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Boosting flexibility: Electricity market reform

Austrian Energy Day 2024

Sven Kaiser

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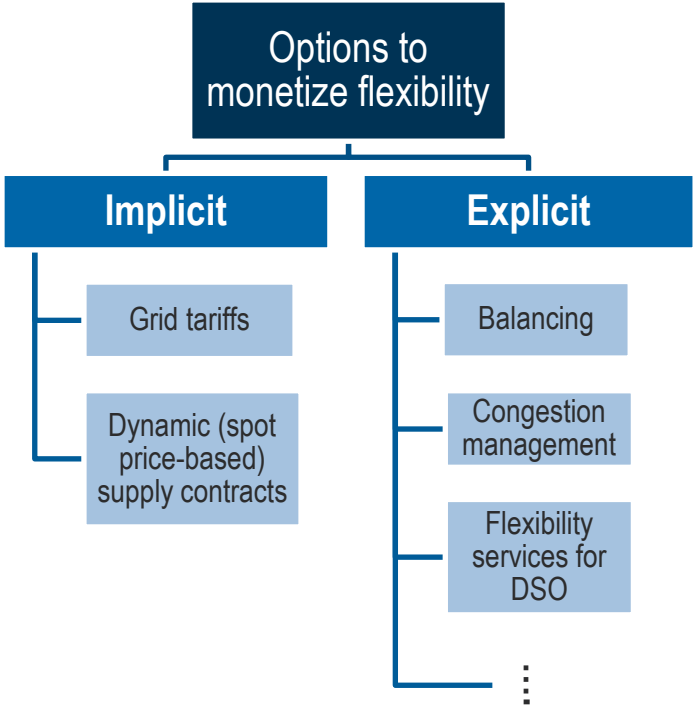
Flexibility in the electricity system

Definitions, needs and options to monetize flexibility

- **Flexibility:**
  - is the ability to change the injection or withdrawal of energy at a defined node of the power system, based on an external signal.
  - means the ability of an electricity system to adjust to the variability of generation and consumption patterns and to grid availability, across relevant market timeframes (EMDR*)
- **Flexibility needs** arise from…
  - **…supply and demand volatility** - load coverage
  - **…grid constraints** - safety margins and operational limits to be maintained



*EU Electricity Market Regulation

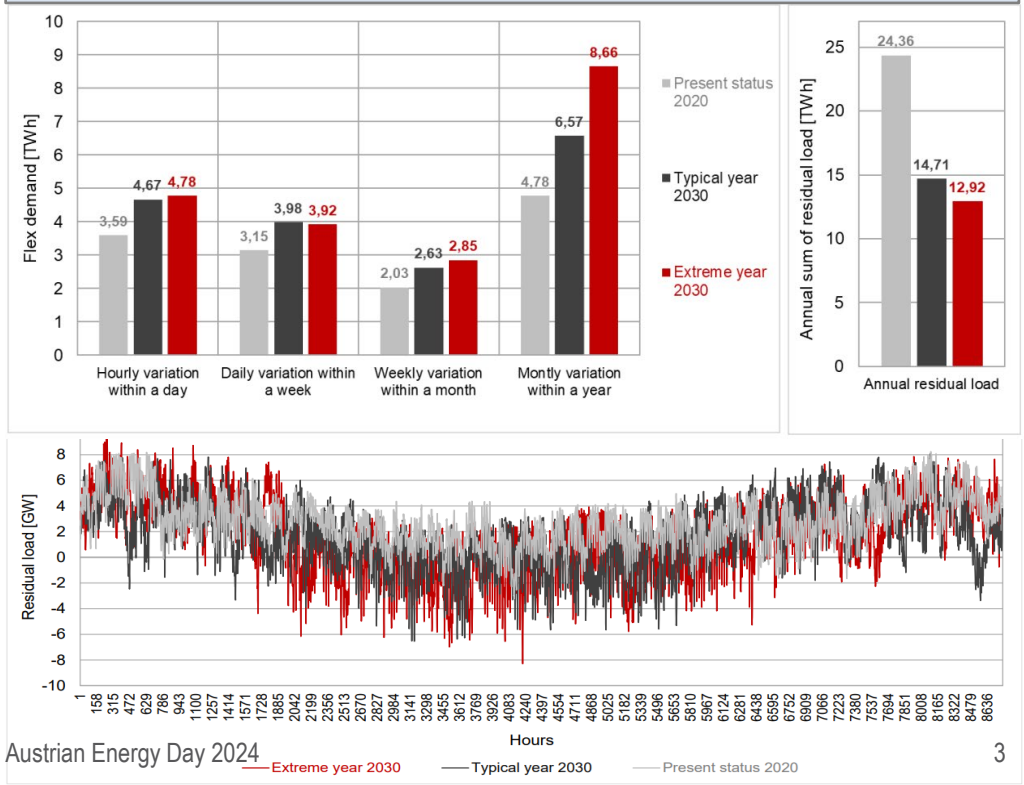
Flexibility needs for load coverage

Increasing for all time horizons

- Intermittent power generation results in **volatility in supply**.
- **Flexibility needs will increase** for all time horizons: at daily, weekly, monthly and seasonal level.
- **Reduction of thermal generation** brings reduction of conventional flexible resources.
- **Residual load** decreases while seasonal variability becomes a challenge.

Source: AIT, TU Wien, FfE (2021)

Need for flexible resources and residual load 2020 and two scenarios for year 2030



The regulatory challenges – and the toolbox

Utilization of "flexibility" touches upon central regulatory areas

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Network cost regulation

- **Incentive Regulation** leading to efficient choices
- Benchmarking approach
- …

Tariff system

- **Incentives** for system-supportive behaviour (e.g. capacity vs. energy-based component)
- **Tariff modells** (smart "interruptable tariffs")
- …

Market Design

- **Congestion management** (participation and remuneration)
- Markets for **flexible services in distribution grid**
- Other („non-frequency related") **ancilliary services**

Market rules & communication

- **Metering system**
- Roles & responsibilities of **market actors** and their relations
- **Data exchanges** (TSO-DSO-coordination, interoperability, ..)
- …

Grid connection

- **Requirements** for generation and demand and storage
- **Flexible conncection agreements**
- …

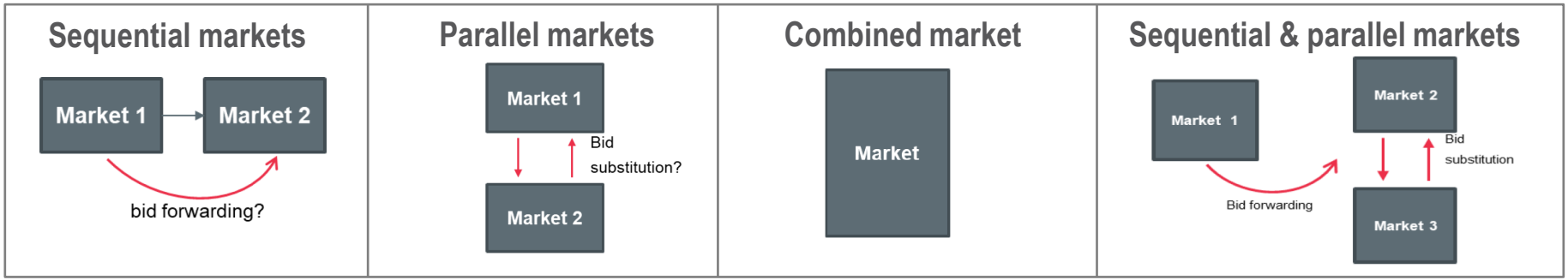
Network investments

- (Distribution) Network investment plans
- …

Guidelines for efficient markt design

Support multi-use of available flexibility resources

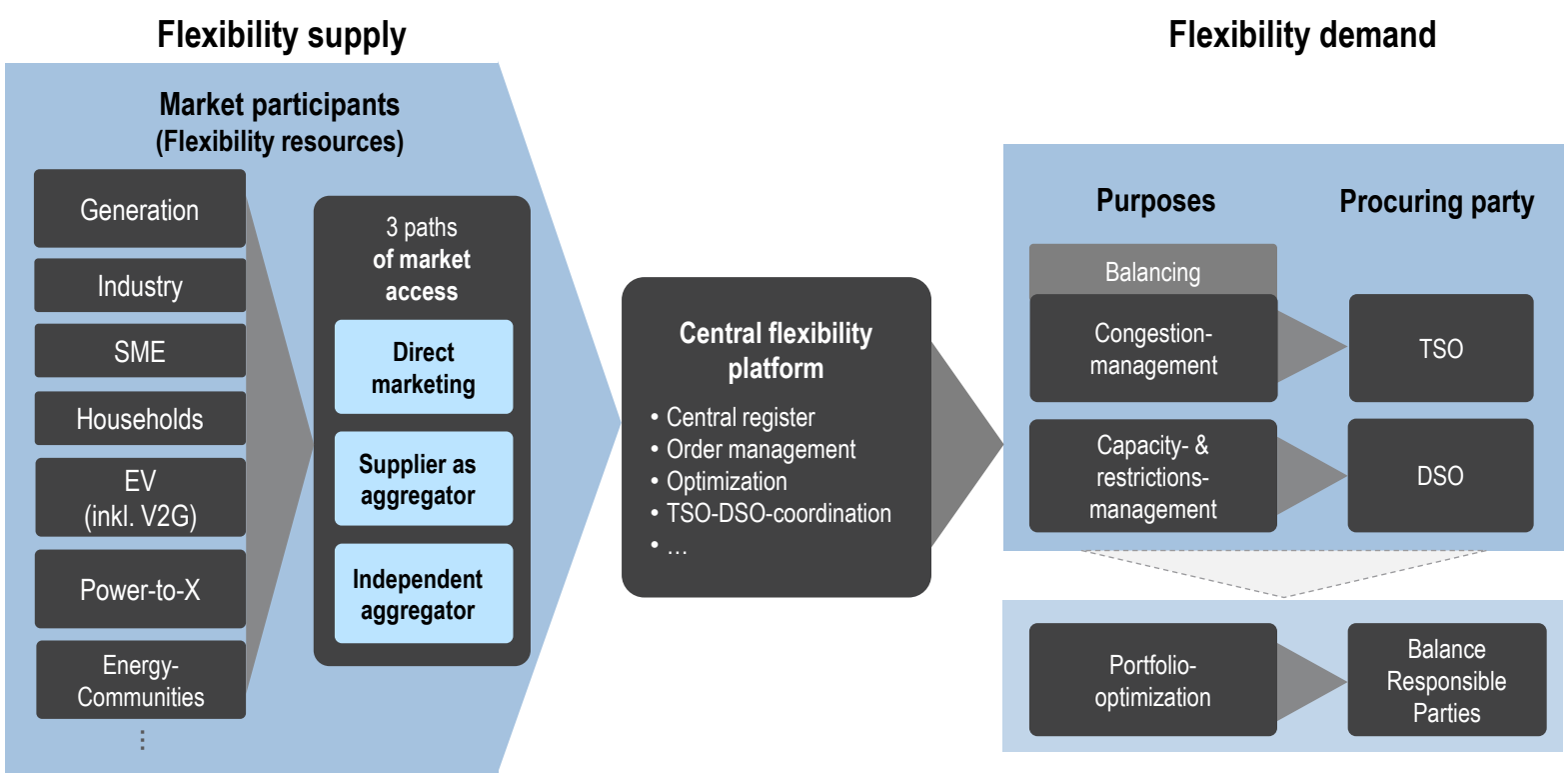
- Consistent legal framework for **congestion management by TSO** and **flexibility services for DSOs**
  - Facilitate the **participation of all grid users**, including demand response
  - Flexibility resources and bids non-exclusiv for TSO or DSO
- Market Design should support **“multi-use“ („value stacking“)**
  - Enabling better liquidity
  - Useful prioritization, if necessary
- „Multi-use“ depending on **timing sequence**, **product design**, **technical requirements, remuneration**



Quelle: AIT (2022)

Concept of a central flexibility platform

Bringing together needs and resources



Network Code Demand Response is (still) in the making

Objectives and timeline

- **EU-wide harmonized rules** on demand response, aggregation, energy storage and demand curtailment
- Rules for **use of flexibility by system operators** to ensure cost-efficient grid operation and development
- **Non-discriminatory procurement** of flexibility & participation of all grid users (generators, storage, demand units)
- Main obectives include the **mobilization of flexibilities** to facilitate the **integration of renewables**
- Processes for…
  - … establishing **terms and conditions** for service providers, coordination between system operators etc.
  - … **EU-wide harmonization** of terms and conditions, where this is considered beneficial

Timeline: ACER draft is currently under consultation – submission to EC is scheduled for March 2025.

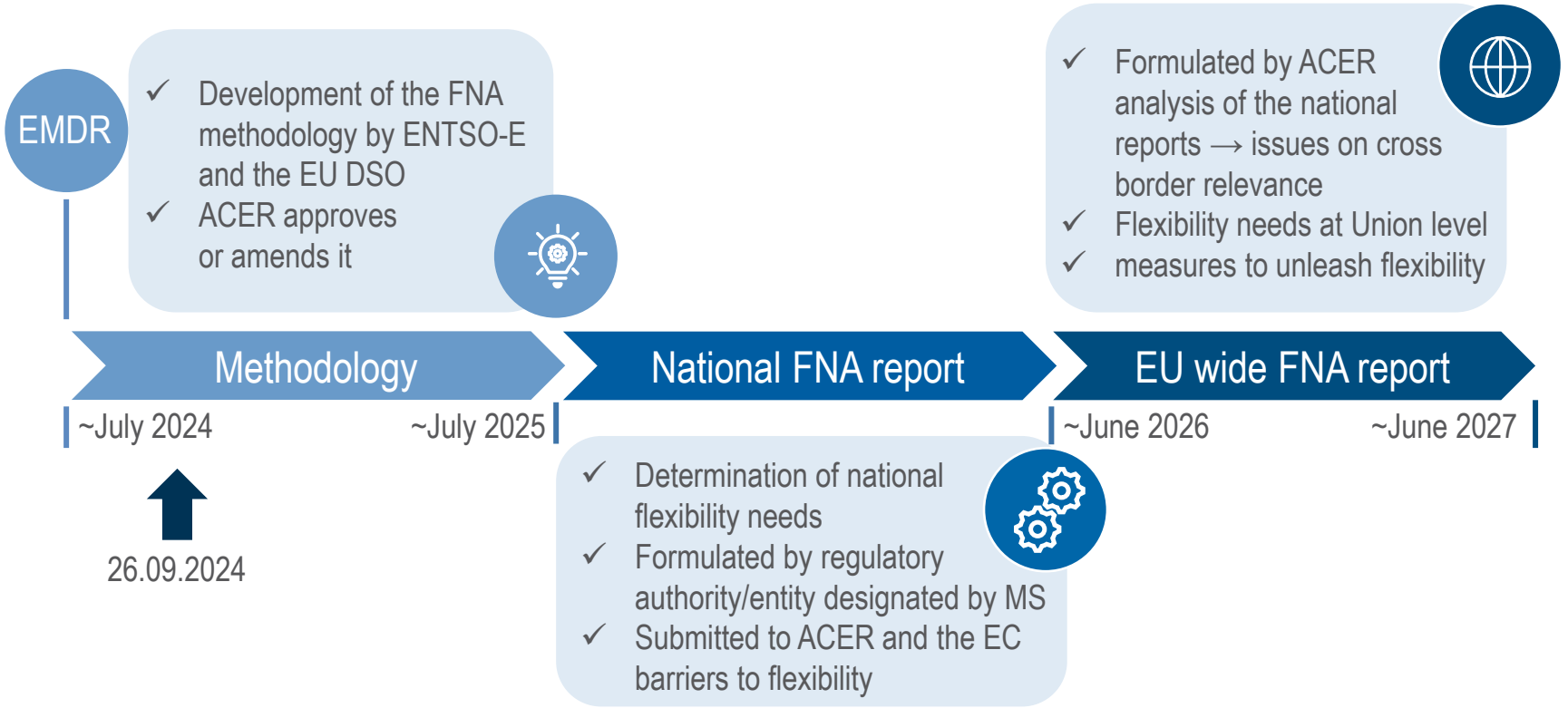
Systematik assessment of flexibility needs

*Objectives and Methodology according to EMDR**

- **EMDR*** requires a periodically **assessment of flexibility needs** at a **national level** and a periodically assessment at **Union level** in order to **foster non-fossil flexibility.**
- The flexibility needs assessment (FNA) is to be based on a **common European methodology** developed by ENTSO-E and the EU DSO entity and approved by ACER.
- The **FNA methodology** has to:
  - include **all available sources of flexibility** in a cost-efficient manner in the different timeframes, including in other Member States
  - include **planned investment** in **interconnection** and **flexibility** at **transmission and distribution** level
  - pursue the **aim** of **decarbonizing the electricity system** in order to achieve the **2030** and **2050** targets
  - contain **guiding criteria** on how to assess the **capability of the different sources of flexibility** to cover the flexibility needs.

Flexibility assessment according to the EMDR

Timeline and interdependencies of the requirements



Summary

- **Increasing need for flexible resources** (especially demand response and storage) on system and distribution level
- The „**regulatory toolbox“** includes a number of central elements
- **Market designs** at national level is still under discussion
  - Legal basis not yet established
  - Network Code Demand Response will define principles for national implementation
- Important for **efficient utilization of flexible resources**:
  - Multi-use/value-stacking
  - Mobilization of distributed flexible resources
  - Close cooperation and coordination between TSOs and DSOs

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