Project status

2008 was an exciting year for the project. The project gathers some 35 researchers at Chalmers as well as at other universities which make it possible to apply a wide range of knowledge to address the key questions identified in the beginning of the project. Several new results have been obtained and the methodologies developed make it possible to address new research questions which have emerged during 2008. The very first Pathways´ Doctoral thesis was also finalized and presented. In all, the project follows the plan and I am looking forward to an inspiring 2009!

New results show that it is possible for the European electricity to meet strict emission targets at a cost ranging from approximately 20 to 50€/ton CO_2 over the period up to year 2050, provided CO_2 capture and Storage (CCS) is used as an option. For UK and Germany, it is shown that a matching transport and storage infrastructure can be developed although this implies significant challenges with respect to provide timely investments in a CCS infrastructure (See page 6).

Filip Johnsson discussing CCS with Prof. Lars Nilsson from Lund University, at the GHGT:s meeting in Washington, November 2008.

For the pulp and paper industry new results have been obtained concluding that applying a high cost of CO_2 alone may not be enough to reach the full potential of CO_2 emissions reduction in the forest industry. To reach the full potential the new and emerging technology pathways may also need some direct support, e.g. technology specific subsidies. (See page 5).

The mapping of the global markets for gas, oil and coal is complete. The work has been proven valuable to understand the need for CO_2 capture and storage and also serve as input to the modeling and assessment of pathways for the European power generation system. A general result from the work is that there are tremendous resources of fossil fuels which obviously impose a great challenge to meet CO_2 emission targets, especially when considering security of supply.

The solid description of the European energy infrastructure from the various databases being developed in the project (power plants, CO_2 storage sites and global fossil fuel infrastructure) has been of great value in the analysis, i.e. the analysis being made rests on a solid description of the present energy system.

An interesting option which links the electricity generation system and the transportation system is Plug-In Hybrid Electric Vehicles (PHEV:s). Possibilities with the PHEV technology were studied in the project and the PHEV technology is shown to be a promising option for moderating intermittent wind power. Yet, it was shown that the ability of PHEV to manage wind power variations depends strongly on the choice of PHEV integration strategy. Ongoing work has the aim to investigate the possibility of the so called Vehicle to Grid (V2G) integration of PHEVs. Also, during 2008 wind power integration in general has been studied.

Work is ongoing with identifying the first Pathways to Sustainable European Energy System. The work takes departure in a "business as usual" scenario as a reference. The plan is to formulate the first Pathways during spring 2009. Thus, the Pathway will cover several key sectors.

As explained in this newsletter (See page 8), the Pathway modeling package for the electricity generation system is being developed to comprise four different models which can provide an analysis of the most important aspects which must be considered when transforming the electricity generation system.

We cooperate with the project Nordic Energy Perspectives around several research questions (See page 7). The Nordic countries are special in that they hold large resources of renewable energy (hydropower, biomass resources and wind power). Thus, the region is a potential resource base for the EU renewable directives.

There are three EU projects related to the project; PLANETS, PATH-TO-RES (See page 4) and ELOBIO. These give all valuable exchange with the international research community and make it possible to communicate and discuss specific Pathway results in a wider scientific audience.

Prof. Filip Johnsson
Project manager of the Pathway project