

# Emission standards can cause the EU ETS to fail

It is possible that there will come emissions performance standards (EPS), setting a roof for the CO<sub>2</sub> emissions (CO<sub>2</sub>/kWh<sub>el</sub>) from the power production. With the ELIN model, Mikael Odenberger shows that introduction of EPS can collapse the carbon emission trade system (ETS) and cause larger imports of gas to Europe as well as higher cost of reaching emission targets.

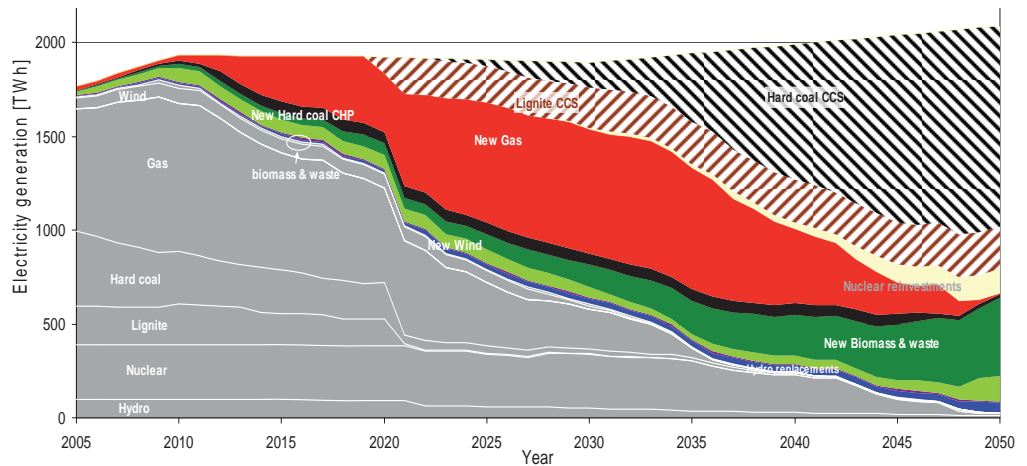


Figure 1. EPS of 350 g CO<sub>2</sub>/kWh from 2015 for new power plants and 500 g CO<sub>2</sub>/kWh from 2020 for existing ones.

## Proposed EPS

In amendments to the IPPC-directive, it is proposed that emissions performance standards (EPS) on the level of for example 350 gram CO<sub>2</sub>/kWh electricity could be applied by e.g. 2015 for only new or both new and old power plants. The implication of EPS for the EU electricity supply system are investigated in the ELIN model by Mikael Odenberger.

## Different combinations were modelled

Three different levels for EPS were simulated: 500, 350 and 150 g CO<sub>2</sub>/kWh and the results are compared with a reference case without EPS. The EPS levels were introduced in different years, with different combinations of new and old plants. Some interesting results from the simulations are:

### Reference case

*In the reference case, the most cost effective way of meeting the EU-20-20-20 targets to 2020 and 85% CO<sub>2</sub> emission reduction by 2050 without any restrictions from EPS, is simulated.*

### EPS of 500 g CO<sub>2</sub>/kWh from 2015 on new plants only:

No major difference from the reference case, but there will be more investments in new coal power plants before 2015, since the EPS will not allow this after 2015. In this scenario there is also a risk for life time expansion of existing plants.

### EPS of 350 g CO<sub>2</sub>/kWh from 2015 for new power plants and 500 g CO<sub>2</sub>/kWh from 2020 for existing ones:

This will force the market to invest in gas power plants, see Figure 1. With heavy investments in gas power plants the introduction of CCS will be slowed down. In this scenario the ETS will collapse (zero prices on emission permits) and not recover until CCS is the build margin.

## System cost increases

In total 12 different combinations of EPS have been simulated. A general result is that the system cost for power production (net present value) will be higher than in the reference case. The work will continue with deeper studies on how EPS can interact with the ETS. This will be done within the Pathways project and in cooperation with Vattenfall.

## Pathways to Sustainable European Energy Systems



### A five-year project

*The European pathways project is a five year project with the overall aim to evaluate and propose robust pathways towards a sustainable energy system with respect to environmental, technical, economic and social issues. The focus is on the stationary energy system (power and heat) in the European setting. Evaluations are based on a detailed description of the present energy system and focus on how the present system can be developed into the future under a range of environmental, economic and infrastructural constraints.*

### Independent results to support decision makers

*The Pathways project is a response to the need for a large and long-term research project on European energy pathways, which can produce independent results to support decision makers in industry and in governmental organizations. Stakeholders for this project are: the European utility industry and other energy related industries, the European Commission, EU-Member State governments and their energy related authorities.*