Chair of High-Power Converter Systems
TUM School of Engineering and Design
Technical University of Munich

Opportunities for Talents

Master Thesis

Decoupling Control of Grid-Forming Wind Turbine Converters Connected to DR-HVDC

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Description

This project focuses on developing a novel control method for offshore wind turbines connected via diode-rectifier-based HVDC systems. Conventional strategies suffer from strong coupling between active and reactive power, causing instability during power fluctuations. The goal is to implement a novel distributed control strategy to decouple power control, enabling stable, communication-free coordination among turbines. The work includes modeling, control design, and simulation validation.

A reference: [1] "Decoupled Distributed Control of Offshore Wind Farms Connected to DR-HVDC Based on Novel Adaptive Virtual Impedance," in IEEE Transactions on Power Electronics

Tasks

Describe the tasks

- Literature Review to understand the background and existing control methods;
- Simulation of the conventional GFM control methods and analyses of the existing issues;
- Development of a novel decoupled control strategy and validation with simulations;
- Modeling and analyses of the developed control strategy.

Prerequisites

List the requirements.

- Great interest and strong understanding of power converters and control theory;
- Proficiency in MATLAB/Simulink or PLECS;

Contact and further information

- Please attach your CV and the latest study transcript to the application

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