

SLOVENIA

Public consultation from on
demand response participation through aggregation

Contribution from

DR4EU

a pan-European aggregators' coalition

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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, whether as aggregators (independent or not) and/or solution providers to/with various partners.



Within DR4EU, the contact persons most involved in the discussion regarding Slovenia are

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Focus

This contribution focuses on the following issues described in the Consultation Document (CD):

- DR participation in electricity markets
- Measurement and verification
- Balance responsibility of aggregators
- Balance responsibility of suppliers and models
- Compensation paid to suppliers (if any)
- Undertakings to pay for the compensation and net benefit
- Detailed Q&A as per the consultation document

➤ **After an overview on DR participation in the markets, responses are provided in blue**

Background and references

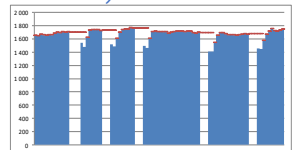
- **CD** stands for consultation document, i.e. the memo published by Slovenian Authorities
- **CEP / Clean Energy Package**
 - **EMD**: directive on electricity market design, (EU) 2019/944
 - **ER**: regulation on electricity markets, (EU) 2019/943
 - Both published on June 14th, 2019 in the OJUE
- **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 as sold
 - 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

General principle: DR in all markets as an alternative to generation

- MS to allow and foster participation of DR in all markets without discrimination versus generation
- Indeed, **DR is an alternative to generation**: DR does not use electricity from generators, DR provides an alternative offered in the wholesale market and delivered by reducing consumption
 - Reducing consumption is a way not to need generation
 - Generation is avoided because DR is sold in the market instead
 - The more DR sold, the less generation
 - Selling DR is not selling energy from generators, it is an alternative
 - As highlighted by its Recital 39, the EMD is about trading flexibility, i.e. change in consumption, not trading energy generated.
- **Note: there is no such thing as "transfer of energy" as suggested by the CD.**
DR takes place after being sold instead of energy, hence energy is not generated and does not exist; energy that does not exist cannot be transferred and this cannot be the justification for any compensation; only costs may be (see *infra*).
- DR should be accepted in all markets
 - DR allowed to bid in day ahead and any wholesale electricity market (EMD 17-1) and also for ancillary services (EMD 17-2)
 - DR should “*participate alongside producers in a non-discriminatory manner*” as stated in the EMD
 - DR should be paid the same market price
 - Level playing field with generators (including similar balancing responsibility, see *infra*)

Measurement and verification: data and methodologies used must be, in any case, adapted to the kind of DR delivered

- Key principle is set in the CEP
 - DR volumes sold need be delivered, so as to ensure grid balance
 - Hence DRPs (be they independent aggregator or not) should be or have a BRP, responsible for any difference between sales and ‘allocated volume’ as clarified by recital 15 of the ER
 - For a DRP, the ‘allocated volume’ is the difference between a baseline and the actual consumption, and its calculation should be ‘**based on a defined measurement and baseline methodology**’
- How to establish such methodologies
 - Baseline methodology should be proposed by DRP in order to be adapted to the kind of DR operations and processes involved. Methodology should be approved by NRA, calculations performed by DRP, and verified by neutral third party
 - Measurement must also be adapted to DR various kinds of operations, consumers and services/markets. Hence it should be based on appropriate submetering by DRP, and verified by neutral third party
 - All under supervision and scrutiny by NRA
 - All defined, regarding ancillary services, in accordance with TSO needs (and not tailormade for generation assets)
- Examples
 - Residential and small C&I consumers
 - Better than smart meters: demand control and monitoring in real time provides appropriate, accurate and reliable data
 - Real-time individually determined baseline has proved effective: on each site, the baseline during short curtailment periods is defined as power measured just before ; such individual baselines are added to form the overall baseline, for all sites curtailed in turn, at aggregated level
 - Industrial consumers
 - Submeters are all the more useful for large consumer sites, and may be installed by aggregators
 - Historical or forecast-based baseline methodologies, or simple pre-curtailment reference, all may be used, provided they prove be reliable according to the kind of DR operated.



Balance responsibility of DRP/aggregators is clearly defined by CEP, similar to generators'

- DR is an alternative to traditional generation, because avoiding to consume makes it possible (and necessary) not to generate. Hence both DR and generation should bear the same balance responsibility
 - After generation is sold, it need be delivered to match consumption. If it fails to deliver the volumes sold, the missing difference will result in a grid physical imbalance. To avoid this, generator need to be or have a balance responsible party, i.e. an entity who will be financially responsible to pay on the basis of the undelivered volumes, called a 'negative imbalance'. This principle is set in article 5 of the ER and already in place EU-wide.
 - The same responsibility should be borne by DR. Indeed, after DR is sold, it need be delivered too, i.e. consumption should be reduced by the volume sold. Should there be a difference, it will result in a grid physical imbalance, exactly as generators. So that the DRP should bear similar balance responsibility: to deliver volumes sold.
- **The EMD provides for a clear definition of the balance responsibility of a DR aggregator** as stated under art.17-3-d, referring to art.5 in the ER, further clarified by its recital 15.
 - Balance responsibility of any market party is to match sales with 'allocated volume'.
 - For a generator, allocated volume is the number of MWh of production as assessed by a meter.
 - For an aggregator, allocated volume is, as per recital 15, the number of MWh of consumption that is avoided. It is assessed as the difference between a baseline (see *infra*) 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.
- The CEP is very clear on the balance responsibility of aggregators, and leaves little room for MS if any, because this is critical to ensure that DR contributes to the grid balance, as an alternative to generation, on a level-playing field.
 - **We agree with the CD that only some 'models' comply with the CEP regarding the balance responsibility of suppliers (cf *infra*).** For instance, **the 'split model' does not comply with the CEP, because it would impose DR and supply be linked**
 - Sharing individual access point would mean that the aggregator would substitute the supplier for a given part of the consumption, e.g. an e-vehicle charging. It would make it mandatory that the aggregator need become a supplier for such part.
 - This would not solve the real issue to balance the grid, hence to match DR sales with actual demand reduction (i.e. the volumes of consumption curtailed, not the remaining volumes)
 - This "split-supply" would not comply with art.13 of the EMD whereby the consumer should be free to choose any aggregator *'independently from their electricity supply contract'*. Hence it need to be possible to operate DR on loads without supplying electricity.

Balance responsibility of suppliers and possible variation 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 slightly 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 imbalance, 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 BRP 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 uncorrected 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 corrected model may be preferred at least when volumes grow.
- The uncorrected 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).

The ‘compensation’ issue (1 / 2): Acceptable *versus* 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 the 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 a transfer of energy (ToE)’ as considered by the CD: indeed, there is no basis for such compensation because there is no such energy: it is not generated, and therefore it cannot be transferred. 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 a ‘transfer of energy’ is not relevant any longer regarding DR, which should be traded as such, and not as a by product, as per 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 Slovenia 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 ensure it does not create unlawful barriers, hence to share the burden, 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 at spot price for correction volume.
 - 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, i.e. basically :**
 - TSO to charge all suppliers because all benefit from reduced sourcing costs thanks to DR (hence pro rata their market share)
 - not to charge DR, or only in exceptional circumstances, as described in art.17-4 establishing the net benefit rule.

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 at 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, DR results in a net benefit for suppliers overall, so that there is no reason DR should pay any compensation to suppliers, 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 rare cases, 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* their 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 Slovenia 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 Slovenia use a ‘corrected model’, the positive imbalance will be cancelled by the correction, so 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, together with benefits- hence the net benefits.
- 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 costs. 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 consistently throughout all markets
- 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

Q&A: #8&9 Model dobave [Model for supply]

8. Kako naj se omogočijo uporabniku vse pravice do izbire in sklepanja pogodb, ki so zahtevane z zakonodajo EU (npr. pravica sklenitve več odprtih pogodb z dobavitelji/agregatorji na istem priključku)?

☐ Z implementacijo modela "split-supply";

☐ Z drugo ustrezno rešitvijo (prosimo, pojasnite predlog rešitve):

8. How should the user be given all the rights to choose and conclude contracts required by EU law (eg the right to conclude several open contracts with suppliers / aggregators on the same connection)?

☐ With the implementation of the "split-supply" model;

☐ With another appropriate solution (please explain the proposed solution):

9. Ne glede na prejšnji odgovor, kakšno je vaše mnenje glede modela »split-supply«? Navedite prednosti, slabosti, pomisleke, predloge.

9. Regardless of the previous answer, what is your opinion on the split-supply model? State the strengths, weaknesses, concerns, suggestions.

The 'split-supply' is not a solution as per EU legislation.

- It does not allow an independent aggregator to operate DR (i.e. an aggregator that does not supply electricity to the consumer). Therefore it does not comply with art17-3 (a) of the EMD.
- it does not ensure that DR and supply contracts are independent. Therefore it does not comply either with art 13-1, whereby consumers should be able to conclude a DR contract "*independently from their electricity supply contract*".

The appropriate solution derives from a clear balance responsibility for each kind of actor, as per recital 15 of the ER

- ✓ DR aggregator is responsible for matching his sales with the change he triggers in participating consumers' load, calculated as the difference between a baseline and the actual consumption. This '*allocated volume*' is used to calculate his imbalance by comparing it to his '*final position in the market*' (i.e. net sales). Thus his responsibility is clear.
- ✓ Supplier is responsible for the remainder, i.e. the actual consumption (corrected or not, cf infra the discussion on suppliers' models). The supplier should simply match this consumption volume with his purchases in the market.
- So they have very different responsibilities, clearly separate, even if involving same consumers.
- This is not related to any 'split-supply' model, that would in fact bind DR and supply, and infringe the EMD.

Q&A: #10 & 11 (1/2)

Model neodvisnega agregatorja [Independent aggregator model]

10. Za spodnje modele neodvisnega agregatorja (IA) prosimo navedite, kako vi vidite prednosti, slabosti ter postopek izvajanja v praksi:

10. For the following models of the independent aggregator (IA), please indicate how you see the advantages, disadvantages and the implementation process in practice:
MODEL ADVANTAGES WEAKNESSES IMPLEMENTATION IN PRACTICE

Existing / Intervention-free model/Corrective/Compensatory

MODEL	PREDNOSTI	SLABOSTI	IZVAJANJE V PRAKSI
Obstoječi			
Model brez posegov			
Korekcijski			
Kompenzacijski			

11. Kateri model agregatorja je po vašem mnenju najustrežnejši za Slovenijo? Prosimo, utemeljite.

☐Obstoječi; ☐Model brez posegov; ☐Korekcijski; ☐Kompenzacijski; ☐“Split-supply” (akter mora integrirati vlogi dobavitelja in agregatorja); ☐Drugi – navedite:

11. In your opinion, which aggregator model is the most suitable for Slovenia? Please justify. ☐Existing; ☐GovModel without interventions; ☐Correctional; ☐Compensatory; ☐“Split-supply” (the actor must integrate the roles of supplier and aggregator); ☐Other - specify:

The CEP does not leave much space, if any, for MS to define their model regarding the balance responsibility of aggregators, as was described supra, due to article 17-3 (d) of the EMD combined with recital 15 of the ER.

The CEP leaves more flexibility for MS to choose models for the balance responsibility of suppliers (cf EMD recital 39).

- MS may choose an ‘uncorrected model’, whereby, when DR occurs, the supplier of participating consumers will have a *positive* imbalance, so that he will be paid by the settlement entity (say the TSO).
- MS are also allowed to use a ‘corrected model’, whereby the ‘perimeter’ of the supplier is ‘corrected’, by adding the curtailed consumption (=DR volume) to the actual consumption of his customers. Then the supplier is deprived of his positive imbalance and related revenue, and he should be entitled to receive a compensation for this correction by the settlement entity (say the TSO).
- In both cases, MS may choose (as per art.17-4) to implement a compensation payment mechanism, so that market parties contribute to pay the TSO (who, in turn, pays the supplier or participating consumers). However, this should not create a barrier to DR. Therefore, the burden must be shared. As per the net benefit rule set forth in art.17-4, the solution is to share the burden among all suppliers because they all benefit from DR reducing their sourcing costs, so they should bear costs pro rata their market shares, so as to share net benefits. DR shall be charged only when and to the extent that costs would exceed benefits.

(to be continued on next page)

Q&A: #10 & 11 (2/2)

Model neodvisnega agregatorja [Independent aggregator model]

In practice

- Slovenia could open all markets based on a model without correction nor compensation mechanism, because this is the simplest approach.
- If and when DR volumes grow, then a corrected model could be implemented. However this is more complex, so that it is not necessary to start with. The correction should entitle the supplier to receive a compensation for this correction from the TSO, at spot price.
- Besides, when DR volumes grow, the TSO may be allowed to charge a compensation to all suppliers, pro rata their market shares, so that the TSO can pay the impacted suppliers, be it:
 - In an uncorrected model: for their positive imbalance
 - In a corrected model: TSO pays suppliers a compensation for the correction.

Such cost sharing mechanism ensures that costs are fairly shared among suppliers, who all benefit from reduced sourcing costs in the market, pro rata their market share.

However, such compensation and cost sharing mechanism will not be necessary if DR develops among all consumers, so that DR volumes are evenly shared among suppliers, therefore suppliers would automatically share both benefits and costs in a fair way, so that DR will ultimately ensure net benefits to all consumers. If DR is not evenly spread among suppliers, then the cost sharing mechanism should be implemented. Besides, this mechanism ensures all suppliers who want to become aggregators can operate DR from their customers on a level playing field with independent aggregators.

- Finally, as DR volumes grow, benefits of DR (as defined by art.17-4) should be regularly assessed and published. If ever benefits would not exceed price of DR, then DR may also be charged to offset the difference, so that, in any case, DR will always provide net benefits to all suppliers, and all consumers.

Q&A: #12 Učinek »odboja« ["Bounce" effect]

12. Kakšno je vaše mnenje glede učinka odboja (MM kompenzira aktivacijo v drugem časovnem obdobju)? Če menite, da je pomemben, kako bi ga sistemsko uredili?
Prost odgovor:

12. What is your opinion about the effect of reflection (MM – measuring point / consumer compensates for activation in the second time period)? If you think it is important, how would you arrange it systematically? Free answer:

Depending on the kind of DR and how it is operated, load may be reduced or only (partially) shifted to a later period. However, the impact on suppliers is really small, because during this rebound, the shifted load will be paid by consumers, and suppliers will learn how to forecast this when volumes grow, so that there is basically no impact on imbalances then that would not be foreseen as consumption usually is.

Accordingly, it should be emphasized that rebound cannot be included in the calculation of the compensation mechanism set forth in art.17-4, which relates only to costs incurred by suppliers **during the activation of demand response.**

Q&A: #13&14 Kompenzacija [Compensation]

13. Ne glede na vaše mnenje glede kompenzacijskega modela: kako naj bi po vašem mnenju uredili vprašanje kompenzacije, upoštevajoč določbo 17(4) Direktive 2019/944, oziroma kdo bi moral nositi stroške?

☐ Po regulirani ceni, a izključno med DOB in NA;

☐ Po regulirani ceni, vendar bi bili lahko zajeti tudi drugi subjekti – pojasnite:

13. Irrespective of your opinion on the compensation model: how do you think the issue of compensation should be regulated, taking into account the provision 17 (4) of Directive 2019/944, or who should bear the costs?

☐ At a regulated price, but exclusively between DOB (supplier) and NA (independent aggregator);

☐ At a regulated price, but other entities could also be covered - explain:

14. Ali imate predlog, kako bi določili model take kompenzacijske cene? Prost odgovor:

14. Do you have a proposal on how to determine the model of such a compensatory price? Free answer:

The key principle to implement any compensation mechanism is to decide in two steps :

- Who should receive what
- Who should pay

According to art.17-4, MS may ensure a compensation is paid by various market parties to the suppliers impacted by DR.

However, this should not create a barrier to DR nor aggregators, so that the cost should be shared, not charged to DR. The calculation methodology set forth under the net benefit rule ensures that DR is charged only if and to the extent it would benefit suppliers less than it would cost them.

The costs that can be taken into account and compensated are limited in the article to direct costs incurred during the activation of DR.

Rather than a regulated price, the spot price could be used, i.e. the price in the day ahead wholesale market for this period, or some kind of average, provided the formula to calculate this average would be justified and published. This average could reflect the cost of DR for suppliers, which is the cost of buying DR volumes which are not generated electricity, hence not consumed nor billed to consumers.

Q&A: #15&16

Metodologija »baseline« ["Baseline" methodology]

15. Kateri kriteriji morajo biti upoštevani pri definiranju metodologije za določitev »baseline« (možnih je več odgovorov):

- ☐ Natančnost;
- ☐ Preprostost;
- ☐ Celovitost;

☐ Drugo – prosimo opredelite in utemeljite:

15. What criteria must be taken into account when defining the methodology for determining the "baseline" (several answers are possible):

- ☐ Accuracy; ☐ Simplicity; ☐ Integrity; ☐ Other - please specify and justify:

https://library.cee1.org/sites/default/files/library/10774/CEE_EvalDRBaseline_2011.pdf

The key criteria to select any baseline methodology is to make it reliable and predictable during operations, so that the DR aggregator can ensure in real time he meets his commitments and delivers the exact volume.

For instance, an aggregator should be allowed to use data from his own meters or submeters, if he wishes to, in order to deliver DR volumes with maximum accuracy and reliability.

Conversely, imposing to use data from TSO&DSO meters that would not be available in real time may result in poor accuracy.

16. Od česa naj bo odvisna določitev metodologije "baseline"?

- ☐ Od produkta prožnosti;
- ☐ Od modela agregatorja;
- ☐ Od produkta prožnosti in modela agregatorja;
- ☐ Od produkta prožnosti, načina aktivacije in modela agregatorja;
- ☐ Obstajati mora ena sama metodologija "baseline";
- ☐ Drugo – navedite:

16. What should the determination of the baseline methodology depend on? ☐ From the product of flexibility; ☐ From the aggregator model; ☐ From the flexibility product and the aggregator model; ☐ From the product of flexibility, the method of activation and the model of the aggregator; ☐ There must be a single "baseline" methodology; ☐ Other - specify:

The baseline methodology should depend on the kind of DR delivered: i.e. the kind of product, and also of loads and consumers. For instance, for residential consumers, and small commercial, a real-time individually determined baseline is appropriate, i.e. considering that each site would have remained using the same power if it had not been briefly curtailed.

No single baseline should be enforced. Any baseline methodology should be proposed by the aggregator and authorised by the NRA (or by the settlement entity, under supervision of the NRA).

Q&A: #17 & 18

Metodologija »baseline« ["Baseline" methodology]

17. Na katerih ravneh naj bodo določeni kriteriji za določitev metodologije "baseline"? Utemeljite svojo izbiro (zakaj menite, da je določena ureditev potrebna oziroma ni potrebna).

☒ Izključno na ravni agregiranega portfelja MM, ostalo je dogovorno;

☐ Na ravni agregiranega portfelja MM in posameznih MM;

☐ Kriterijev ni treba določiti, "baseline" naj se definira dogovorno;

☐ Drugo – navedite:

17. At what levels should the criteria for determining the baseline methodology be set? Justify your choice (why do you think a certain arrangement is necessary or not necessary).

☐ Exclusively at the level of the aggregated MM portfolio, the rest is agreed;

☐ At the level of the aggregate portfolio of MM and individual MM;

☐ The criteria do not need to be defined, the "baseline" should be defined by agreement;

☐ Other - specify:

The baseline may be determined using individual metering data and/or forecasts, but it should be used (and assessed as reliable and accurate or not) only at aggregated level.

18. Kako naj se metodologija regulira oziroma kontrolira?

☐ To ni potrebno oziroma pomembno;

☐ Metodologijo (enotno) izda oziroma potrdi regulator;

☒ Metodologije (več možnih) potrdi regulator;

☐ Sama metodologija ni pomembna, pomembni so končni rezultati (pravilnost napovedi); Komentar (izbirno):

18. How should the methodology be regulated or controlled?

☐ This is not necessary or important;

☐ Methodology (uniformly) is issued or approved by the regulator;

☐ Methodologies (several possible) are approved by the regulator;

☐ The methodology itself is not important, the final results are important (correctness of the forecast); Comment (optional)

Any baseline methodology should be proposed by an aggregator and approved by the NRA (or, under the supervision of the NRA, by the settlement entity as per published rules approved by the NRA).

Q&A: #19 & 20

Metodologija »baseline« ["Baseline" methodology]

19. Med zaključki dela Rossetto, N. je mogoče zaslediti naslednja priporočila za določitev »baseline« na podlagi izkušenj iz ZDA:

- a) Za energijske produkte je smiselno uporabiti oceno na podlagi zgodovine odjema v dnevih, ki jim neposredno sledi aktivacija.
- b) Nasprotno, pa je za sistemske storitve na podlagi aktivnega odjema bolje pogledati razliko med odjemom neposredno pred aktivacijo in odjemom neposredno po aktivaciji.
- c) Za produkte povezane z zmogljivostjo, se »baseline« lahko določi iz največje stopnje odjema zabeležene v predhodnem letu s strani ponudnika storitve, ki se pojavi istočasno kot največji odjem celotnega elektroenergetskega sistema.

Nadalje, priporočila glede določitve »baseline« je podal tudi USEF in sicer na ravni posameznih produktov in modelov.

Kakšno je vaše mnenje glede podanih predlogov in posameznih sklopov produktov/ storitev?

- Rossetto, N. (2018), 'Measuring the intangible: an overview of the methodologies for calculating customer baseline load in PJM', FSR Policy Brief 2018/05 (<http://hdl.handle.net/1814/54744>)
- <https://www.usef.energy/app/uploads/2017/09/Recommended-practices-for-DR-market-design-2.pdf> (Poglavje 6.2)

19. In the conclusions of N. Rossetto's work, the following recommendations for a 'baseline' can be made, based on experience in the United States:

- a) For energy products, it makes sense to use an estimate based on the history of consumption in the days immediately followed by activation.
- b) Conversely, for active consumption-based ancillary services, it is better to look at the difference between consumption immediately before activation and consumption immediately after activation.
- c) For capacity-related products, the "baseline" can be determined from the maximum consumption rate recorded in the previous year by the service provider, which occurs at the same time as the maximum consumption of the entire electricity system.

Furthermore, recommendations on the definition of "baseline" were also given by USEF at the level of individual products and models.

What is your opinion about the given proposals and individual sets of products / services? Free answer:

Unfortunately, the American study did not take into consideration the EU market design and products, so that it cannot be used.

The USEF report was an early analysis, and most of it does not comply with the CEP any more. Besides, it failed to encompass residential sector properly. And it was inspired mainly by utilities with little experience if any in DR participation.

Our recommendations are based on a wide experience in various countries (and comply with the CEP). For instance, after several years using data from T&DSO meters, France recently moved to using submetering data provided the aggregator, to improve accuracy and reliability.

20. Ali morda na podlagi vseh informacij lahko opredelite najustreznejše metodologije za določitev »baseline« (na ravni produktov/ modelov ali splošno)? Prosimo vključite utemeljitve. Prost odgovor:

20. Based on all the information, can you perhaps identify the most appropriate methodologies for determining the "baseline" (at product / model level or in general)? Please include a justification. Free answer:

Baseline methodology depends on the kind of DR operated (market/product, flexibility resources, operation mode).

Rules should define how an aggregator can propose an appropriate methodology, how this will be assessed (criteria and required efficacy) and approved.

Q&A: #21-25

Vzpostavitev registra prožnosti [Establishment of a flexibility register]

21. Register prožnosti se kaže kot učinkovita rešitev pri izvajanju storitev prožnosti na integriranih ali povezanih trgih in intenzivni koordinaciji OPS, ODS in OT.

a. Ali menite, da je vzpostavitev Registra prožnosti potrebna oziroma smiselna za učinkovito izvajanje procesov trgovanja s prožnostjo?

☐ DA;

☒ NE;

☐ Ne vem;

Komentar (izbirno):

12. Flexibility register seems like a usefull solution for flexibility management on integrated markets and intensive coordination among TSO, DSO and Market Operator.

a) Do you think establishment of flexibility register is needed for efficient flexibility trading:

☐ Yes; ☐ No; ☐ I don't know;

Comment:

Q&A: #26 & 27

Vzpostavitev registra prožnosti [Establishment of a flexibility register]

26. Kako naj bi po vašem mnenju potekalo obveščanje glede storitev prožnosti? Razmislite tako o vzpostavitvi storitve na posameznem MM kot tudi o izvajanju storitev (»aktivacije prožnosti«).

Prost odgovor:

26. How do you think communication on flexibility services should take place? Consider both setting up a service on an individual MM as well as performing services ("flexibility activation").

Free answer: Only realized DR curtailment at portfolio level (aggregated, not at MM).

27. Če ste, ali boste predvidoma v prihodnje v vlogi agregatorja – kaj menite glede možnosti posredovanja naslednjih podatkov?

27. If so, are you expected to act as an aggregator in the future - what do you think about the possibility of providing the following information?

DATA FEASIBILITY COMMENTARY

Daily - activations at the level of MM

☐ YES;
☐ NO;
☐ PARTIALLY;

Daily - realizations at the level of MM

☐ YES;
☐ NO;
☐ PARTIALLY;

Daily - activations aggregated by AGE

☐ YES;
☐ NO;
☐ PARTIALLY;

Daily - realizations aggregated by AGE

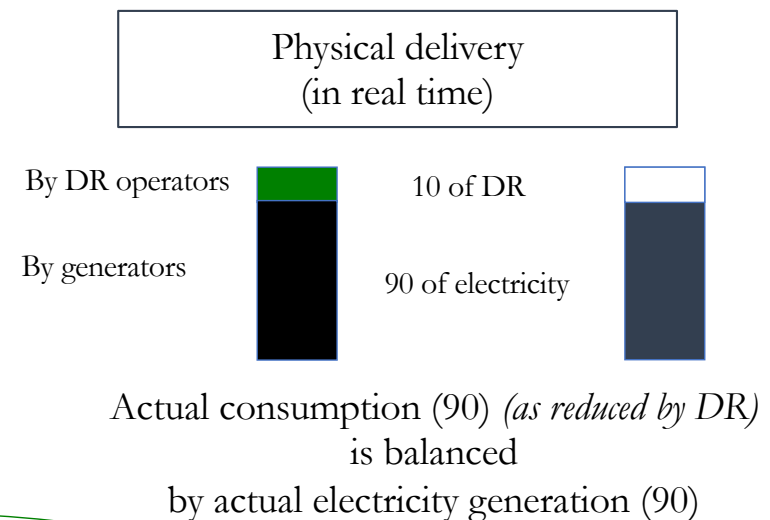
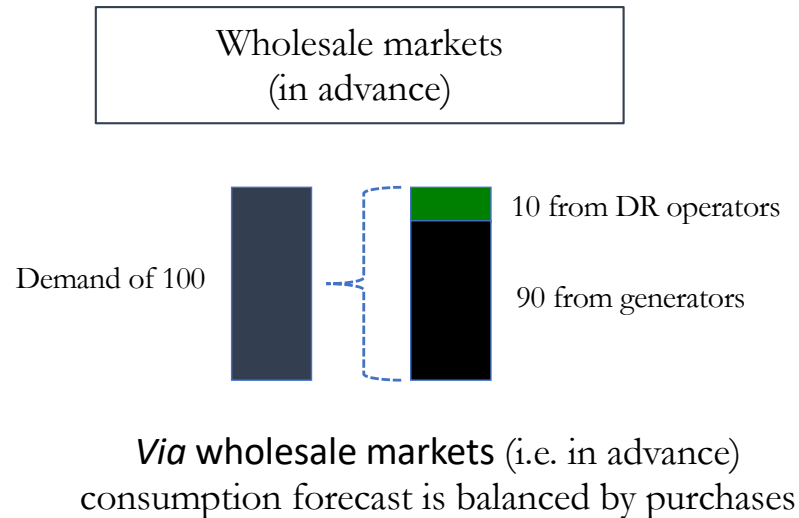
☐ YES;
☐ NO;
☐ PARTIALLY;

PODATKI	IZVEDLJIVOST	KOMENTAR
Dnevno – aktivacije na nivoju MM	<input type="checkbox"/> DA; <input checked="" type="checkbox"/> NE; <input type="checkbox"/> DELNO;	
Dnevno – realizacije na nivoju MM	<input type="checkbox"/> DA; <input checked="" type="checkbox"/> NE; <input type="checkbox"/> DELNO;	
Dnevno – aktivacije agregirano po DOB	<input type="checkbox"/> DA; <input checked="" type="checkbox"/> NE; <input type="checkbox"/> DELNO;	
Dnevno – realizacije agregirano po DOB	<input checked="" type="checkbox"/> DA; <input type="checkbox"/> NE; <input type="checkbox"/> DELNO;	The information should be made available: - by the aggregator to the settlement entity at aggregated level (and details only when compliance check needed). - to other market parties, only at nationally-aggregated level (not per aggregator), and only if several aggregators operate (so as to protect commercially sensitive information)

Appendix 1

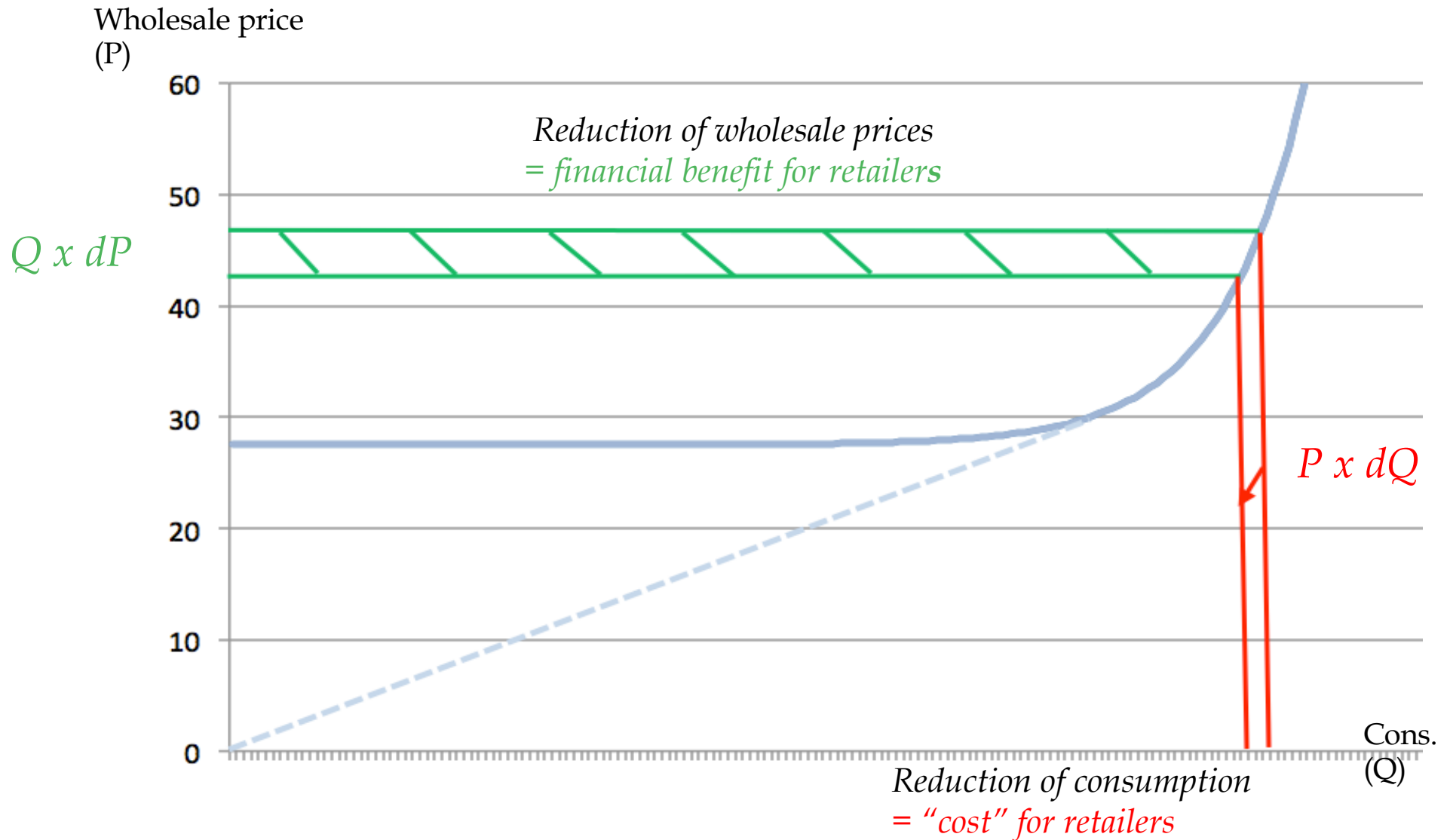
Diagrams describing
DR participation in all markets
and the net benefit principle

DR in the wholesale markets



- DR ensures energy is neither generated nor consumed, in two steps
 - DR avoids generation via the market
 - DR reduces consumption physically
- DR ensures balance *instead of* generation
 - DR avoids expensive generation

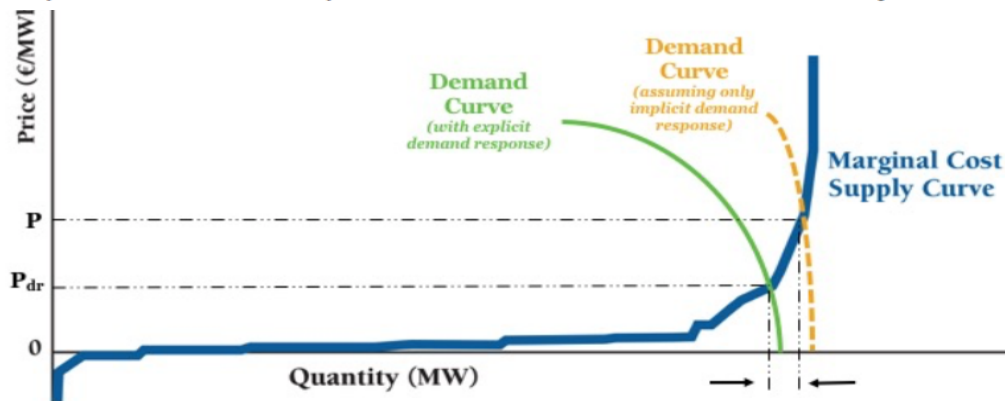
Selling DR on Energy Markets to Avoid High Prices



DR in European electricity markets

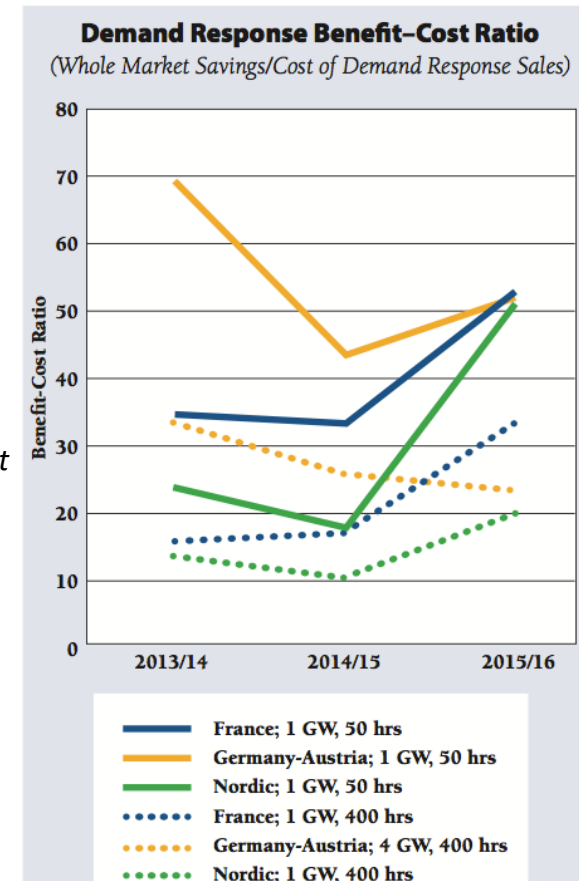
Benefit / Cost Ratio >> 10

Explicit Demand Response Reduces Wholesale Electricity Prices



Source: The Regulatory Assistance Project

	Market	Year	Average decrease in spot price on application of DR (€/MWh)	Whole market retailer benefit [M€]	Compensation payment to retailers (based on French compensation model) [M€]	DR sales [M€]	Retailer market benefit/ (Cost = DR sales)
400b/1GW	FRA	2013/14	13.01	379.27	28.06	24.68	15.37
		2014/15	11.81	344.57	27.93	20.77	16.59
		2015/16	18.99	515.54	21.42	15.72	32.80
	GER-AUT	2013/14	20	635.83	24.44	19.13	33.24
		2014/15	13.83	458.89	22.66	17.9	25.64
		2015/16	11.29	355.13	18.4	15.58	22.79
	NORDIC	2013/14	7.71	186.32	19.69	14.26	13.07
		2014/15	5.49	135.12	18.08	13.47	10.03
		2015/16	10.21	272.75	14.75	13.98	19.51



Benefits from market-based DR: reduce sourcing costs for retailers

450 GWh/mkt = 1.6 G€/y
benefits for retailers

Benefits at the heart of the new market design

Consumers' voice paved the way



ELECTRICITY AGGREGATORS:

STARTING OFF ON THE RIGHT FOOT WITH CONSUMERS

- Consumers should not bear the cost of payments/compensation between suppliers and independent aggregators. If the need for such payments is verified, these should be financed by all market participants benefiting due to the trade of flexibility in the wholesale market.

➤ Compromise found in new Directive (EMD)

- Member States may implement a compensation paid to retailers of curtailed consumers
- Clear distinction between compensation *to* suppliers versus who pays it
- Compensation should not be a barrier to DR => share among various parties
- How to share taking account of benefits
 - compensation paid by those who benefit directly, i.e. all retailers
 - ... also by DR subject to the **net benefit principle**

Only when and to the extent that benefits to retailers would not exceed costs for retailers

=> Net benefit for all retailers, to be ultimately transferred to all consumers

Demand response for balancing: same compensation mechanism (if any)

Before balancing

Purchase of
100 or 90
By retailers from
generators



Generators
Deliver 90



Consumers
would tend to
use 100

*Involving demand-side flexibility
reduces drastically
the cost of reliability for all*

Need for balancing by the TSO

Balancing costs to be paid by BRP of failing party ("short")
(whether retailers having purchased only 90,
or generators having sold 100 but generated only 90)

TSO Balances with DR

Delivery

Consumption (real)

By DR operators



10 of DR (activated by TSO)

By generators

90 of electricity



**Beware of the trick of a
partial description**

MWh

Sell electricity
surplus to
TSO ??

*DR would capture an excess
of electricity?? No*

Not enough electricity: when
DR is called for balancing, it's
because system is « short »

Remember:

*All the energy generated is consumed and
paid to retailers*

*BRP rules ensure compensation among
retailers for their exchanges*

- DR ensures balance (90=90)
- Retailers sell all the electricity generated (90)
- Retailers sell less than if TSO had called additional generation for balancing (10+90=100)
- "Cost" for retailers = forgone retail revenues
- **Such cost may be compensated to retailers, by TSO; then TSO shares the cost among market parties according to the same rule as for day ahead market**

Appendix 2

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.