The “Clean Energy for All Europeans” Package and the Future Challenges and Opportunities for the Energy Sector

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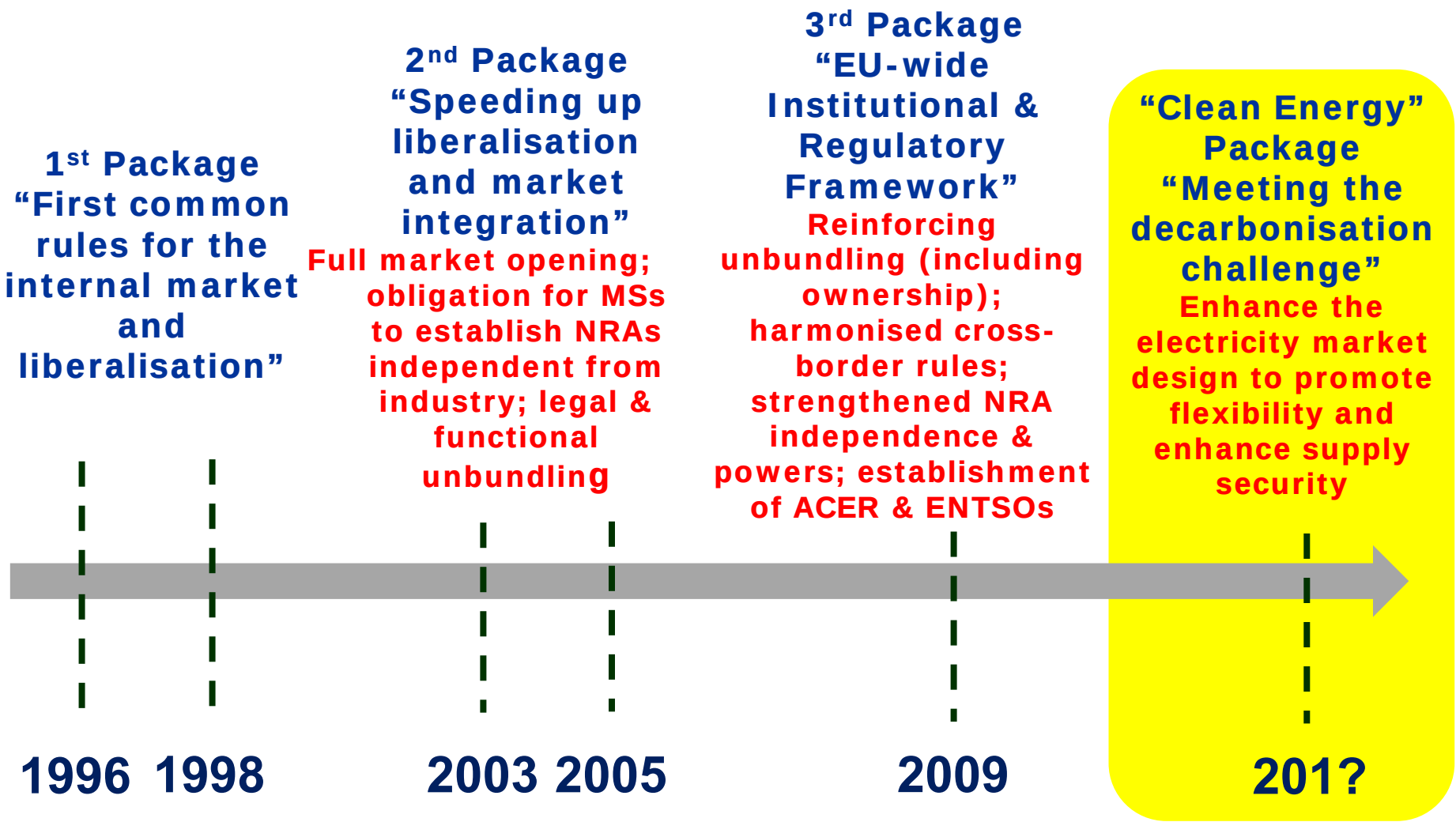
The Clean Energy Package
Beyond the Single Energy Market

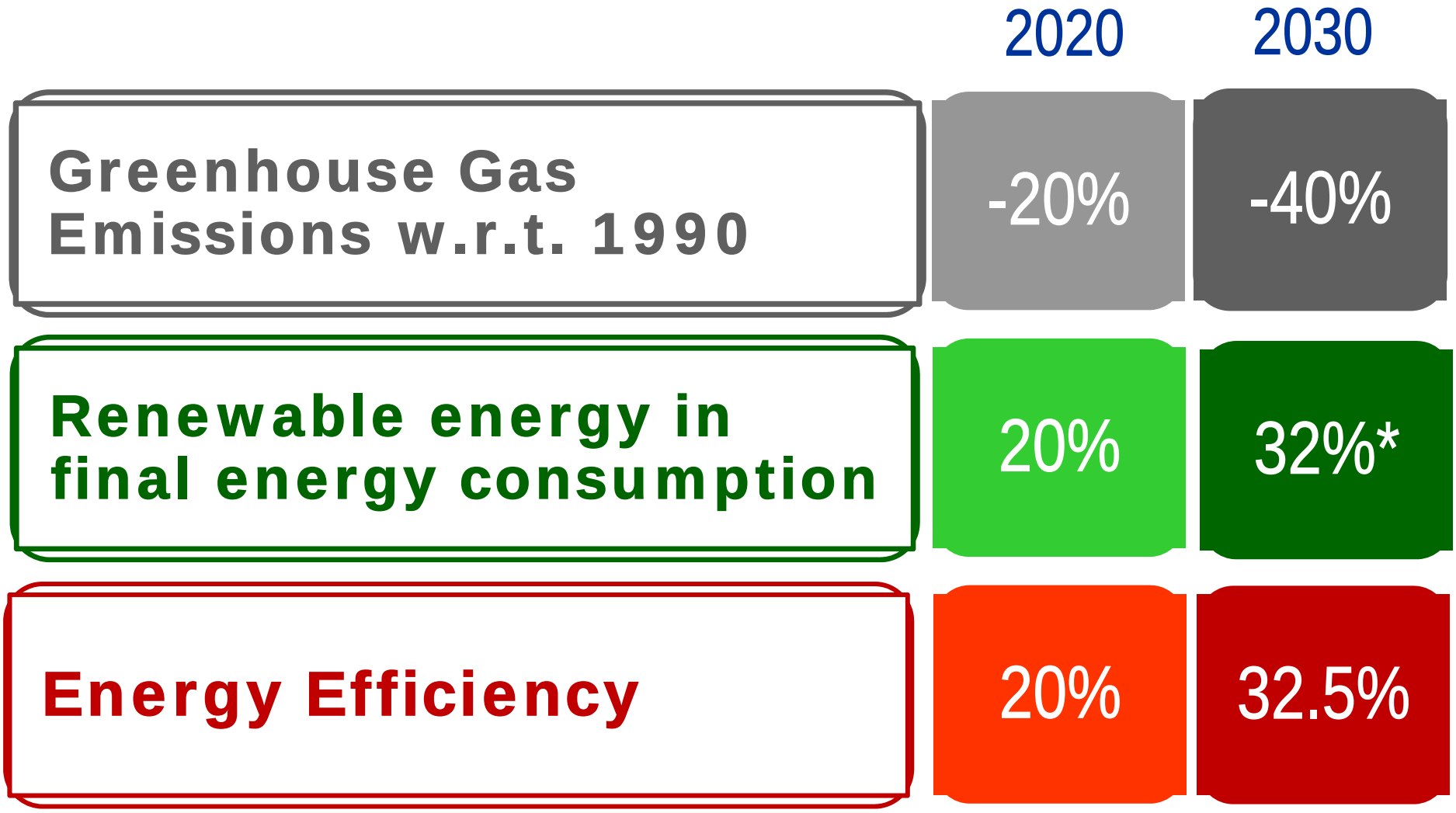


The Clean Energy Package Objectives

- Aims at:
  - **providing the stable legislative framework** needed to facilitate the **clean energy transition**, thus contributing to the **Energy Union**
  - enabling the EU to deliver on its **Paris Agreement commitments**
- Three main goals:
  - Putting **energy efficiency first**
  - Achieving **global leadership** in **renewable energies**
  - Providing a **fair deal to consumers**

ACER
Agency for the Cooperation of Energy Regulators

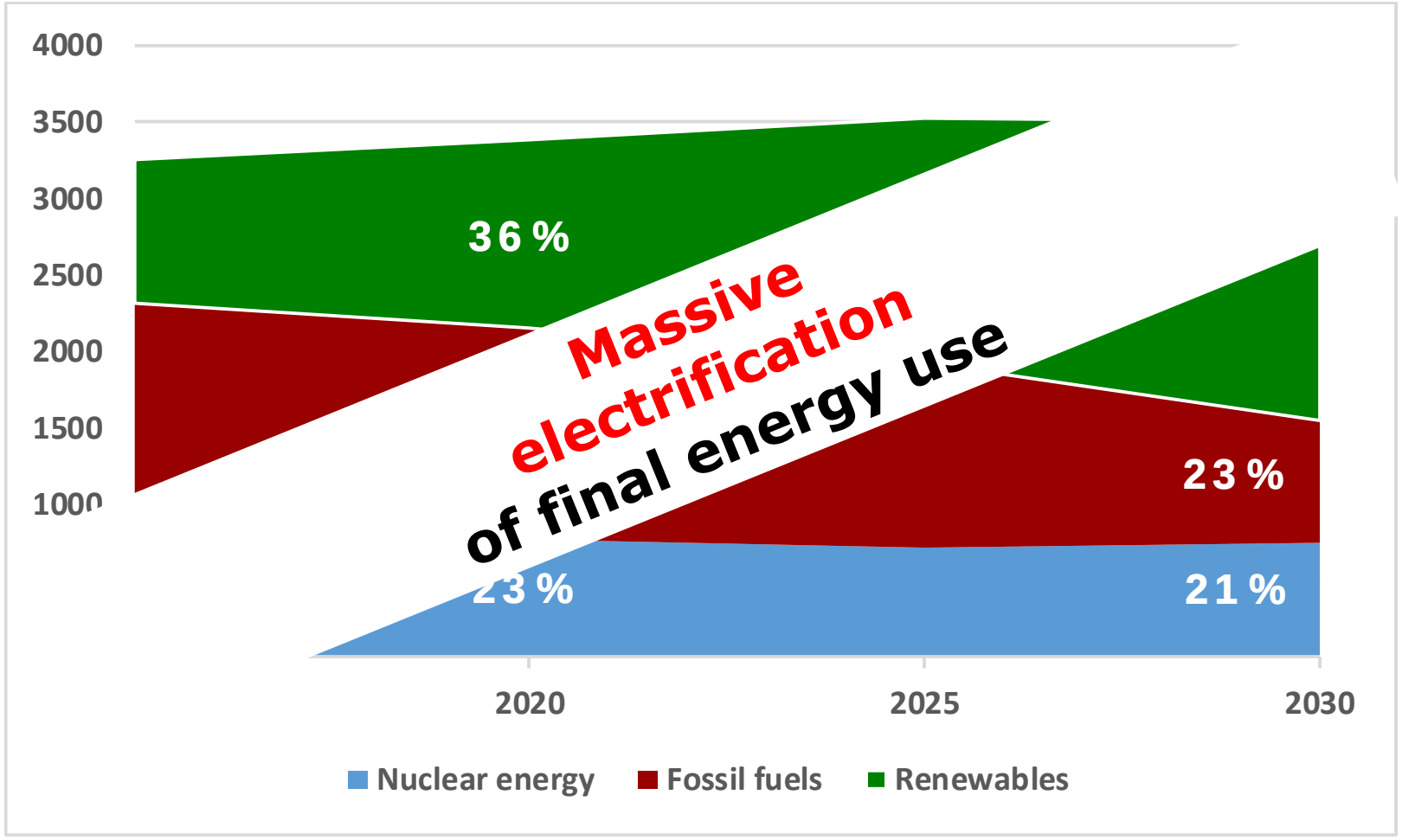
EU Climate and Energy Targets



* Possible upward revision in 2023

Renewable Energy in the Electricity Sector

Gross electricity generation by source in the EU: EUCO3232.5 modelling (TWh)



The Clean Energy Package (CEP)

Electricity Regulation (RECAST)

- Contains the majority of new wholesale market rules

Electricity Directive (RECAST)

- Contains the majority of new retail market provisions

ACER Regulation (RECAST)

- ACER tasks and procedure

Regulation on Risk preparedness (NEW)

- Member States put in place appropriate tools to prevent, prepare for and manage electricity crisis situations

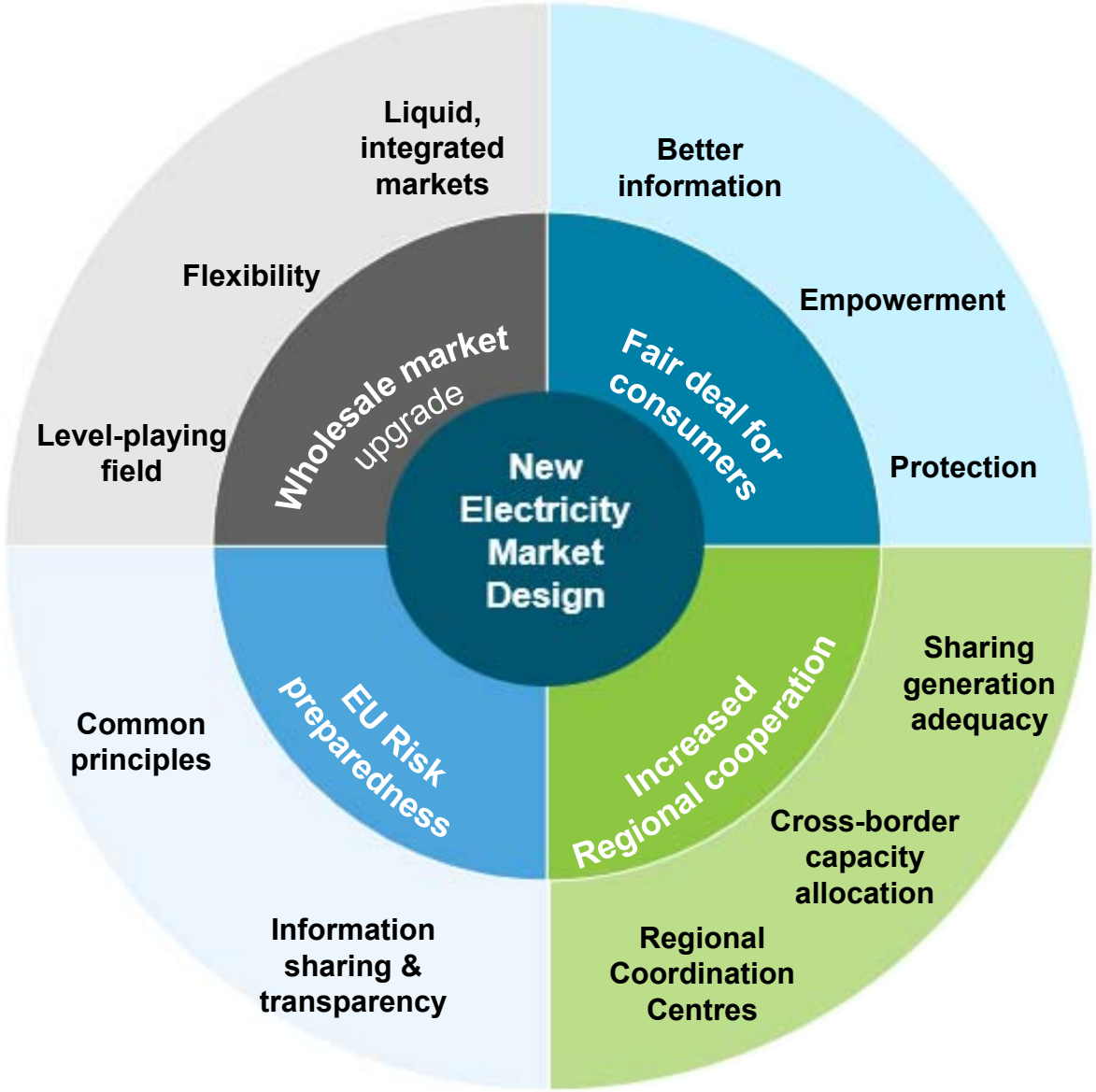
Energy performance in buildings Directive (AMENDED)

Energy efficiency Directive (AMENDED)

Energy Union Governance Regulation (NEW)

Renewable energy Directive (NEW)

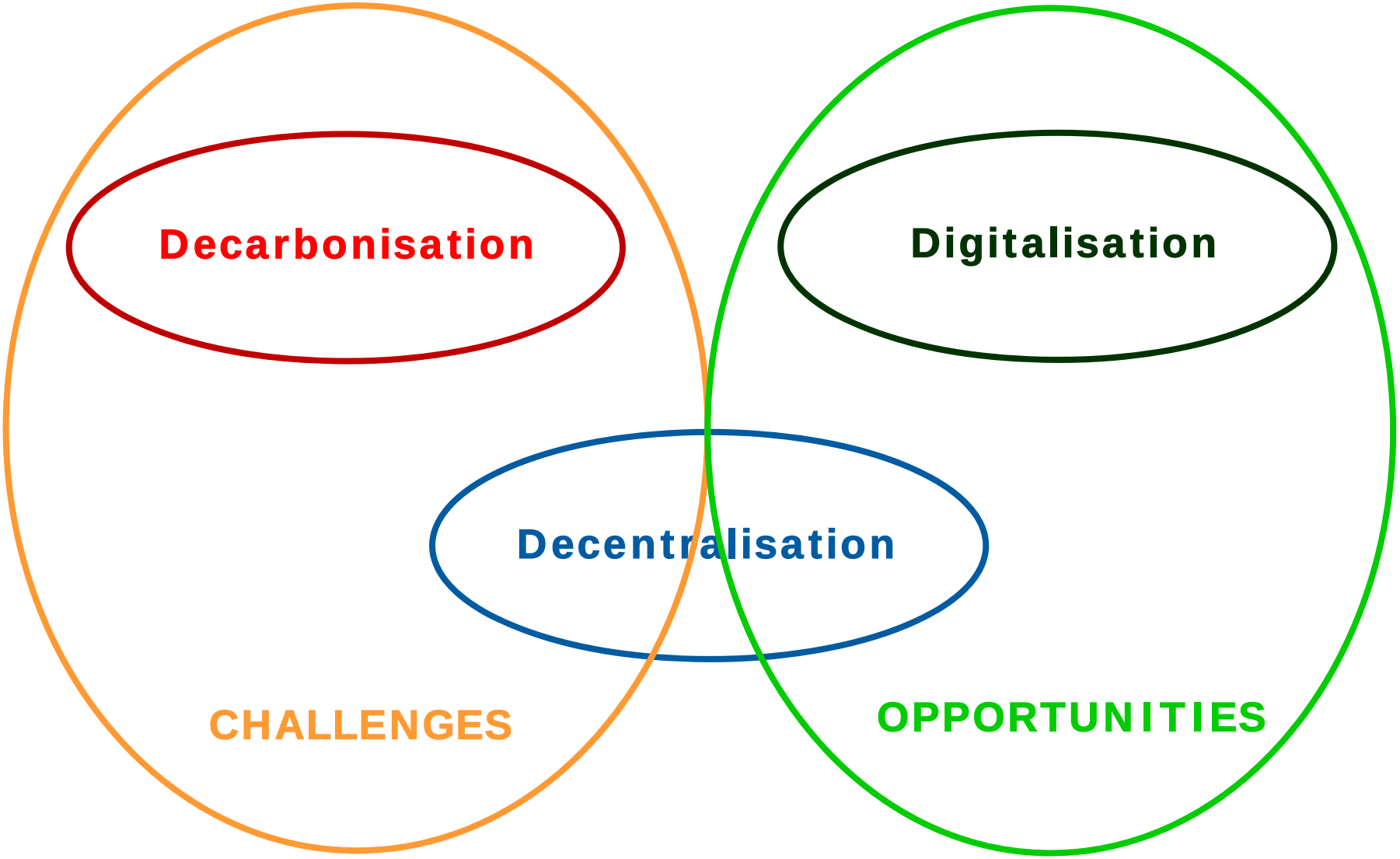
CEP: Electricity Market Design



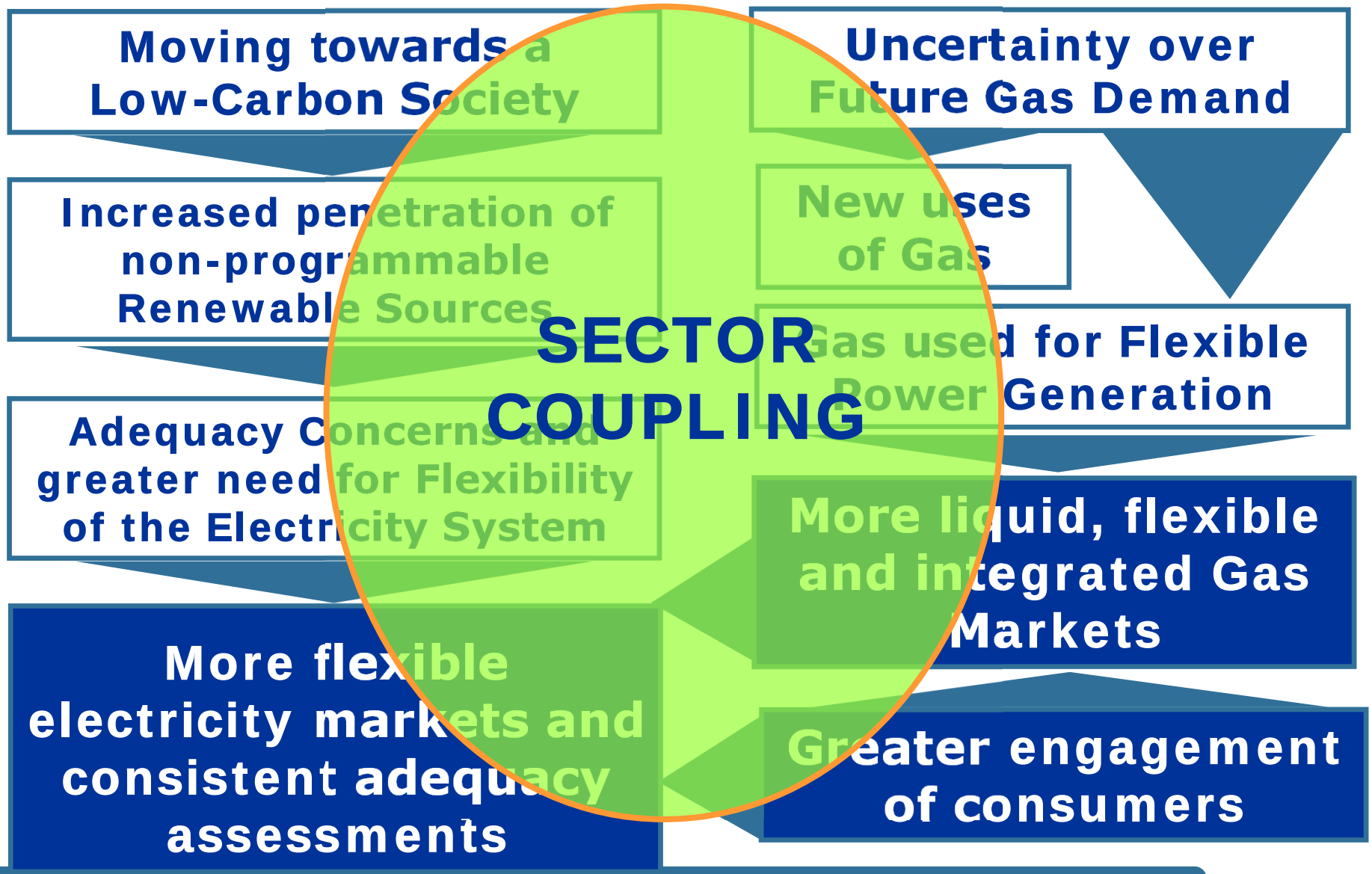
CEP: Electricity Market Design at a glance

- Speedier and more agile consumer ***switching*** of suppliers
- Enabling consumers to access ***dynamic pricing***
- Allowing ***scarcity pricing***
- Rewarding **flexibility** for generation, ***Demand Response and storage***
- Coordinated ***resource adequacy assessments*** to identify adequacy concerns and avoid overcapacity
- Explicit ***cross-border participation*** in Capacity Remuneration Mechanisms
- Common rules on ***crisis prevention***
- Enhanced ***Bidding Zone review*** process
- ***Maximisation of cross-border capacity*** and ***non discrimination*** between internal and cross-border exchanges
- Focus on and reinforcement of ***regional TSO cooperation*** through ***Regional Coordination Centres (RCCs)***
- Stronger ***TSO-DSO cooperation***
- Creation of the ***EU DSO Entity***

Energy Transition 3Ds

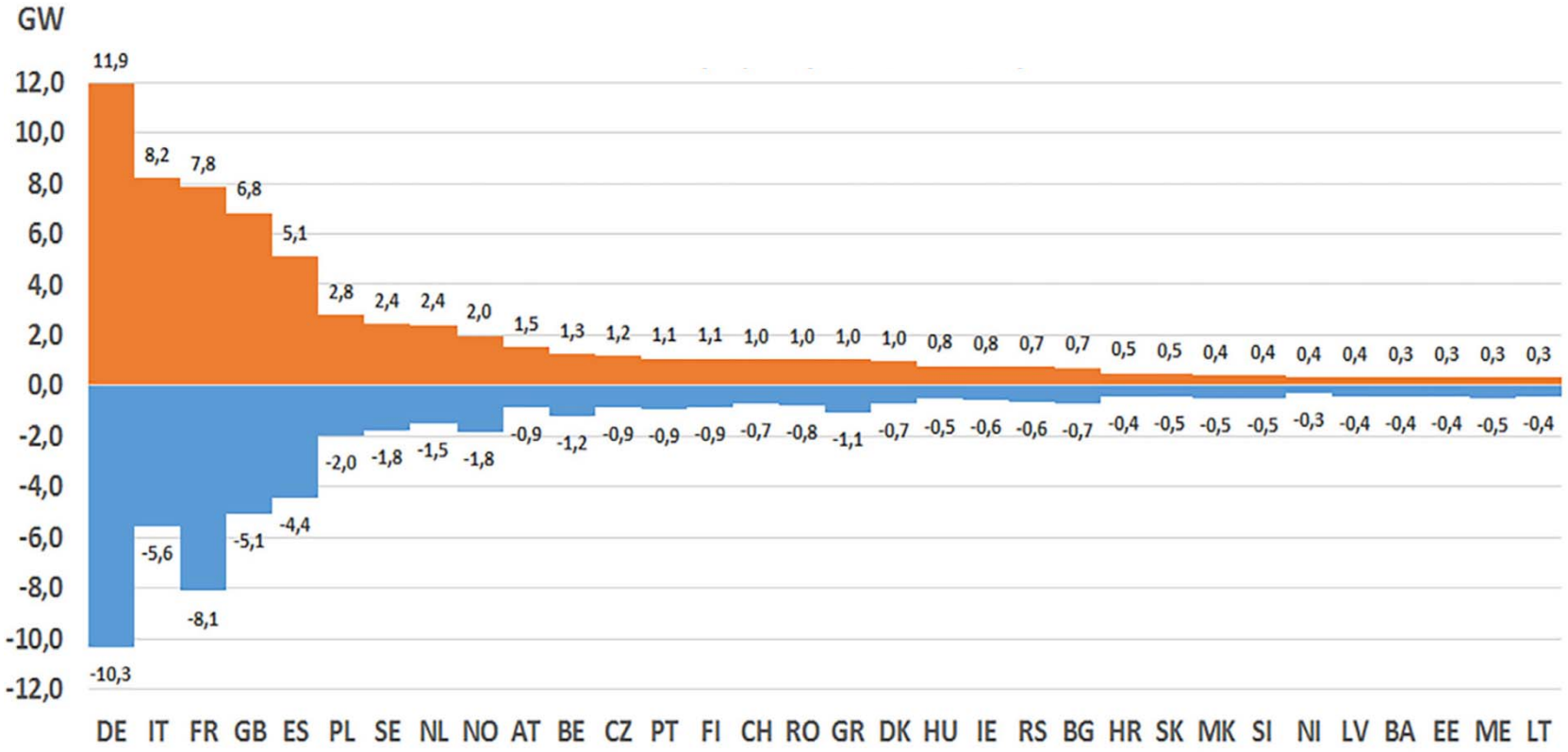


The EU Energy Sector: trends and challenges



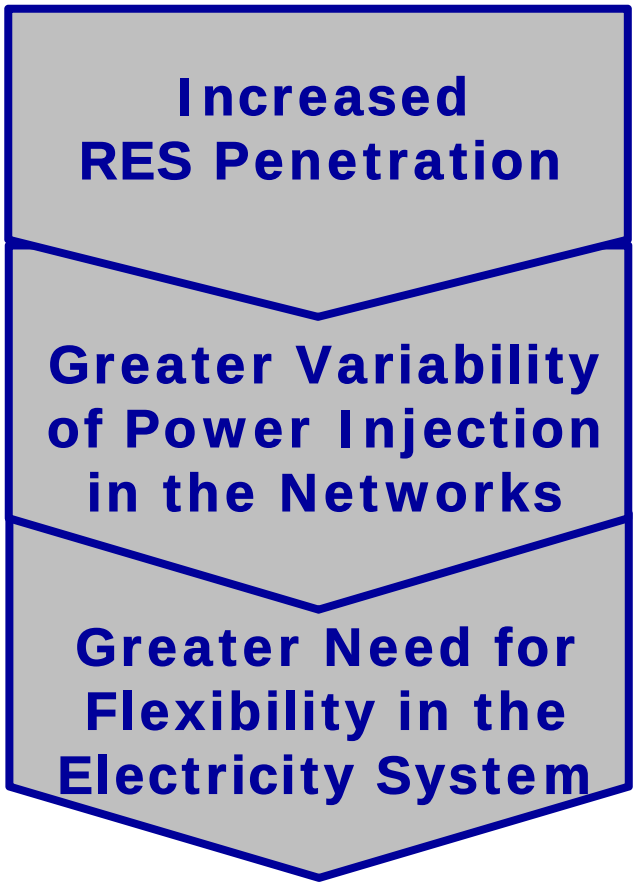
The Flexibility Challenge (1)

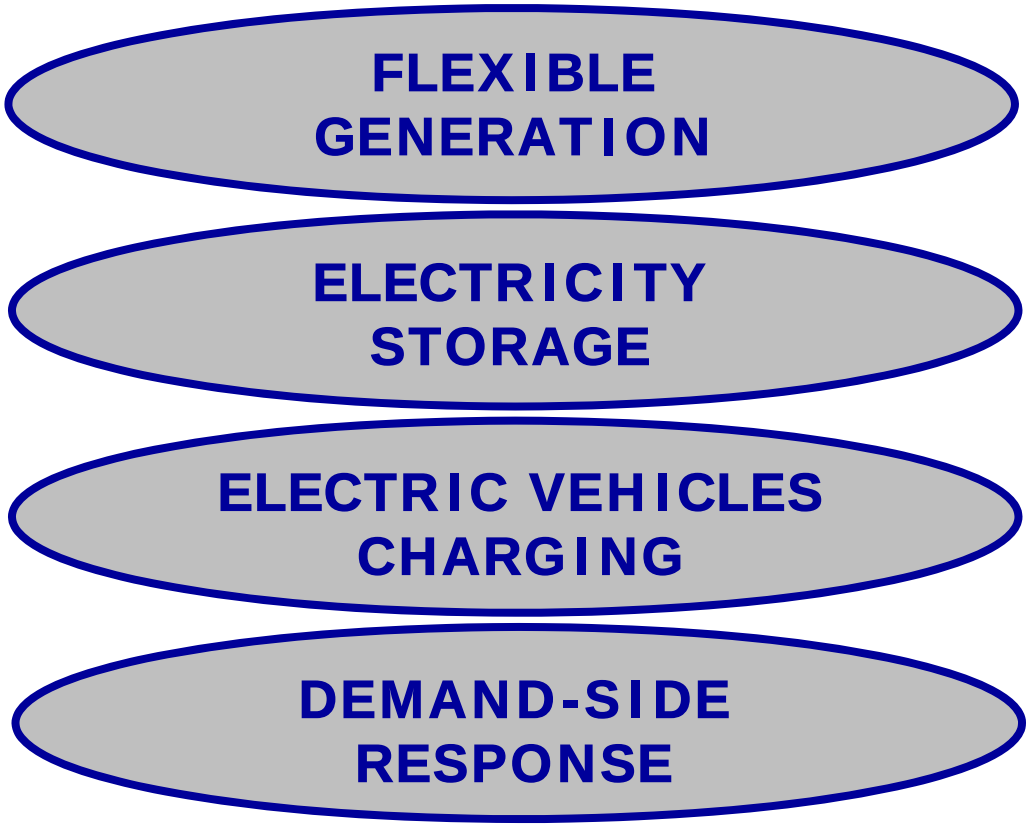
Absolute values of the residual load hourly ramps by country (99.9 percentile = 3σ)



Source: ENTSO-E, Scenario Outlook and Adequacy Forecast 2015

The Flexibility Challenge (2)

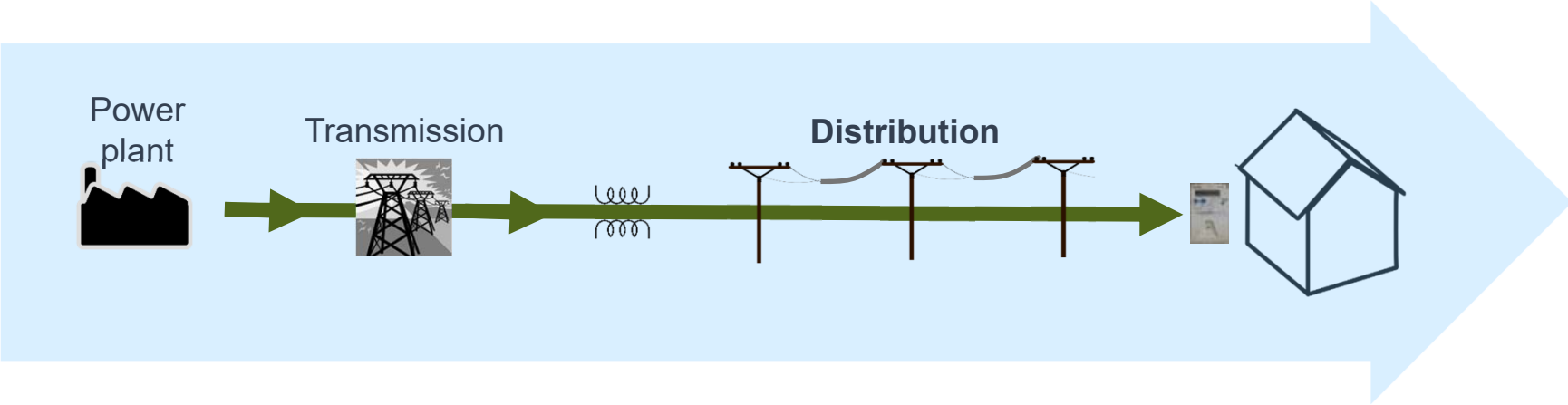




- Most of these resources are/will be connected to **distribution grids**

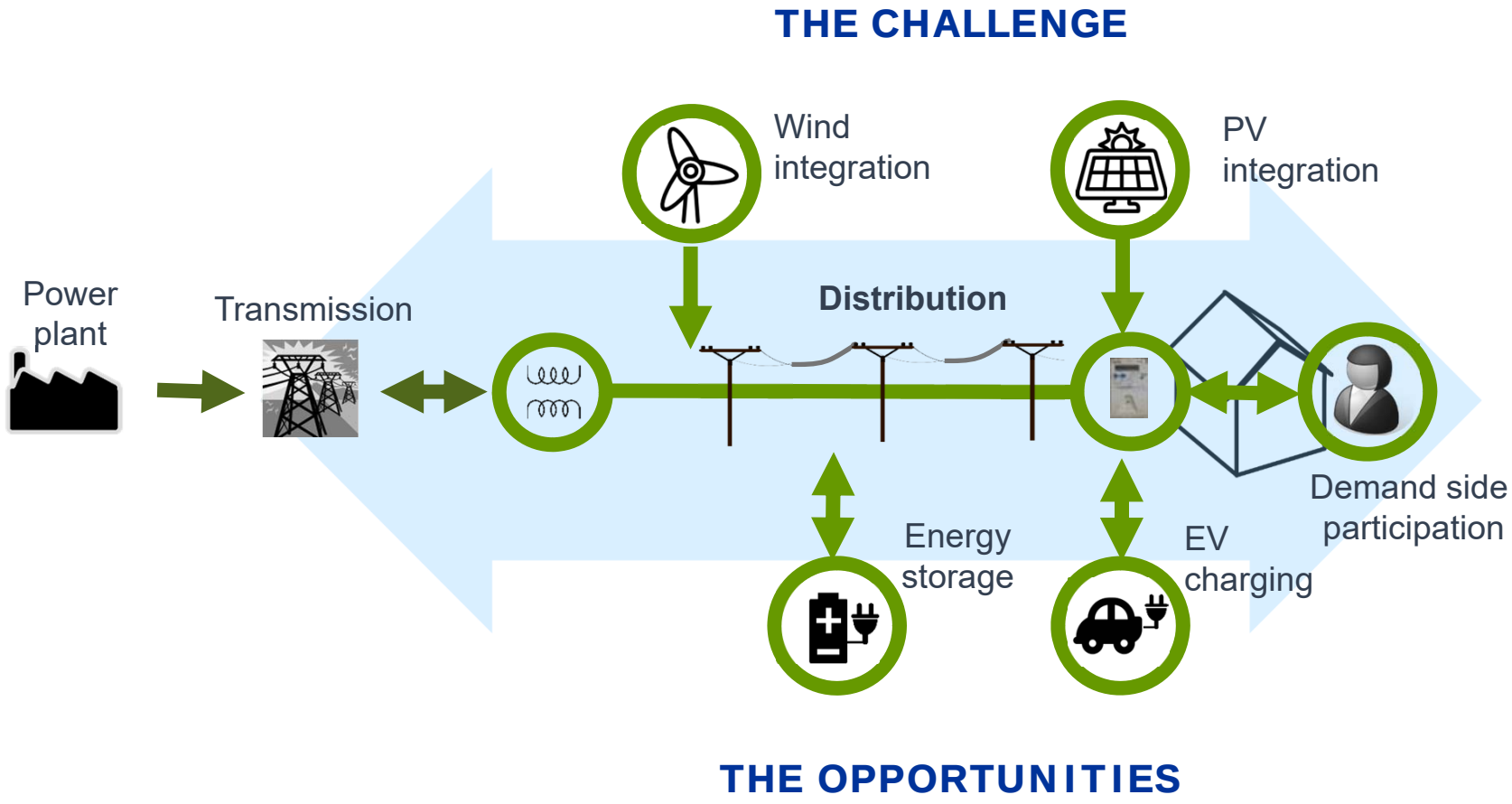
A Changing Paradigm (1)

From a centralised power system…



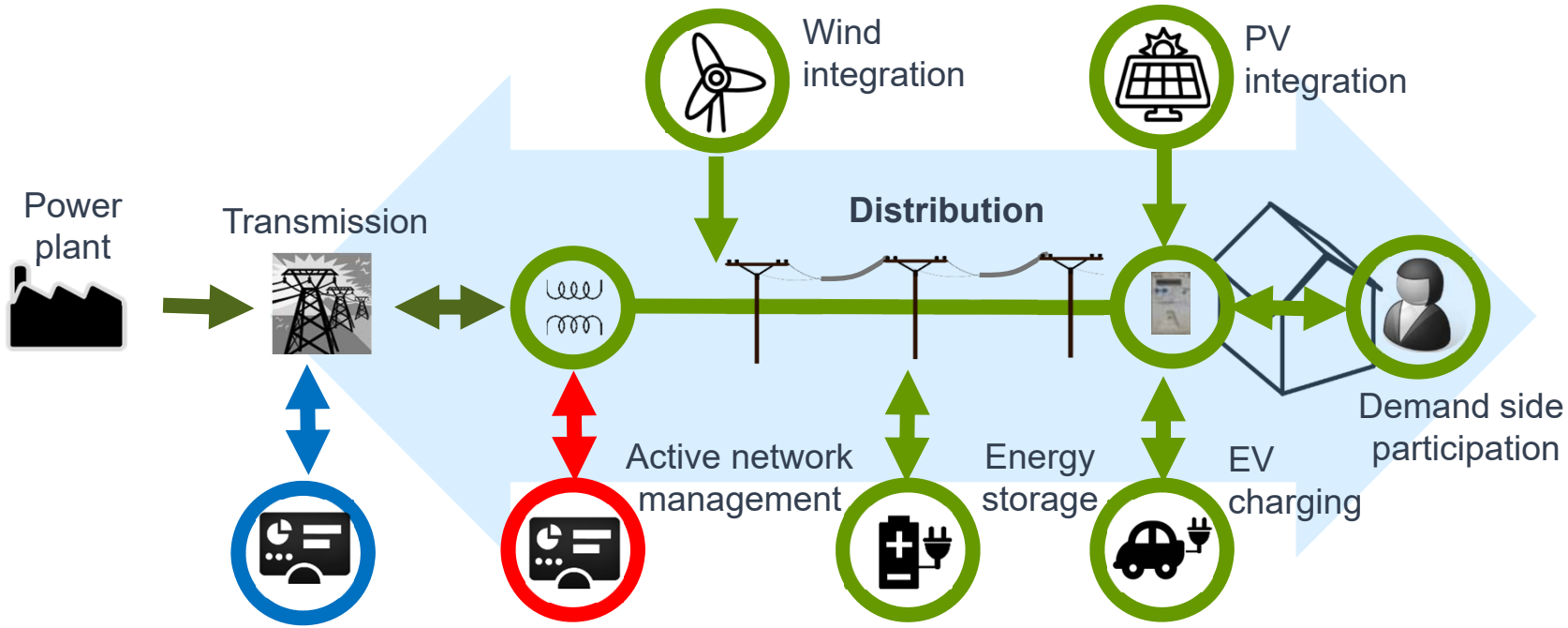
A Changing Paradigm (2)

… to a decentralised one.



A new Role for DSOs

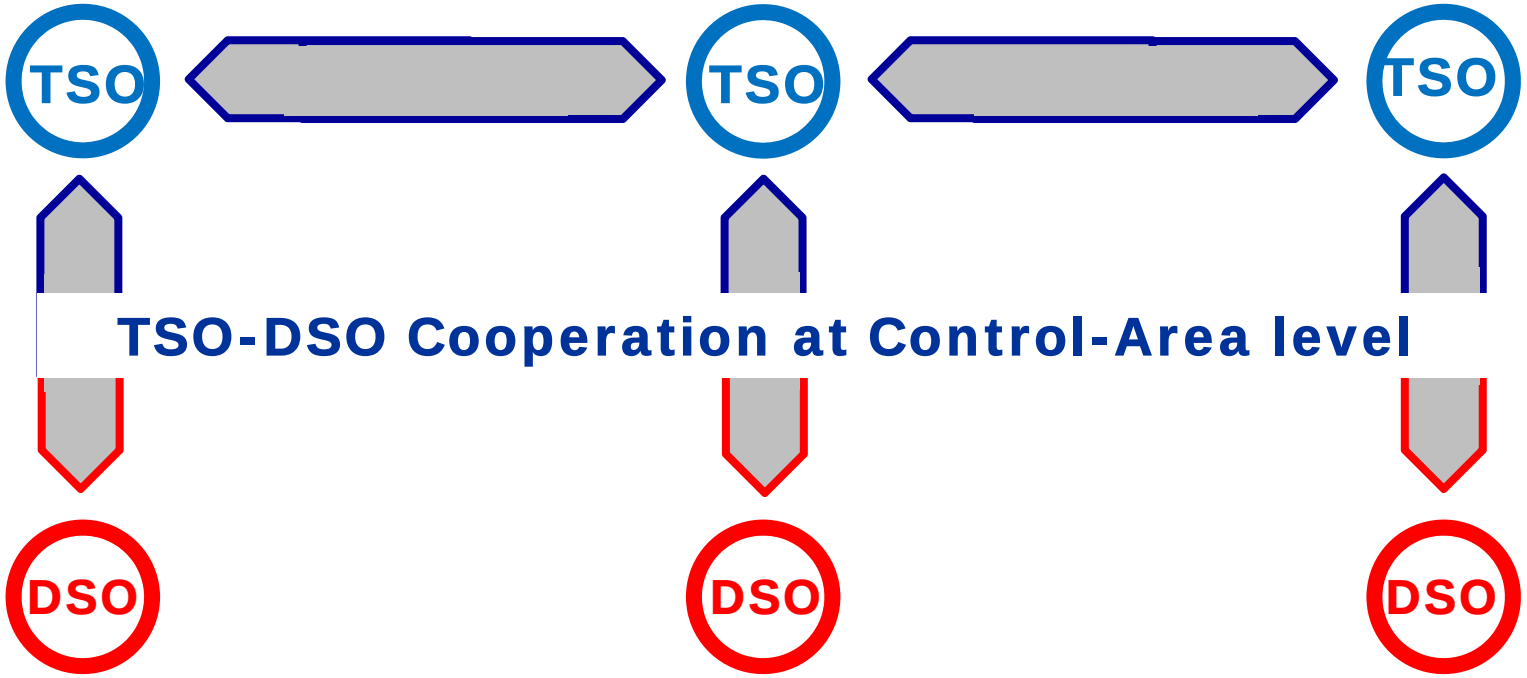
- Greater need to operate the distribution grid in an active way to balance more variable injections with flexibility resources



Which model of cooperation?

TSO-DSO and TSO-TSO Cooperation

Regional and Cross-Regional TSO Cooperation (Regional Security Cooperation)



Sector Coupling

- Closer ***electricity and gas*** market and system integration
- ***Power-to-gas technologies*** allow the use of the gas infrastructure economically to:
  - Store
  - Transport over longer distances

  power (produced from renewable energy sources)
- This may lead to ***competition*** between ***electricity and gas infrastructure*** and their operators

Beyond Sector Coupling

- More generally, grid and non-grid solutions may compete in supporting system development and operation
  - e.g. demand response vs grid development to manage local congestion

Moreover:

- What is the ***future role of gas***?
- What is the ***role of hydrogen*** in the decarbonisation path?

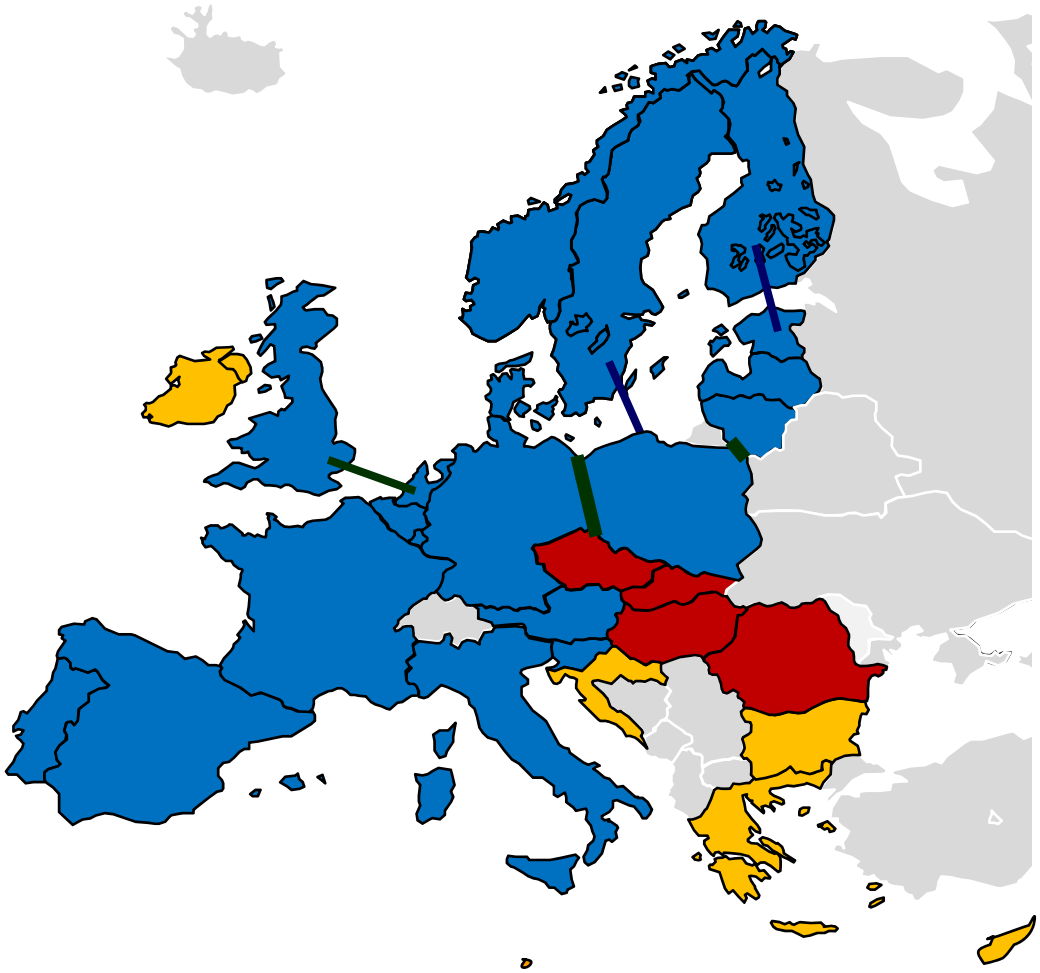
Regulatory Implications

- Can TSOs and DSOs still act as ***neutral*** market facilitators?
- Regulatory enabling of Smart Technologies
- Demand aggregation:
  - Regulatory framework (compensation)
  - Business model (independent aggregators)
- Reserve and balancing markets:
  - Technological neutrality
  - Market Design (upward/downward reserve, duration of commitment, etc.) to enable wider participation, subject to minimum performance requirements
  - Framework of TSO-DSO cooperation

RES and the IEM: it is so obvious!

- A well-integrated and well-functioning Internal Electricity Market is essential for accommodating a greater share of RES
- A well-integrated and well-functioning Internal Electricity Market:
  - Does NOT require full price convergence at all times across the whole EU
  - BUT must be based on:
    - Optimal geographical structure (bidding-zone configuration)
    - Optimal network development (optimal sizing of intra-zonal and cross-zonal capacities)
    - Optimal use of the available capacities:
      - How much is made available to the market
      - How capacity is allocated

The EU internal electricity day-ahead market



Today:
80 % of borders coupled
46 borders coupled in a single coupling
3 borders coupled separately
12 borders still waiting to be coupled

Final goal:
EU-wide day-ahead market coupling with implicit auctions

4M MC = 4M Market Coupling

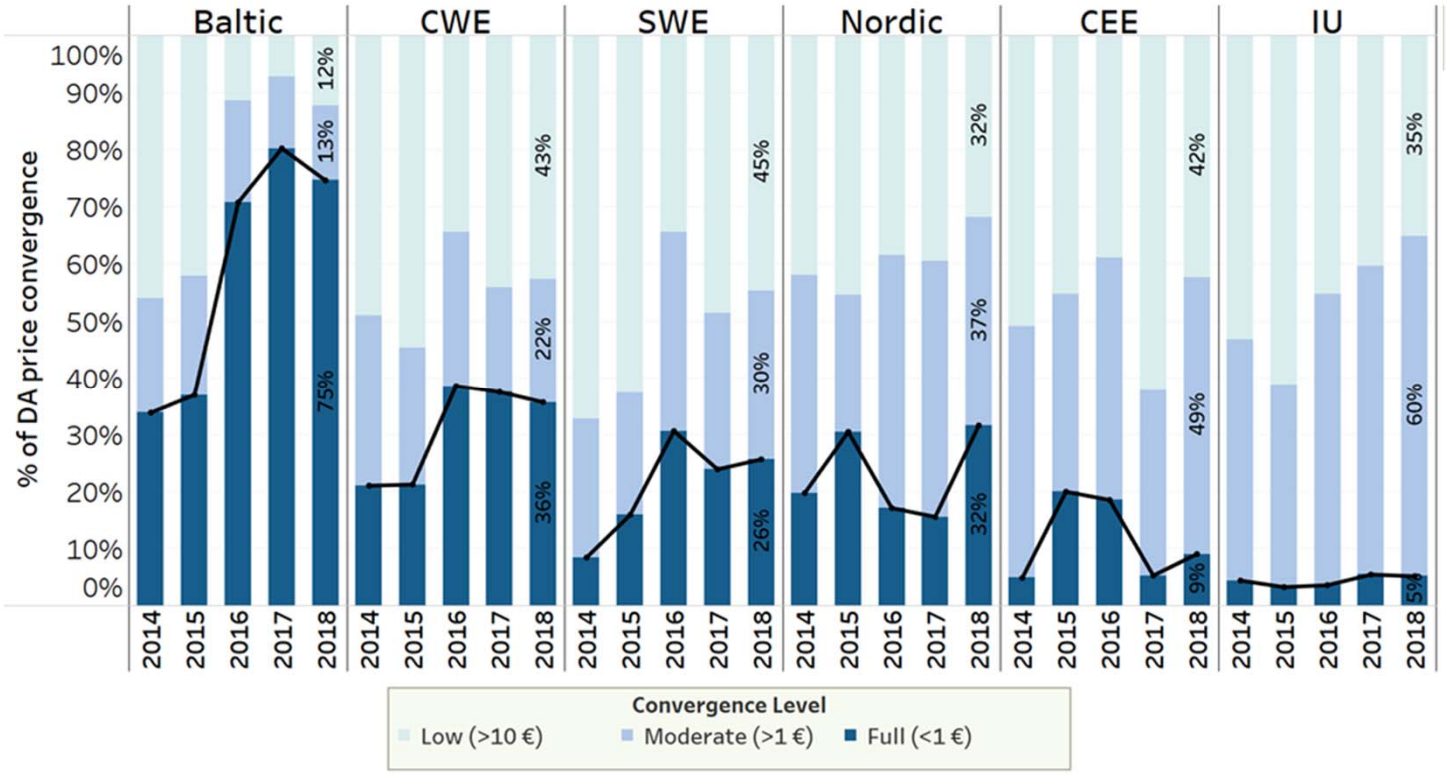
PCR = Price Coupling of Regions

Not coupled yet

Price convergence in the IEM

A well-integrated and well-functioning Internal Electricity Market does NOT require full price convergence at all times across the whole EU …

Day-ahead price convergence in Europe, 2014–2018 (% of hours)



Source: ENTSO-E and ACER calculations.

Price differentials in the IEM

… but average price differentials > 10€/MWh beg the question of whether capacities are optimally sized, used and allocated!

Average and absolute average price differentials on some borders in the EU 2016 – 2018 (€/MWh)

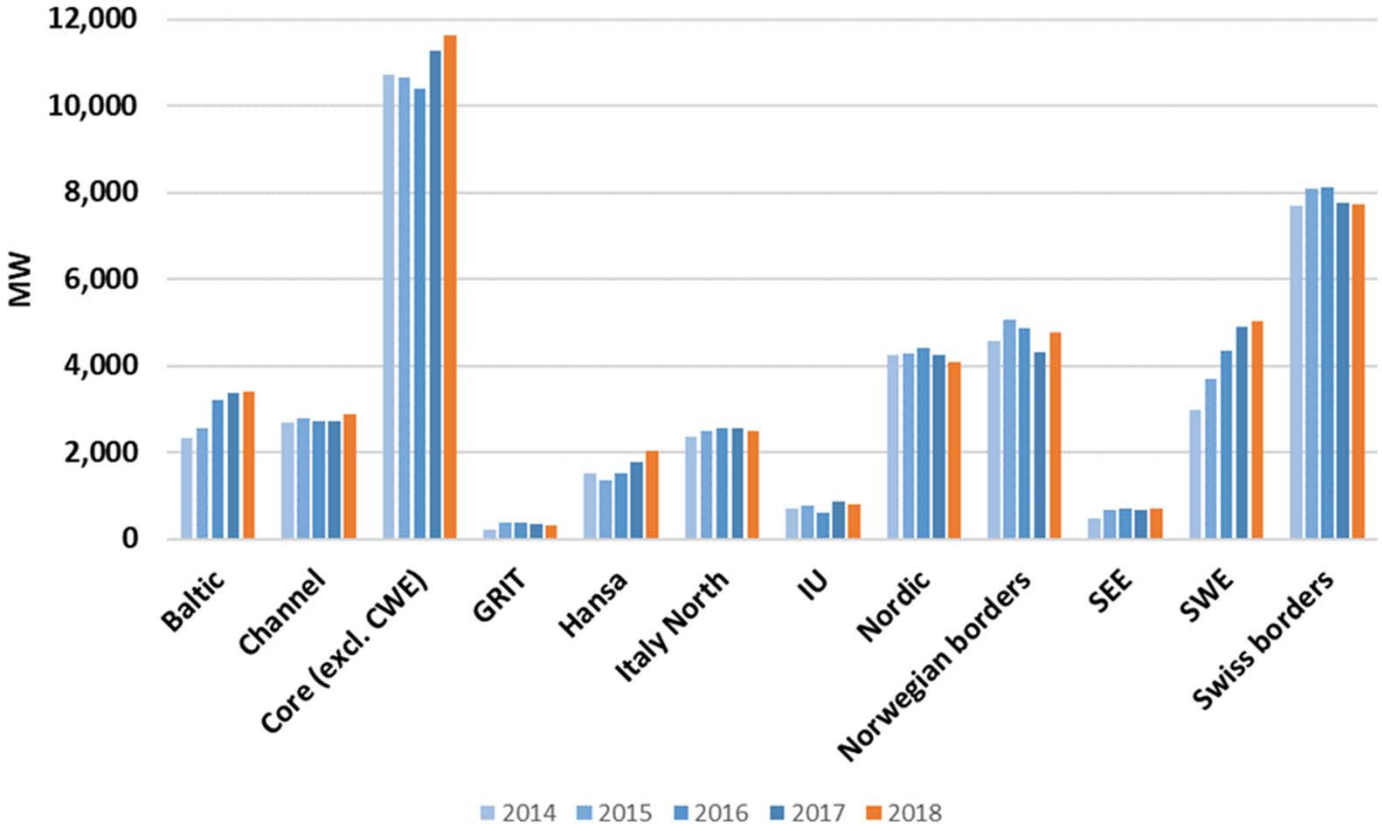
Border	2016	2017	2018	2016-2018	2016	2017	2018	2016-2018
BG-GR	-6.0	14.6	-19.7	-3.7	14.6	19.8	24.8	19.8
FR-GB	-12.4	-6.8	-14.7	-11.3	15.4	12.5	15.6	14.5
AT-IT	-13.7	-20.2	-14.4	-16.1	13.7	20.2	14.5	16.2
BG-RO	-0.3	-8.3	-5.7	-4.8	11.4	14.8	13.6	13.3
GB-NL	16.9	12.4	12.4	13.9	17.0	13.1	12.7	14.3
FR-IT	-5.9	-9.4	-10.5	-8.6	7.3	9.8	11.0	9.4
ES-FR	2.9	7.3	7.1	5.8	8.0	10.2	10.8	9.7
NL-NO2	7.1	10.4	9.3	8.9	7.5	10.6	10.6	9.6
GB-IE	4.0	5.9	2.9	4.3	13.8	10.5	10.4	11.6
DE-PL	-7.5	-2.8	-7.7	-6.0	10.0	8.7	9.9	9.5

Source: ENTSO-E and ACER calculations.

Increasing cross-border capacities

Cross-border capacities made available to the market increased over the last years

Net Transfer Capability averages of both directions on cross-zonal borders, aggregated by CCR – 2014–2018 (MW)

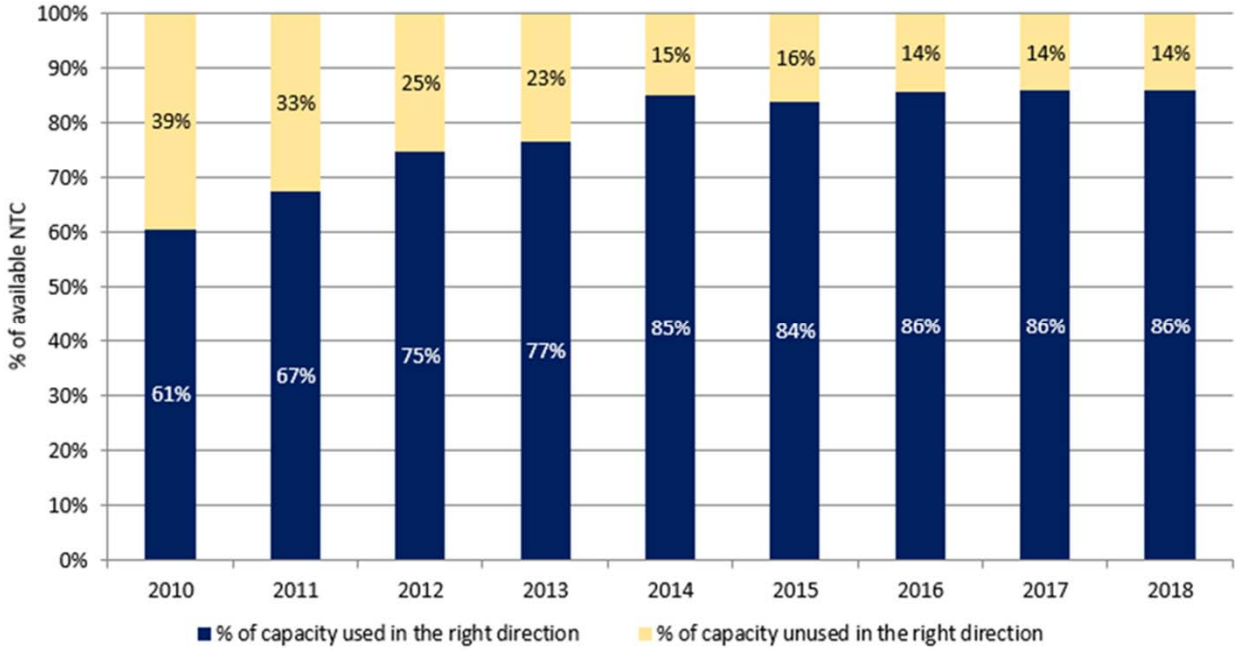


Source: ENTSO-E, NRAs, Nord Pool and ACER calculations.

Cross-border capacity utilisation (1)

Significant improvements in the efficiency of the use of cross-border capacity in the day-ahead timeframe

Share of the available capacity (NTC) used in the 'right direction' in the presence of a significant price differential (>1 €/MWh) on 37 European electricity borders (%)



More efficient use of cross-border capacity through "market coupling"

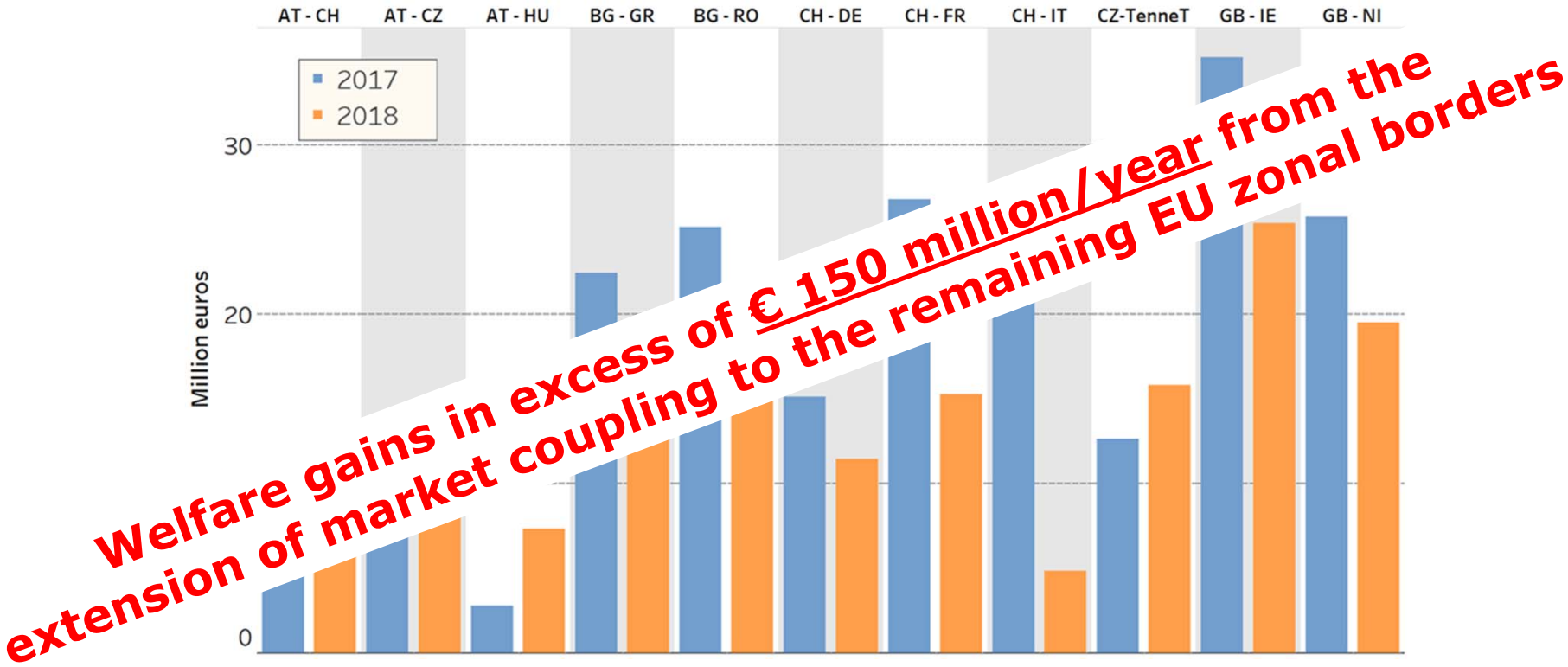
Estimated Annual Benefits
€ 1 billion

Source: ACER (2019).

Cross-border capacity utilisation (2)

… but there is still scope for improvement

Estimated social welfare gains still to be obtained from further extending DA market coupling per border – 2017-2018 (million euros)

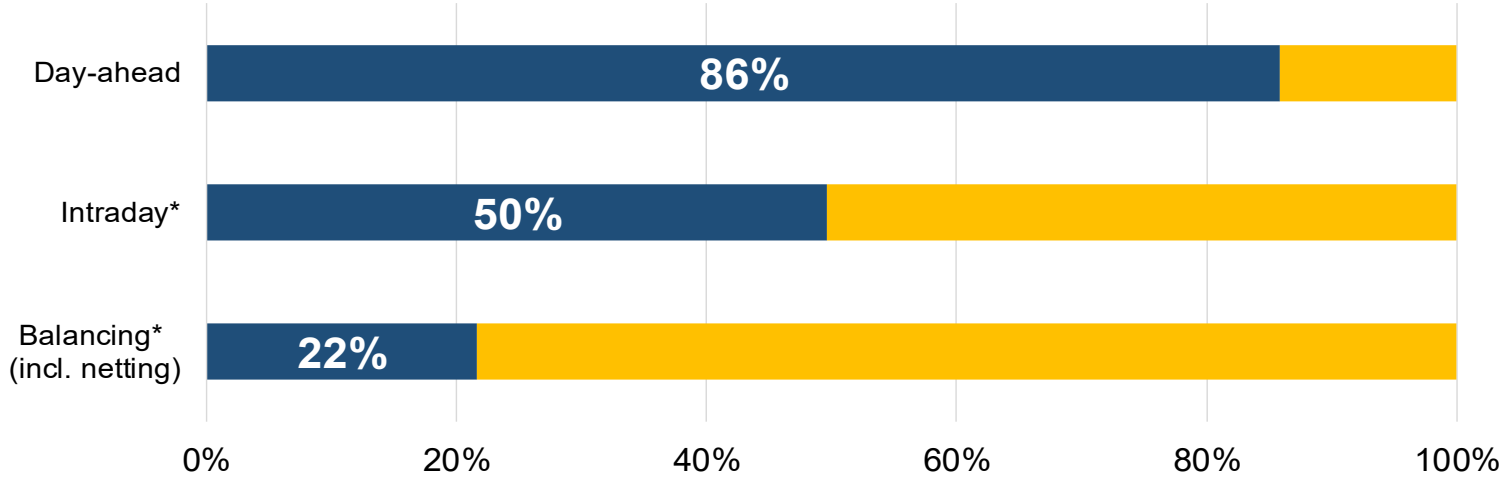


Source: ACER (2019).

Cross-border capacity utilisation (3)

… also in the intraday and balancing timeframes

Share of the available capacity (NTC) used in the 'right direction' in the presence of a significant price differential (>1 €/MWh) on 37 European electricity borders in different timeframes 2017 (%)



Yearly change (2017/2016)

+0 %

+0 %

+3 %

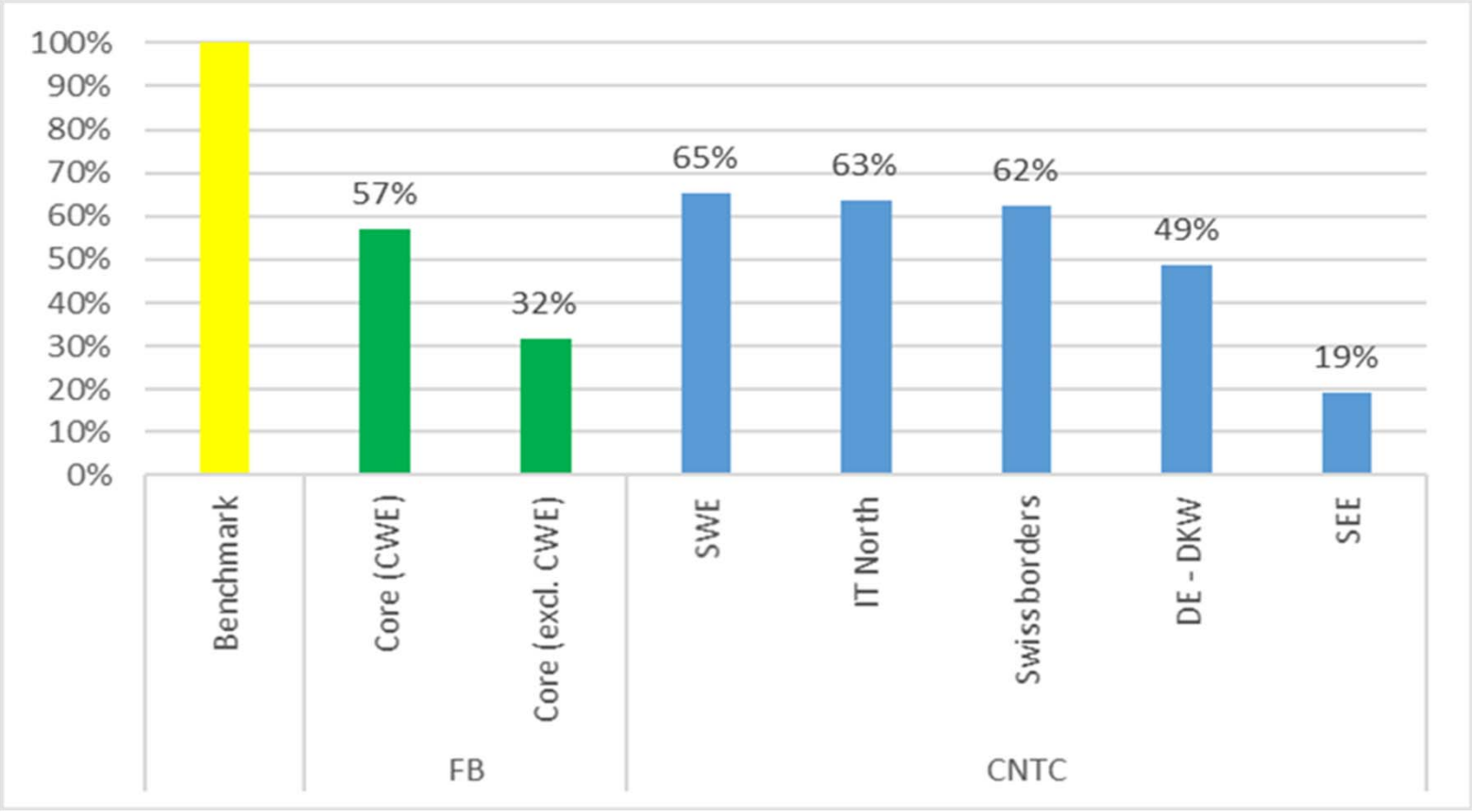
Note: * ID and balancing values are based on a selection of EU borders.

Source: ACER calculations based on ENTSO-E, NRAs and Vulcanus (2017).

Cross-border capacity availability

… and in the amount of cross-border capacity made available to the market

Ratio of available tradable capacity to benchmark capacity on HVAC borders per CCR 2017 (%)

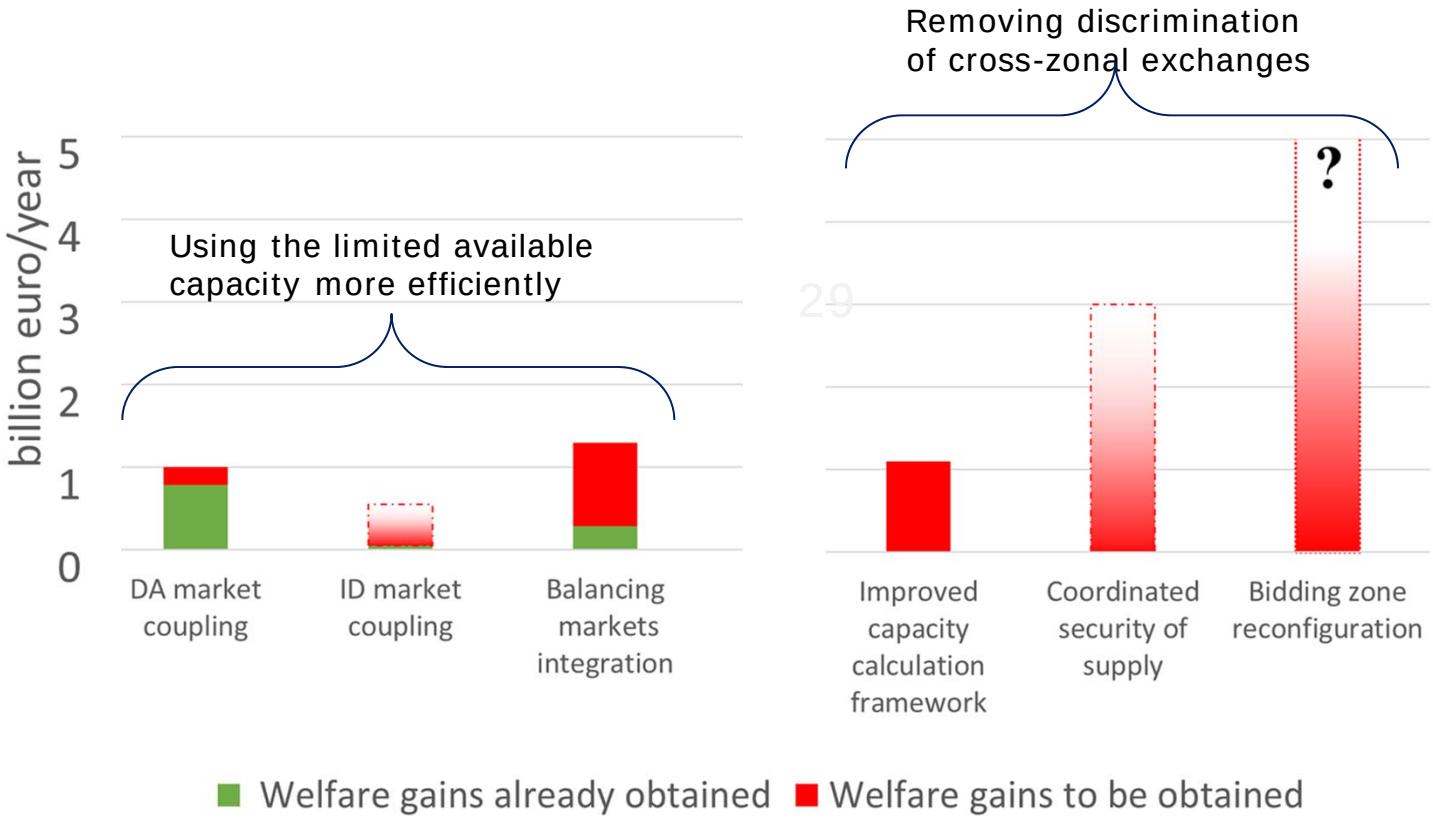


Source: ENTSO-E, NRAs and ACER calculations.

Benefitting consumers

EU energy consumers have gained a lot from the integration of the internal electricity market, but could gain even more!

Social welfare* benefits already obtained and to be obtained from various actions intended to increase EU markets integration



Note: *Gross benefits. The fading colour for some categories indicates that the welfare gains are based on third-party estimations and/or subject to considerable uncertainty.

Source: ENTSO-E, NRAs, NEMOs, Vulcanus and ACER calculations.

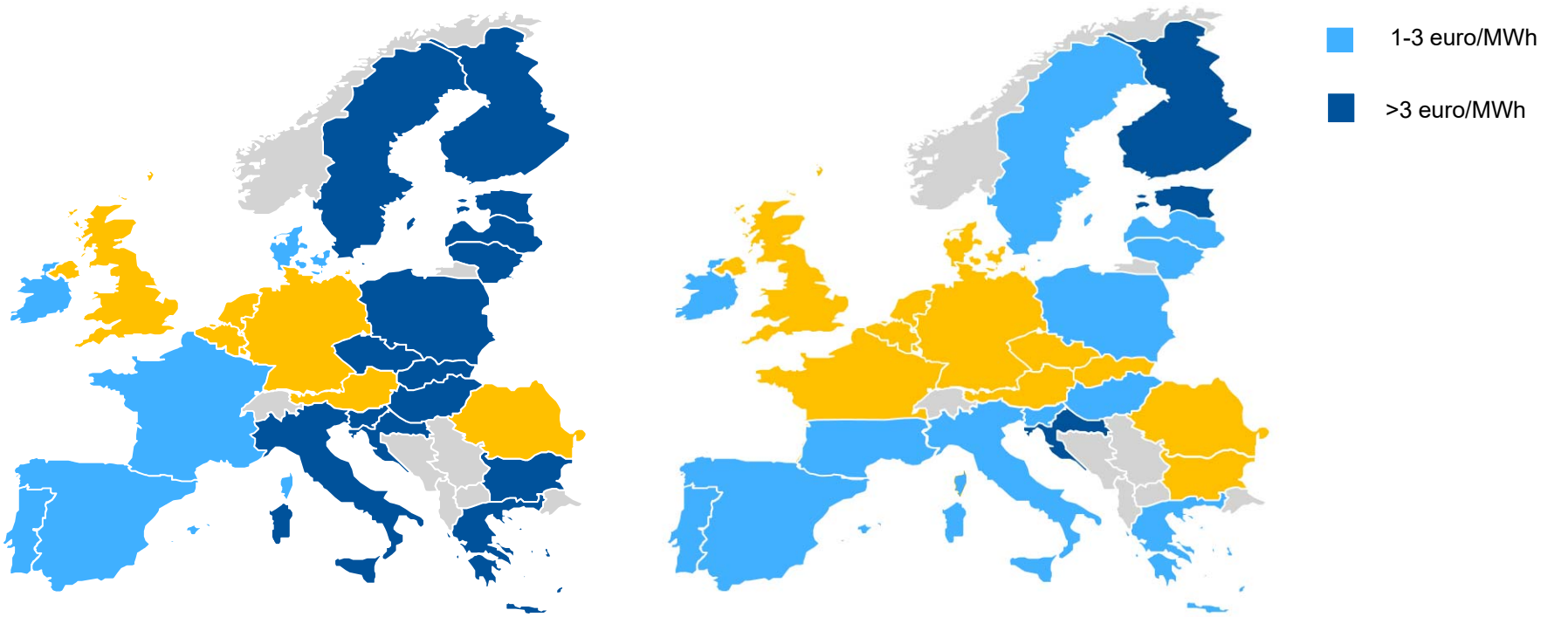
The EU Internal Gas Market

High levels of supply price convergence have been reached across most parts of the EU

Estimated gas supply sourcing cost* compared to the TTF hub

2012: TTF = 25.7 € /MWh

2017: TTF = 17.0 € /MWh



Note: *Suppliers' sourcing cost assessment based on a weighted basket of border import and hub product prices

Full and efficient use of the cross-border transport capacity

Estimated Annual Benefits
€ 400 million

Source: ACER 2017 Market Monitoring Report, Gas Wholesale Volume based on NRA input, Eurostat Comext, BAFA, Platts.

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Thank you for your attention

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