Low Carbon Societies Network

Second Newsletter of the Low-Carbon Societies Network
December 2009

This newsletter is devoted to some of the first activities of the "Low-Carbon Societies Project": analysing existing low-energy scenarios for France and Germany. The results are presented in the two main articles; see next pages.

The Project Team, Artefact.

The first network seminar took place on November 10, 2009 at Artefact in Northern Germany.
Presentations are now available online from the web site.

Coming events:

December 10, 2009, 10:00 - 12:00: Climate Forum'09 COP15 Side Event:
Low-Carbon Societies Network Workshop:
"Scenarios for Fast Transition to Sustainable Energy"
(NGO Forum Parallel with COP15) .
The workshop will address sustainable energy scenarios in France, Germany, Denmark, EU and UK.
Speakers from: Germanwatch, Climate Action Network - France, INFORSE-Europe, and Centre for Alternative Technology in Wales/ ZeroCarbon Britain.
Venue: Blue hall - Klimaforum09, (near to the main train station), DGI-byen, Tietgensgade 65, 1704 Copenhagen V, Denmark.

December 18, 2009, 13:00 - 15:00: ***COP15 EU Side-Event***
"***Joining Forces - Civil Society - Research Partnerships to Combat Climate Change and Promote Sustainable Development"***.
With presentations of the network cooperation and discussions. Presentations by Gunnar Boye Olesen, INFORSE-Europe, Jan Burck, Germanwatch, a.o.
Venue: EU Pavilion, Room Schumann, Bella Center, Copenhagen.
Note: Requires registration for COP15.

March 22-26, 2010: Seminar on "Low-Carbon Scenarios" during EU Sustainable Energy Week, Bruxelles.
Date, time and precise venue to be announced.
See website: www.lowcarbon-societies.eu .

April, 2010: European Seminar: "Low Carbon Societies Network", Bruxelles.
Date, time and precise venue to be announced.
Read more at www.lowcarbon-societies.eu .

This newsletter is published by the "Low-Carbon Society Project", financed by the 7th Framework Program (FP7) for research of the European Commission.

The project's official name is ENCI-Low-Carb "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 on 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: ove@inforse.org (Gunnar Boye Olesen), or meike@rac-f.org (Meike Fink). **You can also register on the web site**, and subscribe to this newsletter.

Our Project Team will also build two ambitious energy scenarios for 2050 for Germany and France. In the process we will use stakeholder dialogues to build support for the scenarios and to identify measures that can counter negative social and economical impacts.

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Low Energy Scenarios for Germany

By Jan Burck, Germanwatch

Several scenarios are aiming to make the future as low-carbon as possible for Germany until 2050. They all present measures to reach this future. The analysed scenarios are:

- BMU: *"**Lead Study 2008.** Further development of the 'Strategy to increase the use of renewable energies' within the context of the current climate protection goals of Germany and Europe"* (BMU 2008) in cooperation with the DLR Institute for Technical Thermodynamics for the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).
- FfE: ***"Energiezukunft 2050"*** (2009) by the Forschungsstelle Energiewirtschaft e.V. (FfE) for the four biggest energy suppliers in Germany (EnBW, E.ON Energie, RWE Power, Vattenfall Europe).
- WWF: ***"Modell Deutschland Klimaschutz bis 2050"*** by Ökoinstitut, Prognos AG for WWF Germany. Its "innovation scenario" includes one scenario with Carbon Capture and Storage (CCS), and one without CCS.
- Greenpeace: "Klimaschutz: Plan B 2050" (2009) by EUtech for Greenpeace.

Studies	Low-energy scenarios for Germany until 2050	CO_2-emission reduction aim (base year 1990)	Primary energy demand, reduction of fossil-energy resources (base year)	Share of renewable energies in primary energy	Strategies
BMU	Leitstudie - Lead Scenario	78.50%	37% (2005)	47.60%	Renewable energies for electricity production, CHP with coal and gas
	Leitstudie - Efficiency Scenario	85%	27% (2005)	57.50%	Renewable energies for electricity production, CHP with coal and gas
FfE	Energiezukunft 2050 - Scenario 3	70%	< 10% Mineral-oil demand	36%	Extend the life duration of nuclear power plants to 60 years, change behaviour in society, combined heat and power plants, CCS
WWF	Innovation Scenario without CCS	87% of all GHG	Coal: -98%, mineral-oil products: -91% (2005), no petrol, diesel: 4 PJ	76.60%	Renewable energies, changing behaviour in society, carbon to a moderate extent, CHP, geothermal energy
	Innovation Scenario with CCS	86% of all GHG	Hard coal: -88%, lignite coal: -68% (2005)	58.70%	Renewable energies, CCS, CHP, changing behaviour in society
	Model Germany Klimaschutz by 2050	95% of all GHG	Additional measurements (CCS from biomass)	85%	Renewable energies, CCS, CHP, changing behaviour in society
Greenpeace	Klimaschutz: Plan B 2050	90%	Marginal use of fossil fuels	Mainly through renewable energies	Promote CHP & renewable energies for electricity production, geothermal energy, nuclear phase-out

Comparism:

The scenarios' emission reduction goals for 2050 in comparison to 1990 levels differ greatly:

The least ambitious scenario is the one by FfE which assumes that a reduction of 70% by 2050 is possible, followed by the BMU lead study (78.5%), which has a very ambitious "efficiency scenario" aiming at a reduction of 85%.

A slightly greater reduction is estimated by WWF (with CCS 86%, 87% without).

The Greenpeace scenario refers to a reduction of 90% by 2050 and a third WWF scenario states that a reduction of 95% by 2050 is possible. Yet, it must be considered that while the reductions by WWF include all GHG, the others refer only to CO_2.

The scenarios particular assumptions vary in terms of initial conditions.

An early nuclear phase-out (2015) is assumed by Greenpeace, whilst others consider a phase-out by 2050 (BMU, WWF) or even the extension of the life duration of nuclear power for another 60 years (FfE).

Another crucial difference concerns the assumptions in regard to social acceptance. Scenarios by FfE and by WWF are based upon an environmentally friendly change in the behaviour of the consumers.

Given these great discrepancies in terms of the overall aim of the scenarios, the sectoral predictions vary accordingly. In all scenarios changes occur concerning the shares that the different energy sources hold for the primary energy demand. There is a notable spread in, for instance, the projected possible reduction of the use of fossil fuels, ranging from 37% (BMU) to about 90% (WWF). Similarly, the delivered energy demand will be greatly reduced in 2050 in all scenarios, varying from estimations of about 37% (FfE), 52% (BMU), and 58% (WWF) to a reduction of 64% considering the predictions of the BMU.

Furthermore, figures are given for the sectors: heat supply, electricity, traffic, industry, the households, as well as for the categories of business, commerce and service.

A range of financial outlooks concerning the amounts of funding resources and their temporal progressions is given as well. Amounts vary from an estimated 20bn €/a (with a gradual increase) to 22bn €/a, peaking in 2033 at 32bn €/a.

In a last extensive section, different measures suggested by the scenarios to reach the emission-reduction goals are illustrated according to the different sectors (see table).

The long-term low-energy scenarios for Germany differ widely both in terms of their emission-reduction ambitions and in terms of their initial political assumptions. Some of the scenarios are highly influenced by the commissioner of the study. Together they offer a wide range of measures that are suitable for reducing the use of carbon-intensive energy and therefore for reducing emissions.

The full report can be downloaded here: http://www.lowcarbon-societies.eu/ .

Summary of the Analysis of Existing French Low-Carbon Scenarios

By Meike Fink, Project Coordinator

In recent months, we analyzed some of the existing French energy scenarios according to various indicators.

For instance, we looked at the emission reductions projected for the different sectors, the predictions of energy-demand evolution, and the nature of the model(s) behind each scenario, as well as the general mix of energy and technology.

The Table to the right illustrates the enormous differences between the scenarios.

	Year	Emission in 2050 (MtC)	Emission reductions	Mtoe final energy
négaWatt	2050	110	-75%	107
négaTEP	2050	129	-64%	135
MIES	2050	117-120	-69%	140-146
DGEMP	2050	125	-64%	116
Prévot	2030	137	-63%	152
Syrota-Markal	2050	187	-55%	153
Syrota-MedPro-POLES	2050	162 (102 with CCS)	-60% / (-74% with CCS)	100,5

The **emission reductions** range from -75% to -55%. Final energy demand shows huge variation as well.

For example, the Syrota-Markal scenario, which only reached an emission reduction of about 55%, was limited by the macro-economic model that was used (MARKAL), which predicted that the prices to achieve a higher degree of reduction would rise so much as to make it infeasible.

In addition to the varying choices of technology, the differences are also due to the characteristics of the underlying technical assumptions.

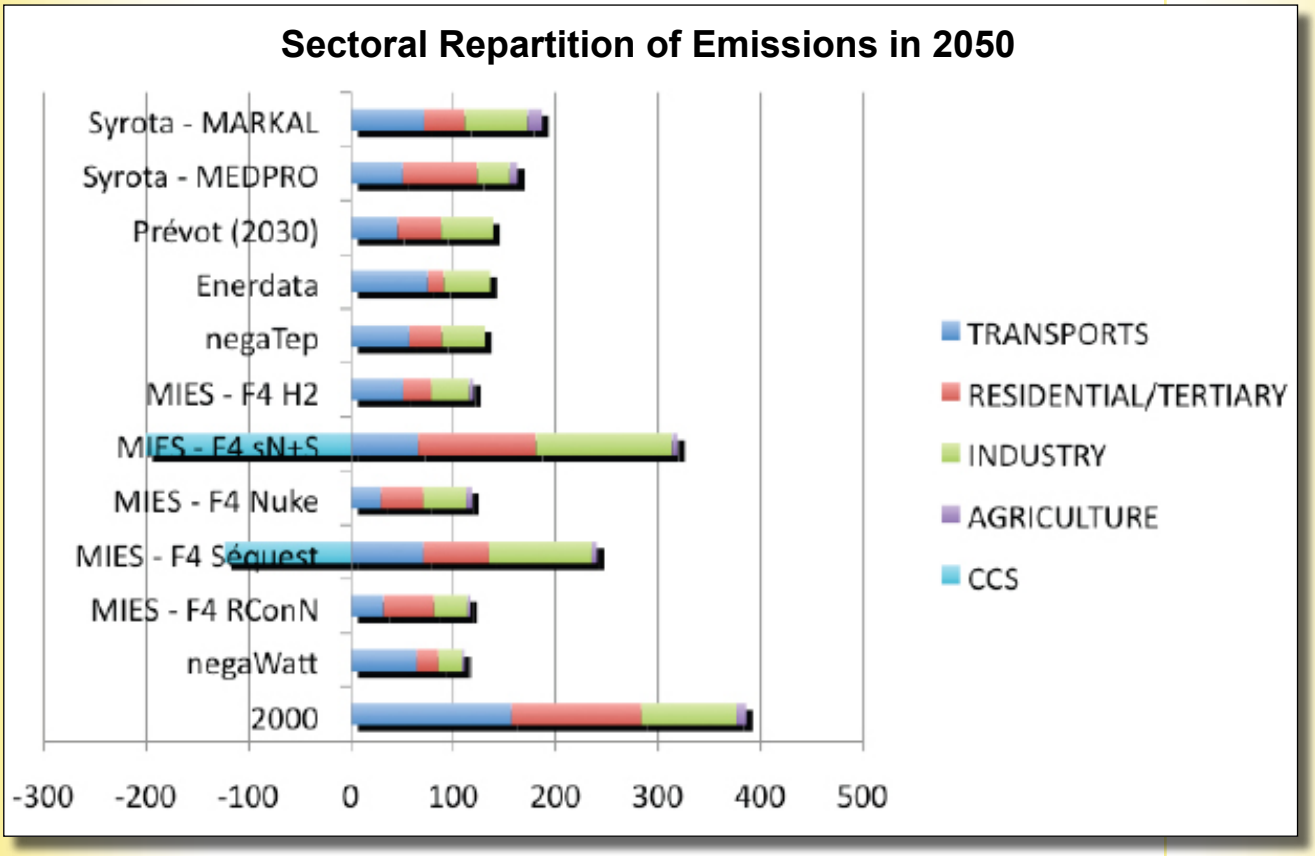
Emission-reduction potentials of the different sectors were evaluated quite unequally:

Transport sector:
between -47% and -82%
Building sector (residential and tertiary): between -5% and -88%
Industry: between +40% and -81%

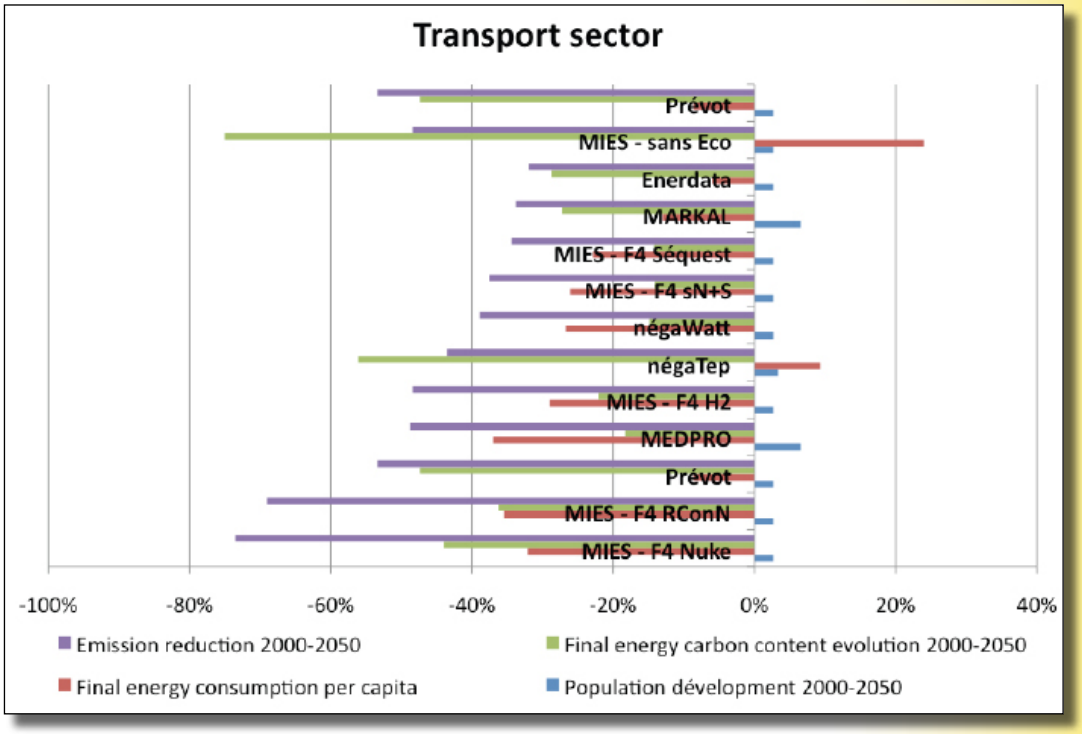
On the following graph, "the **sectoral repartition of emissions** in the mitigations scenarios in 2050" is represented.

The use of Carbon Capture and Storage (CCS) allows conserving high emissions mainly in the industrial sector (centralized emissions). Both scenarios using CCS increased emissions of the industrial sector (not taking into account the CCS).

The share of the emissions of the different sectors highly varies from one scenario to another.



The analysis of the **evolution of the transport sector** sharply highlights the different approaches of the scenarios (cf. following figure). The scenarios with the highest emission reduction rate (violet lines) hinge on major electrification of the transport sector by nuclear energy, which is indirectly represented by the yellow line indicating a **decarbonization of the energy sources**. But the majority shows also a high reduction of the final energy consumption per capita (red line) through efficiency measures.



The négaTep scenario counts on a decarbonization using second-generation biomass and nuclear electricity without taking into account the emissions due to land-use changes. As electricity is used as additional energy source to boost the energetic output of biomass, the final energy consumption per capita rises.

The more "traditional" scenarios have lower reductions. They are built either on **reductions of the per capita consumption** or (mainly) on modal shifts (road to rail) that decreases the emission per km.

Only two scenarios include a **nuclear phase-out:** the NégaWatt scenario, which is also the one with the lowest primary energy need; and one of the four scenarios elaborated for the MIES (interdepartmental unit for CC).

Even though they both stop the use of nuclear power plants, they do not agree on how to replace the needed electricity. NégaWatt is based on a reduction of the final energy demand due to efficiency measures and behavioral changes, thus allowing the use of renewable energies.

However, the MIES scenario has chosen a more technical solution, a rise in fossil-energy use coupled with CCS (Carbon Capture and Storage).

Another quite surprising result was the relatively unambitious goals for coverage of energy consumption by **renewable energies.**

On the graph below, you see the energy mix in 2050.

Unsurprisingly, blue, which represents nuclear energy, dominates the picture. The main exception is again the NégaWatt scenario, which calls for 90% of electricity production to come from renewable energy sources.

These scenarios have not evaluated their respective degrees of **social acceptability.** This is quite questionable, since in the Syrota MARKAL scenario the installed nuclear power capacity will double by 2050.

Scenarios are meant to give an idea of possible **energy futures,** but there is no consensus about which is the most desirable for everyone. The output depends on other factors and also strongly on the political vision of the sponsor behind the scenario.

Results may vary widely, depending heavily upon whether one intends to show that a nuclear phase-out is possible or, e.g., that nuclear energy can electrify all sectors while reducing emissions.

All of the analyzed scenarios are available for download at www.lowcarbon-societies.eu .