System and market integration of wind power in Denmark

Denmark has more than 10 years’ of experience with a wind share of approximately 20 per cent. During these 10 years, electricity markets have been subject to developments with a key focus on integrating wind power as well as trading electricity with neighbouring countries. This article introduces a methodology to analyse and understand the current market integration of wind power and concludes that the majority of Danish wind power in the period 2004-2008 was used to meet the domestic demand. Based on a physical analysis, at least 63 per cent of Danish wind power was used domestically in 2008. To analyse the remaining 37 per cent, we must apply a market model to identify cause-effect relationships. The Danish case does not illustrate any upper limit for wind power integration, as also illustrated by Danish political targets to integrate 50 per cent by 2020. In recent years, Danish wind power has been financed solely by the electricity consumers, while maintaining production prices below the EU average. The net influence from wind power has been as low as 1e3 per cent of the consumer price.

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