
Continental Europe

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TRACTEBEL

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Congestion management

The Clean Energy Package | European level

Enabling the long-term vision for a climate neutral continent by 2050



2016 November

The EC set out the Clean Energy Package composed of 5 Directives (D) and 3 Regulations (R):

2018 First Publications in the Official Journal

(see procedure below)

June

Energy Performances in Buildings (D)

December

Renewable Energy (32% RES target in 2030) (D)

Energy Efficiency (-32.5% in 2030 vs PRIMES 2007) (D)

Governance of the Energy Union (R)

2019 May (scheduled)

Electricity Regulation

Electricity Directive

Risk Preparedness (D)

ACER (R)



The Council has to approve the political agreement reached



WHY

WHAT

HOW

The Clean Energy Package

This package is the legal framework necessary to reach ambitious energy and climate commitments (Paris COP21, 2050 EU Climate Strategy) by transitioning towards a greener and modern economy:

1. Putting Energy Efficiency First
2. Demonstrating Global Leadership in renewables
3. Delivering a fair deal for consumers

Energy Efficiency (Energy Efficiency & Buildings)

- -32.5% in 2030 vs PRIMES 2007 (upward clause in 2023)
- Extension of the annual energy saving obligation
- Towards a low and zero-emission building stock in by 2050
- Strengthen long term building renovation strategies
- Supporting ICT and smart technologies

Renewables (Renewable Energy)

- 32% RES Target (upward clause in 2023)
- Establish a framework for self consumption

Market Design (Elec R. & D., ACER, Risk Preparedness, Governance)

- Towards the European Model
- Consumers as active players of the electricity systems
- Stricter and harmonized CRM rules across MS
- ACER: strengthened role & Regulatory Observatory
- Common methods for assessing risks & managing elec. crises

Legislative Procedure

1. The EC proposes a text.
2. The **Council** and the **Parliament (EP)** adopt their versions, amending EC proposals.
3. The three entities formally meet under the guidance of the EU Presidency to agree on a common text (**trilogue procedure**)
4. The EP and the Council have a final vote on the agreed text
5. Publication in the Official Journal (OJ) of the EU
6. National Parliaments has 2y to translate Directives into national law (Regulation directly implemented)

Capacity Outlook: More than 90GW of today's reliable thermal capacity closed by 2030. Intermittent Wind and PV will double, increasing by more than 140GW.

Nuclear

Policy driven

Nuclear phase-out in **DE** (end of 2022) and **BE** (2025)
 Nuclear in France according to **RTE Ampere Scenario**
 (63.1 GW today and 48.5 GW in 2030)

RES Development

Entso-E TYNDP 2018 : Decentralized Generation
 Capacity installed in EU14 (modelling scope):

- **PV** 108 (350) GW in 2018 (2030),
- **Wind Onshore** 133 (191) GW in 2018 (2030),
- **Wind Offshore** 16 (58) GW in 2018 (2030)

Coal-based Generation

Policy driven

Coal is phased-out in **FR** (end of 2021), **IT** (2025), **UK** (non-CCS, 2025) and **NL** (2029).
 Technical lifetime of 40y in other countries (economic extensions not allowed).

Gas-based Generation

Technical lifetime

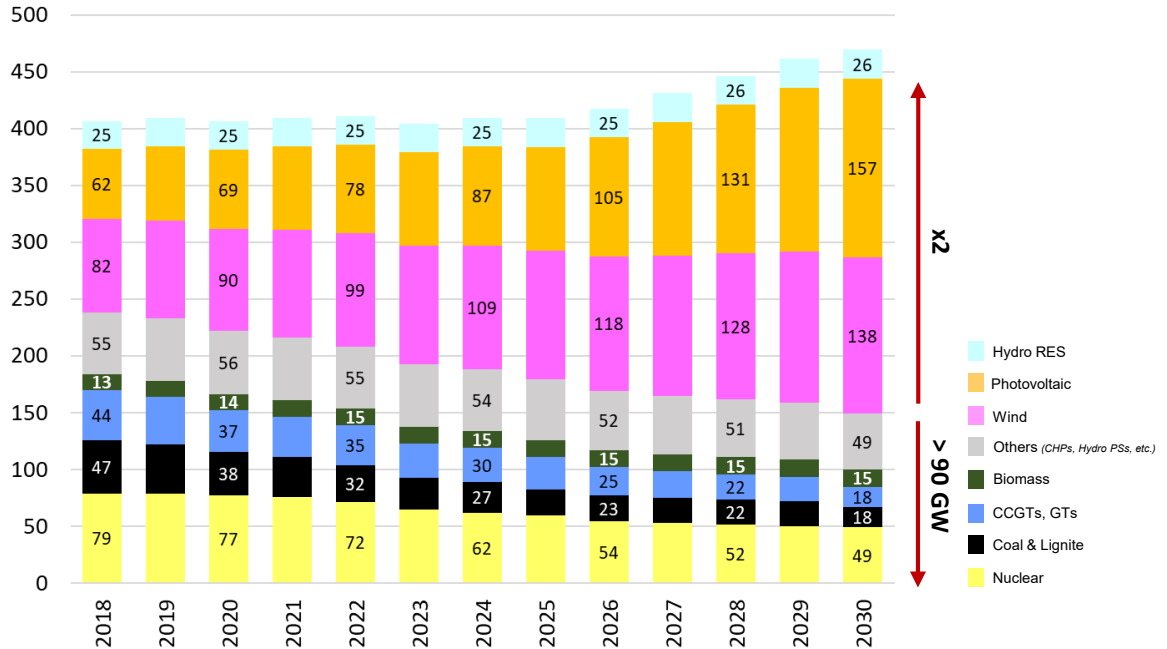
Operation of existing assets, based on technical lifetime: CCGT 20y, GT 20y . A sensitivity is foreseen with economic asset management: lifetime extension, reconversion, brownfield development)

Demand & Peaks

IEA WEO 2017 New Policies Scenario

CAGR 2018-30 : ~0.35% (both for annual and peak load)

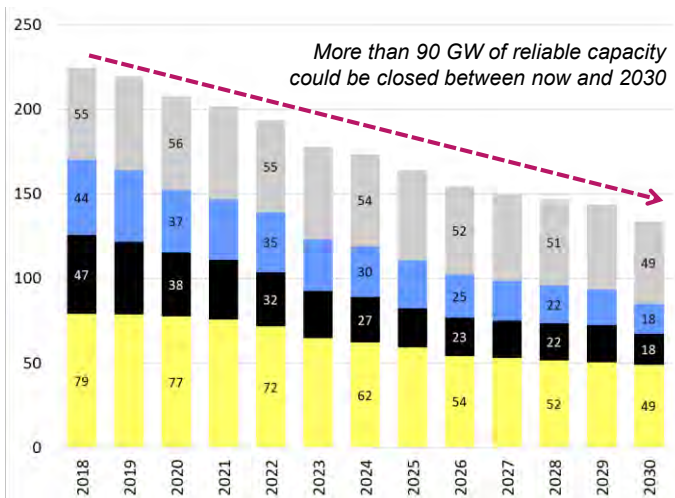
Capacity Evolution RES & Existing Thermal - CWE4* [GW]



* BE, DE, FR, NL

Without further incentives to keep existing or to build new reliable capacity, severe adequacy issues appear as of winter 2022/23.

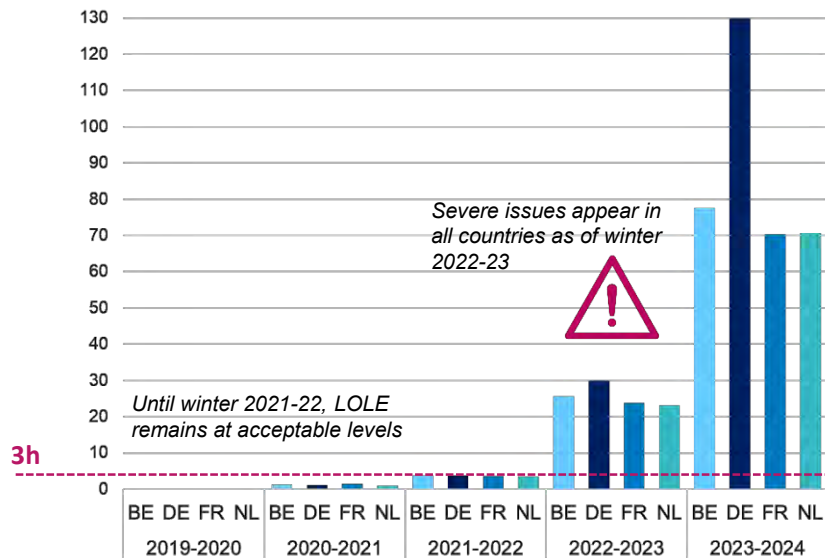
Capacity Evolution Existing Thermal & RES - CWE4* [GW]



* BE, DE, FR, NL

- Coal & Lignite
- Nuclear
- CCGTs, GTs
- Others (Hydro PS, CHPs, etc.)

Expected scarcity hours during winter periods [hours/year]



3h

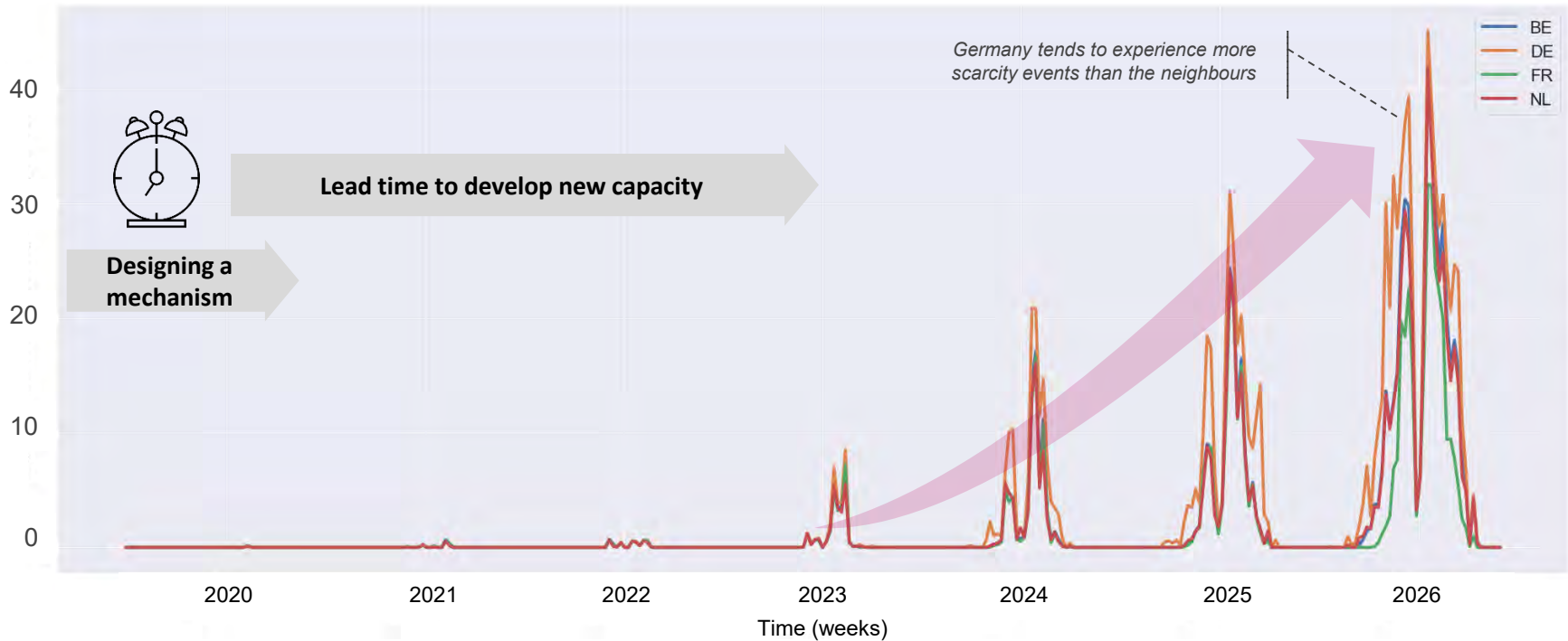
Energy Not Served [GWh/y]

	19/20	20/21	21/22	22/23	23/24
BE	0	0	0.3	13	50
DE	0	0	1.1	94	342
FR	0.1	1.6	1.2	4.5	7
NL	0	0	0.3	0.3	0.3

Scarcity events tend to happen simultaneously across countries as of winter 2022-23. Measures have to be taken now.

CASE WITHOUT FURTHER INCENTIVES

Expected number of scarcity hours per week [hours/week]



The European Target Model

based on a temporal sequence of forward, short term day-ahead and intraday as well as real-time balancing markets.



The simplified grid representation (especially for ATC, but also for Flow-Based) requires **countertrading and out-of-market redispatch measures** to align with the physical characteristics of the grid.

- European market integration started with integrating DAM (market coupling, auction based) and is further implemented at IDM (XBID) and Balancing (e.g. TERRE, PICASSO) level.
- The view is that DAM are the reference, while IDM and Balancing are adjustment markets.

CACM Guidelines – Key requirements for the establishment of single day-ahead and intraday coupling

COMMISSION REGULATION (EU) 2015/1222

- (Preamble 13) Capacity should be allocated in the day-ahead and intraday market time-frames using **implicit allocation methods**, in particular methods which allocate electricity and capacity together. In the case of single day-ahead coupling, this method should be implicit auction and **in the case of single intraday coupling it should be continuous implicit allocation**.
- (22) Reliable pricing of transmission capacity should be introduced for the intraday market time-frame, **reflecting congestion** and (Art.55) shall be **based on actual orders**.
- (7) There are two permissible approaches when calculating cross-zonal capacity: flow-based or based on coordinated net transmission capacity. The **flow-based approach should be used as a primary approach for day-ahead and intraday capacity calculation** where cross-zonal capacity between bidding zones is highly interdependent.
- Art. 53, **products accommodated**: the continuous trading matching algorithm is able to accommodate orders covering **one market time unit and multiple market time units** - all NEMOs shall consult [...] market participants, to ensure that available products **reflect their needs**.



CONTINUOUS TRADING + EFFICIENT PRICING AND USAGE OF TRANSMISSION CAPACITY = CONTRADICTION?

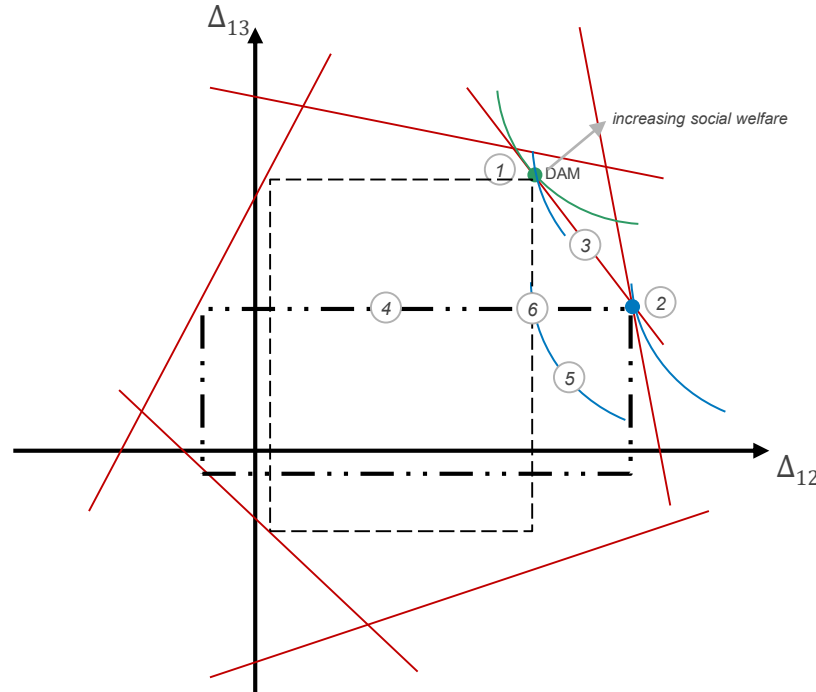
Continuous trading and “Tâtonnement” do not necessarily lead to the socially optimal intraday dispatch

3-zones setting - Net exchange balances – DAM dispatch with FBMC and Intraday dispatch with auctions (FBMC) or continuous trading (ATC)

- ① The DAM clears, taking flow-based market coupling constraints into account
- ② New information on RES, load and plant availabilities imply a modified objective function. The IDM clearing with the same FBMC constraints would deviate from the DAM clearing as a result.
- ③ The new dispatch can be achieved with auctions, by moving “on the FBMC border

Can this new dispatch be achieved with bilateral/continuous trade?

- ④ Condition 1: the CT algorithm updates the ATC box after each trade
- ⑤ Condition 2: trades are beneficial for market participants. This is not true in this example, since social welfare decreases here.
- ⑥ Condition 3: the algorithm knows the efficient FBMC dispatch beforehand and does not allocate “too much capacity in the right direction”. Otherwise, trade may never converge.



Legend:

- Flow-based constraints of the day-ahead market
- Objective function DAM
- Objective function IDM
- Optimal dispatch in day-ahead or intraday, according to the flow-based constraints
- ⌊ ATC constraints, based on the day-ahead flow-based constraints (possibly updated during the intraday CT)

In the meantime, ACER has proposed 3 auctions...

3 auctions:

1. 15 :00 D-I: cross-zonal gate-opening time
2. 22:00 D-I: when the first intraday capacity re-calculation is — at least as a first step - expected to be finished
3. 10:00 D: when the second intraday capacity re-calculation is — at least as a first step - expected to be finished

**DECISION No 01/2019
OF THE AGENCY FOR THE COOPERATION OF
ENERGY REGULATORS**

of 24 January 2019

**ESTABLISHING A SINGLE METHODOLOGY FOR PRICING INTRADAY CROSS-
ZONAL CAPACITY**

THE AGENCY FOR THE COOPERATION OF ENERGY REGULATORS,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators¹, and, in particular, Article 8(1) thereof,

Having regard to Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management², and, in particular, Article 9(11) thereof,

Having regard to the outcome of the consultation with the concerned regulatory authorities and transmission system operators,

Having regard to the favourable opinion of the Board of Regulators of 23 January 2019, delivered pursuant to Article 15(1) of Regulation (EC) No 713/2009,

Whereas:

1. INTRODUCTION

- (1) Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management (the 'CACM Regulation') laid down a range of requirements for cross-zonal capacity allocation and congestion management in the day-ahead and intraday markets in electricity. Chapter 5 of the CACM Regulation

Congestion management

Bidding zones are large and often national. Requiring:

- Calculation of cross zonal available capacity
- Intra-zonal redispatch → potentially reserve capacity for re-dispatching
- Avoid discrimination between internal and cross zonal flows → until now some preference to internal flows. The new regulation article 13 and 14 aim to change this by introducing a minimum available capacity for cross border trade.
- Regular bidding zone reviews → first attempt by ENTSO-E (2018) received some criticism
- Some liberty for member states to move to finer spatial granularity in the intraday market → Polish move to nodal pricing



Festgestellter Bedarf an Reservekraftwerksleistung für die Winter (in MW)

Bericht vom	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2022/2023
30. April 2019	-	-	-	-	-	5.126	-	10.647
27. April 2018	-	-	-	-	6.600	-	6.600	-
28. April 2017	-	-	-	10.400	3.700	-	-	-
29. April 2016	-	-	-	-	-	-	-	-
4. Mai 2015	-	6.700-7.800	6.600-7.700	-	-	1.600	-	-
26. Sep. 2014	545*	-	-	-	-	-	-	-
2. Mai 2014	3.091	6.000	-	7.000	-	-	-	-
30. Sep. 2013	-	4.800	-	-	-	-	-	-

* zusätzlich für das 1. Quartal 2015

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https://www.bundesnetzagentur.de/DE/Sachgebiete/ElektrizitaetundGas/Unternehmen_Institutionen/Versorgungssicherheit/Netzreserve/netzreserve-node.html