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Progress on market reform: EMR, the I-SEM and the TEM

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Electricity Market Reform

Belfast 28th March 2014

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Disclaimer

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 have been on the Panel of Technical Experts for the EMR but speak entirely in my own capacity.

Outline

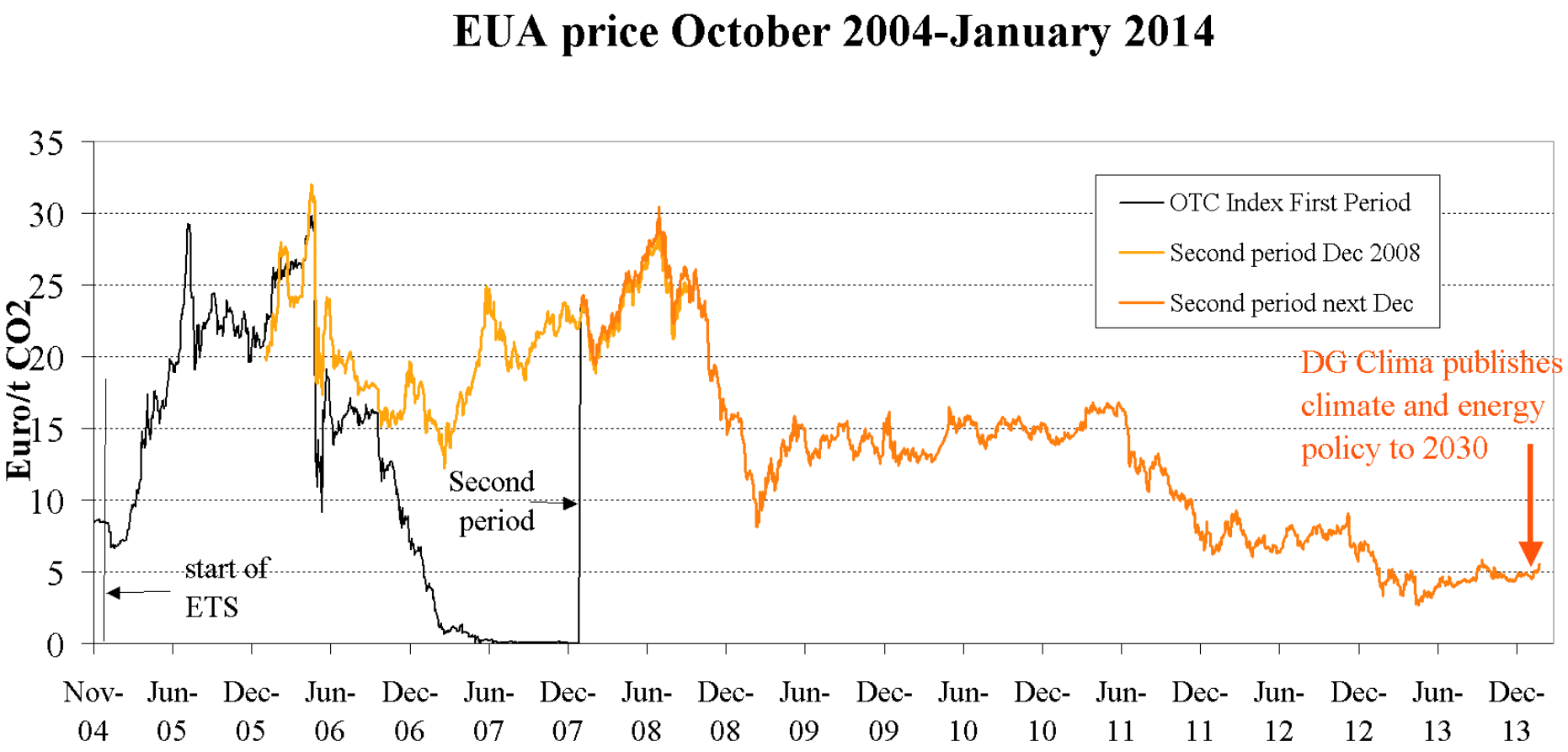
- Progress with UK's EMR
- Mismatches between TEM and SEM
  - energy-only market, simple bids to PXs vs complex bids vs centralised dispatch with capacity payments
- Active consultation on SEM market design
  - For the wholesale market
  - For capacity payments
  - to address high wind penetration

Aim to deliver the Integrated SEM: I-SEM

Progress with the EMR

- Energy Act 18 December 2013 to address:
  - Security of supply and carbon/RES targets
  - problems with EU ETS
  - market failures
- To deliver secure low-C in UK affordably
  - => capacity payments
  - => Carbon Price Floor
  - de-risk investment => Contracts to lower cost of capital
- Problems with contract design
- Problems with finance

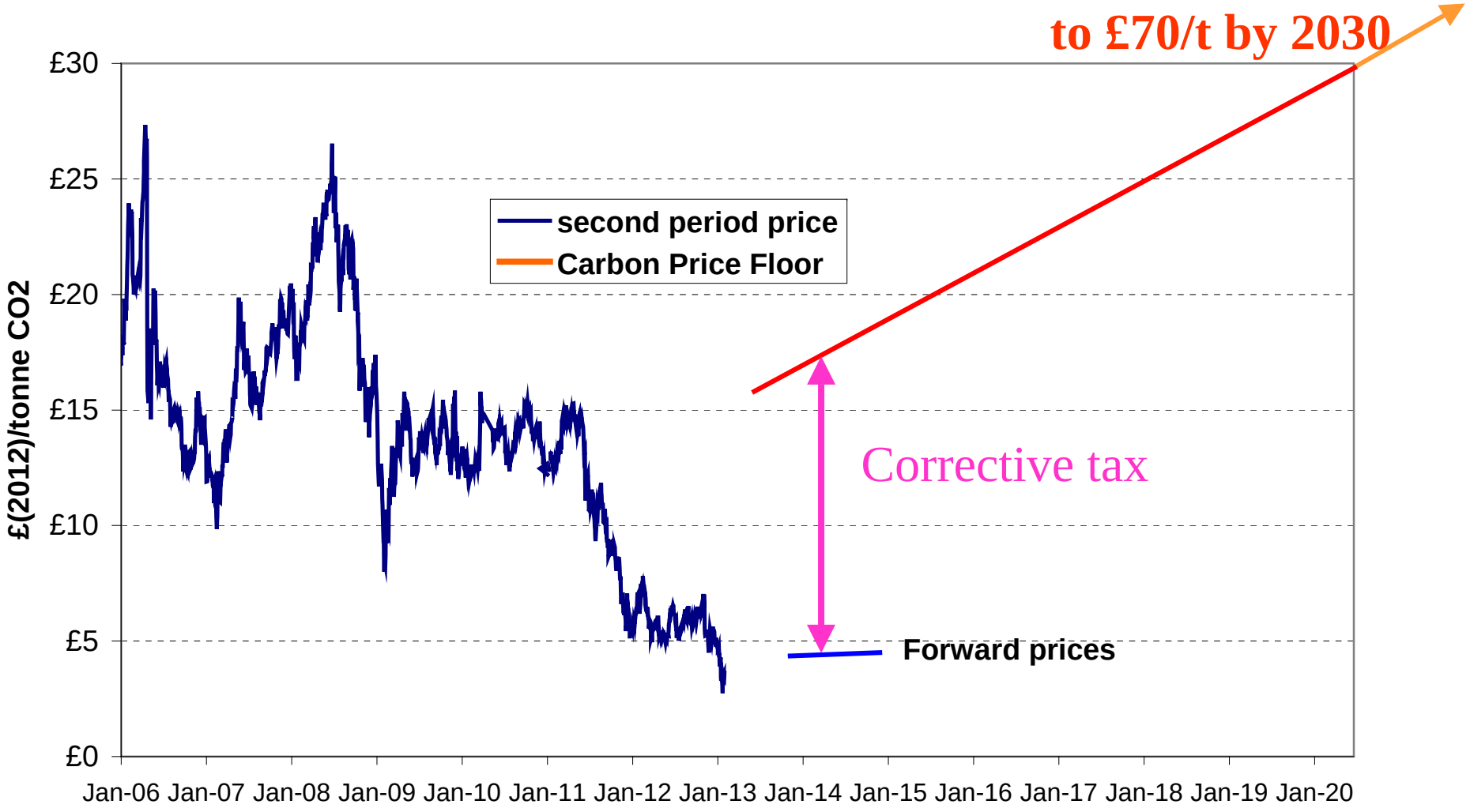
Little recovery after backloading and tightening post 2020



Source: EEX

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

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



Source: EEX and DECC Consultation

Long-term contracts

- CO_2 price unpredictable, CPF not credible
- Need to attract new sources of finance
  - balance sheet of incumbents inadequate
- Market risky to new entrants in non-fossil gen
  - but attractive to incumbents with retail customers
    - hedges some of wholesale volatility

=> long-term contract-for-difference (CfD) enforceable in courts

CfD in *Energy Act 2013*

- Government announces strike prices and annual subsidy limit (Levy Control Framework)
  - uniform by technology (except Island wind), set 2014-17
  - runs in parallel with ROCs (pFiTs) to 2017

  => has to be made as attractive as ROCs

  => comparable rate of return (rather high for on-shore wind)

  => undermines logic of lowering cost by lowering risk

  => relies on locational grid signals (still under review)
- may lead to tender auctions if levy control breached

  => could then lead to better market-led outcome

Conclusions on EMR

- Low-C generation needs long-term contracts needed as no credible futures markets for corrective carbon tax
- FiTs make sense for unreliable RES (wind etc)
  - need to avoid exposure to balancing etc.
- EMR hampered by existing RO scheme
  - will be more expensive than intended
- Should move to auctions asap

Subsidies should come from general taxation

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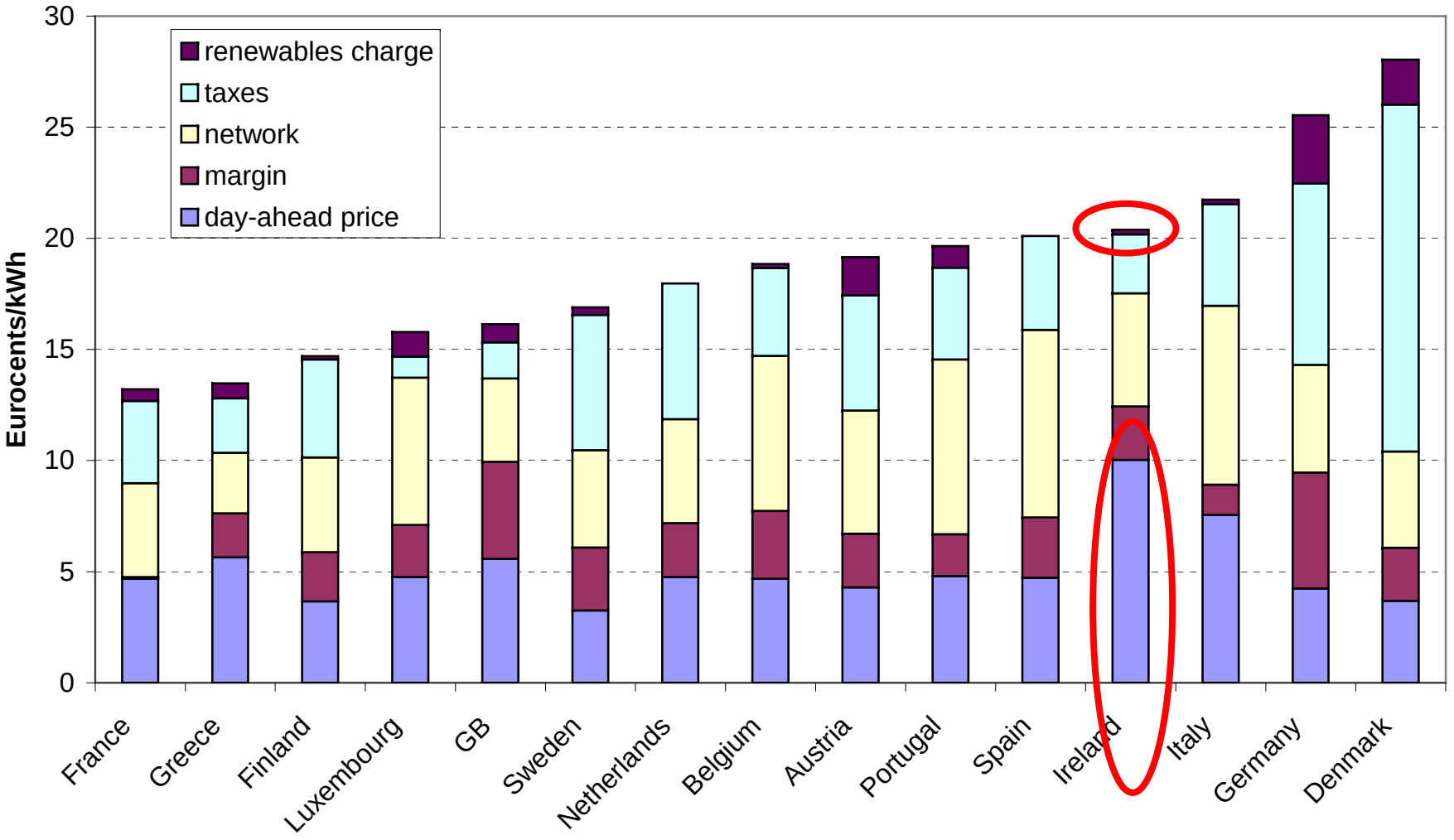
Problems with the SEM

- Prices high because of high wholesale prices
  - inevitable in small peripheral system?

  => Need to insulate prices from RES charges
- Interconnectors inefficiently dispatched
  - will be resolved by market coupling in 2016
- Capacity payments poorly targeted
  - DG COMP hostile to poorly justified CPs
- N-S transmission links need strengthening
- Gen TUoS charges not adequately spatially varied?
  - Vary from £385 in NI to £535/MWmnth (£4.6-6.4/kWyr)
- High wind requires DS3 reforms

Build-up of final retail domestic price 2012



Source: DECC 2013 at https://www.gov.uk/government/uploads/system/uploads/.../qep551.xls
Source: Derived from the International Energy Agency publication, Energy Prices and Taxes

Advantages of current SEM

- Efficient dispatch:
  - unit commitment central dispatch lowers cost compared to self-commitment and energy-only trading
  - benefits larger in small systems
  - will increase as wind penetration rises
- BCoP mitigates market power:
  - remains a problem in near term at least
  - provides comfort for new entrants
- Capacity payments
  - necessary to mitigate political and regulatory uncertainty
  - problem is their efficient design and stability

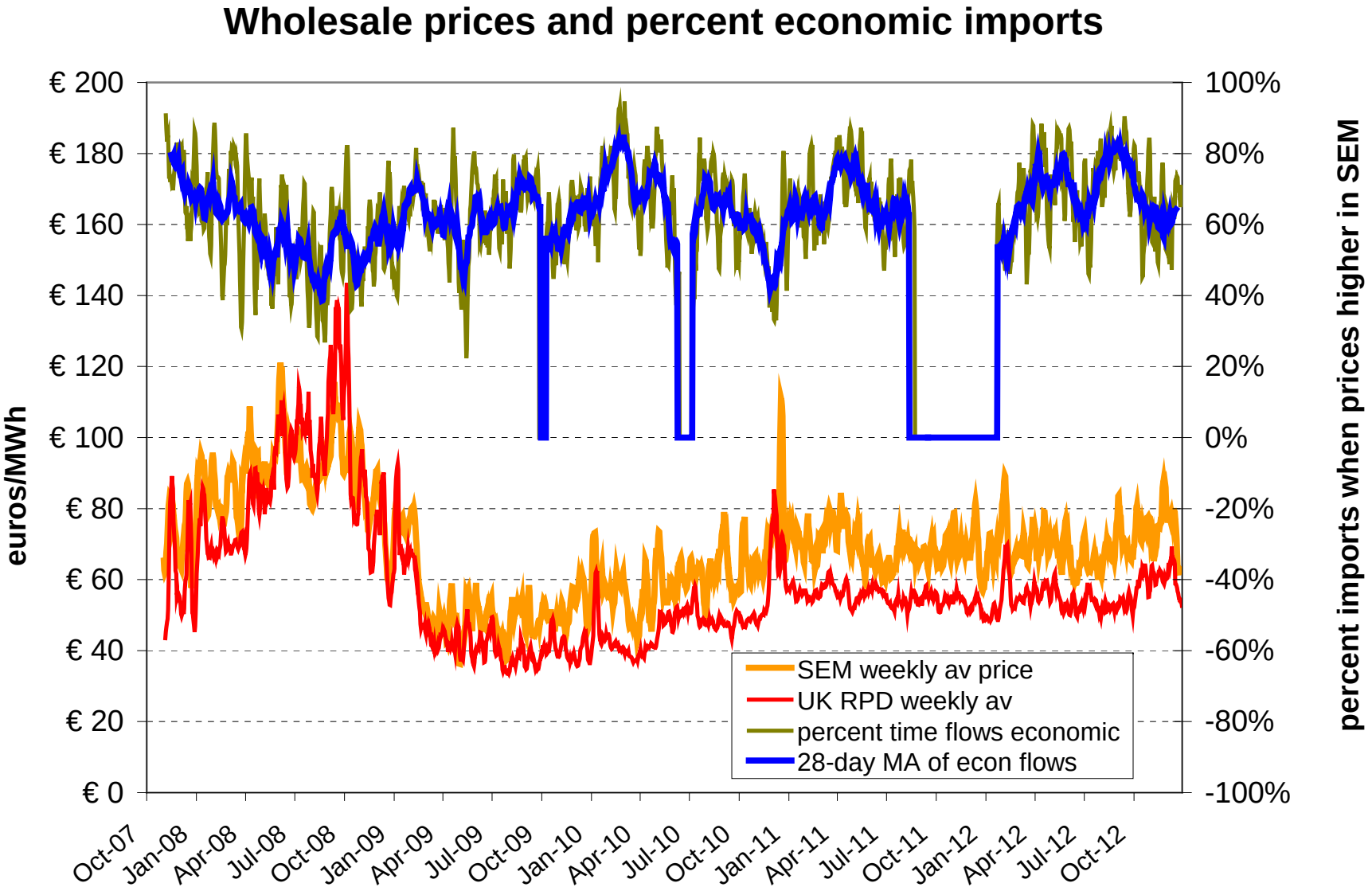
Adapting to TEM

- 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?

One-third of the time flows are perverse



Annual benefits from coupling Moyle *and EWIC* (950/910MW imports, 580MW exports)

Deadband (€/MWh)	Consumer Surplus (€ millions)	Producer Surplus (€ millions)	Total Potential Gain in Social Welfare (€ millions)
0	28.6	12.1	40.7
5	23.7	7.0	30.7
10	19.6	4.1	23.8
15	16.6	2.8	19.4

Note: **Deadband** is the remaining price difference below which traders are too risk averse to risk trading

Source: SEM-11-023

Capacity payments

- GB will have capacity payments from 2018
  - in return for capping wholesale price at £6,000/MWh
  - VoLL taken as £17,000/MWh, LoLE = 3 hours
- Efficient trade over interconnectors requires efficient scarcity pricing

=> LoLP*(VoLL - SMP)

=> reform SEM capacity payment to this?

But SEM price cap of €1,000 far below this

SEM Capacity Payments 2012 and 2013

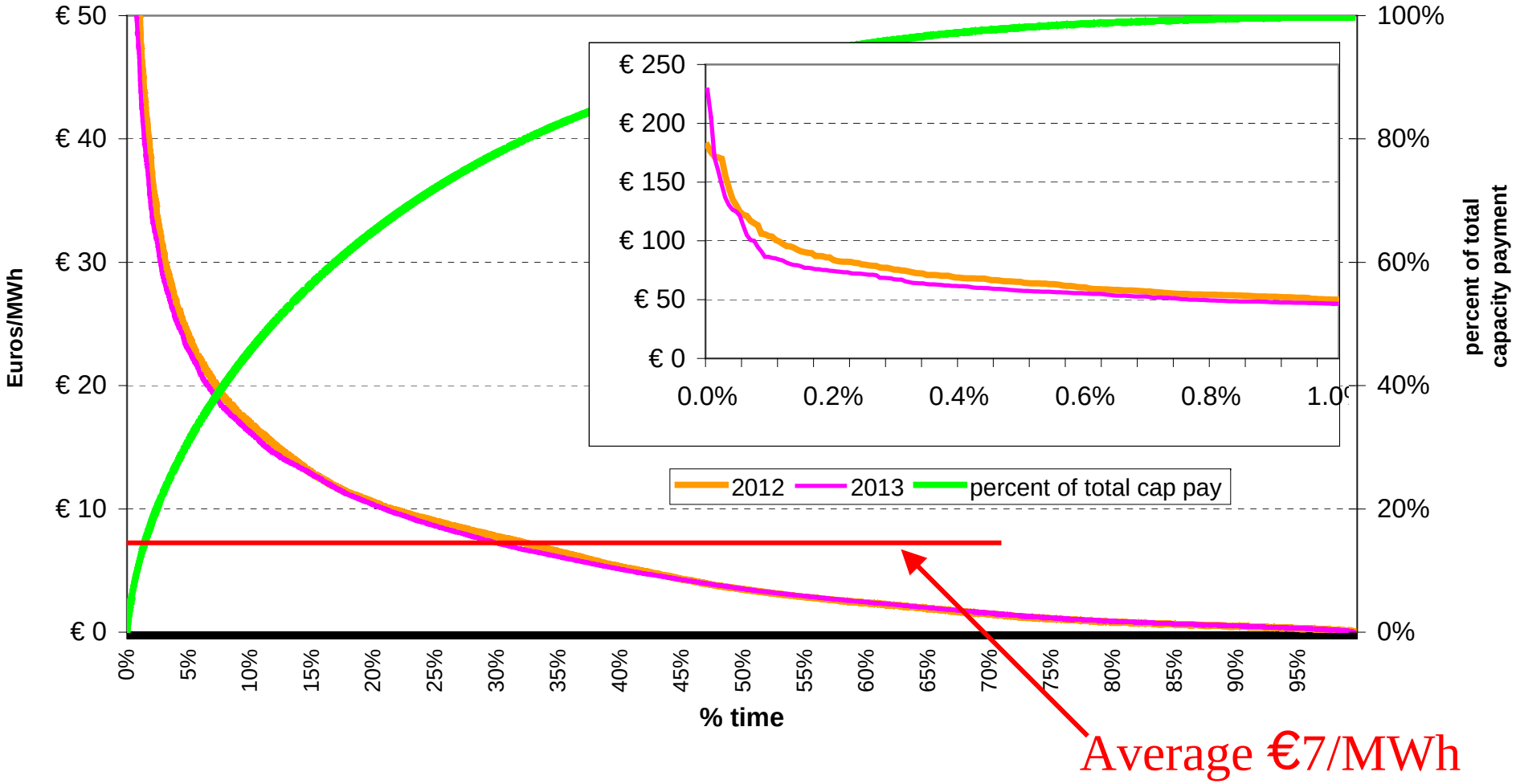
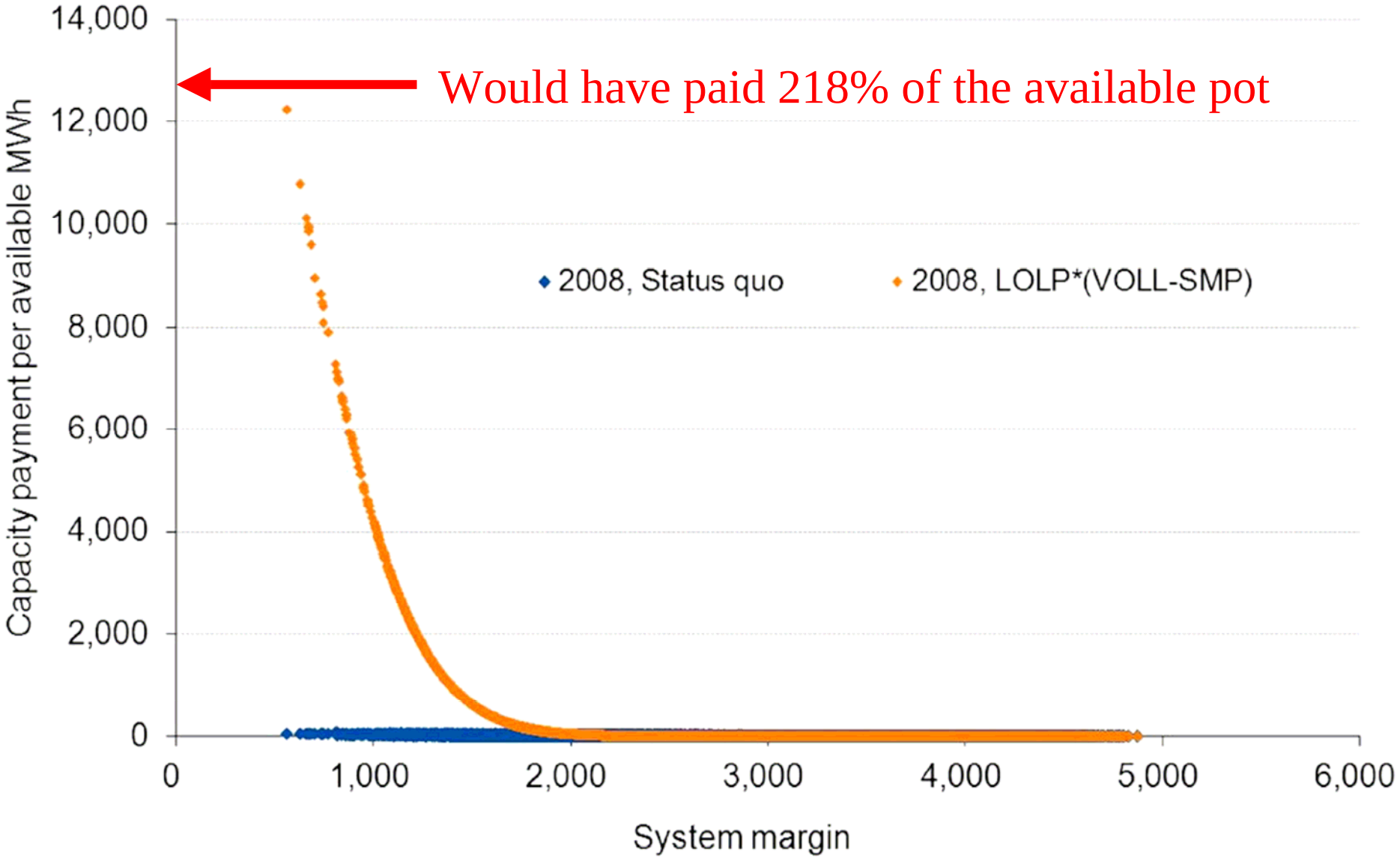
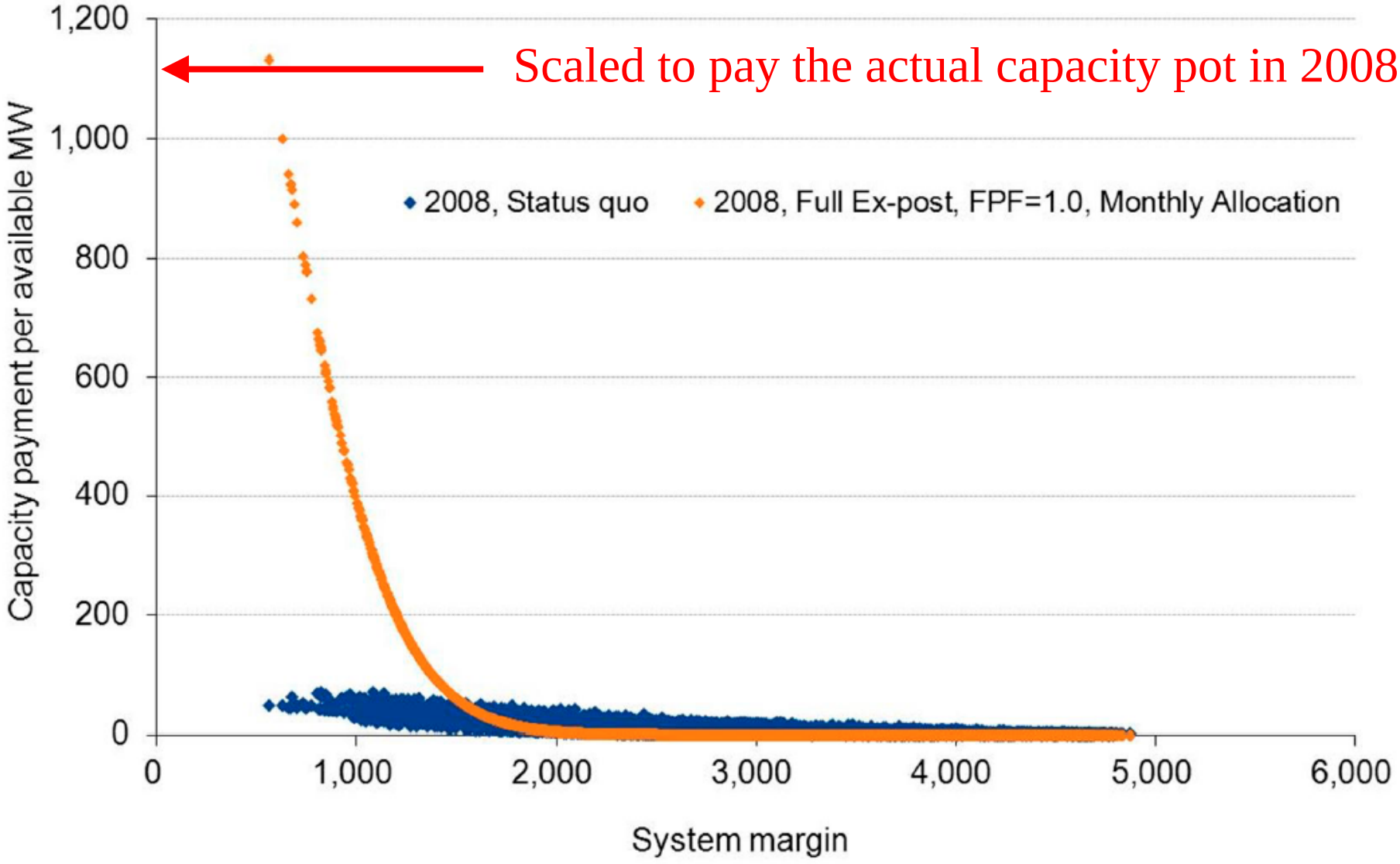


Figure 5 – Capacity Payments in € per available MWh vs. ex-post margin, 2008, under the LOLP × (VOLL-SMP) benchmark design



Source: Poyry: Capacity Payment Mechanism Medium Term Review 2011

Figure 6 – Capacity Payments in € per available MWh vs. ex-post margin, 2008, under the benchmark full ex-post design



Day-ahead pricing

- SEM sets price on basis of ex-post dispatch
- DA markets set price on ex-ante bids
  - Intra-day markets will allow adjustments
- I-SEM design will need to adapt to his
- DA dispatch provides prices for DA trading
- Adjusted in light of wind, demand, outages

  => revised dispatch and intra-day/balancing prices (effectively ex post prices) for deviations from initial dispatch

Who chooses initial and revised dispatch?

Conclusions

- TEM improves use of interconnectors
  - realises value to SEM consumers who own ICs
- GB market changing
  - coupled on Continent, has CPF and CP from 2018
  - price cap to be raised to £6,000/MWh

=> could increase SEM exports when GB stressed

=> care designing SEM CPM

- Central dispatch probably more efficient

If kept need to devise efficient intra-day trading

Spare slides

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Acronyms

BCoP	Bidding Coide of Practice
CfD	Contract for difference
CP(M)	Capacity Payment (Mechanism)
CPF	carbon price floor
DA	Day ahead
EMR	(UK) Electricity Market Reform
ETS	Emissions Trading System
EUA	EU Allowance for 1 tonne CO_2
EWIC	East-West Interconnector
FiT	Feed-in tariff
IC	Interconnector
LCF	Levy Control Framework
LoLE	Loss of Load expectation (expected number of hours of LoL)
LoLP	Loss of Load Probability
RES	Renewable energy supply
RO(C)	Renewable Obligation (Certificate)
TEM	Target Electricity Market
TUoS	Transmission use of system (charge)
VOLL	Value of Lost Load

Ti

Price duration curves at 2013 prices