ARERA
Autorità di Regolazione per Energia Reti e Ambiente

Ancillary services from distribution networks

Final workshop of the project SmartNet – 16 May 2019

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Introduction

The current electricity system is characterized by a growing penetration of non-programmable renewable and distributed generation and, at the same time, by the reduction of large-scale programmable thermoelectric plants (those that have historically provided resources for ancillary services).

The Italian Regulator is defining new rules concerning dispatching, as well as promoting new grid infrastructures,

in order to optimize the ***integration of renewable energy sources****,*
taking advantage of their potential
but at the same time
ensuring an ***adequate security level*** *of the national electricity system.*

Revision of dispatching rules

- General revision of dispatching rules taking into account the new context and the consequent need for new flexibility in the system.

- Ensure that the market and TSO can exploit the potential of unpredictable renewable power plants and distributed generation (for example enabling them to join the ancillary services market, above all for the reduction of load).

- Evaluate the best solution regarding the evolution of the distribution network, and the role of DSOs.

This would allow the integration and the further spread of non-programmable RES & DG, guaranteeing the security of the electrical system.

Possible reduction or lesser increase of the cost of dispatching due to the presence of RES

Three different dispatching models

In 2013 Italian Authority started a public debate to discuss different future dispatching models to be implemented in order to supply flexibility resources even from distributed generation. For this purpose, the following models were presented:

- **Centralized Dispatching Extended (Model 1)**. It's centralized and under the responsibility of Terna; the user is responsible for the submission of tenders in the ancillary service market - MSD (directly or through a trader).

- **Dispatching Local DSO (Model 2).** It's carried out locally by the distributor who is responsible to Terna of the tenders on MSD by purchasing capacity through a local market in which distributed generation can participate (directly or through a trader).

- **Profile of exchange AT / MT Scheduled (Model 3)**. It's carried out centrally by Terna involving the units connected to the National Transmission Grid, while the distributor has the responsibility to ensure that, in real time, energy exchange with the main grid respects what has been planned.

MSD opening - 1

The resolution 300/2017/R/eel published by the Italian Authority refers to a transient regulation, based on Model 1, aimed at testing the procurement methods, from non programmable RES, distributed generation and demand, of resources only for global services.

1. Enabling to MSD

- Voluntary enabling to MSD for production units and consumption units which are not obliged (units different from thermal and hydro plants > 10 MVA).
- TSO (Terna) defines the criteria for the voluntary certification (in terms, for example, of minimum size, minimum duration of supply of a given dispatching resource dispatching, etc.) and the verification procedures, through test trials.

MSD opening - 2

- Enabling to MSD must be based on technological neutrality in order to allow the widest possible participation of production and/or consumption units, but also storage systems, in full consistency with the EU regulation (balancing guidelines) in favor of competition.

- The authorization can be obtained for the supply of even one service (and not necessarily for all the services now provided for large, high-programmable plants). BSPs must be allowed to declare themselves available to provide an "asymmetrical" service or to provide only for an increase (or decrease) of their input (or withdrawal) profile. Thus participation on MSD can be as flexible as possible, taking into account the technical characteristics of the production and consumption units.

MSD opening - 3

2. Aggregation

- The wider the geographical basis on which the aggregation is allowed, the more favoured the participation of users to the market is; it will be easier for the dispatching users bringing together a plurality of users able to respond to dispatching orders ensuring high reliability margins.
- BUT aggregation cannot neglect the real constraints of the network, otherwise it would be useless or even harmful for the system. In fact, from Terna's point of view, the UVA is the equivalent of a single user that provides ancillary services: so, any movement performed to provide those services must not generate new problems deriving from network constraints.
- In pilot projects, production units > 10 MVA cannot be aggregated: they can be enabled to MSD individually only; non relevant production units and consumption units can be aggregated in enabled virtual unit - UVA (Terna defines the optimal geographical dimension). In this case, BSP is really an aggregator and may be different from BRP.

MSD opening - 4

3. Services and remuneration

- In pilot projects, it is possible to submit bids on MSD for congestion resolution, tertiary reserve and balancing.
- The remuneration, in € for each MWh actually moved, derives from MSD (pay as bid).
- Only in the case of aggregations, a remuneration in capacity (between 15,000 and 30,000 €/MW/year), limited to the testing phase, is recognized to the BSPs who submit upward balancing offers for at least 2 to 4 consecutive hours in the range between 2:00 pm and 8:00 pm every day from Monday to Friday.

MSD opening - 5

4. Role of the DSO

- At the moment, DSOs can only report preliminarily the presence of critical issues on their networks to the interested BSPs and to TSO, in order to take these aspects into proper account to define the geographic scope of the UVA. So, at the moment, DSOs haven't an active role.
- In the expected final scheme, DSO will play a more active role, participating to the next review of the dispatching reform.

MSD opening - 6

5. Communication

- Communication between TSO and BSPs has been defined by TSO.
- It is in the responsibility of the BSPs the communication with the individual production or consumption units that they manage, with minimum requirements that will be defined at least for production units.
- For example, a device, the so-called "plant controller", is going to be installed close to the production plants connected to LV and MV distribution networks. This device should be able to receive signals from the BSP (aggregator), translating them into indications to the production plant, according to strategies shared between the producer and the corresponding BSP.

Dispatching innovation

In a future with more distributed generation and RES plants, but poor in terms of flexibility by large-scale programmable plants:

- will it be necessary to review the technical conditions for qualification to provide ancillary services (guaranteeing technological neutrality) so that they do not contain barriers for some technologies?
- does the actual dispatching model (Model 1) need to be revised in order to better utilize the potential of widespread resources?
- will it be necessary to define modalities and economic conditions with which the DSO acquires resources for local services (today it only serves in a few contexts, since the distribution networks have been designed in *fit and forget* mode)? How?
- how will the role of the DSO evolve?
- how will the cooperation between TSO and DSO evolve?

Future role for DSOs

The first experiments carried out within the SmartNet pilot project can be very useful for future regulatory developments.

Probably, in Italy, Model 1 continues to be the preferable one.

However, even continuing to apply Model 1, the role of DSOs must evolve and must be reviewed in terms of:

- **facilitator in the procurement of resources for global services**
- **purchaser of resources for local services (when and where needed).**

Thanks for your attention