

## **FINLAND**

### **Long-term Climate and Energy Strategy**

#### **Government Report to Parliament 6 November 2008**

##### ***Abstract***

Climate change and its prevention have become one of mankind's major challenges. Approximately 80 per cent of the greenhouse gas emissions causing global warming originate in energy production and consumption, including transport. Therefore, climate and energy policy have become closely entwined in the past few years. The Government has submitted a report to Parliament on climate and energy policy in 2001 and 2005. Since the latest report, international and EU climate and energy political objectives and obligations have changed to such an extent that, in 2007, a policy position was set down in the Government Programme of Prime Minister Vanhanen's second Cabinet, stating that the Government would draw up a long-term climate and energy strategy at the beginning of its current term, to define the principal objectives and means of Finland's climate and energy policy for the next few decades, within the context of the European Union and its objectives. It was decided that the Strategy would be submitted to Parliament in the form of a report.

The report was prepared under the steering of the Government's Ministerial Working Group on Climate and Energy Policy. The preparatory body for the Ministerial Working Group has been the Climate and Energy Policy Network, comprising representatives of several ministries, including the Ministry of Employment and the Economy, Ministry of Transport and Communications, Ministry of Agriculture and Forestry, Ministry of Education, Ministry for Foreign Affairs, the Prime Minister's Office, the Ministry of Finance, and the Ministry of the Environment.

The report consists of an outline and strategy texts, including background information, and four appendices. On the other hand, the strategy proper describes the changes that have taken place in the international operating environment, and presents the Government's outlines for energy and climate policy in the forthcoming years, alongside proposals for key measures for the attainment of the EU's objectives regarding the promotion of renewable energy, the enhancement of efficiency in energy consumption, and decreasing greenhouse gas emissions.

According to the trend outlined in the strategy, the share of indigenous energy, and that of renewable energy in particular, will increase markedly over current levels. The share of renewable energy will increase to 38 per cent of total final energy consumption, the efficiency of the energy system will improve, and greenhouse gas emissions will begin to fall on a permanent basis. Furthermore, the share of coal and oil on our energy balance sheet will decrease, and the diversity of our energy system will further improve, while the risk to our energy supply posed by crises originating outside our country will diminish. To an extent, our energy system would be based on greater use of electricity than before.

Enclosed with the strategy are assessments of the impacts and costs of frameworks of measures from the perspectives of energy consumers and the general factors governing public finances and the national economy, such as gross national product and employment.

The appendices include lists of the background reports for the strategy, the parties contributing to the reports, the background calculations of the report, and its framework of scenarios etc. The Government has not commented on these. They have been drawn up by civil servants in the Ministry of Employment and the Economy, and other relevant ministries.

The strategy presents two scenarios: the baseline in compliance with current measures and development, and the objective, meeting the EU's and national objectives. According to the scenarios, for 2020, electricity consumption would, at the baseline, be 103 TWh (terawatt-hours), primary energy consumption 479 TWh, final energy consumption 347 TWh and greenhouse gas emissions 89 Mt CO<sub>2</sub>-eqv. (million equivalent carbon dioxide tonnes) and corresponding emissions outside the emission trading sector, 36 Mt CO<sub>2</sub>-eqv. According to the objective, in 2020, electricity consumption will equal 98 TWh, primary energy consumption 430 TWh, final energy consumption 310 TWh and emissions outside the emission trading sector 30 Mt CO<sub>2</sub>-eqv. Emissions within industries included in emission trading are specified in accordance with EU-wide emission trading, which is under modification.

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#### Keywords

Energy and climate strategy, greenhouse gas emissions, the Kyoto Protocol

## ***Introduction***

According to the Government Programme of Matti Vanhanen's second Cabinet, the Government will draw up a long-term climate and energy strategy at the beginning of its current term, to define the principal objectives and means of Finland's climate and energy policy for the forthcoming decades in the context of the European Union and its objectives. It was decided that the Strategy would be submitted to Parliament in the form of a report.

For the preparation of the strategy, a ministerial working group for climate and energy policy has been established, including representatives from all Government parties. The ministerial working group is chaired by *Mauri Pekkarinen*, Minister of Economic Affairs, and the other members are *Sirkka-Liisa Anttila*, Minister of Agriculture and Forestry, *Tarja Cronberg*, Minister of Employment, *Jyri Häkämies*, Minister of Defence (*Ilkka Kanerva*, Minister of Foreign Affairs, until 4 April 2008), *Jyrki Katainen*, Minister of Finance, *Paula Lehtomäki*, Minister of the Environment (from 28 September 2007 to 11 April 2008, *Kimmo Tiilikainen*), *Jan Vapaavuori*, Minister of Housing, and *Stefan Wallin*, Minister of Culture and Sport.

Working under the ministerial working group, a contact network, comprising representatives of various ministries, has been responsible for the coordination of work between the sector ministries, and the preparation of issues for the ministerial working group.

The long-term climate and energy strategy describes changes in the international operating environment over the last few years, and presents the measures required in Finland, e.g. concerning the objectives for the reduction of greenhouse gases, energy sourcing, renewable energy and energy efficiency, on the basis of the guidelines approved by the European Council in the spring of 2007,

and the climate and energy package based on them, presented by the European Commission in January 2008.

The aim of the strategy is to provide a basis for the Government's statements, both in European Union negotiations and other international contexts, and in domestic policy preparation and decision-making.

The main focus of the strategy lies in the guidelines up to 2020, and the measures they require. Furthermore, visions up to 2050 have been presented in order to emphasise the long-term nature of climate and energy policy.

The aim of the strategy at hand is to contribute to ensuring the implementation of the Kyoto Protocol, and meeting its obligations, alongside the rapid and flexible initiation of the implementation of post-Kyoto period obligations in 2013. By that time, the adequacy of post-Kyoto period emission reduction measures should be ensured, and the potential additional measures required should be presented in view of the 2020 obligation, so that obligations related to the schedule and efficiency of implementation measures set by the EU are met. Furthermore, the EU requires that, in 2016, member countries present an in-depth assessment of how they will meet the obligations set for 2020.

The starting points and background analyses of the strategy are described in more detail separately, in the reports and memorandums drawn up by various ministries on their respective administrative sectors. These are listed in appendix 3 to this report.

The Government Programme also included the decision to draw up a foresight report on energy and climate policy. The foresight report, prepared by the Prime Minister's Office, will continue and supplement the guidelines of the Climate and Energy Strategy, with a particular focus on long-term climate and energy policy extending beyond the timeline of this strategy, alongside global development and preparation for the impacts of climate change.

## ***1 Key conclusions***

The intense increases in oil, coal and natural gas world market prices, and the high price of emission allowance in the EU's emission trading, have significantly changed the price relationship of fossil energy forms and renewable energy, in favour of the latter. In the current situation, renewable energy has become more competitive than before. As a consequence of increasing fuel prices and emission allowances, even consumers' electricity, heating and transport costs are rising. Higher energy prices motivate energy saving and improve the profitability of energy saving measures. Regardless of this, new steering methods shall be introduced in order to facilitate the meeting of the obligation proposed by the Commission for Finland: increasing the share of renewable energy to 38 per cent.

Without new energy policy measures (baseline), the consumption of primary energy would increase from 380 TWh in 2005 to approximately 480 TWh by the year 2020. In the same period, final energy consumption would increase from circa 300 TWh to circa 350 TWh.

In 2005, the final consumption of renewable energy sources was 86 TWh, and according to the baseline scenarios, their use in final consumption would increase to 106 TWh. According to the

baseline, renewable energy sources' share of final energy consumption would increase from 28.5% in 2005 to only some 31% in 2020, while the obligation proposed by the Commission for Finland is 38%.

The baseline would entail an increase in electricity consumption at a pace of only around one per cent per year until 2020, totalling 103 TWh by that time. In 2007, consumption was slightly in excess of 90 TWh.

Without new climate policy measures, Finland's greenhouse gas emissions would total some 90 million equivalent carbon dioxide tonnes in 2020, i.e. approximately 20 per cent more than the emission level of 1990. This increase in emissions is almost fully due to increasing emissions from the Emission Trading (ET) sector, as referred to in the proposed EU emission trading directive, i.e. mainly energy production and industrial processes. However, emissions from non-ET sectors, such as transport, house-specific heating and agriculture will, within the baseline, remain on their current levels until 2020.

By 2050, the total consumption of energy and the consumption of electric energy will continue to increase further and, without new measures influencing consumption, consumption will be approximately one quarter higher in that year than at present. Greenhouse gas emissions would increase by as much as 30%.

Results according to the baseline indicate that energy consumption and emissions will increase by more than would be admissible according to the obligations proposed by the Commission for Finland. The objectives for reducing emissions, promoting the use of renewable energy, or enhancing the efficiency of energy consumption, cannot be reached without new climate and energy policy measures.

In order to achieve these objectives, even Finland must implement integrated energy and climate policy measures, which emphasise energy efficiency and energy saving, and the increased use and production of renewable energy sources. The objectives set by Finland's strategy are similar to those of the EU's strategy: environmental sustainability, security of supply, and competitiveness of energy supply.

The strategic objective set by the Government for Finland entails halting and reversing the growth in final energy consumption so that, in 2020, final energy consumption is approximately 310 TWh, i.e. over 10% less than the baseline. The longer-term vision entails a further decrease in final energy consumption by 2050 of at least one third of the 2020 quantity. In order to attain these objectives, the efficiency of energy consumption must be enhanced, particularly in housing, construction and transport. The range of measures required is broad and will be completed as part of the work of the Energy Efficiency Committee, which is currently underway.

The goal is to increase the share of renewable energy to 38 per cent by 2020, in line with the obligation proposed by the Commission for Finland. This is a challenging obligation, and its attainment fundamentally depends on having final energy consumption enter a downward trend. Finland's natural resources would facilitate the additional use of renewable energy, but in order to realise this, the current subsidy and steering systems must be rendered more effective, and structures changed. Indeed, meeting such an obligation would require an intense increase in the use of wood-based energy, waste fuels, heat pumps, biogas and wind energy. As a new promotional method, a cost-effective feed-in tariff system, operating on market terms as far as possible, will be introduced.

Finland is preparing itself to meet the objectives set for renewable energy through its own measures, without the flexibility mechanisms between member states as planned for in the Directive. Under the current notion flexibility mechanisms will be based on voluntary cooperation between the member states so that they will have control over the use of those flexibility mechanisms. If necessary, Finland can utilise flexibility mechanisms either as a buyer or seller, depending on the costs of increasing renewable energy in Finland and in other member countries.

The starting point for our electricity sourcing is access to sufficient and moderately priced electricity with good security of supply, so that electricity sourcing simultaneously supports other climate and energy policy goals. The high share of energy-intensive industry, and the long lighting and heating season are characteristic of our electricity consumption structure. In future, our electricity sourcing will continue to be based on a versatile system based on several energy sources, diversified thanks to the cogeneration of power and heat. Our own production capacity will be able to provide for peak consumption and possible import disturbances.

In constructing our own capacity, priority will be given to plants that do not emit greenhouse gases, or ones with low emissions, such as combined power and heat plants using renewable fuels, and financially profitable and environmentally acceptable hydro and wind power plants. Furthermore, we will prepare for constructing additional nuclear power.

According to calculations, in terms of sufficient electric energy, a decision-in-principle as per the Nuclear Energy Act on the additional construction of nuclear energy generation would be necessary in the next few years, i.e. during the current Government term, to facilitate the replacement of condensing power capacity causing emissions, with capacity with no emissions, and to improve the self-sufficiency of electricity sourcing. The consideration concerning a decision-in-principle will be based on the premise that nuclear power will not be constructed in this country for the purposes of permanent export of electricity.

This strategy includes key steering methods in order to meet the aforementioned objectives. Matters concerning financing needs will be handled and decided on as part of the framework decision and budgeting processes of the state economy. According to the framework decision reached by the Government on 13 March 2008 on the state economy for the years 2009–2012, with respect to any financial needs exceeding the framework decision, a stand will be taken in the budget proposal for 2009, and the framework decision of spring 2009. In connection with the budget proposal for 2009, decisions were based on measures targeted at the years 2008 and 2009.