

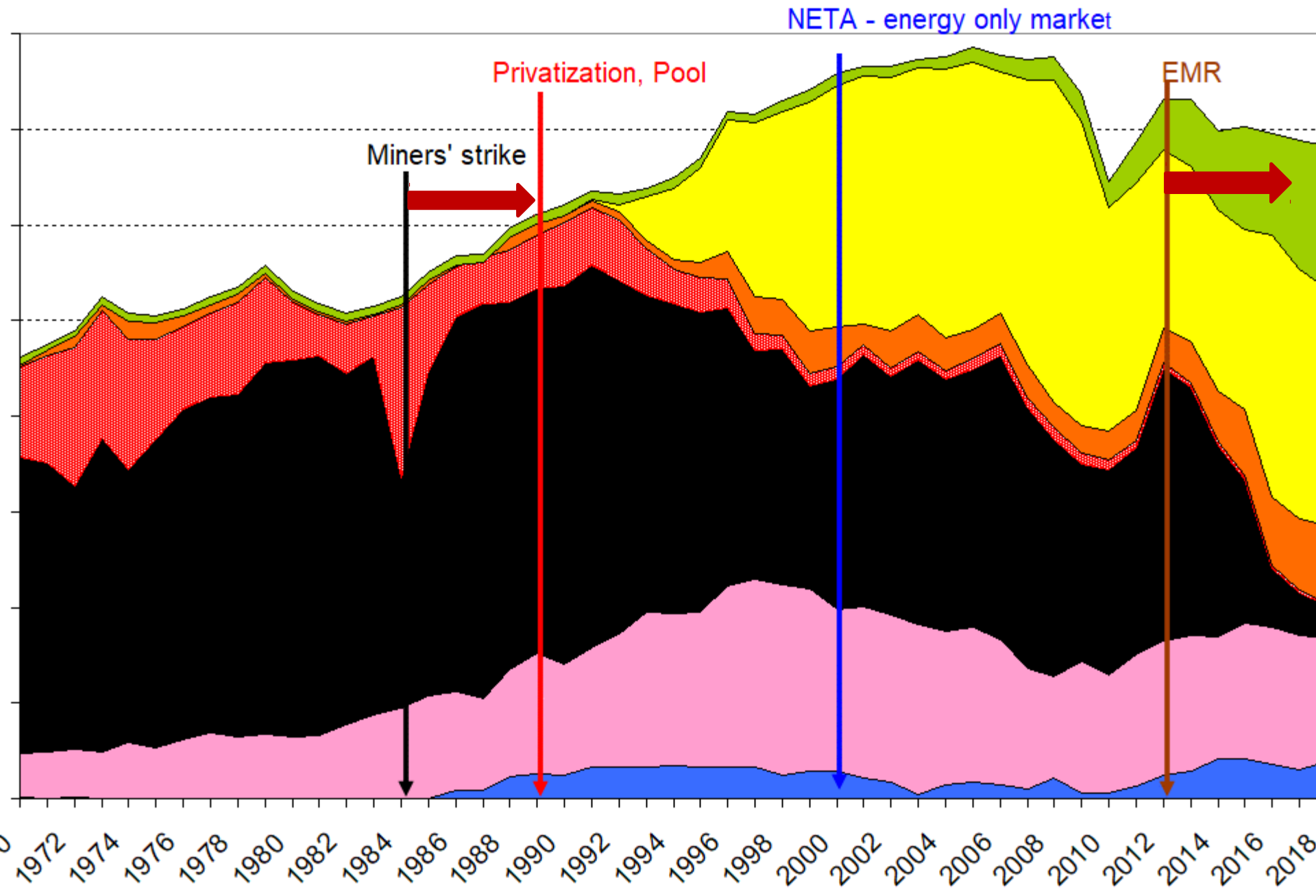
# Strengths and weaknesses of the British Electricity market model

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**FSR-IAEE online seminar**

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# Generation supplied by fuel 1970-2018



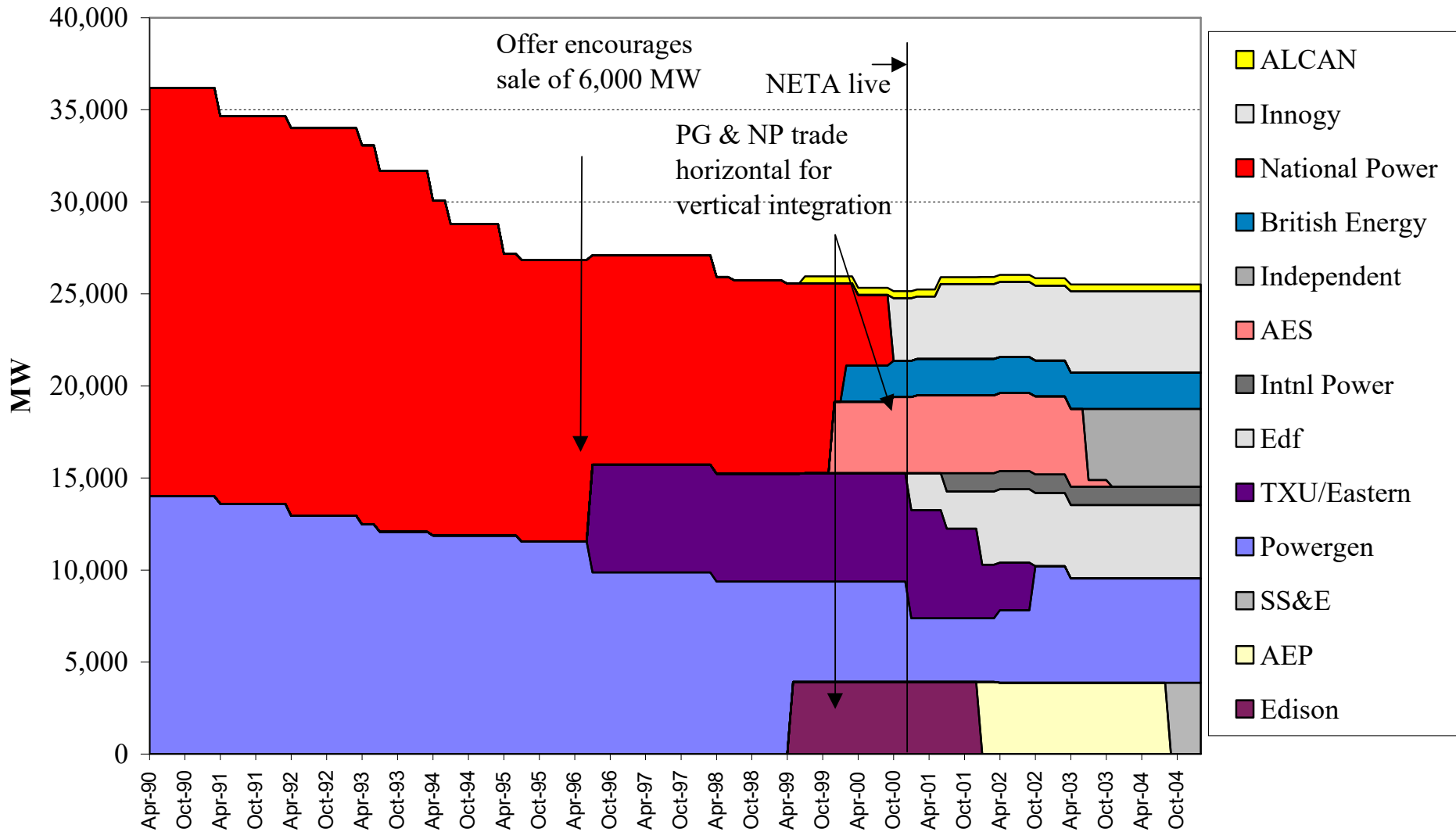


- Privatization: private owners more efficient than public
    - but private cost of capital roughly double public sector
    - => payback period half, 10 years without guarantees
    - early generation investment backed by 15-yr PPAs
    - network regulated under RPI-X, then RIIO
  - 1989: spare capacity, CCGTs cheap, coal costly
    - pool: central dispatch with capacity payments
    - ideal for competitive bidding but privatized as fossil duopoly
    - => “dash for gas”, overcapacity => competition
  - NETA (2001) replaced pool with energy-only market
    - failed to deliver needed investment
    - renewables support failed to deliver
- => 2011 Energy Market Reform



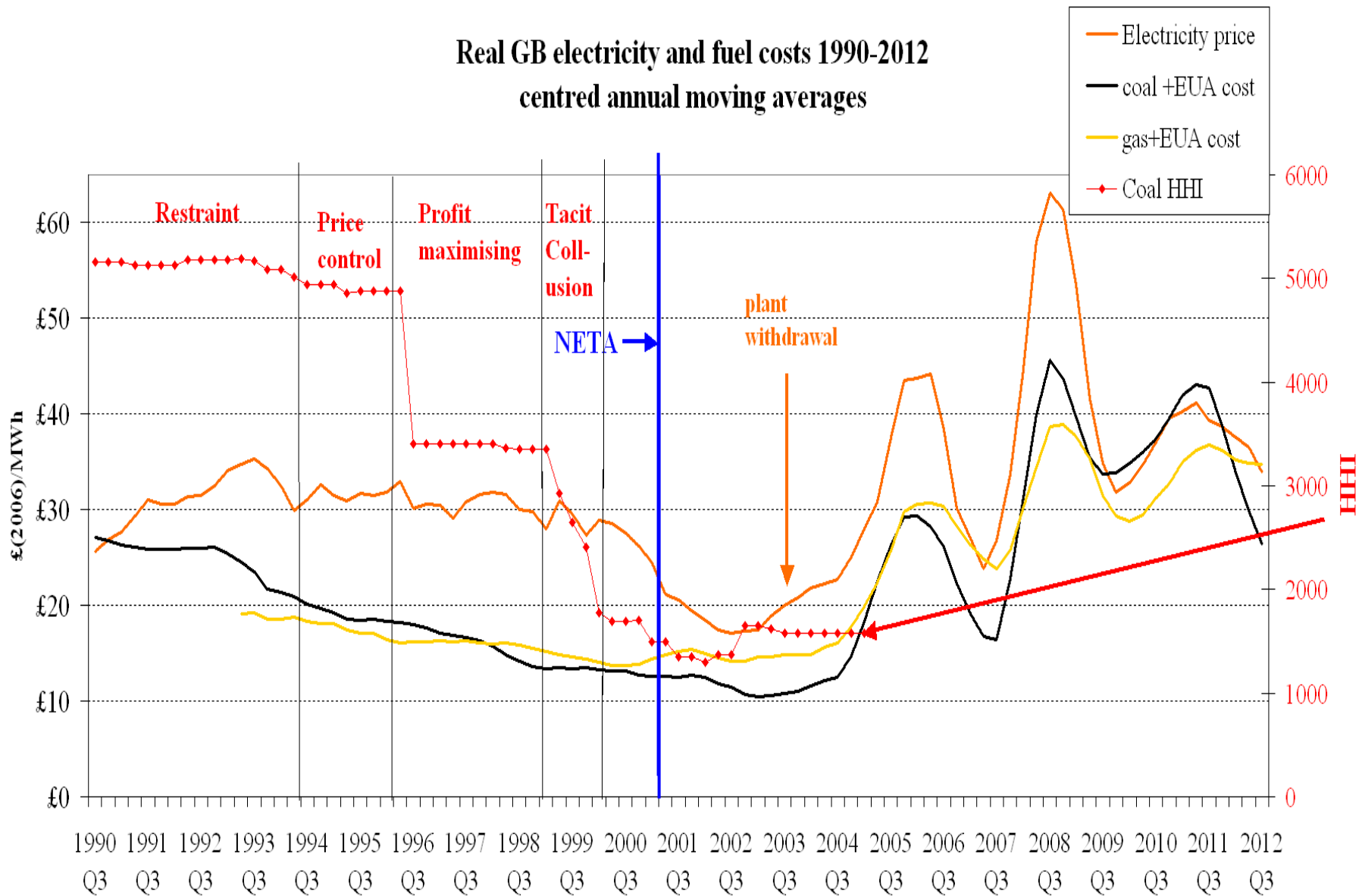
# The gradual emergence of a competitive industry

## Capacity Ownership of Coal Generation 1990-2004



Source: NGC Seven Year Statements, various years, and data from J Bower and C Humphries, slide from D Newbery

# NETA: Profit margins fell, fuel and power prices more volatile



## Why EMR?

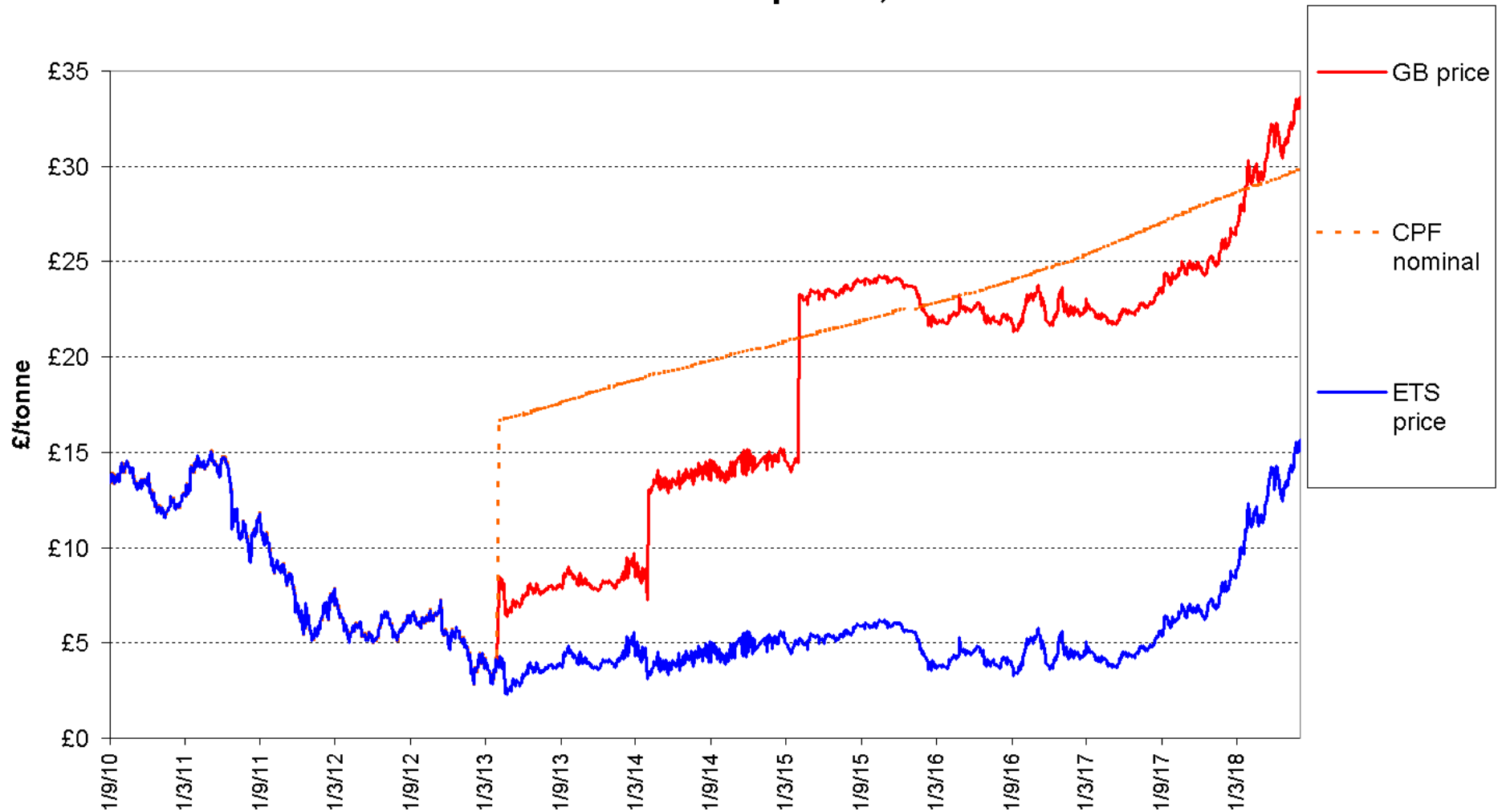
- ETS offers **inadequate low-C investment signal**
- **RES not on target**
- Generation investment crunch but **no investment**  
***Consensus that market not delivering objectives***

=> **capacity payments auctioned**

- HMT sets Carbon Price Floor in 2011 for 2014
- de-risk **RES investment** => Contracts to lower WACC
  - Originally bureaucratically set, then auctioned

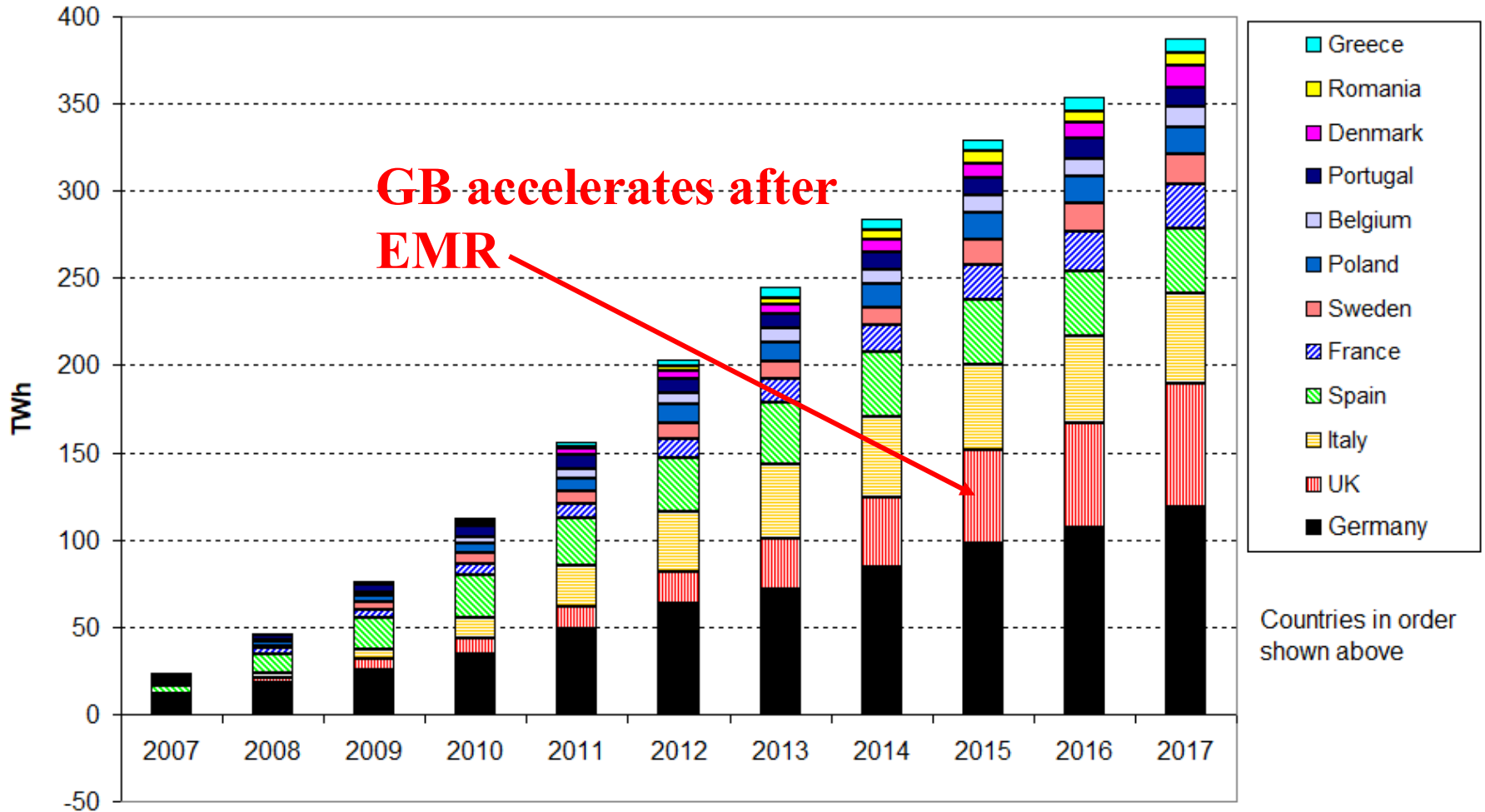
# GB Carbon Price Support and resulting CO<sub>2</sub> price

### ETS and GB CO<sub>2</sub> prices, 2011-18



# EU renewable generation added since 2006

Cumulative increment in RES-E since 2006 top 12 MSs





RPI-X improved **operating efficiency**

successfully delivered **network investment**

but hard to benchmark

=> **replaced by** Revenue = Incentives + Innovation + Outputs (**RIIO**)

Network **innovation competitions very successful**

Reforming network tariffs less so with capacity auctions

unseemly entry on small diesel generators on distribution networks



GB: rich evidence of **what works and what not**  
**renewables support** now good, could be improved  
very durable investment **needs contractual support**  
nuclear & CCS inching towards RAB finance

Regulation: **good at investment** assurance  
leading on **innovation support**  
**less good at agile tariff adjustment**

*moving to better balance of competition in and for  
market, auctions and RAB finance*



CCGT	combined cycle gas turbine
CCS	carbon capture and storage
CfD	Contract for Difference
EMR	Electricity Market Reform => <i>Energy Act 2013</i>
NETA	New Electricity Trading Arrangments
PPA	Power purchase agreement
RAB	Regulatory asset base (on which investors earn return + depreciation)
RES	Renewable energy/electricity supply
RIIO	Revenue = Incentives + Innovation + Outputs
RPI-X	revenue indexed to retail price index less efficiency factor (X)
WACC	weighted average cost of capital