

A REVIEW OF THE EUROPEAN GRIDS SERVICES MARKETS SUITABLE FOR DISTRIBUTED LOADS

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Abstract

Insufficient and unreliable data regarding European ancillary service markets lead us to carry out a survey aimed at collecting data and information from European transmission and distribution system operators for the purpose of understanding the markets' capacity for accommodating distributed loads as balancing service providers. A review of literature enhanced the survey knowledge base as far as possible in cases where surveys were not responded to and information was openly available. At the time of writing, the markets found to be closed to the participation of loads or non-rotating masses such as water electrolyzers included Croatia, Czech Republic, Estonia, Latvia, Lithuania, Poland, Portugal, Romania and Spain. The European grid service market landscape is highly heterogenous with contrasts seen in market rules, market transparency, technical requirements and least of all price levels. In this report we present the availability and utilisation prices of balancing products that electrolyzers are technically suited to providing services to. We provide an overview of the market conditions and also present the countries found to be most favourable with respect to utilisation and availability remuneration. Finally, we address that grid services on the distribution level such as congestion management, capacity management and voltage control are not readily offered on the distribution level by distributed system operators.

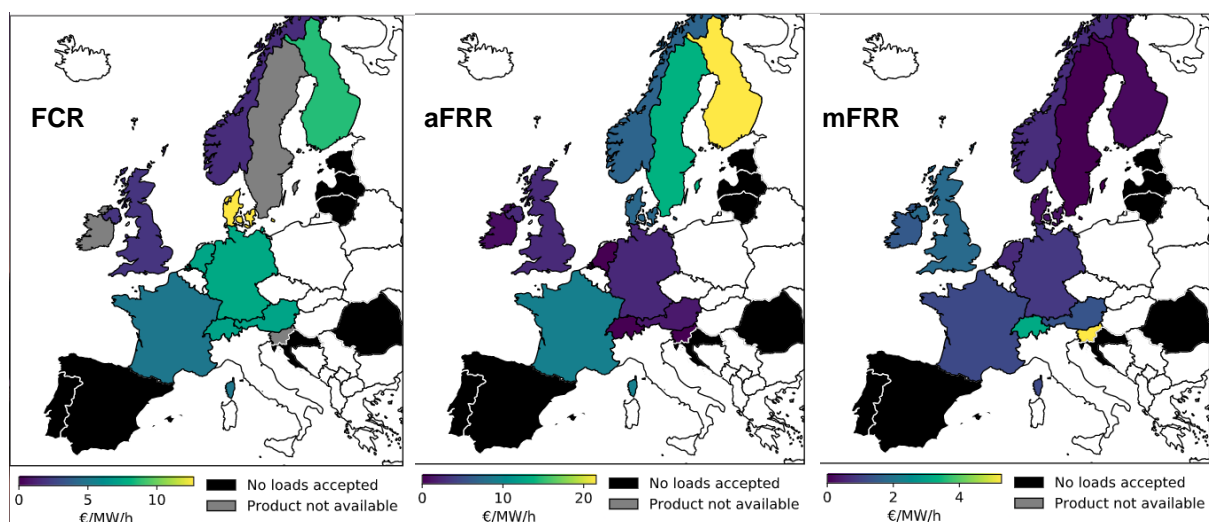


Figure 1: Availability pricing for European balancing markets: Frequency containment reserve (FCR), automatic frequency restoration reserve (aFRR), manual frequency restoration reserve (mFRR), or their corresponding national sub-categories.

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