

European Employment Observatory

EEO Review: The Employment Dimension of Economy Greening

Finland

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1. Introduction

In Finland, the public debate on the objectives of EU climate and energy policy has been based on the IPPC scenarios for greenhouse gas emissions and the effects of climate warming on the state of the world. The depletion of known oil reserves has also increased concerns in the Finnish population about the future and the need to change consumer behaviour.

The message from political decision makers and civil servants about the detrimental impact of the greenhouse effect for Finland has focused primarily on the risks related to the environment. Among other things, the government foresight report on climate policy, published in October 2009, provides an overview of the causes and consequences of the climate crisis. The fight against climate change is depicted on a rather general level with the aid of future scenarios. One of the government's most challenging goals is to get citizens and companies to better understand the impact of climate warming and thus to encourage them to reduce their emission outputs.

In light of ecological impact studies drafted by public authorities and climate scientists, it is natural that public opinion leans on these information sources. According to public opinion surveys, the majority of Finns support compliance with the obligations of the UN's Kyoto Climate Treaty and approve stringent measures to prevent climate change.

Finns are deeply concerned about climate change and the vast majority regard it as a very significant threat. Young people are more willing to change their consumption behaviour than older age groups, although most Finns are willing to make changes in their personal lives to help tackle climate change. Opinion polls reveal that the differences across demographic groups regarding concerns, information and willingness to take action are very small. However, many believe that other Finns are not as willing to take steps for the good of the climate as they are themselves. As such, a strong willingness to act may not necessarily translate into bold action. Over half of Finns believe that they are already acting in an environmentally friendly manner, for example, by reducing the use of their cars and favouring public transport.

According to a survey conducted by the daily newspaper *Helsingin Sanomat* in 2009, the perceived importance of stemming climate change fell by 5 percentage points, to below 70 %. The results can be primarily explained by the rising concerns about the economic crisis and job security, as well as growing criticism of climate policy.

In Finland, a national climate-related public relations (PR) project was carried out during 2002–2007¹, which sought to improve the public's awareness of climate change. The follow-up report on the project concluded that the Finnish population's knowledge about climate change had indeed increased during the PR programme,

¹ PR campaign related to climate change carried out in 2002–2007. The programme sponsored by the Ministry of Trade and Industry concentrated on climate PR for private citizens and schools. Finland also participated in the EU Commission's climate campaign initiated in 2006.

but it is impossible to say whether this can be attributed solely to the campaign or, for example, to the increased news coverage of climate change.

The attitudes of labour market organizations toward greenhouse effects are considerably more realistic than those of the public at large. These organizations proclaim that actions to combat climate warming should be taken globally and should not impact on the competitiveness of Finnish companies. The labour market organizations maintain that the implementation of the climate treaty will weaken companies' employment possibilities especially in the energy-intensive export industry.

Among the trade unions, the strongest measures have been proposed by the metal union, which argues that the most economically profitable way of lowering greenhouse emissions is to build additional nuclear power plants. This spring the government will make its own proposal to the Parliament on the need for additional nuclear power. Three permit applications have been submitted: if these three nuclear projects are approved, they would increase electricity production by 5 000 MW and will, in the long run, reduce carbon dioxide emissions by about 15-20 %. However, it should be noted that because of the prolonged permit decision-making process, the new power plants would not become operational until the beginning of the 2020s.

The employers stress the importance of alleviating the sector-specific impact of greenhouse gases. The general view of the employers is that, among other things, raising the share of renewable energy production should be encouraged via direct investment subsidies. Part of the state's revenues derived from emissions trading must be channelled back to the industrial sectors by easing the energy taxation of manufacturing companies.

2. Business and labour market impacts

Forecasts have already been made regarding the economic impact of climate change in Finland since the latter half of the 1990s. In the first projections, the main emphasis was on the impact of climate warming on Finnish agriculture and forestry. In the preliminary report, it was suggested that the warming of the climate would lengthen the growing season for Finnish trees and crops. The annual increase in agriculture would be EUR 0.2 – 0.6 billion and in forestry some EUR 0.7 billion. The impact in energy production would also be positive, since heating of dwellings would be less expensive.

All in all, warming would serve to boost Finland's GDP by 2 % by the year 2050. According to the study, the greenhouse effect should not constitute a great economic threat to Finland, but on the other hand that the impact of uncertainty should not be downplayed. Environmental catastrophes can, for example, raise world market prices and in agriculture warm winters may cause problems for plants and microbes.

During the last decade, the assessment of economic impacts increased quickly when the mechanisms included in the UN's climate treaty (Kyoto target) and the EU emission trading system directive were drafted.

2.1 VATT's assessment of economic impacts of EU climate policy

Among the domestic research institutions, the Government Institute for Economic Research (VATT) initiated a large-scale climate change research programme in the beginning of the 2000s. They used a general equilibrium model (VATTAGE) to estimate the macroeconomic and sectoral impacts of climate policy over the long run.

The VATTAGE model is a dynamic general equilibrium model that has been mainly used for assessing the impact of tax policy and energy and environmental policy, as well as for preparing long-term economic scenarios. The general equilibrium model is an extension of input-output models which also incorporates changes in the relative prices of inputs and thereby the substitutability of inputs.

According to VATT's findings when using the model, the realization of the Kyoto target and EU energy policy will curb economic growth and employment by the year 2020. The negative impacts are greatest in the short run, specifically in projections extending to the year 2012.

The most significant dampening of growth stems from the impact of the rise in carbon dioxide emission prices, which hits industrial sectors. Higher energy intensiveness than in other EU countries raises industrial companies' marginal costs and in particular weakens the relative competitiveness of metal refining and the forest industry generating a lot of carbon emissions².

According to VATT, the realization of the energy and climate policy targets by the year 2020 will raise the production costs of sectors in the sphere of emissions trading and require increased use of renewable energy sources, as well as savings in energy consumption. The reduction of carbon dioxide emissions not within the sphere of emissions trading by 16 % will require economic control mechanisms, such as the adoption of a feed-in tariff system.

The EU's energy and climate policy programme will affect the economic structure and the level of total production in 2020. The main channel of influence will be the rise in energy costs, which will cut purchasing power and weaken the price competitiveness of exports. According to VATT's calculations, GDP will remain about 0.8 % lower in 2020 than in the baseline scenario (without the EU programme and the Kyoto Treaty). The strength of the impact depends on the price development of emission rights and the adjustment of real wages. The greatest negative impact in VATT's model projections stems from the lowering of consumer purchasing power.

The adjustment of the labour market affects the results considerably on the level of the aggregate economy. The direct impact of the climate package leads to a rise in the prices of emissions' trading, renewable energy and energy savings, which cut consumers' purchasing power and weakens domestic demand. The rise in the level

² Emissions' trading applies to iron and steel production, oil refining, production of construction materials and cement as well as production of pulp and paper. As regards energy production, plants producing over 20 megawatts of power are included in the sphere of emissions trading. In Finland, there are about 300 plants included in the trading scheme, about 200 of which are in the energy sector.

of costs tends to erode real wages. In the case of flexible real wages (a rise in the level of prices is not compensated by a rise in wages), employment gradually revives and, in order to stabilize structural unemployment, real wages remain about 1% lower than in the baseline scenario in 2020. If real wages remain inelastic, the climate package would cause a loss of employment of about 0.4% at the 2020 level.

Emissions' trading curbs investment while the rising price level erodes the return on capital and increases the labour intensity of production. Boosting the share of renewable energy (wind power, bioenergy) and energy conservation will increase investments, but on the whole the energy industry's investments will remain below the baseline scenario.

In the model calculations, about half of the contraction of total production is attributable to the slow-down in growth. The greatest dampening effect on production will be experienced in the energy and metal industry, as well as metal refining. Only in agriculture and forestry will the climate package have a positive impact on production (Table 1).

Regional impacts will reflect the significance of energy-intensive industries. For example, there will be a significant impact on the forest industry cluster in Carelia and oil refining in Itä-Uusimaa. The impacts will be dampened by the growth in labour-intensive industries, for example, in Uusimaa. Forestry-intensive regions will in turn benefit from the growth in demand for timber. Except for primary production and certain subsectors of the machinery and equipment industry, which benefit from increased use of timber and adoption of new energy technology, production in most sectors will remain lower than in the baseline scenario.

Table 1: Change in value added in selected sectors in the year 2020

Public services	Private services	Transport	Energy	Other industry	Engineering	Basic metal	Paper industry	Primary production
-0.5	-3	-0.4	-23	-4.5	-9	-22	-12	+7

Source: VATT (Government Institute for Economic Research).

2.2 ETLA's assessment of the economic impacts of the EU's climate policy

The Research Institute of the Finnish Economy (ETLA) has also conducted several studies on the impacts of climate and energy policy. ETLA's forecasting unit has developed its own forecasting system for evaluating the economic impact of emissions policy.

In the forecasting system, the input-output model designed for the EU region and Finland transforms the impacts of climate policy on exports and domestic demand into sector-specific production impacts. The model is used for forecasting energy consumption, greenhouse emissions, the price of emissions rights and the cost of electricity, as well as for assessing the macroeconomic effects of emission ceilings.

The EU countries' key mechanism for reducing greenhouse gas emissions stipulated by the Kyoto Treaty, is the limiting of emissions of companies covered by the

emissions trading scheme. The tightening of emission ceilings will require a clearly declining trend for EU countries' emissions after 2008.

According to ETLA's baseline scenario, the completion of the new nuclear power plant will lead to significant reductions in 2011 in carbon dioxide emissions from the production of electricity. Furthermore, the adjustment of large EU countries to the emissions ceilings will lead to a considerable rise in the price of emission rights and electricity. The rise in the price of electricity will in turn lead to a slowdown in economic growth and energy consumption, which will mean that Finland's greenhouse gas emissions will decrease during 2008-2012 in accordance with the Kyoto Treaty.

ETLA scenario foresees that the EU economic growth will have to slow down if the emission reduction targets are to be met. In large EU countries this means the dampening of GDP growth by 0.4 and employment growth by 0.3 percentage points by the year 2012. In Finland, the impacts on the growth rate of GDP and employment are approximately double those of the large EU countries.

The emission restriction policy is expected to have a greater impact on Finland and on other small EU countries than on large EU countries. This stems from the export intensiveness of a small open economy and the fact that emission restrictions affect economic growth by eroding the competitiveness of exports as a consequence of the rising cost of electricity and emission rights.

2.3 Green jobs potential in Finland

According to model estimates compiled by research institutes, the climate treaty will have a negative effect on output and employment in both the short and long term. Heavy processing industry will be one of the losers in the movement against climate change, unless an extensive internationally binding climate treaty is reached quickly. Nor will the EU's heavy industry be able to pass the additional costs over to its prices without negatively affecting competitiveness and the delocalisation of carbon-intensive industries into countries which have not yet ratified the Kyoto agreement.

According to calculations by models, even if the amount of jobs within the renewable energy sector were to increase, it would not be able to compensate for job losses experienced by basic industry. Renewable energy, energy saving and cuts in emissions create new technology, new innovations and new professions. They also make old sectors and professions greener.

In a number of studies the additional employment potential of renewable energy has been estimated to be about 20 000 man-years in just under ten years. According to a report by the Rintala task group (2007), the bio-energy sector alone would provide an estimated 12 500 man-years more of employment opportunities by the year 2015, mostly in the production of bio-fuels, harvesting, transport and energy production facilities.

The export industry also has its own opportunities for growth. High levels of Finnish engineering know-how provides export possibilities e.g. of technologies making energy usage more efficient in the processing industry of growing markets.

The structural change of the forestry industry opens new opportunities for a wood-based bio- and energy economy, when the pulp industry will no longer need as much wood for its own processes. New products with a much higher added value than paper or cellulose are in development. Energy companies also have a great need worldwide to invest in efficient electricity and heat production with low emissions (clean-tech markets). According to companies, the economic crisis has not eliminated these needs; rather it has, at most, slowed down the execution of the new investments.

In addition to exports, other sectors such as construction have a significant employment potential. For instance, large transportation projects started by the government last year including, a ring highway in Vantaa, the Espoo subway and the Seinäjoki-Oulu railway tracks, which will bring work for thousands of individuals for a number of years (altogether about 26 000 man-years), decrease emissions and provide transport for people.

The jobs and innovations of the green economy will not be generated only in a few large businesses or projects. Green-collar jobs should not be seen narrowly as only engineering work, rather as a construction of a new kind of well-being and services improving the quality of life in a variety of ways for people in different walks of life and with different educational backgrounds. In particular, jobs will be in small and medium-sized businesses (SMEs) where engineers, installers, metalworkers, forest machinery operators, designers, chemists, publicists, programmers, carpenters and cleaners work. They will be generated for instance in:

- the production of wind power plant parts, heating pumps, power plants operating with renewable fuels and motor construction;
- the harvesting and transportation of wood in forests for energy production;
- the production of renewable energy for power plants, sawmills and cellulose factories;
- farming of energy producing plants and organic products; wood construction;
- the greening of the construction sector;
- construction of tracks and light transportation routes;
- mass transport and railways;
- ground and air heating pump sales;
- the international and national advertising and marketing of green economy products;
- eco-car sales, nature travels and eco-tourism;
- mending, re-using and recycling; and
- research and teaching of environmental fields in universities.

According to Finnish estimates, the amount of green jobs might, at best, increase by about 5000 persons annually, which corresponds to about 2.5-3% of the annual gross increase of about 200 000. The net employment influence will become distinctly greater, because the exit of old technology jobs will grow and also the job opportunities demanding green know-how will be the fastest growing of the new jobs.

2.4 Statistical reforms

Along with international emissions trading, greenhouse gases have acquired a price and have become a new factor in production. In addition, revising the grounds for statistical classification in measuring 'green' production and employment would be well justified due to the rapid expansion of the climate cluster. Indeed, the current challenge facing statisticians is how to measure the amount of green output and employment. The 'reduction race' of emissions and shifting to a new low-emission production economy concerns output and employment in all sectors directly and indirectly.

For the time being, the employment effects of the climate and energy policy have been calculated in the so-called eco-sector. The eco-sector is a sector that develops products and services by which the quality of the environment can be improved. The eco-sector is rather narrow, however, in comparison to the overall climate cluster.

According to the assessment of the Ministry of Labour, the turnover of the European eco-industry has grown by an annual average 5% from the year 1994 to 1999, while GDP grew by an average of 2.5% annually. According to the OECD and Eurostat, eco-industry manufactures products and services which measure, prevent, limit, decrease or fix environmental damages suffered by water, air or soil or problems concerning waste, noise or the eco-system.

In 1999, the total turnover of the eco-industry of EU member countries was EUR 183 billion, which is 2.3% of the GDP of the EU. The eco-industry employs 1.6 million people directly, which is about 1% of the labour force of Europe as a whole.

An in-depth estimate of 'green' output and jobs has not been made for Finland. Although the classifications used by Finland are based on international standards stipulated by EU directives, this does not rule out opportunities to develop the sector-specific satellite data base representing the climate cluster. According to the most recent medium-term operational and financial plan of Statistics Finland this sort of reform programme is not yet forthcoming.

2.5 Government stimulative energy policy measures 2009-2010

In the recovery programmes carried out last year by the government, there was a strong emphasis on projects regarding climate and energy policy. At the end of 2009, new projects totalling around EUR 100-150 million worth of investment were implemented to prevent climate change by re-allocating state expenditures and through an investment programme. Many of these projects will be carried out during 2010.

The most significant increase in expenses to reduce climate change was directed towards new transportation investments and increases in businesses' R&D funds. Additional input was given to increasing the energy efficiency of housing, e.g. by encouraging renovation and providing energy-subsidies aimed at businesses. The feed-in tariff system, which went into effect in the beginning of 2010, will replace some of the energy subsidies in renewable energy production.

In addition to concrete spending increases, the government is in the process of developing several measures to reduce green-house gas emissions in the works. They include, for instance, antitraffic-jam fees in the Greater Helsinki area and the specification of construction regulations to increase energy-efficiency.

3. Conclusions

Debate about the climate and energy policy in Finland is subject to conflicting pressures. The general public supports the use of stringent measures to combat climate change, which is in line with scenarios drafted by climate scientists and politicians. In this sense, the concerns about climate warming are shared.

However, when taking into account the economical effects of climate and energy policy commitments (which are often emphasised by businesses and labour market organisations), controlling climate change is very costly and Finnish industry will especially suffer from substantial production and employment losses in the short term.

The EU's climate and energy policy for the years 2008-2012 sets rather high expectations for Finland in limiting greenhouse gas emissions. Reaching the objectives of Kyoto alone will demand substantial measures to limit greenhouse gases.

The Government Institute for Economic Research and the Research Institute of the Finnish Economy have made several macroeconomic (e.g. employment) impact studies regarding the climate policy of the EU. The main finding of these evaluations is that GDP will become lower in Finland in both the short and long term. The most significant losses will hit the output of the export industry due to its relatively large energy intensiveness.

Developing renewable energy production with lower emissions and industry production processes will require new technology and new ways of doing business. In this respect, the Finnish industry and energy sector are internationally at a comparatively strong position for future development, e.g. to increase exports of components and services.

The uncertainty about the scale of the production and employment effects projected by the forecast institutes is now exceptionally great due to the fact that the EU was the only group of countries at the Copenhagen climate summit to have a binding reduction objective. If a global agreement to reduce emissions is not reached soon, it is likely that the climate strategy of the EU will also have to be revised as regards, for example, emissions trading due to reasons of competitiveness. Otherwise the climate and energy policy commitments will weaken the operational requirements of

businesses across all EU countries and will increase the risk of production being moved to lower cost countries.

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