Design note
Transfer of Energy

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Executive summary

Context and Need for Framework

The increasing share of renewable energy and the electrification of industries and homes have brought significant challenges to grid balancing. These trends, driven by the energy transition and reinforced by recent energy crises, necessitate a reevaluation of existing means of grid balancing. The introduction of numerous decentralized and flexible assets such as electric cars, heat pumps, and home batteries offers potential solutions for grid balancing but also creates new complexities.

Transfer of Energy (ToE) Framework

The Transfer of Energy framework aims to unlock explicit flexibility in the energy system, particularly for smaller, decentralized assets. This framework allows grid users to valorize their flexibility via a Flexibility Service Provider (FSP) independently of their energy supplier. Such a system, which allows to mitigate the impact of flexibility activations on the suppliers and their BRPs, is crucial for maintaining grid stability and ensuring efficient energy use in an increasingly complex market environment.

Existing ToE Models and alternative regimes

Within this note, a distinction is made between ToE models and alternative regimes. The former apply in a market situation with Transfer of Energy. The latter apply for market situations without Transfer of Energy. For these situations, the alternative regimes were developed. When discussing both the ToE models and the alternative regimes, the whole is referred to as 'ToE regimes'.

Several ToE models are currently in use or under development:

1. **Central Settlement Model (CSM)**: This model involves a third party to perform perimeter corrections and financial compensations between market parties.
2. **Corrected Model (CM)**: Currently being tested on TSO connected customers, this model involves adapting meter data or invoices to reflect flexibility activations, and neutralize the impact of the activation on the supplier. A third party performs the perimeter correction.

The alternatives to ToE models are the following alternative regimes:

Opt-Out Regime (OOR) and **Pass-Through Regime (PTR)**: These regimes allow market parties to arrange their compensations without a third party.

Challenges

4 main challenges have been identified:

1. **Absence of ToE models for certain products**: as emphasized by feedback from FSPs, there is a need to extend ToE to aFRR. Additionally, once an FSP-supplier pair engages in a given ToE regime for aFRR, they must apply the same regime for mFRR, affecting the use of existing ToE regimes for mFRR.
2. **High negotiation burden**: The only currently available ToE model (i.e CSM) involves potentially lengthy negotiation processes between FSPs and suppliers before the CREG applies the default transfer pricing formula it has established, in accordance with the current legal framework. This can be cumbersome and time-consuming, especially given the need to negotiate a unique price that applies to all delivery points in the portfolio of a given FSP-supplier pair.
3. **Lack of ToE models for low voltage (LV)-connected points**: There are no ToE models available for LV distributionconnected points, which present barriers to unlocking flexibility at this level. The high number of suppliers and frequent changes in supply contracts in the residential LV market add to the complexity, in addition to the non-expert nature of residential energy consumers.
4. **Imbalance and revenue issues**: Changes in customer behavior due to FSP activations can create imbalances within BRP portfolios and can lead to revenue losses for suppliers who have purchased energy in advance according to expected consumption patterns.

VITO Study Insights

A study by VITO highlighted the necessity of both Balance Responsible Party (BRP) perimeter corrections and financial compensation mechanisms to ensure a level playing field. The study recommended pursuing either the CSM or CM, each with its advantages and disadvantages, to address imbalance issues and revenue losses effectively.

Further Refinements and Evaluations

The Synergrid members have mapped out a strategic plan covering the period from 2025 to 2027, aimed at enhancing the ToE framework and market accessibility. This plan will be regularly evaluated and refined based on market developments and regulatory changes. Key objectives include:

1. **Market Access for All Flexibility Products**:
    a. By 2026, the plan envisions providing access to the balancing market for all balancing flexibility products (aFRR, and mFRR) for low voltage connections. FCR is an exception to this, and excluded from ToE and this design note.
2. **Implementation of ToE Models Using the CSM Method**:
    a. To ensure robust and efficient operations, a ToE model based on the Central Settlement Model (CSM) method as a default option will be implemented for each of these products across all voltage levels.

By achieving these goals, Synergrid aims to unlock significant flexibility potential, enhance the system balance, and support a smooth energy transition.

Glossary

Terminology	Explanation
Automatic Frequency Restoration Reserve (aFRR)	As defined in article 3(99) of the SOGL
Balance Responsible Party (BRP)	As defined in article 2(7) of the EBGL and recorded in the register of Balance Responsible Parties: The BRP is a market participant or its chosen representative responsible for its imbalances.
BRP_{source}	The Balance Responsible Party designated to the Access Point of the Grid User
BRP_{FSP}	The Balance Responsible Party, appointed by the FSP, to take the balancing responsibility for the energy volumes requested by the FRP to the FSP for each quarter-hour of a Flexibility Service activation
BRP Perimeter Correction	The BRP is responsible for maintaining the balance within their balancing perimeter, and will be held financially responsible for any imbalance. Actions by an independent FSP might lead to an imbalance in a BRP's perimeter, for which they are not responsible, nor for which they are expected to activate countermeasures. In context of ToE, the effect of these actions is corrected in order to neutralize the effect on the BRP balancing perimeter.
Customer	In context of this design note, a customer is a client of a supplier or an FSP. The term is used interchangeably with Grid User.
Explicit Flexibility	The alteration of the profile of production, injection, consumption or offtake of energy in response to an external signal given by an FRP

	in order to provide a service to the energy system, in exchange for financial compensation.
Flexibility Requesting Party (FRP)	System Operator requesting Flexibility to support the operation of their grid.
Flexibility Service Provider (FSP)	Market party that provides one or more flexibility services through one or more Service Delivery Points Flex.
Grid User (GU)	A user connected to the transmission, local transport or distribution grids
Manual Frequency Restoration Reserve (mFRR)	As defined in article 3(7) of the SOGL
Transfer of Energy (ToE)	As defined in Art. 19bis §2 of the Electricity Act. Within this design note it serves as the framework to neutralize the effects of the activation of flexibility by the FSP on the Supplier and the BRP of the Grid User. It enables flexibility to be valorized via an independent FSP.
ToE DA/ID	A service delivered by an FSP and carried out task consisting of activating Delivery Points DP_{PG} within the perimeter of a BRP_{source} to deliver an energy volume in the context of executed energy exchanges on the Day-Ahead and Intraday markets for electricity, including over-the-counter exchanges, by the BRP_{FSP}.
Supplier	A legal entity or natural person that sells or resells electricity to customers unless otherwise defined in national or regional legislation.
Synergrid	Synergrid is the association of Belgian electricity and gas Grid Operators, representing AIEG, AIESH, Elia, Fluvius, Fluxys, Ores, RESA, Réseau d'Energies de Wavre, Sibelga.

1. Introduction

Context

The past years have been characterized by a fast-increasing share of renewables in the electricity production mix, and by an important electrification of industrial and residential appliances, all driven by the energy transition and accelerated by the recent energy crisis. These trends are expected to become even more important over the next decade and necessitate the reconsideration of grid balancing strategies. On the one hand, the massive integration of intermittent renewable production in the electricity system creates a major challenge in terms of grid balancing, since it comes with ever more significant last minute forecast errors, that usually translate into grid imbalances. For example: today already, the significant installed capacity of (most of the time decentralized and barely controllable) solar - and of wind - production sometimes creates massive and unexpected excess of injection in the grid, that grid operators have to face in real-time. This issue, known as “incompressibility” is only going to get more critical as the installed capacity of intermittent renewable production increases at fast pace.

On the other hand, as a consequence of the rapid electrification of industrial and residential sectors, more and more flexible assets are connected to the grid. The emergence of electrical cars, heat pumps or home batteries, and the electrification of industrial processes, offer a natural solution to counterbalance the new highly volatile nature of the production mix.

Aside from dynamic pricing contracts, there are currently limited incentives for grid users (especially at low and medium voltage levels) to engage the flexibility of these flexible electrical appliances in the system, which might lead to a scarcity of (affordable) flexibility to balance the grid.

In order to realize a safe and affordable energy transition, improvements in market functioning are required, to encourage flexible electrical appliances to adjust their consumption and/or injection according to the real-time grid conditions.

There exist two ways for these electrical appliances to engage their flexibility in the system and participate to grid balancing by quickly increasing or decreasing injection or offtake of electricity[1]. They can either offer their flexibility explicitly to a Flexibility Requesting Party (FRP) who can then decide the exact volume of flexibility it wants to activate to cover the system needs, by sending an explicit activation request to the Flexibility Service Provider (FSP). Or, they can react implicitly (i.e. outside any explicit bidding process) to price signals that are providing incentives to balance the system, e.g. via the dynamic pricing contracts, the imbalance settlement price a or Time of Use tariff. In order to unlock as much additional flexibility as possible, Synergrid is working on initiatives facilitating both the explicit and the implicit participation in the system.

This design note focuses on initiatives facilitating explicit flexibility for balancing, which is defined in the context of this document as a deviation from the consumption/injection pattern of a given asset

[1] Note that these electrical appliances could of course also engage their flexibility to respond to local needs, through local flexibility markets or dynamic grid tariffs for instance, or to ensure adequacy. This design note focuses on grid balancing aspects. Flexibility products for congestion management and adequacy products are out of scope of this design note.

triggered by an explicit request of the FRP (that could be the TSO via balancing market, or the FSP and his associated BRP which for example sold the energy on the wholesale market via the ToE DA/ID product). It is part of the Program explicit Flexibility, which is a joint collaboration of the Belgian System Operators within Synergrid. This program aims to increase flexibility throughout the system by developing the flexibility products and removing barriers at all voltage levels.

The purpose of this document is to provide interested market actors with a clear insight into the proposal concerning a Transfer of Energy Framework made by the Belgian public system operators. To provide this overview, the next section first clearly describes the need for a Transfer of Energy framework and also describes the relevant legal framework. A second section then discusses the currently existing Transfer of Energy framework, after which relevant possible improvements are explored. Subsequently, the link is made with the study commissioned by Synergrid on the subject, carried out by VITO, and on further analysis conducted by the Public System Operators themselves, translated in their common vision. A proposed roll-out plan (Game Plan) is presented in the seventh section, while an eighth section describes some further considerations. The final section concludes this paper. The appendix serves to provide some further clarifications on the interactions between market parties in the ToE models proposed within this design note.

Need for a Transfer of Energy Framework

In order to unlock as much explicit flexibility as possible in a context where more and more small decentralized flexible assets (e.g. demand response, decentralized storage and generation) are connected to the grid, a framework is needed to allow a grid user to valorize his flexibility for balancing – located at the access point or behind the meter - via a FSP independently from his supplier, as illustrated on Figure 1.

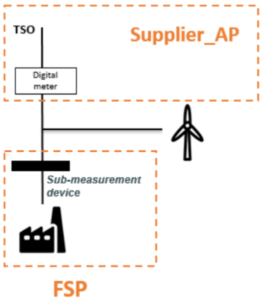

Figure 1: illustration of explicit flexibility provided by an independent FSP behind the meter

In this example, flexibility is provided from the Consumer’s industrial site and the FSP differs from the Supplier at the Access Point (Supplier_AP). Each actor (FSP and Supplier_AP) has its own BRP (BRP_{FSP} and BRP_{source}, respectively).

Developing a market model where the FSP does not necessarily have to be the same actor as the supplier is necessary in the current context to allow aggregators to pool the flexibility of several smaller decentralized assets and to increase the competitiveness.

However, the actions of an independent FSP on a flexible asset lead to two specific issues :

- A foregone revenue issue for the supplier of the access point, and;
- An imbalance issue for the BRP associated to this supplier.

Revenue issue for the supplier

The supplier purchases energy in advance (for instance on the long term or spotmarkets) to supply their customers. If the customer changes his behavior unexpectedly following an activation from the FRP (e.g. from the TSO in case of activation of a balancing product), the purchased energy is still injected in the grid, but no longer sold to the customer, and hence no longer compensated for through the customer contract. Figure 2 illustrates this issue. In this example, the supplier expects the customer to consume 100kWh and purchases this energy in advance. However, the customer receives the request from the TSO, through his FSP, to reduce his consumption with 10kWh for grid balancing purposes. The customer therefore only consumes 90kWh which can be invoiced by the supplier. There remain 10kWh that are injected in the grid but for which the supplier is not remunerated. The supplier therefore incurs a loss. Note that the inverse situation might occur as well, where the customer will consume more energy than initially foreseen by the supplier. All examples can be found in Appendix.

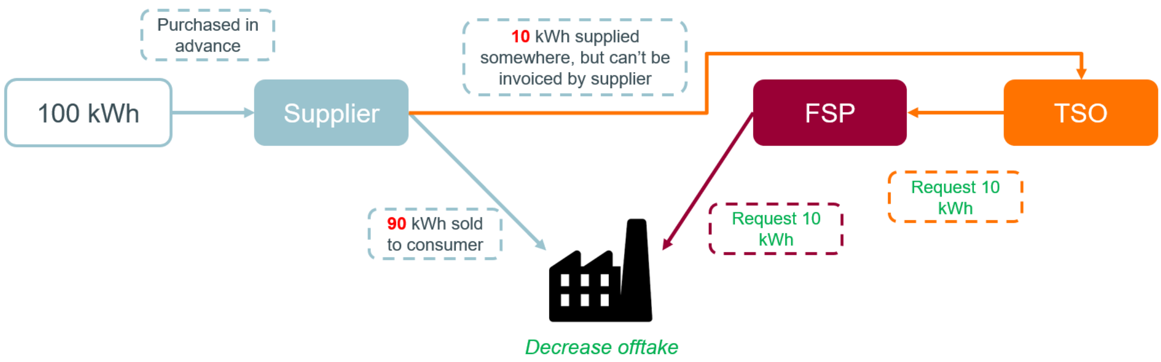

Figure 2 : illustration of revenue issue in case an independent FSP valorizes the flexibility

Imbalance issue

At the same time, an unexpected change in the behavior of the customer introduces a risk of imbalance in the portfolio of the BRP associated to the supplier (called BRP_{source}), over which he has no control. This is illustrated with the example on Figure 3.

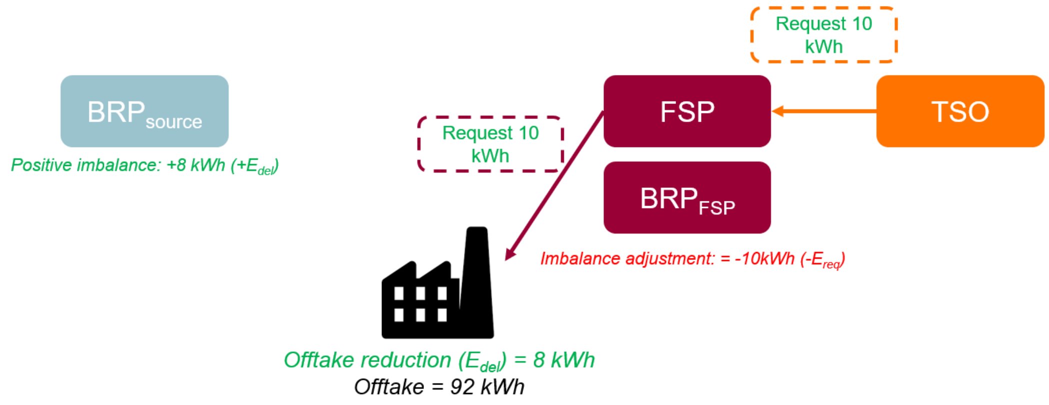

Figure 3 : illustration of imbalance issue in case an independent FSP valorizes the flexibility

In this example BRP_{source} ensures that its perimeter is balanced for the normal consumption expected from the customer (i.e. 100kWh). If, following the request from Elia (through his FSP) to reduce his consumption with 10kWh, the Grid User eventually manages to reduce his consumption with only 8kWh, it leads to an imbalance of +8kWh in the portfolio of the BRP_{source}, over which he has no control. At the same time, according to the rules applicable in case of activations from Elia, the BRP_{FSP} sees his perimeter adjusted with the energy requested by Elia (the 10kWh in our example), which does not provide any incentive to the FSP and its associated BRP_{FSP} to properly deliver the energy requested by Elia.

The Transfer of Energy framework as solution for the revenue and imbalance issues

The "Transfer of Energy" framework foresees a financial compensation for the supplier and a correction on the perimeter of the BRP_{source} and of the BRP_{FSP} which allows to overcome the two aforementioned issue.

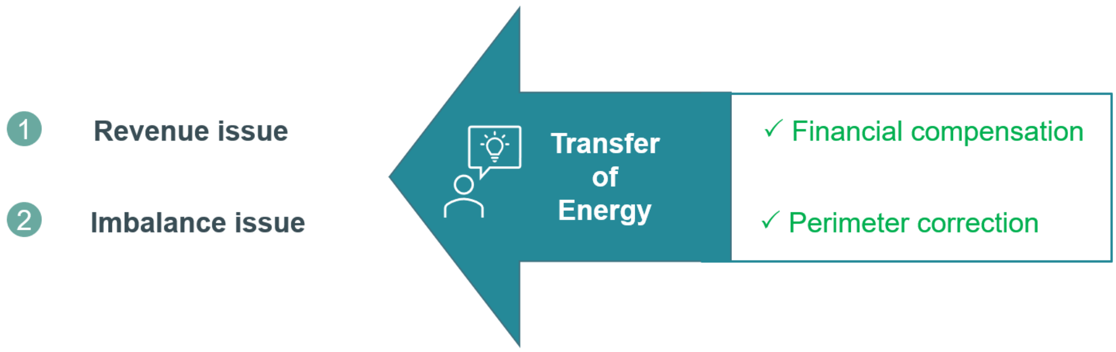

Figure 4 : Transfer of Energy as a solution for revenue and imbalance issues created by independent FSP

There exist several regimes for organizing the "Transfer of Energy" framework ("ToE"). At the time of writing, one ToE model and two alternative regimes are available in the Belgian market:

- one ToE model, called "Central Settlement Model" or "CSM", for which the perimeter correction and the financial compensation between the market parties are performed with the help of a 3rd party;
- two alternatives, called "Opt-Out Regime" or "OOR" and "Pass-Through Regime" or "PTR" where market parties arrange the compensations by themselves. The status of these models and regimes is further detailed in a later section.

Besides, another ToE model, called "Corrected Model" is currently being tested in the format of a Proof of concept on Transmission or local Transport connected customers.

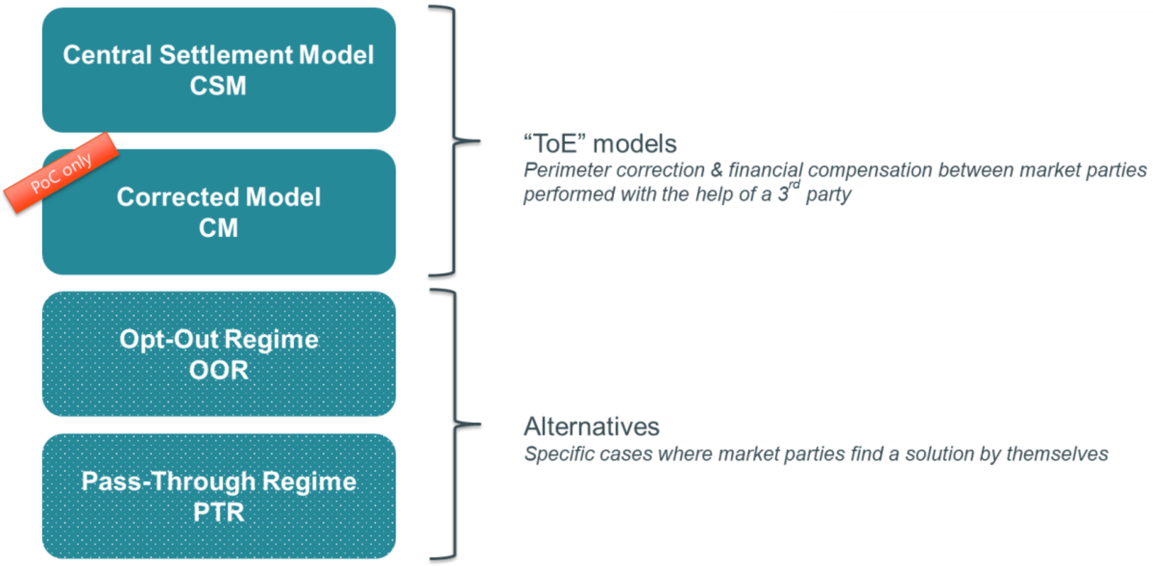

Figure 5: existing regimes organizing the Transfer of Energy

The Pass-Through Regime

In the Pass-Through Regime, Elia only corrects the BRP_{FSP} with the energy requested by the FRP (E_{req}). The BRP_{source} and the supplier are however not impacted by the activation as they pass the created imbalance ($+E_{del}$) to the end-user (who pays deviation based on Imbalance price). The end-user and FSP/BRP_{FSP} settle on their own.

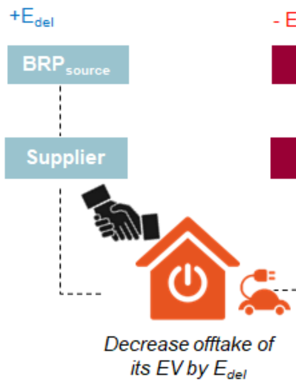

Figure 6 : Illustration of the Pass-Through Regime

In order to participate to this model, the FSP needs to provide the proof that the end-user has a pass-through contract with his supplier/BRP_{source}.

The Opt-Out Regime

In the Opt-Out Regime, Elia only corrects the BRP_{FSP} with the energy requested by the FRP (E_{req}). The BRP_{source}, BRP_{FSP} ,FSP and supplier settle on their own.

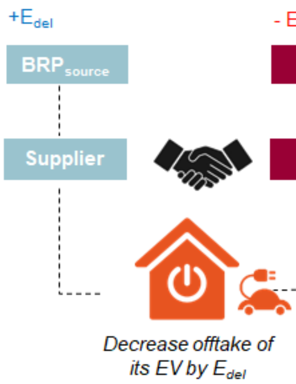

Figure 7: Illustration of the Opt-Out Regime

In order to participate to this model, all parties need to provide the proof of an opt-out agreement.

The "Central Settlement" ToE model

In the central settlement model, Elia corrects the perimeter of both the BRP_{source} and the BRP_{FSP} to make sure that the activation has no impact on the perimeter of the BRP_{source} and that the imbalance created by an activation request that is not correctly fulfilled (cfr. Example in Figure 3: 8 kWh delivered versus 10 kWh requested), is beared by the BRP_{FSP}. To do so :

- the perimeter of the BRP_{source} is corrected with $-E_{del}$
- the perimeter of the BRP_{FSP} is corrected with $-E_{req}+E_{del}$
- where E_{req} is the energy requested by the FRP and E_{del} is the energy delivered by the end user

Besides, all the volumes necessary for the settlement are calculated and put at the disposal of the market parties so that the FSP and the supplier can settle the "transferred energy", at an agreed price. Those volumes are communicated in an aggregated way to the market parties, so that the supplier does not have to know which customers are valorizing their flexibility, nor with which FSP they chose to valorize their flexibility. The price agreed between the FSP and the supplier is therefore not customer-specific. It is a price that is used for the settlement between the FSP and the supplier for all the activations performed on the delivery points that are common to this FSP-supplier pair. If a given FSP-supplier pair does not reach an agreement on the price within a predefined negotiation period (currently fixed at 4 months), a regulated price is imposed by CREG[2] for the settlement between the FSP and the supplier.

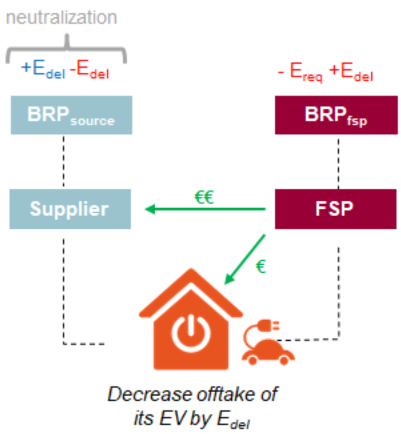

Figure 8: illustration of the central settlement model

In order to participate to this model, the FSP and supplier need to provide the proof of an agreed price, otherwise the CREG may impose the regulated price.

The "Corrected" ToE model

In the corrected model with correction on invoice, Elia corrects the perimeter of both the BRP_{source} and the BRP_{FSP} in the same way as for the Central Settlement Model.

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[2] Beslissing 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 | CREG : Commissie voor de Regulering van de Elektriciteit en het Gas ; Décision portant exécution de l'article 19bis, §§ 3 à 5, de la loi du 29 avril 1999 relative à l'organisation du marché de l'électricité, en vue de rendre possible le transfert d'énergie

Besides, all the volumes necessary for the settlement are calculated and put at the disposal of the market parties so that the supplier can invoice the end-user based on what he would have consumed if no flexibility had been activated, and the FSP can settle the end-user for the delivered flexibility. This time, and contrary to what is done for the Central Settlement Model, those volumes are therefore communicated at individual delivery point level, rather than on portfolio level.

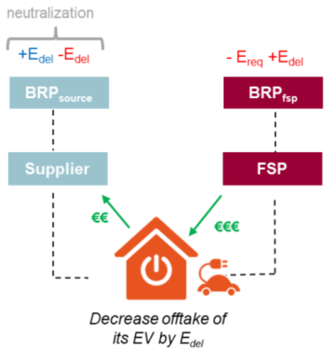

Figure 9 : illustration of the corrected model

Considering the central role of the end-user in this model (due to the fact that the settlement for the "energy transferred between the supplier and the FSP" flows through the end-user since the activated volume is charged through the supply contract, meaning that the end-user is responsible to make sure that he recovers these costs through the agreement he has with the FSP), a proof of the consent of the end-user will be needed in order to participate to this regime. However, as mentioned above, this model is currently being tested under the format of a "Proof of Concept" on Transmission or local Transport Grid connected customers and the final design is hence not yet implemented.

Legal context

The "Transfer of Energy" framework was introduced by the Law of 13 July 2017, amending the federal Electricity Law of 29 April 1999. The Law of 23 October 2022 has brought changes to this framework in order to better respond to the evolving market conditions and to European legislationin order to create the so called "ToE" framework for participation to the FRR balancing market segments, and the DA/ID markets[3].

This framework requires the establishment of a document, the "ToE rules" which shall set out the principles and practical details of the ToE. The first version of the "ToE rules" was published by Elia in 2018[4]. The ToE rules were established by CREG, based on a proposition by Elia. This proposition was presented to the market parties via public consultation. Taking into account the public consultation and in concertation with the regional regulatory authorities, CREG approved the ToE rules. Finally, CREG defined the formula for the financial compensation, as described in the Electricity Act.

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[3] Additionally, it required the creation of the Strategic Demand Reserve Market, now obsolete

[4] The ToE rules can be consulted on the Elia website.

Current status of the Transfer of Energy framework

Today, the three existing regimes (OOR, PTR and ToE CSM) are available for points connected to the Transmission, local transport and HV-MV Distribution grids to offer the flexibility on the mFRR market, as well as on the wholesale (Day-Ahead and Intraday) markets.

Besides, OOR and PTR are also open for Transmission, local transport and HV-MV-Distribution grid connected points willing to participate to the aFRR market since 2021 and OOR for LV Distribution grid connected points since Q2 2024.

Finally, as already explained above, the ToE CM is currently only available under the format of a "Proof of Concept"(PoC) for Transmission and local transport grid connected points only.

Product	Voltage level	Model		
		ToE Central Settlement Model	Opt-out	Pass-Through
FCR		ToE Not Applicable		
mfRR	*Transmission & local transport*	✓Since 2018	✓Since 2018	✓Since 2020
	HV-MV distribution	✓Since 2018	✓Since 2018	✓Since 2020
	LV distribution (<= 1 kV)	TBD	TBD	TBD
aFRR	*Transmission & local transport*	TBD	✓Since 2021	✓Since 2021
	HV-MV distribution	TBD	✓Since 2021	✓Since 2021
	LV distribution (<= 1 kV)	TBD	✓Since 05/2024	✓Since 05/2024
DA/ID	*Transmission & local transport*	✓Since 2021	✓Since 2021	✓Since 2021
	HV-MV distribution	✓Since 2021	✓Since 2021	✓Since 2021
	LV distribution (<= 1 kV)	TBD	TBD	TBD

Figure 10 : current status of the phased development of the Transfer of Energy framework

Evaluation of the current status of the Transfer of Energy framework

As observed in Figure 10, the OOR and the PTR have already been made available on several products and voltage levels.

The OOR and the PTR have the significant advantage to be easy to implement in the tools and IT applications of the System Operators, and can hence rather quickly be made available.

Additionally, the System Operators believe it is important to allow bilateral negotiations and market-based solutions. The Opt-Out Regime and Pass-Through Regime are therefore considered as important features of the current market design.

However these models still come with important barriers and, consequently, are not sufficient on their own:

- the PTR is only applicable for Grid Users with imbalance exposure, limiting its application;
- the OOR requires the Supplier/BRP_{source} and the FSP/BRP_{FSP} to find a bilaterally agreed solution, which requires the cooperation of all involved parties. FSPs have indicated that is

not always possible to come to an agreement with a Supplier/BRP_{source}. Moreover, FSPs indicated that the need of such agreement per supplier comes with a high workload.

It is therefore important to complement the OOR and PTR regimes and offer an alternative solution, in order to allow FSPs to unlock the maximum amount of flexibility possible, while limiting the impact on the Supplier/BRP_{source}.

This alternative solution should take the form of one (or several) ToE model(s), guaranteeing that a Grid User, or an independent FSP, facing the reluctance of a supplier/BRP_{source} to negotiate and come to a bilaterally agreed solution, still has a solution to valorize its flexibility explicitly.

With that respect we can observe that there remain some gaps in the existing Transfer of Energy framework.

First of all, we can notice that no ToE model is available for aFRR. Grid Users or FSPs willing to valorize flexibility on the aFRR markets therefore need to reach an agreement with the supplier/BRP_{source} to apply an OOR or a PTR, which is, as aforementioned, according to the feedback received from FSPs, not always possible.

Synergrid therefore came to the conclusion that one (or several) ToE model(s) should be open for aFRR to allow Grid Users and FSPs to valorize their flexibility in the best possible way. This need is further reinforced by the fact that, once a FSP-supplier pair is engaged in a given regime for aFRR, it has to apply the same model for mFRR. The absence of ToE model for aFRR therefore also has a consequence on the use of the existing ToE model for mFRR.

Secondly, there is currently no ToE available for LV distribution-connected points (i.e. for none of the products). An important aspect to take into account specifically for the LV distribution-connected points is the prevalence of a high number of suppliers in the LV market, and the related high number of supply-contract changes in the residential LV market, as well as the non-expert nature of LV distribution connected Grid Users, as well as the large number of Grid Users connected to these grids. It can be expected that this might lead to difficulties for the FSPs who want to use OOR, given the time-consuming negotiations that need to take place with every supplier. Synergrid therefore felt the need to further investigate if developments and which developments would be required to unlock explicit flexibility on LV distribution-connected points.

Thirdly, we see that the only ToE model available today comes with some limitations and disadvantages, namely because of the possible long negotiation procedure between the FSP and the supplier before CREG can impose a price; and because the price agreed between the FSP and the supplier to compensate for the “transferred energy” will not be equal to the price of the supply contract (due to the fact that the same price has to be used for all the delivery points in the portfolio of this FSP-supplier pair). For this reason, Synergrid wanted to take the time to investigate other ToE models and/or variants of existing ones.

Finally, we see that the ToE DA/ID solution is already implemented on the Transmission, local transport and HV-MV distribution grid connected points but has never been used so far. In parallel System Operators are working on a supply split solution (allowing another supplier on a submeter behind the headmeter), which will, similar to the ToE DA/ID solution, provide direct market access for assets behind the meter. An evaluation by the System Operators can be done after the implementation of supply split to analyze whether flexibility finds its way in the DA and ID markets.

Based on all the aforementioned elements, Synergrid identified the need to continue developing the Transfer of Energy Framework, as also required by the legal framework, keeping in mind the objective to efficiently unlock as much flexibility as possible. In order to verify its assumptions and receive guidance on which ToE models to further develop, Synergrid commissioned the VITO study as described in the next section.

2. Study on the need for correction mechanisms for independent aggregation of DSO end points, as performed by VITO

In 2023/2024 VITO conducted a study on the need for compensation mechanisms for independent aggregation on DSO end points, commissioned by Synergrid[5], in order to identify how explicit flexibility DSO end points can be unlocked in the most efficient way. The study set out to investigate the barriers for balancing market access, as well as evaluate different compensation mechanisms to foster aggregation of supply and demand flexibility on DSO end points for balancing products. As such, it formed the starting point of concrete design discussions between the different Belgian System Operators on Transfer of Energy mechanism for distribution grids.

The VITO study aimed to investigate the necessity for these correction mechanisms (both BRP perimeter correction and financial compensation for the supplier), referred to as ToE above, as well as how the current design live for mFRR can be improved and serve as basis for aFRR. The study concludes:

- There is a complex interplay of economic factors and market dynamics which significantly influence economic transactions;
- BRP perimeter correction is considered as imperative for a level playing field for dependent and independent FSPs;
- Financial compensation is considered as needed to neutralize to some extent the impact on the supplier's net position;
- The Central Settlement Model and Corrected Model are the most promisingc, where both have specific pros & cons for the FSP, Supplier, System Operator (SO) & Customer.

VITO recommendations:

- Consider either the Central Settlement Model[6] or Corrected Model to tackle the imbalance issue and loss of revenue keeping in mind they entail different advantages and disadvantages;
- Contract-based aggregation regimes can still operate alongside independent aggregation models (i.e. OOR and PTR);

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[5] The VITO study can be found here.

[6] Note that in the version of the CSM considered by VITO, the assumption was made that a regulated price is imposed on the market. This is not the case today as legally defined, where market parties negotiate a price first, and only if negotiations fail after 4 months, the CREG imposed price is applied.

- A default model should be applicable with minimal (administrative) burden.

Within their study, VITO stressed the need to develop the relevant ToE models on the different voltage levels and across products, as a key enabler to unlock explicit flexibility. The need to translate these recommendations into operational processes became apparent, as well as the need for further development of the legal framework. The Belgian System Operators have analyzed the different ToE models, current and future regulatory frameworks and investigated the pros & cons behind each model.

Finally, this led to a common vision between the members of Synergrid for the further development of the ToE models, as well as a Game Plan for gradual implementation.

3. The vision of the members of Synergrid

The members of Synergrid value the importance of explicit flexibility, amongst all other enablers (notably, implicit flexibility) to make the energy transition a success. For that, Synergrid and its members are convinced that barriers should be assessed and where needed removed. The need of an affordable, yet fair, correction mechanism has been pointed out by many stakeholders. The ambition of the members is therefore to offer a consistent ToE framework across voltage levels and across products.

Models refinement

The VITO study put forwards two ToE models, the CSM and the CM without however concluding on a preference. Therefore, the members of Synergrid analysed further these two models and their possible variants.

For the CSM, the VITO study recommends having a regulated price imposed for the CSM. However, this is not possible with the current legislation described earlier in the ToE legal framework as outlined in the section on the legal context above. The CREG formula price can only apply if no bilateral agreement is found after a predefined period, currently 4 months. Therefore, given this legal context, the members of Synergrid keep the CSM with either a 1-on-1 price for an FSP-Supplier pair or with the regulated price that applies if negotiation didn't succeed.

For the CM, the VITO study proposes 2 variations:

- Corrected Model with correction at source: a central entity or a meter data company corrects the meter data by the amount of flexibility activation at the source.
- Corrected Model with correction on end invoice: a central entity communicates activated flexibility volumes to the BRP/supplier and this party then invoices the customer as if no flexibility was activated.

In the context of this Belgian system, the central entity role is taken up by the System Operators.

The correction at source variant makes the grid fee calculation impossible and requires significant implementation efforts for System Operators, while offering little added value. Given this – where the CM will be implemented - , the members of the Synergrid opted for the Corrected Model with correction on end invoice.

Further evaluation of the ToE models

Since the VITO study compared CSM and CM without concluding on a preference, the members of Synergrid have pushed the analysis further and investigated the strengths and the weaknesses behind each model on more concrete features. We identified the key aspects on which we further assessed the recommended models, in this way translating the theory in a solid and concrete evaluation.

Impact on BRP_{source} & BRP_{FSP}

With both CSM and CM, the perimeter correction for both BRP_{source} & BRP_{FSP} is completely solved.

Impact on the Supplier/FSP pair

In the CSM, the price negotiation is a complex and imperfect solution, that is difficult and long to go through:

- No price formula exists that will result in a fully correct compensation of the involved parties, meaning that some impact on the Supplier and/or the FSP will remain. Especially, the CREG defined price is not 'one size fits all', and can be suboptimal in some cases.
- The process to negotiate a price can be long and needs to be done by all FSP– Supplier pairs.

In addition, the financial compensation requires financial processes to be set up between the Supplier and the FSP, leading to recurrent operational activities that could increase the total cost of the solution.

On the other hand, there is no need for a relationship between the FSP and the Supplier in the CM: since the compensation for the Supplier is based on a correction of metered values on the invoice, there is no need to negotiate and settle an activation compensation between FSP and Supplier. The compensation for the energy therefore always happens based on the energy price in the GU's supply contract.

Impact on the Supplier

With both CSM and CM, a financial compensation is done for the impact of the activation on its volumes.

The main difference lies in the invoicing: for CSM, there is a post-flex invoicing towards/from the FSP based on ToE volumes whereas for the CM, invoicing is done towards its flex customers. This means that suppliers in the CM need to manage two data flows for their invoice towards the GU, as elaborated further below in this section. Incidentally, since it entails a difference between indexes on the meter device and invoices for customers, it is possible that CM generates more questions from customers to suppliers about the invoices.

Additionally, as already mentioned in the previous section, in the CSM, suppliers are also impacted by the compensation that cannot be perfect since it not based on the price of the supply contract.

Impact on the FSP

Both CSM and CM provide a level playing field for non-independent and independent FSP.

One drawback of the CSM for the FSP is that he could face a lead time, due to the potentially long negotiation process before he can start valorizing the flexibility of his clients. However, the CSM ensures the confidentiality of its clients – this aspect was especially important at the start of the establishment of the "ToE" framework for the participation of demand side flexibility, as a way to ensure that suppliers would not unfairly compete with the FSP when potential flexibility in their portfolio reveals itself. Since then, market parties agreed this assumption might no longer be essential, as long as there is still a possibility to preserve confidentiality for some sensitive clients.

For the CM, FSPs might need to manage some aspects related to customer protection and confidentiality. This is dependent on the data protection requirements to be followed.

Impact on the Grid User

The CSM model is considered to be less complex for the Grid User than the CM, as it is more transparent to them what compensation they will receive. Within the CM, the customer needs to be savvy enough to ensure that they receive a compensation from the FSP large enough that it still covers the invoiced yet unused (as a result of the activation) energy by the Supplier. Especially on LV, with residential consumers, this is an attention point. These attention points are further described in the Appendix. This will introduce additional complexity (on volume and price) to the customers invoice.

The CSM has as an added benefit for the Grid User that the valorization of their flexibility remains anonymous. This way there is no risk that they would receive an administrative fee or different tariff from their supplier because they valorize their flexibility with an FSP different from their supplier.

Efficiency to unlock the flexibility

With the current negotiation process in CSM, there might be periods where flexibility is temporarily frozen in markets with numerous suppliers or frequent supply switches, e.g. in the market for residential consumers. For example a supply switch may lead to a new FSP-supplier pair, which has no agreement yet and thus trigger a negotiation between both parties. In the intermediate time the delivery point has no access to the market.

With the CM, the customer's flexibility participation is exposed towards its supplier, implying the risk of negative financial set-back imposed by the supplier. Although not needed in the presence of a fair correction mechanism, there is no legal or regulatory framework that avoids the possibility of suppliers imposing an administrative fee or applying a different tariff towards customers valorizing their flexibility via the CM. By doing so the business case of participating to Explicit Flexibility can become negative, making the customers opt out of the flexibility market. In addition, as explained in section 0, customers, especially on LV, could also opt out if they are not able to calculate the cost-gain ratio of its flexibility participation correctly at signature of its flexibility contract. Indeed, at any moment of its lifecycle (at contract signature or along the contract duration) the customer would assess its business case and balance its flexibility-income and its flexibility-cost. The calculation for CM might be challenging.

Implementation journey: IT, legal and regulatory aspects

The CSM is already up and running for some types of flexibility, allowing for a quicker and cheaper implementation. Therefore, no or limited changes to legal and regulatory frameworks are foreseen, required IT infrastructure already exists to a large extent and market parties are familiar with the model.

On the other hand, the CM requires an implementation at supplier side to take into account the corrected volumes (which will complement the original ones). This implementation is not available off the shelf (setting up sending/receiving of corrected volumes, including new volumes in invoicing process, ...) and will require implementation costs and time on both supplier and System Operator side. The legal and regulatory journey is likely to be longer and uncertain, especially for aspects related to customer protection and, potentially, exposure of individual data.

CSM as the default model cross-voltage, CM as an alternative for Elia grid

As per VITO's recommendation, a default model should be applicable for all customers (without additional burden) and should safeguard the rights and obligation of the Grid User first. As explained in the section on the evaluation of the current status of the ToE framework, neither the Pass-Through Regime nor the Opt-Out Regime can be the default model.

The members of Synergrid had a particular attention for the customer point of view, i.e. the complexity of model and the protection offered by the model, especially for residential customers, and for the feasibility of a fast implementation. Therefore, the Central Settlement Model is preferred as a default, with the possibility to have three alternatives: Opt-out Regime, Pass Through Regime and finally, for the Elia-connected customers, the Corrected Model.

In this way, Synergrid will first continue developing CSM as the consistent ToE model on all voltage levels and across all products. In the meanwhile, for now, we believe that participation to the Corrected Model should be a choice made by the Grid Users with a full understanding of the implications. This means offering it for Elia-connected Grid Users, for which both models will co-exist.

It shall be noted that, in parallel, the members of Synergrid are working on enablers to increase implicit flexibility on all voltage levels . The members strongly believe that all these initiatives will unlock flexibility and are committed to monitoring this closely. This monitoring shall be continuous but also take the form of a thorough market evaluation when needed, to fully assess the progress and the efficiency of the implemented measures. There will be lessons learned from such market evaluation and additional improvements possible, such as extension of the models under consideration to all voltage levels and products.

Potential improvement ideas for the CSM

During the analysis process, the members of Synergrid also identified some potential opportunities to improve the existing CSM and get closer to the objective to have one default model in place that can be immediately applicable with minimal administrative burden. **These opportunities are out of the hands of the Belgian System Operators.** Nevertheless, these improvements are shared for information.

- **Potentially compatible with current legislation:**

    - Mass bilateral negotiations:

As described earlier in the ToE legal framework in section 0, transfer price setting in the CSM should first favor bilateral negotiations between the FSP and the Supplier. The CREG formula price can only be applicable if no bilateral agreement is found after a predefined negotiation period. The side effect is that during this negotiation period, flexibility is temporarily frozen: a customer cannot participate to the flexibility market with the FSP of his choice as long as this FSP has no bilateral contract with the customer's supplier or as long as negotiations are ongoing between them.

In order to speed up this process, we could encourage FSPs to start negotiations with all the suppliers regardless of whether they already have customers engaged with a specific supplier.

    - Shorten the negotiation period:

The current predefined timing of 4 months for the bilateral negotiation could delay the access of the flexibility, especially when one of the two parties, the FSP and the Supplier, is not willing to move forward in the procedure. In those cases, reducing the timings for negotiations, might encourage all parties to move faster during the negotiations or "agree" faster that they do not want to agree and therefore work with a CREG imposed price.

- **Not compatible with current legislation:**

    - Price agreed by all market parties:

CSM with default price agreed by all market parties, and imposed for new parties entering in the market, might be a future solution, but is not compatible with current legislation and is unsure to result in a workable solution. It may avoid negotiation periods for new FSPs and suppliers entering in the market, but it is not expected to address the fact that the price is never equal to supply contract price ("you win some, you lose some"). An alternative could be to include an obligation to agree on a market price in the FSP-FRP contract.

4. The Transfer of Energy Game Plan

Intro

Based on the analysis in the previous chapters, Synergrid established a Game Plan for the further roll-out of Transfer of Energy. This Game Plan outlines the shared ambition of the System Operators with respect to Transfer of Energy, to unlock explicit flexibility for balancing.

As outlined above, Synergrid proposes to extend the existing CSM mechanism, which is already applicable on the Transmission, local transport and HV-MV distribution grids for the mFRR product and the wholesale (Day-ahead and Intraday) markets, and make it available also for the aFRR product. After that it will be gradually extended to Grid Users connected to the LV distribution grids, for mFRR and aFRR.

CSM will be offered as the default solution. The alternative CM can only be offered to Grid Users connected to the Elia grid.

It is important to note that the proposed Game Plan serves as an indication of timings and order of implementation and that each step is conditional on evaluation. Also depending on the feedback received from the market and evolutions in the market this may be subject to change. Additionally, it is important to keep in mind that several design changes presented in this note will require regulatory approval, which may impact the timeline. These changes will need to be incorporated in the different regulated documents, which have other changes pending as well, each with their own priorities and timing. Some of the proposed changes might require a change in the legal framework, which could have consequences for the timing as well.

Steps

Synergrid proposes to take the following intermediate steps in rolling out the ToE framework to all voltage levels and across all products. This plan supports providing access to the balancing market for the flexibility products (aFRR and mFRR), for low voltage connections by 2026:

1. Extension of existing CSM to aFRR for HV/MV
    - The ambitioned timing is Q3-2025
2. Implementation of CM for aFRR and mFRR for Elia-connected delivery points as an alternative to the current solution
    - This extension is independent of the sequential list of actions with respect to the CSM, so the implementation timing is not constrained by this effort
    - The ambitioned timing is Q3-2025
3. CSM for mFRR on LV distribution grid connected points on the head meter only
    - We propose to start with mFRR on the distribution grid at head meter including ToE (CSM) and the OOR and PTR. As mentioned before, the opening of mFRR with submeters on low voltage is linked to the go-live of supply split on LV distribution grid connected points.
    - The proposed timing is beginning of Q1-2026
4. Proof of Concept for ToE CSM for aFRR on LV distribution grid connected points
    - We propose to start with proof of concept setups first, which will be open to all market parties on a non-discriminatory basis, to validate the concept of ToE for aFRR on distribution grid connected points and to gain experience that will be used in the final design and implementation
    - The proposed timing is beginning of Q1-2026
5. CSM for aFRR on LV distribution grid connected points
    - Based on the experiences and lessons learned of the proof of concept setups, a market wide implementation is proposed for Q3-2026
6. CSM for mFRR on LV distribution grid connected points with submeter
    - The proposed timing is beginning of Q1-2027

- The mFRR service will be opened to distribution grid connected clients on submeter basis at the same time, also allowing the Opt-out and Pass-Through Regimes

After each proposed step, the SOs will evaluate complexity, efficiency and contribution to the goal of unlocking flexibility before implementing the next step.

The below table summarises the end goal of the Synergrid ToE Game Plan in 2027.

Product	Grid	Model			
		ToE Central Settlement Model	ToE Corrected Model	Opt-out	Pass-Through
FCR		ToE Not Applicable			
mfRR	*Transmission & local transport*	✓Since 2018	→ Q3-2025	✓Since 2018	✓Since 2020
	HV-MV distribution	✓Since 2018	TBD	✓Since 2018	✓Since 2020
	LV distribution (<= 1 kV)	→ head Q1-2026 → sub Q1-2027	TBD	→ head Q1-2026 → sub Q1-2027	→ head Q1-2026 → sub Q1-2027
aFRR	*Transmission & local transport*	→ Q3-2025	→ Q3-2025	✓Since 2021	✓Since 2021
	HV-MV distribution	→ Q3-2025	TBD	✓Since 2021	✓Since 2021
	LV distribution (<= 1 kV)	→ PoC Q1-2026 → Q3-2026	TBD	✓Since 05/2024	✓Since 05/2024
DA/ID	*Transmission & local transport*	✓Since 2021	TBD	✓Since 2021	✓Since 2021
	HV-MV distribution	✓Since 2021	TBD	✓Since 2021	✓Since 2021
	LV distribution (<= 1 kV)	TBD	TBD	TBD	TBD

Figure 11 : proposed status of the Transfer of Energy framework after the current Game Plan

Other actions

The ToE Game Plan only covers evolutions with regards to explicit flexibility.

In parallel, the System Operators will also work on making other improvements to market design, such as making a supply split solution available on the distribution grids (depending on roadmap validation by the regulators). In a supply split, a different BRP/supplier from the BRP/supplier on the headmeter can be appointed to a delivery point behind a submeter, in which case no ToE would be necessary. After having developed both mechanisms, the need for further development of mechanisms to unlock flexibility will be evaluated.

Future improvements

In 2027, at the end of the execution of the Game Plan and after the parallel implementation of supply split on all voltage levels, the System Operators will evaluate the results of those developments.

If a further need to unlock flexibility is identified, that is not yet unlocked after the extension of ToE CSM on all voltage levels and CM on the Elia grid, and supply split and the use of submetering, additional improvements can be implemented, such as the investigation of the applicability of CM on the remaining voltage levels, ToE DA/ID on the LV distribution grid, or implicit flexibility.

5. Remaining considerations

Having presented the different ToE models under consideration as well as the vision and game plan for implementation of these models for the different products, this section will focus on the considerations that were made on the processes to support ToE to be put in place for the activation of balancing energy, for both the mFRR and aFRR products.

On the choice by the market parties between OOR, PTR, and the ToE models

The FSP (and BRP_{FSP}) and Supplier (and BRP_{source}) choose a model that applies between them by default for all products. This is either the Opt-Out Regime or the ToE Central Settlement Model model. This model will apply to all Grid Users that are in the scope of that FSP-Supplier pair, unless the Grid User makes an explicit different choice:

1. In case the Grid User has an imbalance pass-through contract with its supplier, the Pass-Through Regime applies for that Grid User;
2. In case the Elia Grid User chooses to use the ToE Corrected Model, this model will apply to that Grid User.

In case the Grid User wants to use a different model, this information needs to be transmitted to the SOs in order to make correct calculations, and for the CM (Transmission and Local Transport Grid connected points only) also to the supplier to perform the correction on the invoice for the Grid User in question.

On the metering requirements

When meter data is used for ToE purposes, the meter device should be MID-compliant, as data will be used for settlement.

Regardless of the above, the further requirements and roles & responsibilities for submetering devices or Dedicated Measurement Devices (DMDs) are under discussion within Synergrid and might differ between the Belgian regions. The SOs will make a recommendation towards the regulators, who will make the final decision on the requirements.

On the energy volume granularity

When an activation is completed, the delivered volume (E_{del}) and the requested volume (E_{req}) will be calculated by the SOs. For the mFRR product, all volumes during activation (I.e. excluding ramping) are determined on a 15’ basis. For aFRR, a metering granularity with a 4’’ frequency is required, for activation control purposes. However, as settlement and BRP perimeter correction happens on a 15’ basis, either by resampling the 4’’ data to a 15’ frequency or by baselining the 15’ value on the Delivery Point.

In general, the granularity of the data communicated towards the different market parties (FSP, Supplier, BRPs) depends on the selected model. Data communication granularity and aggregation will be restricted to the minimum needed to support the process per role (e.g. 15’ data for suppliers).

On combining explicit flexibility and energy sharing

When a Grid User chooses to participate in Energy Sharing, then he will not have the possibility to valorize his flexibility via a model with Transfer of Energy for the related delivery point, to avoid confounding these volumes with the ToE volumes and having multiple corrections on the same volume.

On missing or faulty data

If metering data is faulty or missing on a flex volume, no rectification shall be allowed, as a way to incentivize the FSP to ensure correct submetering. Additionally, it is considered that allowing data rectifications will be a very heavy process, leading to costs for both the SOs and market parties. Assuming that the faulty or missing data would have a very limited impact on the calculations, a system for data rectifications will not be implemented at this time. The occurrence of missing or faulty data will be monitored by the SOs.

On supply switches

It's a given that Grid Users, especially those connected to the LV distribution grid, will switch suppliers from time to time. The System Operators acknowledge that this will lead to small errors in activation and invoicing, since there can be a delay between the actual supply switch and the completion of the process in all relevant systems. However, as the impact is considered small (since errors would happen in both directions and level out), and the associated cost of implementing a system to handle rectifications both on the side of the SOs, as well as the suppliers and FSPs, it is not considered a priority to accommodate the impact of supply switches at this time. It should be noted that it's the responsibility of the FSP to not include end points in bids if a supply switch happened, unless they have an agreement with the new supplier. It's up to the FSP to receive the necessary data from its customers to ensure no end points are included in bids for which there is no agreement between the supplier and the FSP.

On BRP perimeter correction and provisional allocations

The BRP Perimeter Correction is effectuated once a month on the monthly allocation. This means that the provisional allocation is not impacted by flex volumes.

On GDPR

An important aspect to consider is customer (data) protection within FSP contracts with residential consumers in context of GDPR, as data will be shared on (the consumption of) private individuals. The FSP as well as the SOs will need to comply with the EU GDPR legislation.

On financial settlement of supplier compensation

Note that the data provided by SOs for settlement will always be on 15' based kWh basis. No financial amounts for settlement between parties will be communicated. It is up to the market parties settling with each other to convert the provided kWh volumes to euros.

On Rebound

As mentioned in the VITO study, there will be rebound effects, i.e. increases or decreases in energy consumption following an activation of balancing energy. However, as mentioned in the study, explicitly accounting for the rebound effect will lead to practical difficulties due to uncertainty of the size and timing of the rebound effect. Therefore, they will not be integrated in the models at this time.

6. Conclusion

In this document, the Belgian public System Operators described their proposal for a Transfer of Energy Framework. Such a Framework is necessary, as a healthy balancing market needs the liquidity brought by independent FSPs. Successful market entry of these independent FSPs is only possible if two issues which follow from flexibility activations by such an independent FSP are resolved: the loss-of-revenue issue for the supplier and the imbalance impact for the BRP of the supplier.

These two issues need to be resolved through a Transfer of Energy Framework. While there is already an existing ToE Framework, as well as two alternative ToE regimes, currently the framework only exists on the local transport and the transmission level, for 2 balancing products on the HV-MV distribution level and not yet on the LV distribution level. A study was commissioned to examine possible correction mechanisms for DSO endpoints, and based on the findings of this study, as well as further impact analysis carried out by the members of Synergrid, the Belgian public System operators propose the following as a transfer of energy framework for balancing products:

- Central settlement model as a standard model, available where relevant across all voltage levels and for all Elia balancing products
- Corrected model available as optional model for Elia Grid Users
- Opt-out and pass-through regimes remain as alternative options

The proposed framework as outlined above, follows the central recommendation articulated by VITO in the commissioned study, that there is a need for a standard correction mechanism that is available by default. The members of Synergrid propose that the Central settlement model serves as this default model, as this model has very limited end user facing complexity, and allows for aggregation per FSP-Supplier pair, meaning that it could be applicable to the needs of the low voltage segment.

Both the Corrected model as well as opt-out and pass-through regimes are also proposed to be available, in an effort to allow maximal contractual freedom for larger grid users and their suppliers/BRPs, so that they can contract a solution that is tailored to their specific needs.

The main proposed changes compared to the currently existing ToE framework is that the Central Settlement Model is extended towards the low voltage segment and will also be available for the aFRR product, and that the corrected model will be optionally available for transport and transmission grid clients.

Should the necessary approvals be obtained, this note also contains the ToE gameplan, which describes how the proposal outlined earlier will be rolled out. Major milestones include the availability of the CSM for aFRR on the transport and transmission grid by the end of 2025, and by the end of 2026 on the distribution grid. For mFRR, CSM will be available on the distribution grid early 2026. The timings are a function of the demand by Market Parties and developments in the market.

This note shows that a robust and functional ToE Framework will be needed for the existence of a healthy balancing market. Such a healthy balancing market with sufficient liquidity is needed in its turn to support the Belgian system operators in facing the challenges posed by the Energy transition. As this document outlines the proposed ToE Framework made by the members of Synergrid, Synergrid will, after public consultation, draft the necessary documents, and call upon regulatory and legislative authorities to take the necessary steps, so that the members of Synergrid can take implementation in a timely manner, supporting a successful energy transition.

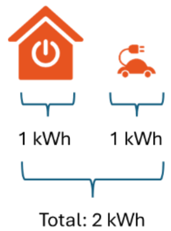
Appendix

The appendix serves to provide more detailed examples for activations of balancing energy for the two ToE models (CM and CSM). Within the appendix, we will have a closer look at all 4 use cases for both models, i.e. increasing or decreasing consumption and increasing or decreasing injection. The attention points for each use case will be highlighted, especially with regards to considerations for Grid Users.

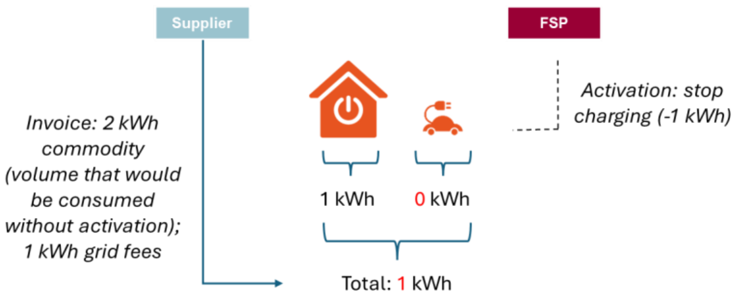
The BRP perimeter correction is not detailed for each use case, since it always happens in the same way across models, as explained earlier in this design note.

Activations of balancing energy in case of CM

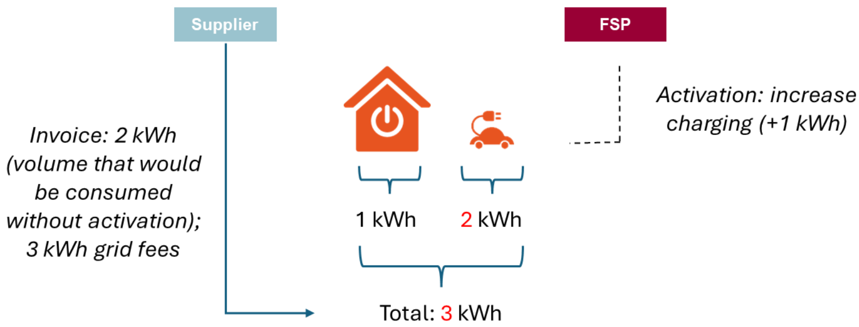
Within the CM, a Grid User that is activated by their FSP will be invoiced for the energy they *would* have consumed had no activation taken place. This is considered to be an attention point, as customers will need to make sure their FSP gives them a flexibility remuneration which at least cover the costs for the Grid User, in addition to a fair flexibility compensation. Below some examples to illustrate. For the first 2 examples, consider a Grid User that would have consumed for a given quarter-hour 2 kWh without activation. Part of this consumption is their EV, the flexible asset, which would be charging and consuming 1 kWh.



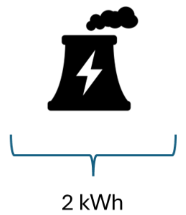
1. Flexibility up (i.e. downward activation of demand): the FSP activates the flexible asset of the Grid User, i.e. the EV, and stops the charging process of the EV. This brings the effective consumption of the Grid User down from 2 kWh to 1 kWh for the quarter-hour in question. However, the supplier will invoice the supply price for the energy based on the corrected metering of 2 kWh. Tariffs and grid fees are calculated based on the actually measured 1 kWh. In this case, the Grid User needs to ensure that the remuneration they receive for their flexibility covers invoiced energy cost for the 1 kWh which was not consumed, in addition to a fair remuneration for their flexibility.



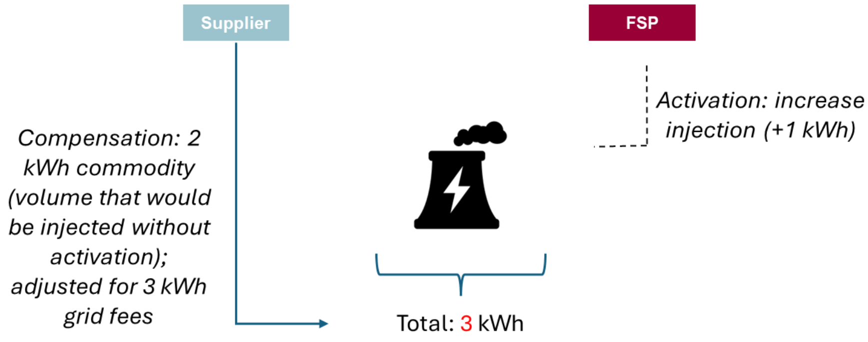
2. Flexibility down (upward activation of demand): the FSP activates the EV of the Grid User, and increases charging from 1 kWh, to 2 kWh which brings the effective consumption up to 3 kWh. The effective (measured) consumption of the Grid User for the given quarter-hour is then 3 kWh, the corrected metering will be 2 kWh. Of this 3 kWh measured, the Grid User will be invoiced for 2 kWh by the supplier at the energy supply price, but will pay tariffs and grid fees on the 3 kWh consumed. In this case, the Grid User will have received 1 kWh of 'free energy' from its supplier, on which they still pay tariffs and grid fees. They will need to make sure that the compensation received from the FSP covers the tariffs and grid fees on this 1 kWh, in addition to a fair compensation for their flexibility. Note that the 'free energy' might constitute a part of this fair compensation.



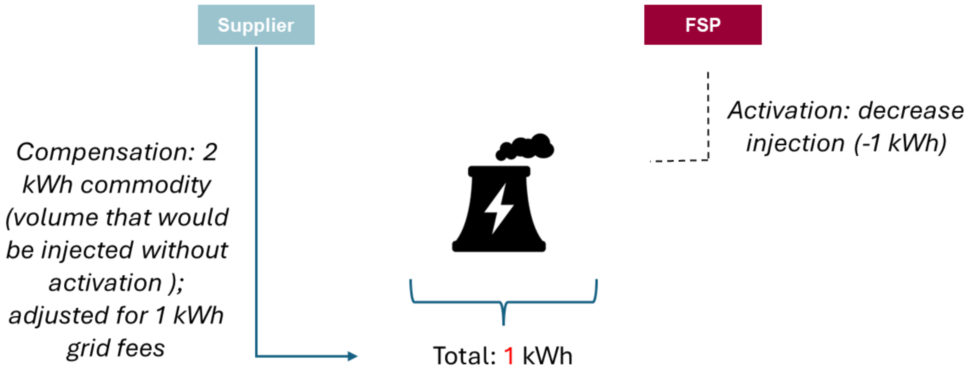
Next, consider a Grid User with injection into the grid. For the following two examples, the Grid User intended to inject 2 kWh into the grid.



3. Flexibility up (i.e. upward activation of injection): the FSP activates the flexible asset of the Grid User, to increase injection. This brings the effective injection of the Grid User up from 2 kWh to 3 kWh for the quarter-hour in question. However, the supplier will remunerate only the originally intended injection of 2 kWh. If applicable, grid fees will be calculated on the actual injection. In this case, the Grid User needs to ensure that the remuneration they receive for their flexibility covers the 1 kWh that was injected, but not covered by the supplier, in addition to a fair remuneration for their flexibility. Note that this situation is similar to the situation of decreased consumption, in the sense that the Grid User needs to be savvy enough to ensure the compensation they receive from their FSP covers the negative impact of their supplier invoicing/compensation energy did they not use/injected extra.

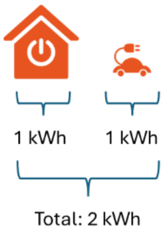


4. Flexibility down (downward activation of injection): the FSP activates the flexible asset of the Grid User, to decrease injection. This brings the effective injection of the Grid User down from 2 kWh to 1 kWh for the quarter-hour in question. However, the supplier will remunerate the originally intended injection of 2 kWh. In this case, the Grid User will be compensated for 1 kWh of energy, which they did not need to inject. If applicable, grid fees are calculated on the actual injection. Depending on the type of asset, this might lead to a cost-saving for the Grid User (e.g. gas turbine) or not (e.g. wind turbine). Note that this cost-saving might constitute a part of the compensation offered by the FSP.

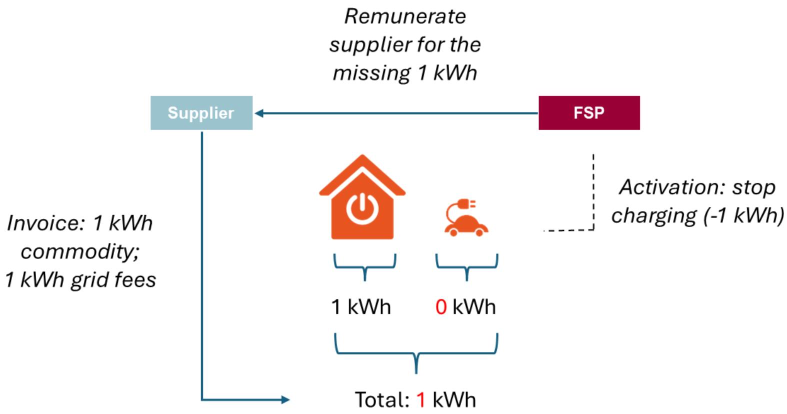


Activations of balancing energy in case of CSM

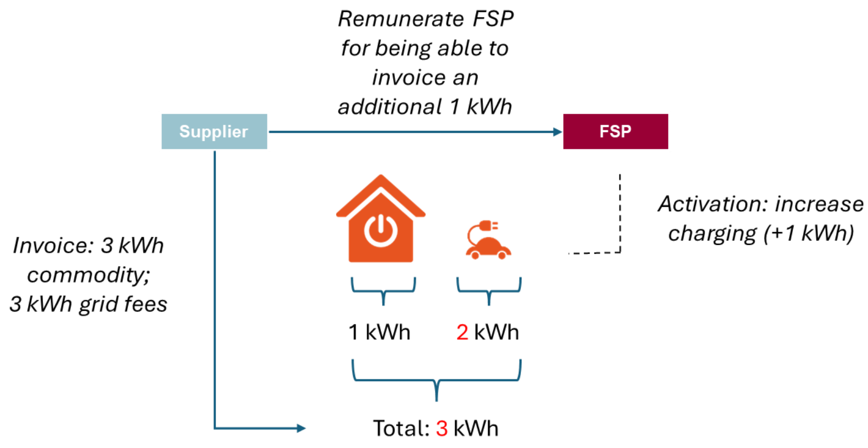
Within the CSM, a Grid User that is activated by their FSP will be invoiced for the energy they actually consume or inject during the activation. The impact on the supplier for the difference in behavior of consumption/injection is settled between the FSP and the supplier, which will in some cases lead to payment from the FSP to the supplier, and vice versa in other cases. Below some examples to illustrate. For the first 2 examples, consider a Grid User that would have consumed for a given quarter-hour 2 kWh without activation. Part of this consumption is their EV, the flexible asset, which would be charging and consuming 1 kWh.



1. Flexibility up (i.e. downward activation of demand): the FSP activates the flexible asset of the Grid User, i.e. the EV, and stops the charging process of the EV. This brings the effective consumption of the Grid User down from 2 kWh to 1 kWh for the quarter-hour in question. The FSP will remunerate the supplier for the 1 kWh they have procured for the Grid User, but which was not consumed by this Grid User. Tariffs and grid fees are calculated based on the actual consumed 1 kWh.

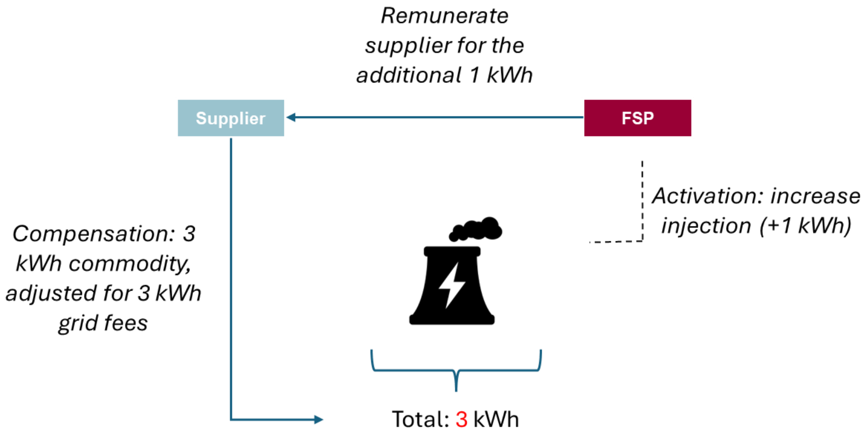


2. Flexibility down (upward activation of demand): the FSP activates the EV of the Grid User, and increases charging from 1 kWh, to 2 kWh. The effective consumption of the Grid User for the given quarter-hour is then 3 kWh. The Grid User will be invoiced for these 3 kWh by their supplier, for both the commodity and the grid fees. The supplier, who can invoice energy they did not need to procure, will have to pay a remuneration to the FSP for this energy (i.e. the inverse of the previous situation), who in turn settles with the Grid User.



Next, consider a Grid User with injection into the grid. For the following two examples, the Grid User intended to inject 2 kWh into the grid.

3. Flexibility up (i.e. upward activation of injection): the FSP activates the flexible asset of the Grid User, to increase injection. This brings the effective injection of the Grid User up from 2 kWh to 3 kWh for the quarter-hour in question. The supplier will remunerate the 3 kWh injected, which was not originally foreseen by the supplier. Therefore, they will receive a remuneration by the FSP. Note that this situation is similar to the situation of decreased consumption, in the sense that it impacts the situation for the supplier.



4. Flexibility down (downward activation of injection): the FSP activates the flexible asset of the Grid User, to decrease injection. This brings the effective injection of the Grid User down

from 2 kWh to 1 kWh for the quarter-hour in question. This means that the Grid User will now be able to supply 1 kWh less, and miss the remuneration for this 1 kWh by their supplier. They will expect this remuneration to be covered by the FSP, which will in turn recuperate it from the supplier, triggering a payment from supplier to FSP. Note that this situation is entirely similar to the upward activation of demand.