



RTDS MODEL FOR OFFSHORE COORDINATED FAST ACTIVE POWER CONTROL

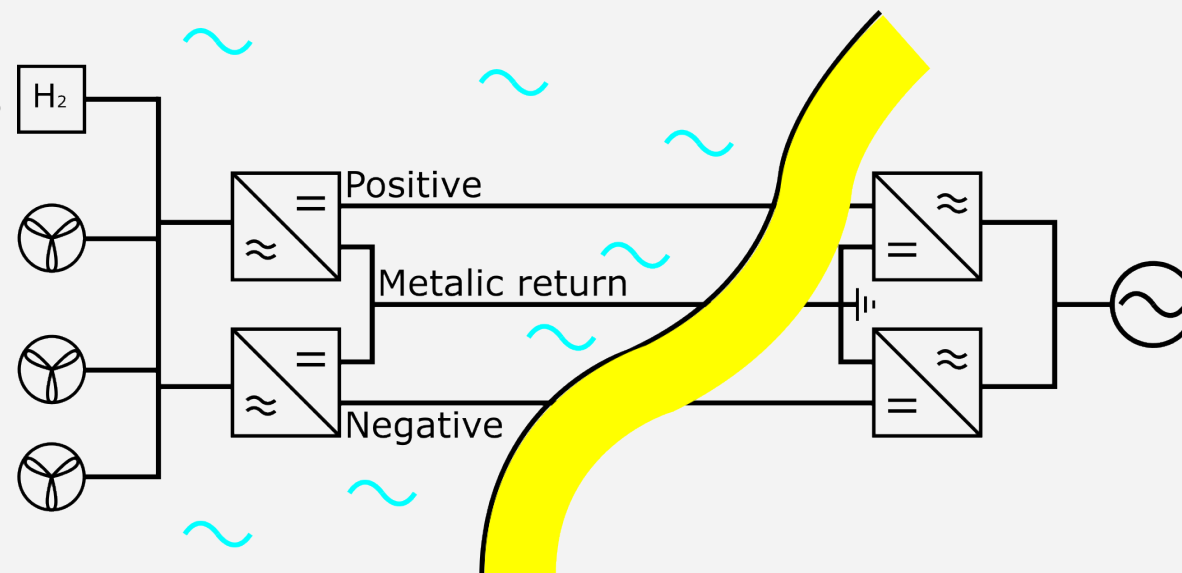
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OFFSHORE ACTIVE POWER CONTROL

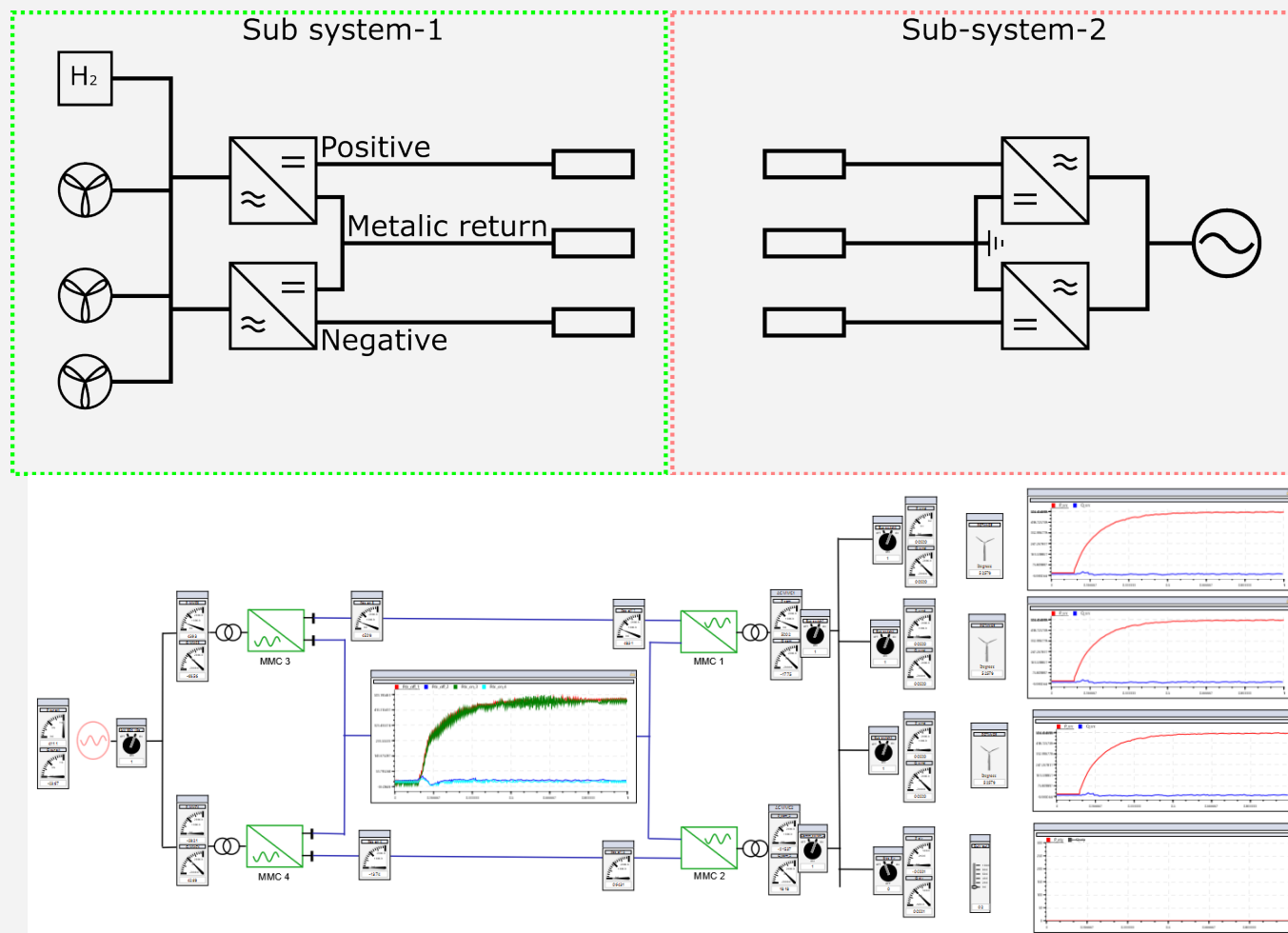
- Integration of converter-based technologies
 - Onshore AC system
 - HVDC bipolar MMC
 - Offshore wind power plant
 - Large-size electrolyzers



- Challenge: stable multi-converter dynamics, effective (coordinated, adaptive) control
- Goal: support to onshore system by fast effective active power control

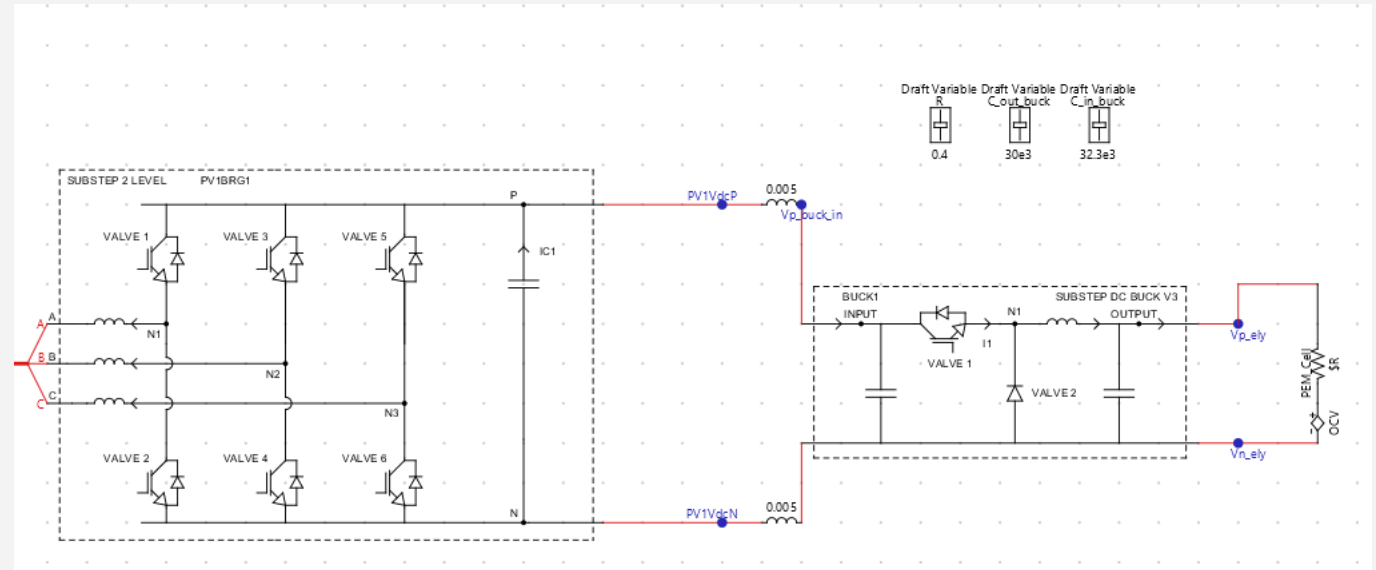
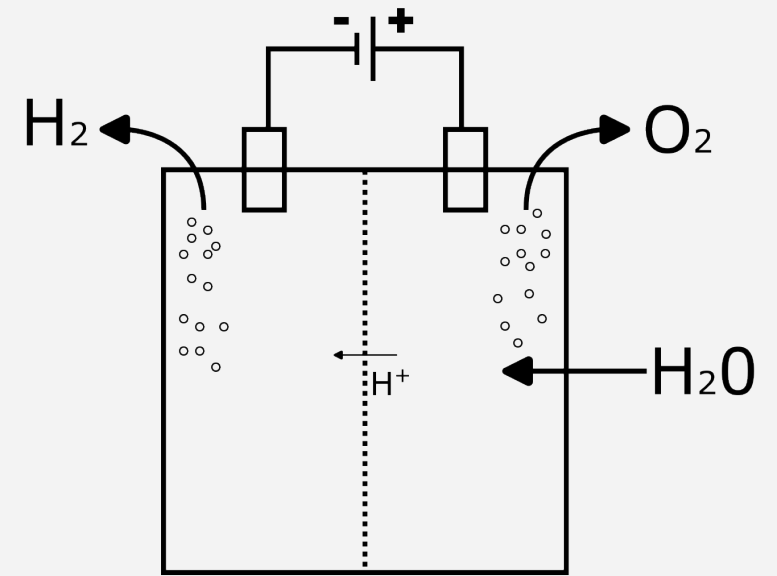
HVDC LINK IN RSCAD

- Multi-rack simulations
- For each 1 GW MMC
 - 6 times MMC5 model
 - Classic inner-outer control loops
- Power sharing ratio



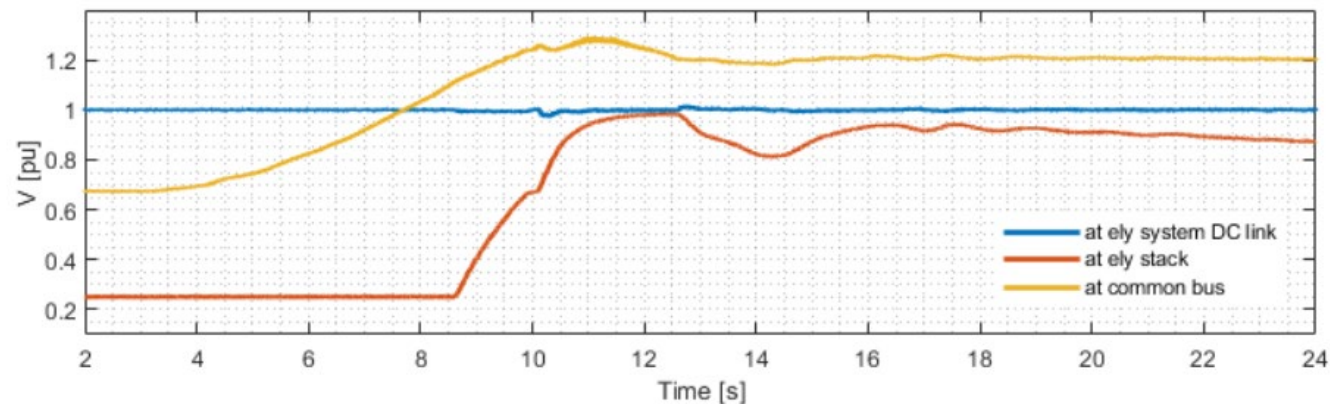
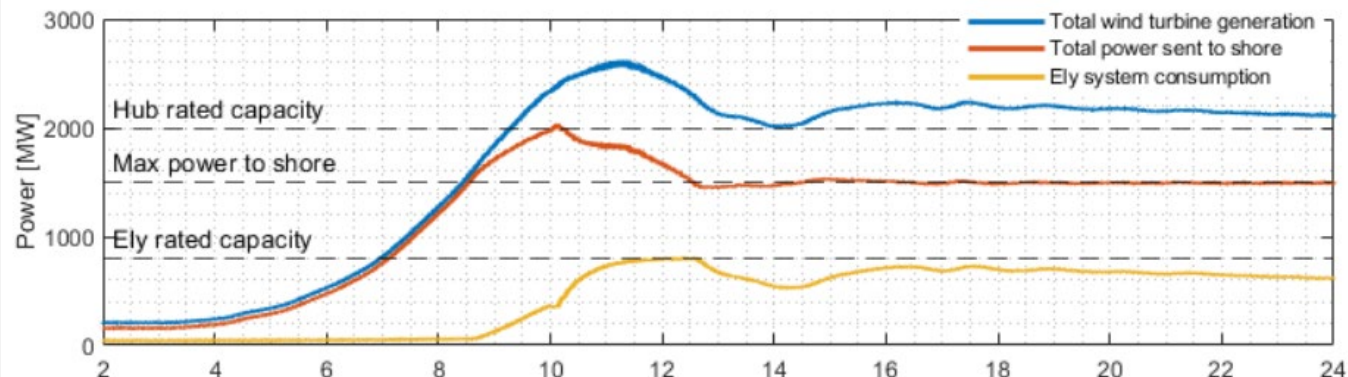
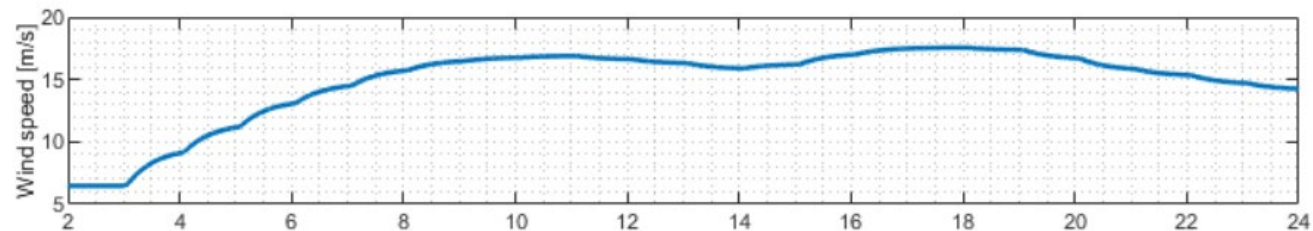
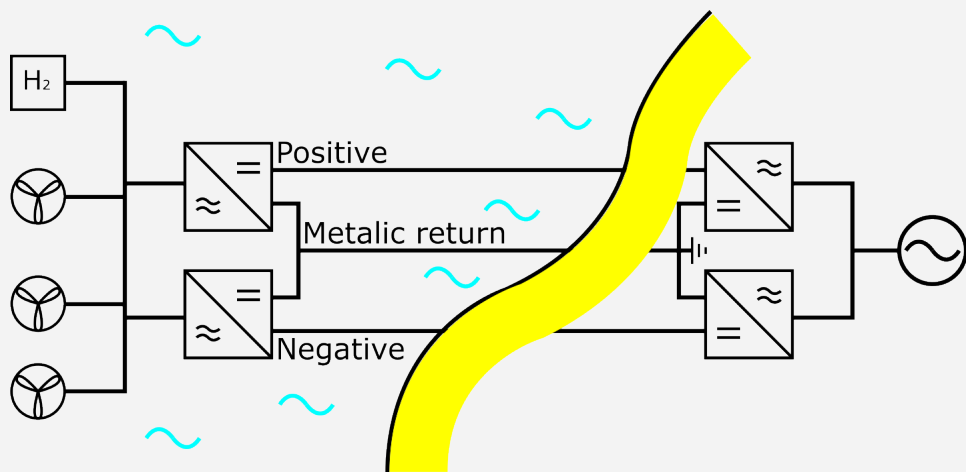
ELECTROLYZER IN RSCAD

- Power rating
 - Open cell voltage
 - Internal resistance
- Power control
 - Buck converter
 - Duty cycle
- Emerging technologies
- Unknown design parameters



INITIAL RESULTS

- Increasing wind speed
- Prevent HVDC-link overloading



MSc thesis, Jane Marchand, 2020

NEXT STEPS

- Evaluate frequency control strategies
- Constraints of power2gas conversion
- (Power) Hardware in the Loop