

Renewable and other Non-conventional Energy Sources

“Renewable energy technologies have come of age. In an open market they can compete with any conventional technology. However, past and current subsidies for the old technologies, especially coal and nuclear, make it necessary to facilitate the rapid introduction of renewable energy, through changes in market rules”, said Claude Turmes, Rapporteur in the European Parliament for Liberalisation Directive.

Within Europe’s distorted energy market renewables need a helping hand to reach the targets of the Renewable Energy Directive, 22% by 2010. The rapporteur proposes a number of important changes that will speed up their introduction:

- Reciprocity action for countries that fail to meet EU targets
- Accelerated planning applications for smaller power stations.
- Priority access to the grid for renewable and CHP produced electricity.
- Fair grid pricing, recognising the avoided costs of embedded generators.

In 2001 the Renewable Energy Directive entered into force, setting clear targets for the Union in its production of renewable energy. By 2010 22.5% of Europe’s electricity (averaged over the Union) should be produced by renewable energy sources. This is clearly an ambitious target, but one that is essential for the viability of the sector. The importance of renewable energy is noted in the 2000 Green Paper on Security of Supply:

“With regard to supply, priority must be given to the fight against global warming. The development of new and renewable energies (including biofuels) is the key to change”¹.

“Only technology-intensive renewable sources can help mitigate the present trend towards increasing energy dependency”².

It is clear that some renewable energy technologies are technically and economically viable in comparison to conventional sources. In particular, wind power is exceeding expectations with over 10 GW of installed capacity in the EU, a five-fold increase in five years. The full potential of renewables is now beginning to be realized. Shell Renewables recently suggested that up to 50% of the World’s energy needs could be met by renewable energy within fifty years. The Commission-funded TERES II study, published in 1997, estimated that renewables could contribute 29% to the EU’s energy by 2020, reducing energy imports by 19% over 1993 levels³. Along with energy efficiency, renewable energy offers the only technologies that will simultaneously reduce dependency on imported energy and emit no net Co2.

The overall aim of the electricity market, as is for all EU policies, is to achieve sustainable development. The power sector is particularly important due to the pollutant nature of some power

¹ Green Paper, page 5

² Green Paper, page 22

³ Energy For the Future, Meeting the Challenge, TERES II 1997

stations, particular the production of Co2 and nuclear waste. However, other parts of the electricity industry have an environmental impact, but often more localized – such as transmission lines. The European Commission was requested by the Council to undertake an analysis of the environmental impact of the liberalisation of the energy sector. However, to date this report has not been completed.

Renewable Energy Sources:

In 2001, the Directive on Renewable Energy Sources finally entered into force sets a target for the EU by 2010 of 12%, with renewable electricity having to achieve a target of 22%. This is an ambitious target and will require changes in the functioning of the electricity market, however, the draft Directive comprehensively fails to support renewables.

In relation to the electricity market, there are two sorts of renewable:

Large Scale: These are large wind parks – onshore or offshore – large biomass and solar-thermal electricity plants, whose grid access is at 400kV or 220kV. At these voltages the connection to the grid will go through the transmission system. This system is already established – but still expanded – and largely paid for, and is used by the coal and nuclear industry. Future planning for the transmission grid should take into consideration the needs of these renewables, especially for offshore wind and wave power.

Smaller Scale: Smaller wind parks, biomass and solar PV will go to the 400 Volt – private household – or the local distribution network – 20 kV. Similar to small-scale fuel cells and gas turbines, these renewables have a stabilising effect on the grid system and bring long-term avoided costs to the grid system. Despite these clear advantages these embedded generators are still required in some countries to pay for transmission systems – which they don't use.

Combined Heat and Power:

The power sector currently produces one third of the EU's greenhouse gases. In order to reduce this, efforts must be taken in all areas: New non-Co2 sustainable supply (renewable energy); energy efficiency and other demand side management measures; and efforts to increase supply side efficiency. Combined Heat and Power (CHP) significantly increases the efficiency at which the fuel is utilised. In a modern CHP plant efficiency levels of 85-90% can be achieved, compared to 30-40% in conventional power stations and 55% in combined cycle power plants. Therefore increases in efficiency can result in significant reductions in fuel use and a halving of Co2 emissions.⁴

In 1997 the Commission approved a strategy to promote CHP across the EU. One of the main objectives was to see a “*doubling of the current share of CHP from 9% to 18% of the total gross electricity generation of the Community produced by CHP by the year 2010*”⁵. The Commission claimed that “*The environmental benefits would be significant. A rough estimate indicates that if a*

⁴ What is Cogeneration. Cogen Europe web site, accessed January 2001 –www.cogen.com

⁵ Communication From The Commission To The Council And The European Parliament
A Community Strategy To Promote Combined Heat And Power (CHP) And To Dismantle Barriers To Its Development
15.10.97 COM(97) 514 final. Section 4.1

doubling of CHP share were achieved, considered as replacement of existing electricity and heat production plants, could reduce CO2 emissions by 150 Mt. per year or approx. 4% of the total EU CO2 emissions in 2010.” The document further states “CHP is an environmentally friendly concept of energy production having the potential to contribute significantly and cost effectively to the security of supply and competitiveness policy aims of the Community.”⁶

The Parliamentary rapporteur is proposing a number of important changes, namely: -

Priority access for renewables: The current Directive states that priority access *may* be given to electricity produced by renewable energy sources. This must be changed to *require* priority access for renewables.

Reciprocity action: Under the current Directive, Member States may take action against another if market opening does not occur as required within the framework of the Directive. This is to avoid market distortions. Similarly, Member States that do not meet the national targets contained in the Renewable Energy Directive may distort the market and should be subject to the same reciprocity requirements as exist for market opening. Denmark today has around 30% small renewables and some 60% combined heat and power in its electricity grid. Other countries have not introduced technologies at such a level and some continue to financially support old technologies, such as coal and nuclear. Due to the relatively high cost of renewable technologies, especially given the subsidise given to support coal and nuclear power, the price of electricity in Denmark has risen fast than in other Member States recently, as a consequence Danish industry is campaigning to have the country step back from its successful energy policy.

Planning Applications: Smaller power plants should not be subject to the same planning applications as much larger proposed stations. Clearly, the environmental impact, actual and potential, of a 1000 MW nuclear power stations is larger than the installation of a handful of wind turbines. As such he rapporteur proposes that small-scale generators, under 50 MW should have an accelerated planning process.

Grid Pricing: The conventional utilities often see renewables and cogeneration investments as a competition to their existing or planned production – this has less to do with the technology and more to do with overcapacity of power stations within the EU. However, whatever the reason it results in the historical operators, who often have undue influence in the grid companies, due to the vertical integration of companies, to discriminate against new players. For example in France even embedded generators – who produce electricity at lower frequency and thus not passed in the transmission system – have to pay a standard fee, regardless of use of parts of the grid. This system does not take note of the avoided costs of these generators. To reduce the opportunities open to the historical operators, the rapporteur has made the following proposals:

- Full ownership unbundling requirements for both the distribution and transmission system operators.
- Greater power for the regulator in setting of prices in the grid.
- Least cost planning obligations for grid system operators to take account of the economic advantages of embedded generators.

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⁶ Com (97) 514 final. Section 4.2