

CLIMATE ISSUE STEERS ENERGY INVESTMENTS

Tougher climate standards and a major need for investment. Europe's energy market is currently in an intensive phase in its transformation to an energy system that can meet the environmental demands of the future while supporting sustainable development of society. Incentives to invest in renewable energy, nuclear power and Carbon Capture and Storage (CCS) technology have risen dramatically, among other things as a result of trading in emission allowances.

In 2008 the climate issue became even more important in the energy markets. The framework for energy supply today and in the future is set by various EU directives. The EU's ambitious targets can be summarised with the formula 20–20–20: by 2020, CO₂ emissions shall be reduced by 20%, the share of renewable energy shall be 20% (compared with today's level of slightly more than 8%), and energy efficiency shall be improved by 20% – with 2005 as the base year. By 2050 the standards will be even higher, when CO₂ emissions are to be reduced by 60%–80%.

At the same time, there is a major need to build new power plants in large parts of the EU in order to replace older plants and meet rising demand for electricity, especially in eastern Europe. In all, more than 800 MW will be needed by 2030. About half of this is entirely new capacity, while the rest concerns replacing older power plants. It is mainly coal-fired plants and nuclear power plants that will have served their useful lives in the coming decades.

Parallel with this, electricity use is expected to increase throughout the EU. Between 2005 and 2020, demand for electricity is projected to grow by slightly more than 20%. The rate of growth is highest in southern and eastern Europe, while Germany and the Nordic countries are expected to have only marginal growth.

Gradually higher electricity prices

The energy markets are also characterised by ever-higher costs. A key reason for this is trading in emission allowances, which is one of the most important regulatory tools for reducing CO₂ emissions in the EU. During 2008 the average price of CO₂ emission allowances was approximately EUR 23/tonne. During the year, commodity prices – oil, coal and natural gas – were also periodically very high, even though they fell back again during the autumn due to the financial crisis.

The carbon dioxide issue is becoming increasingly central to investment decisions. The challenge for energy companies will be to create growth and at the same time meet the climate requirements in a market that is characterised by price pressure, regulation and growing demands from customers and the operating environment.

All things considered, this development has resulted in a sharp increase in incentives to invest in renewable energy. Several of the major European energy companies have

therefore increased their investment in wind power, which has become increasingly more profitable as a result of subsidies, more effective technology and larger volumes.

The market trend towards sustainable energy has also led to a stronger focus on Carbon Capture and Storage (CCS) technology. Both the EU and the International Energy Agency (IEA) believe that CCS will be one of the most powerful tools for reducing CO₂ emissions over time. In January 2008 the European Commission presented a proposal for a legal framework for the expansion of CCS technology within the EU. In September, as the first company in the world, Vattenfall inaugurated a pilot CCS plant based on oxyfuel technology at Schwarze Pumpe in eastern Germany (read more on page 19).

Interest in nuclear power has also had a resurgence in the shadow of the climate issue, since it is virtually free from climate-affecting emissions. Construction of the third generation of nuclear power plants has now been started in a few countries, such as France and Finland. Plans are also being drawn in the UK for new nuclear power plants to secure electricity supply and enable the country to phase out the older generation of power plants (read more on page 20).

Regional electricity markets

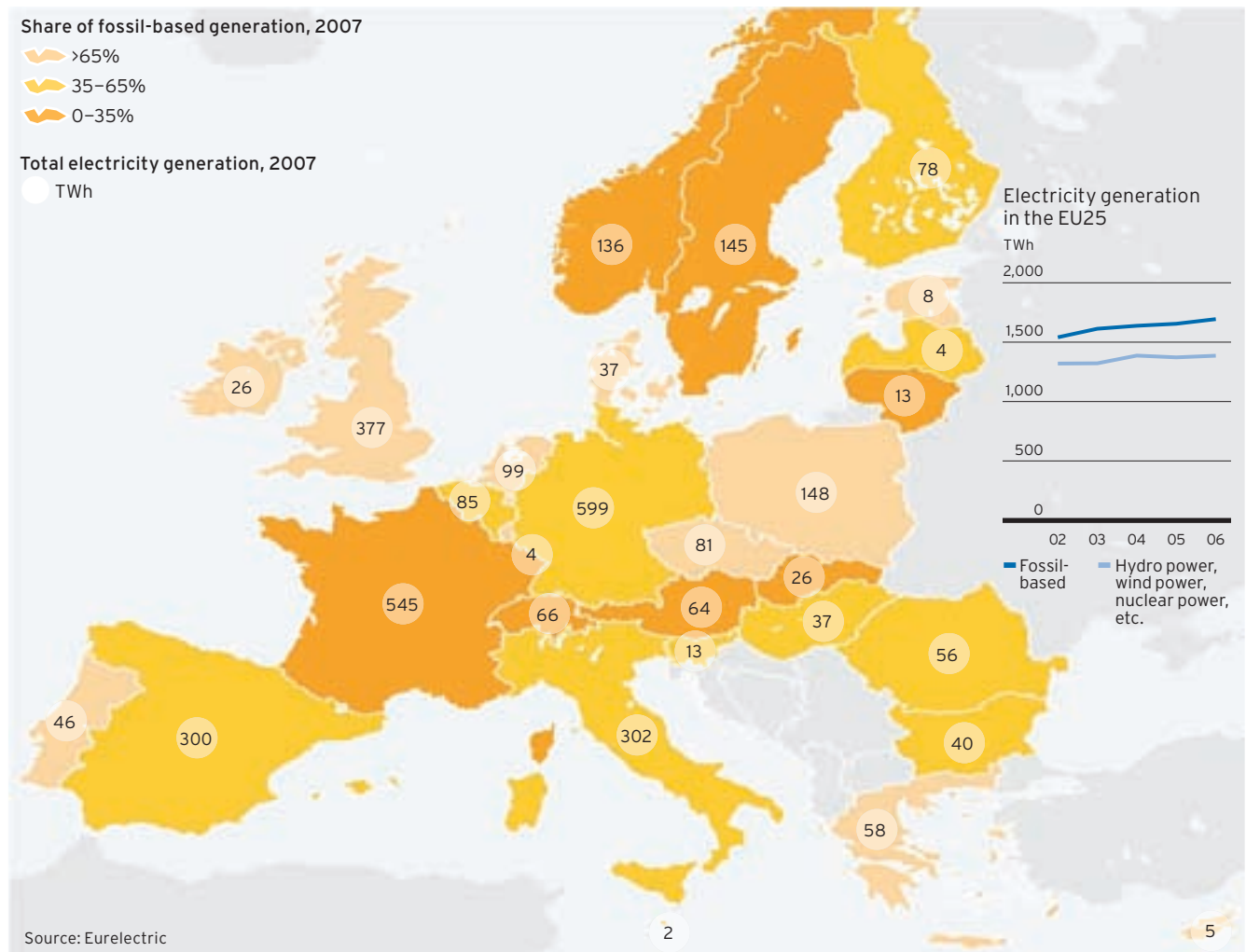
The opening of the EU's electricity and gas markets to competition was completed in July 2007. One aim of this is to create effective price mechanisms and incentives to invest in new generation. But there is still a long way to go before there can be any talk about a uniform European electricity market. In practice, the EU consists of a number of national electricity markets plus one regional market – the Nordic – with the Nord Pool electricity exchange in Norway as the most highly developed.

Being able to build a uniform European electricity market will require expanded transmission capacity between countries. Today only a very small, but gradually growing share, of electricity trading is conducted across EU nation borders. Strengthening the electricity connections and removing transmission bottlenecks is a priority issue in the EU. As part of this work, in 2008 the new NorNed cable between Norway and the Netherlands was inaugurated, with transmission capacity of 700 MW.

Margins under pressure for grid operators

For companies with transmission and distribution operations,

Europe's electricity market



Total electricity generation in the EU27 amounts to approximately 3,200 TWh and has risen steadily by a couple per cent per year since 2002. Germany, France and the UK are clearly the largest producers and account for nearly half of total electricity generation in the EU.

Fossil-based energy still dominates electricity generation in the EU: oil, coal and gas account for 55% of generation. But production varies widely from country to country. For example, in Sweden,

hydro power and nuclear power together account for nearly 90% of electricity generation. In France, nuclear power is dominant and accounts for approximately 77% of generated electricity, while in Austria, hydro power accounts for nearly 60% of all generated electricity. On the other end of the scale are the UK and Italy, for example, whose energy is about 80% fossil-based.

their margins for these operations have come under continued pressure as a result of stricter network regulations.

The European Commission has proposed a system of ownership unbundling, entailing the separation of grid ownership and operation from generation and sales. As an alternative, it has been proposed that companies can be allowed to retain ownership of their grids if operations and planning are transferred to an Independent System Operator (ISO). In most countries, including Sweden, ownership and operation of the grid are already separated from generation and sales. Germany, however, has four transmission companies that are each owned by one of the four largest power companies, including Vattenfall. In France the grid company is owned by EDF.

A group of countries has voiced opposition to the Commission's proposal. As a result, the Commission proposed yet

another alternative, where the power companies can continue to own the transmission companies but under considerably stronger oversight by the regulatory authorities. Which of these three alternatives is chosen in the various countries remains to be seen. In Germany, Vattenfall as well as E.ON are considering selling their respective transmission companies to an Independent System Operator. For electricity distribution, i.e., the transmission of electricity from the grid to households and companies, various types of regulation are in place from country to country, such as cost-based regulation and incentive-based regulation. The grid companies have also had higher demands put on them to ensure reliable deliveries. In the Nordic region, an extensive investment programme is currently in progress to strengthen the distribution network in order to withstand storms, for example.