

“Re-coupling” the GB market: the cost of uncoupling

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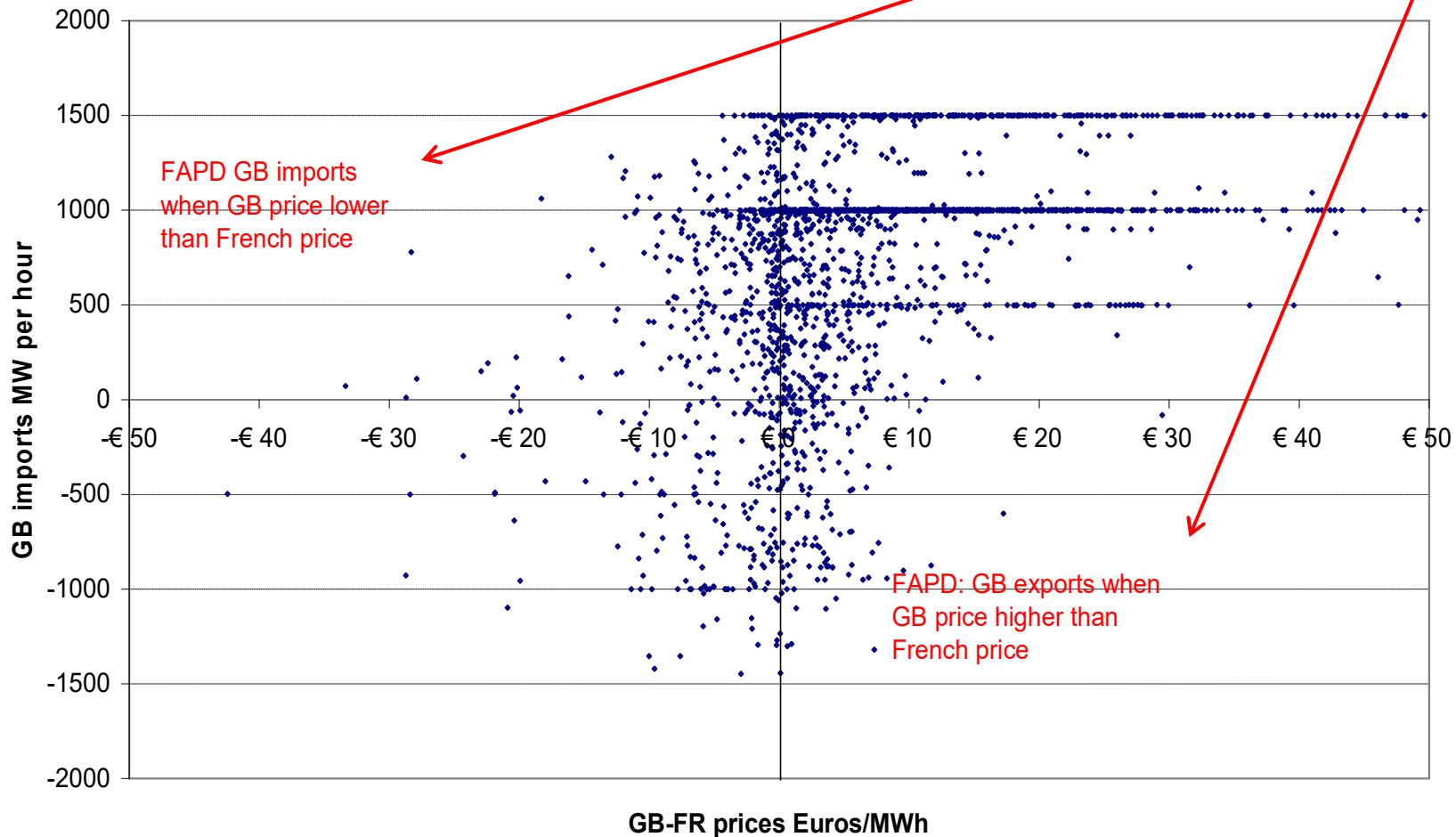
- Single Day Ahead Coupling (SDAC) vs uncoupled
- **Hedging** within and between countries
 - Before and after Brexit
- **Modelling** traders' behaviour post-Brexit
 - Forecasting and loss of value
- Cost of uncoupling GB-Continent
- GB-SEM early experience
 - Intraday remains coupled with SEM

=> why not recouple GB-SEM at Day-ahead?



Before coupling flows *against* price differences - FAPDs

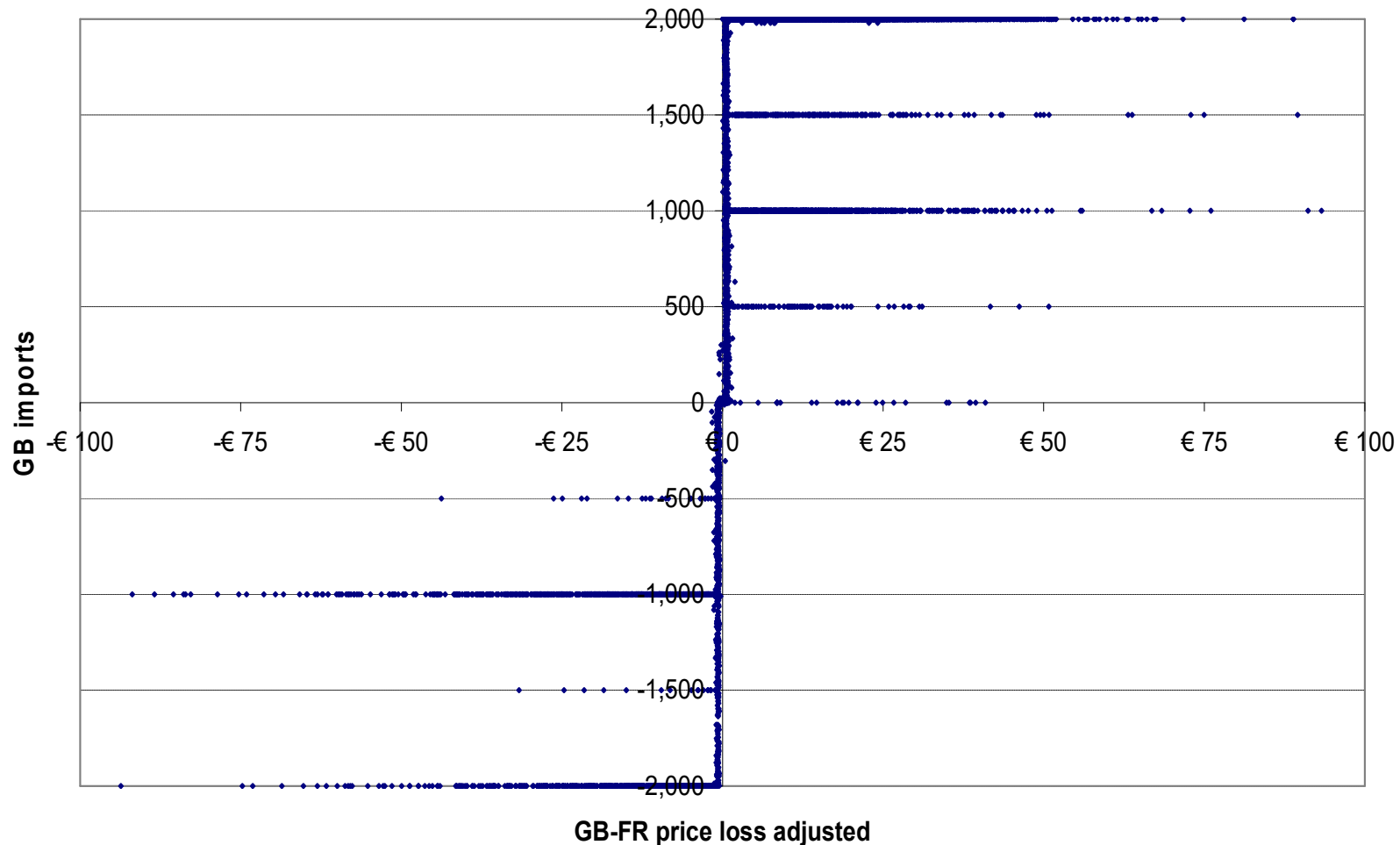
GB imports vs GB-FR prices 2013





After 2014 EUPHEMIA efficiently clears Day-ahead market

Flows vs price differences on IFA 2017

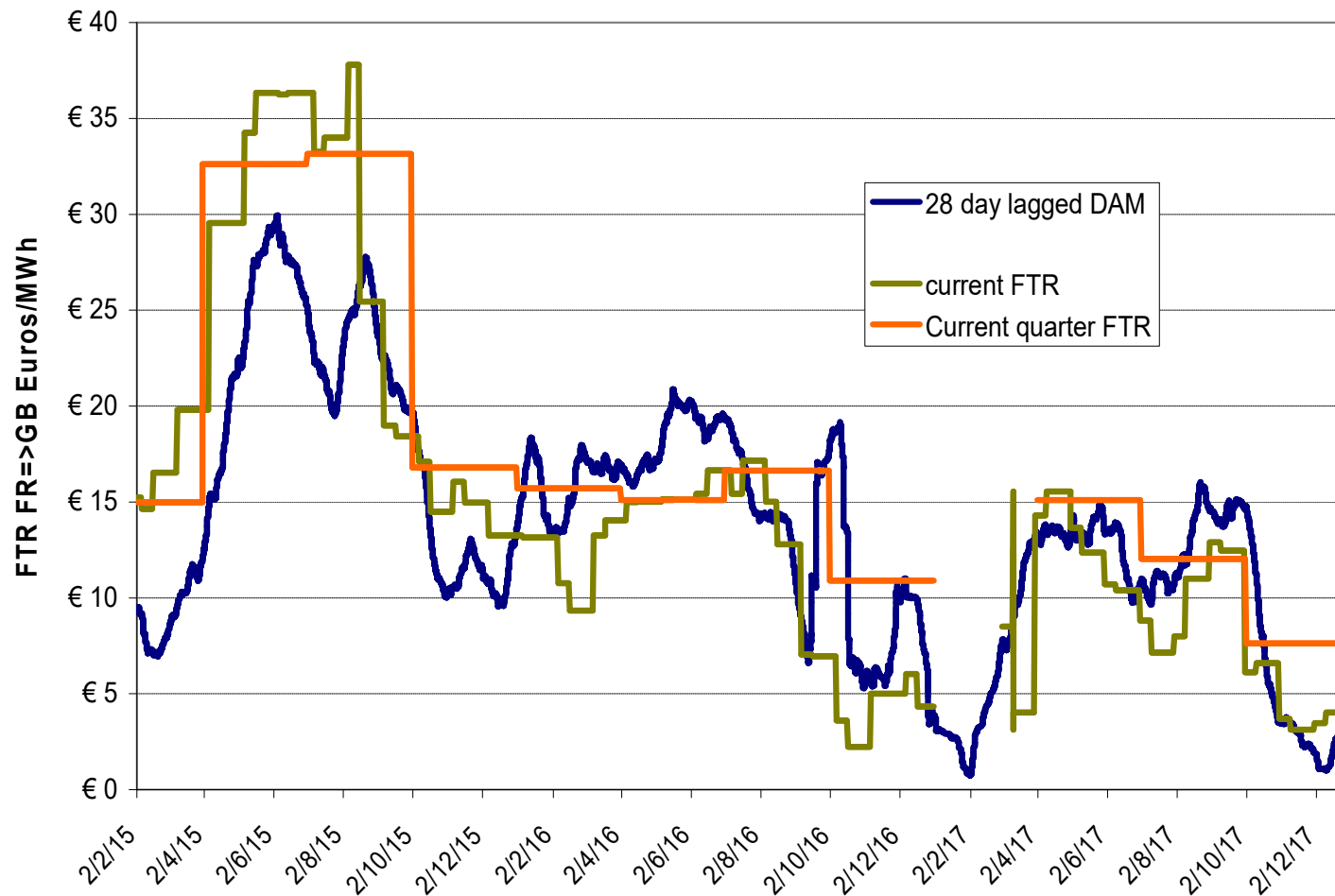


- Physical Transmission Rights (PTRs): options entitle holder to nominate flows over ICs or sell (UIOSI)
 - Sold forward (year, quarter, month ahead) for $p_{GB} - p_{FR}$ or v.v. (per MW)
 - Day-ahead become FTR options under SDAC
 - Total volume limited to IC capacity
- Financial – FTRs: usually obligations, entitled to congestion revenue
 - Can be sold forward. **Cannot offer PTRs and FTRs for same border**
 - Obligations can be netted (as in the IDAs between GB & SEM)
- Contracts for difference (CfDs) allow hedging within a country
 - Pay $(s - p_{GB})/\text{MW}$ for an agreed strike price, s .
- Arbitrage makes local CfD = FTR + foreign CfD



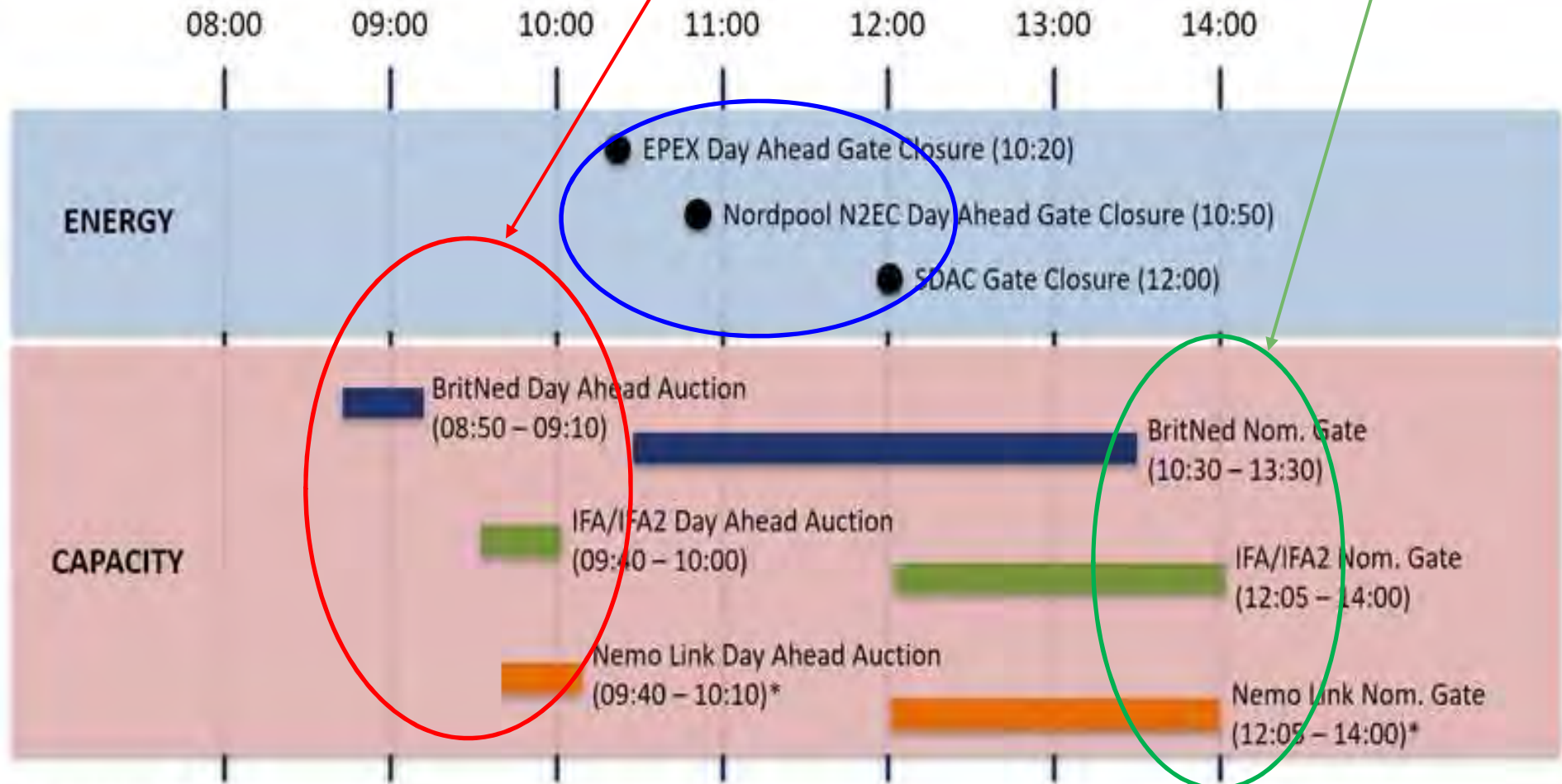
Forward markets converge on DAM spot price

IFA 28-day lagged DAM price, front and current month FTR





GB Day-ahead auction times IC before DAM then nominate



All times in CET

*The Nemo Link times are currently being consulted upon and may change



- Sequence of transactions
 1. At D-1 buy PTR FR=>GB
 2. Buy FR DAM, sell in GB DAM
 3. Nominate for profitable hours over IFA
 - **Risks**: expected value of IFA may differ from DAM price differences
- => **Exposure** to imbalance charge for un-nominated flows or may flow in wrong direction

Question: what is the loss of efficiency from separating the SDAC into three separate transactions?



Forecasting price differences: using autoregressive exog. variables

- Scenario 1 IC auction **before** DAM auctions
 - As with GB - Continent
 - 1A directly forecast price difference
 - 1B forecast each DAM price and take difference
- Scenario 2 IC auction **after** DAM auctions
 - As with Intra-day auctions with SEM

Error Measures for IFA forecasts

Scenarios	MAE €/MWh	MSE (€/MWh) ²	FAPD
1A	€5.49	66.45	9.8%
1B	€5.5	66.55	9.9%
2	€3.89	33.81	11.9%



Actual vs Forecast GB-FR price differences (*IC after DAM*)



- Bids **discounted** to forecast price difference
 - To avoid imbalance charges or FAPD
- Competitive traders bid **least discount** for non-negative cumulative profits over e.g. 91 days

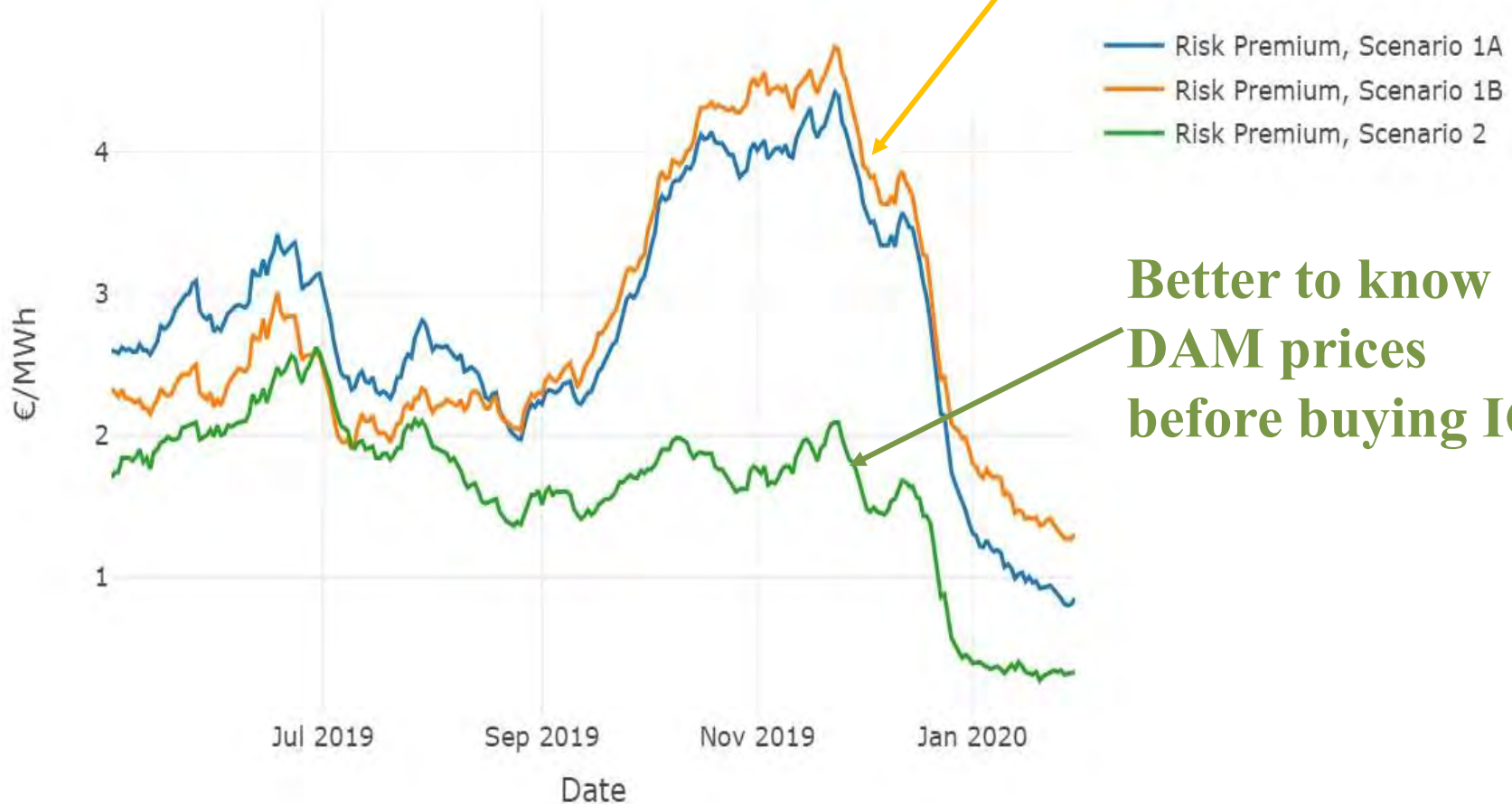
Table: Zero-profit discount for marginal traders on IFA

	Scenario 1A	Scenario 1B	Scenario 2
Risk discount (€/MWh)	€2.35	€2.39	€1.32
Annual Profit (€ mill.) (driven to just-above zero)	0.10	0.06	0.09



IFA trade: inflexible nuclear, temperature-sensitive demand

91-day Risk Premia on IFA





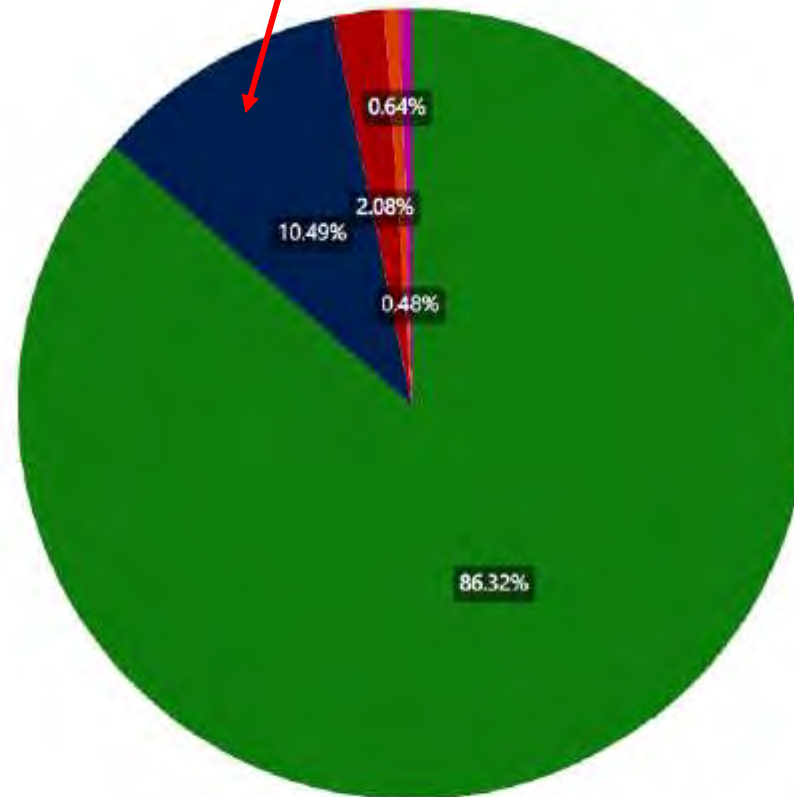
- Reduced liquidity in markets increases risk
- A €2/MWh risk discount = lost IC revenue of **€8 million/yr** over 3 GB-Continent IC's (to FR, BE, NL)
 - Social loss (saving in generation cost or extra export value) slightly more (infra-marginal surpluses)
- Under-used capacity and FAPDs = inefficient use of valuable and costly infrastructure

=> accelerate move to multi-region loose volume coupling

- **Single Electricity Market (SEM)** adopted SDAC in 2018
 - After 5 years transition from a regulated bid Pool model to the EU's Target Electricity Model, transition cost > **€100 million**
 - Improvement on IC s worth **€25+ million/yr**
- Remains within single market, retains SEM, but not SDAC
 - Intraday coupling auctions IDA1, IDA2
 - Two GB DAM auctions: EPEX announces at 9:30; N2EX at 9:50; SEM at 11:00
 - Two Intra-day auctions, IDA1 close 17:30 D-1, IDA2 at 8:00 on Day for half-hour period 25-48



IDA1 is main coupled market, much smaller than DAM



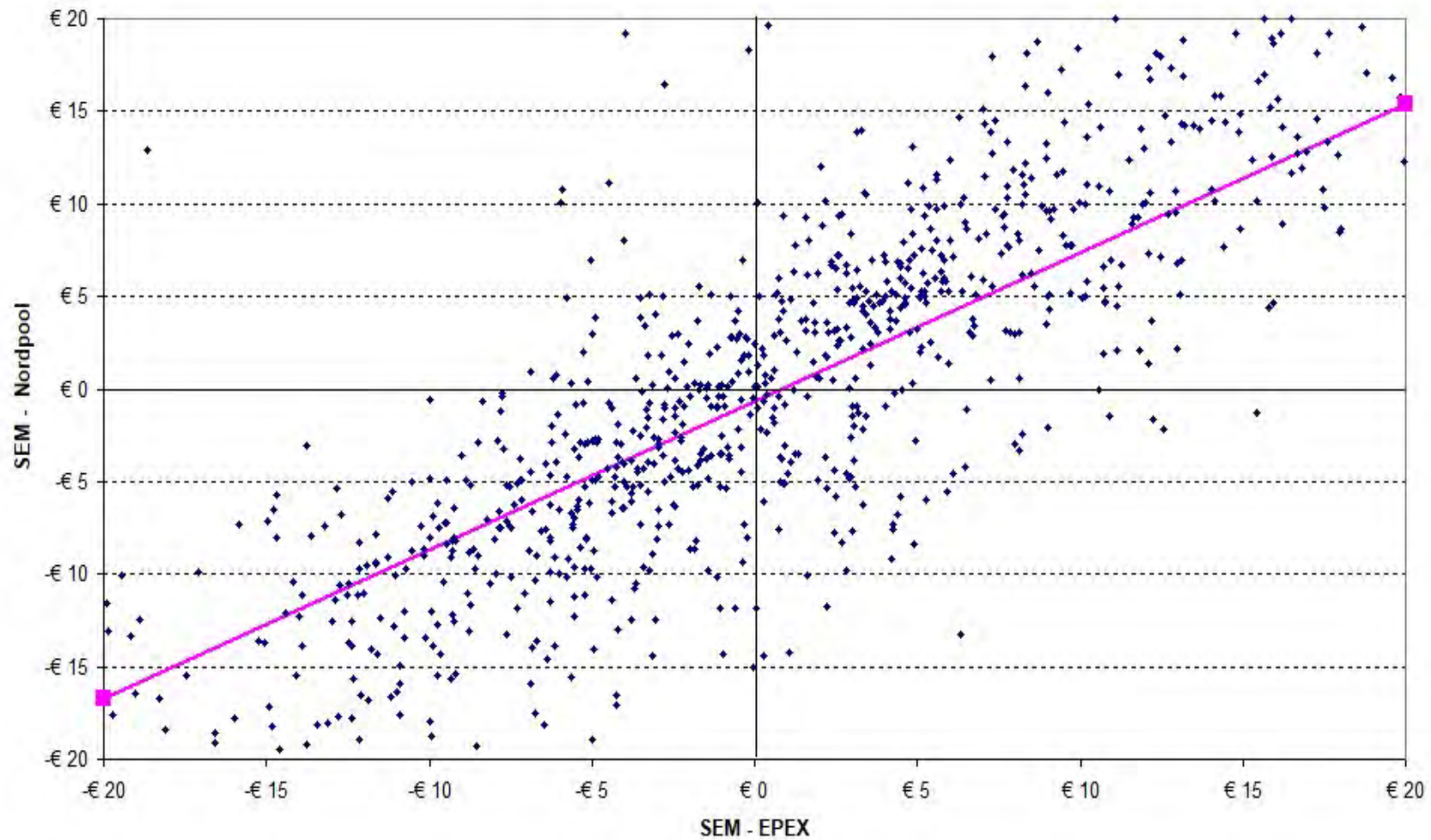
● DAM ● IDA1 ● IDA2 ● IDA3 ● IDC

Graph 4 - Market (Ex-Ante) Share by Value (€/MWh)



There are two GB DAMs!

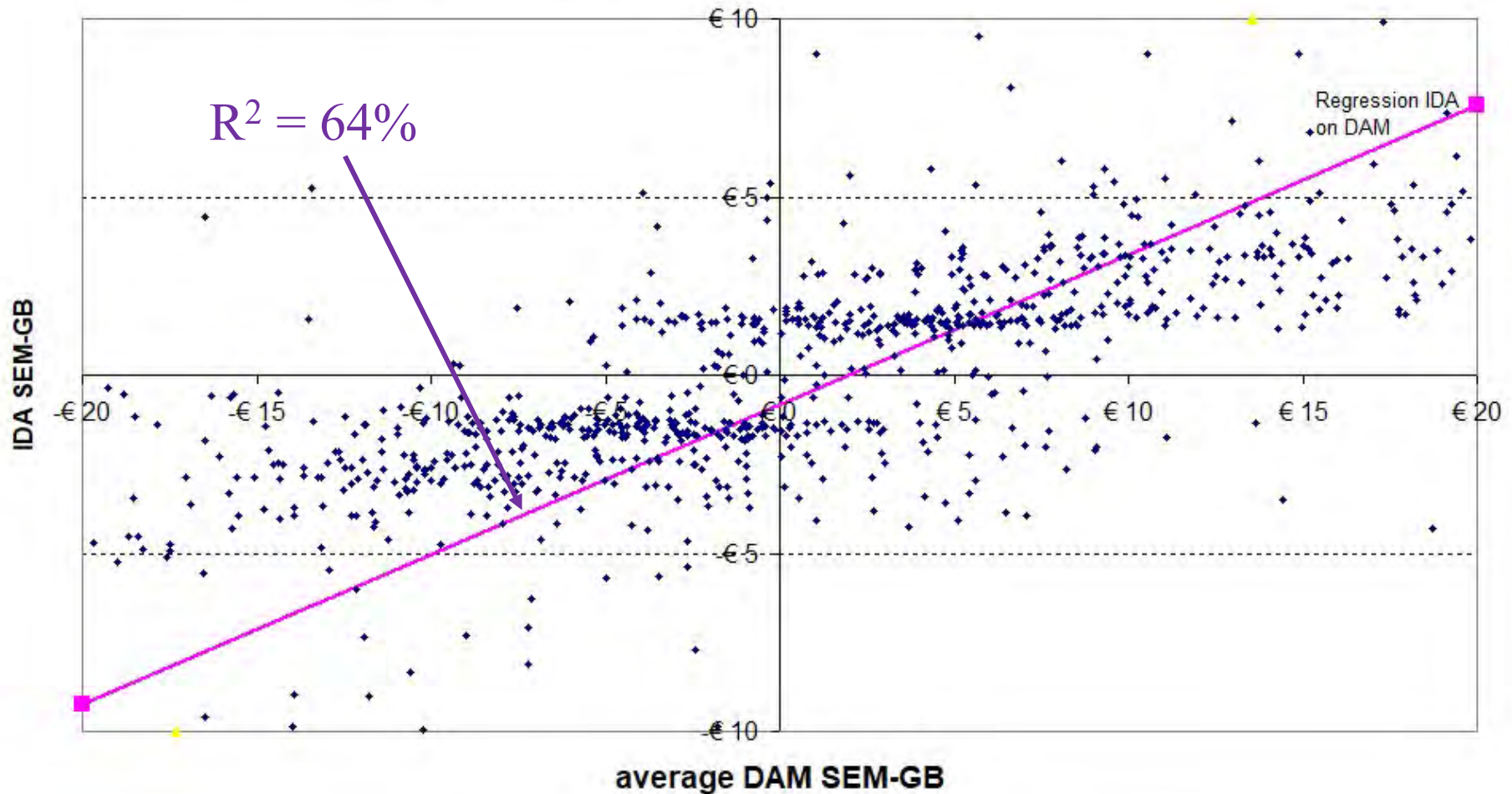
SEM-GB DAM price differences





DAMs poor forecast of IDA price difference

IDA1 SEM-GB against average of DAM SEM-GB price differences



- Trade much impacted by **ramping** constraints
 - They appear either underutilised or have FAPDs
 - Losses are important: Moyle's losses are 2.36%, EWIC's 4.68%
=> Moyle had **non-zero flows 91% of time, EWIC only 43%**.
 - **Flows can only change** by 150 MW/half hour on each (Moyle, EWIC)
 - This explains almost all the apparent inefficiency
- Simulate IDA1 efficient flow from 1 Jan – 11 Feb 2021:
 - Moyle congestion revenue: simulated €4.671 million vs actual €4.319 million; efficiency 92.5%
 - EWIC's congestion revenue: simulated and actual €4.861 million, 100% efficient (as only trades when clearly profitable)

- Uncoupling reduces congestion revenue by €8+ million/yr (social cost slightly more)
- Links to Continent most affected
 - But why not move quickly to intra-day coupling?
- Links to SEM still couple intra-day
 - Appears reasonably efficient but liquidity down
 - => recouple at day-ahead stage – does not impact SDAC

Clear CBA case for reinstating efficient volume coupling

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