# DSOs' role and flexibility needs

**Paul de Wit, EU DSO Entity (Alliander)**

ENTSO-E Stakeholder Webinar:
2030 Market Design to enhance distributed flexibility

*November 12th 2021*

# The EU DSO Entity

## What is the EU DSO Entity?

**1**

**An EU Association legally mandated by the EU Regulation 2019/943**

**2**

**A body of cooperation between all DSO in the EU**

**> 900 DSOs connecting 260 million customers in the EU**

**3**

**An expert Entity**

Providing relevant expertise on:

- DSO – TSO cooperation
- Network Codes & Guidelines
- Facilitating demand side flexibility and users access to market
- Facilitating integration of RES
- Digitalising the DSO systems
- Data management/cybersecurity

**OTHER BENEFITS**

4. Reflecting the new role of DSOs
5. Facilitating DSO/TSO cooperation
6. Creating a forum of expertise
7. Rationalizing the establishment of the European common interest for DSOs

# Power system flexibility is key to a successful energy transition

Increasing volumes of Distributed Energy Resources directly connected to distribution systems: a potential for the whole system flexibility

**01**

- EU Objective to cut GhG emissions by at least 55% by 2030 compared with 1990 levels.
- It implies to reach a share of more than 80% of electricity production from renewable energy sources by 2050

**FROM FOSSIL TO RENEWABLE**

**02**

**FROM A CENTRALISED TO A DECENTRALIZED SYSTEM**

All DSOs are responsible for connecting more than 90% of customers and ever-growing number of local renewable generators.

**03**

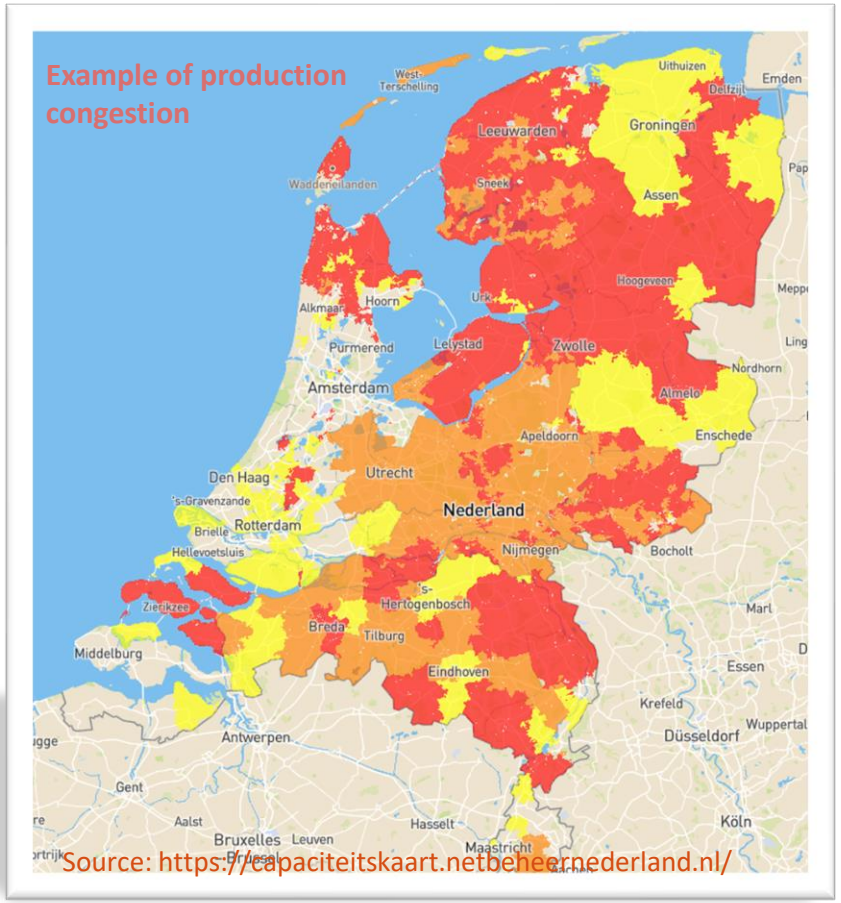
The use smart grid technologies and new solutions are expected to drastically change the distribution of electricity, calling for a more active role from DSOs in managing the distribution system, incorporating demand, as well as decentralised generation.

**FROM ANALOG TO DIGITAL**

# DSOs face an increased number of distribution congestion in their grids

The incorporation of a significantly higher share of highly volatile RES alongside new loads such as electric vehicles or heat pumps, introduces new challenges to the design and operation of the distribution system. DSOs are facing increased challenges in adapting the distribution network to this new reality, with the main one being the occurrence of grid constraints / distribution congestion.

*"In the Netherlands, many new congested areas are due to solar and wind farms."*



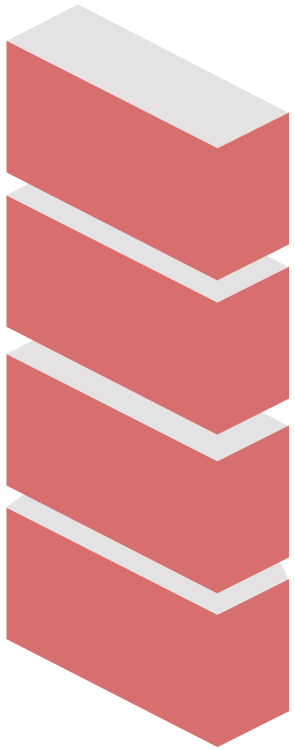

Legenda:
Red: no new prod. connection possible.
Orange: under investigation.
Yellow: possibly congestion in the near future.

# Changing and enhanced role of DSOs

**CORE TASKS**

- Plan, build and optimise the grid
- Connect new customers
- Operate the grid
- Provide system stability via services

**NEW CORE TASKS PER THE CLEAN ENERGY PACKAGE**



- Plan & connect public EV charging infrastructure
- Integrate local storage facilities
- Unlock flexibility
- Smart-metering & data management

As neutral market facilitators, DSOs are undertaking new tasks aiming at unleashing the potential of flexibility into the grid

# Flexibility needs for DSOs

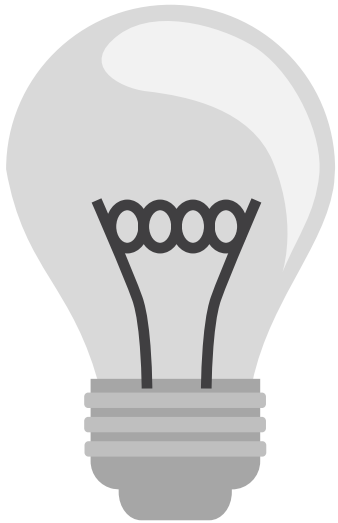
## What is flexibility ?

Modification of generation injection and/or consumption patterns, on an individual or aggregated level, often in reaction to an external signal, in order to provide a service within the energy system or maintain stable grid operation.

## For which purpose(s)?

- To solve congestions.
- Avoid power quality problems (inter alia: voltage problems).
- Serve as an alternative to network reinforcement when it is more cost-efficient than traditional reinforcement of the network.

... via short or longer-term agreements.



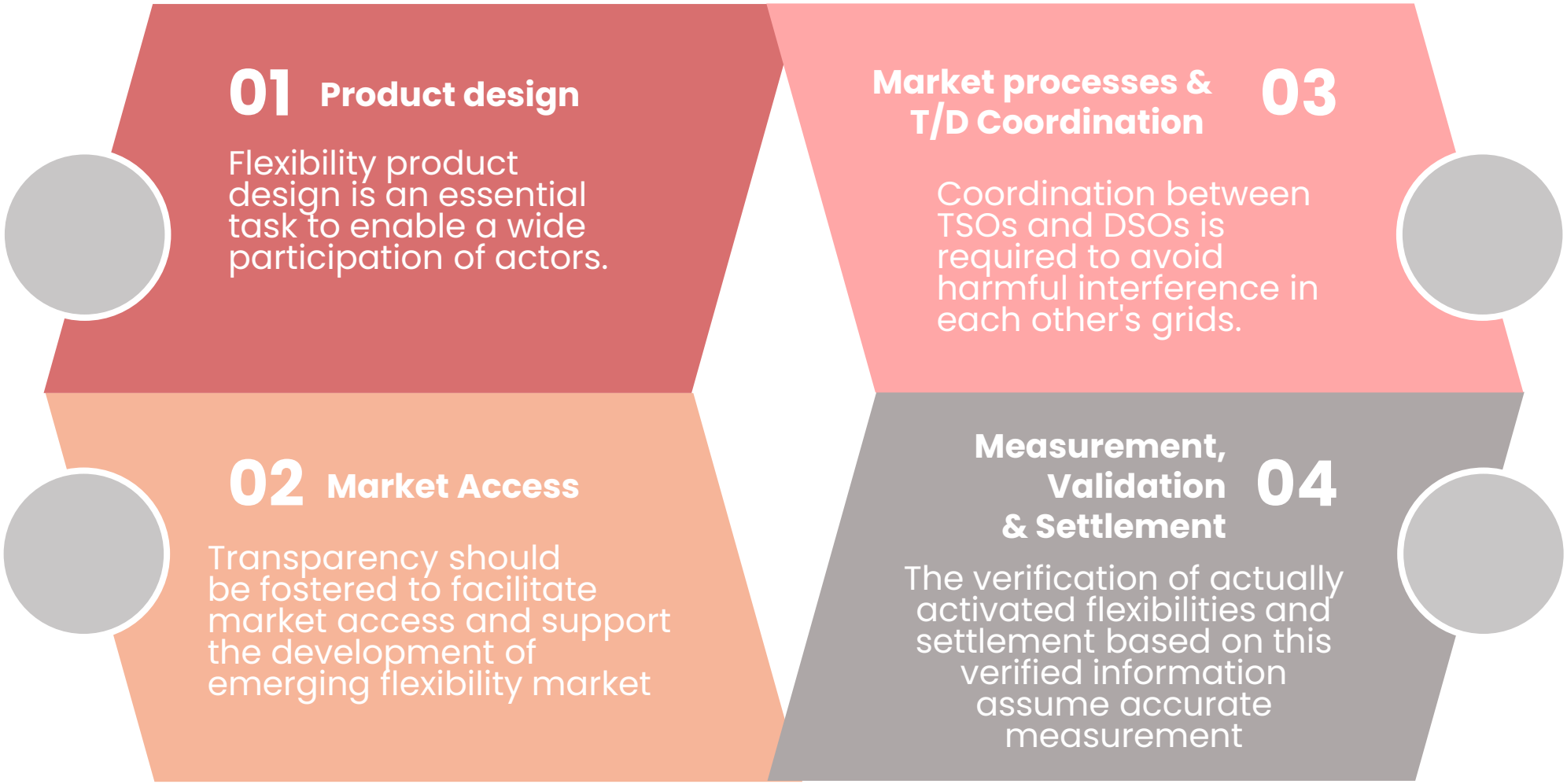
## Which Flexibility services?

- Local congestion management services
- Non-frequency ancillary services (inter alia: voltage control)
- Grid capacity management services.

## Apart from DSOs, when and who can also activate flexibility?

- A flexibility resource can also be activated by:
- Market parties (in reaction to market prices or for balancing purposes)
- TSOs
- Energy communities
- Active customers

# Which market design to enhance distributed flexibility?



# Product Design

## Possibility for aggregation for smaller units

- Aggregation is very important at the distribution level. Smaller units must be able to participate in an aggregated form.

## List of attributes " fit for purpose"

- European harmonisation of the products for congestion management and grid capacity management is not required. However, a common and non-exhaustive EU defined list of attributes could be used, from which all Member States could choose when defining the specific flexibility product
- Product standardisation must be limited to keep flexibility products open to innovation and future development.

# Market access

## DATA EXCHANGE

- Minimum requirements for data exchange are necessary to enable for example market-based congestion management e.g., bids, location, measurements of providers not subject to SOGL data exchange requirements.

## VALUE STACKING

- Market procedures should be designed to enable value stacking while avoiding double payments for the same service activation or gaming.

## FLEXIBILITY RESOURCES REGISTER

- The Flexibility Resources Register(s) collects all the significant data/information about the resources/assets that are seeking participation in flexibility services, including aggregators and associated assets. It offers possible solution to ensure seamless TSO-DSO data exchanges, provide visibility of flexibility potential (benefit for TSO/DSO). Data formats and procedures should be interoperable across the European Union.

## PRODUCT -PREQUALIFICATION

- Product pre-qualification is about checking whether the unit (or aggregate) can (technically) deliver the product requested by SOs.
- The pre-qualification process should be user friendly, striving to minimise the different steps and standardized when possible.

## GRID PRE-QUALIFICATION

- Grid prequalification consist in checking whether the grid can (technically) accept the delivery of the product to the market and if telemetry and measurement requirements are fulfilled, according to the agreed framework between the different system operators on prequalification.
- Participation of distributed assets should not be unduly limited and they shall not exceed the level which is necessary to ensure the DSO and TSO security and grid operation.

# Market processes & DSO/TSO coordination

## DATA EXCHANGE FOR GRID ASSESSMENT

- It is necessary to be able to oblige larger DSO connected users in congested areas to provide the necessary data, even for users who are not considered to be an SGU. Without putting extra burden on all SGUs (in the country).

## COORDINATION FOR SECURITY

- Each system operator is responsible for redispatch actions in his own grid.
- An European IT standard should be developed to monitor and control significant (DSO connected) production and demand facilities. This European IT standard should be made compulsory for relevant connections.

## Harmonised Role Model

- The Harmonized Role Model (HRM) for flexibility services should be developed by the EU DSO Entity preferably in cooperation with ENTSO-E if possible.
- This should be mandated by EU legislation (e.g. development of a Network Code on Demand Side Flexibility).

## THE USE OF THE FLEXIBILITY RESOURCES REGISTER FOR T-D coordination

- The use of the flexibility resources register concept is encouraged to fully allow the necessary coordination between the concerned parties. The exchange of information around a flexibility resources register concept could be regulated at EU level.

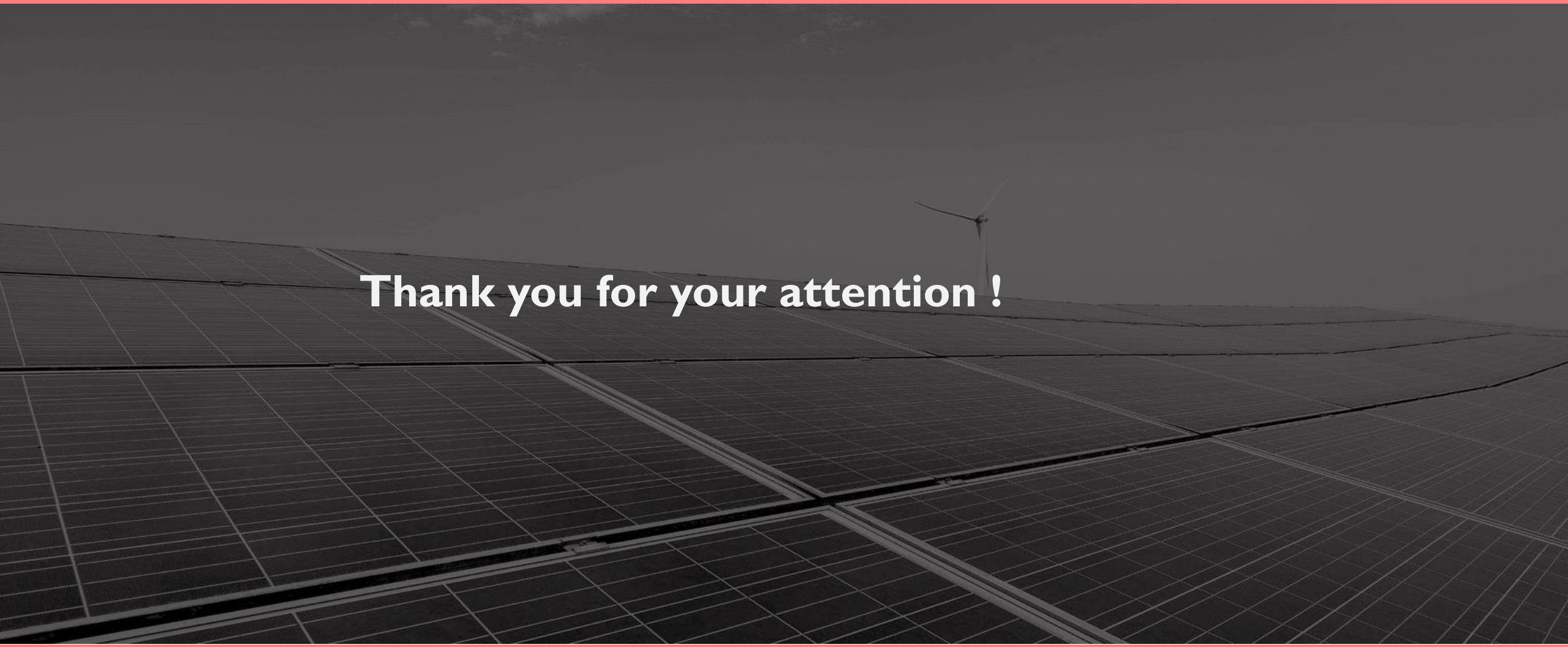
# Measurement, Validation & Settlement

## (SMART) METER DATA EXCHANGES FOR DISTRIBUTED FLEXIBILITY

- Validated historical measurements from main meters must be available to different stakeholders on equal basis while fully respecting relevant privacy and data protection regulations.
- Availability of near-real-time non-validated measurements (< imbalance settlement period) from main meters for settlement and observability processes. This data is increasingly available, but rules are needed for how to use it in these processes, at least in terms of: customer consent, validation of data, access to data, sharing of data

## BASELINING

- Definition of baseline principles which must be accepted in any Member State. Any methods allowed if agreed so between FSP and SO (e.g. accuracy vs. simplicity/transparency of a baseline method).
- Advice to EU DSO entity and ENTSO-E to collect a list of best practices of baseline methodologies. As such, it means that it might be sufficient if only general requirement for such cooperation is established in NC but not the details. The list of best practices could include baseline methods, associated algorithms, examples et


Thank you for your attention !