



## Reduction of the market splitting occurrences: A Dynamic Line Rating approach for the 2030 Iberian day-ahead market scenarios

Hugo Algarvio, António Couto and Ana Estanqueiro  
*LNEG—National Laboratory of Energy and Geology, 1649-038 Lisbon, Portugal*

Rui Carvalho, Gabriel Santos, Ricardo Faia, Pedro Faria and Zita Vale  
*GECAD Research Group, 4249-015 Porto, Portugal*

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### Summary

This article focused on a methodology to detect the impact of using Dynamic Line Rating (DLR) in the Iberian market with high penetrations of variable renewable generations (in 2030). Aligned with previous studies, this research identified that DLR increases transmission capacity by an average of 30% over the Seasonal Line Rating (SLR) approach. However, for around 3% of the time, the DLR capacity is below limits set by the Transmission System Operator (TSO), potentially causing line saturation, degradation, or even damage in severe cases. The study's findings reveal that integrating DLR into cross-border capacities reduces the frequency of market splitting events in the Day-Ahead Market (DAM) from 1,512 to 514, enhancing price consistency. This shift also lowers price disparities from €19/MWh (SLR approach) to €12/MWh (DLR approach) in these events, resulting in an overall reduction of more than 1% in wholesale electricity prices. Adopting DLR could be instrumental in reaching the 2030 renewable energy goals. In the long term, it may reduce the need for new transmission line development, while in the short term, DLR can help prevent grid congestion, reduce market splitting, and limit curtailment of renewable generation.

### Highlights

- Thermodynamic model of conductors and a forecast model to compute the DLR of overhead transmission lines by 2030;
- A methodology to assess the impact of using DLR in future power systems with high levels of variable renewable generation;
- The practical work includes the simulation of the 2030 day-ahead DLR for cross-border lines connecting Portugal and Spain using the OptiRES.lines simulator.



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.



<https://traderes.eu>  
[info@TradeRES.eu](mailto:info@TradeRES.eu)

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