

Flexibility potential: identifying and using it

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1

What is flexibility?

2

How to capture it?

3

Market design recommendations

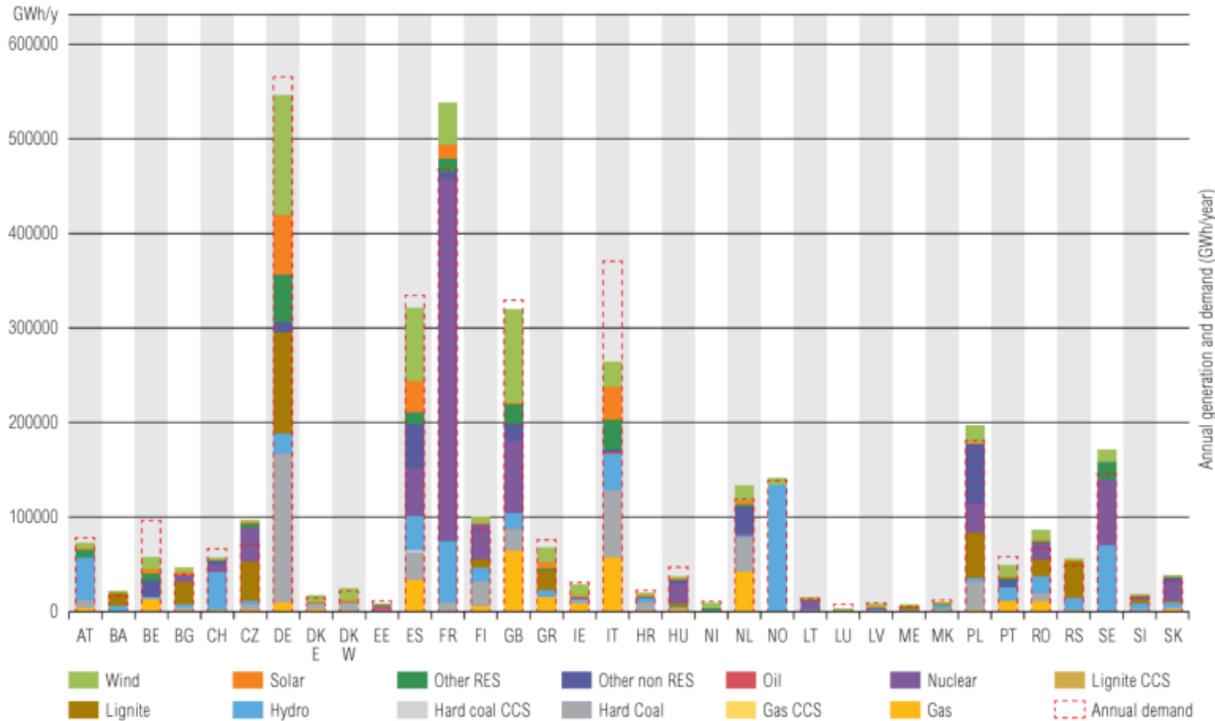
Flexibility in power systems

The paradigm shift

Identifying the potential

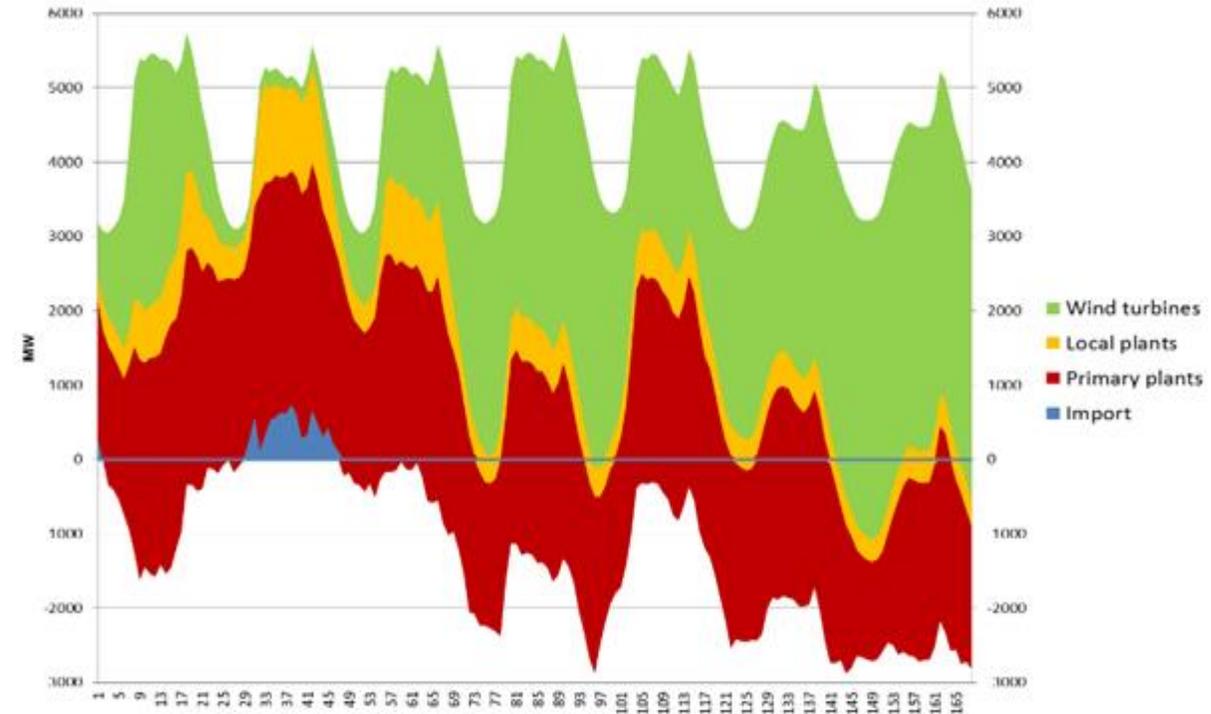
Changes in the power systems

Increased variable generation



Source: Scenarios of ENTSO-E TYNDP

Impact on system operation



Source: Energinet.dk - Dispatch in January 2014 in Denmark

The paradigm shift

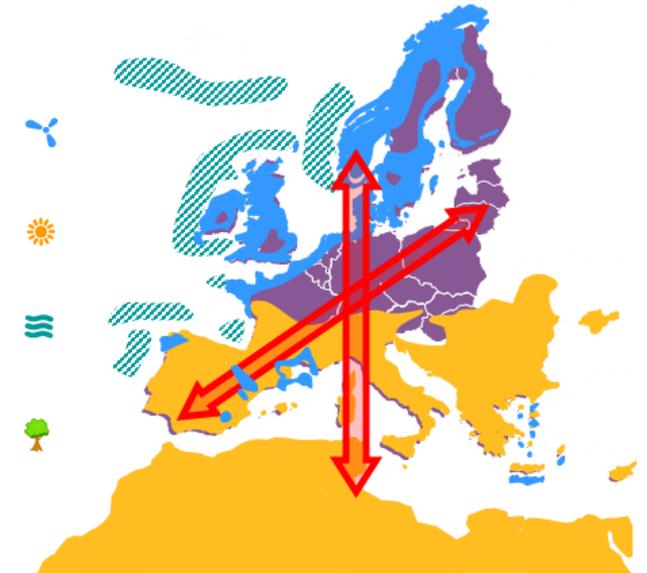
Hundreds of small units



Active consumers



Big flows across Europe



27% RES by 2030 → much higher in 2050 for fulfilling Paris goals from Dec. 2015*

CHALLENGES: system stability, resource variability, new connections, changed power flows, integrating demand side resources, empowering consumers, unlocking flexibility (and managing data)

*COP21 decision: until 2050 global warming shall be limited to < 2°C

Identifying the potential

Intraday
market

Balancing
markets

TSO-DSO
interface

Unlock the potential

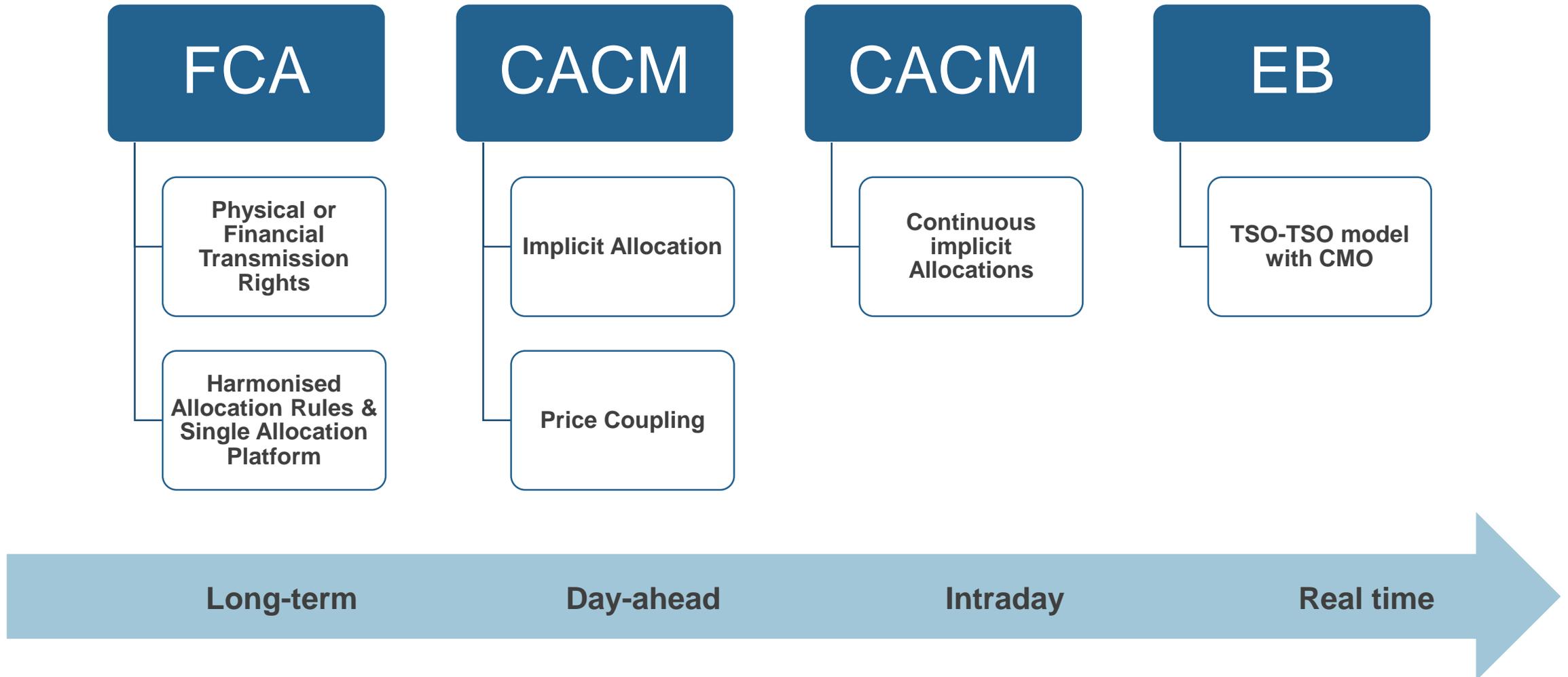
Market guidelines

CACM guideline

EB guideline

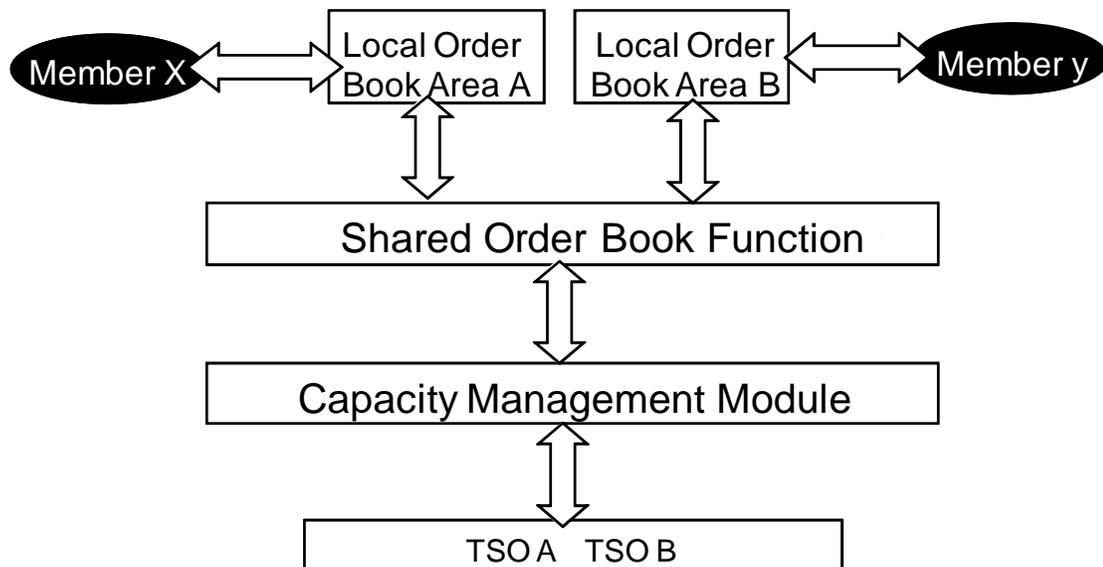
Integrating flexibility

Market-related guidelines



Intraday markets

Target model: continuous trading



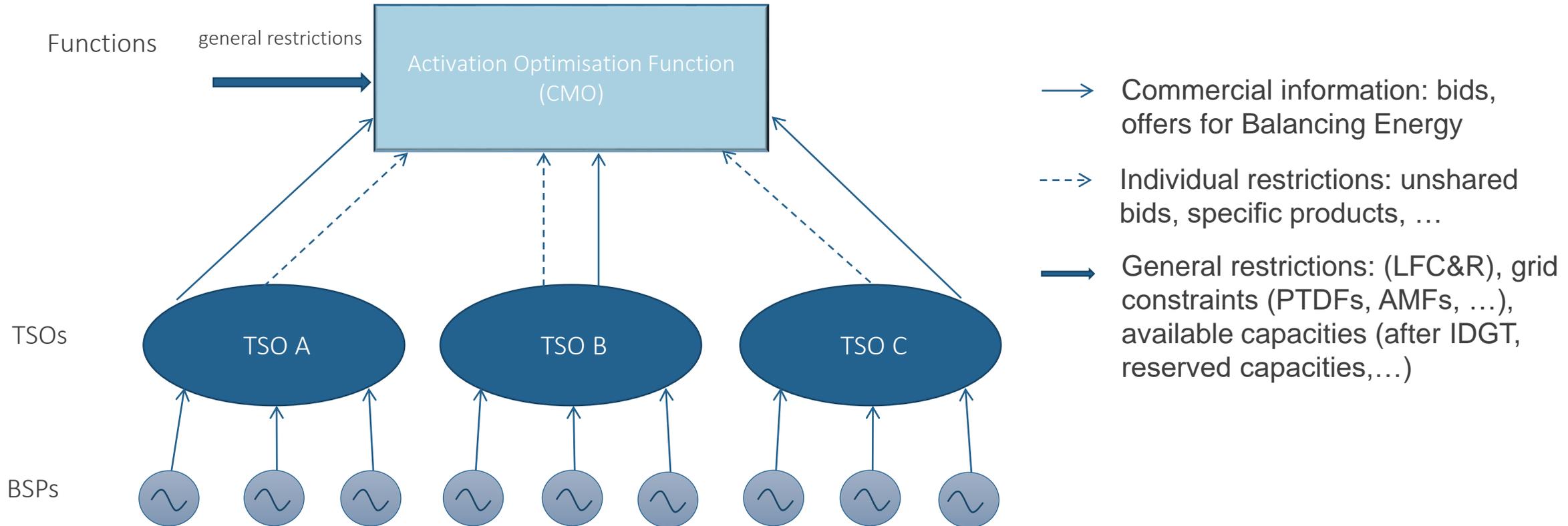
European target model cross-zonal intraday (XBID) capacity allocation and energy trading based on implicit continuous allocation (continuous trading)

A continuous intraday market let positions be fine-tuned close to real time. This is vital to managing wind and solar variability.

The target models setup pools all liquidity to maximize economic benefits.

Basic elements: Balancing market

Target model: TSO-TSO model



Flexibility integration

Three-step approach

Which bids for which needs?

- One CMO or separate balancing merit order and common congestion management mechanism
- TSOs and DSOs to access the bidding platform

How to ensure coordination?

- Coordination between different uses of flexibility
- Maximising liquidity for all uses and timeframes

Which bidding interface?

- Single-entry solution for bids ensuring coordination
- System Operators remain responsible for own process

Market design recommendations

ENTSO-E's vision

Insights for higher integration

The importance of Market Design for ENTSO-E

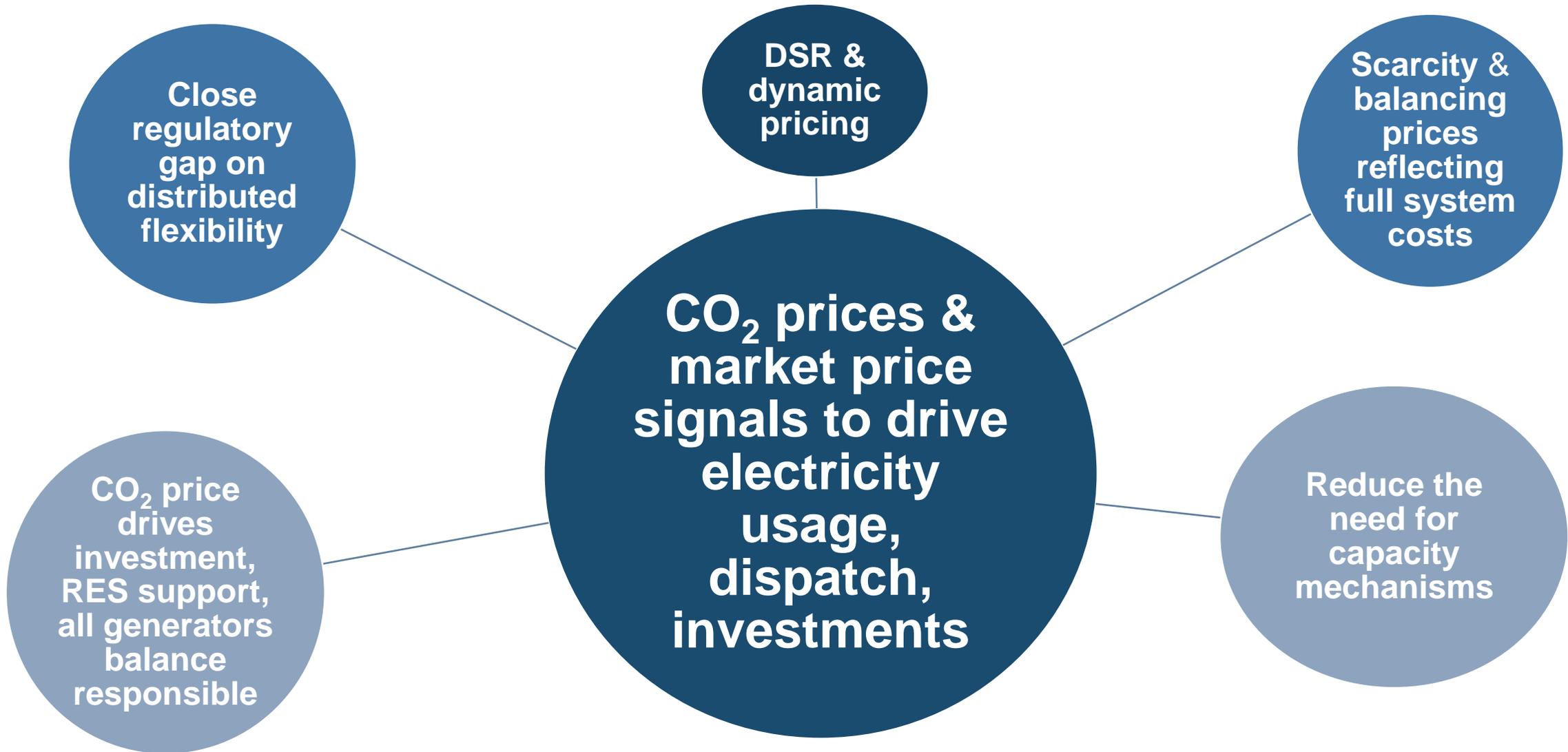
The involvement of TSOs is key for Market Design evolutions

- Legal mandate for the drafting of network codes/ guidelines and for performing regional and European adequacy assessment.
- TSOs deeply involved in market integration in Europe.

An efficient and effective Market Design is key for TSOs

- The more market is incentivized to solve operational challenges on its own, the less TSOs have to intervene.
- Ambitious policy objectives, rapidly changing fundamentals require an adapted Market Design.

ENTSO-E Vision for a MARKET DESIGN



Market Design insights

Key priorities

- Phase out priority dispatch and Feed-in Tariffs to integrate RES into the Market
- Markets to signal real value of electricity for the system and create new revenue streams
- Regional adequacy methodology to be basis for decisions on SoS, RES, market enhancements
- Integrate demand-side into all markets and link retail and wholesale

Further enhancements to the Market

Full and timely implementation of CACM Guideline: Liquid and integrated Day-ahead and Intraday markets

Ensure customers are free to access all relevant markets and enable aggregators' participation

Building on the experience from the early implementation of the EB Guideline and ensuring a full implementation

ID GCT should allow market participants' to adjust their schedules as closely as possible to real time while respecting the time required for guaranteeing system security

To improve the investment signal while mitigating the risks for market participants, new risk hedging products should be introduced

Further enhancements to the Market

Reduce the impact of taxes and levies on power bills

TSOs and DSOs to be involved by ACER and NRAs when examining new models for network tariffs

Linking Wholesale and Retail markets: time-of-use settlement based on smart meters

Integrated solutions for balancing and congestion management on TSO and DSO level

Innovation to underpin the market-based energy transition

Summary

Concluding remarks

- The power markets in Europe are in transition
- With the energy transition the customer has moved to the centre stage
- Renewables drive and necessitate innovation
- Balancing brings together the market aspects and the system operation
- Integration through market-related Guidelines
- A future-proof market design is essential for achieving the goals
- Seamless regulatory framework is needed, anticipating forthcoming changes

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Reliable Sustainable Connected