

## Background

Ongoing integration of continental European system and traditionally and physically less integrated (island) systems such as Great Britain into the Nordic system adds several additional factors to be considered. Strong focus has to be put on stability and sustainability of the system, especially considering that services to reach that goal differ vastly throughout the different countries.

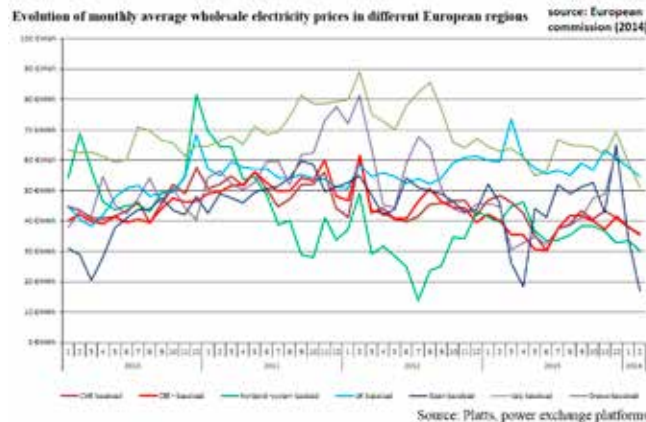
Those ancillary services are the current topic of the ongoing research in this PhD project. The current questions consist of – how do the different services interact; what potential and risk exists for prospective future services; how do market participants realize their goals through offering or calling such services?

## Methods

The pool of methods includes a range of modelling concepts from the fields of (stochastic) optimization and economic analysis, such as scheduling models, game theory, agent based simulation, etc.

### Current topics are:

- development of a river run aggregation algorithm
- pricing of inertial response as an ancillary service
- balancing market arbitrage through hydropower



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2015 - 2019

Multi market short term bidding of hydropower

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