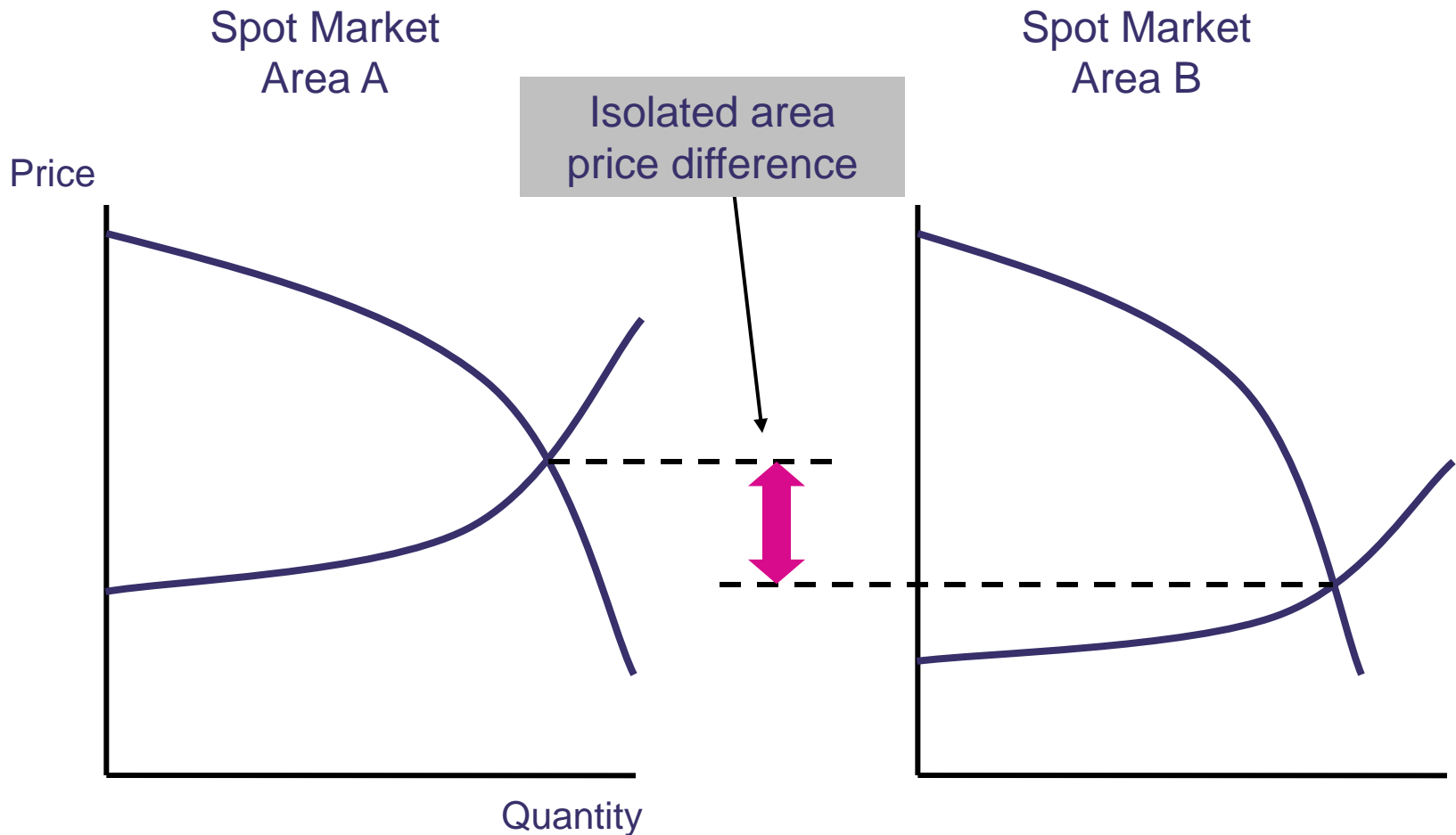


# Price Coupling Regions (PCR) Initiative

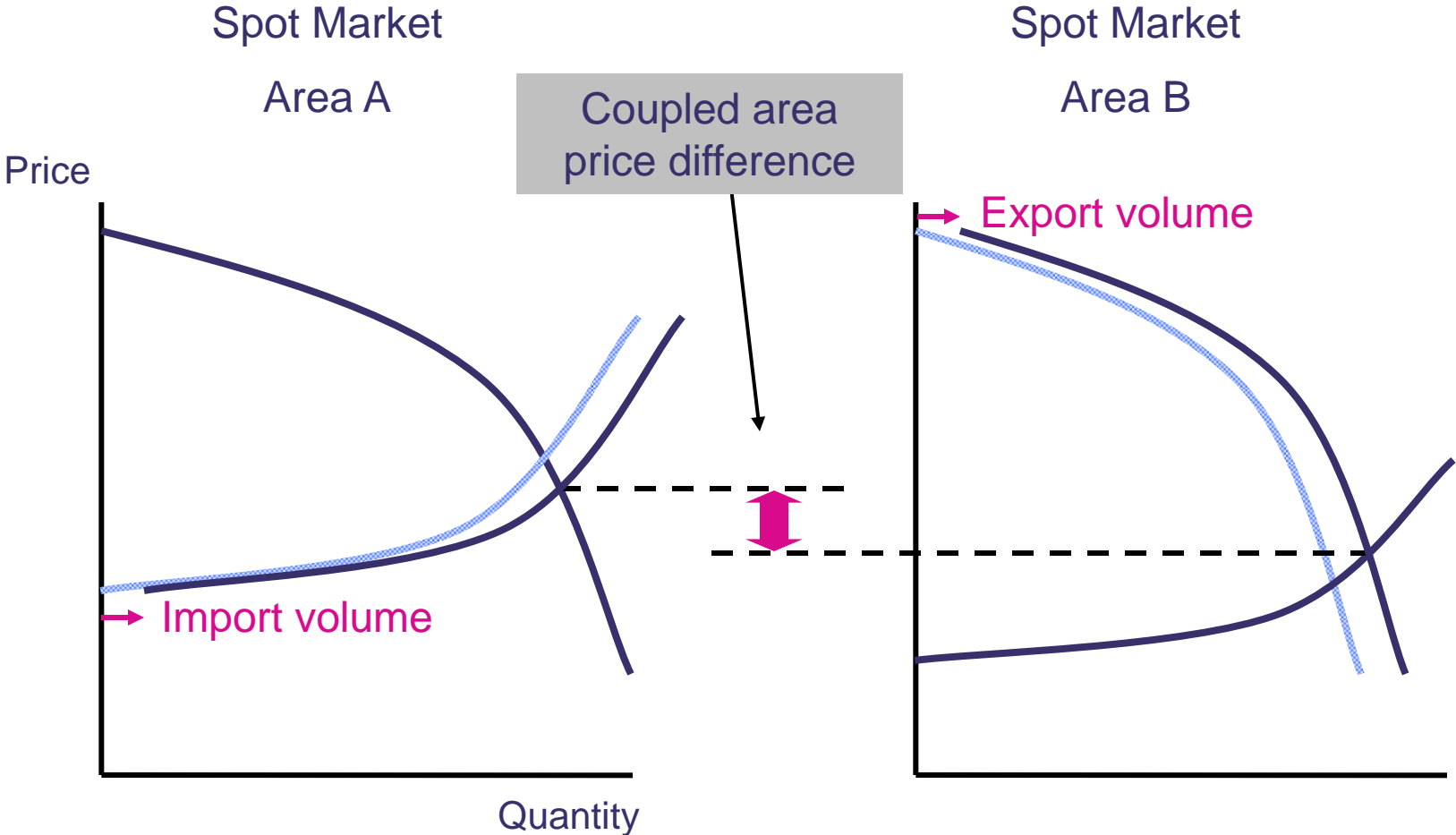
Information Workshop on Emerging Electricity Target Models  
Dundalk, 3 June 2011  
Andrew Claxton - Business Services Director APX-ENDEX

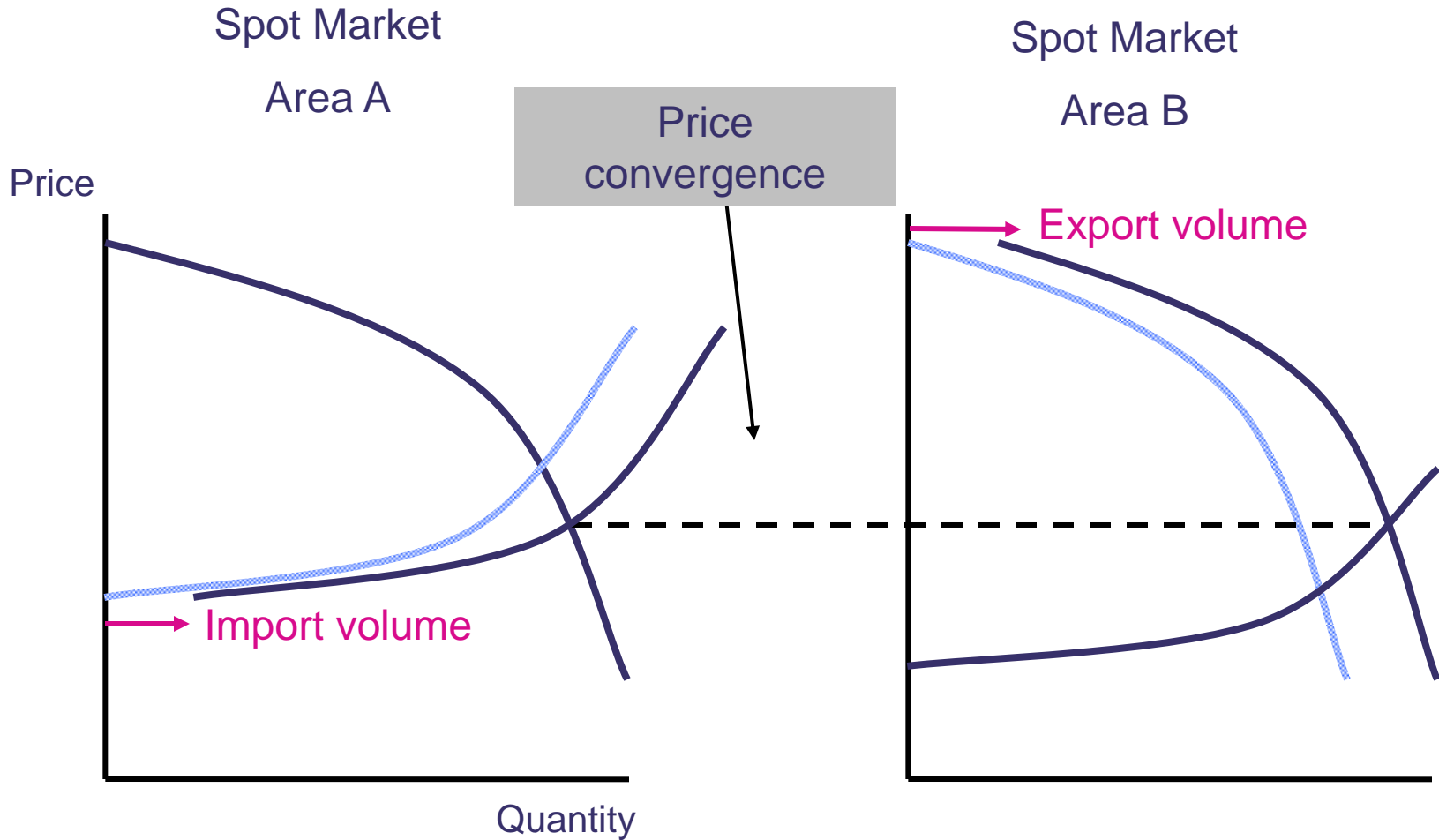
- 🌐 **Market coupling concept**
- 🌐 **Price Coupling of Regions (PCR)**
- 🌐 **Prospects for the North West Europe region and SEM**
- 🌐 **Intraday**

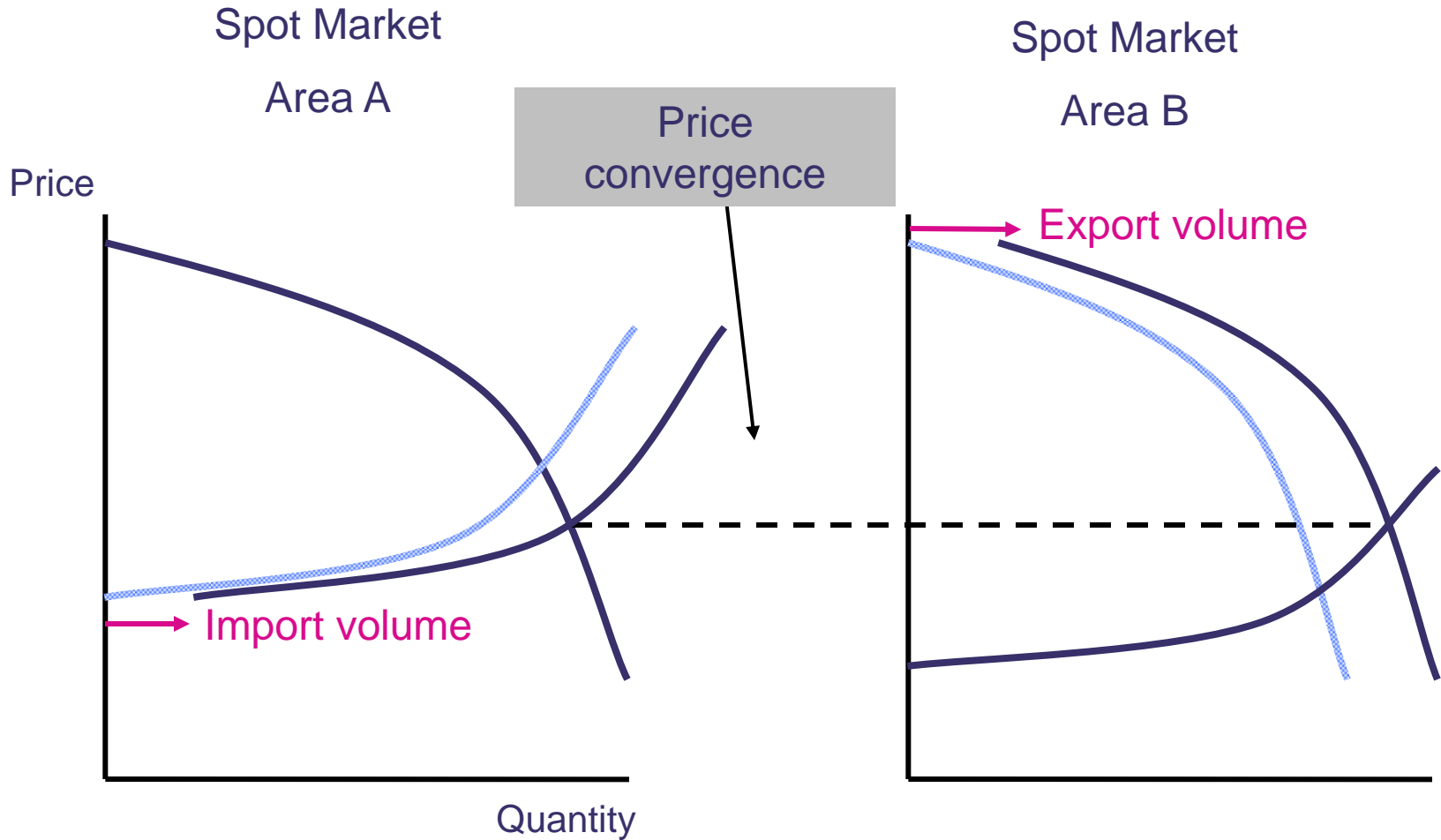
- 🇪🇺 Target model for day-ahead spot market acknowledged by all stakeholders: European-wide single price coupling
- 🇪🇺 Price coupling is a way of linking separate day-ahead (auction-style) spot markets using cross-border transmission capacity; hourly settlement periods
- 🇪🇺 An “Implicit solution”: allocate access to cross-border transmission via energy markets (“explicit auctions” sell transmission capacity separately)
- 🇪🇺 Price coupling is a form of market coupling where prices and flows are determined together (“volume coupling” only determines flows, prices then set locally)
- 🇪🇺 Successful regional solutions have demonstrated clear benefits of price coupling
- 🇪🇺 Target: create one single solution across European connected electricity system

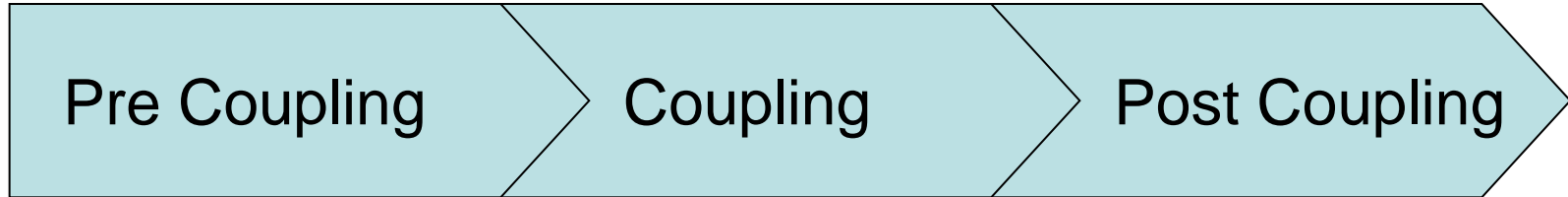


# Impact of cross-border flows









- TSOs calculate firm DA capacity (including UIOSI of forward rights)
  - PXs receive orders from market parties
- PXs jointly calculate prices and net import/export positions of each hub
    - Welfare maximisation
    - Price differences where there is congestion\*
- Shipping:
    - Schedule and nominate cross-border flows
    - Settle exports and imports on relevant exchange; any gain (“congestion revenue”) to TSOs
  - PXs nominate and clear local market trades

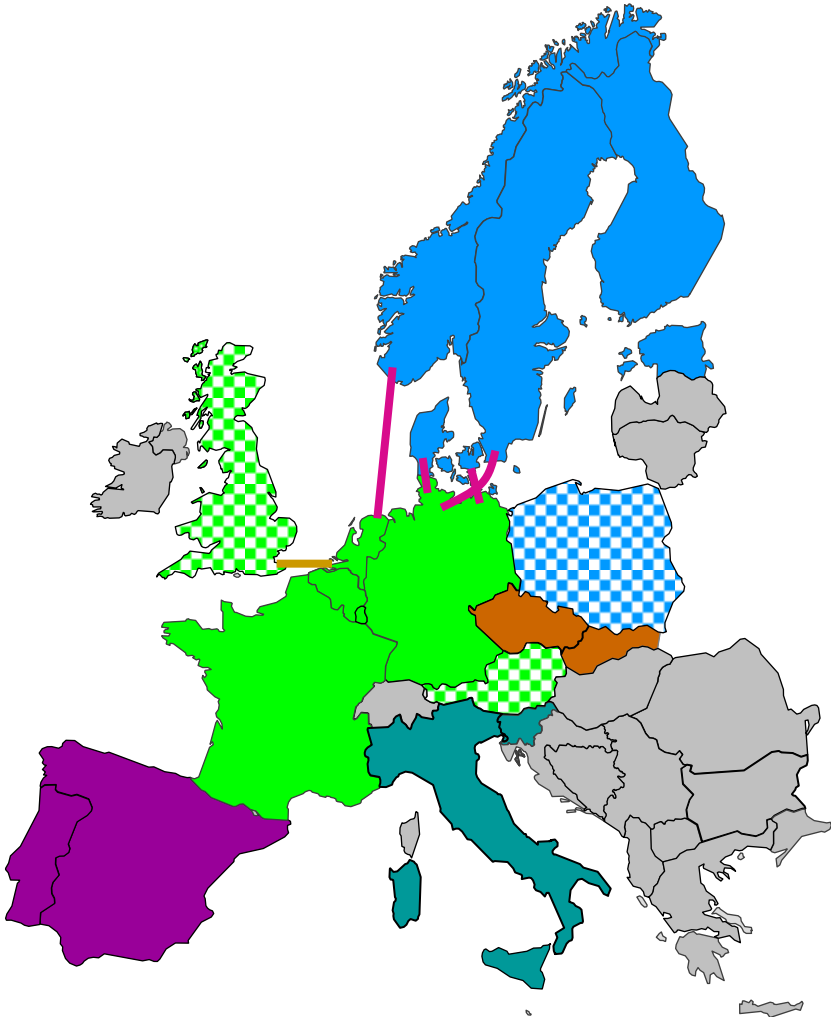
\* also if adjustments for losses and flow related charges (e.g., BSUoS)



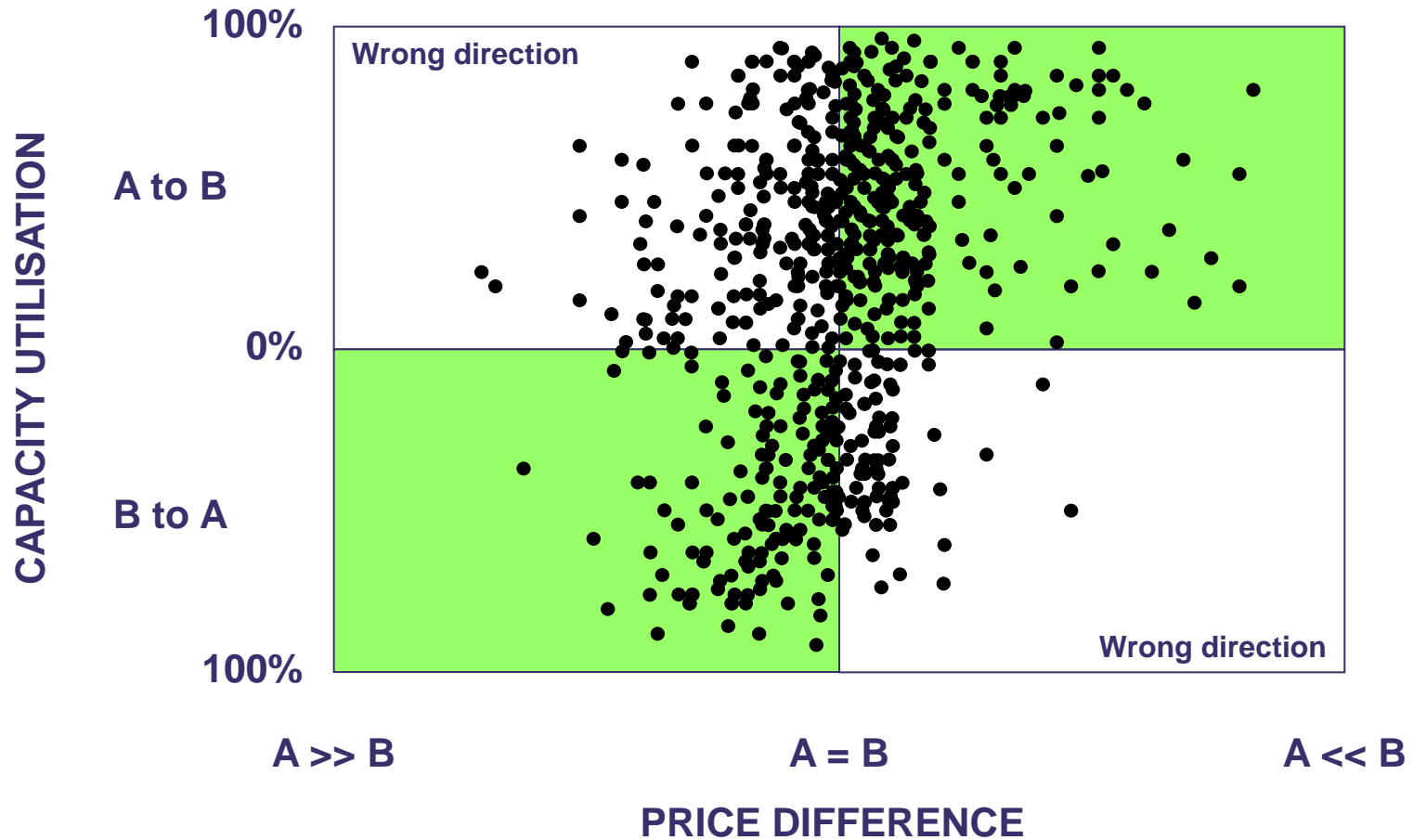
- Removes unnecessary risks of trading short-term transmission capacity and energy separately
- Guarantees optimal utilisation of transmission capacity
- Less prone to market abuse since capacity cannot be hoarded
- All market participants benefit from cross-border capacity
- Encourages growth of liquid, robust spot markets (e.g. Belgium, Finland)

- Optimal use of capacity
- Single price (when there is sufficient capacity)\*

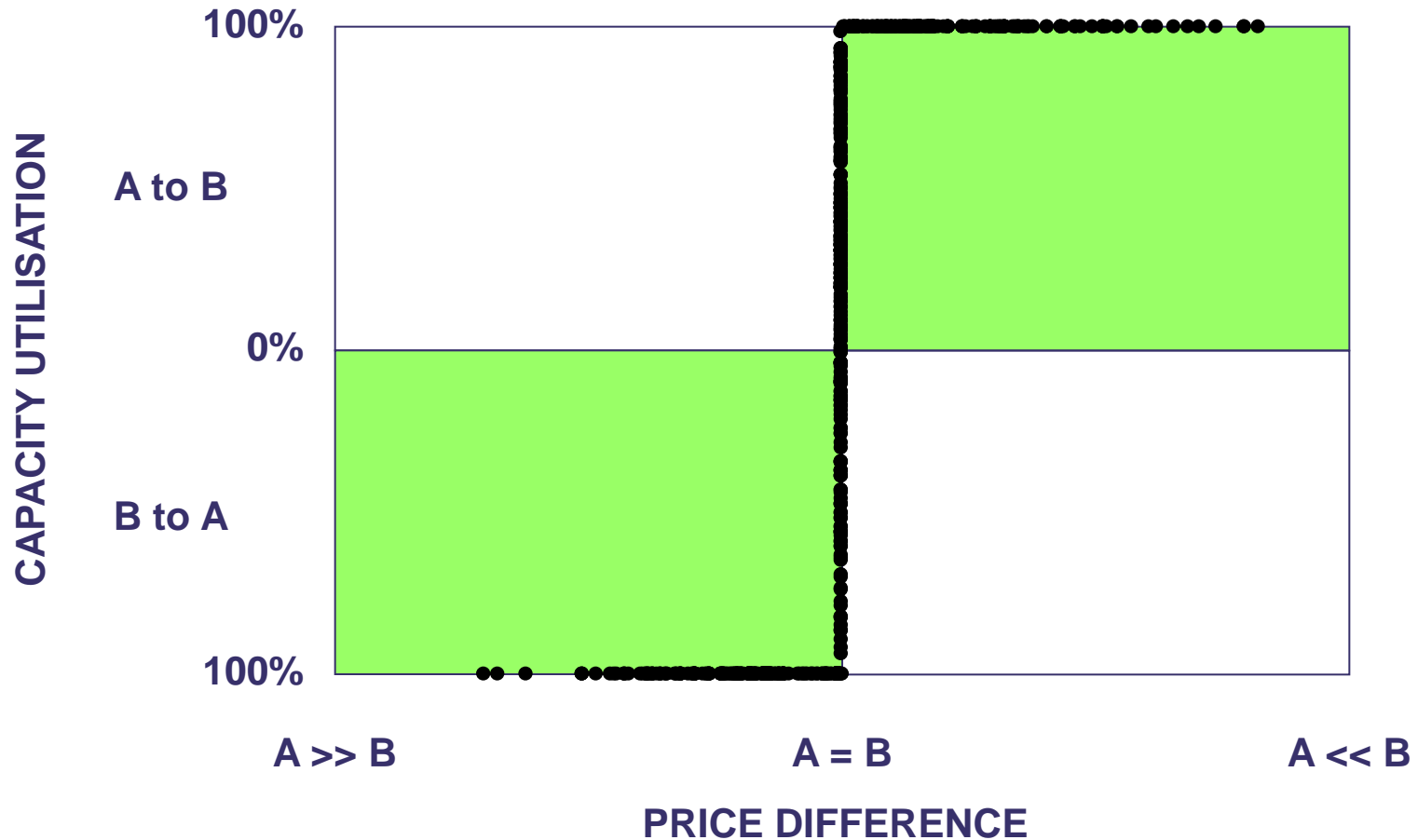
\* in absence of adjustments for losses and flow related charges (e.g., BSUoS)

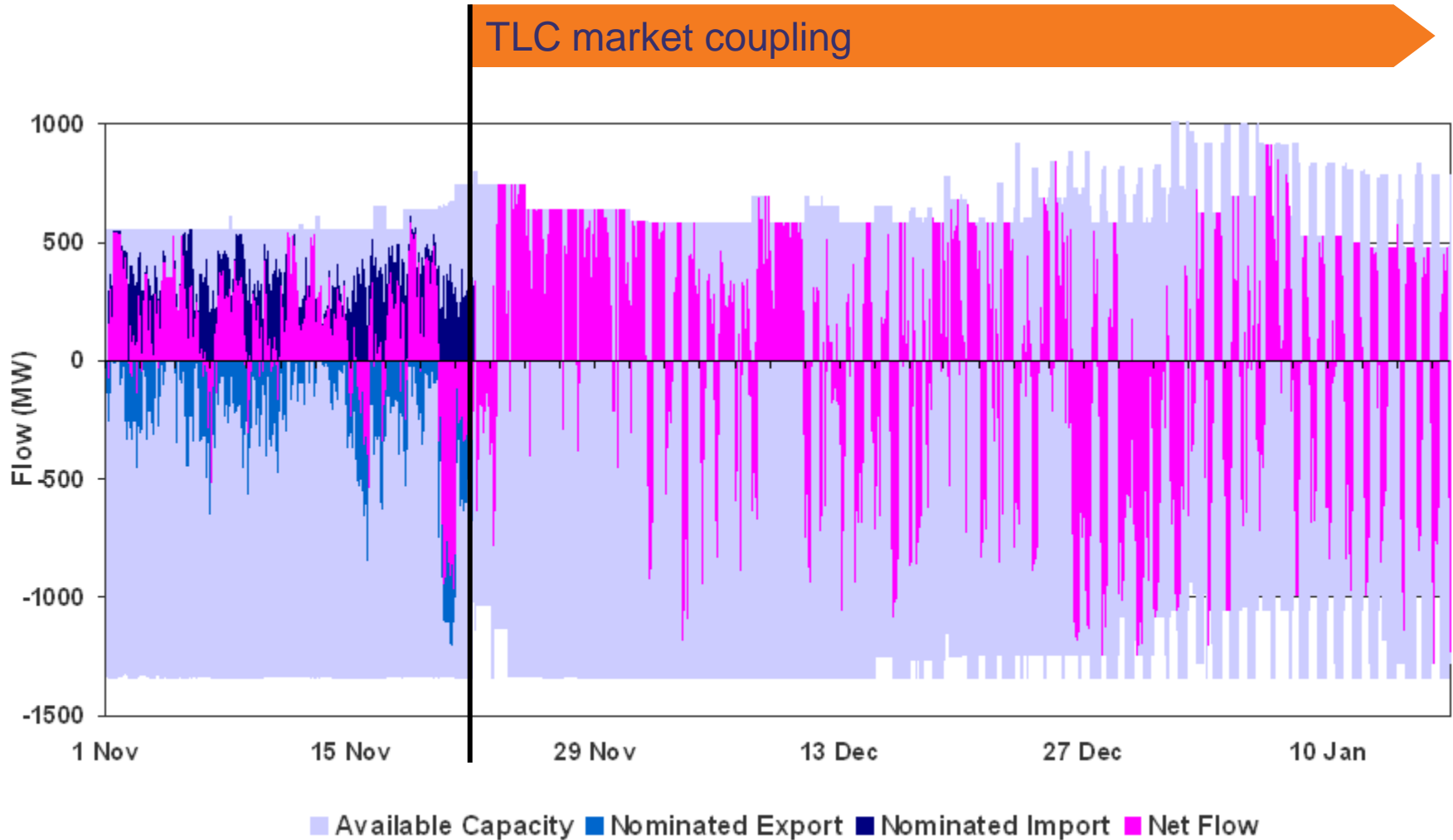


REGIONAL IMPLICIT AUCTIONS		
	<b>CWE</b>	Price coupling
	<b>Austria</b>	AT price coupled to GE/CWE (no congestion)
	<b>BritNed</b>	GB price coupled to NL/CWE
	<b>Nordic + Estonia</b>	Price coupling, also Poland via Swepol
	<b>ITVC</b>	Volume coupling CWE - Nordic
	<b>Italy - Slovenia</b>	Price coupling
	<b>Mibel</b>	Price coupling
	<b>Czech - Slovak</b>	Price coupling



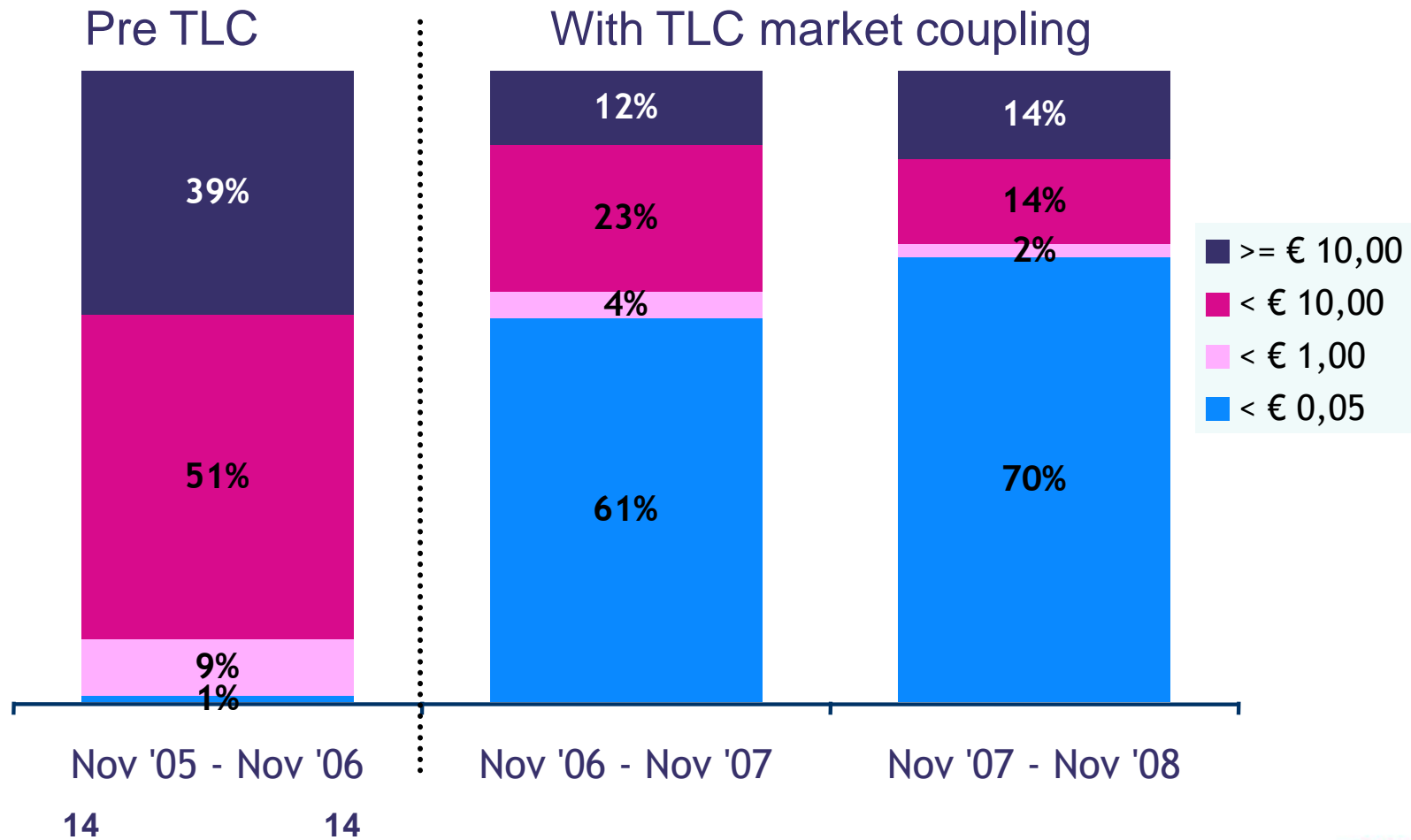
Optimal utilisation (same price unless congested)

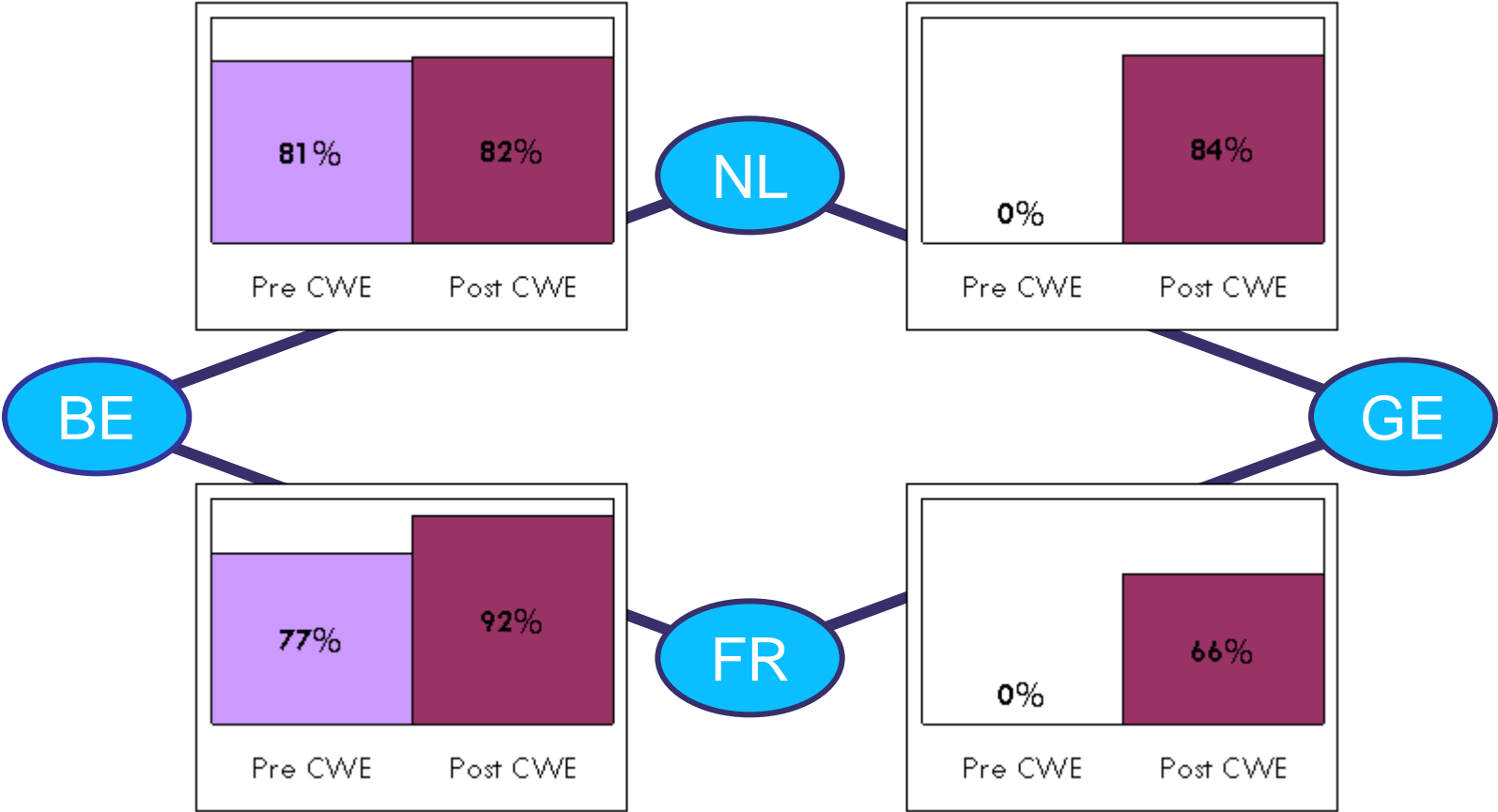




# Trilateral Market Coupling: Price Convergence

Hourly price difference FR-NL, €/MWh

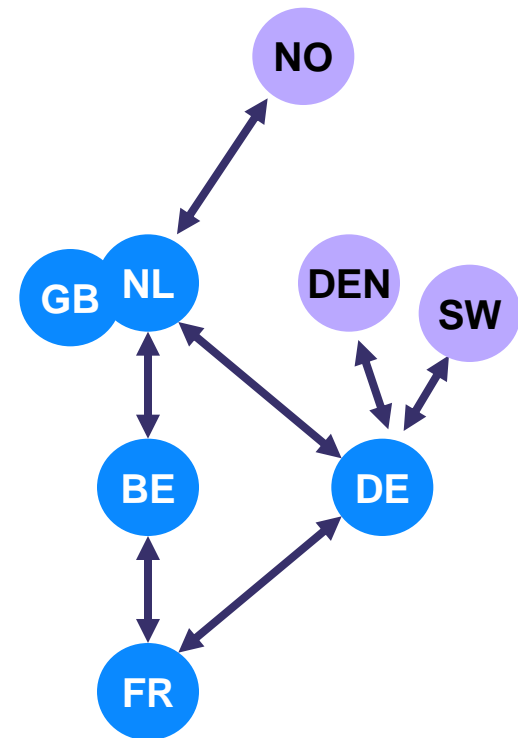




Single CWE price area 66% of hours since start to end Q1

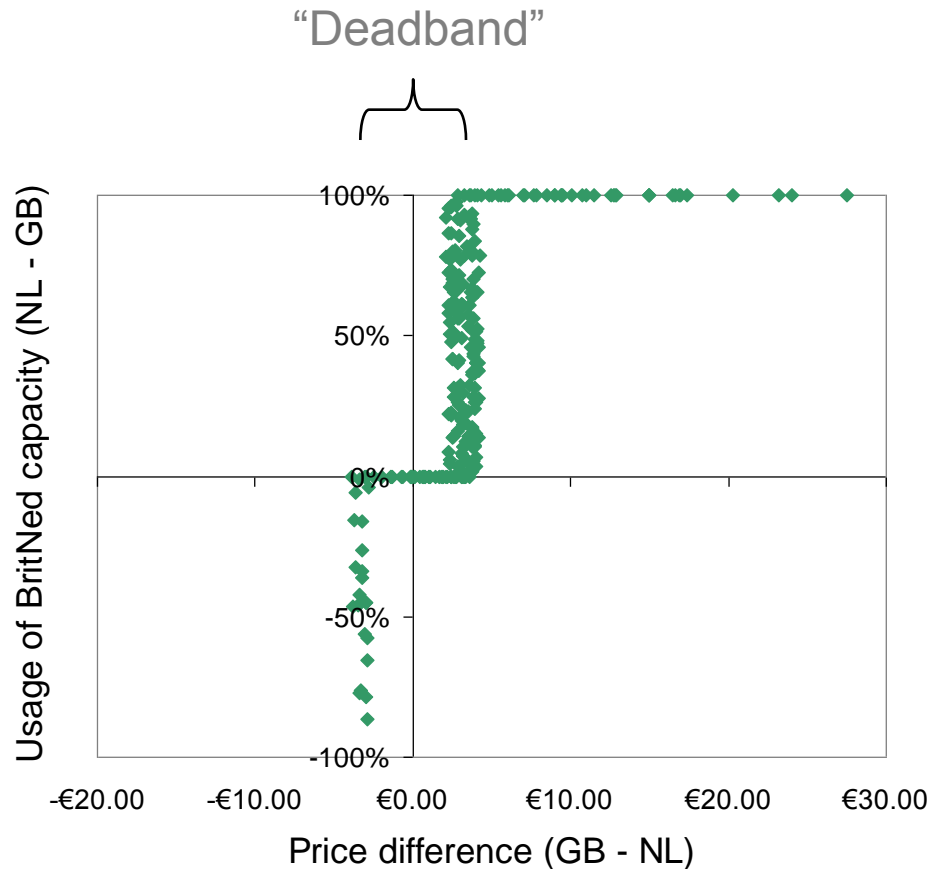
# BritNed 'Embedded Solution'

- ⊕ A price coupling solution linking GB to CWE and Nordic (via ITVC), but without impacting the CWE or ITVC arrangements
- ⊕ Involves embedding the GB market as orders within the Dutch day-ahead auction order book, taking into account currency, losses, flow related charges and ATC
- ⊕ Dutch order book used in ITVC/CWE as normal





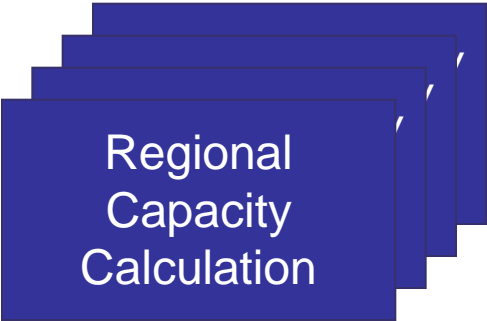
# BritNed deadband due to losses and charges



- Economically optimal solution addresses BritNed marginal costs:
  - Flow-related tariffs - i.e., BSUoS
  - Cable losses and GB system losses
- Deadband depends on value of losses and BSUoS – typically about €3/MWh
- No flow if price difference less than deadband; no full price convergence NL-GB

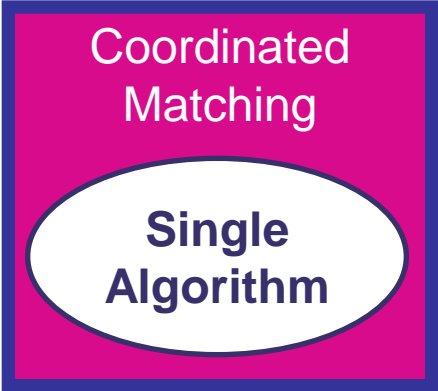
# Overview Day-Ahead Target Model

**Pre-Coupling Functions**  
TSO responsibility



ATC or FB

**Coupling: Matching & Allocation**  
Joint PX responsibility, must meet TSO requirements regarding capacity allocation



Order Books  
←  
Prices, net positions →

**Local Markets**  
PX responsibility






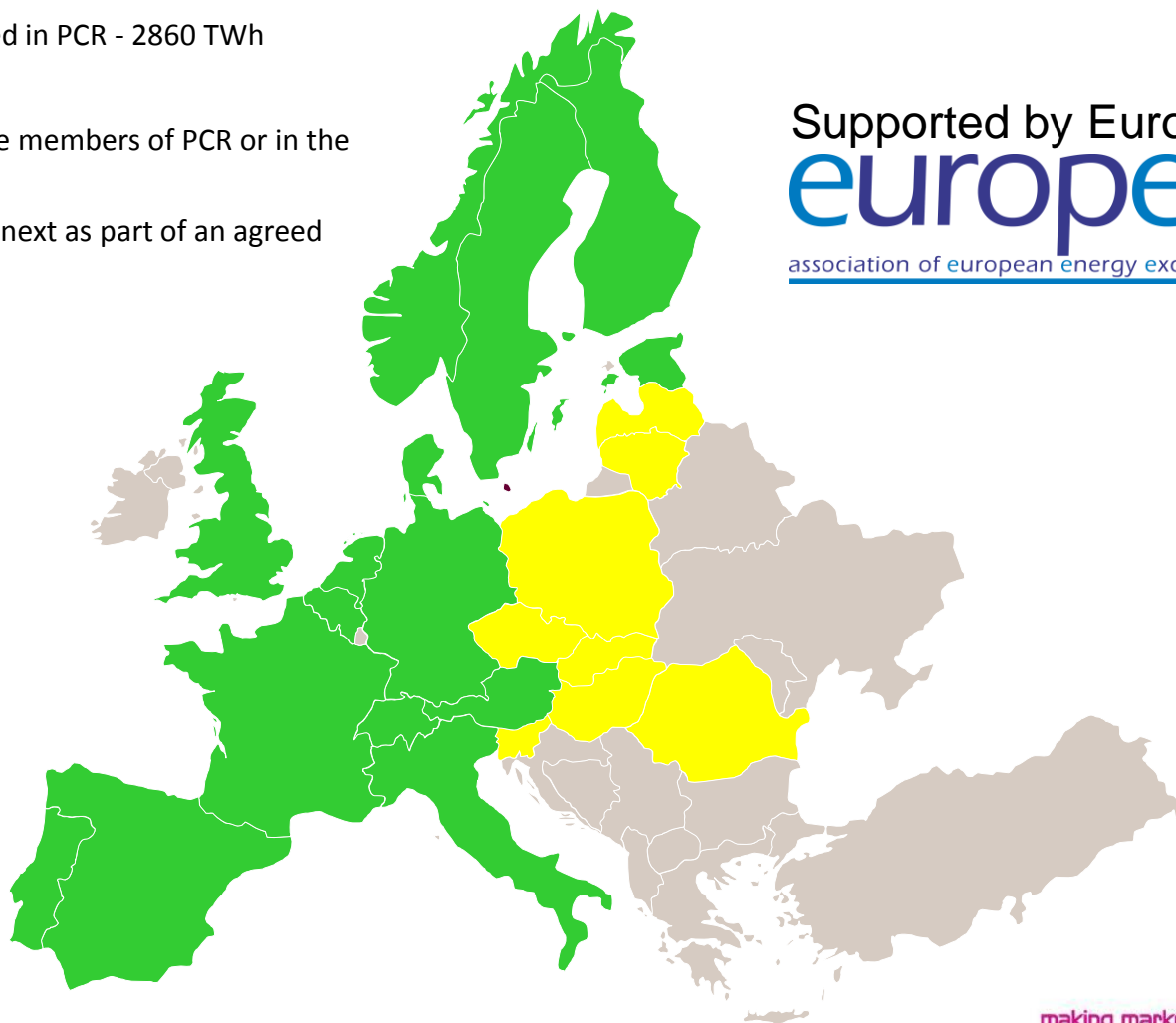
Results

**Post-Coupling Functions**



## Development of the Price Coupling of Regions (PCR) Initiative

-  Markets initially included in PCR - 2860 TWh
-  Markets either associate members of PCR or in the process of joining PCR
-  Markets that could join next as part of an agreed European roadmap

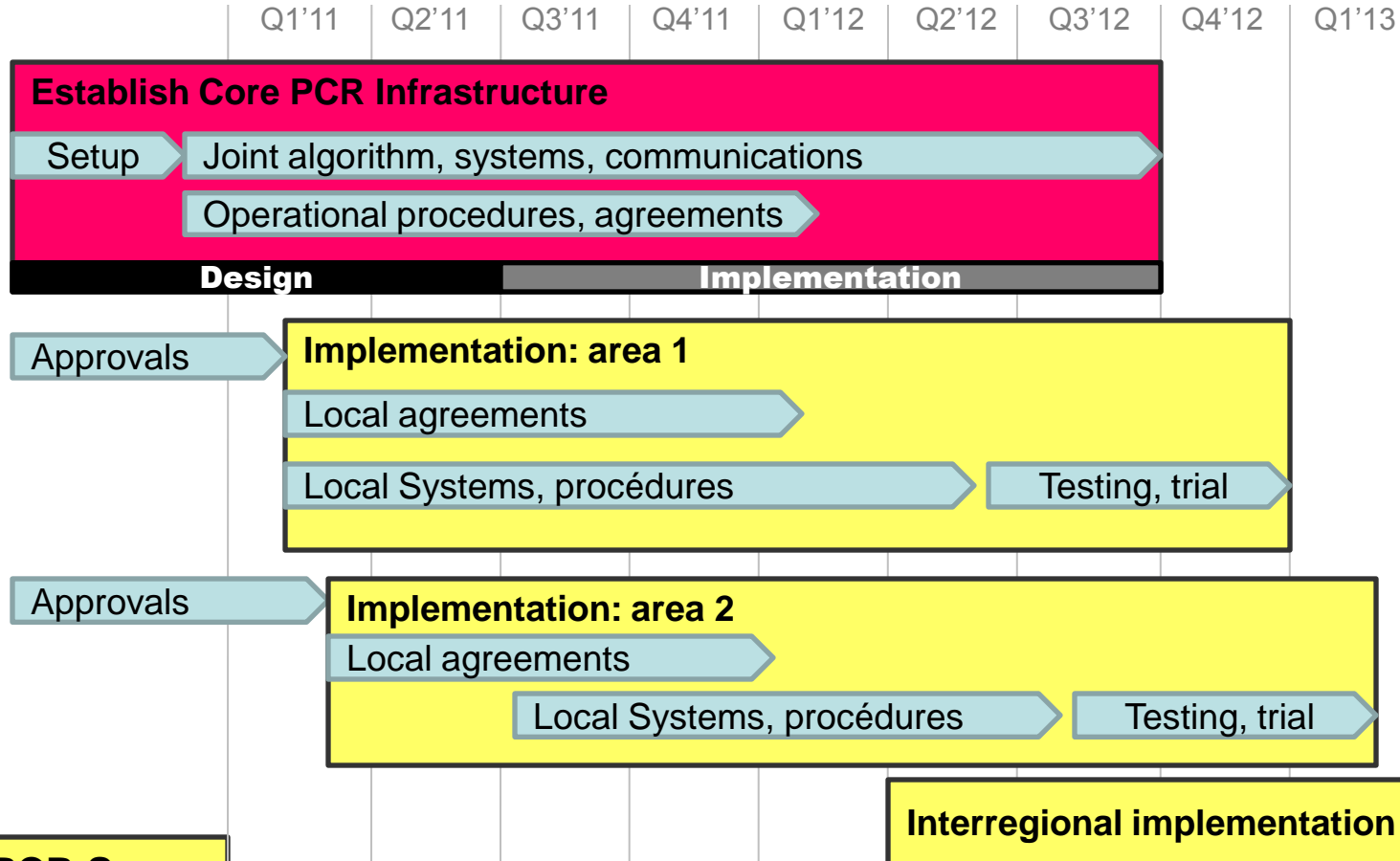


Supported by Europex  
**europex**  
association of european energy exchanges

- PCR project, supported by Europex
  - six core members (Nord Pool Spot, APX-Endex, Belpex, EPEX, GME and OMEL)
  - associate members (OTE, EXAA, HUPX, OPCOM, Polpx, BSP)
- Committed to delivering single European coordinated matching function for market coupling (algorithm, systems and procedures)
- Support parallel regional implementations of PCR, with subsequent joining/extension of regions
- Adoption of PCR algorithm for NWE requires validation with respect to TSOs 3rd package obligations on capacity allocation. In order to move forward:
  - Functional validation by TSOs under coordination of ENTSO-E
  - Work within existing governance arrangements as starting point, but with a view to the future Governance Guideline
  - Local arrangement of funding
- NRAs need to endorse this validation in a timely manner; could take the form of, e.g. a “commitment letter” signed by all NRAs

## IN scope and OUT of scope of PCR

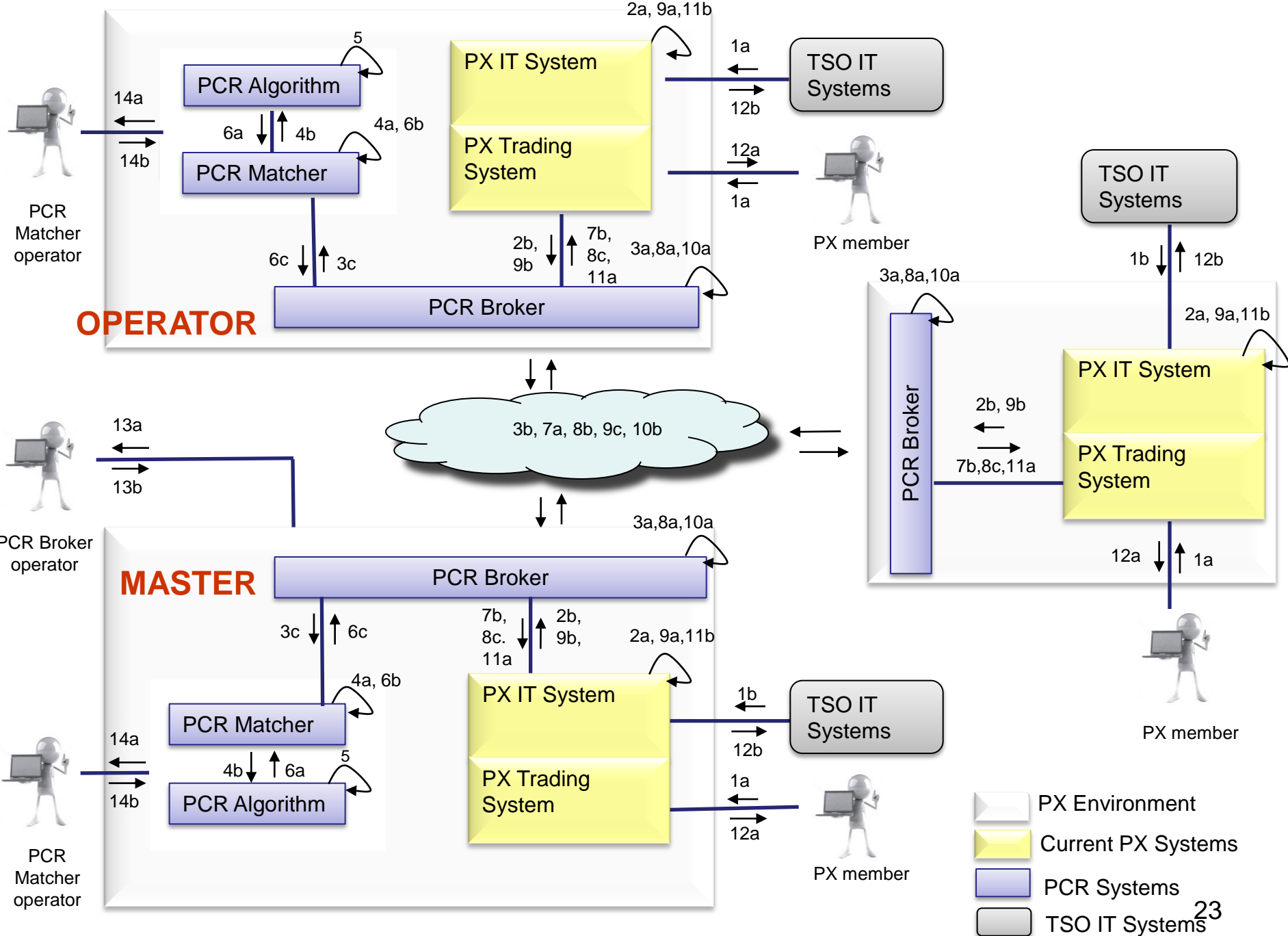
**In Scope of PCR:** Common algorithm, core systems and procedures, joint PX governance



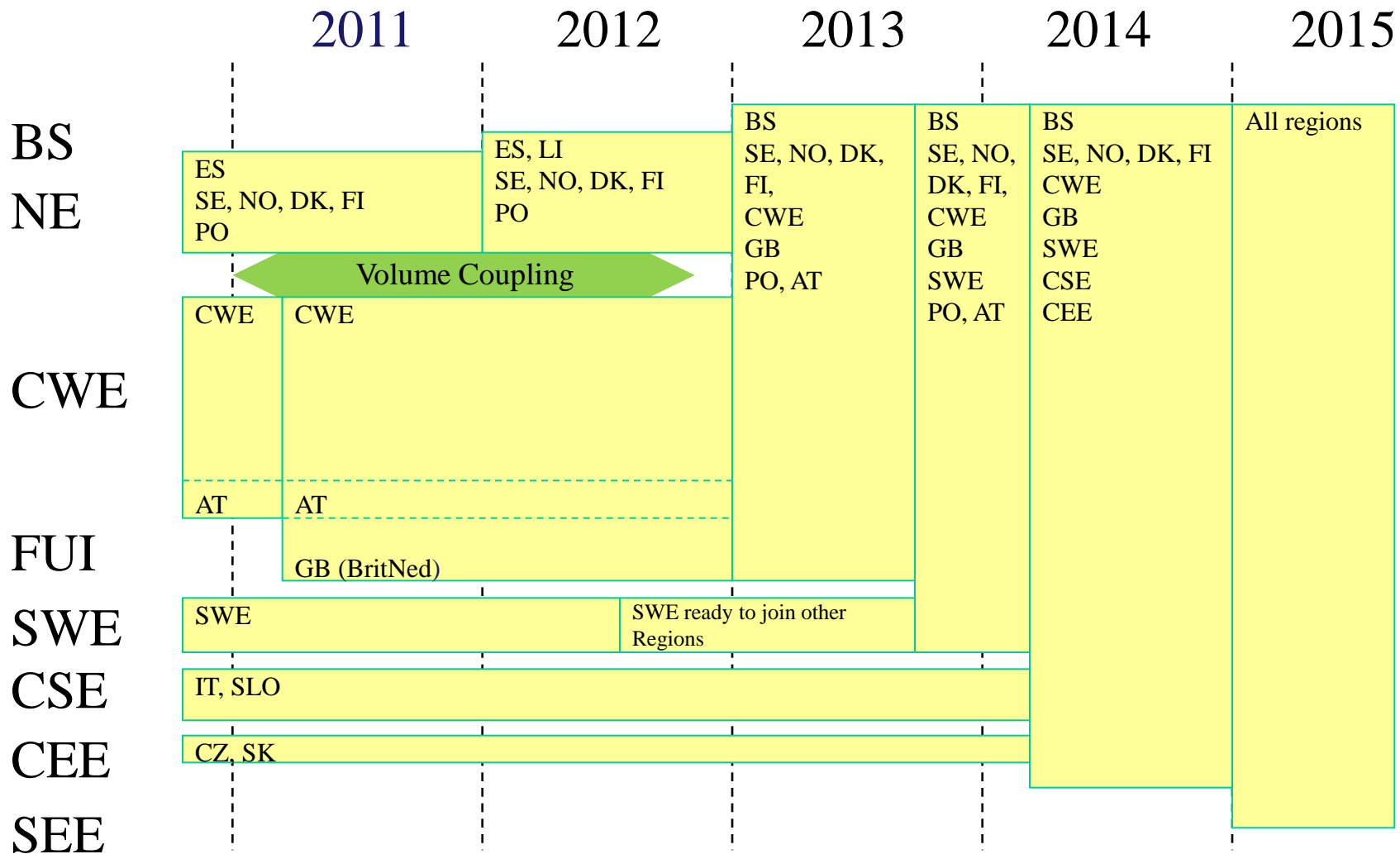
**NOT In PCR Scope:**

local governance arrangements, local nominations, shipping, clearing & settlement, ...

- 🌐 Nearing end of design phase
  - Starting point algorithm selected
    - Cosmos (as used in CWE) chosen following extensive assessment of alternatives
    - Next stage is development of full PCR Algorithm prototype, able to support known requirements
  - Decentralised solution design chosen
    - High level architecture and procedures largely completed (normal and fallback scenarios)
    - Specification of systems starting
  - Joint PX agreements nearing finalisation: co-ownership of algorithm; enduring co-operation agreement
- 🌐 Funding commitments needed soon to enable next phase to start without delay



# Preliminary Roadmap



Open planning issues: CEE, SEE, Ireland (SEM), CH and the joining of SWE to the other Regions



# The NWE Project

- The NWE day ahead project is initiated by ENTSOE – Regional Group North West Europe (NWE)
- Targeted at the introduction of Single Price Market Coupling in the 10 NWE countries by the end of 2012
- Introduction of Flow Based in CWE planned for 2013  
→ **Target Model reached in NWE in 2013**
- As a first step, existing pre- and post-coupling structures shall be used where available. Processes have to be re-assessed
- The current algorithms shall be replaced by a single new algorithm
- The PCR algorithm is positively received and could deliver the allocation service provided meets the public service requirements of TSOs (efficiency, regulation)
- Regular high level meetings with NWE PXs have been held for alignment; initiation terms for a common TSO/PX coupling project are under discussion

- SEM not currently represented in PCR or NWE projects
  - Perceived as incompatible: mandatory pool (hence highly complex bids; closely regulated)
  - Currently an “open question”
- Broadly two options:
  - Significant change to SEM: separate day-ahead, intraday and balancing markets; single, firm day-ahead price  
*Note: Spanish and Italian markets may be interesting examples*
  - Work around with existing SEM – e.g., CfD day-ahead market coupled to NWE:
    - CfD settled against a single hourly reference price in SEM (buyers and sellers trade at same CfD price)
    - Shipper has firm access to interconnector capacity and firm right to buy/sell coupled volume on SEM at the reference price
    - Coupling can accommodate losses, BSUoS

- Target model is continuous implicit market by 2014
  - Capacity automatically allocated via energy trades (can trade with orders in other markets if capacity is available)
  - A “Shared Order Book” (SOB) allowing automatic matching between orders on different exchanges in different countries
  - Hourly, block and “sophisticated” (allowing technical bid parameters) orders
- Interim solution for NWE by 2012
  - SOB
  - OTC access, which may also be used by PXs (where approved by regulators)
  - Slow progress to date due to lack of consensus between PXs, TSOs, market parties.....
- Interim solution may require some simplification for GB – e.g.:
  - Currency: trade in Euros
  - Losses, BSUoS: trade a virtual GB hub in NL and FR; trader responsible for losses, BSUoS
- Application to SEM?

### Amsterdam

Australia Building  
Hoogoorddreef 7  
1101 BA Amsterdam  
The Netherlands  
T +31 20 305 4000  
F +31 20 305 4001

### London

6th Floor  
21 Southampton Row  
London WC1B 5HA  
United Kingdom  
T +44 20 7841 5600  
F +44 20 7841 5601

### Brussels

Boulevard de  
L'Impératrice 66  
1000 Brussels  
Belgium  
T +32 2546 7278  
F +32 2546 7110

### Nottingham

Ergo Building, Mere Way  
Ruddington Fields  
Nottingham NG11 6JS  
United Kingdom  
T +44 115 921 7421  
F +44 115 921 7420