TradeRES
New Markets Design & Models for 100% Renewable Power Systems

TradeRES Research Bulletin

Accelerating Wind Power Investments Through Lower Financing Costs

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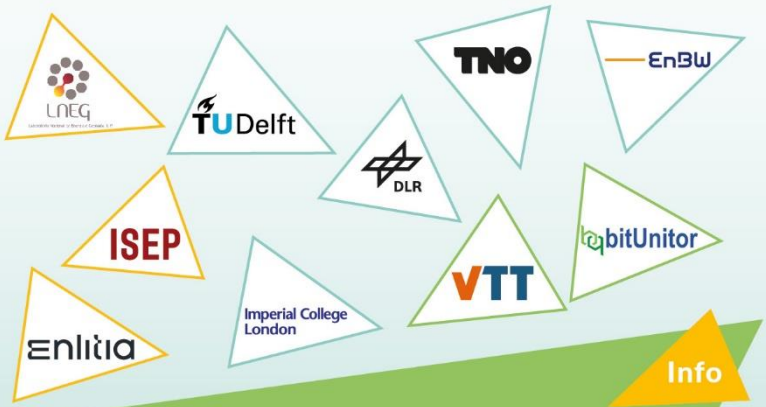
Full paper: https://cris.vtt.fi/en/publications/accelerating-wind-power-investments-through-lower-financing-costs

Summary

Investments in energy projects face various risks that increase the cost of capital. This is particularly challenging for renewable energy projects such as wind power, where most expenses are capital costs. However, risk management schemes, such as contracts for differences and power purchase agreements, have the potential to lower the cost of capital and support the acceleration of renewable energy investments in Europe. The impacts of the weighted average cost of capital (WACC) of wind power are explored within a highly flexible and integrated future power and energy system using the Backbone energy system modelling tool. The modelling setup is based on a soft-linking approach combining capacity expansion planning and production cost modelling stages, and the pan-European dataset used in the model covers multiple sectors and technologies. The results show how the WACC of wind power can have a significant impact on optimised capacities. Moreover, increasing the WACC from 3% to 11% led to a 37% increase in total system costs. On the other hand, the average profits of onshore wind power were typically the highest at a WACC level of 9%, due to a trade-off between the levelised cost of energy and the market value.

Highlights

- The pan-European power system with a high level of sector coupling is modelled and optimised using the Backbone energy system modelling tool.
- Results are explored in terms of capacities, electricity production, system costs, market prices, market revenues, levelised costs of electricity and profits.
- Society has much to gain by keeping financing costs low through risk management mechanisms.



Info

The TradeRES project will develop and test innovative electricity market designs that can meet society's needs of a (near) 100% renewable power system. The market design will be tested in a sophisticated simulation environment in which real-world characteristics such as actors' limited foresight into the future and risk aversion are included.

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1 February 2020

End date
30 November 2024

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