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THE EUROPEAN WIND ENERGY ASSOCIATION


Photo: Vestas

Delivering EU power: Electricity infrastructure and markets

Grids and market rules need to change

Wind energy can provide a substantial share of the European electricity demand. While wind power met about 4% of electricity demand in 2008, targets from the European Wind Energy Association for 2020 and 2030 correspond to penetration levels of 14% and 28% respectively. The electricity grid infrastructure in Europe needs to be upgraded and managed effectively to ensure security of supply, fair and low prices for the consumer, as well as sustainable and climate-friendly power generation. Like other generating technologies that are integrated into the electricity grid, the basic principles of balancing, backing up, aggregation and forecasting apply to wind power as well.

Channelling electricity from wind turbine to consumer

Grids were first established late in the 19th century, usually by companies that also generated electricity. In Europe today, there are five distinct electrical grid areas, providing the electrical needs for close to 500 million people. Once a wind turbine or a wind farm has generated electricity, the power needs to be integrated into an electrical grid through transmission and distribution lines before reaching homes or businesses.

Meeting EU needs with an enhanced grid and more transparent rules

Changes to the way we construct and operate Europe's future grids are required if we are to meet more than one-third of Europe's electricity demand with renewables by 2020 as projected by the European Commission.

An upgraded infrastructure is necessary

The large-scale integration of onshore wind power requires a substantial increase in transmission capacity, new lines and other upgrade measures, both within and between EU Member States.
It is crucial to upgrade interconnectors between countries in order to transfer power more effectively.


Photo: Iberdrola

The offshore challenge

Offshore wind power brings a special challenge since sea-based facilities cost more to build and maintain than onshore wind farms. Building a transnational offshore grid – a so called supergrid – would not only enable access to this huge resource, but would also improve the cross-border power exchange between countries and alleviate the congestion on existing interconnectors.

New management rules are required

Given the absence of effective competition and properly functioning electricity markets, large scale integration of wind power requires priority access to the grid, including during dispatch.

As wind energy penetration increases, there could be a greater need to develop a more harmonised set of Grid Codes at EU level (a set of rules for electricity consumers and generators to connect with the public electricity network in a reliable and safe way), which would require a joint effort by the wind power industry, the broader power sector and system operators.

The Renewables Directive

The recently agreed Renewables Directive already addresses some of the key challenges as it requires EU countries to take "the appropriate steps to develop transmission and distribution grid infrastructure, intelligent networks, storage facilities and the electricity system" to help develop renewable electricity.

They must also speed up authorisation procedures for grid infrastructure.

EU countries must make sure transmission and distribution system operators guarantee the transmission and distribution of renewable electricity and provide for either priority access to the grid system – meaning connected generators of renewable electricity are sure that they will be able to sell and transmit their electricity – or guaranteed access, which ensures that all electricity from renewable sources gets access. The Directive also requires that transmission system operators give priority to renewables during dispatch and minimise the curtailing of renewables when operating the grid.

Now effective implementation in the 27 Member States is needed.

Key objectives

- Aim for more flexibility in the power system (flexible generation, demand side management, interconnections etc.) in order to manage the increased variability induced by renewables, including shorter gate-closure times for more accurate forecasts, and a market for balancing.
- Aim for the unbundling of the vertically integrated companies which own, operate and supply power to the European electricity grid. The current system encourages anti-competitive behaviour.
- Encourage the development of an interconnected European powergrid so that wind power can be transported from wherever it is produced to users who need it.
- Support a structural harmonisation of grid codes (technical requirements) to avoid unnecessary costs for wind power manufacturers and developers and to increase transparency.
- Ascertain that connection requirements and costs for wind power plants are made fair, transparent and socialised among all generating technologies, rather than borne disproportionately by wind farms.
- Ensure the implementation of the forthcoming 3rd Liberalisation Package to establish a regulatory framework based on the Agency for the Cooperation of Energy Regulators, which would defend the public interest, and the European Network of Transmission System Operators, which would oblige TSOs to operate and develop electricity networks as part of a single European grid able to integrate large amounts of wind power.

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