Enabling independent flexibility service providers to participate in electricity markets: A legal analysis of the Belgium case

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Abstract

Ambitious renewables targets of the EU call for creating a flexible electricity system accommodating and facilitating the integration of large-scale intermittent renewable electricity. To further exploit the considerable potential of demand flexibility, final customers need to be fully mobilised to offer their flexibility to electricity markets. The independent flexibility service provider (IFSP) operates independently from the electricity supplier and has a separate balance responsible party (BRP), which plays a key role to that end. However, in activating demand flexibility, suppliers and BRPs are affected and thus likely to impose barriers or restrictions on market entry of IFSPs. This analysis utilizes legal-empirical research to closely examine how to promote broader market participation of IFSPs by regulating their relationships with affected suppliers and BRPs. In doing so, the Belgian regulatory framework is used as a case study. This article further analyses the remaining regulatory gaps and challenges of the Belgian framework.

Keywords: Independent flexibility service provider; Market entry; Belgium; Transfer of energy; Demand flexibility

Abbreviations

ACER	European Agency for the Cooperation of Energy Regulators
aFRR	Automatic frequency restoration reserve
BE	Belgium
BRP	Balance responsible party
BSP	Balancing service provider
CEER	Council of European Energy Regulators
CEP	Clean energy for all Europeans package
CIPU	Coordination of Injection of Production Units
CREG	Commission for Electricity and Gas Regulation of Belgium
DAM	Day-ahead market
DR	Demand response

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DSO	Distribution system operator
EC	European Commission
EPEX	European Power Exchange
FRP	Flexibility request party
ICE	Intercontinental Exchange
ID	Intraday
IEA	International Energy Agency
IFSP	Independent flexibility service provider
mFRR	Manual frequency restoration reserve
NRA	National regulatory agency
ToE	Transfer of energy
TSO	Transmission system operator
VREG	Flemish Regulator of the Electricity and Gas Market

1 Introduction

In the EU electricity sector, there is a trend that most newly installed capacity is based on wind and solar power, which are inherently variable (EC, 2016; IEA, 2018). The electricity system must be flexible enough to level out the substantial and irregular variations in supply that come along with intermittent renewables and thus ensure system balancing (Hoggett, 2017; Papsch, 2020: p 27; Pearson, 2020: p 102; Quan et al., 2015). In this context, enhancing system flexibility has been one of the central goals of the new electricity market design brought forth by the CEP (*Electricity Directive*, recital 9 and article 1). By adjusting electricity use in response to market signals, final customers could provide a vital flexibility source known as demand flexibility or DR (Calver and Simcock, 2021; *Electricity Directive*, recital 10 and Article 2 (20); Powells and Fell, 2019). However, unlocking the potential of demand flexibility is riddled with challenges since final customers have long been narrowly viewed as passive actors in the energy regime and are characterized by inertia (Hampton et al., 2022; Huhta, 2019; Pearson, 2020: p 102; Stede, 2020). Low levels of consumer engagement in DR can be attributed to insufficient economic incentives, lacking information and knowledge about benefiting from DR, as well as the high level of complexity and effort required by DR (EC, 2016; Good et al., 2017; Leinauer et al., 2022; Parrish et al., 2020). The CEP seeks to address these barriers by overcoming disadvantages faced by consumers and empowering them to obtain economic benefits from valorising flexibility in various electricity market segments (*Electricity Directive*, Recitals 37 and 52, Articles 3 and Chapter III; Roggenkamp and Diestelmeier, 2020). A central approach is to enable IFSPs engaged in aggregating and trading flexibility to facilitate market participation of energy consumers

(*Electricity Directive*, Recital 39, Article 2 (18)).[1]

As intermediaries between customer groups and electricity markets (Burger et al., 2017; *Electricity Directive*, recital 39; Poplavskaya and De Vries, 2020: p 105), IFSPs perform various functions. These include identifying and realizing flexibility potentials, offering aggregation services to enable customer loads to meet high minimum bid sizes, providing market information, and risk hedging (Bruninx et al., 2020; Papsch, 2020: p 39; Stede, 2020). When fulfilling these roles, however, these emerging market actors typically run into several barriers in terms of concluding contracts with customers and accessing electricity markets (Annala et al., 2018; Barbero et al., 2018; Leinauer et al., 2022; Poplavskaya and De Vries, 2019; Vandorpe and Callaerts, 2017). Notably, in the case of activating demand flexibility, market entry impediments can arise from opposing interests between IFSPs and other market players (mainly suppliers and BRPs) who are affected by the changed consumption of end users (Forouli et al., 2021; L'Autorité de la concurrence, 2013; Stede, 2020; Vandorpe and Callaerts, 2017: 230).

More specifically, in the event of upward activation of DR (i.e. reduction of consumption), the IFSP diverts the energy that the supplier uses to cover the expected consumption of its customer. Due to the decrease in net offtake, the supplier can no longer invoice this activated energy to the customer, valorising demand flexibility (CREG, 2016; *CREG Decision 1677/3*, section 2.2.1). Due to the financial loss, the supplier is likely to opposite market participation of IFSPs. Moreover, in activating DR, the BRP_{source} (i.e. the BRP has the customer's access point in its perimeter) faces a risk of imbalances (Elia, 2019a). Taking the upward activation of DR as an example, the imbalance generates because the energy injected to cover the customer's demand is not fully taken from the portfolio of this BRP. The BRP_{source} will face imbalance tariffs accordingly.

Prior studies have recognised that barriers and restrictions from suppliers and BRPs could hinder market participation by IFSPs. However, a critical analysis of concrete regulatory approaches to regulating the IFSP's relationship with these affected market players is lacking up to now. This article aims to bridge this gap in the literature by focusing the analytical lens on the regulatory framework governing this relationship in one case study country, Belgium. The choice of the Belgian case is based on the fact that within the EU, Belgium has stood out as a pioneer in promoting market access for IFSPs.[2] In particular, before Union-level actions, its federal legislation had already stepped in to structure the IFSPs' relationship with suppliers and BRPs, one of the most prominent relationships between IFSPs and incumbent market actors. The Belgian case study thus also allows for a clear view of the eminent issues related to reconciling the interests of IFSPs and those of suppliers and BRPs.

Furthermore, by eliciting more detailed and contextually relevant information, this case study sheds light on regulatory challenges and lessons in facilitating market participation of

[1] Because their activities include aggregating multiple customer loads, they are also referred to as 'independent aggregators' in EU law (*Electricity Directive*, recitals 18 and 19).

[2] From 2014 onwards, Belgium has been considered by SEDC – the European industry association of DR operators – as one of the highest-scoring European countries in terms of the market design and environment allowing IFSPs to access balancing markets and thus making demand flexibility commercially viable (Barbero et al., 2018; Delta-EE and smartEn, 2021, 2019; SEDC, 2017, 2015, 2014; smartEn, 2018).

IFSPs. Existing EU law specifies that the measures enhancing market participation of IFSPs should be transposed into national law by December 2020 (*Electricity Directive*, article 71). However, at the time of writing, IFSPs are only active in electricity markets of eight Member States.[3] In this case, policy implications drawn from the study on Belgian law could be beneficial to the pending process of transposing EU law in other Member States.

This article adopts a mixed methodological approach consisting of two steps. First, a legal analysis is conducted to examine how the Belgian framework aligns divergent interests between IFSPs, suppliers, and BRPs. Due to the division of competencies between the federal authority and the regions, both the federal and regional legislation takes measures on that subject.[4] Given that compared to relevant regional rules, the federal regime (comprising the ToE regime and its alternatives) is relatively comprehensive and has been implemented for years, it is the prime focus of this article.[5] Regional rules are only touched upon when it comes to the role of the DSO in assisting data management required for implementing the ToE mechanism. Relevant measures adopted in the Flemish Region are a typical example as they are more elaborate than those in the other two regions.[6] The second step is assessing the Belgian regulatory framework against relevant EU law and the benchmarks for good regulation, as elaborated in Section 4 below. This assessment draws on two major sets of data: (i) publicly available audits, consultation results (e.g., Delta-EE and smartEn, 2021; Elia, 2019a; IBM, 2020) and academic literature, and (ii) survey results derived from empirical research taking the form of questionnaires and semi-structured interviews.

The market actors subject to relevant federal law or the entities representing these stakeholders were surveyed. They include five IFSPs active in the Belgian electricity markets, the association representing suppliers and BRPs (Febeg), the federation representing Belgian industrial energy customers (Febeliec), and the TSO (Elia). The survey questions mainly address the following aspects: (i) whether previously identified barriers for IFSPs have been effectively removed, (ii) whether the relevant federal regime creates unfair obligations and disproportionate burdens on IFSPs and other stakeholders, and (iii) remaining challenges to

[3] These countries include Belgium, Germany, France, Ireland, Italy, Lithuania, Portugal and Hungary (ACER and CEER, 2021).

[4] In Belgium, there is a legal division of energy competences between the federal authority and the three regions (Graaf et al., 2019: p 10; *Special Law on the Reform of Institution*, art. 6. § 1, VII). The federal competences include enabling IFSPs to access balancing markets and the day ahead and intraday (DA/ID) markets and regulating IFSPs' services provided to customers connected to the transmission grid. Safeguarding fair participation of IFSPs in the procurement of flexibility services organized by DSOs, however, falls within the competences of the regions (Vandendriessche, 2020: pp 34 and 40; Vandorpe and Callaerts, 2018: p 189). This means that regional measures regulating the IFSPs' relation with suppliers and BRPs become applicable when IFSPs offer demand flexibility to the DSO.

[5] The relevant federal law was introduced in 2017 as will be indicated in Section 3 below. At the regional level, the legislation regulating the IFSPs' relationship with suppliers and BRPs varies in three regions. In the Flemish Region, major rules in this regard were introduced in 2021 when the Flemish Energy Decree was amended to transpose the CEP. Under this Decree, the Flemish energy regulator, the VREG, is delegated to develop more detailed rules determining the calculation method for the financial compensation between the supplier or the BRP of the supplier and the IFSP (*Amendment of 2 April 2021 to the Flemish Energy Decree*, 2021). At the time of writing, these rules have not been issued. In the Wallonia Region and the Brussels-Capital Region, the most recent legislation has defined the role of IFSPs and specifies that its market entry is not subject to the prior consent of other market actors. However, their relationship with suppliers and BRPs has not been clearly regulated (*Wallonia Electricity Decree*, 2001; *The amendment of 17 March 2022 to the Brussels-Capital Electricity Ordinance*, 2022).

[6] The legislation in the Wallonia Region and the Brussels-Capital Region has not specified the DSO's role in cooperating with the TSO in flexibility data management in the context of enabling demand flexibility from the distribution grid to participate in electricity markets applying the ToE regime (*Wallonia Electricity Decree*, 2001; *Brussels-Capital Electricity Ordinance*, 2001).

market entry for IFSPs. In addition, we also sent questionnaires to independent energy regulators at federal and regional levels. Given that Flemish rules specifying the role of the DSO in the ToE are examined at the regional level, the Flemish energy regulator VREG was surveyed. The study aims to gain further insights into the regulators' views on remaining problems or regulatory challenges named by the literature and other respondents and follow up on the new progress of implementing rules. The questionnaires are provided in the Appendices to this article.

The remainder of the article is structured as follows. Section 2 outlines EU law defining the IFSPs' relationship with suppliers and BRPs, which is relevant to the subsequent assessment of the Belgian framework. Section 3 analyses the Belgian regulatory framework, focusing on major measures contained in federal law. Section 4 assesses this national framework. Section 5 concludes.

2 EU legal framework for IFSPs

The CEP introduced a regulatory framework for promoting market participation of IFSPs. It clearly defines the role, rights, and obligations of IFSPs, which addresses legal uncertainties previously faced by these market actors. Statutory obligations in terms of avoiding impeding market access of IFSPs are also imposed on market actors, TSOs, and DSOs (*Electricity Directive*, articles 31 and 40; *Electricity Regulation*, article 3). Beyond enhancing system flexibility, this framework also plays a key role in attaining the newly built legal objective of the 'consumer-centred electricity market'. Most provisions for IFSPs are contained in Chapter 3 of the Electricity Directive, which is entirely devoted to consumer empowerment and protection. Moreover, the Balancing Regulation and the System Operation Guideline also provide technical rules and conditions for the participation of IFSPs (in their role as BSPs) in balancing markets.[7] In this section, we outline the Union-level rules dedicated to regulating the IFSPs' relation with suppliers and BRPs affected by the activation of demand flexibility, which serve as partial benchmarks for assessing the Belgian framework.

First, the Electricity Directive establishes that market entry of IFSPs is not subject to the consent of suppliers and BRPs. Under Article 17, there is a general requirement for Member States to ensure that each market participant engaged in aggregation, including the IFSP, has the right to enter all electricity markets without the consent of other market participants. To further prevent unjustified barriers or restrictions from suppliers, final customers are granted the right to use electricity services, including aggregation, independently from their suppliers (*Electricity Directive*, article 13). Member States are obliged to guarantee that consumers are entitled to conclude aggregation contracts, not subject to the consent of or discriminatory technical and administrative requirements, procedures, or charges by their electricity suppliers (*Electricity Directive*, articles 13, 15, 16, and 17). This measure is equivalent to banning common constraints placed by suppliers upon their customers and the customer-nominated IFSPs, such as asking IFSPs to obtain their consent before contracting with customers or

[7] While these two network regulations were adopted to implement the Third Energy Package, they are still in force. Relevant measures include the procedures of providing bids for balancing energy or balancing capacity, for instance, prequalification requirements and the rules for procuring balancing services (*System Operation Guideline*, articles 159 and 162; *Balancing Regulation*, articles 16, 18, 25 and 32).

charging the customers cooperating with IFSPs (Barbero et al., 2018; Poplavskaya and De Vries, 2018).

Additionally, minimum requirements are set out by the Electricity Directive to reconcile interests between IFSPs and stakeholders in the case of activating DR. As mentioned in the introduction, the supplier of the customer participating in DR and the BRP of the concerned supplier or customer tend to suffer revenue loss and imbalance tariffs respectively when IFSPs activating demand flexibility. Adequately addressing such impacts is key to preventing barriers from these affected market actors, which hinges upon legal arrangements assigning roles and responsibilities to involved parties fairly. Member States are thus required to put in place non-discriminatory and transparent rules for (i) assigning roles and responsibilities to all electricity undertakings and customers and (ii) the exchange of data between IFSPs and other electricity undertakings in the context of activating DR through aggregation (*Electricity Directive*, article 17). As will be addressed in the next section, such data exchange is crucial to proceed with compensation between the IFSP and the supplier and correct the affected BRP's balancing perimeter. To allow for efficient data exchange necessary for valorising DR, TSOs and DSOs must cooperate (*Electricity Directive*, article 31; *Electricity Regulation*, article 57).

Regarding devising compensation mechanisms to counter the impacts on suppliers or BRPs created by IFSPs, Member States are given a wide margin of discretion (*Electricity Directive*, recital 39 and article 17). However, such compensation schemes – if poorly developed – are liable to create instead of removing hurdles for IFSPs (Pearson, 2020: p 109). Cognizant of this, Article 17 of the Electricity Directive emphasises developing fair and proportionate compensation mechanisms between IFSPs and affected market actors. Member States are thus under the obligation to ensure that the application of such compensation mechanisms will not hinder market entry for IFSPs and that the compensation must be capped not to exceed the costs incurred by the suppliers or the suppliers' BRPs during the activation of DR. Additionally, methods for calculating compensation should be subject to approval by NRAs or by another competent national authority.

EU law only provides generic principles governing interactions between IFSPs and other market actors. How Belgian law promotes market participation of IFSPs through regulating their relations with suppliers and BRPs and concretizing their corresponding roles and obligations is elaborated next.

3 The regulatory framework of Belgium

Before we analyse relevant federal law, we further explain market processes of trading demand flexibility on balancing and wholesale markets and interactions among market actors, as shown in Figure 1. This background may improve understanding of how suppliers and BRPs are affected.

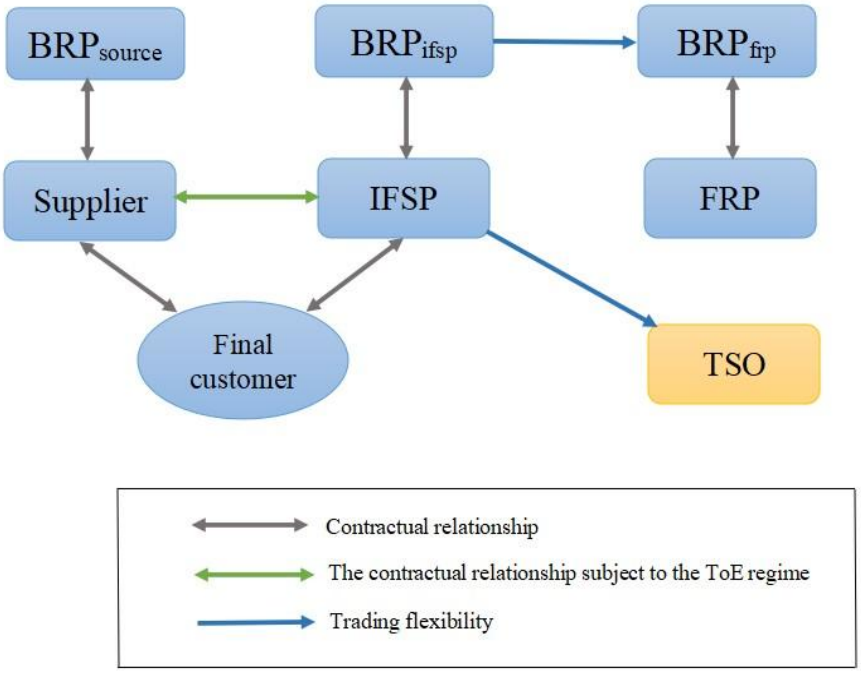

Fig 1. The relationship between the IFSP and stakeholders in activating demand flexibility

Source: Adapted from (Elia, 2019a).

The supplier of the consumer buys energy in advance (via the BRP_{source}) on the electricity market to cover the estimated energy offtake of each access point in its portfolio (Elia, 2019a). The IFSP sells flexibility of the same consumer contracting with it to the BRP_{frp} (i.e. the BRP of the FRP) on the wholesale market via BRP_{ifsp} (i.e. the BRP of the IFSP) or offers flexibility to the TSO, as Figure 1 shows.[8] The IFSP needs to activate flexibility corresponding to the volume sold by asking this consumer to reduce or increase electricity use. In the case of upward activation leading to a decrease in consumption, the supplier of the participating consumer cannot invoice this activated energy anymore and faces revenue loss (*CREG Decision 1677/3*, section 2.1). The IFSP thus needs to compensate the supplier for the sourced (but not invoiced) energy. In the meantime, the balancing perimeter of the BRP_{source} also needs to be corrected to neutralize the impact of the activation on its balancing perimeter. Federal law addresses these by offering the ToE regime and its alternative schemes, which differ in concrete elements and the application scope. The ToE regime applies to day-ahead and intraday (DA/ID) markets, strategic reserve markets and balancing markets (only mFRR markets), and flexibility delivery points located in the high or medium voltage level (*Federal Electricity Law*, article 19bis, § 2; *ToE Rules*, section 4). This approach means that final customers located at medium-voltage feeders of distribution systems are allowed to valorise their demand flexibility on transmission-level markets via the ToE mechanism, two

[8] In the context of DA/ID markets, the trades of flexibility services are carried out by the BRP_{ifsp} and then the IFSP delivers the volume of flexibility sold by the BRP_{ifsp} by activating DR. In balancing markets, the IFSP concludes a contract with the TSO on its own for the provision of flexibility services (FSP Contract DA/ID, Part II; Elia, 2019a, Section 4; *ToE Rules*, Section 7.1).

alternatives to the ToE, i.e. the 'Opt-out' mechanism and the 'Pass-through' mechanism apply to balancing markets (both mFRR and aFRR markets), DA/ID markets, and strategic reserve markets (*ToE Rules*, section 4). They apply to all types of flexibility delivery points. As such, when IFSPs valorise final customers connected to the low-voltage level (e.g., residential consumers) on transmission-level markets, their relationship with suppliers and BRPs is structured by the two alternatives.

3.1 The ToE regime

The ToE mechanism was introduced in 2017 by modifying the Federal Electricity Law (*Amendment of 13 July 2017 to the Federal Electricity Law*, 2017) to define the role of IFSPs and structure their relationship with BRPs and suppliers (*Federal Electricity Law*, article 19bis and article 19ter). The ToE regime explicitly recognises the IFSP's role as an energy service provider chosen by a final customer to valorise its demand flexibility, has a separate BRP, and acts independently from the supplier.[9] On that basis, it establishes three legal arrangements: (i) a fallback financial and contractual framework for addressing the relationship between suppliers and IFSPs, (ii) balancing perimeter correction measures aimed at countering impacts upon BRPs, and (iii) data exchange mechanisms required for accomplishing compensation and balancing perimeter correction. These are mainly elaborated by two legal instruments adopted by the federal energy regulator CREG under the delegation of the Federal Electricity Law (*CREG Decision 1677/3*, 2020; *ToE Rules*, 2021).[10] In the following, the three mechanisms are analysed consecutively.

In Belgium, before the introduction of the ToE regime, the supplier often refused cooperation with the IFSP or even renegotiated the supply contract of the customer who concluded a contract with an IFSP (SEDC, 2017, 2015). This practice was considered a major barrier for the market participants engaged in providing demand flexibility (CREG, 2016; SEDC, 2017). In 2016, having surveyed relevant barriers in Belgian electricity markets, the CREG concluded that public interventions were justified to deal with the relationship between IFSPs and suppliers (CREG, 2016). Given the negative impacts brought to suppliers in the case of upward activation of demand flexibility, prohibiting suppliers from hindering IFSPs from entering markets or contracting with end users is not able to entirely remove potential barriers or restrictions. In this case, financial compensation from IFSPs to suppliers is needed to counter the negative impact on suppliers. While the rationale underlying such

[9] The Federal Electricity Law does not define 'IFSP' directly but Article 19bis § 2 defines 'ToE' as 'an activation of demand flexibility involving a supplier and a flexibility service provider that has a separate BRP and/or a flexibility service provider that is not the supplier.' This defines the role of IFSPs in activating DR. Moreover, this definition means that implicit demand flexibility or price-based DR without the involvement of the IFSP is excluded from the application of the ToE regime (*CREG Decision 1677/3*, section 1; *Federal Electricity Law*, article 19bis, § 2).

[10] In 2017, under Article 37 of the 2009 Electricity Directive, the CREG was not granted competences by this Directive to draw up rules with respect to promoting demand flexibility. Therefore there was no relevant legal basis in EU law. Originally, within the context of Belgium, power delegation like this raised questions about constitutionality, *i.e.* whether delegating executive power to autonomous public bodies was allowed under Article 37 of the Constitution. In its judgement no. 130/2010 of 18 November 2010, the Constitutional Court held that Article 37 of the Constitution does not prevent the granting of specific executive powers to an independent administrative authority such as CREG, which, moreover, remains subject to legal control. In that regard, the Court has held that this is even possible if not directly required by a European Directive. Still, the limited parliamentary control of the independent regulator and accountability following delegating powers remain the subject of ongoing debates (De Somer, 2017: p 233; Degreef et al., 2021: p 360).

compensation is straightforward, several key questions must be addressed in designing compensation schemes. First, given commercial negotiations between suppliers and IFSPs on the compensation payment, to what extent should the regulator intervene in the determination of compensation? Indeed, standardised arrangements between IFSPs and suppliers to address compensation are viewed as a key enabler for improving market entry of IFSPs (Barbero et al., 2018; SEDC, 2017). A relevant question, however, is whether standardised arrangements provided by the regulator should replace commercial negotiations. In this regard, France, for instance, represents an example of using a fixed and standard procedure that compensates the supplier to replace the requirement for a bilateral agreement between the IFSP and the supplier (Kuzemko et al., 2017). Second, how could the design of compensation mechanisms guarantee fair financial compensation, which enables suppliers to be adequately compensated without creating disincentives for IFSPs? This issue also calls for giving due attention to disadvantages or high transaction costs faced by IFSPs in financial compensation. Third, in the case of downward activation of DR, suppliers will benefit from an increase in electricity use, so how should the compensation mechanism be adjusted? The ToE regime presents a set of solutions to deal with these issues.

For the first question, the ToE regime only aims to regulate the relationship between IFSPs and suppliers when there are no bilaterally negotiated solutions. Article 19bis of the Federal Electricity Law specifies this by empowering the CREG to develop rules addressing (i) a formula for determining the standard transfer price used to calculate the compensation, (ii) a financial guarantee, and (iii) a standard fallback contractual arrangement. It provides that if no agreement can be reached between a specific supplier and an IFSP through commercial negotiation, the CREG applies the formula for determining the transfer price between these parties. Therefore, this standard formula designed by the regulator is only intended to play a residual role, *i.e.* to provide a last resort.[11] In other words, the aim of the formula is only to prevent the absence of an agreement on determining the compensation from being a barrier for IFSPs to enter the market (CREG, 2016; *CREG Decision 1677/3*, section 1).

Similarly, standard clauses for the contractual relationship between IFSPs and suppliers are only applicable in the absence of an agreement on the modalities of their contractual relationship (*Federal Electricity Law*, article 19bis, § 5). Annex 1 to the CREG Decision 1677/3 sets out the standard clauses that can be applied in whole or in part, which address force majeure, suspending the application of the standard clauses, and enforced execution, for instance. The supplier and the IFSP can deviate from these standard arrangements at any time by mutual agreement and notifying the CREG as required.[12]

The ToE regime takes an approach to encourage negotiated solutions while offering standard arrangements comprising a formula for determining compensation and standardised contracts as fallbacks in case no agreement is realised between suppliers and IFSPs. While

[11] The explanatory memorandum to the Amendment of 13 July 2017 to the Federal Electricity Law shows that the legislator prefers the negotiated contractual arrangement for the financial compensation between the IFSP and the supplier of the final customer (*CREG Decision 1677/3*, section 1).

[12] In the event of a later agreement reached between the two parties about compensation, after jointly communicating to the CREG, the decision of applying the standard formula will be suspended for the duration of this agreement (*CREG Decision 1677/3*, article 14).

standardised arrangements only serve as a last resort, their significance lies in protecting IFSPs against disadvantages or high transaction costs they potentially suffer from in commercial negotiations. Lacking such fallback standard arrangements makes it possible for suppliers to restrict market entry for IFSPs by obstructing the reaching of the bilateral agreement. This fear can manifest even more when suppliers are allowed to provide aggregation services for end customers, and IFSPs become their potential competitors. For instance, in Nordic countries, suppliers are allowed to work as aggregators (Barbero et al., 2018). Neither EU law nor some national law prohibits suppliers from acting as flexibility service providers or aggregators to valorise end users' demand flexibility. Most suppliers, however, do not actively engage in trading DR in practice because many also own generation assets whose rents would be diminished if price peaks were reduced, i.e. the losses that DR would cause to the undertaking's upstream subsidiary outweighed the savings that DR would bring to the undertaking's supply subsidiary (Pearson, 2020: p 106). In other words, suppliers may have conflicts of interest in terms of providing flexibility services for consumers.

Nevertheless, the possibility of offering flexibility services by suppliers makes them and IFSPs become competitors. This situation may lead to the exclusionary behaviour of suppliers, which has been identified at the Member State level (L'Autorité de la concurrence, 2013). An additional risk is that suppliers exploit the relatively weak position of smaller-sized IFSPs in negotiations to reach unfair compensation in the absence of standardised solutions to which the IFSPs could resort. The presence of standard arrangements enables the party perceiving unfair results in the commercial negotiation to be not subject to the consequences of the negotiation by applying to the CREG to apply these fallback solutions (*CREG Decision 1677/3*, articles 7-12).

Having defined the role of standard compensation arrangements offered by regulation, the second key issue is how they guarantee fair compensation when involved parties resort to standard solutions after failing to reach an agreement. This issue is notably addressed in the standard formula for determining the standard transfer price used to calculate the compensation as follows (*CREG Decision 1677/3*, article 3):

Transfer price = {[73 % * 1/3 (Cal Y+2 + Cal Y+1 + M+1) + 27 % EPEX spot BE DAM] * 1,05} +/- 5 %

Where

'Cal Y+2' = the average daily quotes published by ICE INDEX during the year two years before the year of activation for the product baseload (expressed in €/MWh)

'Cal Y+1' = the average daily quotes published by ICE INDEX during the year preceding the year of activation for the product baseload (expressed in €/MWh)

'M+1' = the average daily quotes published by ICE INDEX during the month preceding the month of activation for the product baseload (expressed in €/MWh)

'EPEX spot BE DAM' = the quote published by EPEX spot Belgium on the DA market for the hour the activation takes place (expressed in €/MWh).

In terms of the design of this formula, several considerations mirroring the idea of ensuring fair compensation merit further examination here. First, it seeks to prevent disadvantaging IFSPs and creating detriments to suppliers (CREG, 2016; *CREG Decision 1677/3*, section 2.2.1). The formula considers the impact of transfer prices on the profitability of both the supplier and the IFSP. Taking upward activation as an example, on the one hand, a transfer price that is too low could penalize the affected supplier, leaving opposition from the supplier unresolved. On the other hand, a too-high price would make the participation of the IFSP unprofitable, deterring its market entry.[13] The CREG noticed that the margin taken on the ToE is the only source of remuneration of the IFSP on 'energy only' markets (CREG, 2016). On these grounds, the CREG Decision 1677/3 determines the indexes and corresponding weighting used in the formula so that IFSPs will not be disadvantaged while suppliers could be fairly compensated (*CREG Decision 1677/3*, section 2.2.2).

Furthermore, section 2.2.3 of this Decision added some uncertain components to the formula. This first intends to make the formula unattractive for the IFSP and the supplier to encourage negotiated solutions for determining the transfer price. It also aims to avoid the problem of gaming that would arise in case the result of the standard price formula can be predictable during the negotiation. The party favoured by this 'predictable' price would be tempted to make the bilateral negotiation fail to enjoy the standard price. It is particularly problematic where there are more upward than downward activations in practice, and suppliers are more likely to take advantage of the formula to exaggerate the transfer price in the upward direction, creating disincentives for IFSPs. For these reasons, a monthly index (i.e. 'M+1' component in the formula) and the DA market index (i.e. EPEX spot BE DAM component) were added to the formula as factors of uncertainty as their values are not always known at the time of negotiation (*CREG Decision 1677/3*, section 2.2.3 and article 3).

Additionally, a bank guarantee is required to ensure the implementation of compensation offered by IFSPs to suppliers (*CREG Decision 1677/3*, section 3.1).[14] For example, each IFSP must provide a single bank guarantee for all suppliers whose portfolios the IFSP is active and ensure that the amount of the bank guarantee does not fall below the required minimum threshold. The TSO is appointed to regularly monitor whether the IFSP meets these bank guarantee requirements of this Decision. In case of non-compliance, the TSO is required to refuse the activation of flexibility at the request of the concerned IFSP until the relevant provisions of the bank guarantee have been met.

Lastly, the financial compensation is two-way between the IFSP and the supplier, depending on whether the activation increases or decreases electricity use. Suppliers need to reimburse IFSPs for downward activation of demand (i.e. increase in consumption) since they can bill more electricity to their customers than they have acquired to cover expected consumption (*CREG Decision 1677/3*, section 2.2.1). The increased turnover must be repaid

[13] Such unduly high compensation to suppliers has emerged in some European countries. For instance, in France, 90% of the aggregators' profit is handed back to retailers, holding back further participation of them and the commercialization of DR (Barbero et al., 2018).

[14] Given that the preparatory work for the Amendment of 13 July 2017 to the Federal Electricity Law did not contain any clarification of the contractual guarantees, the CREG mainly elaborated the financial guarantee mechanisms in the Decision 1677/3. Moreover, the CREG inferred from § 3 of Article 19bis that the financial guarantee only needs to be provided by the IFSP so that the compensation to the supplier could be ensured.

to the IFSP so that it can compensate its customers.

Aside from impacts on suppliers, the BRP_{source} will be out of balance when an IFSP delivers a volume of flexibility through a net-offtake reduction or increase of one delivery point located in its perimeter (CREG, 2016). If the balancing perimeter of the BRP_{source} is not corrected, it will suffer imbalance tariffs. To avoid its potential loss, the ToE Rules establish a range of provisions to correct their balancing perimeters for each quarter hour of the activation period in different circumstances (*ToE Rules*, section 13). A set of obligations are placed on the IFSP to notify the characteristics of each activation to the TSO (*ToE Rules*, section 14.2). The TSO then informs the BRP_{source} of relevant information, including, for example, the total activated flexibility volume per quarter-hour in its portfolio (*ToE Rules*, section 14.3).

The implementation of the above-mentioned mechanisms for compensation and balancing perimeter correction would be impossible without exchanging relevant data among stakeholders involved in the activation of demand flexibility. However, this raises many concerns about data security and transaction costs. Almost all parties involved in the ToE, ranging from the IFSP to the final customer, have diverse data that should be protected. The IFSP may request confidentiality of the list of its customers, while confidentiality of the sales price tends to be requested by the supplier (CREG, 2016). The industrial and commercial customers providing flexibility may also be worried about passing on commercially sensitive data (Leinauer et al., 2022; Stede, 2020). The Federal Electricity Law thus assigns a new role to the TSO as a neutral flexibility data manager (FDM) to perform central management of data relating to the ToE to ensure safe and efficient data exchange.[15]

According to Article 19ter of the Federal Electricity Law, such data management tasks involve collecting, calculating, processing, and transferring the information necessary for calculating the delivered volume of demand flexibility, with due observance of confidentiality. Moreover, according to this legal provision, the TSO must regularly monitor the market and inform the CREG of any indication of manipulation affecting the determination of the activated flexibility volumes. To ensure confidentiality, the supplier and the BRP_{source} cannot verify whether the communicated data are correct (CREG, 2016). Thus, there is a need for systematic monitoring of the TSO's activity to ensure the data's reliability. To that end, relevant competence has been granted to the CREG (*Federal Electricity Law*, article 23, § 2, 13°). Article 19ter also addresses data management costs by allowing the TSO to recover costs incurred in the performance of data management tasks. However, to ensure that the costs are transparent, reasonable, and duly justified, such cost recovery is subject to a host of principles in the tariff methodology.

In addition, the ToE Rules further elaborate notification procedures under which the data used to address impacts on the supplier and the BRP_{source} are exchanged from the IFSP to the latter two parties via the TSO, and data security is safeguarded as follows:

- IFSPs are required to notify the TSO of particular sets of data, and the TSO then

[15] In the CREG 2016 Study, the CREG recommended entrusting the role of data manager to the TSO because the TSO is the only market actor able to fulfil the function of the FDM which requires to have an overall picture of the Belgian control area (CREG, 2016).

processes and communicates needed data to the supplier and BRP_{source}. In the context of providing ancillary services and DA/ID flexibility services, respectively. For instance, IFSPs are obligated to inform the TSO of the characteristics of each activation, such as expected and activated volumes, the activation period, and the final list of delivery points within the specified timescale.

- Certain conditions are laid down in Section 16.1 of the ToE Rules to guarantee the confidentiality of commercially sensitive data. By way of example, for the BRP_{source}, the perimeter correction is made per quarter hour at the portfolio level, and the impacts on the portfolio generated by different delivery points are only presented in an aggregated manner.

3.2 Two alternatives to the ToE regime

Beyond the ToE regime, two alternative mechanisms – 'Opt-out' and 'Pass-through' – are available to structure the relationship of IFSPs with suppliers and BRPs. The ToE mechanism offers the most elaborate framework for dealing with the rights and obligations of involved parties, while the other two alternatives apply where there is no need to trigger the full ToE mechanism.

An Opt-out agreement allows the IFSP and other stakeholders (including the supplier, the $BRP_{ifsp,}$ and the BRP_{source}) to enter into an agreement within which the issues that the ToE mechanism intends to deal with (e.g., transfer price, contractual modalities, and financial guarantees) are jointly settled (*ToE Rules*, section 8.2). In the case of a Pass-through mechanism, the BRP_{source} and the supplier are not impacted by the changes in the customer's typical consumption as a result of demand flexibility activation since they have already financially passed their imbalance or loss to the customer with a pass-through contract in advance (Elia, 2019; *ToE Rules*, section 8.2). The Pass-through mechanism enables a simplified pattern for the participation of the IFSP since additional negotiations with the customer's supplier and BRP_{source} to address compensation and perimeter correction are no longer needed.

Overall, the circumstances with the presence of Opt-out and Pass-through are called 'market situations without ToE' (Elia, 2019; *ToE Rules*, section 8.2). Hence, there is no need to adopt solutions provided by the ToE regime (*CREG Decision 1677/3*, section 1). These two alternatives are defined within federal rules to provide options for market players. Applying these two alternatives is bound by some requirements to ensure that the two exceptions have adequately addressed the critical issues governed by the ToE mechanism. Those requirements include the obligation for the IFSP to ensure the Pass-through contract between the supplier and the end customer is unambiguously clear. Suppliers and customers also must communicate the existence of such contracts to the TSO. Suppliers and customers face penalties if this obligation is breached, and concerned delivery points will be excluded from providing flexibility services via IFSPs (*ToE Rules*, section 15.3). As for the Opt-out regime, the proof of the Opt-out agreement should also be communicated by the IFSP to the TSO (*ToE Rules*, section 8.2).

3.3 The role of the DSO in the ToE regime

As noted above, the ToE regime also applies to flexibility delivery points at the medium voltage level. When IFSPs trade demand flexibility from end users connected to the medium voltage level on balancing and wholesale markets, they should also be subject to rules contained in the ToE mechanism. However, such flexibility located at the distribution system's medium-voltage feeders is outside the TSO's operational domain (Hermann et al., 2022). When demand flexibility from the distribution grid participates in balancing markets or wholesale markets, certain sets of data necessary for implementing the ToE need to be communicated from the DSO to the TSO. In this case, the TSO's above-mentioned data management tasks cannot be well performed without the assistance of the DSO. However, improving the DSO's performance in respect of effectively cooperating with the TSO and managing flexibility data falls within the region's competence. The successful application of the ToE also hinges upon to what extent the regional legislator gives due regard to underpinning its implementation when devising the concrete obligations of the DSO.

In this respect, to enhance TSO-DSO cooperation required by EU law in the interest of enabling consumers connected to distribution networks to widely participate in balancing and wholesale markets, the Flemish Region, for instance, has taken actions to define the role and obligations of the DSO in applying the ToE. Article 4.1.8/2 of the Flemish Energy Decree clearly states that the DSO fulfilling the obligations regarding flexibility data management also serves the valorisation of flexibility involved in a ToE and meeting the needs of the TSO. Thus, the relevant obligations of the DSO are not only set for procuring flexibility for local congestion management. Instead, the Flemish legislator has started defining the DSO's role in enabling demand flexibility in the distribution grid to participate in multiple marketplaces applying the federal ToE regime.

The role and responsibilities of the DSO in helping implement the ToE are further materialised by the Technical Regulations for the Distribution of Electricity issued by the VREG. First, the exchange of data for facilitating market participation of flexibility has been listed as a key aspect that the DSO should seek cooperation with the TSO (*Technical Regulations for the Distribution of Electricity*, article 6.1.3). Moreover, to clarify the roles and responsibilities of the DSO and the TSO within the TSO-DSO cooperation framework, the Regulations require an agreement between the TSO and the DSO on the calculations and exchange of data regarding flexibility connected to the distribution network (article 6.1.6, § 2). This agreement should contain the procedures for the exchange of data, the respective responsibilities for the quality, the periodicity of the data provision and the reliability of this data, as well as the confidentiality of the data exchanged (*Technical Regulations for the Distribution of Electricity*, article 6.1.6, § 1). Second, the DSO is tasked with timely calculations for flexibility-related data at the delivery points in its distribution network as well as timely data provision to the TSO within the framework of the tasks assigned to it by the above-cited article 4.1.8/2 of the Flemish Energy Decree (*Technical Regulations for the Distribution of Electricity*, article 6.1.11, § 2).

4 Assessment of the Belgian framework

The characteristics of good regulation and the 'best' benchmarks or criteria for evaluating whether a particular regulatory framework is a 'well-functioning regulatory framework' are the subject of much debate and research.[16] Considering this, for present purposes, we examine the federal regulatory framework using a relatively broad approach that classifies the frequently cited benchmarks for good regulation into procedural and substantive dimensions (Baldwin, 2012: p 261). From the procedural perspective, the due process of engaging wide-ranging stakeholders has been followed while formulating relevant federal rules. In making rules for the ToE regime, the CREG and the TSO have carried out extensive and inclusive consultations to involve affected parties, from agenda setting and design through to implementation of relevant rules (CREG, 2016; *CREG Decision 1677/3*, section 6; *CREG Decision 2195*, section 2; Elia, 2019). Thus our focus will be on the examination against the substantive criteria for good regulation. They mainly cover (i) the extent to which the legislative aim of promoting market participation of IFSPs is achieved; (ii) whether measures for addressing compensation and perimeter correction define the rights and obligations of IFSPs, suppliers, and BRPs fairly; and (iii) the undesired side effects and unreasonable costs.[17] EU law reviewed in Section 2 materialises the principles for assigning relevant roles and responsibilities, which are also employed to assess the Belgian regulatory framework. Through this assessment, regulatory gaps or the potential room for further improving this national framework can be better identified.

Based on these assessment benchmarks, we structured the questionnaires for this article, as explained in the Introduction. We received survey results from two IFSPs, the VREG, the Febeg, and the Febeliec, in the form of interviews or replies to questionnaires. A condensed summary of the feedback we received is given in Table 1, which will be further detailed hereunder.

Table 1. A summary of the feedback on the federal rules regulating the relation of IFSPs with suppliers and BRPs

Respondents	**Feedback**	
IFSPs	Benefits	Remove barriers coming from suppliers and BRPs
		Widen possibilities to valorise flexibility
	Negative impacts or remaining gaps	The complexity of the ToE regime creates extra hurdles
Febeg	Benefits	Opt-out and Pass-through mechanisms could help to mitigate institutional complexity
	Negative impacts or remaining gaps	The ToE regime generates heavy administrative burdens and complex procedures
		Increased public interventions arising from the ToE may impede competition

[16] It is hard to search for commonly agreed benchmarks to measure the regulatory regime in a pluralistic society because actors or organisations with different interests and motivations tend to adopt diverse benchmarks to assess the regulatory regime and determine regulatory quality (Baldwin, 2012: pp 260-262; Sunstein, 1990: p 84).

[17] These criteria are built on Baldwin, 2012: p 261.

Febeliec	Benefits	The ToE regime contributes to (i) creating an additional channel for valorising flexibility; (ii) increasing the bargaining power of consumers with suppliers, BRPs, and IFSPs, and (iii) enhancing market functioning
VREG	(i) Belgian DSOs and the TSO are setting out new agreements on data exchanges between them to facilitate the provision of frequency-related ancillary services from the distribution network; (ii) The Flemish DSO (Fluvius) has not started procuring flexibility; (iii) The tension between the TSO and the DSO in accessing demand flexibility is indeed a potential problem when the DSO starts procuring flexibility	

According to the surveyed IFSPs and the Febeliec, following the implementation of the ToE regime, there have been advances in overcoming previously identified barriers from suppliers and BRPs and empowering customers. This view implies that this regime has contributed to promoting broader market participation of IFSPs and final customers, which is in line with EU law promoting DR reviewed in Section 2. However, in terms of the other two assessment criteria, the survey results and publicly available data indicate remaining problems and challenges.

First, residual impacts on suppliers remain to be addressed, undermining the fairness of measures assigning rights and obligations to the agents involved in activating demand flexibility via IFSPs. As indicated above, the regulatory framework at the federal level promotes market participation of IFSPs by regulating their relationship with suppliers and BRPs, and fairly defining their roles, rights, and obligations is the linchpin of regulating such relations. While the surveyed IFSPs did not perceive unfair obligations, disadvantages faced by suppliers in activating demand flexibility have not been fully considered in the federal regime. For example, suppliers have some flexibility in their portfolio to manage their balancing perimeter optimally and react to unpredictable circumstances (Barbero et al., 2018; Hartnett et al., 2021: p 280). The activation by IFSPs might refrain suppliers from using such flexibility, and thus brings about risks and costs to suppliers (Elia, 2019a).

Furthermore, in the context of applying the pass-through mechanism, the timing for providing the information about the aggregated activated flexibility volumes from the TSO (as the FDM) to the supplier is not in line with the timing of the normal process of invoicing the customers' consumption (Elia, 2019a). As a result, the supplier has to send the invoices twice to correct the factual consumption, which could create additional costs. Such timing of notification has not been amended in the latest ToE Rules approved in 2021 (*ToE Rules*, section 16.2). These instances imply that the potential impacts on suppliers in activating demand flexibility have not been sufficiently identified and considered in defining the obligations of IFSPs and the FDM.

Second, while the respondents have different evaluations of the ToE mechanism, a common view is that it has complex and lengthy procedures and places heavy administrative

burdens on relevant market actors. The IFSP is subject to more than ten requirements, including data exchange (*ToE Rules*, sections 7 and 14), implying potentially high costs to implement this mechanism and the risk of hindering market entry for potential entrants. More specifically, the ToE mechanism sets up a group of preconditions for IFSPs ahead of demand flexibility activation, including the mutual agreement between them and suppliers and a valid bank warranty. As stipulated in the ToE Rules and the CREG Decision 1677/3, the TSO verifies relevant declarations, agreements, and guarantees before allowing the participation of delivery points and the activation by the IFSP. There have been instances that some assets have been blocked from entering the balancing market due to such complexity. For example, before the introduction of the ToE regime, non-CIPU units could already participate in the mFRR reserved market via an IFSP without needing the consent of the BRP_{source} or the supplier, which is as such less complex (Elia, 2019a).[18] Now the participating assets and IFSPs are all subject to the arrangements provided by the ToE regime if no agreement is reached between them and suppliers and BRPs.

When seeking to address barriers from other market players, it is clear that the highly elaborate ToE mechanism burdens the participation of IFSPs. It raises a fear that the dedicated framework to promote market entry for IFSPs could, paradoxically, bring about precisely the opposite of its intended purposes over the long run.[19] So far, there has been no adequate evidence that the complexity of the ToE regime has hindered market entry for IFSPs.[20] However, potentially high transaction costs and heavy compliance burdens stemming from applying the ToE regime increase the risk of deterring potential market entrants and burdening small IFSPs.[21] Concerns that market liquidity would be adversely affected arise accordingly, which also implies that this regime is not yet consistent with the idea of good regulation or better regulation that searches for less burdensome regulation and achieves regulatory objectives without unduly restricting business (Baldwin, 2012: p 262; Baldwin et al., 2012: p 319).

The possible adverse impacts stemming from the complexity of the ToE mechanism also imply the importance of allowing and clearly defining alternative options. The survey results have proved that, to some extent, the 'Opt-out' and 'Pass-through' mechanisms help mitigate complexity concerns of the ToE mechanism by creating adequate space for simplified solutions that IFSPs and stakeholders could jointly seek.

Third, the survey respondents, especially IFSPs and the Febeliec, also highlight that while significant, merely relying on the ToE regime does not suffice to promote market

[18] The Non-CIPU unit means a technical unit that is not undertaken in a valid CIPU contract being technically capable of making available and supplying the concerned service through a delivery point (Elia, 2019b).

[19] Regarding paradoxes of regulation, namely the regulatory strategies defeating the goal of law, see Sunstein, 1990: p 74.

[20] The study of the Belgian TSO in 2019 shows that the introduction of the ToE regime had not led to additional flexibility volumes on electricity markets and the number of active IFSPs decreased (Elia, 2019a). However, there are no available data indicating that this correlation between the ToE regime and active IFSPs and demand flexibility volumes still exists after 2019.

[21] In this regard, for example, studies in emission trading schemes show that small and medium enterprises may suffer competitively because they are far less able than large companies to deal with the extensive administrative and informational burdens (Baldwin et al., 2012: p 214; Butzengeiger and Michaelowa, 2004). Most recent research on DR also warns that complex regulatory frameworks are becoming regulatory obstacles (Leinauer et al., 2022).

participation of IFSPs. Other remaining market barriers may explain why the ToE regime has not significantly increased flexibility volumes to balancing markets such as the 'Bidladder'.[22] Even though the Bidladder is explicitly organised to improve market access of IFSPs,[23] its liquidity remains low. The lack of liquidity might be partially attributed to the stringent technical requirements of this balancing market segment and the IFSPs' preference for reservation fees (Elia, 2019a). It implies that remuneration and product requirements are always closely linked to market participation of IFSPs. Another frequently mentioned obstacle relates to the prequalification processes, which are deemed to lead to *de facto* barriers for small and new market entrants.[24] According to the existing prequalification test requirements adopted by the TSO in balancing service procurement, the IFSP (in its role of the BSP) is required to perform a new prequalification test if it wishes to add new delivery point(s) to its pool of flexibility.[25] However, it takes one or two months to accomplish the new test, making IFSPs face considerable costs to add new flexibility delivery points.[26] In the meantime, this prequalification process also suggests that the customer cannot perform a prequalification test with a new IFSP while it is under contract with another one (Elia, 2019a). Therefore, when changing the IFSP, the customer would lose income due to performing a new prequalification test, which impedes switching IFSPs and competition between IFSPs.

Furthermore, it appears that incumbent IFSPs also contribute to hindering market entry of new IFSPs. As early as 2016, the CREG had received feedback that incumbent IFSPs held back competition by signing long-term contracts or contracts with tacit renewal with their customers (CREG, 2016). Restricted customer switching has long been regarded as a substantial barrier to entry for new market players and effective market opening (Jones, 2019: p 62). However, the feedback from the surveyed IFSPs shows that this problem remains unresolved, which indicates that there can be several regulatory loopholes in the federal regime. First, there is a lack of specific provisions for promoting the switching of IFSPs in the Federal Electricity Law.

Furthermore, the cooperation between the CREG and Belgium Competition Authority is inadequate in monitoring anti-competitive behaviour and exchanging relevant information.[27] Finally, as already mentioned, the lengthy prequalification procedure also represents a barrier to switching IFSPs, making it difficult or impossible for a new IFSP to compete against an

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[22] The mFRR products are divided into reserved and non-reserved. The participants contracted by the TSO in the reserved market receive capacity remuneration or reservation remuneration. To increase competition, when the TSO needs to activate bids, the non-contracted parties are also allowed to participate in providing energy bids alongside the contracted market participants. But they only receive activation remuneration, not reservation remuneration (Elia, 2019b).

[23] The BidLadder is a platform operated by the TSO gathering different (kinds of) bids for mFRR balancing energy, whether reserved or non-reserved. Combined with a ToE solution, it aims at enabling IFSPs or grid users to offer the TSO flexibility for balancing purposes (Elia, 2019c).

[24] The problem is also confirmed by Leinauer et al., 2022; Poplavskaya et al., 2021.

[25] Adding a new delivery point in the pool of the IFSP means that the IFSP contracts with a new customer to use its flexibility (Elia, 2020).

[26] According to EU network regulations, successfully completing prequalification and ensured by the connecting TSO is a prerequisite for the successful completion of the qualification process to become qualified flexibility providing units and BSPs. Thus in the implementation of the new qualification procedure, the participating customers and IFSPs cannot provide balancing services and get remunerated (*System Operation Guideline*, article 159; *Balancing Regulation*, article 16; Elia, 2020).

[27] The energy regulator has duties of monitoring the level and effectiveness of market opening and competition in electricity markets and the requirement of cooperating with the competition authority (*Electricity Directive*, article 59; *Federal Electricity Law*, article 23).

incumbent. This situation could further increase market concentration in balancing markets and lead to high risks of strategic bidding and market power.[28]

Prior research underlines that the key components or variables of market design could enhance or neutralize each other's effects in promoting market entry (Poplavskaya and De Vries, 2019). The presence of these prominent barriers in Belgian electricity markets demonstrates that greater market participation of IFSPs relies upon the combination of the framework regulating the IFSPs' relation with suppliers and BRPs and other measures addressing remaining market entry impediments.

Lastly, there is a potential problem concerning the performance of the DSO. Whether the DSO can fulfil its obligation to support the implementation of the ToE regime remains to be seen after its procurement of flexibility begins. The ToE regime further lowers barriers for IFSPs to valorise demand flexibility connected to the transmission or medium distribution level. Together with reinforced measures for improving market participation of final customers, it can be expected that customers located in the distribution grid will increasingly offer demand flexibility to wholesale and balancing markets (Hadush and Meeus, 2018; Hermann et al., 2022). Moreover, higher prices in these transmission-level markets could be more attractive for IFSPs and consumers engaged in DR, which could limit the availability of these local flexibility sources to the DSO for local congestion management and efficient network operation (Hermann et al., 2022; Roos, 2017; Villar et al., 2018). It is especially the case when system balancing by the TSO and local congestion management by the DSO coincide or even these two entities engage in simultaneous procurement of flexibility services (Hadush and Meeus, 2018; Ruester et al., 2014; Vagropoulos et al., 2022). Under this circumstance, the DSO may face misaligned incentives between ensuring adequate flexible resources for distribution network management and assisting the delivery of such resources to the TSO. This situation could thereby affect the performance of the DSO to fulfil its role in managing and exchanging data necessary for proceeding with the ToE regime when IFSPs activate the flexibility connected to its system. So far, according to the VREG, the Flemish DSO has not started procuring flexibility, although relevant procurement specifications have been established and approved. These potential challenges deserve further attention after the DSO starts procuring flexibility and more consumers connected to the distribution system offer flexibility via IFSPs on transmission-level markets. Moreover, beyond monitoring by the regional regulator, improving the DSO's performance in assisting data exchange in the context of the ToE may also hinge upon the development of market models for easing TSO-DSO tension in flexibility service procurement (Hermann et al., 2022; Vagropoulos et al., 2022).

5 Conclusion

This article has examined the legal approaches to structuring the IFSPs' relationship with suppliers and BRPs taken in Belgium, focusing on those contained in its federal law. The Belgium example suggests that searching for fair allocation of rights and obligations between

[28] The concentrated nature of balancing markets in the EU has long raised concerns over strategic bidding and market power (Poplavskaya et al., 2021, 2020).

IFSPs and affected parties in activating DR is key to removing barriers imposed by the latter rather than solely obliging them to grant market entry of IFSPs. The elaborate regulatory framework established at the federal level also demonstrates that doing so is more than simply 'copying and pasting' the provisions of EU law. Several policy implications and lessons can be drawn from the Belgian case.

First, combining commercial negotiations and standardised arrangements as fallback solutions is pivotal to adequately regulating the relationship between suppliers and IFSPs. The legal analysis has demonstrated that merely requiring compensation agreements between IFSPs and suppliers would be of limited utility in removing barriers created by suppliers.[29] Standard compensation arrangements prevent the involved parties from being subject to unfair compensation solutions stemming from commercial negotiations. The approach of encouraging negotiated solutions while offering standard fallback solutions also embodies the idea of proportionate interventions in free markets or 'least intrusive' regulation (Baldwin, 2012: p 262). The design of these standard schemes must then be able to address compensation fairly when commercial negotiations fail. The analysis shows that the formula for determining compensation is designed to achieve this by neutralising impacts on suppliers while avoiding discouraging market entry of IFSPs. The survey conducted for this study also suggests that barriers from suppliers and BRPs are no longer significant in Belgian electricity markets applying federal rules.

Despite this, the above assessment also demonstrates the remaining regulatory gaps and newly created problems against the criteria for good regulation, which brings to light specific areas for improvement. Given the pervasive challenges of developing a well-functioning regulatory framework for DR and relevant market players within the EU and even globally (IEA, 2021), the following lessons from Belgium's experiences are worth highlighting.

First, there is a need for greater awareness of the potential side effects of structuring the IFSPs' relationship with suppliers and BRPs through unduly prescriptive rules. Indeed, a certain complexity of the ToE mechanism may result from its nature of involving several parties. However, one should remain cautious about complexity, regulatory burdens, and unreasonable costs existing in the regime to avoid the legislative will of fostering greater participation of IFSPs being defeated. The rule makers thus need to deal more rigorously with the significant trade-off of creating a robust and fair but simplified enabling framework for IFSPs. How this might be done perhaps also lies in reforming energy sector regulation to minimize undue public interventions and make the framework for IFSPs compatible with the liberal market thinking underlying EU energy law.[30] The complexity of the ToE regime also highlights the need for defining alternatives, such as 'Opt-out' and 'Pass-through' mechanisms, within which market players could take simplified solutions by a mutual agreement to counter impacts on suppliers and BRPs. Additionally, there are residual negative impacts on suppliers that should be considered in the ToE regime and alternative schemes. This analysis also points to another challenge relating to the proper implementation of the ToE mechanism, which might appear in the near future when the DSO starts procuring

[29] This model exists in some EU countries (Poplavskaya and De Vries, 2018).

[30] For more discussions about better regulation initiatives in the EU and Belgium, see De Mulder, 2018: p 137.

flexibility services.

Also notable are other market entry barriers named by respondents and existing studies. They imply that the framework regulating the IFSPs' relationship with suppliers and BRPs should be applied together with other measures improving the existing market design to achieve greater market participation of IFSPs and final customers.

Finally, this article is based on legal analysis and qualitative analysis, which restricts its capability of examining whether the standard formula contained in the ToE regime, especially the determination of indexes and weighting within that formula, entails potential risks or problems for fairly addressing compensation between the involved suppliers and IFSPs. This assessment relies on a quantitative analysis, which future studies can address.

CRediT authorship contribution statement

Ting Chen: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Frederik Vandendriessch**e: Conceptualization, Methodology, Supervision, Writing – review & editing.

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Appendices: Questionnaires for IFSPs, Febeg, Febeliec, the TSO, CREG and VREG

Subject: The questionnaire for IFSPs about the regulatory framework for flexibility service providers in Belgium
Date: 4 June 2021

The goal of this survey is to receive feedback from market participants engaged in providing flexibility service regarding the implementation of Belgian law governing participation of flexibility service providers (FSPs).

1. Decision 1677 implementing Article 19bis, §§ 3 to 5 of the Electricity law (hereinafter "Decision 1677") provides the formula for determining standard transfer price and applicable standard clauses in absence of agreement between suppliers and FSPs. The Decision shows CREG endeavors to avoid detriments to suppliers in activating flexibility while ensuring the compensation to not create barriers for FSPs. Do you think the ToE model envisioned by CREG is fair enough and sufficient in practice? Are there any cases where the formula and requirements of bank guarantee create disproportionate burden for FSPs in terms of profitability and market access?

2. Do you think the Rules for organizing ToE in DA/ID markets approved in 2021 are sufficient for promoting FSPs access DA/ID markets? If not, can you explain which added or adjusted rules under the instrument are likely to create barriers or disproportionate burden on FSPs?

3. The public consultation results contained in the CREG Study (F) 160503-CDC-1459 show that incumbent aggregators hinder market entry by signing long-term contracts or contracts with tacit renewal with their customers. In the survey conducted by Elia in 2019,[31] several FSPs also highlighted the problem of limited switching of FSPs and the correlation between a simultaneous activation of Multiple FSPs on a Delivery Point (hereinafter "Multiple FSP activation") and promoting market entry of FSPs. But Section 15.6 of the adjusted ToE rules issued in 2020 shows that Multiple FSP activation are not encouraged. In the absence of specific rules allowing switching of FSPs in the federal Electricity Law,[32] from your point of view, does such provision significantly amplify the barriers to market access and competition? Do you have any advice to promote switching of FSPs and remove barriers to market access created by incumbent market players?

4. When activating demand flexibility, do you perform automated control of the client's technical units? Have you encountered problematic activation that is caused by faults in hardware or software or communication errors and leads to damage to end customers?

5. Are you imposed disproportionate obligations under the FSP/TSO or FSP/DSO contract?

[31] The gathered feedback, see Elia, 2019 Study on the Transfer of Energy in DA-ID markets, available at <https://www.elia.be/-/media/project/elia/elia-site/public-consultations/20190617_study-on-the-transfer-of-energy-in-da-id-markets.pdf>

[32] See 29 APRIL 1999. - Wet betreffende de organisatie van de elektriciteitsmarkt.

If yes, can you illustrate with examples? What are negative effects caused by such undue burden?

Subject: The questionnaire for Febeg about the regulatory framework for flexibility service providers in Belgium
Date: 26 May 2021

The goal of this survey is to receive feedback from market parties regarding the implementation of existing Belgian rules governing participation of flexibility service providers (FSPs). There are some questions based on the feedback on the existing ToE rules you gave in the public consultation conducted by Elia in 2019 (hereinafter "2019 consultation"):

1. In the 2019 consultation, you mentioned that "the DSO/FSP contract, together with the Network Flex Study (NFS) is unreasonable and disproportionate, creating a hurdle for market participation of demand response". Can you give some examples to further illustrate which party is subject to disproportionate obligations and responsibilities under the existing DSO/FSP contracts? You also mentioned that such contract excludes certain commercial activities. Can you explain which commercial activities are adversely affected by such contract?

2. Decision 1677 implementing Article 19bis, §§ 3 to 5 of the Electricity law (hereinafter "Decision 1677") addresses the standard solution to determine the compensation of the transferred energy between the FSP and the supplier of the original end customer. Such financial compensation, according to the Decision and the Study (F) 160503-CDC-1459, concerns the supplier and not his BRP. In the abovementioned consultation, we have noted your concern about the disadvantage suffered by the BRP_{source} under the formula. You mentioned that only the BRP_{source} still has to pay the requested fees for accessing DAM/CIM and thus such fees should be included in the compensation formula. Are there other examples to confirm the detriments or disadvantages faced by original BRPs (or the BRP_{source}) along with the implementation of the standard solution proposed by CREG? Do you have any suggestions to ensure that the costs and interests of original BRPs could be considered in a fair manner in this formula?

Subject: The questionnaire for Febeliec about the regulatory framework for flexibility service providers in Belgium
Date: 26 May 2021

The goal of this survey is to receive feedback from market parties regarding the implementation of existing Belgian rules governing participation of flexibility service providers (FSPs). Based on feedback and comments gathered through the 2019 consultation conduced by Elia regarding the ToE rules (hereinafter "2019 consultation"),[33] there are

[33] See Elia, 2019 Study on the Transfer of Energy in DA-ID markets, available at <https://www.elia.be/-/media/project/elia/elia-site/public-consultations/20190617_study-on-the-transfer-of-energy-

further questions about switching of FSPs and protection of industrial customers in activation of demand flexibility.

1. The public consultation results contained in the CREG Study (F) 160503-CDC-1459 show that incumbent aggregators hinder market entry by signing long-term contracts or contracts with tacit renewal with their customers. In the 2019 consultation, you also highlighted the correlation between a simultaneous activation of Multiple FSPs on a Delivery Point (hereinafter "Multiple FSP activation") and promoting switching of FSPs. But Section 15.6 of the adjusted ToE rules issued in 2020 shows that multiple FSP activation are not encouraged.[34] In the absence of specific rules encouraging switching of FSPs in the federal Electricity Law,[35] from the end customer perspective, will Section 15.6 significantly amplify the "locking effects"? For allowing for more flexible switching between offers of FSPs and ensuring the benefit of end customers, do you have any advice to mitigate the impacts of incumbent FSPs on market entry and competition?

2. Under current ToE rules, do you think the interests of industrial customers are adequately considered and protected? In this respect, for example, in pilot projects of demand response in other countries, there have been instances that problematic activation causes financial damages to customers. Are there any industrial users showing concerns about the problematic activation? Further, fully automated control of the client's technical units by FSPs or aggregators has been technically possible and such automation is expected to play a key role in unlocking demand flexibility.[36] Has such automated activation been common in Belgium? Are there any cases where the activation (including automatic activation) does not perform as intended or required?

Given the problematic activation occurred in other countries, some scholars and regulators have noted there might be a need for a redress mechanism to address financial or non-financial damages to participating customers. Do you think existing contract law or consumer protection law in Belgium and the EU are sufficient to address such issues? If not, in your opinion, what mechanisms might be needed to further protect end customers in further implementing ToE?

Subject: The questionnaire for the Belgian TSO (Elia) about the regulatory framework for flexibility service providers in Belgium
Date: 26 May 2021

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in-da-id-markets.pdf>.

[34] See Regels voor de organisatie van de Energieoverdracht, available at <https://www.elia.be/-/media/project/elia/elia-site/public-consultations/2020/20201019_public_consultation_on-the_rules_on_the_organization_of_the_transfer_of_energy/20201019_toe-rules_nl_clean.pdf>

[35] See 29 APRIL 1999. - Wet betreffende de organisatie van de elektriciteitsmarkt.

[36] See e.g EC, Commission Staff Working Document Impact Assessment Accompanying the document Proposal for a Directive of the European Parliament and of the Council on common rules for the internal market in electricity (recast) Proposal for a Regulation of the European Parliament and of the Council on the electricity market (recast) Proposal for a Regulation of the European Parliament and of the Council establishing a European Union Agency for the Cooperation of Energy Regulators (recast) Proposal for a Regulation of the European Parliament and of the Council on risk preparedness in the electricity sector, SWD/2016/0410 final, Section 2.1.3.

The goal of this survey is to receive feedback from market parties regarding the implementation of existing Belgian rules governing participation of flexibility service providers (FSPs). Aside from various issues involved in the 2019 survey for the study of extending the ToE to DA/IA markets, there are several questions concerning switching of FSPs and risks of problematic activation.

1. According to the ToE rules enacted by Elia, the End User Statement submitted by FSPs shall contain the end customer's mandate to the FSP to activate a certain amount of demand flexibility at the Delivery Point. If the activated volumes must be consented by the end customer, does that mean the fully automated control of the client's technical units by FSPs or aggregators to react to market signals has not been allowed in Belgium? If yes, in view of the theoretical benefits of such automation recognized by the EC for instance,[37] is that possible such automation is emerging in Belgian electricity markets? If yes, is it necessary to put in place specific rules for further protecting end customers and impose obligations to improve due attention of FSPs and aggregators?

2. In other countries, there have been examples of problematic activation where DR technology goes wrong and does not perform as intended or required and end customers suffer financial damages.[38] When implementing ToE rules on balancing markets, are there such cases in Belgium? If yes or there are risks of such problematic activation, do you think end users may suffer disadvantage under current ToE rules? Is that necessary the ToE rules provide the mechanisms for apportioning blame between market parties like the FSP and the end customer?

3. In the survey results contained in the Study on Transfer of Energy in DA and ID markets (hereinafter "2019 Study"),[39] stakeholders highlighted the ToE rules blocked competition among FSPs and their market entry. One of concerns in this regard relate to regulatory barriers to switching of FSPs. Stakeholders (e.g. NEXT KRAFTWERKE) pointed out that prequalification test with a new aggregator while be under contract with another one is not allowed. Thus, the installation owners face the loss of one-month income in case of changing aggregators, disincentivizing switching of aggregators and greatly locking the existing flexibility with the current aggregator. In that light, a key question is whether the prequalification procedures need to be adapted to remove such barriers to switch FSPs and competition. Is allowing the prequalification test with multiple aggregators closely linked to simultaneous activation of Multiple FSPs on a Delivery Point (hereinafter "Multiple FSP activation")? If approving such prequalification test corresponds to approving Multiple FSP

[37] The positive effects include unlocking the full potential of DR in the residential and commercial sector to reduce transaction costs and active efforts of customers. See e.g. EC, Commission Staff Working Document Impact Assessment Accompanying the document Proposal for a Directive of the European Parliament and of the Council on common rules for the internal market in electricity (recast) Proposal for a Regulation of the European Parliament and of the Council on the electricity market (recast) Proposal for a Regulation of the European Parliament and of the Council establishing a European Union Agency for the Cooperation of Energy Regulators (recast) Proposal for a Regulation of the European Parliament and of the Council on risk preparedness in the electricity sector, SWD/2016/0410 final, Section 2.1.3.

[38] See e.g. F Friis and T H Christensen, "The challenge of time shifting energy demand practices: insights from Denmark" (2016) 19 *Energy Research & Social Science* 124; S Nyborg and I Røpke, "Constructing users in the smart grid—insights from the Danish eFlex project" (2013) 6 *Energy Efficiency* 655.

[39] See 2019 Study on the Transfer of Energy in DA-ID markets.

activation, given the complexity of allowing the latter, are there other ways to mitigate impacts upon switching FSPs and market entry through improving the prequalification procedures?

4. The adjusted ToE rules in 2020[40] seem to prohibit the possibility to offer simultaneously in balancing and DA/ID markets with the same Delivery Point (hereinafter "Combo-activation") via imposing "Penalties for the simultaneous participation of a Delivery Point in an activation of the Flexibility Service AD/ID and in an mFRR or an aFRR energy bid" in Section 15.5. However, in the 2019 Study, Elia has noted multiple benefits of such activation and stated that Combo functionality might be developed if the additional implementation efforts it implies are manageable and marginal. In your cost-benefit analysis, how could the costs of allowing this outweight its benefits in maximizing the flexibility provided by a single asset to the markets? Can you explain the trade-offs therein briefly?

Subject: The questionnaire for the federal energy regulator CREG about the regulatory framework for flexibility service providers (FSPs) in Belgium
Date: 8 September 2021

The goal of this survey is to receive feedback from CREG regarding the implementation of the transfer of energy (ToE) regime.

1. From the perspective of CREG, to what extent has the ToE regime achieved the legislative goal of promoting market participation of demand flexibility? Are there any remaining or new challenges faced by the ToE regime (taking into consideration of the need for transposing the EU Clean Energy Package)?

2. A consultation conducted by Elia in 2019 shows that the existing ToE mechanism contained in the CREG Decision 1677 and the Rules on the Organization of Transfer of Energy is highly complex.[41] It raises concerns that resultant administrative burdens or complexity may in turn hinder market access of FSPs and the practical efficiency of the ToE mechanism. What do you think about such concerns? Do you have further actions to refine or streamline the ToE-related rules?

Subject: The questionnaire for the Flemish energy regulator VREG about the regulatory framework for enabling flexibility service providers (FSPs) to participate in Belgian electricity markets
Date: 26 October 2021

The goal of this questionnaire is to collect feedback from VREG concerning market

[40] See Regels voor de organisatie van de Energieoverdracht inwerkingtreding op xx/xx/2021.
[41] See Elia, 2019 Study on the Transfer of Energy in DA-ID markets, Section 8, available at <https://www.elia.be/-/media/project/elia/elia-site/public-consultations/20190617_study-on-the-transfer-of-energy-in-da-id-markets.pdf>. See also Regels voor de organisatie van de Energieoverdracht and Beslissing (B) 1677/2 houdende uitvoering van artikel 19bis, §§ 3 tot 5 van de wet van 29 april 1999 betreffende de organisatie van de elektriciteitsmarkt, om de energieoverdracht mogelijk te maken.

participation of FSPs at the distribution level.

1. As far as we know, in the Flemish Region, the DSO Fluvius has not started procuring flexibility services for network operation or local congestion management. Is that true?

2. Load curtailment or flexibility services, which one is the relatively common congestion solution used by the DSO?

3. Existing literature points out that the use of the flexibility resources located in the distribution grid by the TSO for system balancing and network management will impact the availability of these resources to the DSO.[42] It is particularly the case when the balancing actions by the TSO and congestion management by the DSO occur simultaneously.[43] This implies that the DSO may well face misaligned incentives between ensuring adequate flexible resources for its own use and promoting the delivery of such resources to the TSO. In practice, are there relevant problems? If so, to what extent can these issues reduce the DSO's incentives to facilitate flexibility resources connected to its network to participate in the balancing market or other electricity markets?

4. According to a VREG's advice to the legislative proposal of amending the Energy Decree, it appears that, in practice, the DSO procured flexibility services by organising its own tender and the DSO had not organized its own local market.[44] However, the Energy Decree grants the FSP the right to enter the local congestion market.[45] Has this local congestion market been organized already? If not, is there a timeline for establishing this market?

5. Art. 6.1.12 of the Technical Regulations for Electricity Distribution defines the different role of VREG in approving the agreements concluded between the DSO and the TSO and in commenting on procedures adopted between the system operators. What is the reasoning behind this distinction? Is that because the TSO-DSO agreement is specifically required by Art. 4.1.18/1 of the Energy Decree and Art. 31 (9) of the Recast Electricity Directive?

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[42] See S Y Hadush and L Meeus, "DSO-TSO cooperation issues and solutions for distribution grid congestion management" (2018) 120 *Energy Policy* 610.

[43] Ibid.

[44] See Advies van de VREG van 27/11/2020 met betrekking tot het voorontwerp van decreet tot wijziging van het Energiedecreet van 8 mei 2009 tot gedeeltelijke omzetting van richtlijn (EU) 2018/2001 van het Europees Parlement en de Raad van 11 december 2018 ter bevordering van het gebruik van energie uit hernieuwbare bronnen en tot omzetting van richtlijn (EU) 2019/944 van het Europees Parlement en de Raad van 5 juni 2019 betreffende gemeenschappelijke regels voor de interne markt voor elektriciteit en tot wijziging van Richtlijn 2012/27/EU, Section 3.4.

[45] See Decreet houdende algemene bepalingen betreffende het energiebeleid (hereinafter the "Energy Decree"), Art. 4.1.17/1. §1.

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