Economic models to achieve European Union's 20-20-20 targets

An international team of economists and other experts in social sciences has developed models to improve the European climate and energy policies in the framework of the project Economic Modeling for Climate-Energy Policy (ECOCEP). They contribute to European Union's (EU) commitment to mitigate climate change, enable the energy transition, and facilitate energy savings.

Climate change is one of the biggest challenges to the economy. From the Kyoto Protocol of 1997 to the Paris Agreement of 2016, several countries around the world agreed on the reduction of the emissions of greenhouse gas. The European Union (EU) adopted policies to deal with greenhouse gas emissions in its 20-20-20 targets. The European funded research project Economic Modeling for Climate-Energy Policy (ECOCEP) has been carried out successfully from 2014 to 2017. The research project was based on EU's 20-20-20 targets on carbon dioxide emissions, renewable energy, and energy efficiency.

An economic research project

In ECOCEP, participating researchers have estimated the economic value of the effects of climate change and developed models to assess the economic impacts of mitigation and adaptation policies. Models have been developed or improved with an integrated approach and advanced economic tools. The project drove four great sets of results on the reduction of greenhouse gas emissions, the increase of the share of renewable energy, the increase of energy efficiency, and non-market effects.

The first set of results are models on the effects of greenhouse gases mitigation and adaptation policies. A primary example of a contribution in this area is work on the impact of carbon pricing, brown coal availability, and the cost of gas. Besides, other results improved the key parameters of economic models. In particular, they delivered new econometric estimations on the modelling of the biofuel market, which can play a role in the effort to mitigate climate change.

The second set of results is on the energy transition, to increase the share of renewable energy in order to mitigate climate change. Several results deal with the electricity sector, as it is the primary carrier of renewables. In addition to electricity, bioenergy has a high potential as an instrument of climate change mitigation. With the project's results, we now have a better understanding of the price transmission between biofuels, fuels, and food commodities. Finally, as fossil fuels remain in use, the project focused on improving models on the prices of oil and electricity and the general determinants of the price of energy.

The third set of results examined household behavior in consuming energy, their preferences for renewables, and their choice of energy efficiency measures. The research work investigated how households have changed their electricity consumption pattern by adjusting to the changes in the price of electricity and to the availability of subsidies for energy efficiency measures. It also covered the choice of households for modes of transportation.

The fourth set of results bundles the themes of non-market effects, risks, and equity of climate policies. The research work included estimates of non-market impacts of climate change on ecosystems, notably the valuation of non-market services provided by forest ecosystems and wildlife resources. Finally, some results deal with the distribution of wealth and economic inequalities brought about by energy policies.

Relevance in a new policy context

The results of the project ECOCEP remain relevant in the context of the adoption of the Energy Union Package (2016). The EU established new targets to be met by the horizon of 2030, which are more ambitious than those of 2020: first, a 40% reduction of greenhouse gas as compared to the level of 1990; second, 27% share of renewable energies in the energy portfolio; and third, 27% of energy saving through the increase of energy efficiency as compared to the business-as-usual.

An international research consortium

ECOCEP reinforced and extended an international network of scientific research on the economics of climate change and energy. Participants were coming from four beneficiary institutions in Europe: Charles University, the coordinator of the project (Czech Republic), Fondazione Eni Enrico Mattei (Italy), the University of Oxford (United Kingdom), and Toulouse School of Economics (France). They were seconded to top academic institutions in Australia, Canada, New Zealand, Russia, South Africa, and the United States.

The project provided beneficial support for the training and transfer of scientific knowledge among the participating institutions and their research staff. In practice, the project facilitated the transfer of knowledge between selected staff-members from four research institutions in the EU on the one side and seventeen partner institutions from the rest of the world on the other. It was funded by the People Programme (Marie Curie Actions) of the European Union's Seventh Framework Programme Grant Agreement No 609642.

Website

For further information, please redirect to the website: <http://ecocep.cuni.cz/>