UNIVERSITÄT DUISBURG ESSEN

Offen im Denken

LEHRSTUHL FÜR
ENERGIEWIRTSCHAFT
PROF. DR. CHRISTOPH WEBER

EWL

Masterarbeit

Thema:

Curative Redispatch as option to increase transmission network capacity utilization?
Regulation, methodical approaches and evaluation.

Hintergrund und Inhalt der Arbeit:

The shift in the German power plant portfolio raises questions about grid adequacy. In recent years, variable renewable energy is injected increasingly into the grid. Given the fluctuant nature and geographical localizations of renewable energy sources, the transmission lines often face congestions.

In the past, preventive redispatch considering the n-1 criteria was established to ensured reliable and secure power transmission by adopting power plant schedules derived by market results, if necessary. Yet it requires excess capacities. In the context of low public support for transmission grid expansion, curative redispatch is one option to enable further grid flexibility and thus, it may limit network extension needs. This approach takes advantage of the permitted temporary line overloading rate as short-time buffer to mitigate congestion issues in fault cases through switching on and off network elements.

In the context of this work, a small power flow model should be created, implemented and evaluated that takes into account the effects of such redispatch. The main focus of this thesis should be the methodical aspect. First, current literature concerning curative redispatch has to be identified and evaluated. Next, an (redispatch) optimization model for a short-term time period has to be developed and exemplary applied for selected use cases. Thereby, especially the depiction of beforehand derived market results is important. Finally, a qualitative assessment of curative redispatch compared to preventive redispatch should be made under consideration of both derived simulation results and qualitative estimation of implementation costs for curative redispatch.

Anforderungen:

Knowledge and/or skills in power flow research, as well as energy economics are required. Basic knowledge in programming (i.e. Matlab, Python, Julia, …) as well as optimization (i.e. GAMS, PuLP, JuMP, …) are expected.

Beginn der Bearbeitung:

Ab sofort.

Ansprechpartner:

Weitere Informationen sind auf Anfrage bei Hendrik Kramer erhältlich.

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Bei Interesse senden Sie bitte Ihre Bewerbungsunterlagen (Lebenslauf, Leistungsnachweise, Motivationsschreiben) an die oben genannte Email-Adresse.