Increasing the contribution from renewable energy sources

In many European countries, electricity from renewable sources has a low market share. In order to increase this share, the generators of renewable energy should not be burdened with the full risk of market and grid connection costs, according to recent research.

Overall, renewable energy only meets a small percentage of Europe’s electricity needs, but figures differ from country-to-country. In Germany, 14 per cent is derived from renewable sources, while in the UK the share had reached just 4.1 per cent by 2005.

The extent of economic support needed to encourage the integration of more electricity from renewable sources into the existing market is a controversial issue. Supporters of free markets often favour obliging electricity generators to take all the commercial risk. Opponents argue that generators should not be subject to full market forces while European energy markets are not fully deregulated or competitive.

The study examined the integration of wind power in three countries in Europe – Germany, Spain and the UK. In Germany, full responsibility for electricity sales, balancing loads and grid integration is borne by system operators and suppliers, and related costs are passed to the consumers. In Spain, generators can choose between full and partial responsibility for market integration of their electricity, receiving different tariffs as a result. In the UK however, generators take full responsibility for these costs.

Intermittent renewable technologies, such as wind, solar and hydropower, have zero fuel costs (though they are subject to high capital costs and long lead times) and are drawn upon first when dispatching energy, changing the structure of the power supply. In power markets with high renewable energy shares, market prices decrease whenever supply from wind energy is high. This short-term effect reduces the market revenue of wind power producers, if they are exposed to market prices, as when wind yields are high, their market revenues become lower than average market prices.

Other special characteristics of supplies from intermittent renewable sources are that they are difficult to predict. With high shares of renewable energy in the electricity system, generators can face considerable charges for not forecasting their generation correctly and unbalancing the system. This is due to the need for high-cost flexible conventional generators, which help balance demand and supply.

Integrating higher shares of wind energy into the electricity system also requires upgrading the network infrastructure. If all the network reinforcement costs have to be covered by the wind power project, this constitutes a significant barrier to wind power development.

The researchers conclude that exposing wind power projects to the full commercial risks leads to high project costs and constitutes a significant barrier. If ambitious targets for renewable energy are to be met, then the public must bear some of the risk. However, they also argue that a system with all integration costs borne by the electricity consumers gives no incentive to generators to minimise overall integration costs. The interdependency of these factors needs to be recognised in the design of Europe’s renewable energy policies and market regulations.


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