

Market Reforms for Stressed Conditions: The Case of Europe

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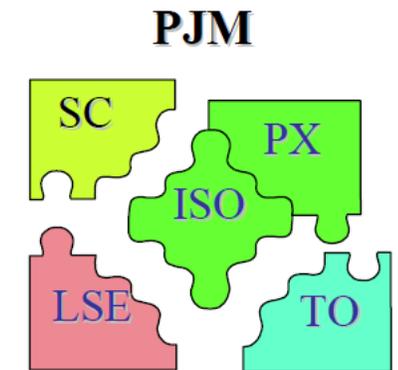
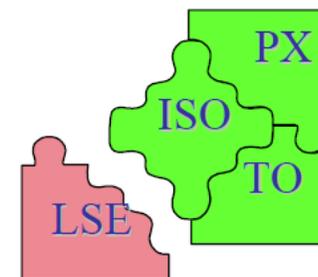
An Overview of European Market Design

Major Differences Between US and Europe

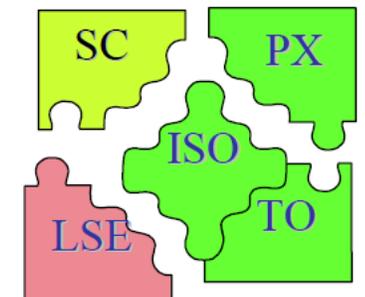
- European market design resembles, most closely, the pre-2001 California design
- Separation of *power exchange* (PX) and *transmission system operator* (TSO)
- Simplified representation of transmission network via *zonal pricing*
- Diminished role of real-time market:
 - *Balancing responsible parties* (BRPs) encouraged to maintain balance in real time
 - *Balancing service providers* (BSPs) balance the system by activating reserve
- No real-time market for reserve capacity



U. K. (before 2001)



NORD POOL



The Day-Ahead Market

- **Price Coupling of Regions (PCR)**: project of European power exchanges to create a single day-ahead price coupling solution
- **EUPHEMIA**: the algorithm developed by *N-SIDE* (*UCLouvain* spin-off) for computing day-ahead price
- Zonal pricing results in various challenges
 - Operational efficiency (congestion management cost)
 - Discretionary provision of available capacity by TSOs
 - Surprisingly, investment signals and gaming are discussed less currently among stakeholders
- Nodal pricing no longer tabu in European market design discussions (for example, Polish TSO is investigating a nodal design)

PCR users and members

- Markets using PCR: MRC
- Markets using PCR: 4MMC
- Markets PCR members
- Independent users of PCR
- Markets associate members of PCR



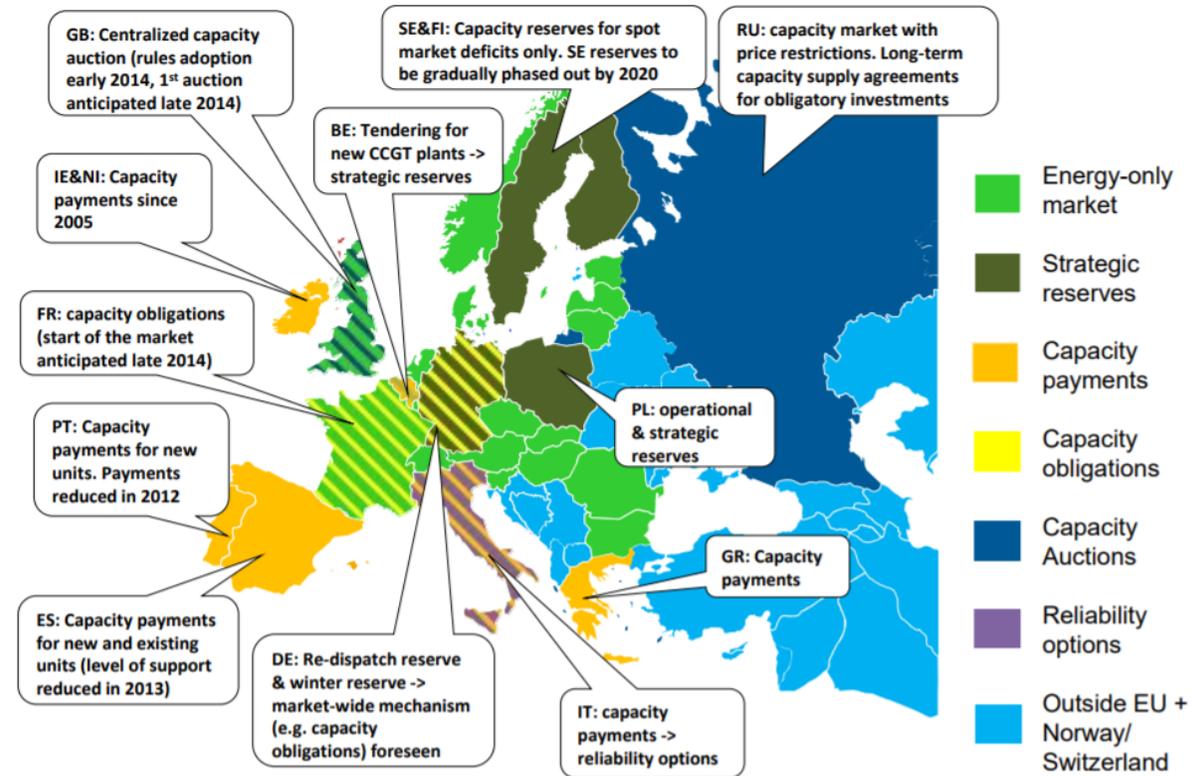
Real-Time Operations

- Transmission system operators (TSOs) manage real-time operations
- TSOs procure reserve capacity from individual generators in month/day-ahead auctions from balancing service providers (BSP)
- *Nominations*: day-ahead production schedules submitted to TSOs for individual generators, according to
 - day-ahead cleared trades
 - reserve commitments
- In real time, the TSO uses (i) stand-by units (called *free bids*), (ii) BSP capacity, and (iii) topological corrections in order to de-congest and balance the system
- Activated reserves are only paid for activated energy in real time, not real-time reserve capacity
- There are two major ongoing projects attempting to coordinate activation of reserves across Europe: **PICASSO** (secondary reserve) and **MARI** (tertiary reserve)

ORDC Developments in Europe

Balkanization of European Electricity Market

- Diverse approaches towards remuneration of (flexible) capacity in Europe
- Some of these measures draw scrutiny as possibly constituting anti-competitive *state aid*
- European Commission not in favor of balkanization of member-state market rules
- Two *legal documents* of the European Commission indicate favorable view towards ORDC:
 - Electricity balancing guideline
 - Clean energy package



Source: Eurelectric

European Commission Electricity Balancing Guideline, Article 44(3)

Each TSO may develop a proposal for an additional settlement mechanism separate from the imbalance settlement, to settle the procurement costs of balancing capacity pursuant to Chapter 5 of this Title, administrative costs and other costs related to balancing. The additional settlement mechanism shall apply to balance responsible parties. This should be preferably achieved with the introduction of a **shortage pricing function**. If TSOs choose another mechanism, they should justify this in the proposal. Such a proposal shall be subject to approval by the relevant regulatory authority.

Official Journal of the European Union

COMMISSION REGULATION (EU) 2017/2195
of 23 November 2017
establishing a guideline on electricity balancing

Clean Energy Package, Article 20(3)

Member States *with identified resource adequacy concerns* shall develop and publish *an implementation plan with a timeline* for adopting measures to eliminate any identified regulatory distortions *or market failures as a part of the State aid process*. When addressing resource adequacy concerns, *the* Member States shall in particular *take into account the principles set out in Article 3 and shall consider:*

...

(c) introducing a **shortage pricing function** for balancing energy as referred to in Article 44(3) of Regulation 2017/2195;

...

European Parliament

2014-2019



TEXTS ADOPTED

Provisional edition

P8_TA-PROV(2019)0227

Internal market for electricity *I**

European Parliament legislative resolution of 26 March 2019 on the proposal for a regulation of the European Parliament and of the Council on the internal market for electricity (recast) (COM(2016)0861 – C8-0492/2016 – 2016/0379(COD))

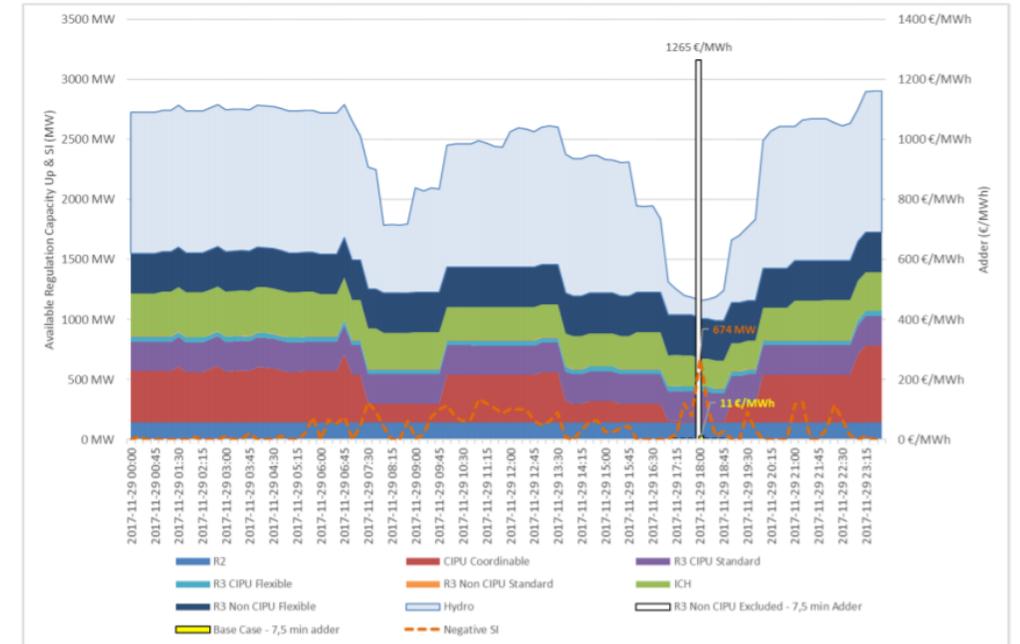
(Ordinary legislative procedure – recast)

The Belgian ORDC Studies

- **First study (2015)** [1]: How would electricity prices change if we introduce ORDC in the Belgian market?
 - **Finding:** it could enable the majority of combined cycle gas turbines, which are currently operating at a loss, to *recover their investment costs*
- **Second study (2016)** [2]: How does scarcity pricing depend on
 - strategic reserve
 - value of lost load
 - restoration of nuclear capacity
 - day-ahead (instead of month-ahead) clearing of reserves
- **Third study (2017)** [3]: can we take a US-inspired design and plug it into the existing European market?
 - **Finding:** the energy adder in itself will not suffice, the first step is to put in place a *real-time market for reserve capacity*

ORDC Developments in Belgium

- **ELIA ex-post simulation (2018)** [4]: ELIA (Belgian TSO) releases report on the simulation of scarcity prices in the Belgian market for 2017
 - **Finding:** comfortable year, infrequent occurrence of adders
- **ELIA parallel run (2019):** By October 2019, ELIA will be posting adders publicly
- **New question(s):** could Belgium implement ORDC unilaterally? How do the adders interact with the MARI and PICASSO platforms?



ORDC adder on November 29, 2017
Source: ELIA [4]

Thank You

For more information

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References

- [1] A. Papavasiliou, Y. Smeers. “Remuneration of Flexibility under Conditions of Scarcity: A Case Study of Belgium”, the *Energy Journal*, vol. 38, no. 6, pp. 105-135, 2017.
- [2] A. Papavasiliou, Y. Smeers, G. Bertrand. “An Extended Analysis on the Remuneration of Capacity under Scarcity Conditions”, *Economics of Energy and Environmental Policy*, vol. 7, no. 2, 2018.
- [3] A. Papavasiliou, Y. Smeers, G. de Maere d'Aertrycke, “Study on the general design of a mechanism for the remuneration of reserves in scarcity situations”, June 6, 2019.
- [4] ELIA, “Study report on Scarcity Pricing in the context of the 2018 discretionary incentives”, December 20, 2018.