

Making electricity market reform work

David Newbery

EU Electricity Market Reform

Dublin 13th March 2013

<http://www.eprg.group.cam.ac.uk>



Although I am an independent member of the SEM Committee these are my personal views and should not be interpreted as reflecting any current or future view of the SEM Committee.

I am indebted to Colin Broomfield for help interpreting data on the Moyle, but remaining mistakes are all my own

- Mismatches between TEM and SEM
 - energy-only market, simple bids to PXs vs complex bids vs centralised dispatch with capacity payments
 - no firm day-ahead prices for market coupling
- Principle: keep central dispatch for SEM
 - what is the simplest route to the TEM?
 - Will the SEM have price splitting?
 - How does this interact with the UK EMR?

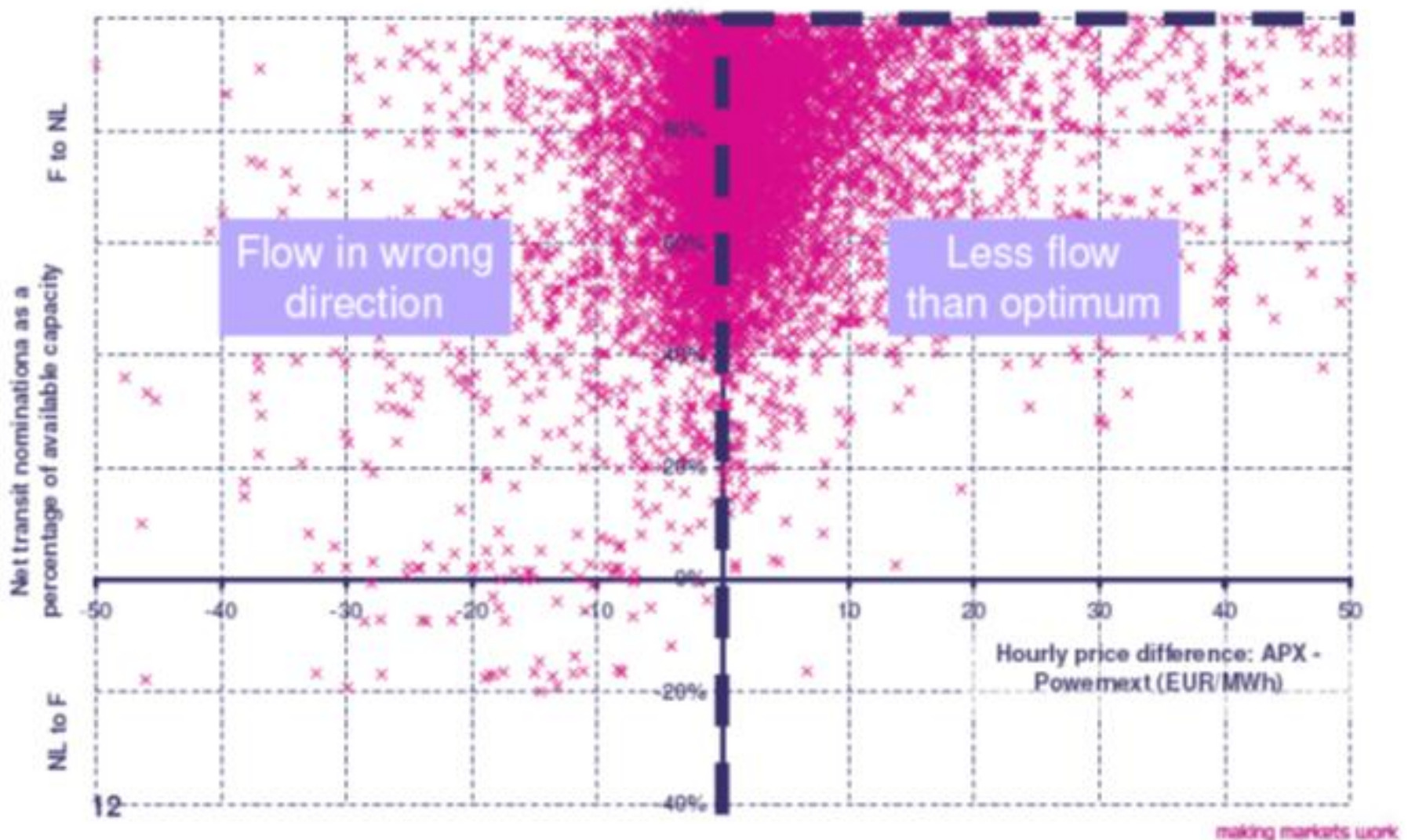
The TEM is still evolving - intraday, balancing

- **Efficient dispatch:**
 - unit commitment complex, efficiency over decentralised simple bids appreciable, much larger in small systems
 - will increase as wind penetration rises
- **Mitigates market power:**
 - remains a problem in near term at least
 - provides comfort for new entrants
- **Capacity payments**
 - increasingly seen as necessary to mitigate political and regulatory uncertainty
 - problem is their efficient design and stability

- Central issue is market coupling
 - DA bids/offers for interconnectors submitted to central auction office => prices in each zone
 - prices on PXs and use of ICs simultaneous
=> efficient use of ICs
 - price zones defined by congestion not borders
- To do: intra-day and balancing trades over Ics

What is it worth? How might it be done in SEM?

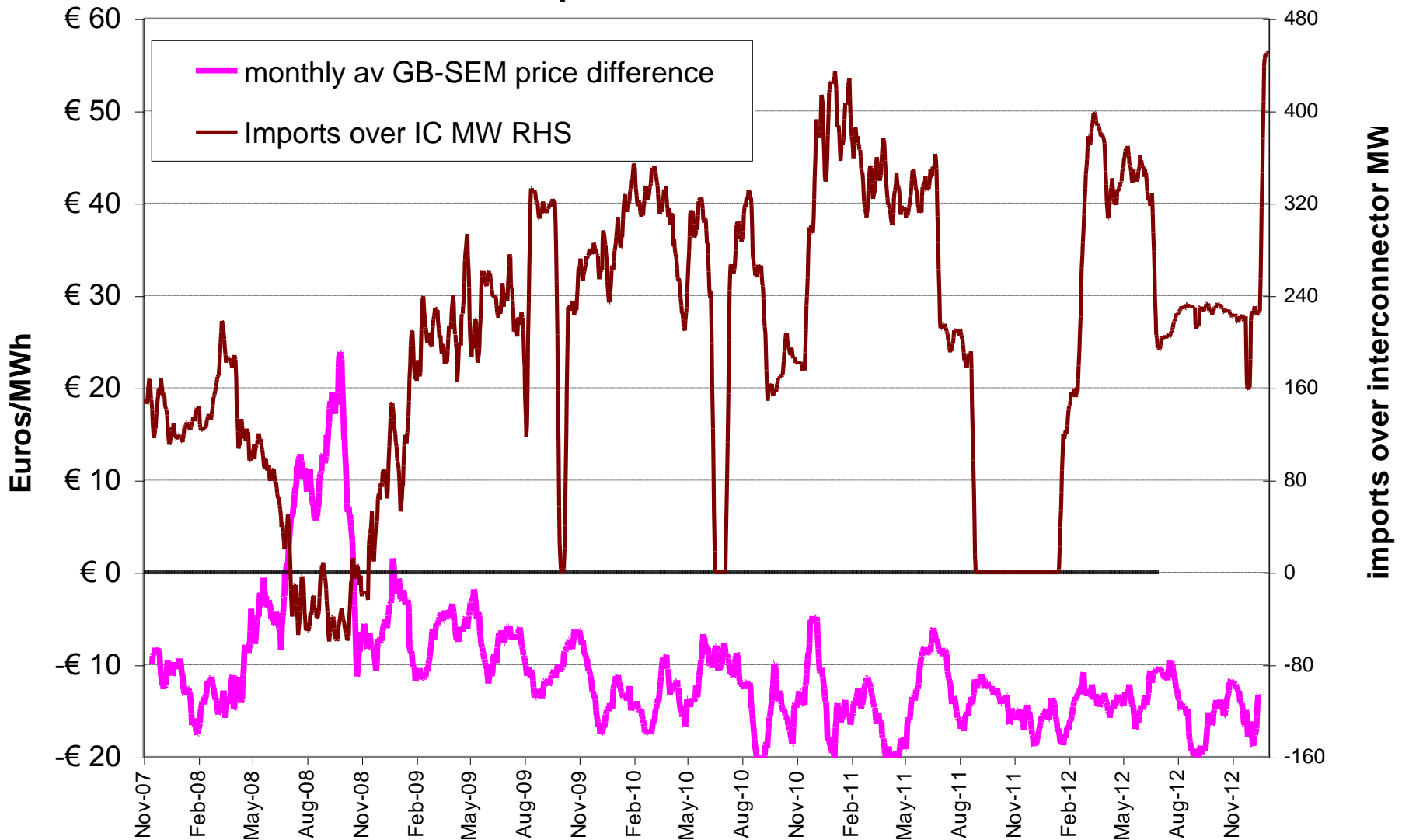
Inefficiency of explicit auctions



Price differences and utilisation of the NL-FR interconnector
Source: Moss (2009)

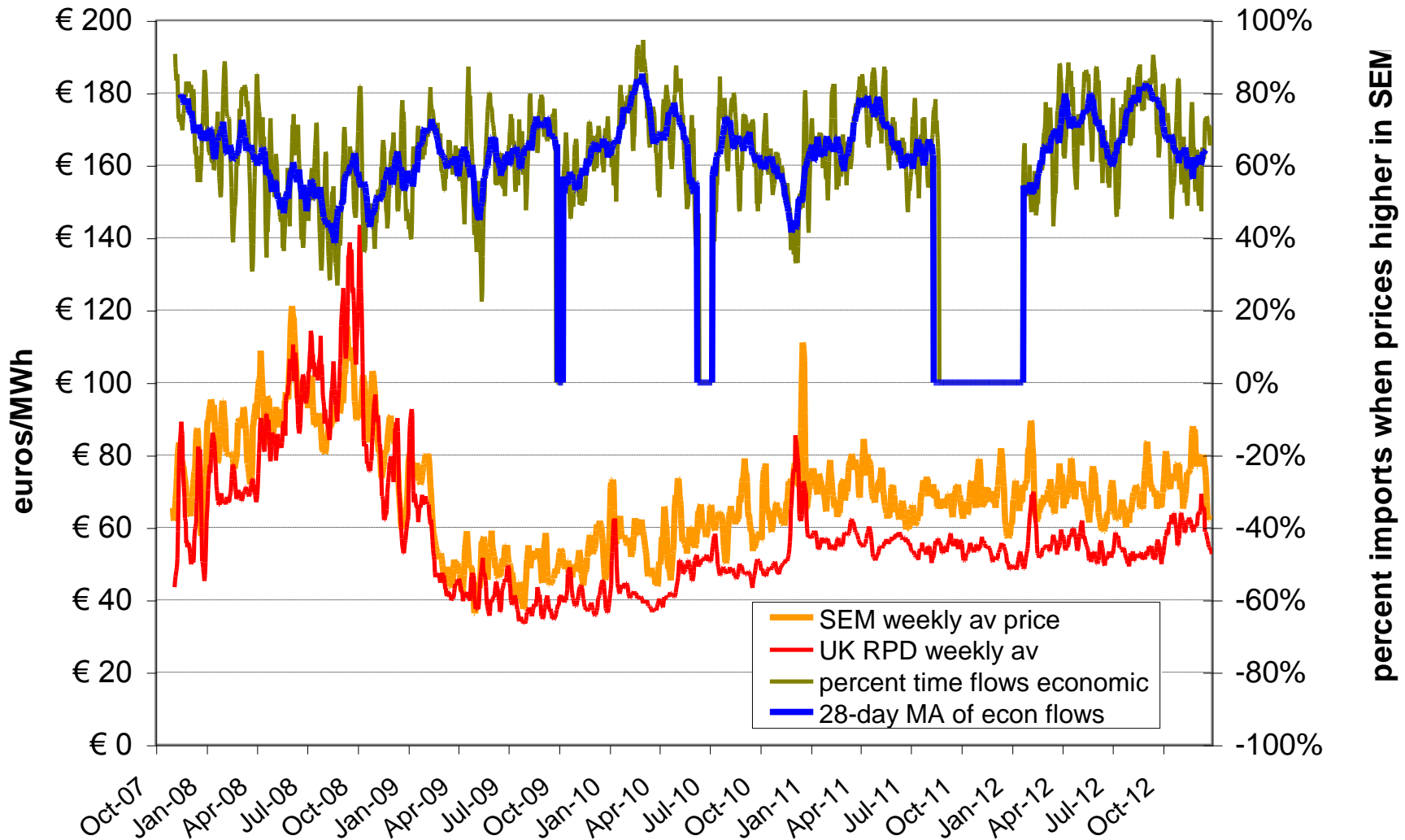
SEM normally imports

UK RPD - SEM wholesale price difference and interconnector flows in MW



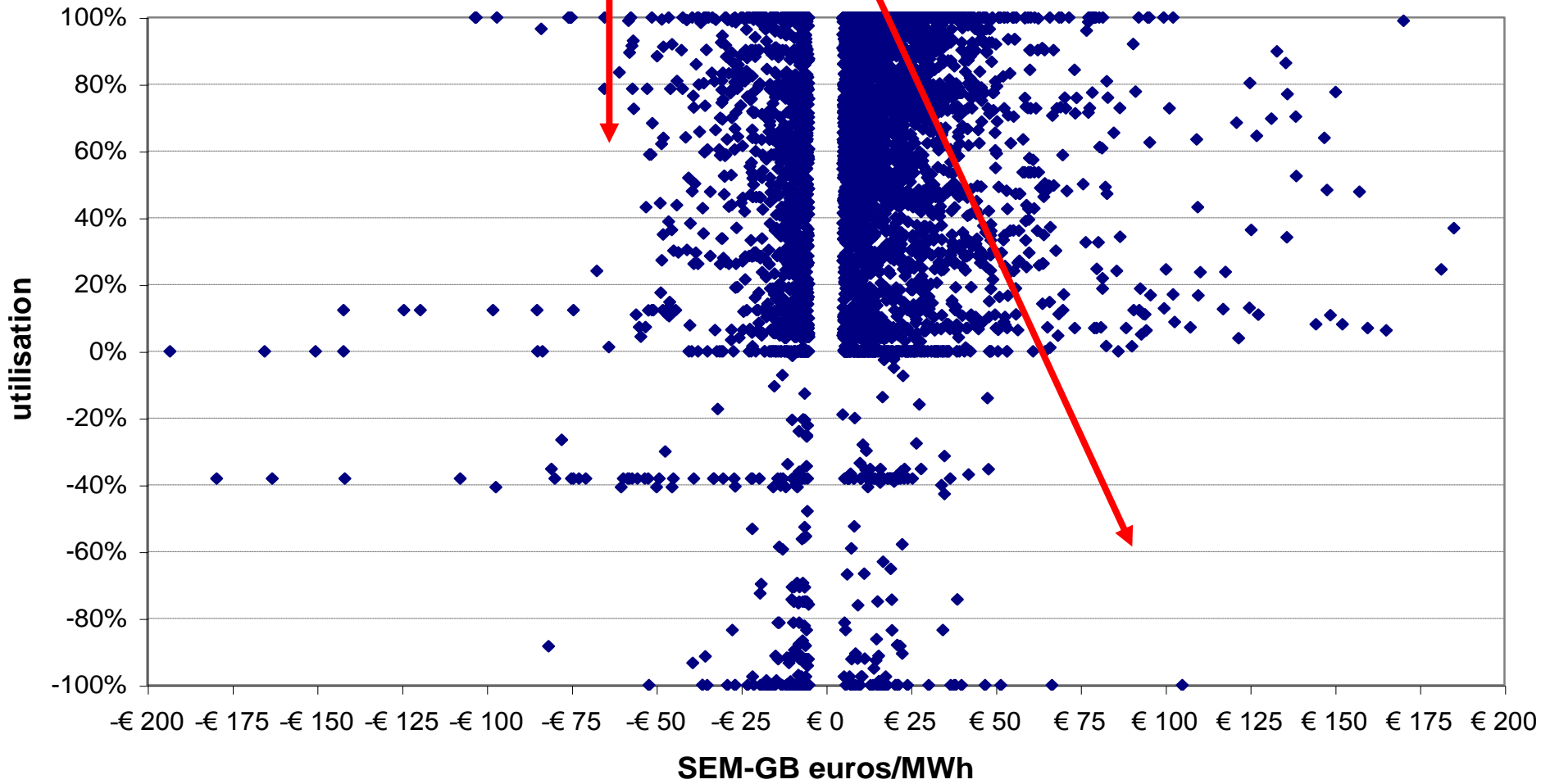
One-third of the time flows are perverse

Wholesale prices and percent economic imports



Perverse flows

Scatter of Moyle utilisation against price difference











Capacity taken as **max flow not nominal capacity**

Market coupling - status 2011

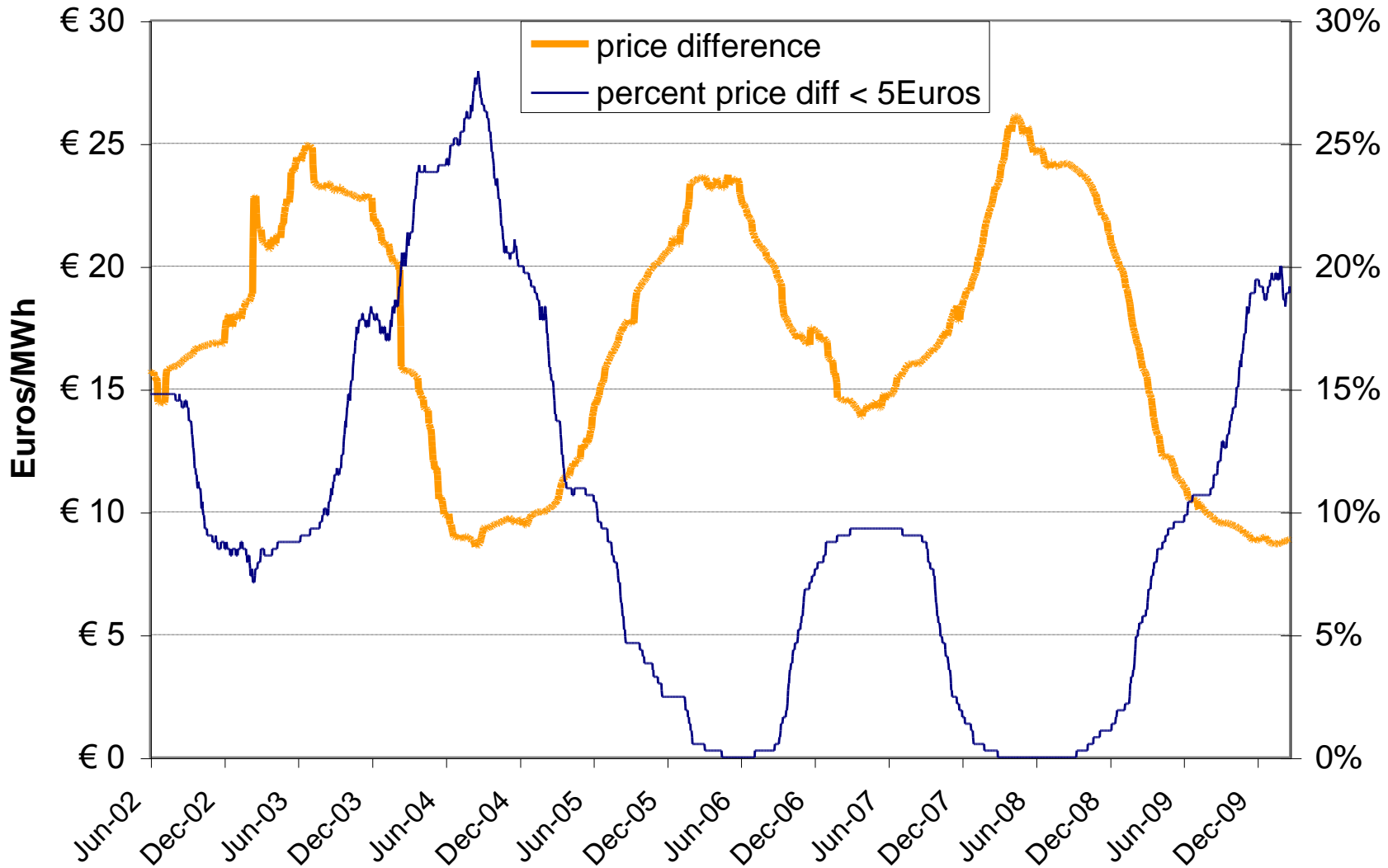
price zones defined by constraints
not borders



REGIONAL IMPLICIT AUCTIONS		
	CWE	Price coupling
	Austria	1 AT PX price coupled to GE (no congestion)
	GB	1 GB PX price coupled to NL via BritNed only
	Nordic + Estonia	Price coupling, also Poland via Swebpol
	ITVC	Volume coupling CWE - Nordic
	Italy - Slovenia	Price coupling
	Mibel	Price coupling
	Czech - Slovak	Price coupling

Price difference NL-GB before Britned

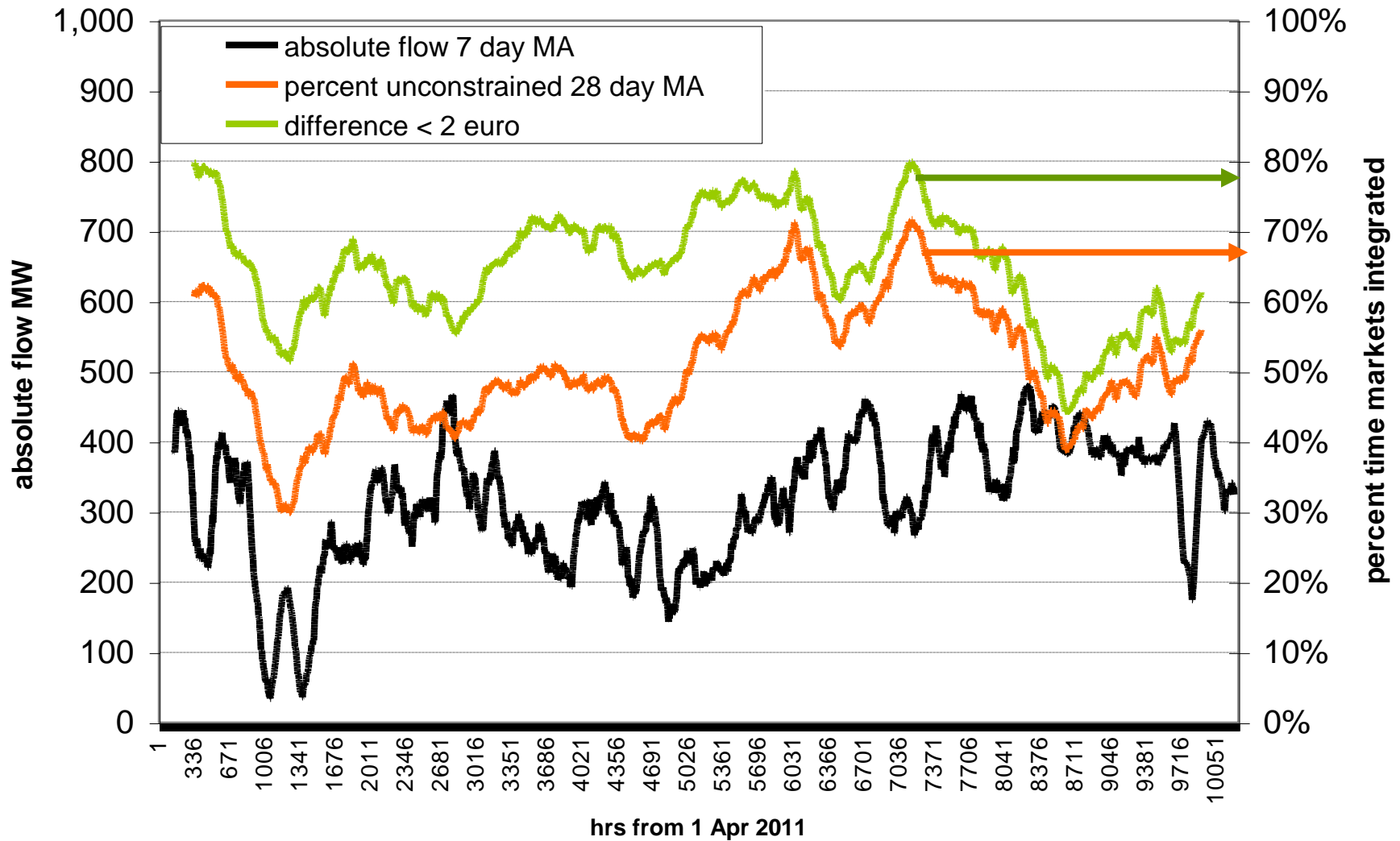
Annual averages of absolute price differences GB-NL



Source: UKPX, APX

Utilization of Britned

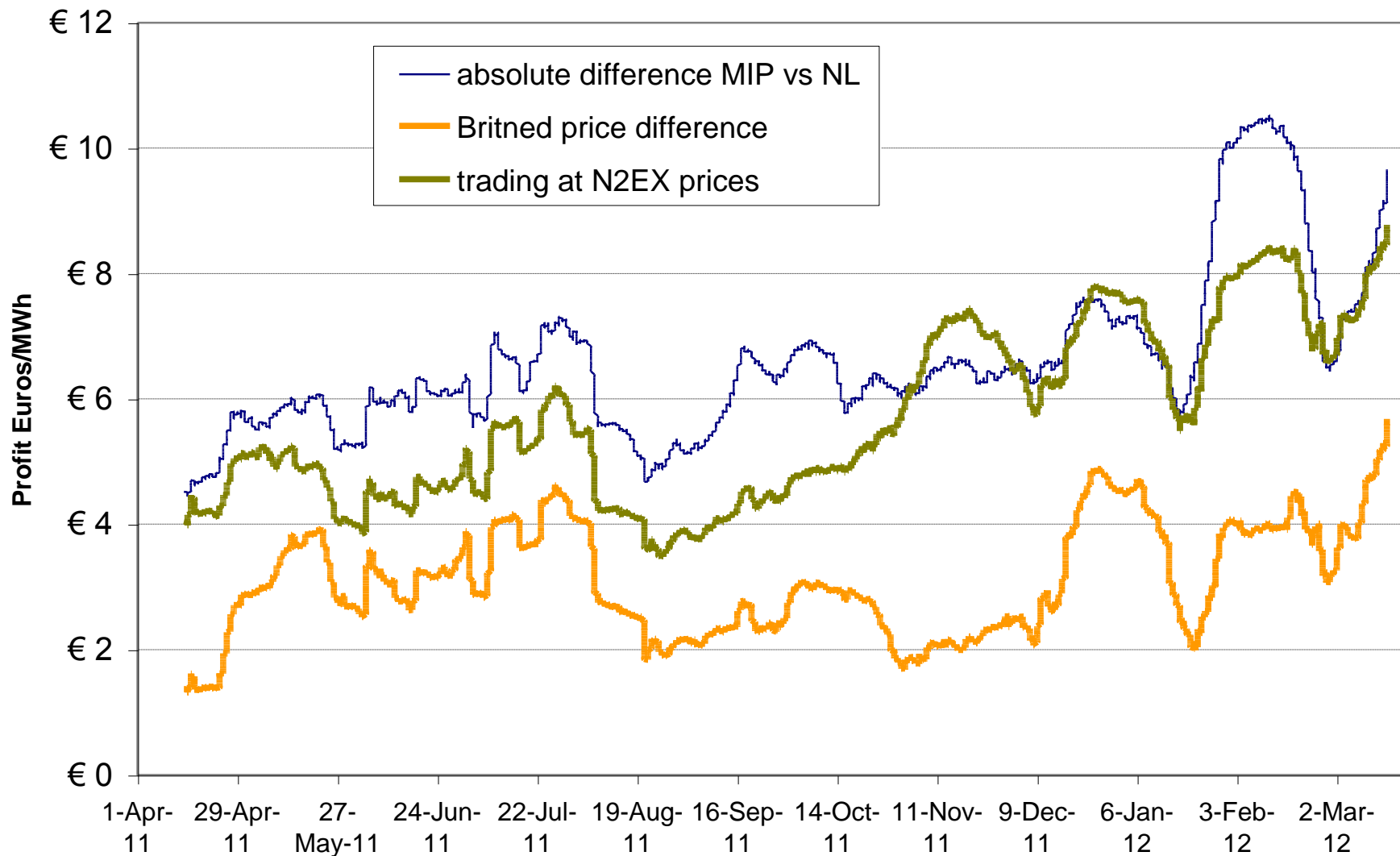
Average flow and degree of integration over Britned from 1/4/11



Source: Britned

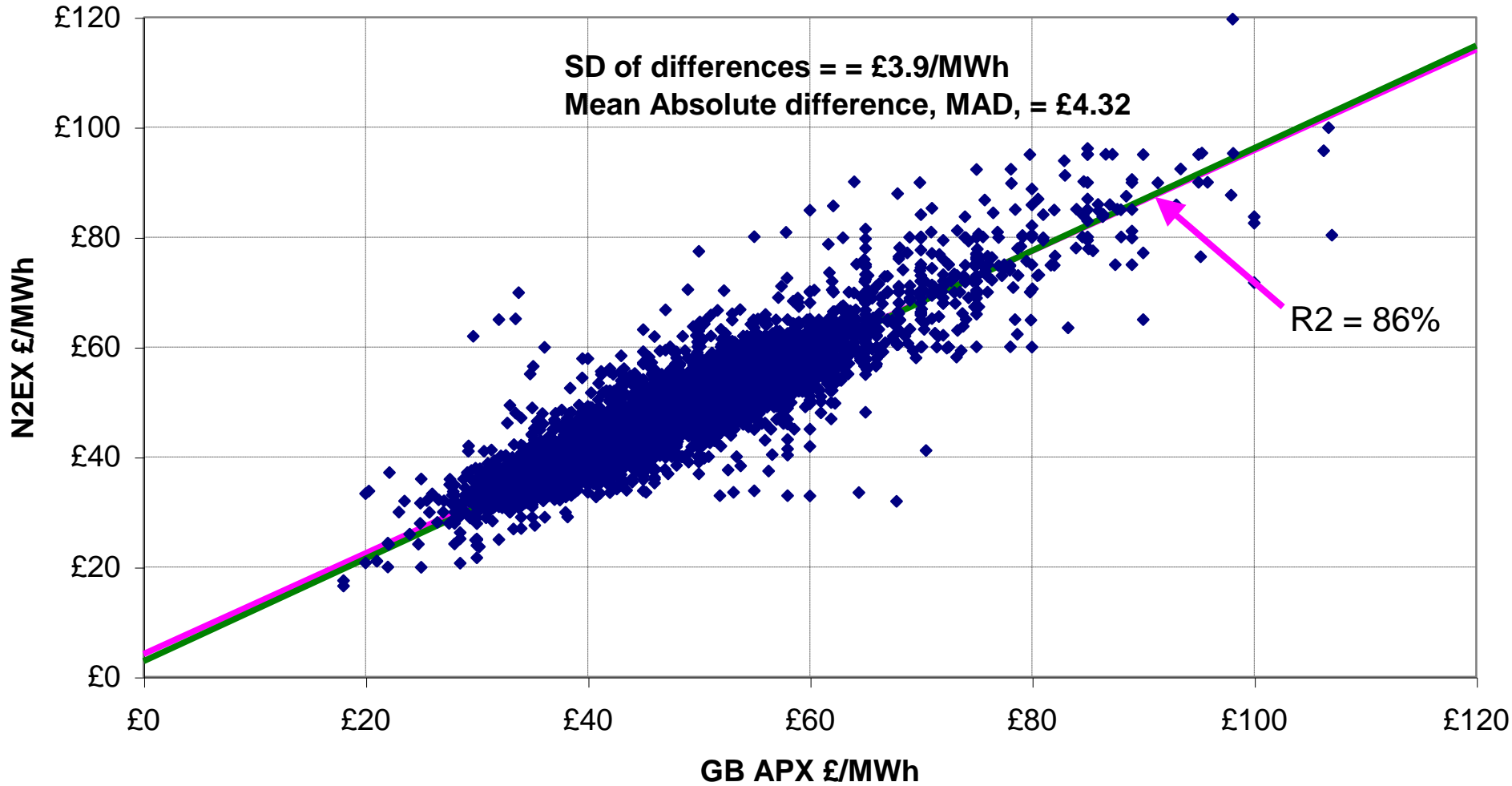
Profits would be higher trading at MIP or N2EX prices

Arbitrage profit on Britned 28 day Moving Average



Source: own calculations from Britned and N2EX data

Scatter of N2EX on GB APX 1/4/11 to 31/3/12



- SEM sets price on basis of **ex-post dispatch**
- DA markets set price on **ex-ante bids**
 - difference are balancing actions to be charged out
 - easy to distinguish, think how best to charge
 - => **check their materiality**
- Possible approach: MO submits simple bid and offer schedules into EU auction, minimal change to SEM?
- Agents choose (**but check for moral hazard**)
 - firm DA contracts subject to imbalance charges
 - or current ex-post pricing

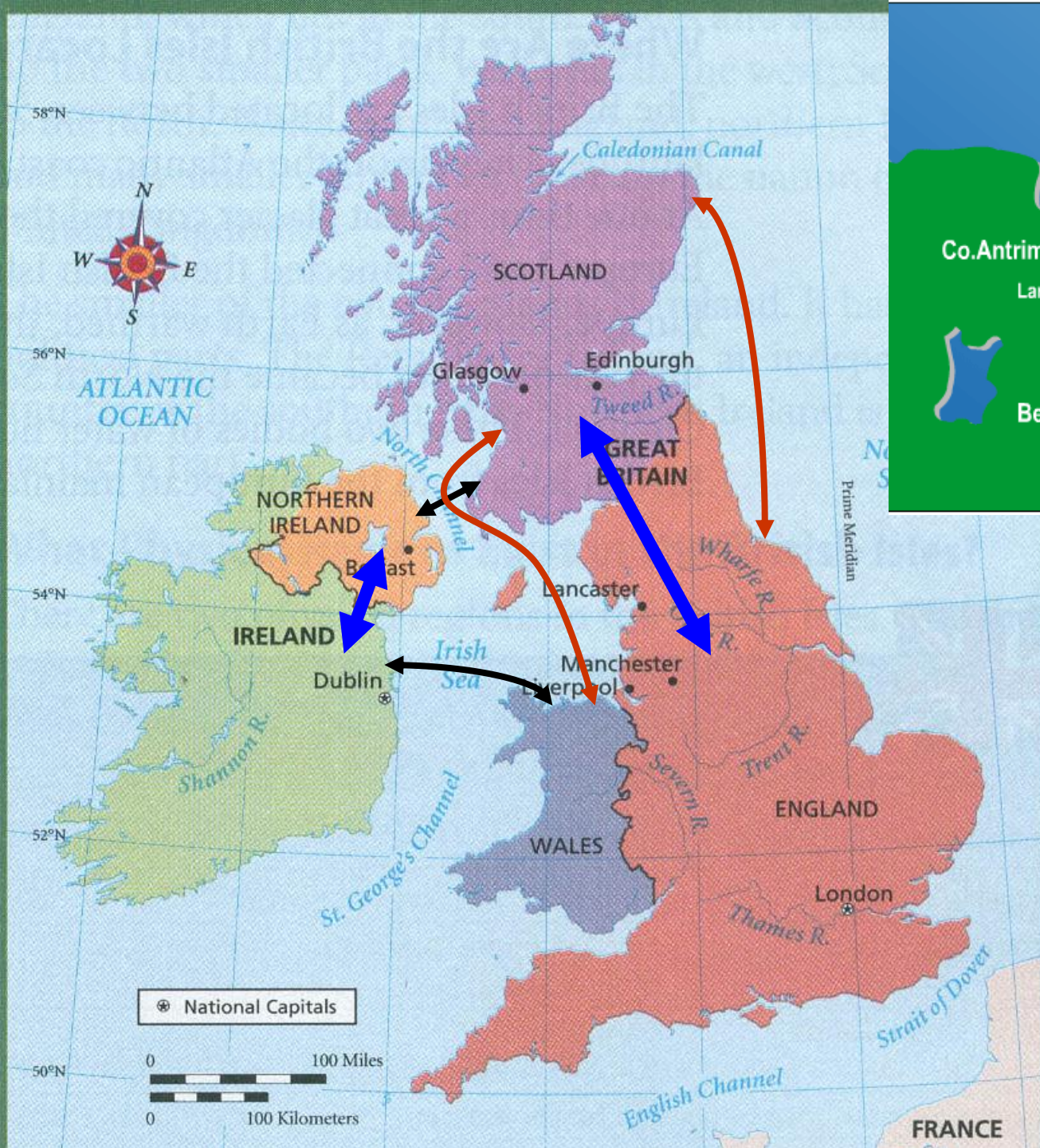
The Scottish border is already congested

- **BETTA** creates single price zone for GB
 - => costly constraints at Cheviot boundary
 - => excessive encouragement to wind in windy unpopulated Scotland
 - => **Ofgem** proposes expensive bootstraps



Source: Ofgem

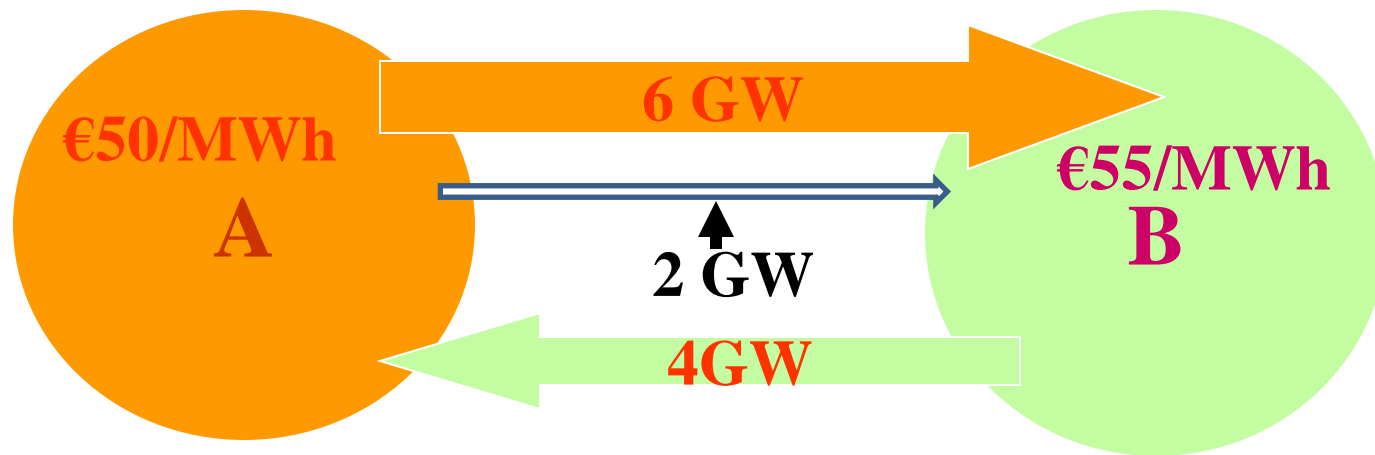
- TEM requires identifying significant constraints
 - cost of counter-trading outweighs liquidity benefit
- candidates: Cheviot boundary and NI-RoI?
- Interconnectors join SC-NI and RoI-E&W
- High wind: flows $SC \Rightarrow NI \Rightarrow RoI \Rightarrow E\&W$?
- “Bootstraps” $NI \Rightarrow SC \Rightarrow E\&W \Rightarrow RoI$?



4 possible zones
 SC, NI, RoI, E&W
 Congestion?
 SC-NI
 NI-RoI?

Firm FTRs allow netting

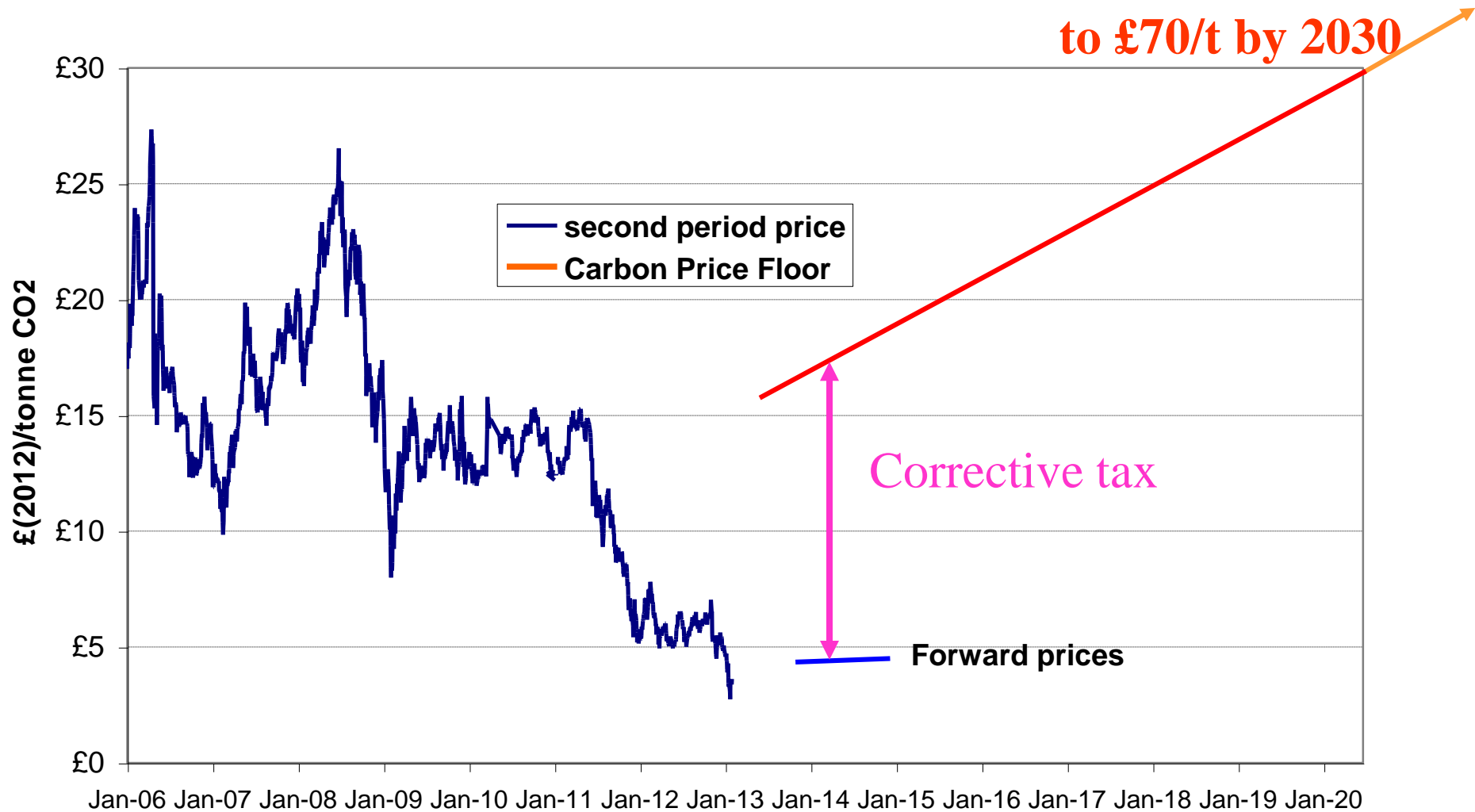
- 2 GW interconnector between countries A & B
- FTRs obligations trade at **€5**



Netting can dramatically increase imported competition

UK's Carbon Price Floor - in Budget of 3/11

EUA price second period and CPF £(2012)/tonne



- Carbon Price Floor in UK now confined to GB
 - simplest solution for SEM
- £20/tCO₂ = **extra €20 /t CO₂** in 2015 (EUA = €5/tCO₂)
 - = €9 /MWh **extra** for CCGT, €18 /MWh for coal
- => higher E&W prices (SC - depends on wind?)
- => relieves constraints on Moyle & EWIC
- => relieves NI-RoI constraint?
- How will RES fare in the SEM?

- TEM forces massive improvement on use of interconnectors
- Aim should be to deliver this with least fuss
- CPF may alter trade flows over ICs
- Need to think of harmonising RES support?
- Fortunately SEM has until 2016 to adapt
 - and can watch MIBEL adapt first

BETTA	British Electricity Trading and Transmission Arrangements
CPF	carbon price floor
CWE	Central West Europe
DA	Day ahead
EMR	(UK) Electricity Market Reform
EPS	emissions performance standard
ETS	Emissions Trading System
EUA	EU Allowance for 1 tonne CO ₂
E&W	England and Wales
FTR	Financial Transmission Rights
IC	Interconnector
MA	Moving average
MIBEL	Market of Spain and Portugal
MIP	Market Index Price (prompt PX price)
NL	The Netherlands
RES	Renewable Electricity Supply
SC	Scotland
SEM	Single Electricity Market for Ireland
TEM	Target Electricity Market

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