High shared costs imposed by the mutualisation schemes implemented in France since 2012 could jeopardize the viability of some wind power plant projects. In parallel, locations of new projects are far from power substations also increasing costs for wind developers.

In this context, we propose new strategies for the connection of wind power plants (WPP) into the distribution network to increase the feasibility of new projects.

Case study n°3: Non-standard WPP connections to the distribution grid. DSOs standards for a WPP (≤ 17 MW) connection are 240mm2 copper or aluminium. However, 630mm2 and 2x240mm2 aluminium are good candidates to lower total connection costs (investments and losses) while reducing losses.

Well-known for reducing losses the 240mm2 copper solution is never competing with 630mm2 aluminium in case of standard 12MW WPP connection. The wind project owner could rather choose either 2x240mm2 or 630mm2 aluminium cables for distances over 2 km, avoiding a bigger amount of losses (-17% for the 2x240mm2 solution and up to -37% for the 630mm2 solution) than the 240mm2 copper solution while lowering the investment too.

1-Avoiding over-sized equipments on the WPP connection can generate substantial savings on the connection costs (24% in this example). However, well-sized equipments tend to increase losses and only the producer benefits from economical gains.

2-Turning available power capacity calculation into a dynamic allocation reduces significantly the energy losses and therefore the shortfall.

3-Connection costs integrate cable supply and laying. The economical optimum is estimated by French DSOs by balancing losses costs and investments.

References

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