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# Participation of Demand Response in the Balancing Market

## Metering & Settlement

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**αδμηε**

ΑΝΕΞΑΡΤΗΤΟΣ  
ΔΙΑΧΕΙΡΙΣΤΗΣ ΜΕΤΑΦΟΡΑΣ  
ΗΛΕΚΤΡΙΚΗΣ ΕΝΕΡΓΕΙΑΣ

# 1. Metering Section

# Representation Table of Demand Response Portfolio's Meters

Reference Date	BSP name	BSP EIC	Portfolio name	Customer name	Consumption Location	Voltage Level	Metering point
Ημερομηνία Αναφοράς	Επωνυμία Παρόχου Υπηρεσιών Εξισορρόπησης στον οποίο ανήκει το Χαρτοφυλάκιο Κατανεμόμενου Φορτίου	Κωδικός EIC Παρόχου Υπηρεσιών Εξισορρόπησης στον οποίο ανήκει το Χαρτοφυλάκιο Κατανεμόμενου Φορτίου	Ονομασία Χαρτοφυλακίου Κατανεμόμενου Φορτίου όπως καταχωρείται στα συστήματα του ΑΔΜΗΕ	Επωνυμία πελάτη Χαρτοφυλακίου Κατανεμόμενου Φορτίου	Θέση κατανάλωσης πελάτη Χαρτοφυλακίου Κατανεμόμενου Φορτίου	Επίπεδο Τάσης Σύνδεσης πελάτη Χαρτοφυλακίου Κατανεμόμενου Φορτίου	Κωδικός Αριθμός Μετρητή/ Παροχής εγκατάστασης που ανήκει στον συγκεκριμένο πελάτη του Χαρτοφυλακίου Κατανεμόμενου Φορτίου

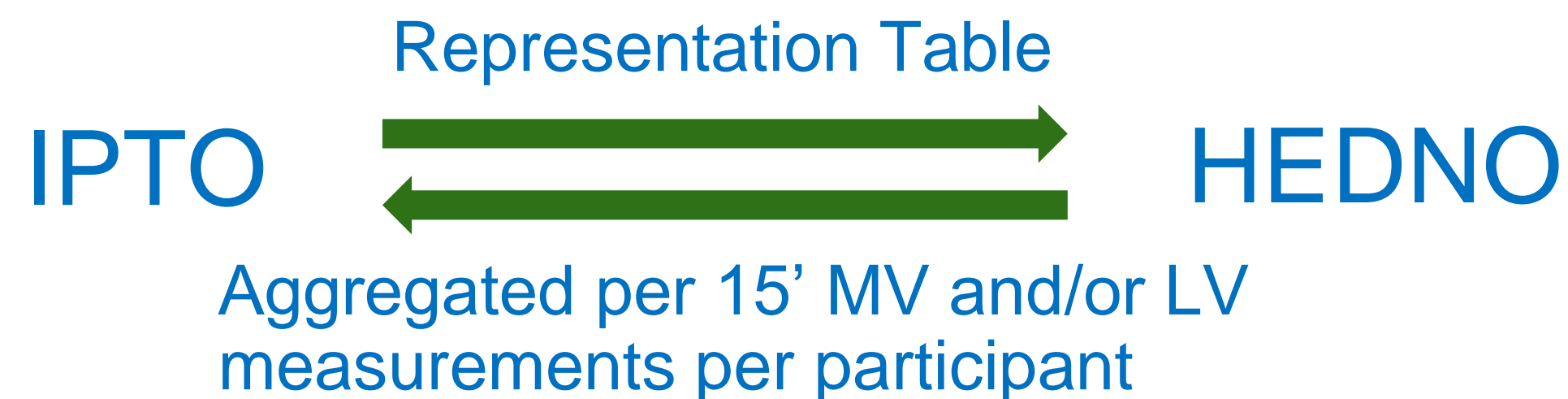
→ Submitted by DR Aggregator in electronic format (xls, csv) in order to be inserted to the Meter Data Management System

# Composition of Demand Response Portfolio's Measurements

Notice → A DR Portfolio can comprise Loads of any Voltage Type



1. HV Loads' measurements are provided by IPTO Metering
2. MV and LV Loads' measurements are provided by HEDNO:



# Files provided through the Metering Platform

For each DR Aggregator the following types of files will be available through the Metering Platform:

1. Validated meter data per 15' for each HV Consumer installation that is represented by the DR Aggregator.
2. Aggregated energy data per 15' for all Voltage Levels.
3. Standing data (Name, Location, Meter identification) for every installation represented by the DR Aggregator.

## 2. Settlement Section

# Introduction

Settlement of Balancing Market consists of the calculation and remuneration of the following:

1. Balancing Capacity
2. Balancing Energy
3. Imbalances
4. Uplifts' accounts
5. Non-Compliance Charges

# 1. Balancing Capacity (1)

For each Balancing Service Entity and for each Imbalance Settlement Period, the upward and downward Balancing Capacity supplied for FCR, automatic FRR and manual FRR shall be calculated taking into account:

- a) The segments of the individual steps of the Balancing Capacity Offer that have been validated on the basis of the last ISP execution, whose solution timeframe shall include that specific Imbalance Settlement Period.
- b) the availability in MW of the Balancing Service Entity for the provision of the service in real time.
- c) the percentage of a time period within an Imbalance Settlement Period when the Balancing Service Entity was available for the provision of Balancing Capacity in real time.



# 1. Balancing Capacity (2)

$$mFRRQ_{e,t}^{up} = \sum_s \sum_{as} (mFRRQ_{e,as,t}^{up}) \times T_{e,t}^{mFRR,up}$$

$$mFRRC_{e,t}^{up} = \frac{1}{4} \times \sum_s \sum_{as} (mFRRQ_{e,as,t}^{up} \times OP_{e,s,t}^{mFRR,up}) \times T_{e,t}^{mFRR,up}$$

$$T_{e,t}^{mFRR,up} = \mathbf{100\%}$$

$T_{e,t}^{mFRR,up}$  The percentage of a time period within an Imbalance Settlement Period,  $t$ , when a Balancing Service Entity,  $e$ , was available for the provision of upward manual FRR in real time

## 2. Balancing Energy (1)

The activated energy for each Imbalance Settlement Period shall be calculated separately for the manual FRR and for purposes other than balancing.

- The upward activated Balancing Energy for manual FRR  $ABE_{e,t}^{mFRR,up}$  or for purposes other than balancing  $AOE_{e,t}^{mFRR,up}$  of a Dispatchable Load Portfolio, is the reduction in energy consumption corresponding to the Adjusted Dispatch Instruction for manual FRR or for purposes other than balancing in relation to their respective Market Schedules
- The downward activated Balancing Energy for manual FRR  $ABE_{e,t}^{mFRR,dn}$  or for purposes other than balancing  $AOE_{e,t}^{mFRR,dn}$  of a Dispatchable Load Portfolio, is the increase in energy consumption corresponding to the Adjusted Dispatch Instruction for manual FRR in relation to their respective Market Schedules

## 2. Balancing Energy (2)

The Instructed Energy of a Balancing Service Entity  $e$  for an Imbalance Settlement Period  $t$  is

$$INST_{e,t} = MS_{e,t} + ABE_{e,t}^{mFRR,up} + ABE_{e,t}^{mFRR,dn} + AOE_{e,t}^{mFRR,up} + AOE_{e,t}^{mFRR,dn}$$

For the Dispatchable Load Portfolios, the upward activated energy ( $ABE_{e,t}^{mFRR,up}$ ,  $AOE_{e,t}^{mFRR,up}$ ) has a negative sign while the downward activated energy ( $ABE_{e,t}^{mFRR,dn}$ ,  $AOE_{e,t}^{mFRR,dn}$ ) has a positive sign.

**For Dispatchable Load Portfolios with the exception of pumping and for Imbalance Settlement Periods for which balancing energy is provided, the Market Schedule shall be considered equal to their Baseline  $MS_{e,t} = BL_{e,t}$**

### Balancing Energy debits and credits

$$ABEC_{e,t}^{mFRR,up} = ABE_{e,t}^{mFRR,up} \times BEP_{z,t}^{up}$$

$$ABEC_{e,t}^{mFRR,dn} = ABE_{e,t}^{mFRR,dn} \times BEP_{z,t}^{dn}$$

### 3. Imbalances

The Imbalance of a Dispatchable Load Portfolio  $e$  for an Imbalance Settlement Period  $t$  shall be equal to the difference between the quantity of energy that results on the basis of the Entity's certified measurement data  $MQ_{e,t}$  and the Entity's Market Schedule  $MS_{e,t}$  as given below:

$$IMB_{e,t} = MS_{e,t} - MQ_{e,t}$$

The Imbalances adjustment of a Dispatchable Load Portfolio  $e$  that provides Balancing Energy for manual FRR or energy for purposes other than balancing for an Imbalance Settlement Period  $t$  is given in the following function:

$$IMBADJ_{e,t} = INST_{e,t} - MS_{e,t}$$

The Final Imbalance of a Dispatchable Load Portfolio  $e$  that was not operating under AGC for an Imbalance Settlement Period  $t$  shall be equal to the Imbalance plus the Imbalances adjustment as given below:

$$FIMB_{e,t} = IMB_{e,t} + IMBADJ_{e,t} \xrightarrow{\text{Imbalance amount in } \text{€}} IMBC_{e,t} = FIMB_{e,t} \times IP_t$$

**For Dispatchable Load Portfolios with the exception of pumping and for Imbalance Settlement Periods for which balancing energy is provided, the Market Schedule shall be considered equal to their Baseline  $MS_{e,t} = BL_{e,t}$**

# Important remarks for Balancing Energy and Imbalances

- DR portfolios' offers are included in the determination of the Balancing Energy Price based on the Activated Balancing Energy that they are awarded.
- There is no Adjusted Dispatch Instruction for DR portfolios calculated according to the reference matrix of the "Activated Balancing Energy Calculation Methodology".
- Activated mFRR balancing energy for pumping is calculated in relation to its Market Schedule, while for DR portfolios it is determined in relation to its Baseline.
- DR portfolios under prequalification testing are assumed for settlement purposes to be in Commissioning Operation, so they are remunerated for their imbalances and not for Balancing Energy.

## 4. Uplifts' Accounts

The remunerated capacity and the credits or debits for Activated Balancing Energy and Imbalances of DR portfolios are included in the UPLIFT2 and UPLIFT3 Accounts respectively.

# 5. Non-Compliance Charges

## Demand response specificities

Article 97. Consequences of significant deviation from the Registered Characteristics

*NCAP*: the dispatchable capacity of Dispatchable Load Portfolios

Article 98. Consequences of non-compliance with manual FRR Test Instructions

for upward manual FRR  $TDIDEVe,t = |TDINSTE,t| - (ble,t - MQe,t)$

for downward manual FRR  $TDIDEVe,t = |TDINSTE,t| - (MQe,t - ble,t)$

Article 99. Consequences of significant deviation from the Dispatch Instructions

*NCAP*: the dispatchable capacity of Dispatchable Load Portfolios

Article 100. Consequences of significant systematic demand imbalances

Imbalance Settlement Periods during which a Dispatch Instruction was issued for Balancing

Energy supply from a Dispatchable Load Portfolio shall be excluded from the calculation

Thank you for your attention

For more information:

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