

IMPROVING FLEXIBILITY PROCUREMENT: OPTIONS FOR PRODUCT STANDARDIZATION

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Overview

The current European landscape of flexibility services is versatile. Services for balancing, congestion management (CM) and intraday (ID) markets differ based on their degree of harmonization, the technical challenge they are meant to solve, the need owner and their specific product characteristics. As the number of flexible technologies and their availability at different network levels are evolving, so do – to an extent – the attributes of flexibility products and the requirements to flexibility service providers (FSPs). Overall, however, country implementation and product requirements remain largely heterogeneous.

To enable interoperability of flexibility use for different services, in the course of the project DigIPlat¹, we identify flexibility attributes and analyze ways in which heterogeneous flexibility products could potentially be standardized. The standardization of requirements for flexibility products is aimed at enabling a more efficient use of flexibility for multiple use cases, balancing and CM but also the ID market promising an increase in market liquidity and – in the best case – lower overall system costs. The goal of increasing liquidity in the flexibility market(s) must be balanced against the difficulties of meeting more specific system needs, accounting for technology-specific attributes and implementation efforts. We show that product standardization in fact represents a scale, on which the trade-offs between liquidity, system efficiency, ease of participation and implementation effort characterize potential solutions. We further show that product standardization should be analyzed on two complementing levels, 1) international in the sense of product-wise standardization and 2) national in the sense of cross-product integration. Regarding the second, we argue that there is still a lot of untapped potential for increasing the efficiency of flexibility procurement and identify the main issues that need to be addressed, such as the use of locational information for multiple services or harmonization of pricing rules.

Methods

The identified attributes of flexibility are first classified along the technical and trading dimension. We then analyse ways in which flexibility products can be standardized. In order to compare and analyse different flexibility product requirements in a structured manner, we lean on the stepwise approach proposed by [1]. We mainly focus on two types of flexibility services, balancing and CM. The analysed system services in this work cover frequency containment reserve (FCR), automatic and manual frequency restoration reserves (aFRR and mFRR) and redispatch. We further take integrated wholesale electricity markets, day-ahead (DA) and ID, into account as FSPs providing balancing or CM services are likely to participate in them as well. This affects their bidding strategies to varying degrees.

The analysis of the potential for standardization is conducted on two levels: 1) product-wise standardization on the international level, and 2) cross-product integration on the national level. The former aims at advancing the integrated European energy market and cross-border flexibility exchanges, competition, and joint procurement of flexibility services. For the latter, we propose advanced bid forwarding and linking approaches to facilitate integration or full-scale product harmonization of product attributes on a national level.

Results

Concerning product-wise standardisation on the international level, we find that product requirements for the European DA, ID and balancing energy markets are already standardized to a large degree. In the case of balancing products, the current regulatory framework demands that FSPs need to be prequalified for all markets they intend to participate in. At the moment, the prequalification processes are neither standardized among different TSOs nor for different products. In terms of the trading dimension, we find that, thanks to the Electricity Balancing Guideline [2], product-wise standardization for balancing energy products is already at an advanced level and has already produced significant welfare gains for the participating TSOs since the go-live of cross-border balancing energy platforms, PICASSO and MARI, in 2022, according to ENTSO-E's estimations [3]. The

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same applies to the coupled DA and ID markets, where product standardization is particularly high. In contrast, the standardization of balancing capacity markets is still lagging behind. Redispatch is the least standardized service and varies significantly in terms of procurement methods, lead times, pricing rules and technical requirements. The largest advantage of a product-wise standardization approach is that it creates a level playing field for actors from different countries taking part in integrated markets. System operators, in turn, can profit from a larger flexibility pool. The recent Framework Guideline on Demand Response does in fact propose improving product-wise standardization and streamlining prequalification processes [4]. It, however, does not propose introducing or harmonizing redispatch procurement. Based on the local nature of redispatch, we reach the same conclusion.

In terms of cross-product integration, we identify three implementation options. First, the most flexible approach allowing to preserve most of the existing product characteristics is a bid forwarding and linking approach. Here, a market operator or a transmission system operator (TSO) would have the possibility to forward bids that have not been awarded in one market to other markets with subsequent gate closure times (GCTs). The main benefit for an FSP is the chance to participate in more than one market with the same flexible resource and therefore simplify the decision-making process. On the downside, depending on the exact forwarding rules, this option might be less transparent and potentially more difficult for an FSP to plan for.

Next on the scale is a partial harmonization approach, where some of the individual product features could remain in place, but at the same time, a co-optimization of several products is introduced. In this option, products are harmonized to a large extent, yet retain their individual qualities. A FSP retains the possibility to submit their bids for different products. As a result, their technical requirements may still differ. All flexibility products are submitted to the same flexibility platform with the same GCT. In this way, valuable flexibility potential is not excluded while the TSO may deploy flexibility in a more efficient manner using co-optimization. An FSP prequalified for several products could use exclusively linked bids pointing to the same flexible resource. Consequently, a TSO could substitute bids in several markets if this action would increase overall system efficiency / reduce total system costs.

As the third option, a fully harmonized flexibility product is analysed. In case the definition of the “universal flex” is quite restrictive, the product would become more versatile for the TSO (and potentially also for the DSO) but also more restrictive for potential FSPs as required product characteristics would converge to the highest common denominator. This would ensure a high quality of the harmonized services, yet it risks excluding a large share of potential providers. On the other side, a less restrictive product definition would potentially endanger product quality.

Conclusions

We find that different degrees of product standardization are conceivable, both on the international product-wise and national cross-product levels. However, the benefits of full standardization should be evaluated against the background of potential trade-offs such as the risk of excluding some of the valuable flexibility potential or the implementation costs. Thus, in the short to medium term, full-fledged harmonization of several products is not considered very likely due to the barriers on organizational, technical and regulatory levels. Furthermore, it is not considered very likely that the vast majority of redispatch volume will be procured very close to real-time for system security reasons. Therefore, to maximize the use of available and new flexibility resources, full exploitation of the potential of international product-wise standardization, on the one hand, and cross-product integration using bid forwarding and linking concepts on the other hand seems most beneficial. In this regard, the most crucial points that remain to be addressed include the use of locational information for multiple markets, harmonization of pricing rules for different products to avoid distorted incentives and defining new rules for portfolio aggregation that are compatible with redispatch provision.

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