



Demand, Storage & Flexibility

We choose Earth

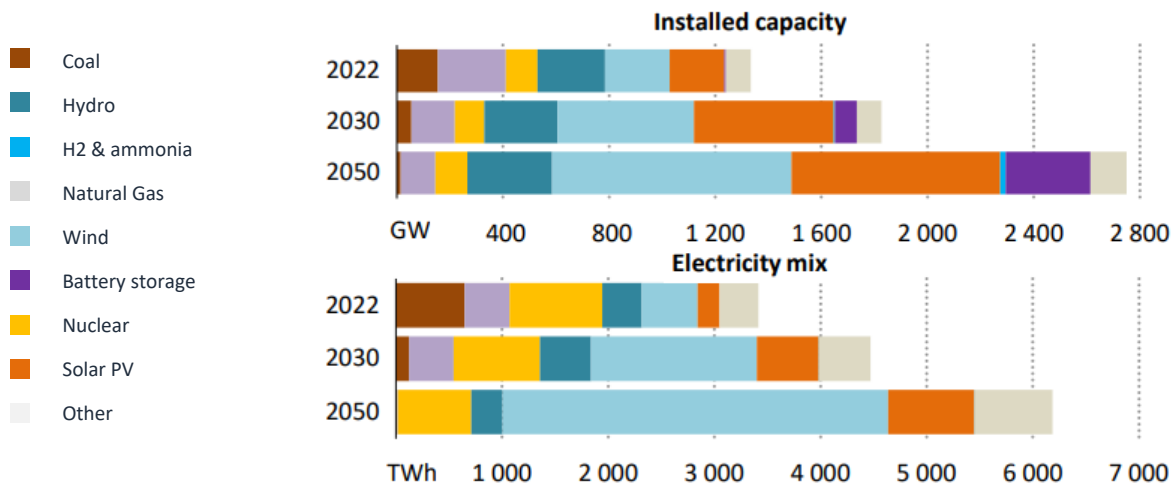
May 2025

Why do we need flexibility so badly?

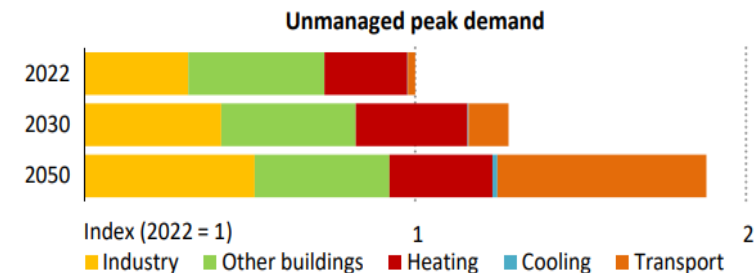
Changing Patterns in Energy

- Renewable but more variable & less dispatchable **SUPPLY** (e.g. wind, solar)
- Demand **ELECTRIFICATION** (e.g. transports, H&C)
- **DECENTRALIZATION** of resources (e.g. self-consumption, energy sharing)
- **NEW DEMAND** types (e.g. data centers)
- **TECHNOLOGY** development (e.g. storage, automation, AI)
- **LOW INTERCONNECTION** Iberia – rest of Europe

Energy mix



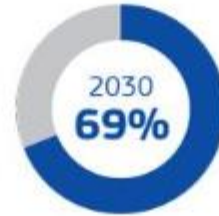
Peak Demand



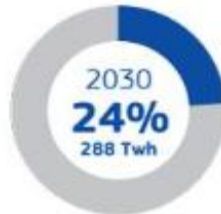
Flexibility is not just the new hype

Flexibility needs in numbers

Share of
renewable
energy



Flexibility
needs (% of
demand)



Storage
capacity

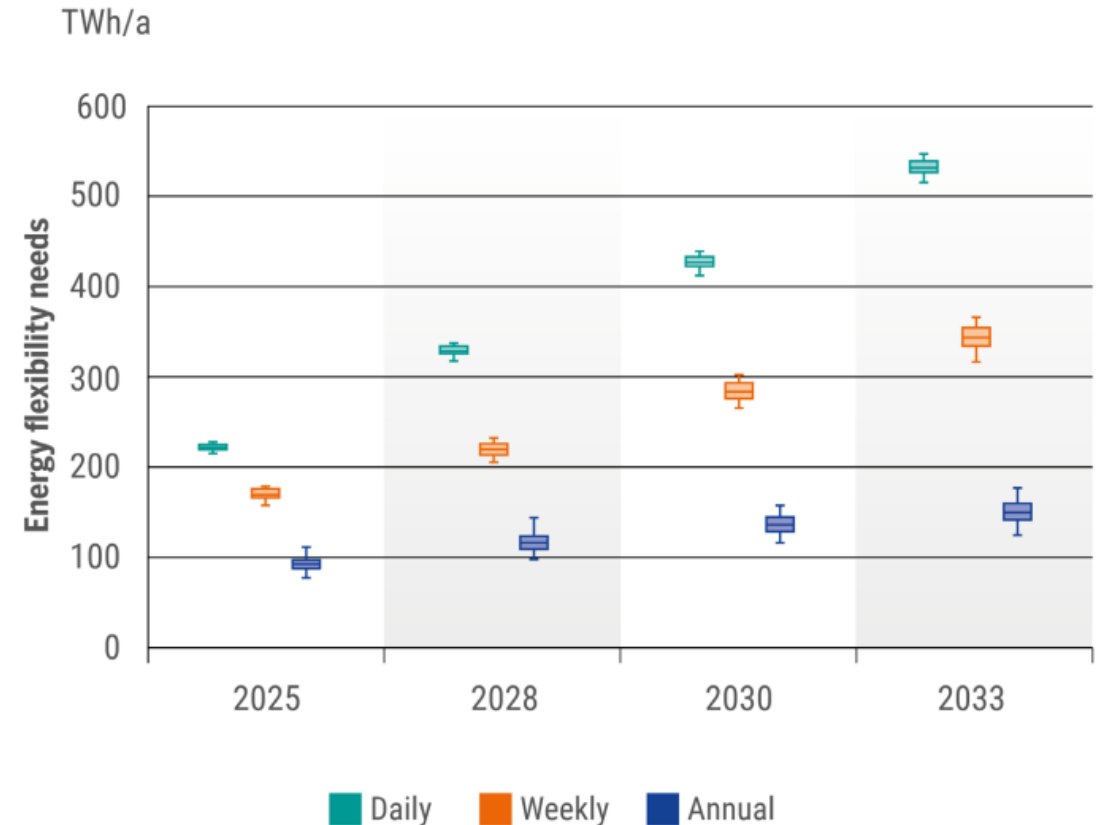


2030
200 GW



2050
600 GW

EC, 2023 – Recommendation to Member States on Storage



ENTSO-E, 2024 – System Flexibility Needs for the Energy Transition

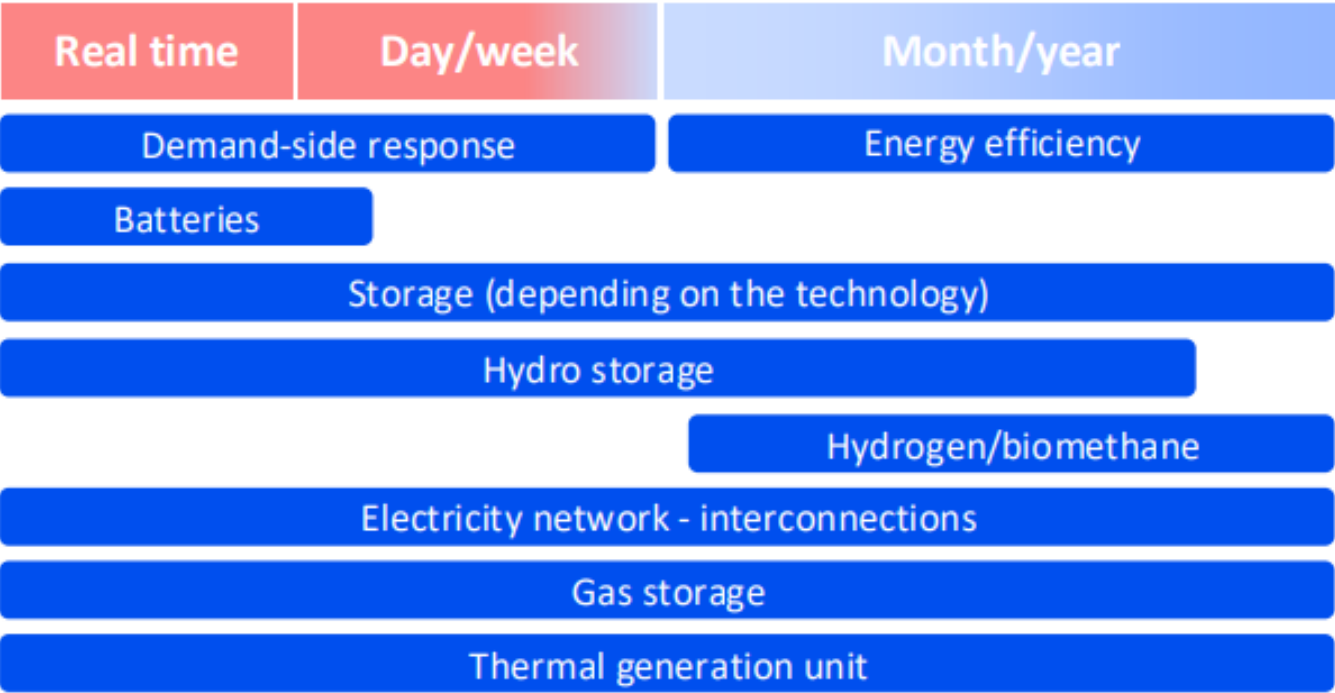
This means the system will need to be able to modulate and adapt quickly ... and thus the need of the debate of flexibility

Different technologies for different flexibility needs

The role of demand and storage

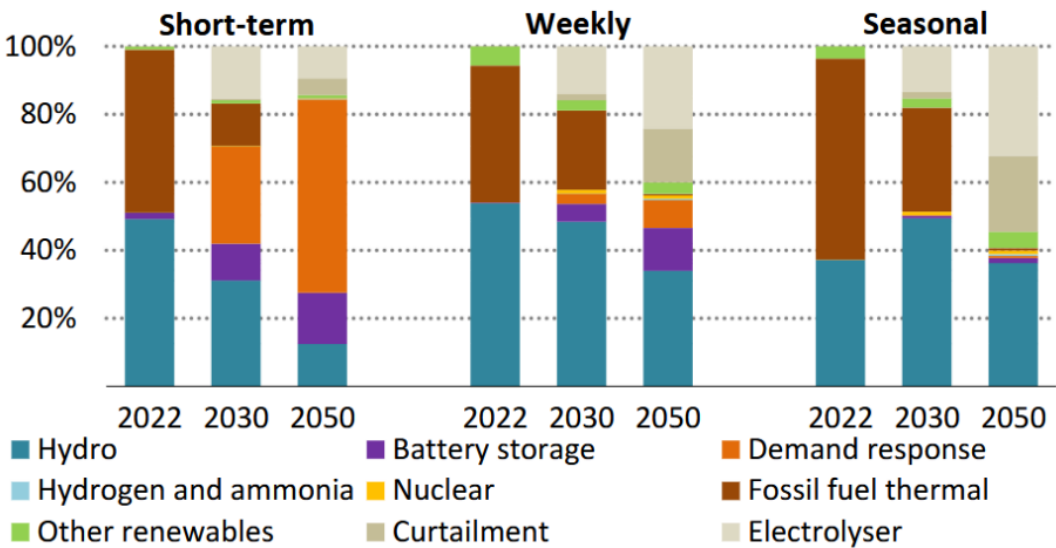


Flexibility services provided by various technologies



ACER, 2025 – Unlocking Flexibility: barriers to demand response

Flexibility solutions' contributions towards 2050 in Europe

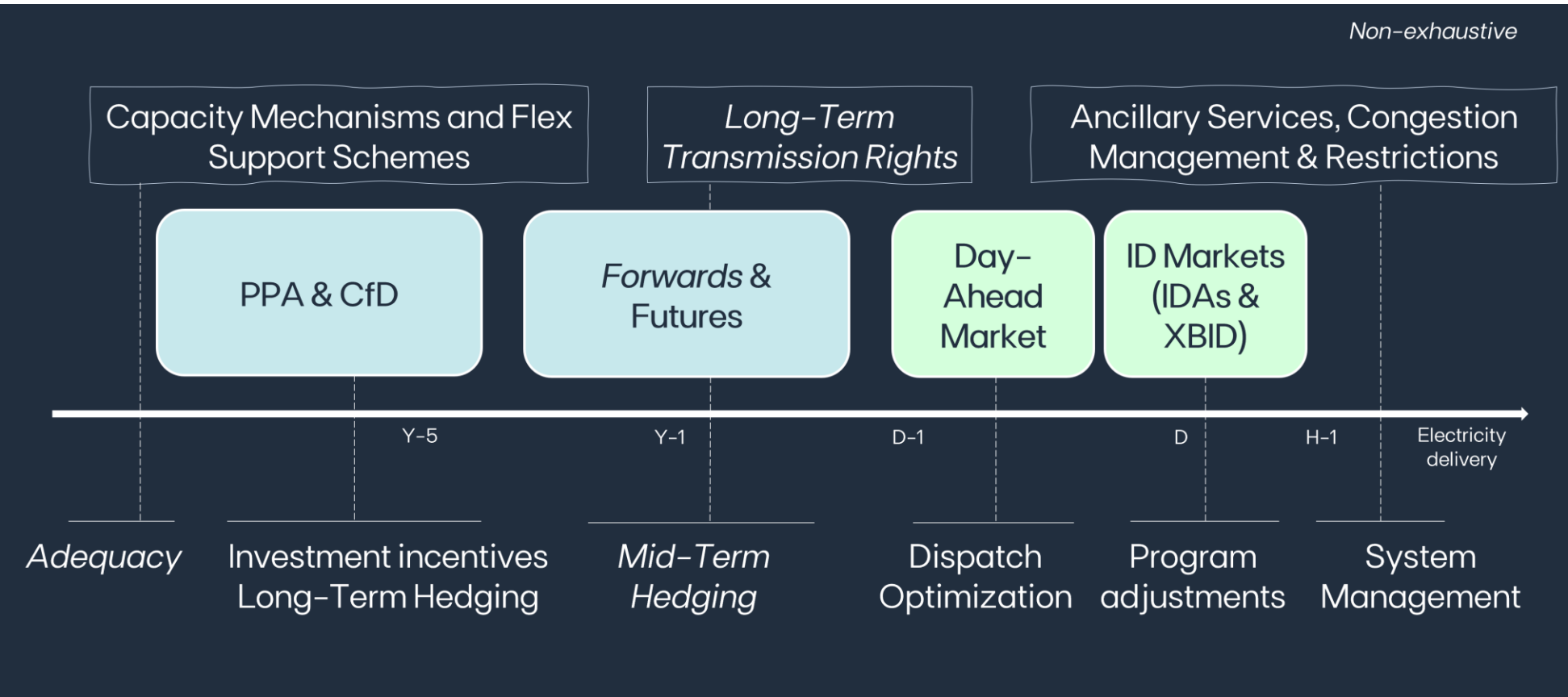


IEA – Managing the seasonal variability of demand and supply

Flexibility can be used across all electricity markets



Flexibility is the capacity to modulate profiles in reaction to a trigger. Market price-signals are the most effective...

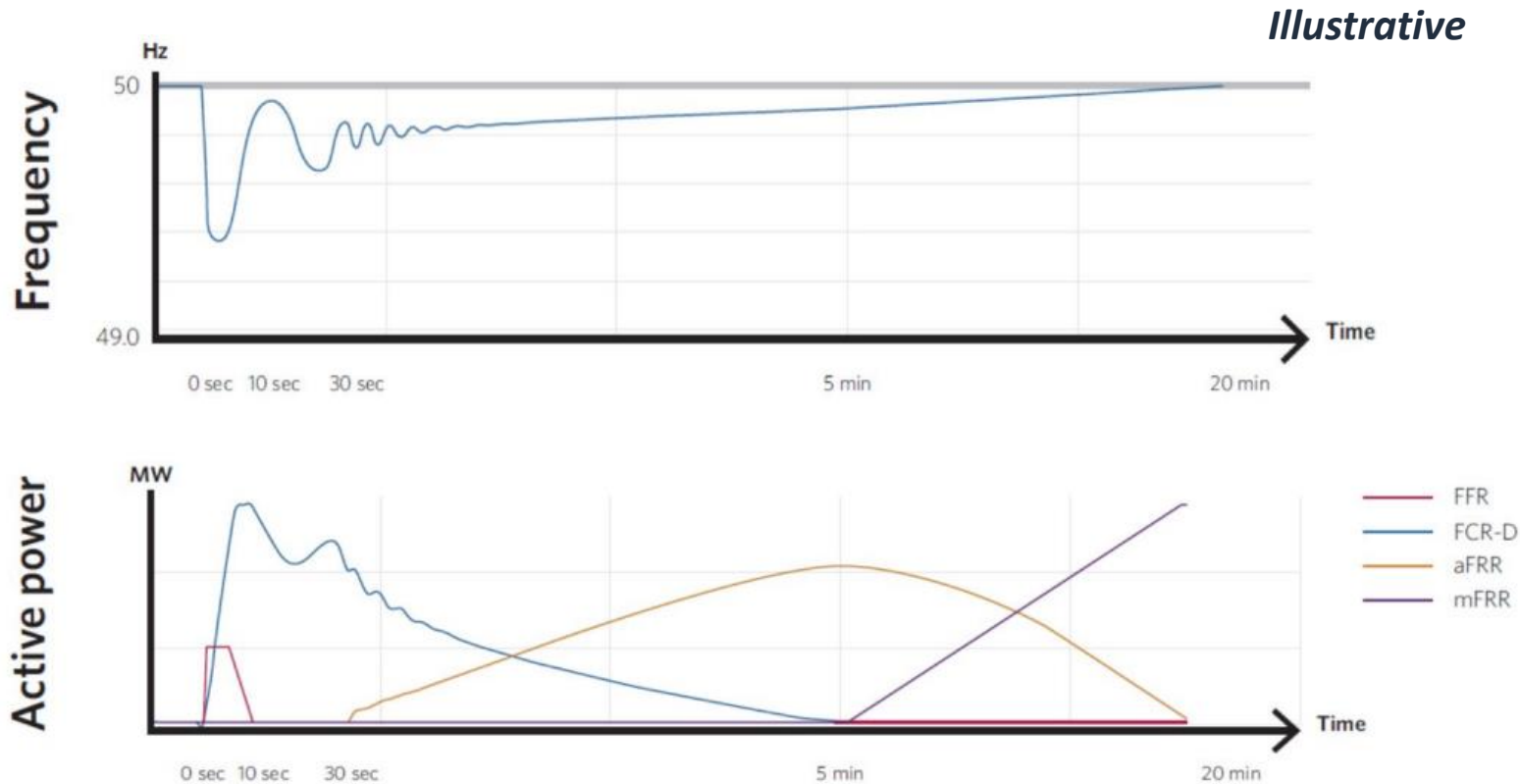


- There is no such thing as a flexibility market
- Flexibility is the capacity to change from baseline
- It can be used across all markets (higher potential if combining technologies and digital)

The best driver is through proper price signals, and market-based mechanisms.

Flexibility can be used across all electricity markets

... ancillary services requiring an enhanced framework...



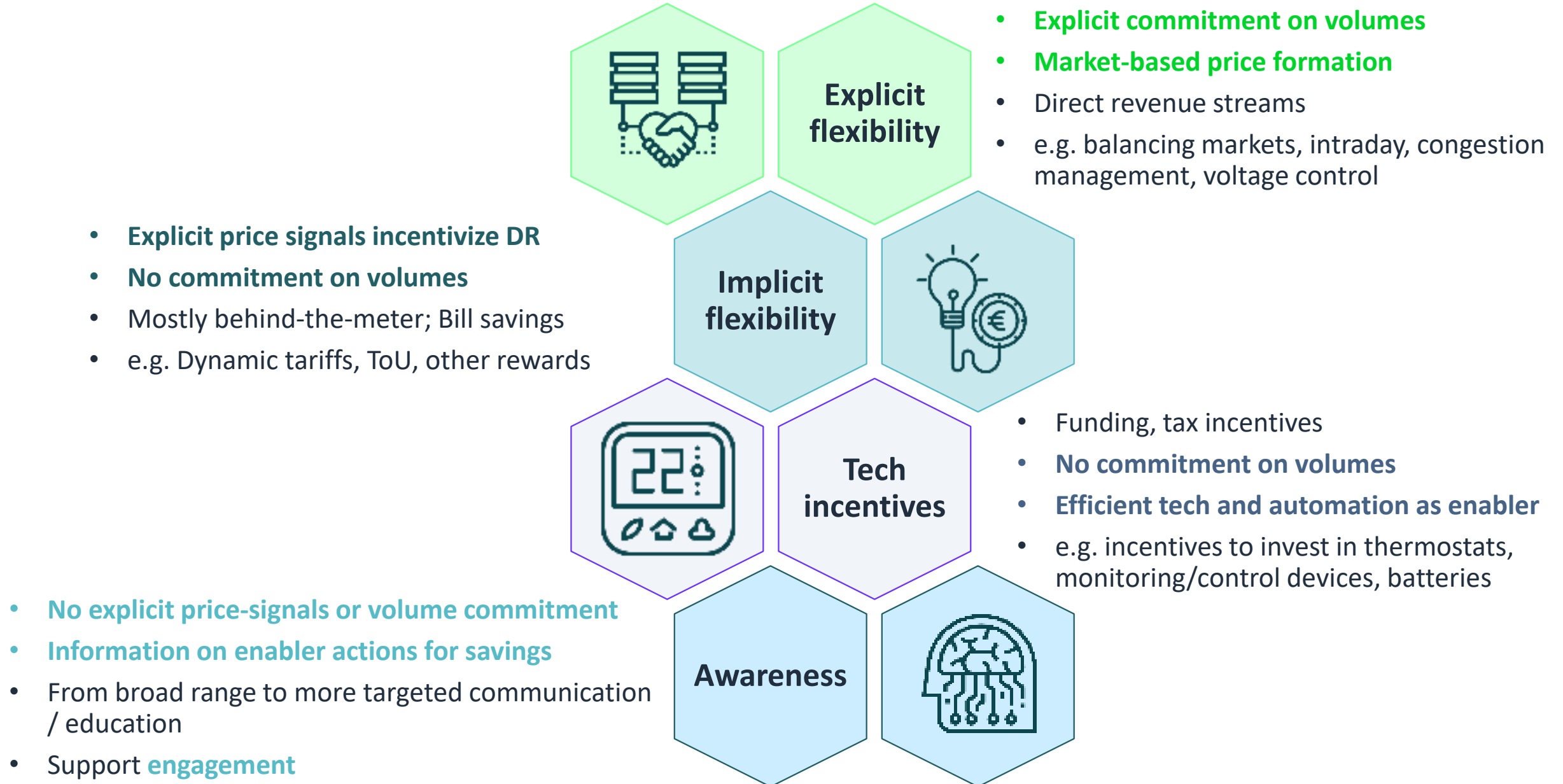
- In Portugal it is compulsory for generators type D to provide frequency services
- **FCR not remunerated.**
- **Capacity price for “aFRR” capped to a reference price in Spain** (though the service is different)
- **Energy in “aFRR” is paid at the price of mFRR (no bid).**
- **Capacity for mFRR not procured** (exception for non-standard product only available for industrials).
- No framework for FFR, Inertia, ...

ENTSO-E, 2024, Overview of Frequency Control in the Nordic Power System

Better framework is needed for fast frequency, inertia, but also non-frequency related such as blackstart, voltage control, ...

Better results when combined

... but flexibility can be triggered by several different tools



There are still obstacles to overcome to untap flex potential

BARRIERS

RECOMMENDATIONS

1	Access to all electricity markets	Add demand and storage flexibility as eligible for all electricity markets, including aggregated assets; ensure proper remuneration
2	Consumer lack of awareness or engagement	Engagement, with educational campaigns, training, and tools that facilitate information including available incentives
3	Data access & exchange	Evolve in regulatory conversations around interoperability, including for appliances, and support automation
4	Inadequate setting for aggregation	Set clear rules, ensuring correct volumes for imbalance settlement (it's not about billing to consumers, but balance responsibility)
5	Price interventions acting as shields to price signals	Encourage pricing innovation at supplier level; avoid overregulation and price intervention
6	Permitting and grid connection	Streamline permitting, establish KPIs (including for environmental licensing); ensure grid investment and evolve connection process

A lot was already foreseen in CEP, just lacked implementation

Previous Directive and Regulation (from 2019) ... & existing network codes (e.g. EB GL from 2017) already set the tone and the ground rules such as:



Access to ALL
electricity markets



Technological neutrality
(including aggregated resources)



Market-based
procurement



Smart-meters roll-out

What else is happening at EU level?

Non-exhaustive

Security of supply

- **Non-fossil flex support** schemes
- Streamline **capacity mechanisms**
- **Adequacy** (review ERAA methodology)

Storage

- Storage Recommendation
- Possible EU **storage strategy?**
- Non-fossil **flexibility assessments and NECP targets**
- AFIR: **e-mobility**
- NC RfG 2.0

Demand

- NC on Demand Response
- Energy sharing
- DR through **Dedicated Measurement Devices**
- Guidance for **flex in retail** contracts
- NC DC

Grids

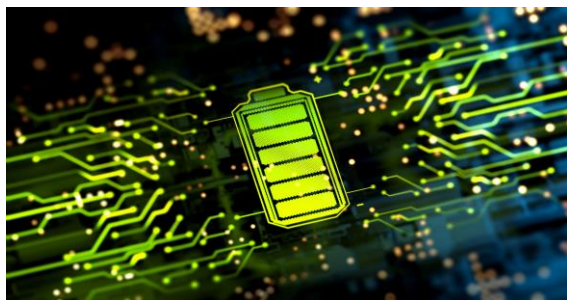
- “Flex markets”
- **Flexible connection agreements**
- **Grids Action Plan**
- Delegated Acts on **data access & interoperability**
- **Interconnections**

What needs to step-up in Portugal



Framework for **enhanced ancillary services** (e.g. inertia, fast frequency)

Market-based procurement and remuneration of FCR and standard balancing products (incl. capacity)



National **storage strategy**

Set national **flexibility targets with & support schemes**

Facilitate co-located storage



Develop adequate framework for **grids investment**

Incentives to **innovation and flexible management of the grid**

And other elements: agile **permitting** with KPIs, **stable** regulation, participated **consultations and exchange** on framework review, better **alignment between different policy tools**

Q&A



Thank you Obrigada

The logo features the lowercase letters 'edp' in a white, sans-serif font, centered within a dark blue circle. This central circle is surrounded by three concentric rings of varying colors: a bright cyan ring, a medium blue ring, and an outer purple ring. The background is a dark navy blue. The rings are slightly offset from each other, creating a sense of depth and movement.

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