

WEBINAR

# Recent developments of the electricity market design in France and Germany

December 12th 2024



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Avec le soutien du



Ministère fédéral  
de l'Économie  
et de la Protection du Climat

en vertu d'une décision  
du Bundestag allemand



DFBEW Webinar: „Recent developments of the electricity market design in France and Germany“

# TOWARDS A CAPACITY MARKET IN GERMANY – THE “POWER PLANT SAFETY ACT” AND THE RECENT CAPACITY MARKET DEBATE IN THE LIGHT OF THE BREAKUP OF THE COALITION GOVERNMENT

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12.12.2024

# AGENDA

- 01 EU Electricity Market Design Reform: Impact on capacity mechanisms**
- 02 Incentivizing secured capacity in Germany: Recent plans and motivation**
- 03 Power Plant Safety Act as an interim solution**
- 04 Proposals for a capacity mechanism in Germany**
- 05 Outlook: New government and political developments**

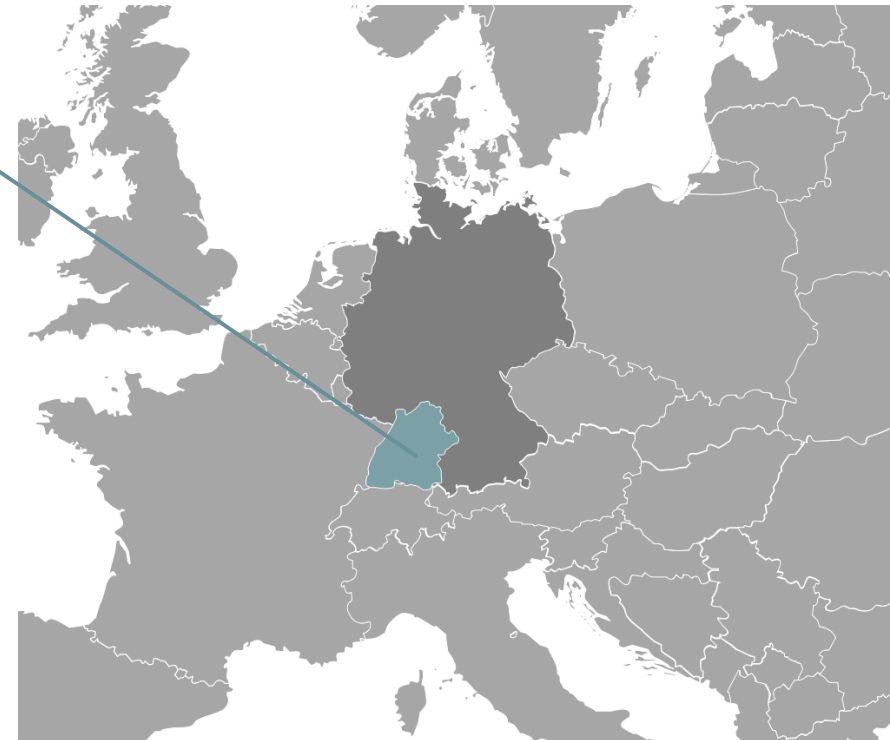
TransnetBW

# TRANSPORTNET BW AT A GLANCE



TransnetBW

At the heart of the European transmission grid



- / Certified Independent Transmission System Operator
- / Founded in 1998 as EnBW Transportnetze AG, renamed TransnetBW GmbH in 2012
- / Employees: approx. 1,600 (by 2024)
- / Customers: Electricity producers and regional electricity suppliers, 11 million people and numerous companies in Baden-Württemberg

## EU Electricity Market Design Reform

# NO FUNDAMENTAL CHANGES TO THE MARKET DESIGN BUT COMPREHENSIVE MEASURES WERE DECIDED

### / Introduction of a legislative package in 2023 to reform the European electricity market design (EMD)<sup>1</sup>

- / Agreed upon in Dec 2023, approved by the European Parliament in April 2024, adopted by the Energy Council in May 2024 and entered into force on July 16<sup>th</sup>, 2024
- / The EMD is the EU's long-term response to the energy crisis of 2022



### Some important measures:

- / Providing long-term investment signals through **Power Purchase Agreements** and the introduction of bilateral **CfDs** as the **main instrument of state support for renewable energies** from 2027
- / Measures to **protect electricity customers**, e.g. by introducing hedging rules for distributors
- / **Promote flexibility** in electricity markets
- / Examine the creation of “**virtual regional hubs**”
- / Creation of a “**peak shaving instrument**” for TSOs
- / Adjustments to the European **framework for national capacity mechanisms**
- / ...

<sup>1</sup> The new electricity market design rules consist of the [amending Directive EU/2024/1711](#) and the [amending Regulation EU/2024/1747](#).

## Impact of the EMD on Capacity Remuneration Mechanisms

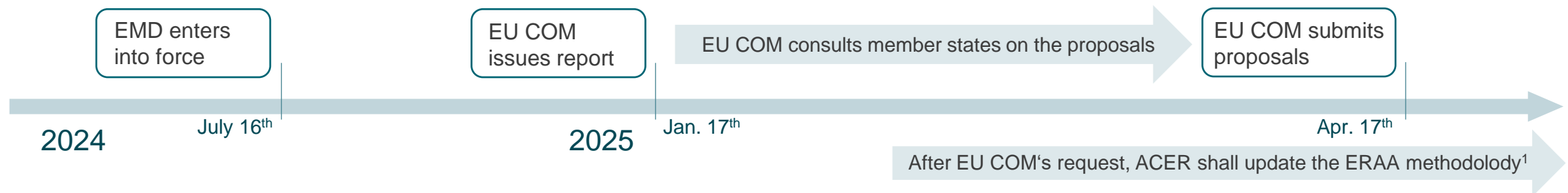
# CAPACITY MECHANISMS AS A STRUCTURAL ELEMENT OF THE ELECTRICITY MARKET

- / Capacity Remuneration Mechanisms (CRMs) are 'normalised' in the EMD:
  - / **No longer defined as 'measures of last resort'** or temporary market design solution.
  - / However, they cannot be authorised for a period longer than ten years.
- / Member States that already apply a CRM should consider to **promote the participation of non-fossil flexibility**, such as demand response and energy storage.
- / Member States could impose **technical performance standards and CO<sub>2</sub> emission limits that restrict participation in capacity mechanisms to flexible, fossil-free technologies.**
- / **Derogation from the 550g CO<sub>2</sub>/kWh emission limit, under strict conditions** (e.g. existing power plants commissioned before July 2019) and for a limited period of time (max. until end of 2028).
- / Additionally, a **regular review of national CRMs** with regard to their necessity and design is envisaged.
- / Overall, the financing of dispatchable capacity and ensuring security of supply will continue to be largely organised by the Member States themselves within the framework of the existing European requirements.

## Impact of the EMD on Capacity Remuneration Mechanisms

# UPCOMING PROCESS ON HOW TO SIMPLIFY THE CAPACITY MECHANISMS ASSESSMENT PROCESS

### Streamlining the framework for the approval of Capacity Mechanisms:



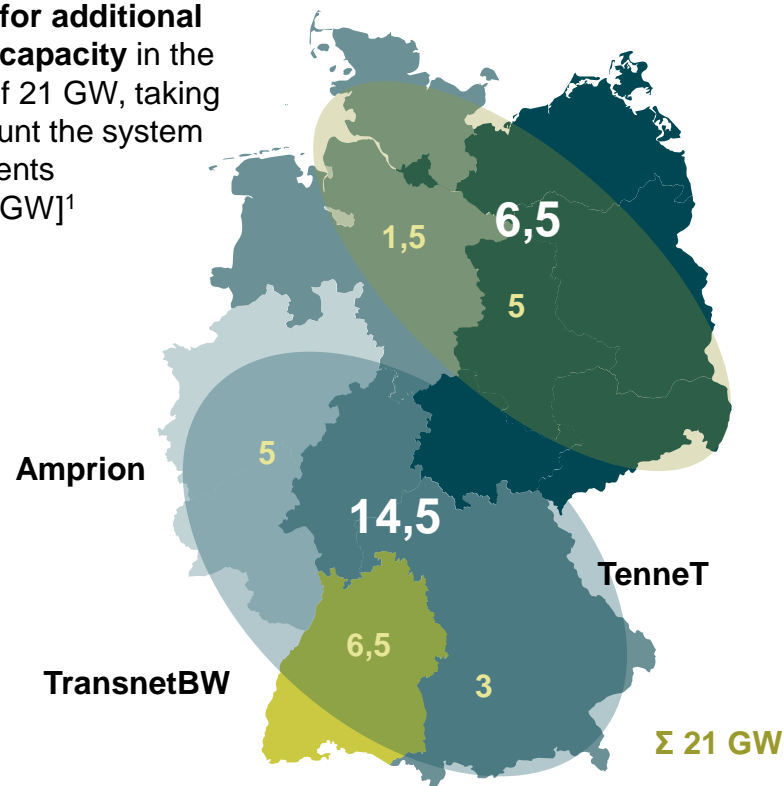
- / As the procedure for the adoption of capacity mechanisms has proved to be complex, **possible ways of streamlining and simplifying the process** of applying a CRM shall be investigated.
- / The EU Commission will **issue a report**, followed by a concrete proposal, **assessing those possibilities**, such as a “fast-track” approval process for CRMs meeting certain criteria as well as revising the ERAA methodology.
- / TransnetBW **welcomes the recent changes** introduced by the EMD Regulation but **further improvements are needed** to the European regulatory framework, in particular to facilitate a simpler and quicker introduction process of CRMs.

<sup>1</sup> ERAA = European resource adequacy assessment

## Incentivising secured capacity in Germany: Current plans and motivation

# SECURITY OF SUPPLY AND SYSTEM REQUIREMENTS CALL FOR RAPID NEW CONSTRUCTION OF SECURED CAPACITIES

**Localisation of the demand for additional secured capacity** in the amount of 21 GW, taking into account the system requirements [2030, in GW]<sup>1</sup>



### Ressource Adequacy

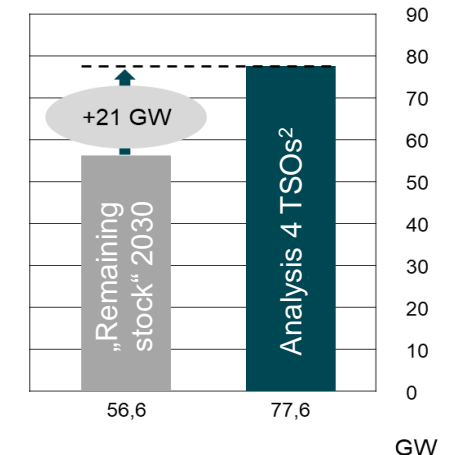
Security of supply analyses show that an enormous increase in secured capacity will have to take place in Germany by 2030 (and beyond).<sup>2</sup>

### Transmission Adequacy

In particular, regional demand for ramp-up potential for grid congestion measures (redispatch)

### Frequency and voltage quality

### Versorgungswiederaufbau



Geographical localisation of the additional secured capacity is **essential in order to cover regional system requirements.**

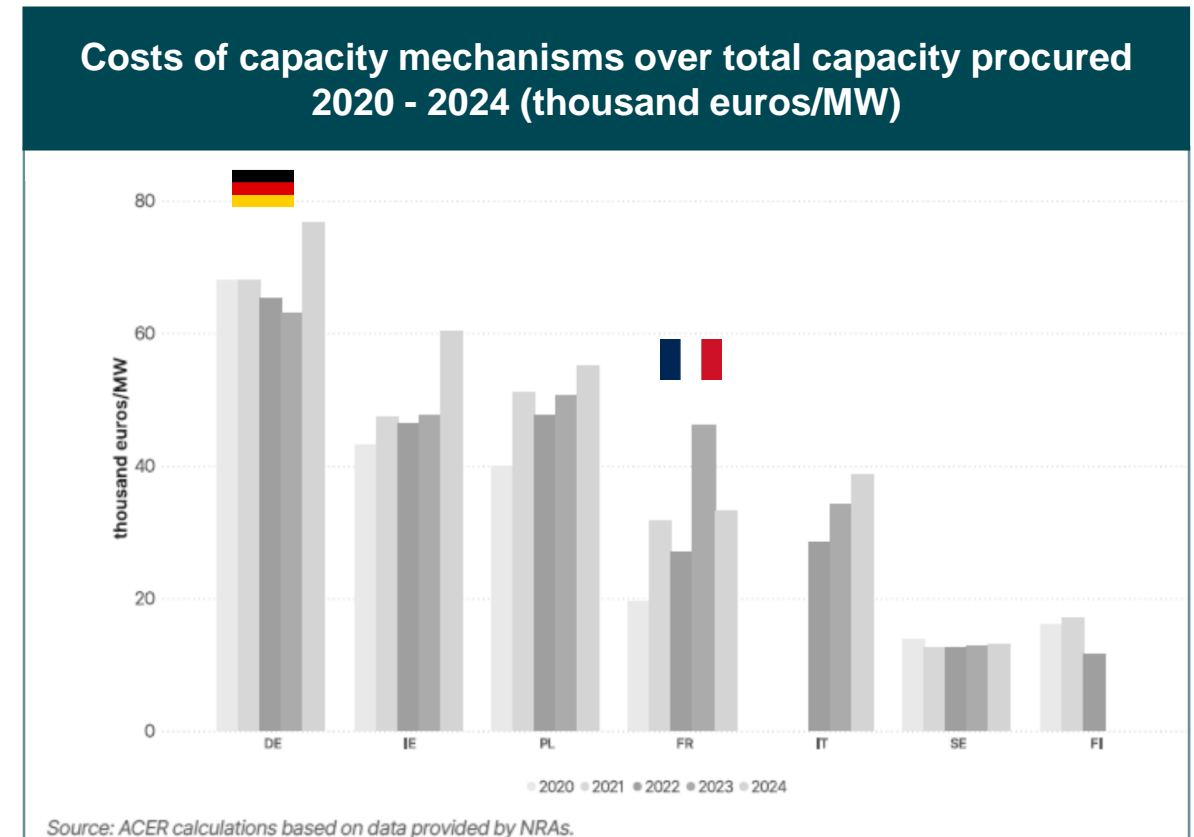
<sup>1</sup> Source: German TSOs. Exemplary target-oriented localisation of the demand for new capacity

<sup>2</sup> Source: Additional security of supply scenario of the TSOs for the LA 2030 study. The BNetzA's current SoS report assumes the construction of 17-21 GW of new natural gas-fired power plants by 2031.

## Incentivising secured capacity in Germany: Current plans and motivation

# EXISTING CAPACITY RESERVE IS INSUFFICIENT

- / Recent Capacity Reserve (until 2026):  
≈ 1,2 GW awarded
- / Required to maintain SoS standard: ≈ 21 GW
- / Expansion of Capacity Reserve?  
/ No incentives for required new construction



## Incentivizing secured capacity in Germany: Current plans and motivation

# ACCORDING TO THE CURRENT GERMAN GOVERNMENT'S PLANS, A CAPACITY MECHANISM SHOULD BE OPERATIONAL BY 2028

### Power Plant Safety Act<sup>1</sup> Tenders: 2025 - 2027



Tenders for **12.5 GW** of gas-fired power plant capacity and 500 MW of long-term storage capacity


### Capacity Mechanism Operational from 2028


Four design proposals were debated:


Peak price hedging obligation

Decentralised capacity market

Centralised capacity market 

Combined capacity market („KKM“) 

 preference of the German TSOs

 preference of the current government

2025

2028



**Breakup of the coalition government in Germany in November 2024:** Further implementation of both the tenders for gas-fired plants and the capacity mechanism is unclear and very likely to be delayed.

<sup>1</sup> = Kraftwerkssicherheitsgesetz (KWStG)

## Power Plant Safety Act as an interim solution

# POWER PLANT SAFETY ACT („KWSG“) ACCORDING TO RECENT DRAFT BY GERMAN GOVERNMENT<sup>1</sup>

/ According to the KWSG, in total 12.5 GW of power plant capacity and 500 MW of long-term storage capacity will be put out to tender.

### 1. Pillar: Decarbonization

- / Tender volume:
  - / **7 GW H2-ready gas-fired power plants:**
    - / Min. 5 GW new build
    - / Max. 2 GW modernisation
  - / 0.5 GW hydrogen sprinter power plants
  - / 0,5 GW long-term storage
- / Fuel Switch to H2 obligatory from 8<sup>th</sup> year after commissioning
- / Funding: Capex + contract for difference for fuel costs after fuel switch to H2

### 2. Pillar: Security of Supply

- / Tender volume:
  - / **5 GW new gas-fired power plants**
- / Fuel switch: No specification
- / Funding: Capex

/ The power plants are to be **built predominantly in the southern part of Germany**; incentive via a locational element.



Parliament's approval of the law unlikely before new elections.

<sup>1</sup> = Kraftwerkssicherheitsgesetz (KWSG), draft of 22 november 2024

## Power Plant Safety Act as an interim solution

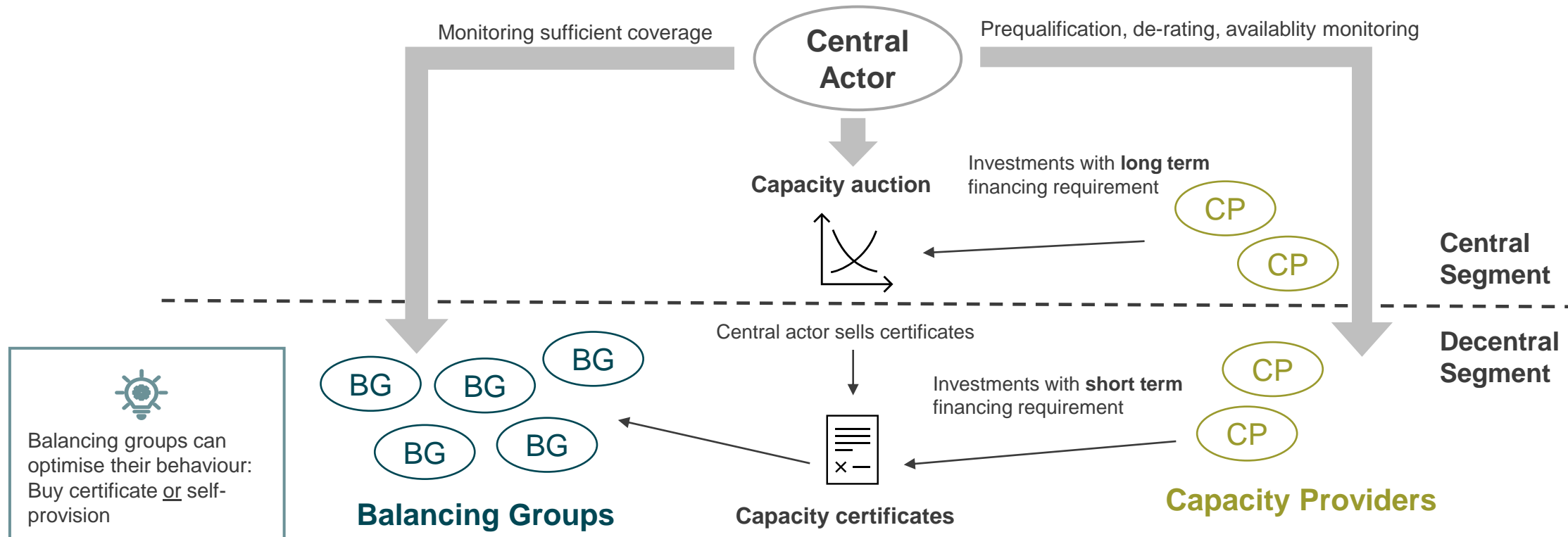
# POWER PLANT SAFETY ACT: LOCATIONAL ELEMENT TO INCENTIVISE POWER PLANTS IN SOUTHERN GERMANY

- / Power plants are to be **built predominantly in southern Germany** to reduce redispatch costs and ensure transmission adequacy.
- / The tenders include a **locational element** to meet the target of **2/3 of power plant capacity in the south**.
- / **Price steering instrument** to achieve the target:
  - / **Bonus for capacity in southern Germany** (“*Südbonus*”) changes the bidding order, making it more likely to be subsidised but does not affect the awarded bid value: the bonus does not increase the subsidy received.
  - / Bonus: 220 Euro/kW installed capacity of the bid



## Proposals for a capacity mechanism in Germany

# COMBINED CAPACITY MARKET AS THE CURRENT GOVERNMENT'S FAVOURITE - NEW ELECTIONS REOPEN THE DISCUSSION ON DESIGN



Implementation of a capacity market no longer possible under the current (remaining) government. Future government likely to favour a capacity market but concrete design option remains open.

## Proposals for a capacity mechanism in Germany

# GERMAN TSOS FAVOUR A CENTRALISED CAPACITY MARKET WITH A LOCAL COMPONENT

- / **Security of supply:** Ensures that sufficient capacity is available to meet demand.
- / **Investment incentives:** Provides clearer and more stable incentives for investment in secure capacity.
- / **Complexity reduction:** Reduces complexity for bulk buyers and suppliers compared to decentralised systems.
- / **Efficiency:** A centralised approach can make the coordination and management of capacities more efficient.
- / **Transparency:** The auction process is often more transparent and comprehensible.
- / **Local incentives:** Easiest inclusion of local component possible (→ It is important that power plants are built in the right places to fulfil the requirements of a stable and secure electricity system)
- / Many **experiences** from other countries (Belgium, UK, Ireland, Poland, Italy)

### 4 TSO proposal: Central capacity market with local component<sup>1</sup>



## Outlook: New government and political developments

# OUTLOOK: INCENTIVISING SECURED CAPACITY SHOULD REMAIN A PRIORITY FOR A NEW GOVERNMENT

- / Breakup of the coalition government in Germany on November 6<sup>th</sup>, 2024: Federal election expected to be held end of February 2025.
- / Power Plant Safety Act / tenders for H2-ready gas-fired plants
  - / Adoption of the current draft law very unlikely under the remaining government.
  - / Expected delay in finalizing /adapting the legislation of at least several months.
- / Capacity market implementation
  - / Responsibility of the next federal government to implement a capacity market by law.
  - / Design must then be worked out, enshrined in law and authorised by the EU Commission.
- / **In general, the introduction of direct tenders for new capacities and a subsequent implementation of a capacity market still seems likely under a new government, but high uncertainty about the schedule and concrete market design.**

- / TSO perspective:
  - / The next government should prioritise the tenders for new capacity and capacity market plans and **enable a fast implementation.**
  - / In order to cover system requirements, it is **crucial that secured capacity is built at system-serving locations.**
  - / Until sufficient new construction has been realised, the **reserve power plants** must be kept operational.



Le réseau  
de transport  
d'électricité

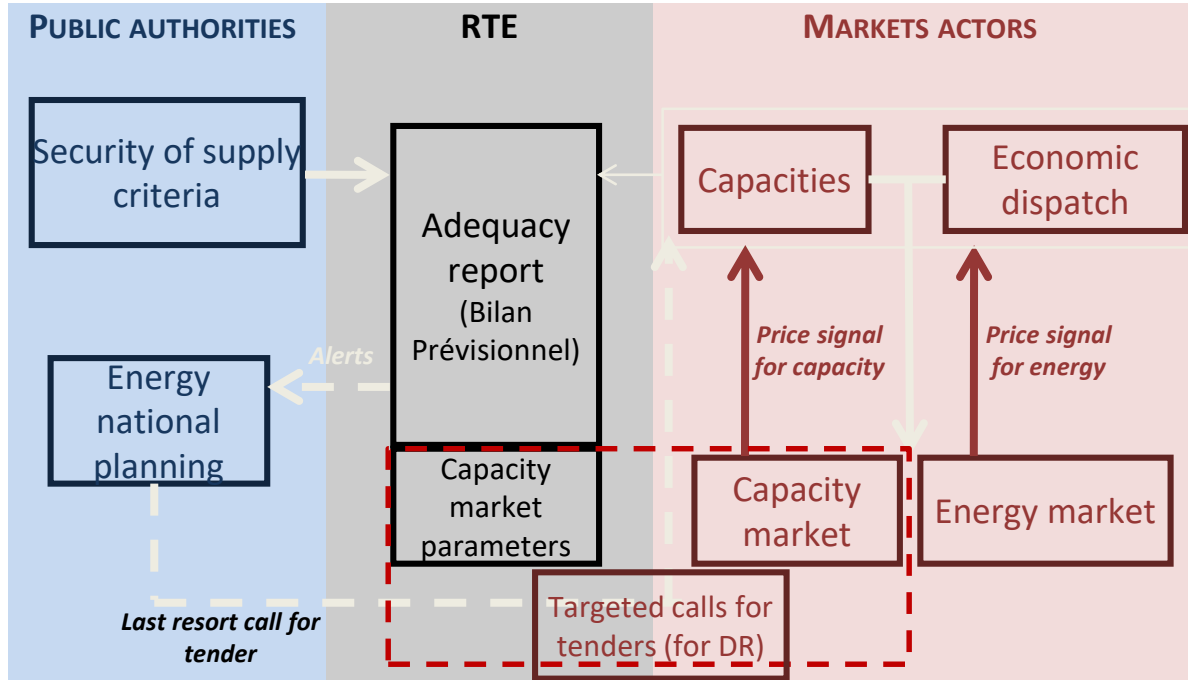
# Market mechanisms ensuring the security of supply

## Overview of the french market architecture

# A three layers architecture

To ensure security of supply in a competitive environment

Main features



- A capacity obligation for suppliers through a dynamic process that takes account of the thermal sensitivity of consumption
- Availability commitments for all capacity verified markets and physical checks
- An incentive for suppliers to control consumption during peak periods

The capacity mechanism is a tool to support the energy transition, which gradually evolve from a vision focused on the national peak to an approach integrating the flexibility needed by the system in a context of development of intermittent energies.

# The capacity market in a nutshell

## SoS criteria

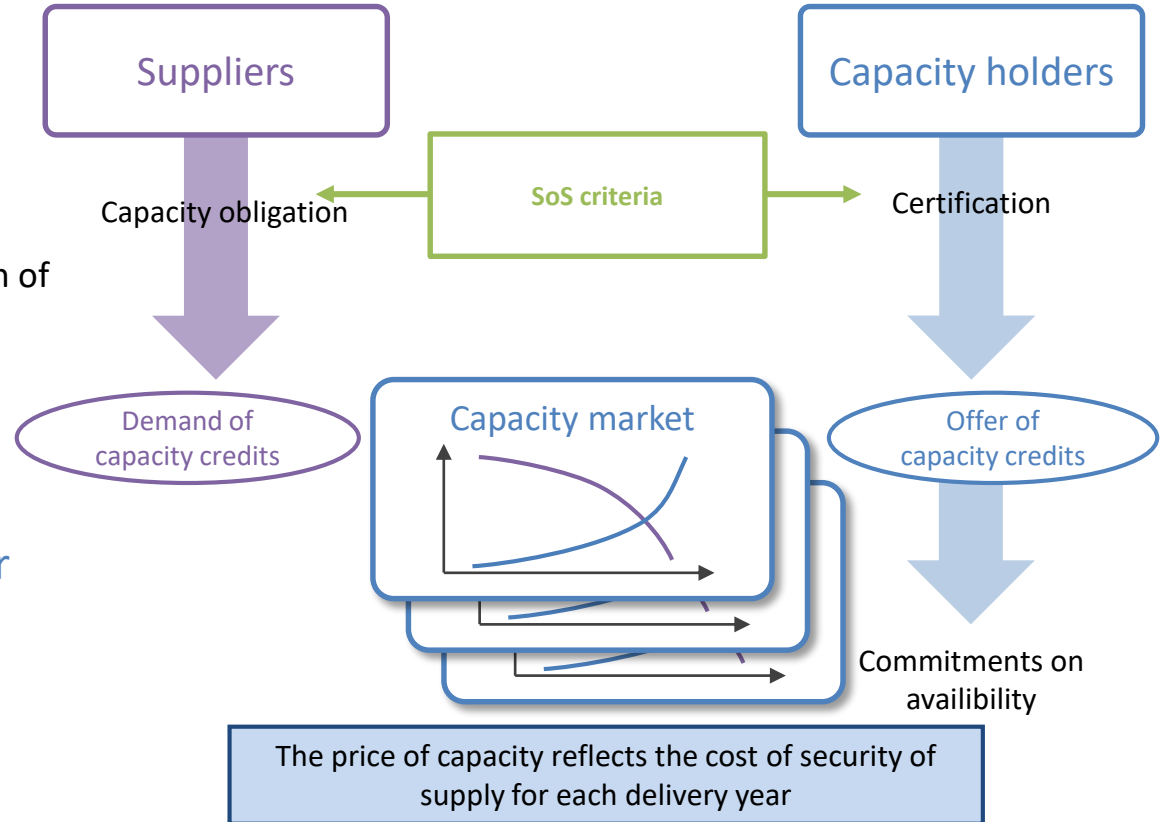
LOLE = 3h in France (2h after exceptional measures)

## Obligation on suppliers

- Based on the peak consumption of their clients
- Parameters known ex ante, real obligation based on measured consumption

## Availability commitments for capacities holders

In exchange, they receive capacity credits



# A decentralised, self-adapting mechanism to cover demand as closely as possible

No centralised obligation elaborated by a central entity on the base of forecasts but a decentralised evaluation by each supplier, based on the accurate knowledge of their clients and the evolutions

- **A continuous feedback loop** ensuring security of supply at a minimal cost and giving the right incentives to all actors (consumers and producers)

## Obligation in practice

Suppliers' obligations are based on a reference cold wave

- Based on consumption during winter peak period
- Calculated to an extreme  $T^\circ$  representative of the risk against which the system is seeking to hedge (so that the obligation is independent of a specific weather)
- A safety coefficient

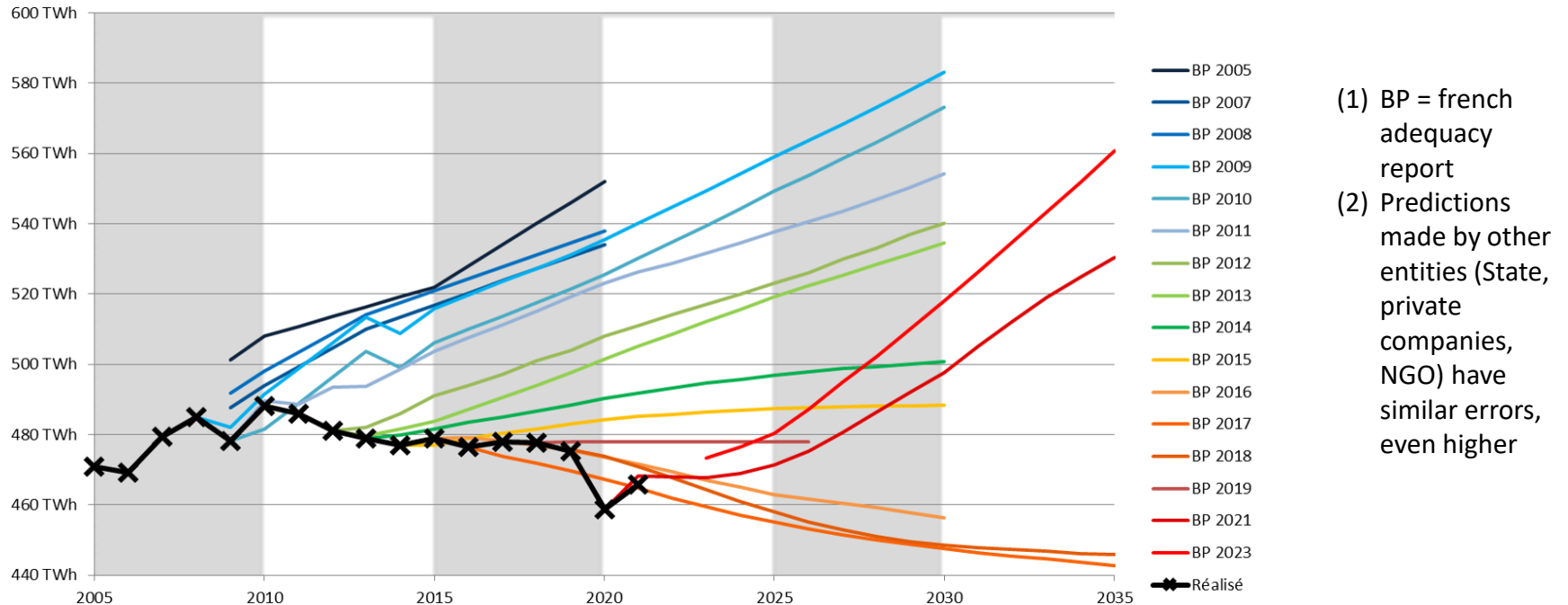
$$Obligation_s \approx \sum_{site \in S} obligation_{site}(s)$$

$$obligation_{site}(s) = CS * \sum_{j,h} \frac{measured\ consumption(s,j,h) + gradient_s(j,h)[Text(h) - TFLS(h)]}{nbhourspeakperiod}$$

# The difficulty of predicting and the advantages of a decentralised mechanism

"Prediction is very difficult, especially if it's about the future." W. Churchill

Evolution des prévisions de consommation en énergie



- (1) BP = french adequacy report
- (2) Predictions made by other entities (State, private companies, NGO) have similar errors, even higher

## Volume effect of a decentralized mechanism

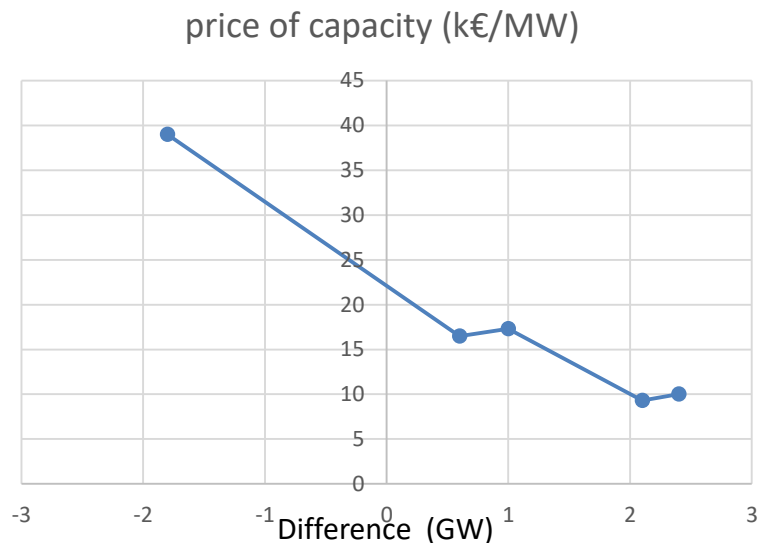
|      | Obligation forecast (GW) | Measured obligation (GW) | Gap (GW) | Price of capacity (k€/MW) |
|------|--------------------------|--------------------------|----------|---------------------------|
| 2017 | 90,0 BP 2015             | 87,8                     | 2,2      | 10                        |
| 2018 | 90,3 BP 2015             | 87,9                     | 2,4      | 9,3                       |
| 2019 | 96,4 BP 2015             | 94,4                     | 2,0      | 17,3                      |
| 2020 | 95,6 BP 2015             | 88,4                     | 7,2      | 16,5                      |
| 2021 | 93,5 BP 2016             | 92,7                     | 0,8      | 39                        |

- Mean gap per year : +2.9 GW
- An obligation based on forecasts would have been **2.9 GW higher** on average per year
- Without taking into account the price effect, it represents on average **an extra cost of 46 M€ per year**

(\* ) All the data used are public and available on the RTE's website and the CRE's website

## Price effect of a decentralized mechanism

|      | price of capacity (k€/MW) | Certified capacities (GW) | Measured obligation | Difference |
|------|---------------------------|---------------------------|---------------------|------------|
| 2017 | 10                        | 90,2                      | 87,8                | 2,4        |
| 2018 | 9,3                       | 90                        | 87,9                | 2,1        |
| 2019 | 17,3                      | 95,4                      | 94,4                | 1          |
| 2020 | 16,5                      | 89                        | 88,4                | 0,6        |
| 2021 | 39                        | 90,9                      | 92,7                | -1,8       |



- An estimation of the sensitivity of the price of capacity to the difference (Certified capacities-obligation) is **7 k€/MW / GW**.
- With a gap of 2.9 GW in terms of volume, the price effect is estimated to **20 k€/MW/per year**
- The extra cost (of a unique centralized obligation) is estimated to **1,8 Billion euros/per year (\*\*)**, compared to the cost of a decentralized mechanism when the price effect is taken into account

(\*) All the data used are public and available on the RTE's website and the CRE's website

(\*\*) due to the ARENH mechanism, the cost for the consumers would have been lower

# Certification process

Capacities of production and capacities of Demand Response are on an equal footing

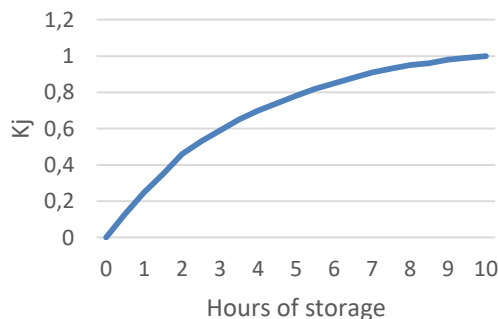
## General principle

The certification of a capacity reflects its contribution to security of supply

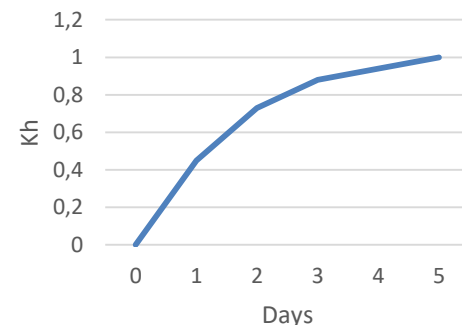
## In practice

- Taking account of actual availability during peak periods
- Stock constraints taken into account (for Hydro and batteries)
- A rebalancing mechanism offering flexibility to capacity operators

Discount rate for constraints on daily capacities



Discount rate for constraints on weekly capacities



## Evolutions of the french capacity mechanism

A new capacity mechanism for 2026

- A centralized obligation and centralized calls for tender, with a demand fixed by public authorities
- A flexible process to limit extra costs





**Thank you for your attention**

## Questions ?

December 12th 2024



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DES RISQUES**  
*Liberté  
Égalité  
Fraternité*

## Coming up next...

- January 22th | Franco-German Energy Forum, Online  
**Outlook on the future European electricity market design**
- January 28th | Paris  
**Franco-German energy transition galette**
- February 11th | Side Event, Essen  
**Capacity Market and Demand Response: Technical and economic potential for the industry and the electricity grid in Germany and France**

▶ Registration now open on [ofate.eu/dfbew.eu](https://ofate.eu/dfbew.eu)

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