

Contribution to the
Swedish Ministry of Infrastructure
on the transposition of the Clean energy package
regarding

Demand response participation through aggregation

from
DR4EU
a pan-European aggregators' coalition

June 2020

Introduction

- This response is provided by DR4EU, a pan-European coalition of companies operating demand response in more than 20 countries in Europe and beyond.



- Within DR4EU, the contact persons most involved in discussions in Sweden and the Nordics are
 - Fuse Box: tarvo@fusebox.ee
 - Sympower: anders.tonhammar.loof@sympower.net
 - Voltalis: pierre.bivas@voltalis.com

Focus

This contribution focuses on the issues regarding demand response aggregation and participation in the markets.

It refers to the EI report (*Ei R2020:02*), particularly its pages 667 and onwards regarding recommended changes to the Swedish law.

For further details, it will also refer to a more recent report published by NordREG (involving EI) with more comprehensive provisions regarding *Nordic Regulatory Framework for Independent Aggregation*.

Background and references

- **SR** stands for the report from EI used as a basis for the consultation by the Swedish ministry.
- **NR** stands for the report from NordREG, *Nordic Regulatory Framework for Independent Aggregation*
- **CEP** / Clean Energy Package
 - **EMD**: directive on electricity market design, (EU) 2019/944
 - **ER**: regulation on electricity markets, (EU) 2019/943
 - Both published on June 14th, 2019 in the OJUE
- **MS** stands for Member State in the EU
- **DRP stands for Demand Response Provider**, i.e. an entity offering demand response in the electricity system
 - Be it for instance by:
 - Bidding in the day ahead energy market; or as a BSP, i.e. providing balancing services to the TSO (e.g. FCR or mFRR)
 - Aggregating load changes triggered among a large number of consumers, then called a DR aggregator
 - An independent aggregator, as seen from the consumer, i.e. not linked to his electricity supplier; or by the supplier who would operate as a DRP, i.e. trigger consumption changes and sell DR as an aggregator would
 - In all cases, DRP commits to deliver (explicit) Demand Response in the exact volumes he sells
 - Hence DRP should be or have a balance responsible party (BRP) as detailed hereafter
- **DR refers to Demand Reduction** in most cases, the main kind of demand response participation, although it could include also demand increase triggered to meet a system or market need

DR in all electricity markets

=> balance responsibility to deliver volumes sold

- DR is to participate alongside producers, with no discrimination, in all electricity markets
 - DR is an alternative to generation, to compete on a level playing field
 - DR should bear the responsibility, same as generation, to deliver volumes sold
- DR is to reduce both generation and consumption
 - When DR is sold in a market, less generation is
 - When DR is delivered, it means consumption is reduced
 - Provided volumes sold = volumes delivered, DR creates no imbalance
- When DR is delivered properly up to sold volumes, no imbalance hence no imbalance charge – exactly like generation
- Failures to deliver DR create imbalances in the system exactly as failures from generation does: they should both be penalised equally
- The legislation proposed by SR does not match this requirement

Balance responsibility of DR aggregator is defined in the CEP: **proposed legislation does not comply**

- The EMD provides for a **clear definition of this balance responsibility** under art.17-3-d, referring to art.5 in the ER, further clarified by its recital 15.
 - Recital 15 clarifies what are ‘the imbalances created in the system’: not vague at all, very precisely limited to the difference between ‘allocated volumes’ and sales (‘final position in the market’)
For an aggregator, as for any market party, balance responsibility is to match sales with ‘allocated volume’.
 - For a generator, allocated volume is the number of MWh of generated as assessed with a meter.
 - For an aggregator, allocated volume is, as per recital 15, the number of MWh of consumption that is curtailed. It is assessed as the difference between a baseline and the remaining actual consumption.
 - The responsibility for the remaining actual consumption should remain with the supplier (and his BRP).
 - **The aggregator should be financially responsible for (and only for) any difference between his allocated volumes, as actually delivered, and his sales;** the aggregator should **not** be responsible for anything else; exactly as a generator is, no discrimination.
- The CEP is thus very clear on the balance responsibility of aggregators, and leaves little room for MS if any. The reason is straightforward: this is critical to ensure that DR contributes to the grid balance, as an alternative to generation, on a level-playing field.
- **The proposed legislation, as explained by the SR, does not comply with the CEP, because it would impose DR aggregators to be responsible for other parties’ imbalances, not their own**

DR should remain independent from supply, not forced to enter into an agreement with the supplier's BRP

- The SR suggests to define standard contracts between the DR aggregator and supplier's BRP: such contract is not needed at all, as per the CEP, **no such obligation should be imposed on DR aggregators.**
- The aggregator should bear his own balance responsibility, as defined by the CEP (see previous pages).
- There is no need to enter in an agreement with the supplier's BRP.
 - The aggregator is responsible for the change he triggers in the load actually consumed by participating consumers, so as to match his sales in the market
 - The supplier is responsible for the actual consumption (the one that remains notwithstanding DR), and should match such sales with purchases in the market
 - Thus responsibilities are clear and separate, no contract is needed
- The EMD sets clearly that DR aggregation should be independent from supply
 - Not only art. 17-3 (a): *'no consent from other market participants'*
 - Also art. 13: *'independently from their supply contract'*
 - Supplier and his BRP are linked (contractually or more)
 - Aggregator should not be forced to enter into an agreement with the supplier's BRP
 - Aggregator should be or choose a BRP of his own, independently from the supplier if he wishes to
- The DR aggregator should bear his own balance responsibility, independent from supply
- The SR proposes to impose a contractual agreement that is not needed, and would infringe the CEP

Balance responsibility of suppliers and possible variations on models

- While the CEP defines precisely how to calculate the balance sheet of aggregator as described *supra*, some flexibility is left to MS, regarding the model to account for DR in the balance sheets of electricity suppliers.
- As clarified by Recital 39 of the EMD, MS may introduce a ‘perimeter correction’, so that two models are possible, whether such correction is used or not, with different impacts on the suppliers’ BRP of participating consumers:
 1. Without ‘correction’, as per existing rules, such supplier will, in case of a DR event, be accounted for a **positive** imbalance, and be paid accordingly by the TSO at positive imbalance price. This is similar to what happens when a supplier is ‘long’ and there is no cost for the BRP, rather a revenue.

Besides, when DR occurs, it is likely that the system would tend to be ‘short’, so that the positive imbalance price is even better than the spot price. Therefore, the BRP is happy and can pass this benefit to the supplier, as they use to do according to their bilateral contract. Hence, with this model, no compensation need be paid to the BRP/supplier. Here, it should be emphasized that a compensation is possible according to the directive only for the suppliers/BRPs that are directly affected by DR activation, and only for the costs they incur during DR activation. With an uncorrected model, there is no such cost, so that suppliers and their BRPs should not receive any ‘compensation’.
 2. With a ‘correction’, the supplier’s BRP is deprived from his positive imbalance, and will not receive the related payment from the TSO(*). Indeed, the ‘correction’ means the TSO will modify the balance sheet of the suppliers’ BRPs, so that the consumption of their customers will be changed and considered as higher than it really is. With such model deviating from reality, the suppliers’ BRPs will be deprived from their positive imbalances, and will not receive the related payment from the TSO. Hence, to be fair, when the TSO will thus ‘correct’ (i.e. modify) the balance sheet of a BRP, the TSO should simultaneously compensate the BRPs for this correction.
- Both models end up being somehow similar: suppliers and their BRPs are fairly treated and happy, as they have been compensated by the TSO, either for their positive imbalance, or for the correction imposed.
- The slight differences are : the first model is simpler, because there is no need to change the current definition of the balance responsibility of suppliers, nor to create new financial flows. However, it may be argued that suppliers/BRPs are overcompensated, at a (high) positive imbalance price, while spot price would be sufficient – hence the second model may be preferred at least when volumes grow.
- The first model should be preferred as long as financial amounts remain small, i.e. as long as DR volumes are relatively small, or as soon as they are evenly spread among consumers (and therefore among suppliers/BRPs).

Further issues raised by the NordREG report (NR)

How to tackle costs and benefits properly among suppliers

The key to open markets to DR:
properly define balance responsibilities + do not create a
barrier with a ‘compensation’ mechanism

*The NR suggests it would not be worth opening all markets to DR, because of two issues considered unsolved, although **the CEP does provide solutions***

- How to properly split the balance responsibilities of supplier and aggregator: yet this is defined by the CEP as described *supra*
- How to tackle the cost for suppliers (‘lost value’ as per the NR):
 - The NR suggests DR aggregators sell energy they should buy, while in fact DR is an alternative to energy, based on avoided consumption, not supply; hence the CEP requires MS to allow participation of DR as an alternative to generation, no discrimination (art.17.1 of EMD)
 - The NR considers costs for suppliers without taking into account the benefits provided by DR to all suppliers (thus ultimately to all consumers): the solution to this issue is covered by art.17.4 on a possible ‘compensation’ to suppliers, if the MS so wishes. Such compensation, if any, should be borne by all market parties, so as not to create a barrier to DR.
 - How to tackle costs and benefits, and how to implement a ‘compensation’ (if any) that complies with the CEP, is described in the next pages

Following the principles set forth by the CEP on these two issues is vital to ensure DR can develop and thus contribute to the energy transition and better use of renewables.

The ‘compensation’ issue (1/2): Acceptable and undue justifications

- According to the EMD, a compensation to suppliers/BRPs may be implemented by MS under strict conditions set forth in art.17-4.
 - In particular, compensation may be paid only to those suppliers or their BRPs which are directly affected by DR, and only up to the cost they incur during DR activation.
 - With a corrected model, it may be argued that the ‘correction’ imposed on the suppliers’ BRPs is a cost for them, thus justifying paying them a compensation based on this correction.
- Hence, in no case does the EMD leave any possibility to justify any compensation:
 - ‘for unmatched positions’ (as the NR puts it) also called ‘balance sheet errors to the electricity retailers’, at least not as long as there is no cost for them, such as with the uncorrected model.
 - ‘related to the ownership of the energy’ as sometimes considered: indeed, there is no basis for such compensation because there is no such energy DR would change the ownership of.
DR is not about selling energy, but avoiding energy (generation and use). This is why the EMD has ruled out any of the old justifications based on the idea that ‘an independent aggregator can be interpreted as selling third-party energy’. Mentioning that ‘a market participant must own the energy that is traded’ is not relevant any more regarding DR, which should be traded as such, as opposed to any such obsolete interpretation.
- The EMD set clear principles to ensure (as clarified by recital 39) that ‘*all customers should have access to electricity markets to trade their flexibility*’, not to re-sell energy: the EMD allows DR to be traded, as such, as an alternative to generation, without any discrimination. For sure, charging a compensation to DR and not to generation would be a radical discrimination so that interpreting DR as if IA would be selling third party energy is now impossible in the EU. (It has also been ruled out in the US, as backed by the Supreme Court, as well as in several countries in Asia).

The ‘compensation’ issue (2/2): How to comply with the EMD

- Should Sweden (and Nordic countries) wish a ‘compensation’ be paid to suppliers, the conditions set forth by the EMD should be carefully met.
 - To achieve this, the key innovation embedded in the EMD is to separate two different issues:
 1. Whether a compensation should be paid to suppliers or their BRPs? This is a possibility left to MS, provided the compensation is limited to those parties *directly* affected and to their *direct* costs during DR activation.
 2. Who should pay the compensation?
 - MS may require any ‘electricity undertaking’ to pay, not only nor even specifically DR aggregators.
 - On the contrary, the EMD imposes that any compensation scheme “shall not create a barrier to market entry” of DR.
 - To share the burden, and ensure it does not create unlawful barriers, the EMD sets forth a simple principle: the net benefit rule.
 - Charging ‘compensation’ costs to DR only would obviously create a barrier to market entry
 - As showed supra, in a corrected model, suppliers/BRPs are likely to claim a compensation for correction at spot price.
 - It would not be possible to justify that the compensation price should be reduced over time due to better forecasting experience: the correction cost does not depend on forecasts, and would remain around spot price(*).
 - The obligation to pay spot price for each volume sold in the wholesale market (at spot price!) is a barrier excluding DR (and a radical discrimination versus generation).
- The only solution left by the EMD for MS who wish to set a ‘compensation’ to their suppliers is to share the burden of this compensation among market parties, and basically not to charge DR, or not only, as described in art.17-4 establishing the net benefit rule.

(*) Besides, it would be **very dangerous** to consider that suppliers should receive a smaller compensation because they will reduce their purchases when they know DR is sold in the market. Indeed, it would mean that: (i) either suppliers buy less DR, so that demand would not be reduced and they need to buy more generation ... otherwise the grid would be disrupted because demand would exceed generation; (2) or suppliers buy less generation, then again they need to buy more DR or the grid would break down, and they will require a higher compensation. Hence in no case is it possible for suppliers to buy less just because they expect DR to occur, precisely because DR occurs insofar as it is bought.

The economics behind the net benefit rule:

how to ensure that DR always benefits all consumers

- As soon as DR is allowed to bid in the wholesale markets, DR will be selected, and sold, only when cheaper than alternative bids, so that:
 - Less generation will be sold: DR bids will be chosen instead
 - Market will settle out lower prices.
- For suppliers, economic consequences are two-fold:
 - Benefits: they will save money from buying cheaper in the market, and this will ultimately benefit consumers.
 - Costs: they will buy DR volumes they cannot bill to consumers (as opposed to MWh-s from generation, which are consumed)
- At this stage, the analysis is simple: as long as benefits are greater than costs, there is no reason DR should pay any compensation to suppliers overall, because this would mean overcompensating them.

Because numbers show that benefits are indeed due to be many times greater than cost (cf various market studies worldwide already), DR should not contribute to any compensation to suppliers – only if ever benefits would in fact not exceed costs.

However, a compensation may be defined *among* suppliers, in order to share benefits and costs evenly *among* all suppliers, and ultimately *among* customers, i.e. all consumers.
- Benefits are spontaneously shared via the market, because all suppliers will buy cheaper thanks to DR.
- Costs may not be evenly spread, and this depends on the market model used for balance sheets.
- Indeed, when DR volumes will be sold in the market and bought by suppliers, these volumes will be accounted for as inputs in their balance sheets, just as any MWh purchased. This will end up creating an ‘accounting imbalance’ for those suppliers with consumers reducing their load, i.e. a positive imbalance (note: it is an accounting imbalance, not a physical imbalance of the grid).
- Should Finland use an ‘uncorrected model’, this positive imbalance will owe them a payment from the TSO, so that BRPs/suppliers are fine without any specific ‘compensation’ for DR.
- Should Finland use a ‘corrected model’, the positive imbalance will be cancelled by the correction, but the BRPs should receive from the TSO a compensation for this correction he would impose them (and no payment by consumers for energy neither used nor generated).
- Ultimately, the TSO will end up charging his costs either (in the uncorrected model) to BRPs, or (in the corrected model) to market parties. And in the end, these will in turn finally transfer these costs to consumers.
- To sum up: DR will benefit suppliers, but in some cases there will be a cost for the TSO. And ultimately both will be transferred to the consumers. Hence DR will ensure a net benefit to all consumers provided benefits are greater than cost. In the event costs would exceed benefits, the EMD allows to charge the difference to DR. Hence **the EMD ensures that DR will always benefit all consumers.**

Practical solutions for a ‘compensation’ mechanism

- DR should be accepted in all electricity markets, including both wholesale day ahead markets, and ancillary services, and the following principles should apply throughout the Nordics
- At first, no new mechanism is needed:
 - Balance responsibility of DRPs is similar to generators’
 - Balance responsibility of suppliers remains unchanged (‘uncorrected model’)
 - No specific calculation or ‘compensation’ is needed
- If and when DR volumes grow and reach a given threshold so that they become significant, say over 3% or 5% of total market volumes (in MWh)
 - Implementation of a corrected model may be considered, without or with a compensation scheme
 - If DR is evenly spread among consumers and suppliers/BRPs, no new mechanism is needed
 - Otherwise, a cost/benefit analysis should be run
 - On the one side, the benefits of DR for all suppliers and consumers should be assessed, confirming the opportunity to let DR grow further
 - On the other side, the cost of implementing a specific compensation scheme should be assessed, and compared to the uneven sharing of net benefits resulting from DR among all suppliers.
 - Then, if appropriate, the compensation mechanism should be implemented with a view to share fairly the net benefits induced by DR among all suppliers, hence all consumers
 - These benefits should be assessed regularly, e.g. yearly, to confirm DR remains beneficial to all consumers

Appendix

Key provisions on DR from the CEP

*Article 17***Demand response through aggregation**

1. Member States shall allow and foster participation of demand response through aggregation. Member States shall allow final customers, including those offering demand response through aggregation, to participate alongside producers in a non-discriminatory manner in all electricity markets.
2. Member States shall ensure that transmission system operators and distribution system operators, when procuring ancillary services, treat market participants engaged in the aggregation of demand response in a non-discriminatory manner alongside producers on the basis of their technical capabilities.
3. Member States shall ensure that their relevant regulatory framework contains at least the following elements:
 - (a) the right for each market participant engaged in aggregation, including independent aggregators, to enter electricity markets without the consent of other market participants;
 - (b) non-discriminatory and transparent rules that clearly assign roles and responsibilities to all electricity undertakings and customers;
 - (c) non-discriminatory and transparent rules and procedures for the exchange of data between market participants engaged in aggregation and other electricity undertakings that ensure easy access to data on equal and non-discriminatory terms while fully protecting commercially sensitive information and customers' personal data;
 - (d) an obligation on market participants engaged in aggregation to be financially responsible for the imbalances that they cause in the electricity system; to that extent they shall be balance responsible parties or shall delegate their balancing responsibility in accordance with Article 5 of Regulation (EU) 2019/943;
 - (e) provision for final customers who have a contract with independent aggregators not to be subject to undue payments, penalties or other undue contractual restrictions by their suppliers;
 - (f) a conflict resolution mechanism between market participants engaged in aggregation and other market participants, including responsibility for imbalances.

4. Member States may require electricity undertakings or participating final customers to pay financial compensation to other market participants or to the market participants' balance responsible parties, if those market participants or balance responsible parties are directly affected by demand response activation. Such financial compensation shall not create a barrier to market entry for market participants engaged in aggregation or a barrier to flexibility. In such cases, the financial compensation shall be strictly limited to covering the resulting costs incurred by the suppliers of participating customers or the suppliers' balance responsible parties during the activation of demand response. The method for calculating compensation may take account of the benefits brought about by the independent aggregators to other market participants and, where it does so, the aggregators or participating customers may be required to contribute to such compensation but only where and to the extent that the benefits to all suppliers, customers and their balance responsible parties do not exceed the direct costs incurred. The calculation method shall be subject to approval by the regulatory authority or by another competent national authority.

5. Member States shall ensure that regulatory authorities or, where their national legal system so requires, transmission system operators and distribution system operators, acting in close cooperation with market participants and final customers, establish the technical requirements for participation of demand response in all electricity markets on the basis of the technical characteristics of those markets and the capabilities of demand response. Such requirements shall cover participation involving aggregated loads.

Recital 39 in the Directive

- (39) All customer groups (industrial, commercial and households) should have access to the electricity markets to trade their flexibility and self-generated electricity. Customers should be allowed to make full use of the advantages of aggregation of production and supply over larger regions and benefit from cross-border competition. Market participants engaged in aggregation are likely to play an important role as intermediaries between customer groups and the market. Member States should be free to choose the appropriate implementation model and approach to governance for independent aggregation while respecting the general principles set out in this Directive. Such a model or approach could include choosing market-based or regulatory principles which provide solutions to comply with this Directive, such as models where imbalances are settled or where perimeter corrections are introduced. The chosen model should contain transparent and fair rules to allow independent aggregators to fulfil their roles as intermediaries and to ensure that the final customer adequately benefits from their activities. Products should be defined on all electricity markets, including ancillary services and capacity markets, so as to encourage the participation of demand response.

Recital 15 in the Regulation

- (15) Title V of Regulation (EU) 2017/2195 established that the general objective of imbalance settlement is to ensure that balance responsible parties keep their own balance or help restore the system balance in an efficient way and to provide incentives to market participants for keeping or helping to restore the system balance. To make balancing markets and the overall energy system fit for the integration of the increasing share of variable renewable energy, imbalance prices should reflect the real-time value of energy. All market participants should be financially responsible for the imbalances they cause in the system, representing the difference between the allocated volume and the final position in the market. For demand response aggregators, the allocated volume consists of the volume of energy physically activated by the participating customers' load, based on a defined measurement and baseline methodology.

Article 13 in the Directive: Aggregation contract

1. Member States shall ensure that all customers are free to purchase and sell electricity services, including aggregation, other than supply, independently from their electricity supply contract and from an electricity undertaking of their choice.