Managing Critical Weather Conditions in a Large-Scale Wind Based European Power System - The TWENTIES Project

Experience from existing large offshore wind farms show that the geographical concentration of wind power leads to increased wind power variability, and that the response to storm front passages raises new issues: this may lead to a sudden shut down of the wind farm when the wind speed exceeds the cut-off wind speed (typically 25 m/s). Experience has shown that a large offshore wind farm in this way can be shut down from full power to zero power in less than 5 minutes. Thus, in the planned offshore development in the North Sea, several GW of wind power could be shut down within less than one hour as a result of a storm passage, which may impact the security of the whole European electric system. The storm passages will be a threat to the whole system reliability and stability, unless the wind power shut down is carefully coordinated.

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