

MARKET COUPLING AS EFFICIENT CAPACITY ALLOCATION METHOD ON THE FRANCE-SPAIN INTERCONNECTION

SC C5 – Market Disturbance Workshop
G.Barbieri (RTE - France), J.Bogas (OMIE –
Spain), E.Peregrina (REE – Spain)



PLAN

Workshop – “Large Disturbances – System operation and Market Performance Perspectives”

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MARKET COUPLING AS EFFICIENT CAPACITY ALLOCATION METHOD
ON THE FRANCE-SPAIN INTERCONNECTION

- 1. CONTEXT:** EXPLICIT ALLOCATION OF DAY-AHEAD EXCHANGE CAPACITIES BETWEEN SPAIN AND FRANCE
- 2. DRIVING EVENTS:** INEFFICIENT USE OF INTERCONNECTION CAPACITIES
- 3. OUTCOME:** IMPLEMENTATION OF MARKET COUPLING
- 4. OBSERVATIONS:** IMPROVED MARKET EFFICIENCY

Context: explicit allocation of day-ahead capacities

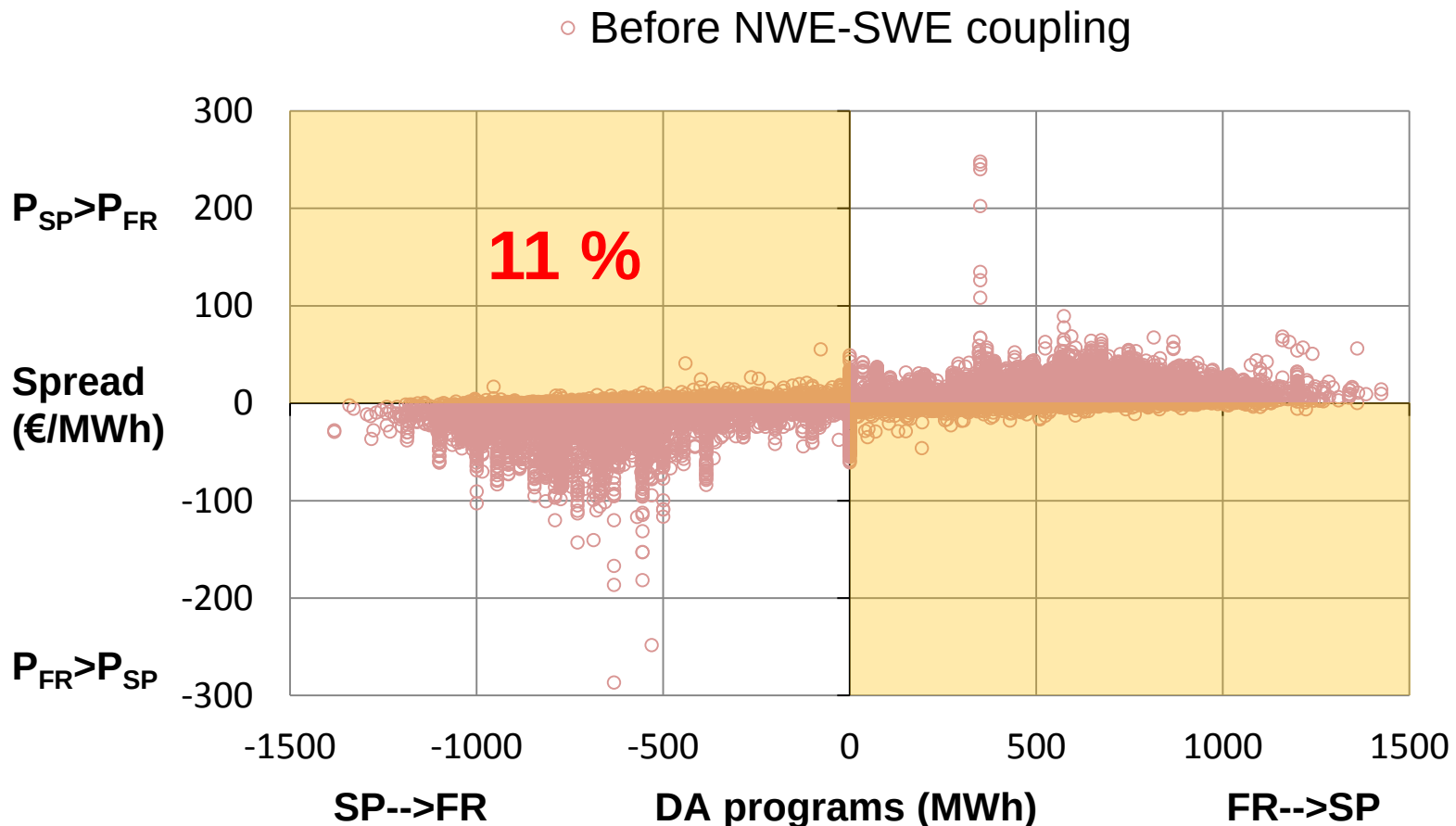
- In both France and Spain organized **wholesale electricity markets exist**
- Tradable energy products range from long term yearly products to **hourly products at day-ahead** and intraday horizons
- The spot (day-ahead - reference) markets are managed by the Power Exchanges **OMIE** in Spain and **EPEX** in France
- **Both markets are zonal**, delivering a single electricity price for the entire country
- Only energy products are traded in the **Power Exchanges**
- **Exchange capacity between France and Spain** (approximately 1200 MW) **was allocated through an explicit auctions market mechanism** at the yearly, monthly, **day-ahead** and intraday timeframes

Driving events: before market coupling

- The explicit auctions at the daily timeframe were not the highest efficiency capacity allocation method:
exchange capacity and energy had to be traded in two different steps
- This **limitation** led to a **not always efficient use of the interconnection**:
 - energy flowing **against** the market spread **in some hours**
 - **price divergence** with non-saturated exchange capacity
- Cost of these inefficiencies was estimated at **~12 M€ / year**

Driving events: non correct use of interconnection

Day-Ahead Exchanges vs. Day-Ahead Spread



Outcome: market coupling

- The market coupling of zonal markets is the European target model:
 - Implicit allocation of Capacity simultaneously with energy allocation, optimizing the use of cross border capacities in line with the Markets results
- France had already been coupled with Germany, Belgium, the Netherlands and Luxembourg (**Central West Europe - CWE** Coupling)
- The market coupling was extended to UK and Scandinavian and Baltic countries (**North West Europe - NWE** Coupling) in February 2014
- Spain was already coupled with Portugal (MIBEL Market) since July 2007
- In May 2014 the daily explicit auctions on the France-Spain interconnection have been replaced by the European market coupling mechanism
- A shared and common algorithm (Price Coupling of Regions - PCR solution) was used

Outcome: market coupling in EU

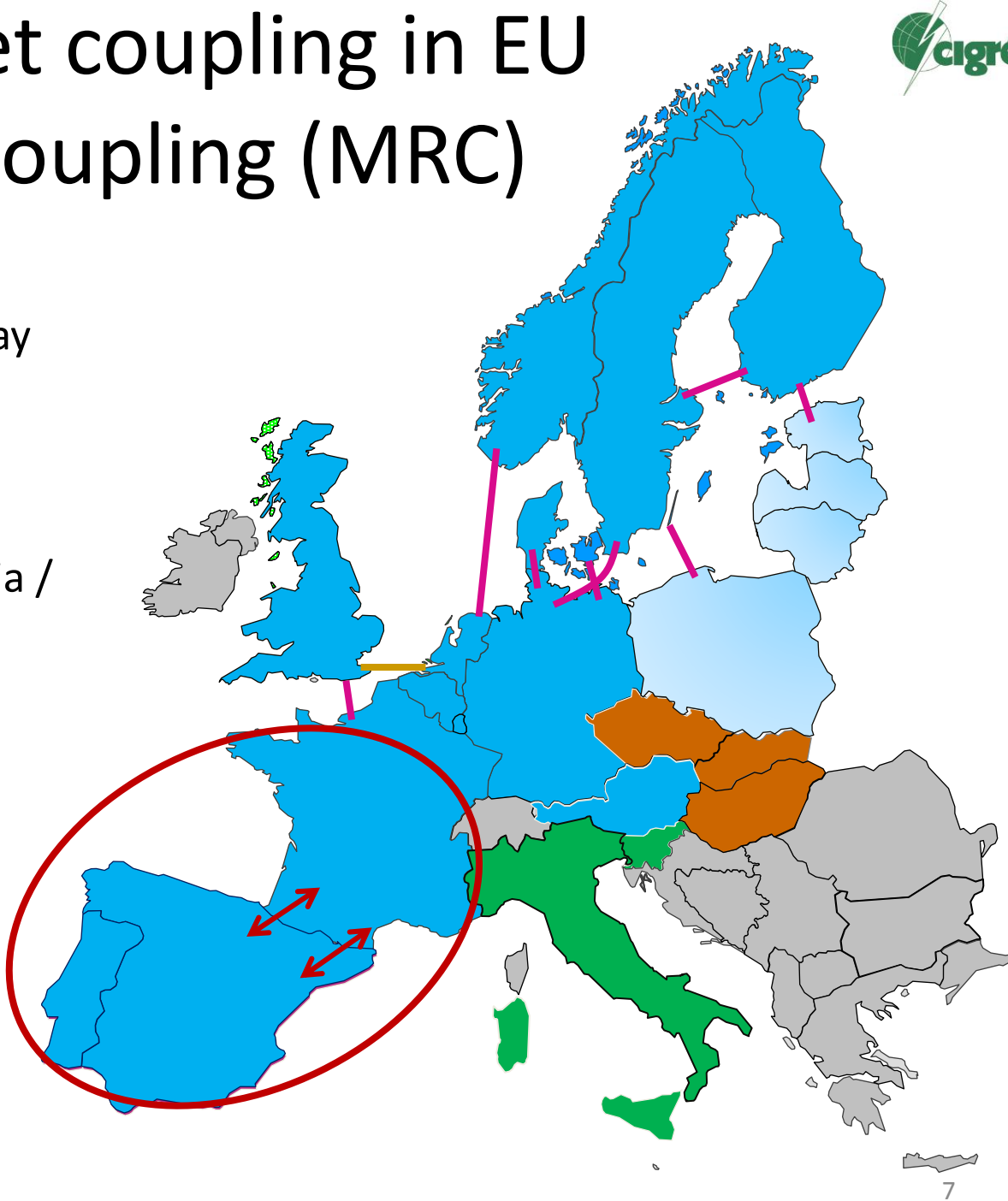
Multi Regional Coupling (MRC)

Project NWE + SWE : may 2014

Italy / Slovenia

Czech Republic / Slovakia / Hungary

Project NWE+SWE =
2500 TWh/year
(75% European electric
consumption)

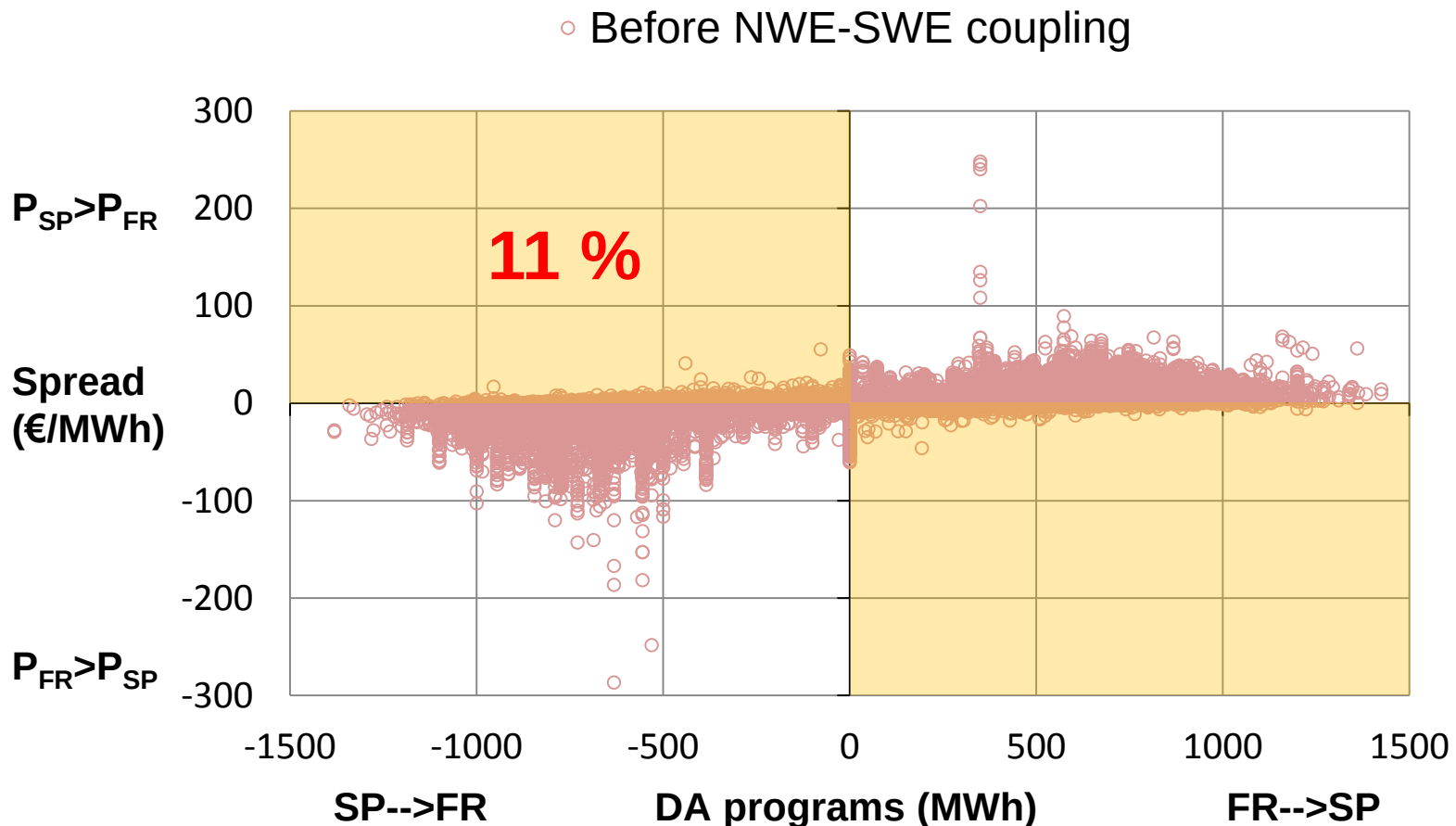


Observations: methodology

- **Improved market efficiency measured by the following indicators:**
 - a) *Use of the interconnection*
 - b) *Number of participants competing for capacity*
 - c) *Price convergence between France and Spain*
 - d) *Price volatility*
 - e) *Market resilience*
- **Historical data from 2012 to July 2014**
 -  – **CWE:** period from 1st January 2012 to 4th February 2014 (France coupled with the Netherlands, Belgium and Germany only)
 -  – **NWE:** period from 4th February 2014 to 13th May 2014 (CWE + UK and Scandinavian countries)
 -  – **NWE-SWE:** period after 13th May 2014 (NWE + Iberia => MRC)

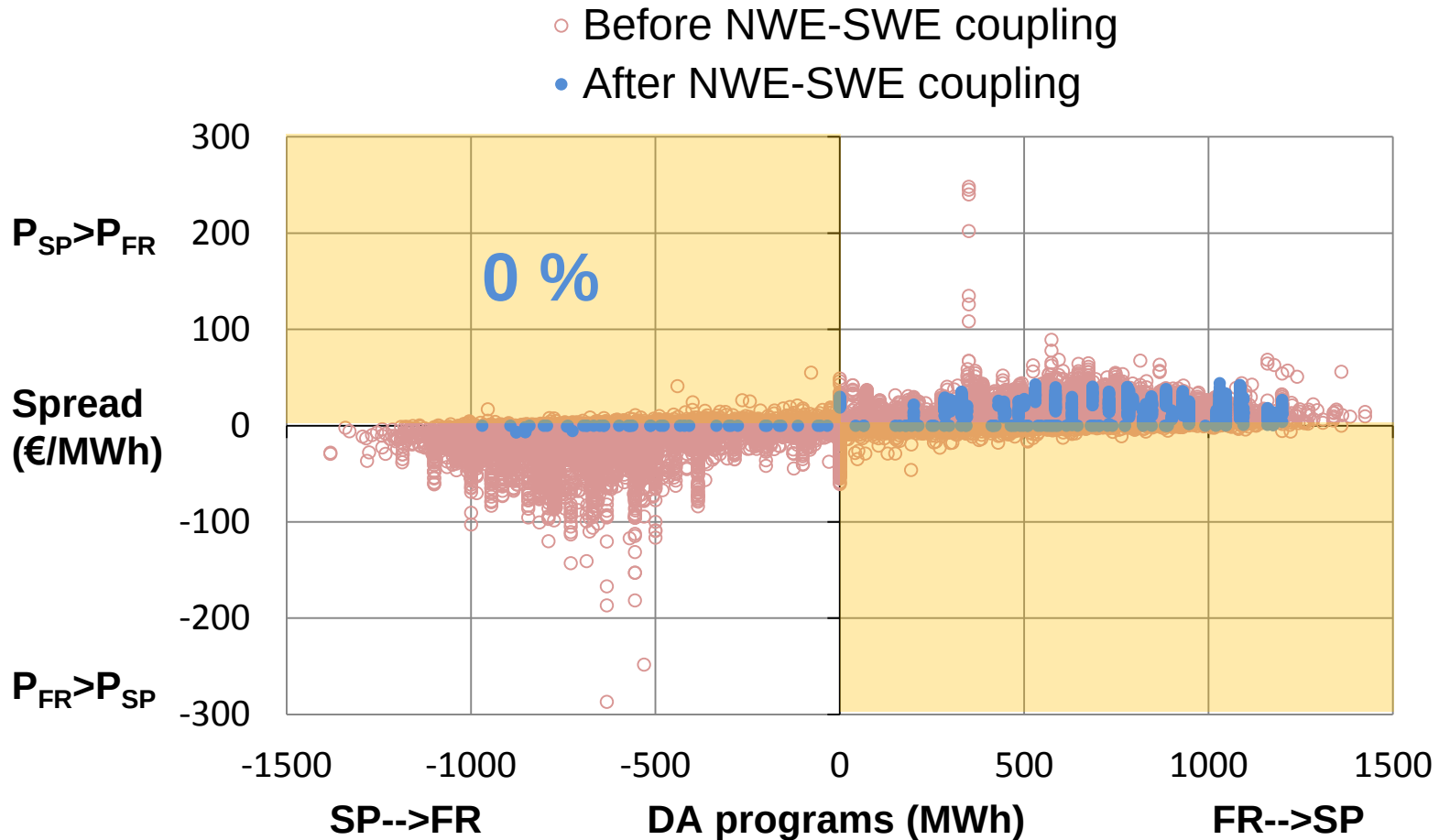
Observations: efficient use of the interconnection

Day-Ahead Exchanges vs. Day-Ahead Spread

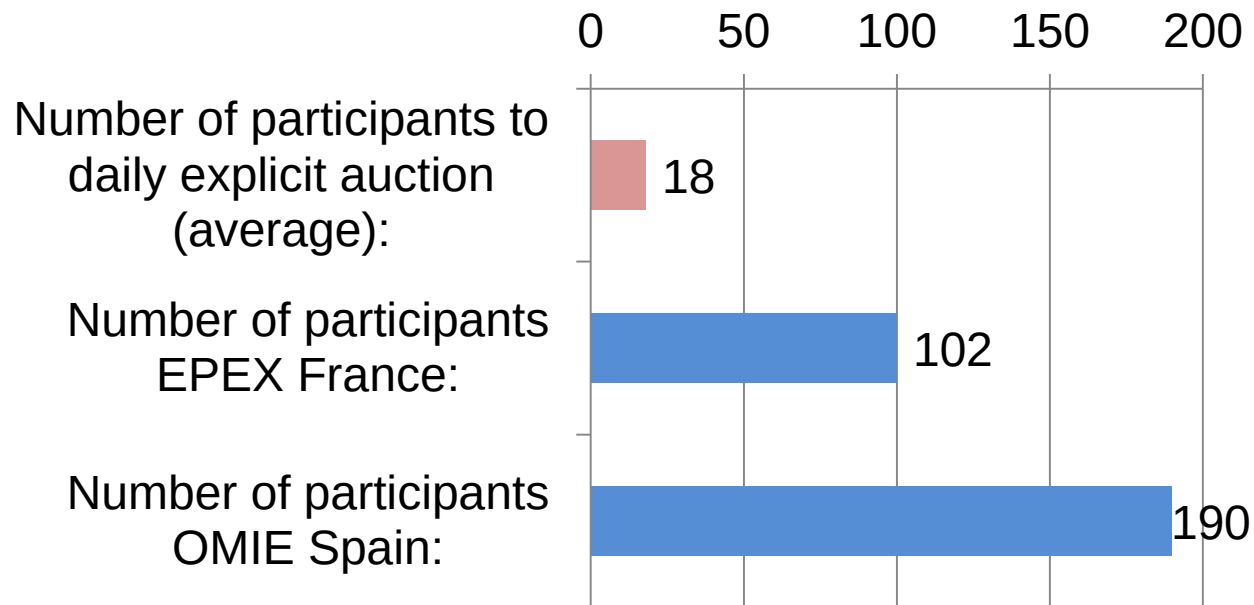


Observations: efficient use of the interconnection

Day-Ahead Exchanges vs. Day-Ahead Spread



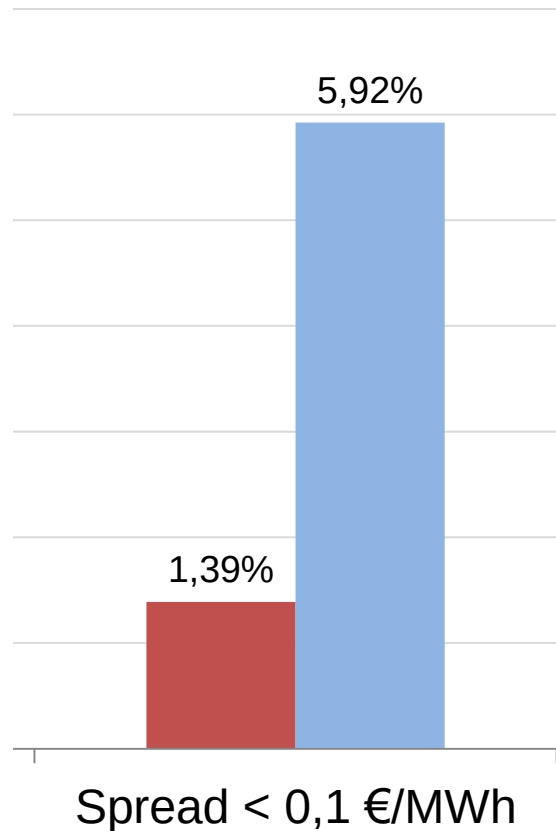
Observations: higher number of participants competing for capacity



Observations: price convergence increased

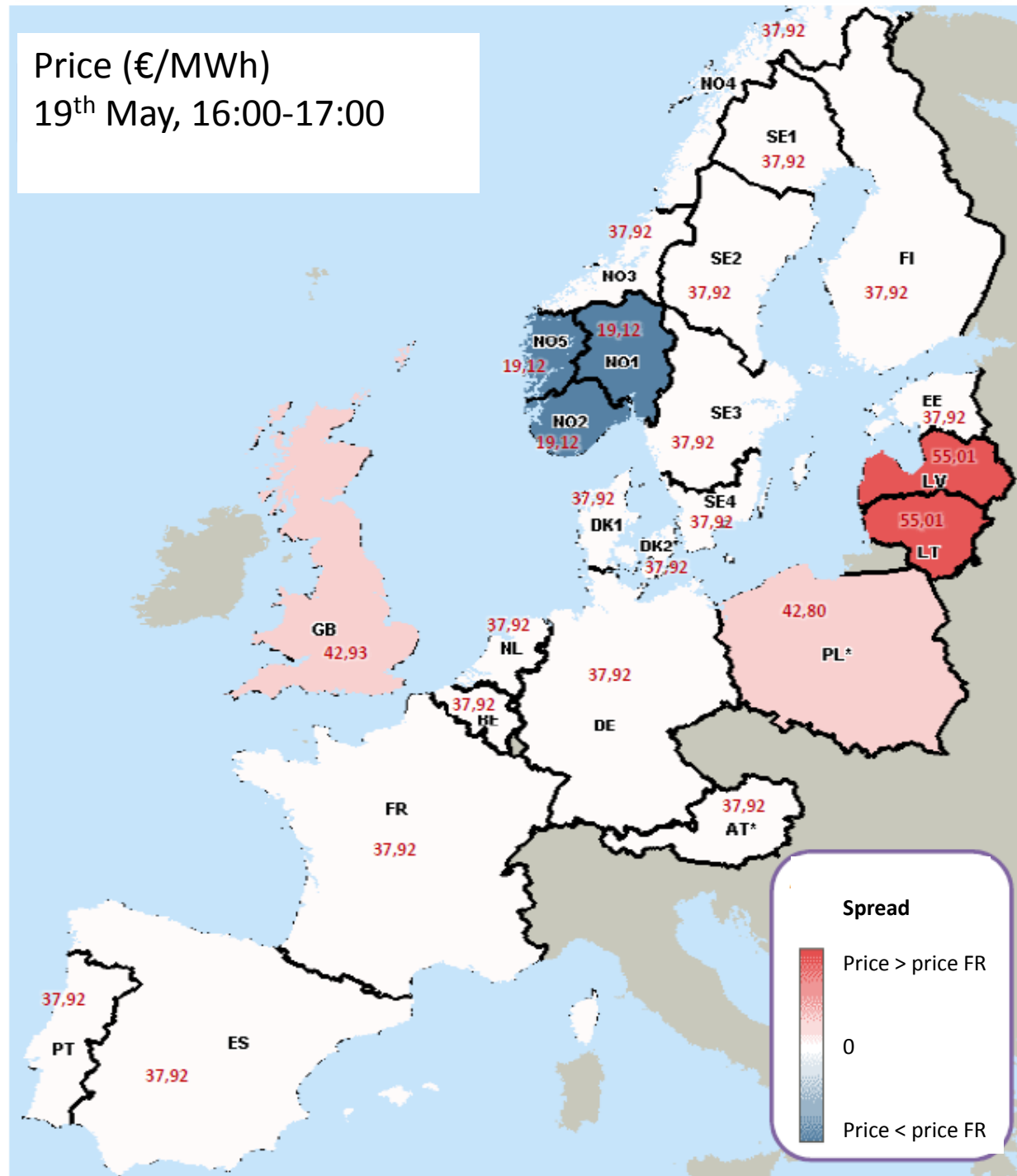
Price Convergence, % of time

■ Before NWE-SWE coupling ■ After NWE-SWE coupling



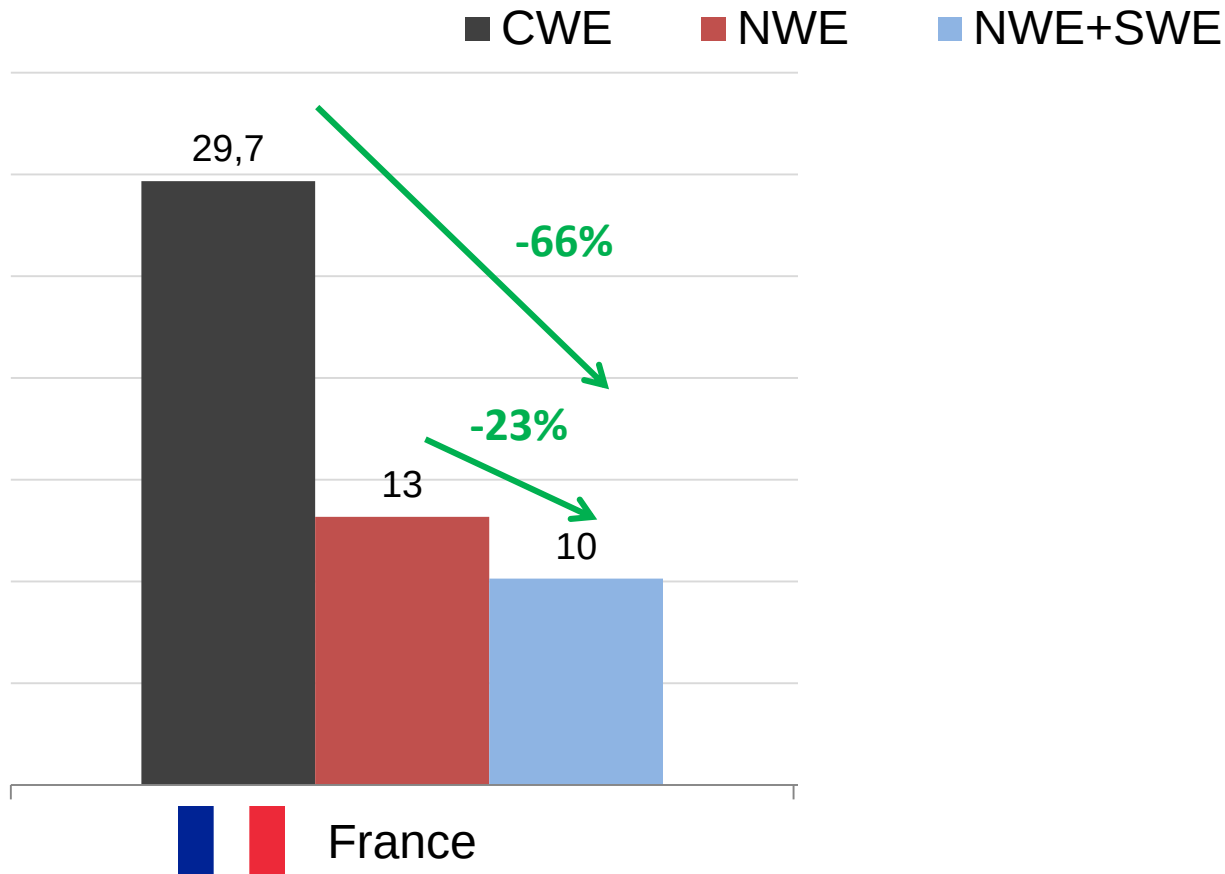
Exemple of Price convergence in Europe

Price (€/MWh)
19th May, 16:00-17:00



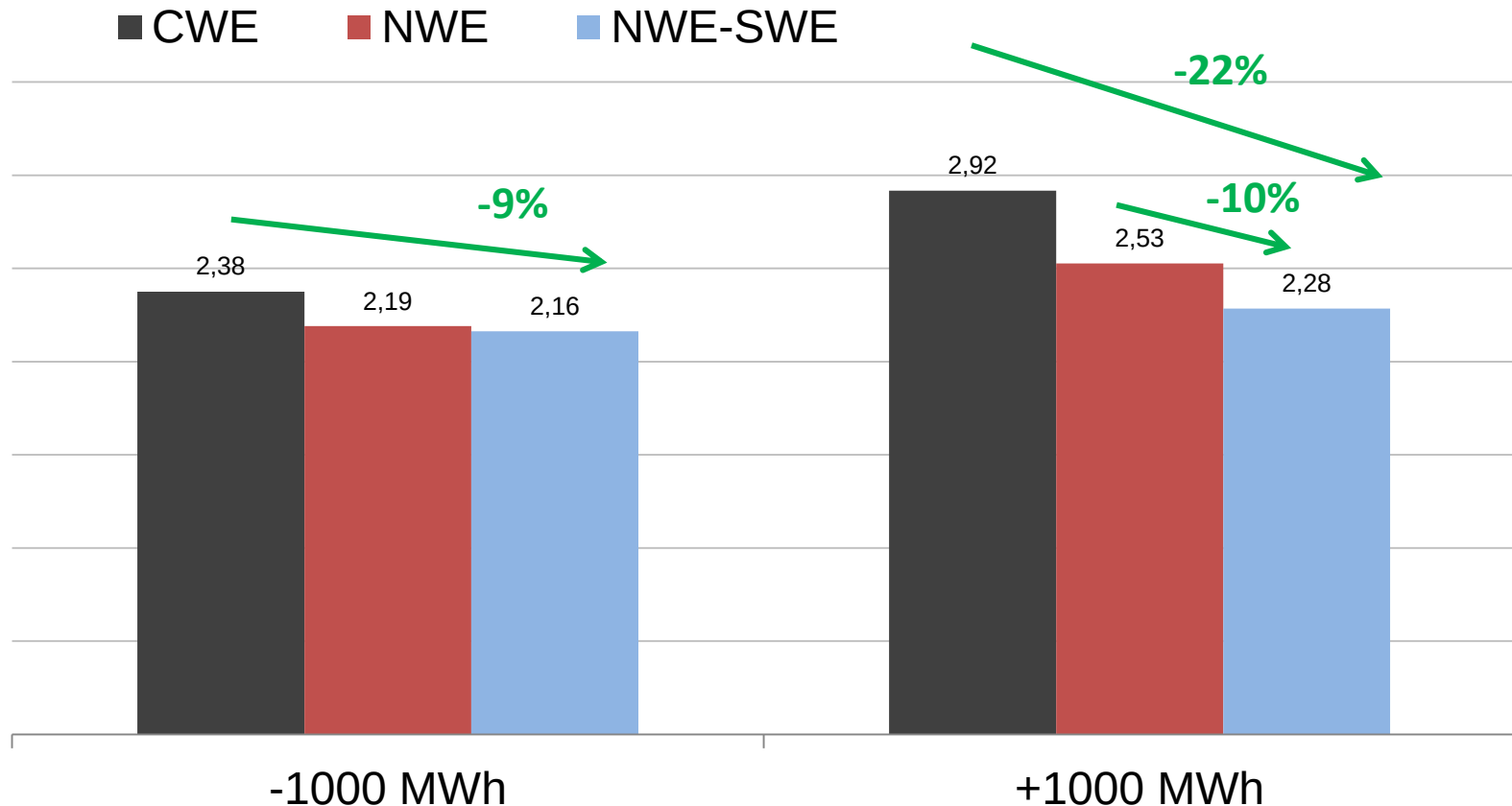
Observations: price volatility decreased

**Price volatility (standard deviation of D-1 hourly prices),
€/MWh**



Observations: market resiliency increased (France)

Average Resilience (absolute price variation with price inelastic order of +/- 1000 MWh), €/MWh



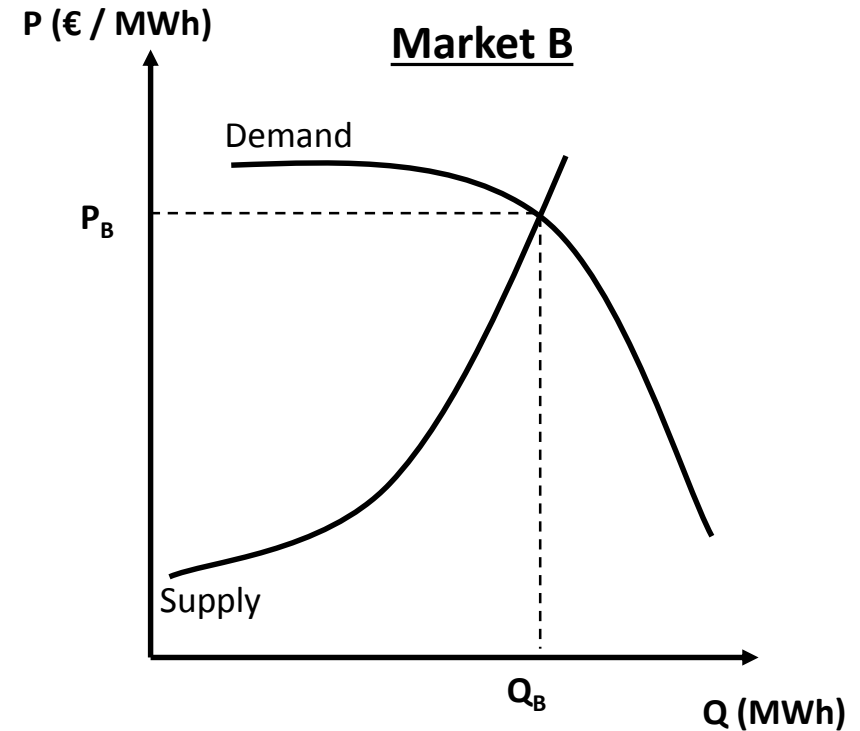
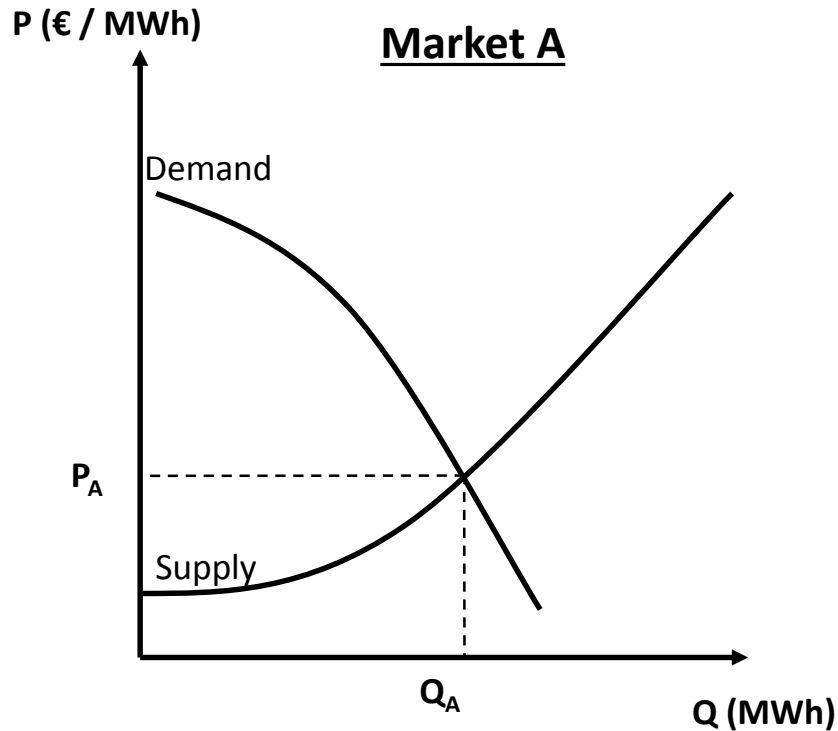
Conclusions

- Proven and confirmed usability of the market coupling model with a shared and common algorithm in an important part of European price zones
- Improved efficiency in the **use of the interconnection**
- Increased **number of participants** competing for capacity
- Increased **price convergence**
- Decreased price **volatility**
- Increased market **resilience and liquidity**

...the way forward: extension of day-ahead market coupling to all EU countries !

ANNEXES

Market coupling principles

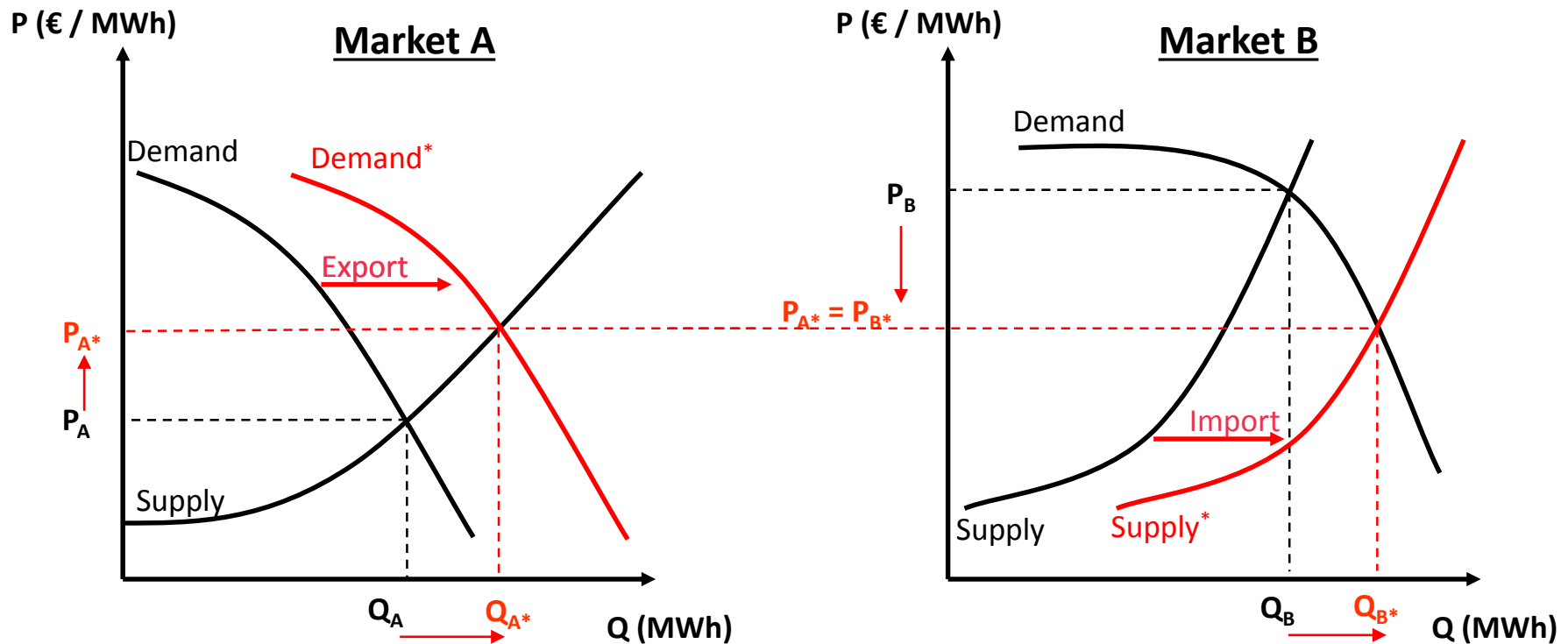


Isolated Market B price > Isolated Market A price

Market A can export towards market B

Market coupling principles

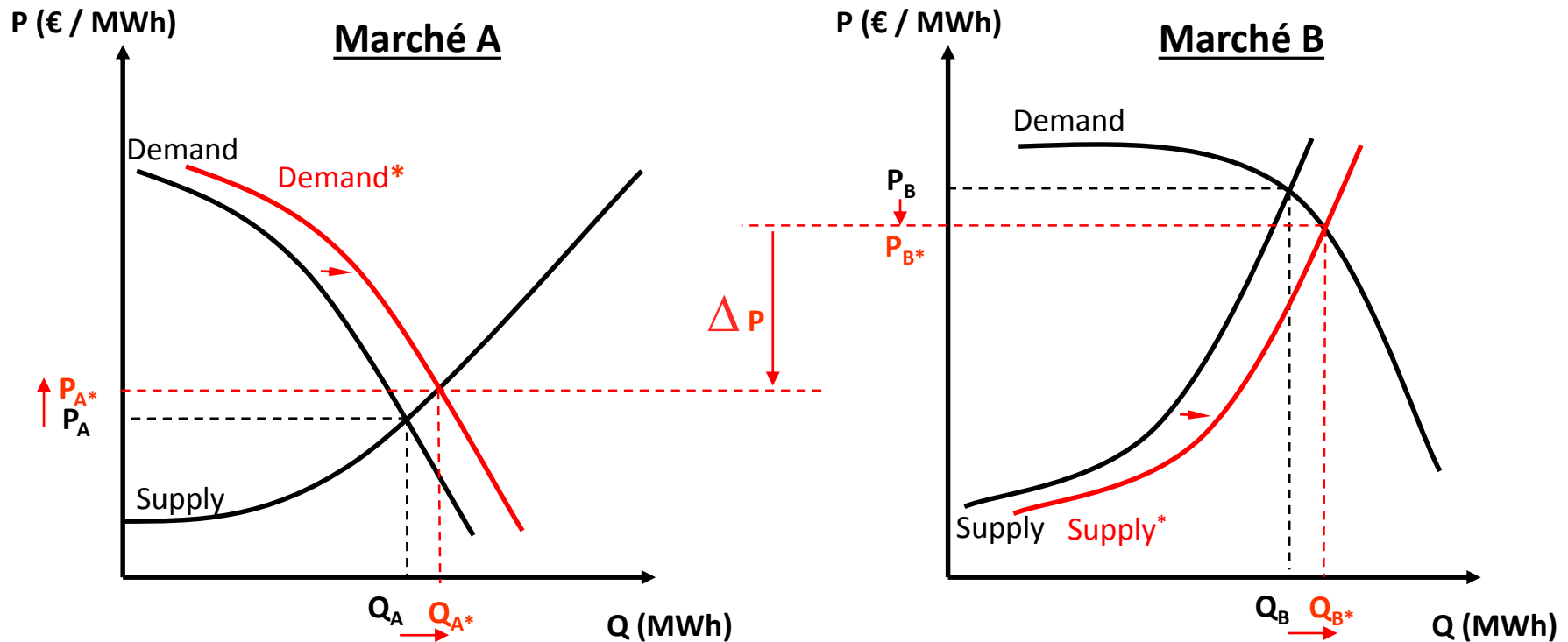
No congestion case



If the export capacity from A to B is enough, then markets A et B prices converge

Market coupling principles

Congestion case



If the export capacity from A to B is limited and not enough, then a spread market price remains

Market coupling principles

–Implicit allocation of Capacity simultaneously with energy allocation aiming at optimizing the use of cross border capacities in line with the Markets results.

–Simultaneous interconnection capacity allocation and the associated energy:

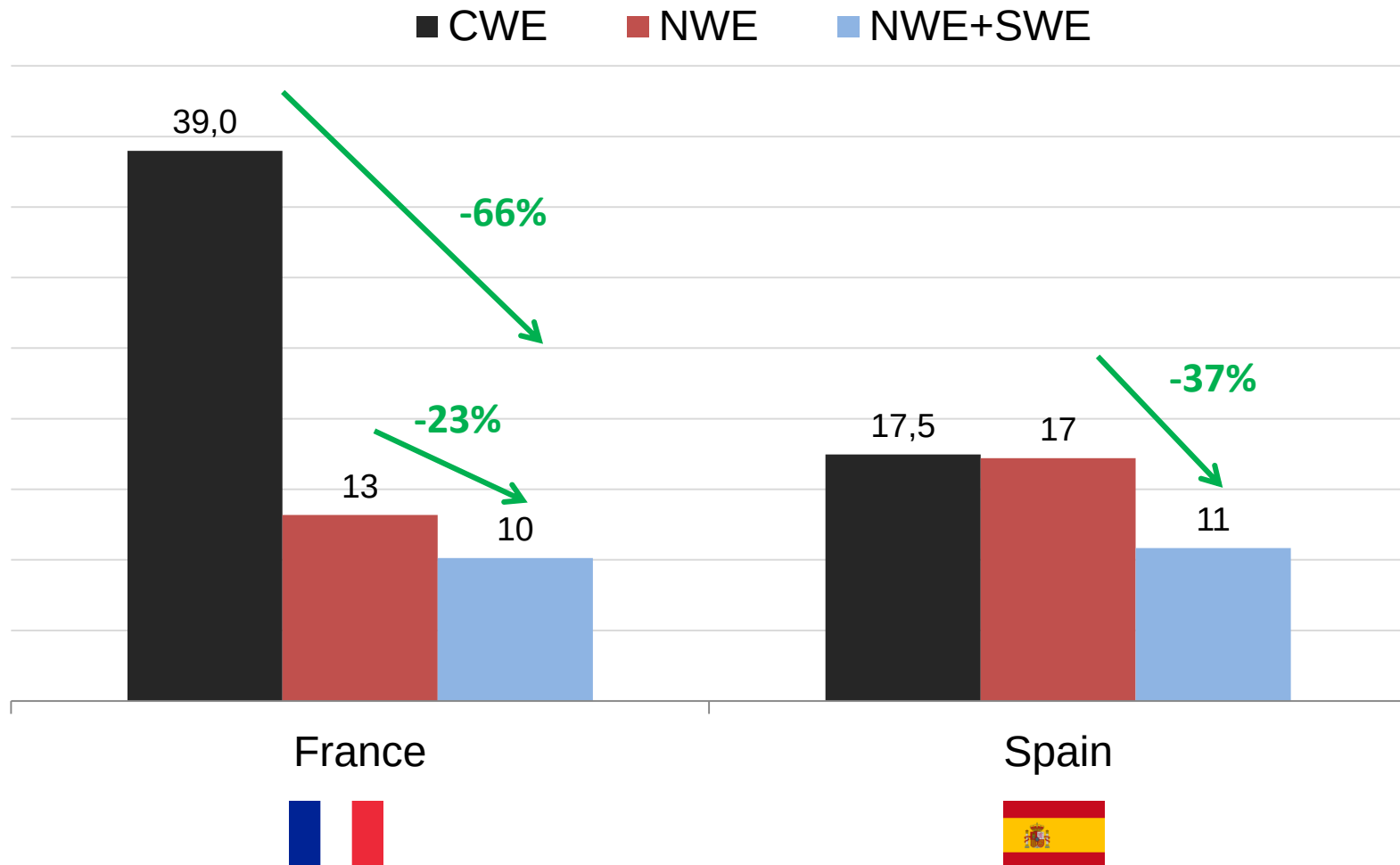
- More liquidity on the power exchanges
- Best price convergence between countries
- Less price volatility

–Best capacity utilization

- Remove adverse flows (flow from the most expensive to cheapest countries)
- Simplify the allocation process and capacity utilization

Observations: price volatility decreased (February–July data)

Price volatility (standard deviation of D-1 hourly prices),
€/MWh - period: February - July



Observations: market resiliency increased (France – February-July data)



Average Resilience (absolute price variation with price inelastic order of +/- 1000 MWh), €/MWh - Period: February - July

■ CWE ■ NWE ■ NWE-SWE

