



EU Market Integration, Market Coupling & Price Formation

Process toward an EU Internal Electricity Market

International Workshop on Electricity Sector
Modernization, Brasilia 4-5 Sept 2019

Agenda

- Architecture of the EU electricity market
- Electricity trade and price formation
- System operation and TSO-cooperation
- Importance of price signals and key challenges EU market

1. Architecture of the EU electricity market



Development of the Internal Energy Market (IEM)



Internal Electricity Market

- Market restructuring and integration since 1996
- 4 packages of EU legislation
- Key features
 - Unbundling
 - Retail market liberalisation
 - Consumer protection
 - Consolidation of suppliers/generators
 - Emergence of power exchanges
 - Independent energy regulators
 - Stronger cooperation: ENTSO-E + ACER
 - Harmonisation of rules (EU netcodes)

Main actors in the EU market

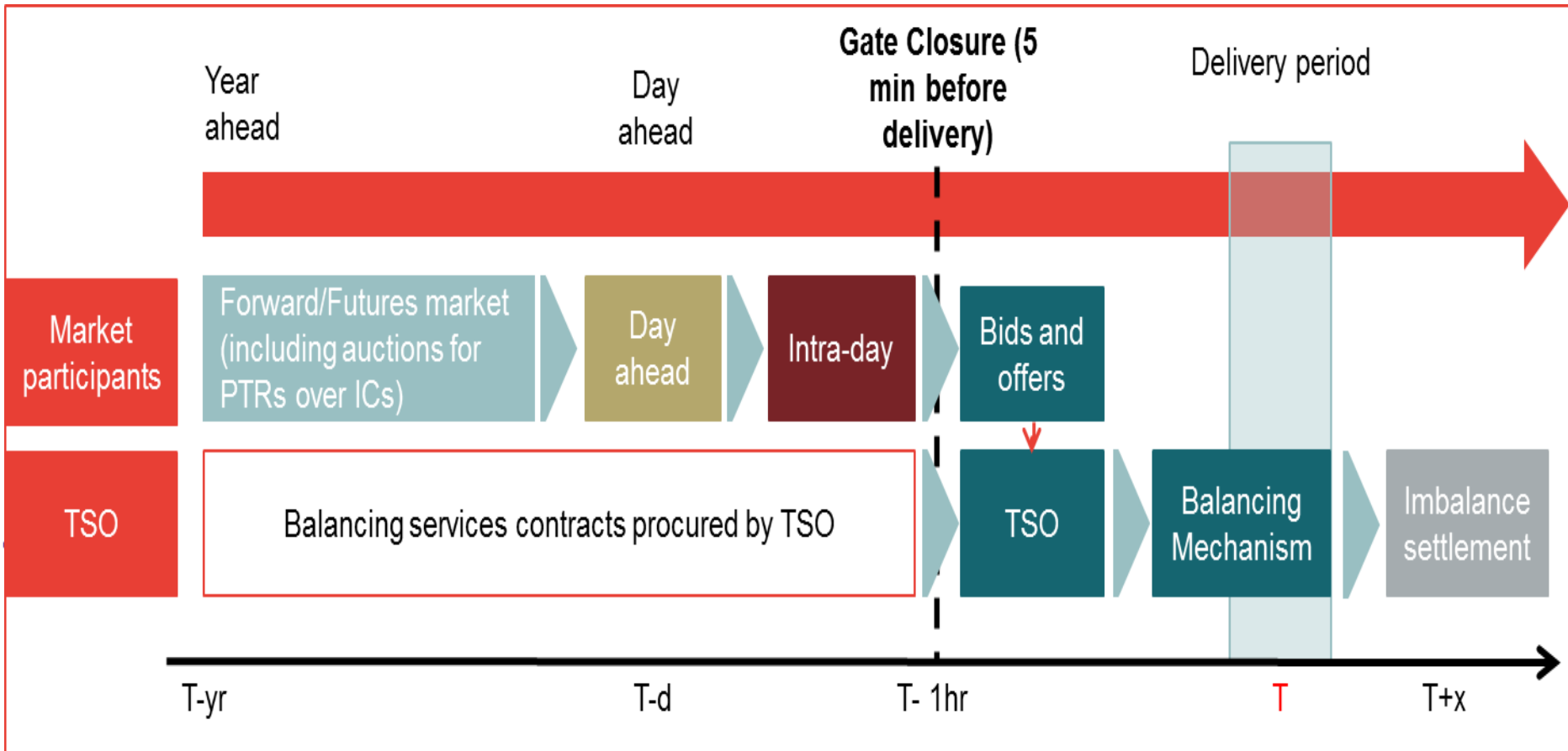
- TSOs (ENTSO-E)
- DSOs
- Traders
- Power exchanges
- NRAs (ACER)
- EU Commission
- National ministries
- Producers/generators
- Suppliers
- Large consumers
- Small consumers
- New players:
 - Storage operators
 - Aggregators
 - Local energy communities

2. Electricity trade and price formation



Electricity trade and price formation

- Market functioning, energy exchanges and bidding zones
- Different wholesale markets
- Market coupling, role of interconnections and price convergence
- EU netcodes and harmonisation process

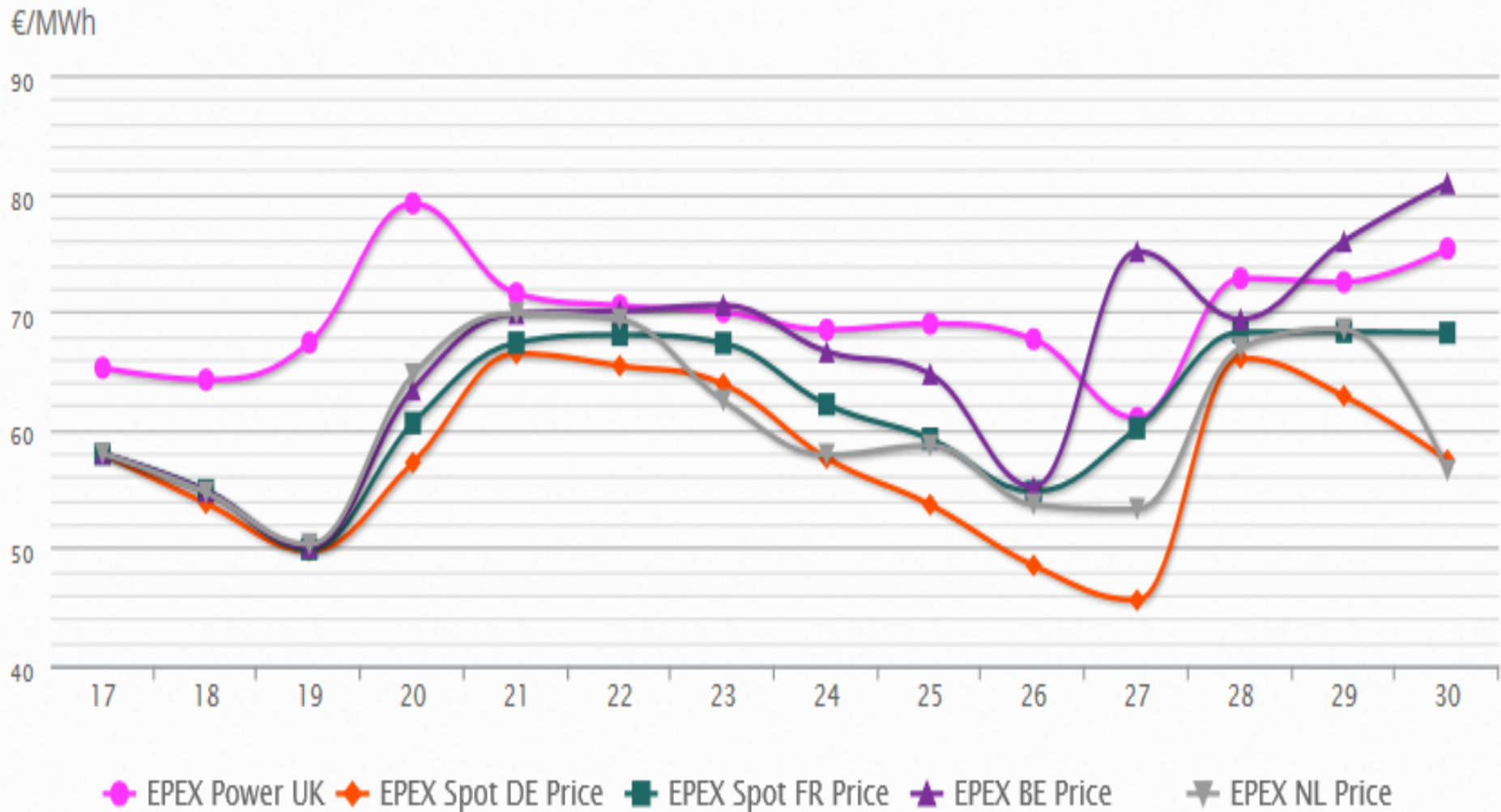


Forward/futures	Day ahead	Intra-day	Balancing Mechanism	Imbalance settlement
Market participants hedge their exposure to the spot price by trading forward.	Contract between buyer and seller for following day's delivery.	Intra-day trading allows the fine-tuning of contracted position between the day ahead market and gate closure	At gate closure the TSO takes over to balance consumption and generation in real time.	Distributes costs of grid balancing actions to responsible parties (generators or retailers).

EU Bidding Zones



Trade in the EU interconnected system: Price Convergence



Applying date : 17 Aug 2018 - 30 Aug 2018

EU regulatory framework: electricity codes

Connection Related Codes

- **Requirements for Generators** (RfG)
- **Demand Connection Code** (DCC)
- **HVDC Connection Code** (HVDC)
- **Connection Procedures** (CP)

System Operation Related Codes

- **Operational Security Network** (OS)
- **Operational Planning & Scheduling** (OPS)
- **Load Frequency Control & Reserves** (LFCR)
- **Operational Procedures in an Emergency** (EP)
- **Staff Training** (ST)

Market Related Codes

- **Capacity Allocation & Congestion Management** (CACM)
- **Forward Capacity Allocation** (FCA)
- **Electricity Balancing** (EB)

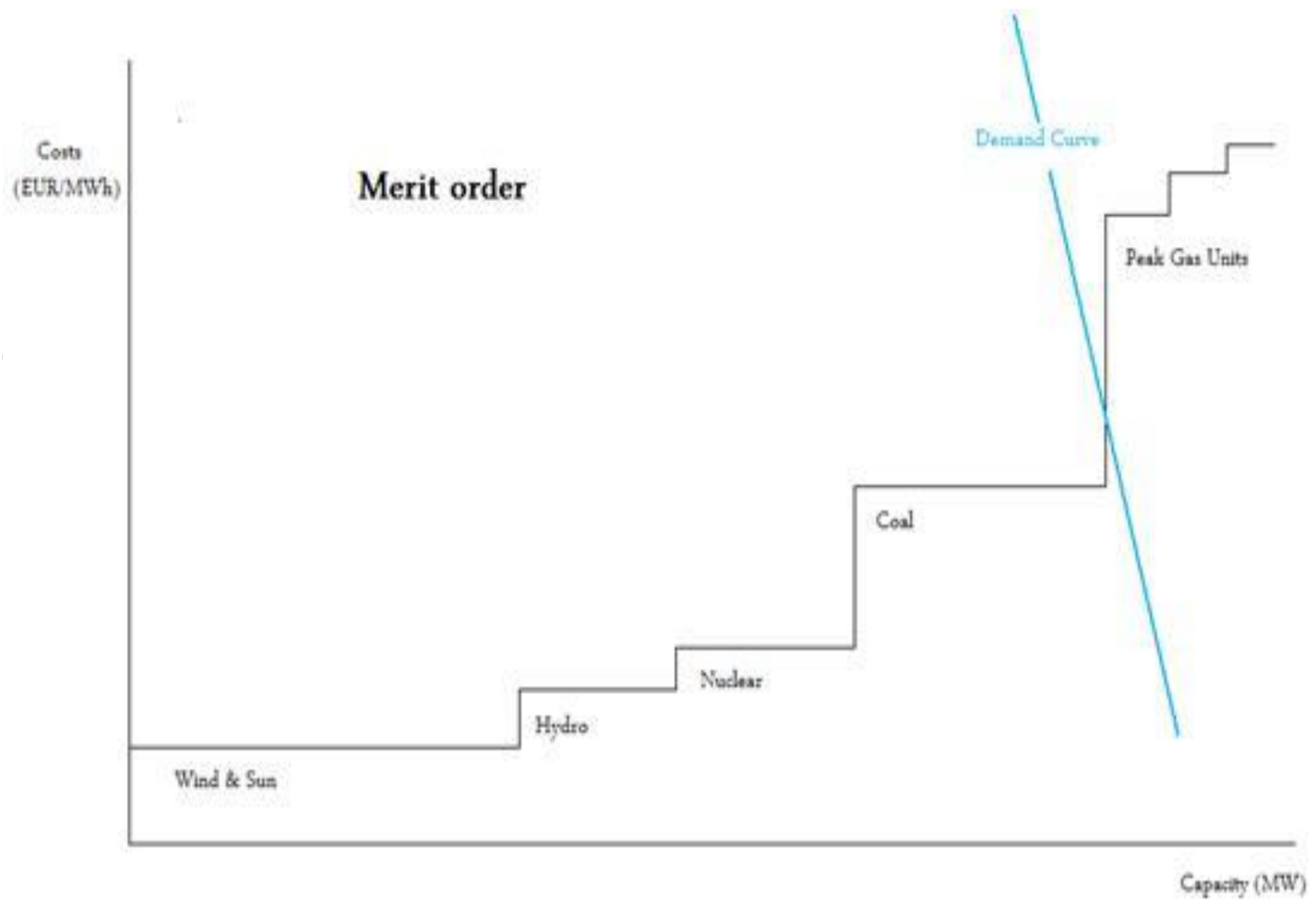
3. System operation and TSO-cooperation



System operation and TSO cooperation

- Merit order concept/ marginal pricing
- Capacity allocation
- Regional TSO cooperation
- Operational security + the role of the “regional security coordinator”(RSC)





4. Importance of price signals + Key challenges EU market



Price signals and Key challenges

- Need for increased flexibility in the system
- Role of short term markets
- Scarcity pricing
- “Energy only”- market vs need for CRMs
- Intensify regional cooperation: role of RSCs
- Optimisation of bidding zones (..or toward nodal?)

Competitive energy markets - competitive economy



Questions and discussion

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