

European Union Energy Day: Transitioning the Electricity Sector – Regional Balancing

Konstantin Staschus, PhD
ENTSO-E

World Future Energy Summit
17 January 2017, Abu Dhabi

OVERVIEW

- The role of ENTSO-E in the EU
- What do 27% renewables by 2030 = +/- 45% for the power system mean?
 - Fluctuating, low capacity factor renewables providing large % of the load lead to much more installed capacity than load, and to temporary regional surpluses and deficits to be curtailed, stored, or transported from low-value to high-value areas
 - This needs clear cross-border technical and market rules consistent on continental scale, a strong continental grid, a strong continental forward, day-ahead and especially intraday market,...
 - ... and also clear market rules for the procurement and trading of balancing energy
- The good progress achieved and underway:
 - Joint planning for the strong continental grid
 - Single algorithms and software for continental day-ahead and intraday trading
- 4 different balancing products defined in the Balancing Guideline.
- How the European Commission's Clean Energy for All Package helps



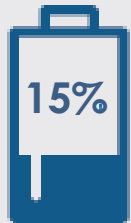
42 TSOs
35 countries



Over 300 000 km of
transmission lines

7 times the Earth's circumference

3300 TWh electricity
consumption

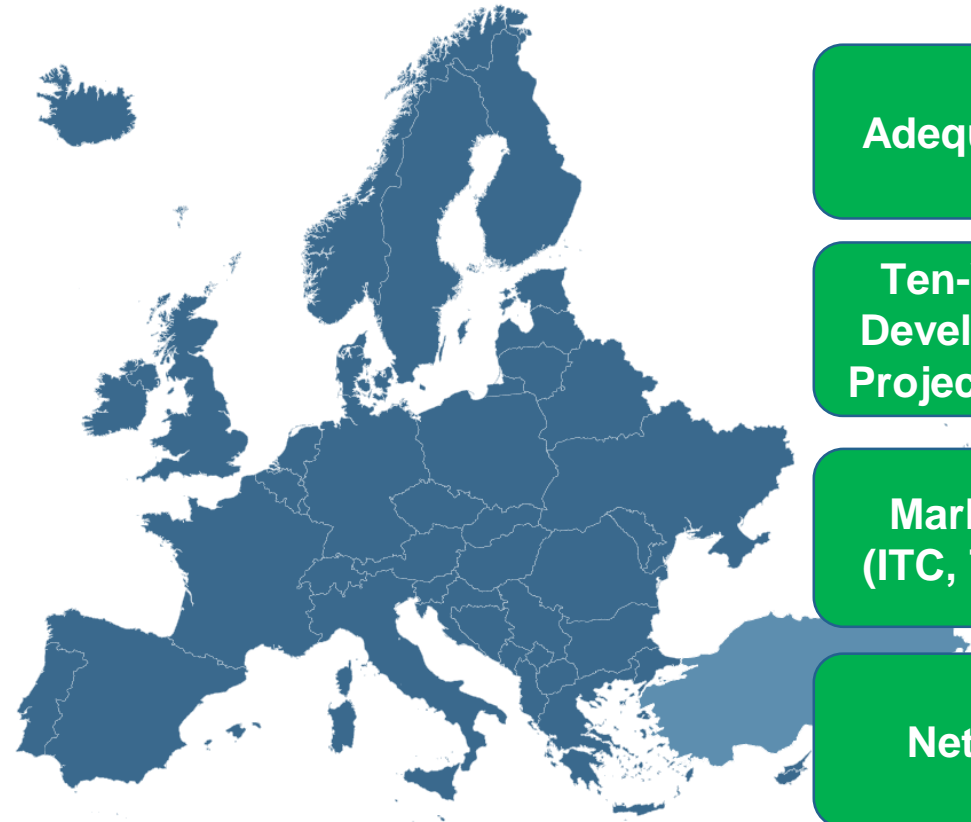


15%
of the global
electricity
consumption



over 500 million
people served

ENTSO-E: legal mandates from four different EU laws



Adequacy Analyses

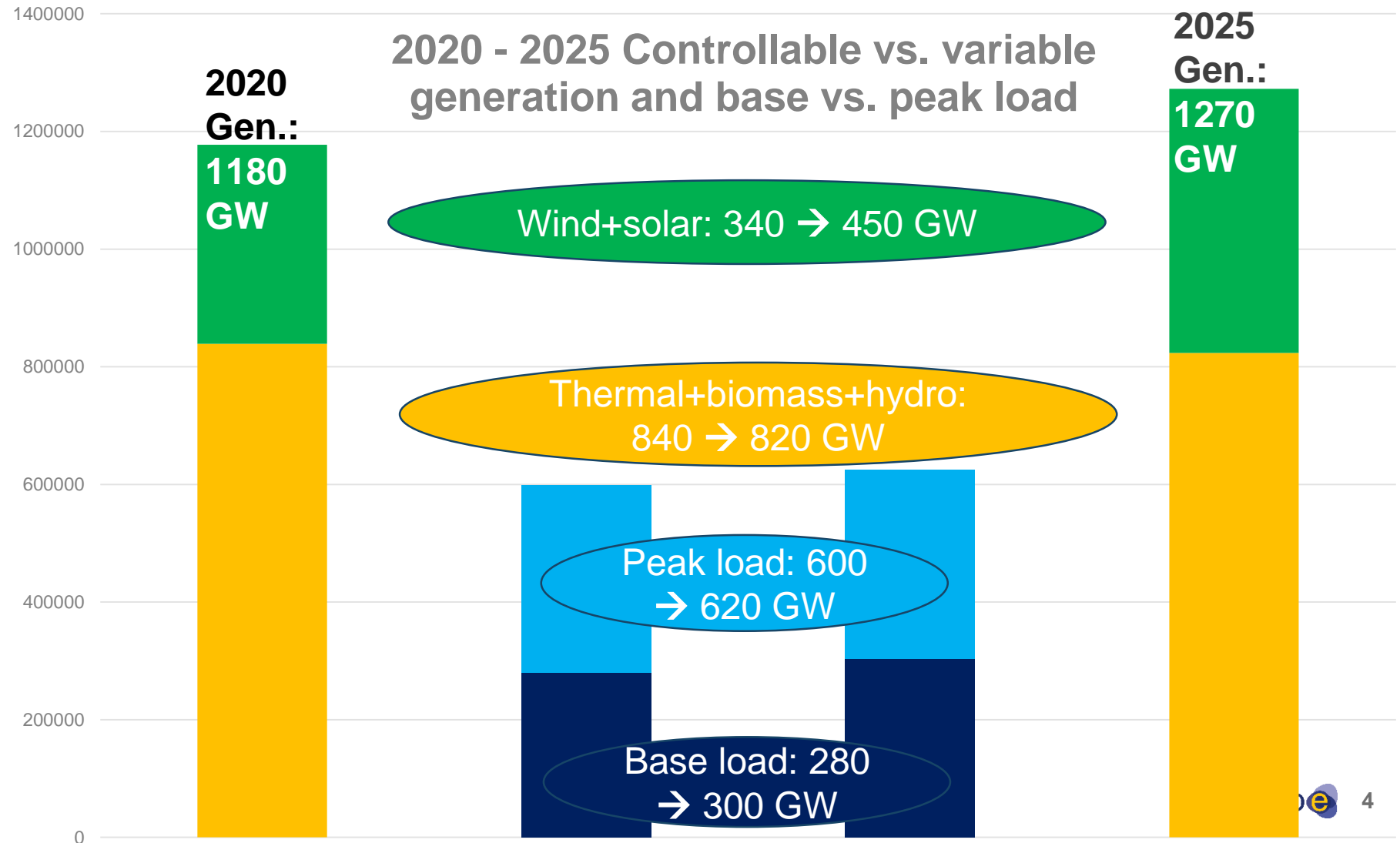
Ten-Year Network
Development Plans/
Projects Common Int

Market Platforms
(ITC, Transparency)

Network Codes

ENTSO-E MID-TERM ADEQUACY FORECAST: The low-capacity factor RES effect visible already:

high installed capacities;
curtail, store
or transport



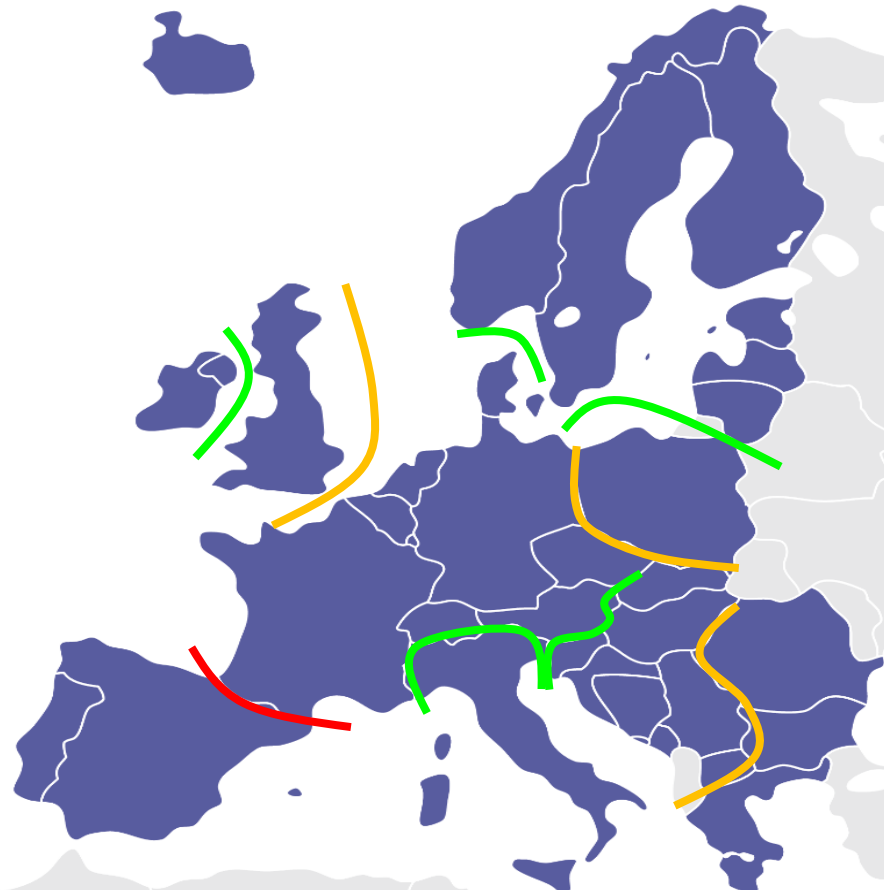
TYNDP 2016 – putting the right infrastructure in place to integrate renewables



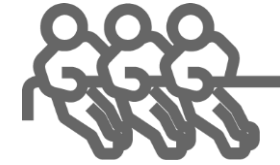
2x more interconnection capacities by 2030

Integrating up to 60% renewable energy sources

Up to 5 €/Megawatt hour reduction on bulk power prices



Every 2 years in ENTSO-E joint market and network studies of all TSOs, plus cost-benefit analyses of hundreds of projects



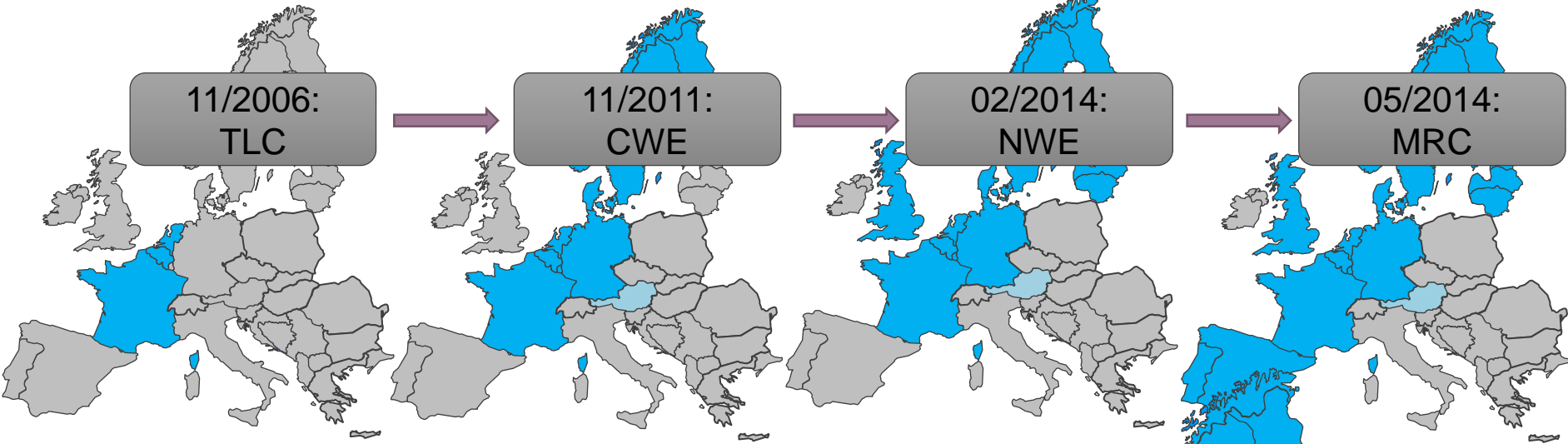
1% increase in the total consumer bill

€150 billion investment

50 – 80% emissions down

30 – 90 TWh reduced RES spillage

DAY-AHEAD MARKET COUPLING HISTORY

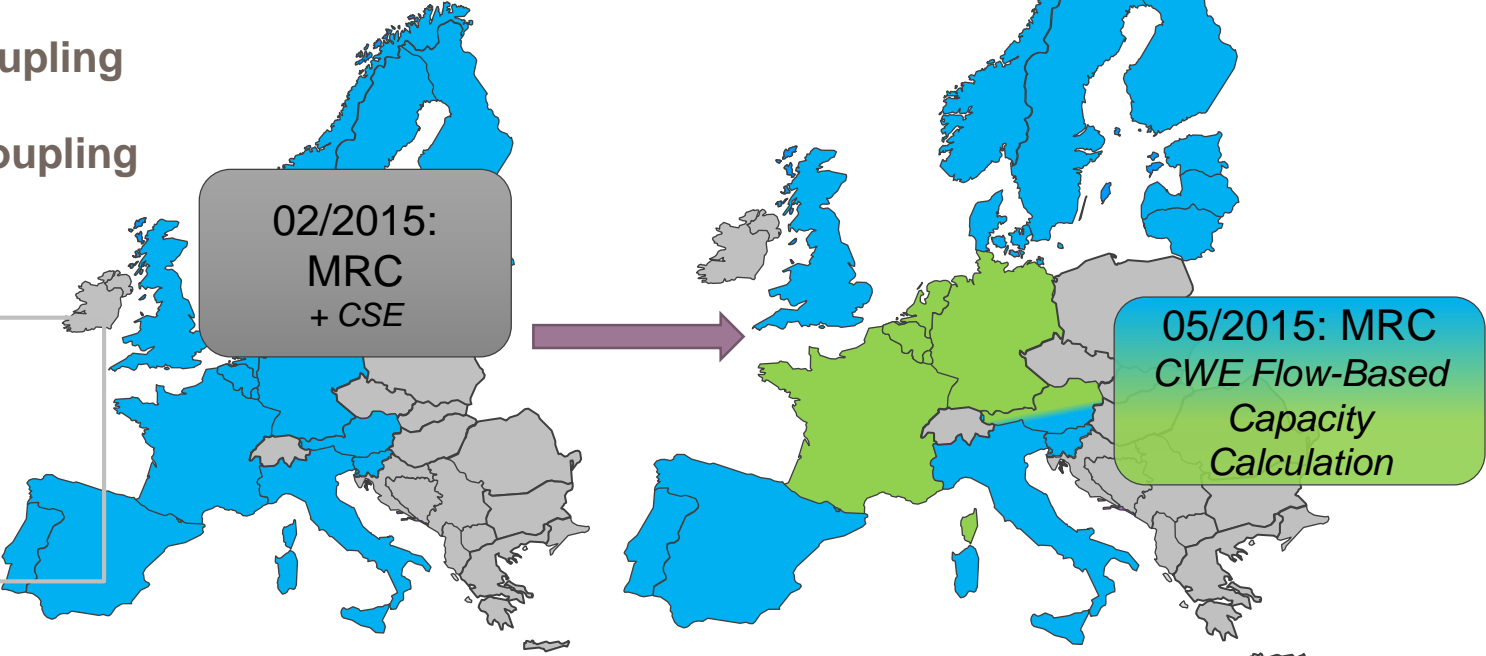


■ ATC-based Market Coupling
■ Flow-Based Market Coupling

Capacity Calculation (TSOs):
ATC-based vs. Flow-Based

VS.

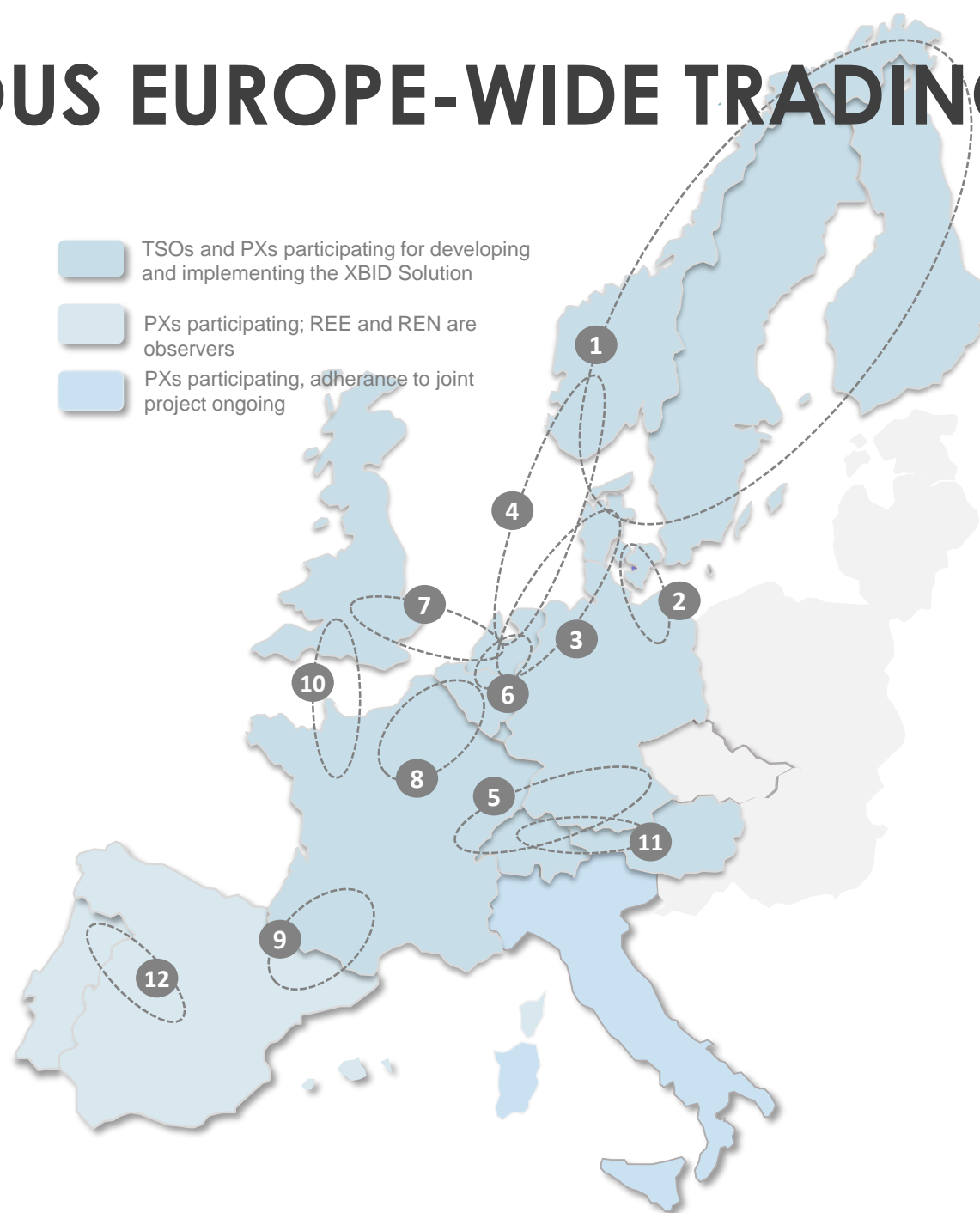
Auctions: (PXs):
Implicit (=Market Coupling)
vs. Explicit



INTRADAY CONTINUOUS EUROPE-WIDE TRADING:

**One common (stock exchange-like) software
+ Local Implementation
Projects:**

**Under testing now, go-live
planned late this year**



EU Regional Security Coordinators (RSCs):

A dynamic and efficient approach to realise the benefits of regionalisation

- Support TSOs in maintaining system security and optimisation of operations
- Delivery of 5 standard services by end-2017 to all TSOs
- ENTSO-E ensures interoperability



YES to

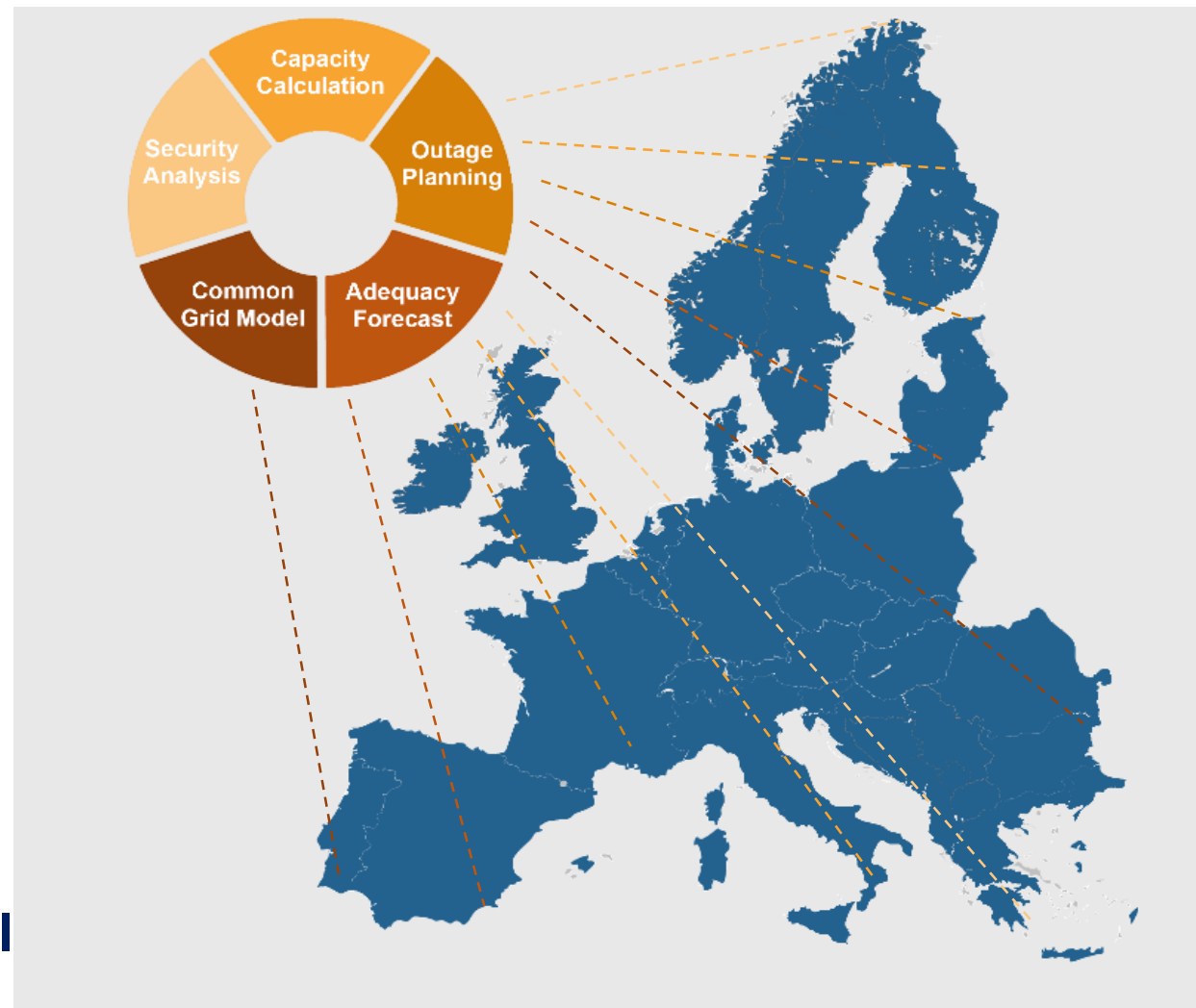
- closer cooperation
- incremental & modular approach



NO to

- transfer of decision-making on secure system operations

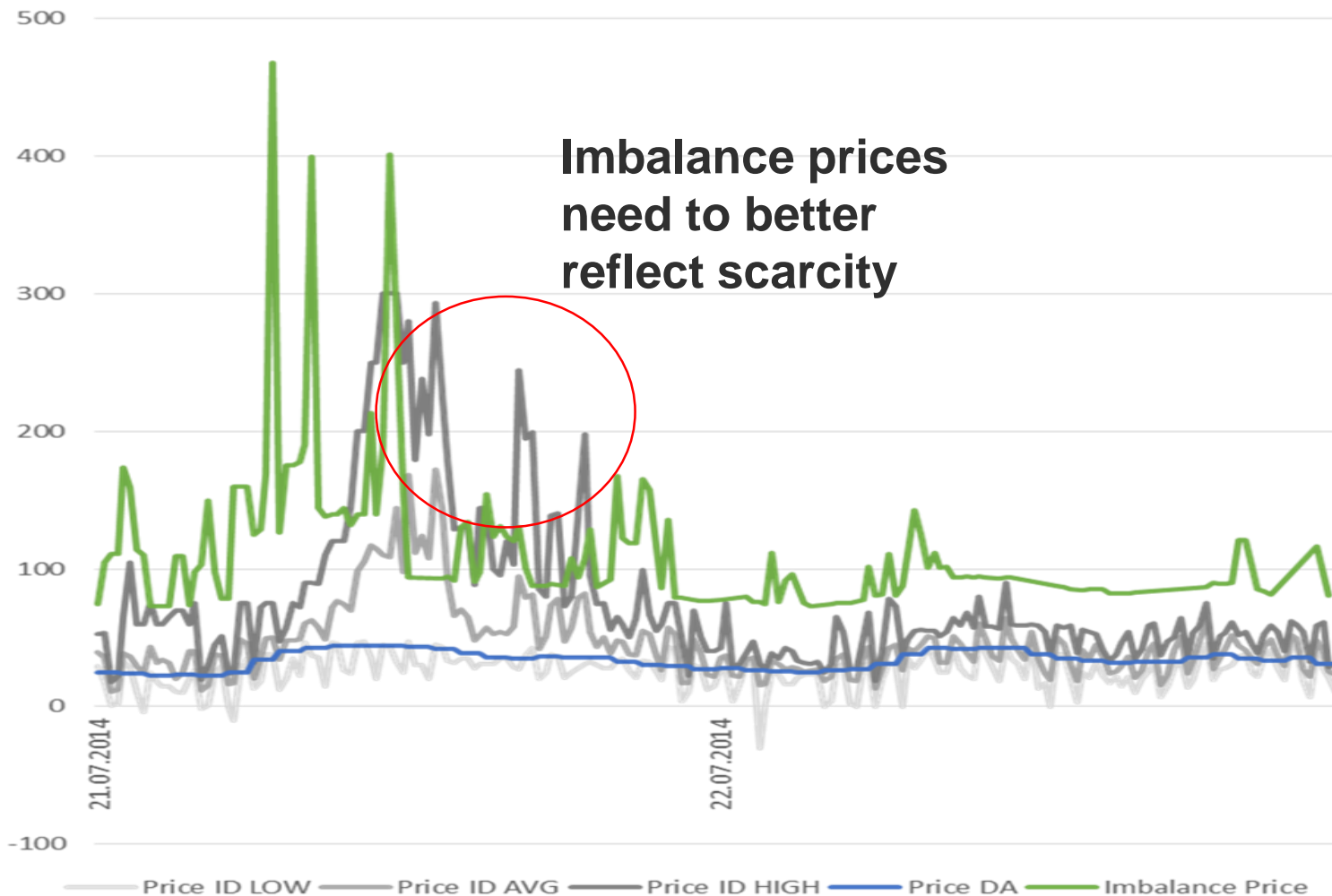
- **Stronger Member States' and NRAs' regional cooperation is crucial.**



APPROPRIATE GENERATION INVESTMENT SIGNALS?

Balancing responsibility and scarcity pricing

Deviation from forecasts – Germany 21/22 July 2014



Source: EEX

Scarcity-pricing for system scarcities

- Unconstrained price-formation
- (Capacity, flexibility, system services)
- Risk-hedging tools
- Balancing responsibility
- Retail participation

Electricity Balancing Guideline

- **Progressive convergence of products & processes** to create regional and EU markets: pricing, imbalance settlement period, standard products, procurement timeframes, option to reserve of cross-border capacity
- **European Balancing Energy markets** created for:
 - Imbalance Netting
 - Frequency Restoration Reserves with automatic activation
 - Frequency Restoration Reserves with manual activation
 - Replacement Reserves
- EBGL increases opportunities for **flexible providers** and facilitate access of new players' – i.e. **RES** and **demand response**:
 - Liquid and competitive markets
 - Separate procurement of upward and downward balancing energy
 - Minimum bid size for standard products 1 MW

BRINGING NEW ACTORS TO THE MARKET

Renewable Energy Units



Smart consumption

Does the Clean Energy Package address the challenges?

Improve price signals

- Positive removal of price caps unless set at VOLL
- RES integration: review of priority dispatch and balancing responsibility will have limited positive effects on markets and operations.
- ID and Bal markets: some requirements inconsistent with Balancing Guideline
- Non-frequency ancillary services often not suitable to market procurement (i.e. voltage control)

Enhance Demand Response

- Consumers right to participate to all markets directly or via 3rd party
- Crucial importance of dynamic pricing recognized
- Easier supplier switching
- Fair financial compensation from aggregators to suppliers is needed
- Rules on DSR and data management to be further developed via NC/GL

Stronger cooperation

- Regional TSO cooperation proposals overshoot target: disregard subsidiarity and TSOs' liabilities, danger of micromanagement
- Lack of stronger NRAs' and governments' cooperation
- Acknowledges TSO-DSO cooperation, but make sure distributed flexibilities are pooled not segregated
- Consistent EU adequacy assessment good but to be complemented by national studies

THANK YOU

FOR YOUR ATTENTION



Konstantin.Staschus@entsoe.eu



+32 4 786 80 882



**For more information:
<http://www.entsoe.eu>**



**Av. de Cortenbergh 100
1000 Brussels Belgium**