Low Carbon Societies Network

April 28, 2010

EU Stakeholder Seminar on Low Carbon European Energy Scenarios University Foundation, Brussels, Belgium

At this, the Network's first stakeholder seminar, the main topics will be European low-carbon scenarios and what kind of electricity grid we need for 100% renewable energy supply. The seminar will discuss three scenarios in particular:

- Scenario by Friends of the Earth Europe / Stockholm Environmental Institute (SEI) with 40% CO_2 reduction by 2020 and 90% by 2050, covering EU-27
- Scenario by INFORSE-Europe (International Network for Sustainable Energy) on a transition to 100% renewable energy by 2050, covering EU-27
- "Roadmap 2050" with scenarios commissioned by ECF (European Climate Foundation), including a 100% transition to renewable energy of the EU-27 power sector by 2050.

Participants in the discussion will include scientists, politicians, NGOs and industry representatives.

The discussion of the kind of electricity grid we need for a 100% renewable energy will include presentations of a study of the grid needed for the 100% renewable energy scenario within ECF's "Roadmap 2050", as well as an INFORSE scenario making full use of local flexibility and using an intelligent grid as a backbone for the 100% renewable energy supply in a country -- in this case, Denmark.

Venue: Club of University Foundation, Brussels, Belgium.

Sign up to the Seminar at http://www.lowcarbon-society.eu .

October 5, 2010

Low Carbon Societies Network Seminar, Centre for Alternative Technology (CAT), Wales, UK

Reserve the date already now for the second Network's seminar, where we will discuss how best to develop the network as well as key issues surrounding transitions to low carbon societies.

Topics will include public and stakeholder participation in and acceptance of transitions to low carbon societies; news about scenarios; speed of transitions to low carbon sectors of society; and other related subjects.

The Venue: The new conference center at the Centre for Alternative Technology (CAT) in Wales. CAT is a center visited by 75 thousands of people every year.

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- Energy Scenarios in Germany and France - Comparing Apples and Oranges, Project Report
- European Senarios for a Transition to Sustainable Energy
- New initiatives for Baltic, Danish and Hungarian sustainable energy scenarios

This newsletter is published by the *"Low-Carbon Societies Network"* project, financed by the European Commission's 7th Framework Program for Research (FP7). The project's official name is *ENCI-Low-Carb* or *"European Network Engaging Civil Society in Low-Carbon Scenarios"*. The project period is 2009-11.

The aim of the creation of a European network on energy scenarios is to facilitate information flows between Civil Society Organizations (CSOs) and research institutes in Europe about low-carbon energy scenarios and technologies.
We want to establish a lively exchange concerning existing scenarios and examples of best practices already in place today that will be indispensable in meeting the requirements of a low-carbon society.

If you want to join our network, please contact the Project Team.
Alternatively, you can register on the web site, as well as subscribe to this newsletter.

Our Project Team will build ambitious energy scenarios for 2050 for Germany and France. In the process we will meet with stakeholders to build support for the scenarios and to identify measures that might counter negative social and economical impacts.

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www.lowcarbon-societies.eu

Low Carbon Scenarios and Model Assumptions – an Example from the RECIPE project

Brigitte Knopf, Gunnar Luderer from Potsdam Institute for Climate Impact Research, and Meike Fink from RAC-France (photos from left to right)

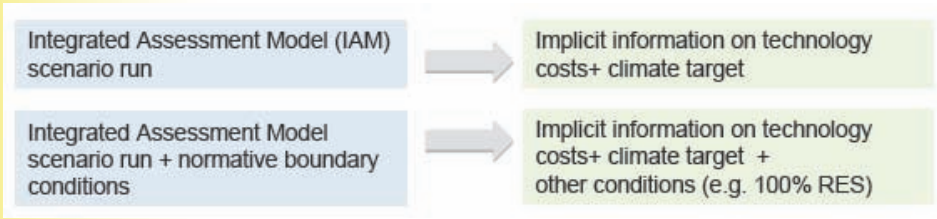


Introduction to Models and Low Carbon Scenario Development [1]

The aim of the ENCI project is to support the flow of information between researchers and NGOs about low-carbon energy scenarios and technologies.

To this end, it is of the utmost importance that the underlying assumptions of the models used by researchers be stated clearly.

Various kinds of models and approaches are used in the Integrated Assessment (IA) modeling community, which is assessing climate change within the broader contexts of economics, technology and politics.



IA models vary significantly; e.g., some include only an energy system scenario, whereas others add an economic module that evaluates the macro-economic costs and consequences of climate-change mitigation. The economic models vary in their core assumptions, which range from neoclassical optimal growth models to neo-Keynesian models. Assumptions about technological flexibility also differ from one model to another, due to different cost assumptions, amongst other things.

Two discrete modeling approaches account in part for the large differences that are reported in low-carbon scenarios. In most IA scenario runs, the only aim is to reach a certain climate target. The models try to reach this constraint while satisfying the objective function in the model. These objectives can be very different in the various models, e.g., cost minimisation in the energy sector vs. optimisation of global welfare. The energy mix resulting from this approach often shows a broad portfolio of energy technology options, including Carbon Capture and Storage (CCS) and nuclear energy [2].

In a different scenario approach, not only is a climate target set, but so is a condition concerning a broader political or sustainability aspect, which leads to a kind of "normative" boundary condition within this scenario. This could be the goal of reaching a 100% share of renewable energy sources in the electricity sector by 2050. Both approaches have their advantages and disadvantages. The most important point is that these approaches should be explained clearly when scenarios are being presented and compared.

No single model or scenario approach is right or wrong. Models do not predict the future; they generate plausible, self-consistent scenarios and can give answers only in the "if-then" mode.

These scenarios, in turn, may serve as useful input as scientists and policy makers explore a range of possible developments, discuss the plausibility of underlying assumptions, and derive appropriate courses of action.

An Example - Comparing Optimization Models

In the RECIPE (Report on Energy and Climate Policy in Europe) project, various transformation pathways have been compared, using underlying assumptions made explicit and attainable for policy makers. RECIPE outlines roadmaps towards a low-carbon world economy.

Three structurally different energy-economy IA models were used to explore possible future development paths in line with the 2°C target under a range of different assumptions about the nature of the low-carbon transition.

Two of the models, IMACLIM-R and REMIND-R, are part of the ENCI project as well.

Although both include an economic module and analyse a scenario in which only a climate target is set, they employ very different approaches.

One main difference is the partial use of production factors that can lead to underused capacities or unemployment in IMACLIM-R.

Sub-optimal investment decisions resulting from the interplay between inertia, imperfect foresight and myopic 'routine' behaviors are taken into account.

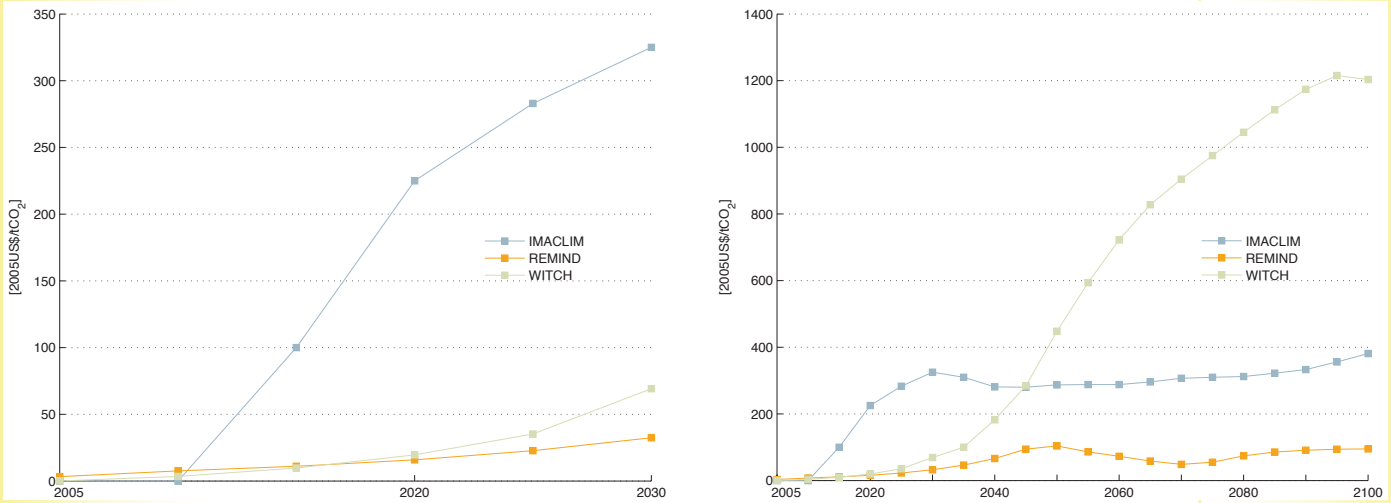
By contrast, in REMIND-R, economic dynamics are calculated through inter-temporal optimization, assuming perfect foresight by economic actors.

Under-investments or unemployment, e.g., therefore are not taken into account, but the model provides a benchmark for an optimal pathway towards a low-carbon economy.

Different carbon price trajectories of these two and a third model (WITCH) reflect the general uncertainty about CO_2 prices.

Model assumptions on macro-economic flexibilities, the nature of the decision process (perfect foresight vs. imperfect foresight), and the availability and cost of low-carbon technologies (learning processes reduce their costs) have a strong impact on the simulated carbon price level.

REMIND-R and WITCH are perfect-foresight inter-temporal optimization models and therefore envisage smoother development of the carbon price until 2030, but exceed those estimated by IMACLIM-R in the longer term due to the more conservative assumptions concerning technology substitution within the energy sector.



Similarly, real-world carbon prices will depend strongly on:

- (1) a stringent yet flexible global framework for achieving deep emission reductions,
- (2) the ability of policymakers to establish credible expectations of short-, medium- and long-term reduction targets,
- (3) the portfolio of technological abatement options and their rate of innovation, and
- (4) the participation of major emitters in a global agreement to control climate change.

Thus, carbon prices will remain moderate only if policymakers succeed in establishing credible expectations of future emission cuts and in fostering low-carbon innovation as well as in achieving broad regional and sectoral coverage of climate policy.

Despite differences in models' methods, assumptions, and detailed results, robust common conclusions emerge from all models:

- Effective climate protection at low cost is achievable only if we act without delay.
- Reductions needed to achieve ambitious stabilization targets require large-scale transformations of energy systems.
- All models project a rapid decarbonization of the electricity sector and an immediate phase-out of investments in conventional fossil power generation capacity.
- Emission reductions outside the power sector, particularly in transport, are projected to be more challenging.
- Long-term mitigation costs depend strongly on energy-efficiency improvements and the availability of abatement options in transport sectors.

These results underline the paramount importance of technological innovation to overcome the dependence of this sector on fossil fuels.

We Must Learn from the Differences

The differences among the models can provide significant insights into the development of these scenarios. The variations in results are rooted in the sensitivity of the conclusions to the choices of parameters and methodology. Analysis of the diversity and sensitivity of model results can provide insights informing the appropriate range of policy discussions and the scope of healthy disagreement.

1) Here, as elsewhere in the Low-Carbon Society Network, the primary focus is on scenarios and strategies for 80% or greater reduction of CO_2 emissions.
2) Depending on the assumption used in the models of the full costs and availability of nuclear power, CCS and other solutions.

The Network at UNFCCC COP15, Copenhagen

Meike Fink and Jan Burck at the exhibition booth during COP15 in Copenhagen in December 2010.

The Network's work was exhibited at the UNFCCC COP15 in the Bella Center and at the parallel NGO forum Klimaforum'09 at the DGI Center as part of the INFORSE exhibition booth.

More than 50 participants were interested in the Low Carbon Societies Network's Side Event on the NGO Climate Forum in Copenhagen on December 10, 2009.

Links to pictures, presentations, and interviews by the Climate Change TV: Event's section of the website: http://www.lowcarbon-societies.eu/index.php?id=22

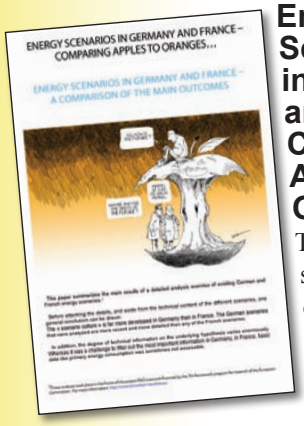
The Climate Change TV made Interviews on the Low Carbon Societies Network's work with Meike Fink , Gunnar Boye Olesen, and Paul Allen.

News from the Network:

French Greenhouse-Gas Emission Reduction Scenarios

This report analyses and compares 11 French scenarios and energy visions until 2050 (2030 for one scenario).
It reveals enormous differences among methodologies, models, sectorial hypotheses and assumptions about development of international oil prices. It highlights sectorial contributions to the global emission reductions and categorizes the scenarios according to the methodology used. It was written by the Climate Action Network – France and CIRED (Centre International de Recherche sur l'Environnement et le Développement) within the framework of the Low-Carbon Society Project.

Available in French with a summary in English at the project's website: http://www.lowcarbon-societies.eu
Published February, 2010.



Energy Scenarios in Germany and France: Comparing Apples and Oranges

This report summarizes a detailed analysis of German and French energy scenarios.
It analyses various scenarios and their main outcome. While the variations among the scenarios are large within each country, they are even larger when making this cross-border comparison.

The report was written by Climate Action Network - France and Germanwatch within the framework of the Low-Carbon Society Project.

Available in English at the project's website: http://www.lowcarbon-societies.eu .
Published February, 2010, final version.

European Scenarios for a Transition to Sustainable Energy

An increasing number of scenarios show how the 27 EU countries could change to sustainable energy.
An overview and links to the scenarios are available on the project website: http://*www.lowcarbon-societies.eu* .
This includes:

"Europe's Share of the Climate Challenge - Domestic Actions and International Obligations to Protect the Planet"
Stockholm Environment Institute (SEI) & Friends of the Earth - Europe, 2009.
Available online at http://www.sei-international.org/?p=publications&task=view&pid=1318 .

"EU-27 100% Sustainable Energy by 2050"
INFORSE-Europe, International Network for Sustainable Energy - Europe, 2009 Update.
Available online at http://www.inforse.org/europe/VisionEU27.htm .

"Roadmap 2050 - A Practical Guide to a Prosperous, Low-carbon Europe"
European Climate Foundation.
To be published April 13, 2010.
See http://www.europeanclimate.org .

"EU Energy [R]evolution - a Sustainable EU27 Energy Outlook"
Greenpeace, December 2008
Available online at http://www.greenpeace.org/eu-unit/press-centre/reports/EU-energy-revolution-report .

"The Vision Scenario for the European Union"
Öko-Institut, Greens/EFA Group in the European Parliament Berlin, 2006.
Available online at http://www.greens-efa.org/cms/topics/dokbin/155/155777.pdf .

"Power Choices: Pathways to Carbon-Neutral Electricity in Europe by 2050"
Published by the Eurelectric, the union of the electricity industry (power companies) in the EU, 2009.
Available online at http://www.eurelectric.org/PowerChoices2050/ .

Scenarios: Global/Regional/National under the web site http://www.lowcarbon-societies.eu .

New Initiatives for Baltic, Danish and Hungarian Sustainable Energy Scenarios

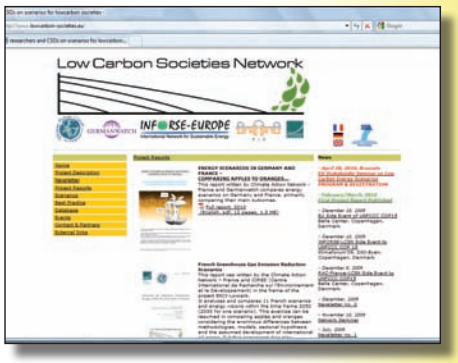
INFORSE-Europe and its members are starting work on sustainable energy visions for Hungary and Estonia, as well as on updating the visions for Latvia, Lithuania, and Belarus. Further, update of the Danish vision is planned.

In each country a scenario will be developed or updated, explaining how fossil fuel could be phased out by 2050 or earlier.

For Hungary, a scenario will also show how to phase out nuclear power. The scenarios will use national available-renewable-energy potentials and existing energy-efficiency measures that would be cost-effective within the scenario period.

In addition to the technical scenarios and energy balances, the new visions will also include forecasts of costs of major elements of the transitions, thereby indicating possible future energy costs.

Read about the INFORSE sustainable energy visions and scenarios at www.inforse.org/europe/Vision2050.htm
Project website: http://www.lowcarbon-societies.eu .



Project Reports under the web site http://www.lowcarbon-societies.eu .