue to examine additional international gas connections, working with multi-country partnerships to find and develop economically feasible options that can increase security of supply and possibilities for competition.*

### **Electricity**

- ▶ *Make greater efforts to harmonise rules in the Nordic electricity market, particularly common approaches to enhancing security of supply and market oversight.*
- ▶ *In order to ensure more efficient development of transmission infrastructure, adopt a common Nordic approach to mechanisms for financing transmission investment.*
- ▶ *Make greater use of ex ante regulation, particularly to encourage more efficient pricing of transmission and the disposition of transmission congestion rents.*
- ▶ *Proceed with the legal separation of distribution from retailing. Evaluate the minimum size of companies to be separated.*
- ▶ *Examine further measures to increase customer choice, including supplier of last resort policies.*

### **Nuclear Power**

- ▶ *Ensure that the licensing process for the new plant is completed without unnecessary delay within the current regulatory framework.*

- ▶ *Pursue active regulatory support for the implementation of the high-level waste repository.*

### **Energy Research and Development**

- ▶ *Develop an indicator or set of indicators that manages to better assess the effectiveness of government-funded energy research and development (R&D) efforts.*
- ▶ *Monitor and support the industry R&D effort to ensure that the existing and future nuclear power plants continue to improve their technical and safety performances and that radioactive waste is managed and disposed of safely.*