

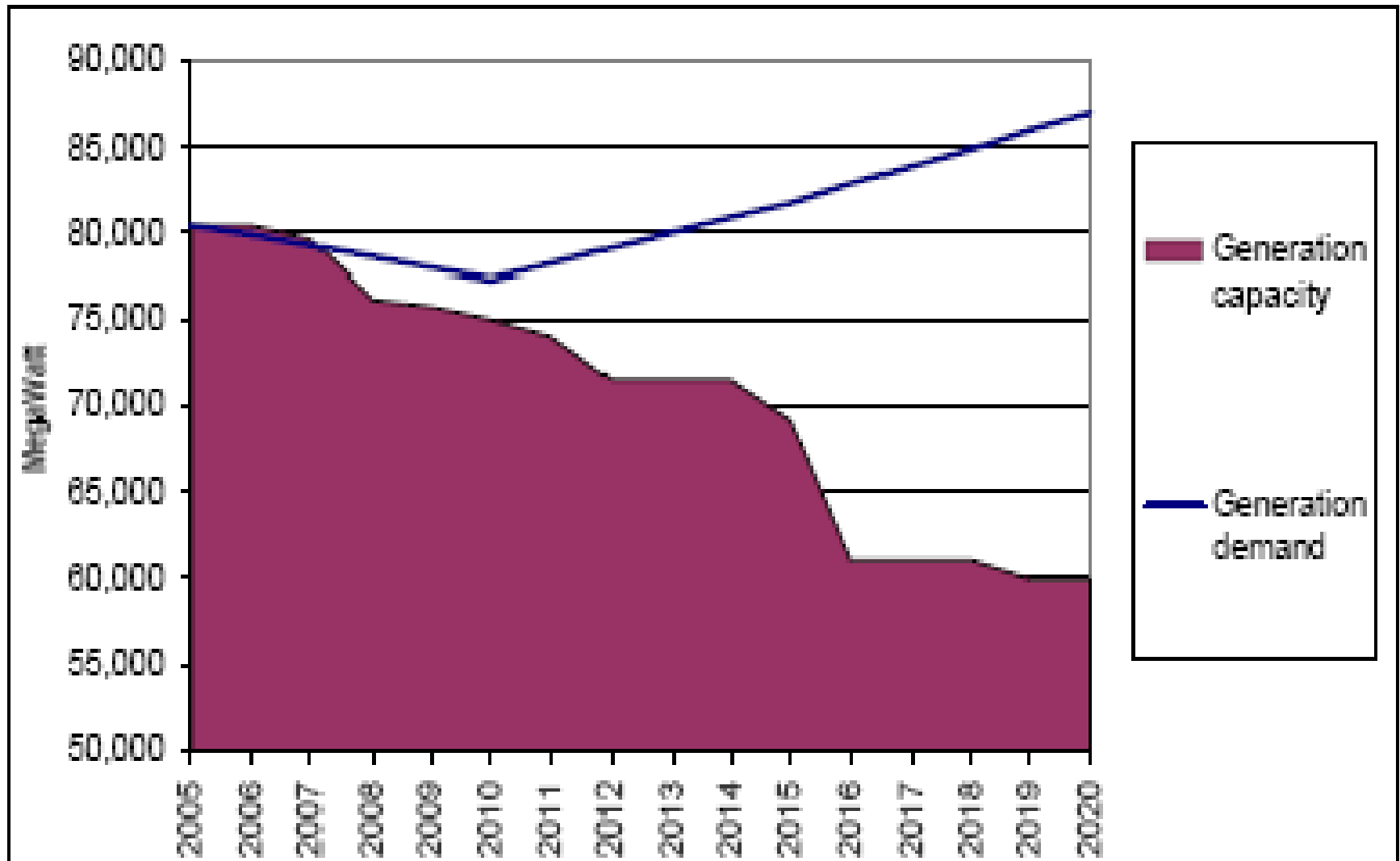
Presentation of the Hatfield IGCC Project

Michael Gibbons,
Director, Powerfuel Power Ltd

gibbonsmjs@aol.com

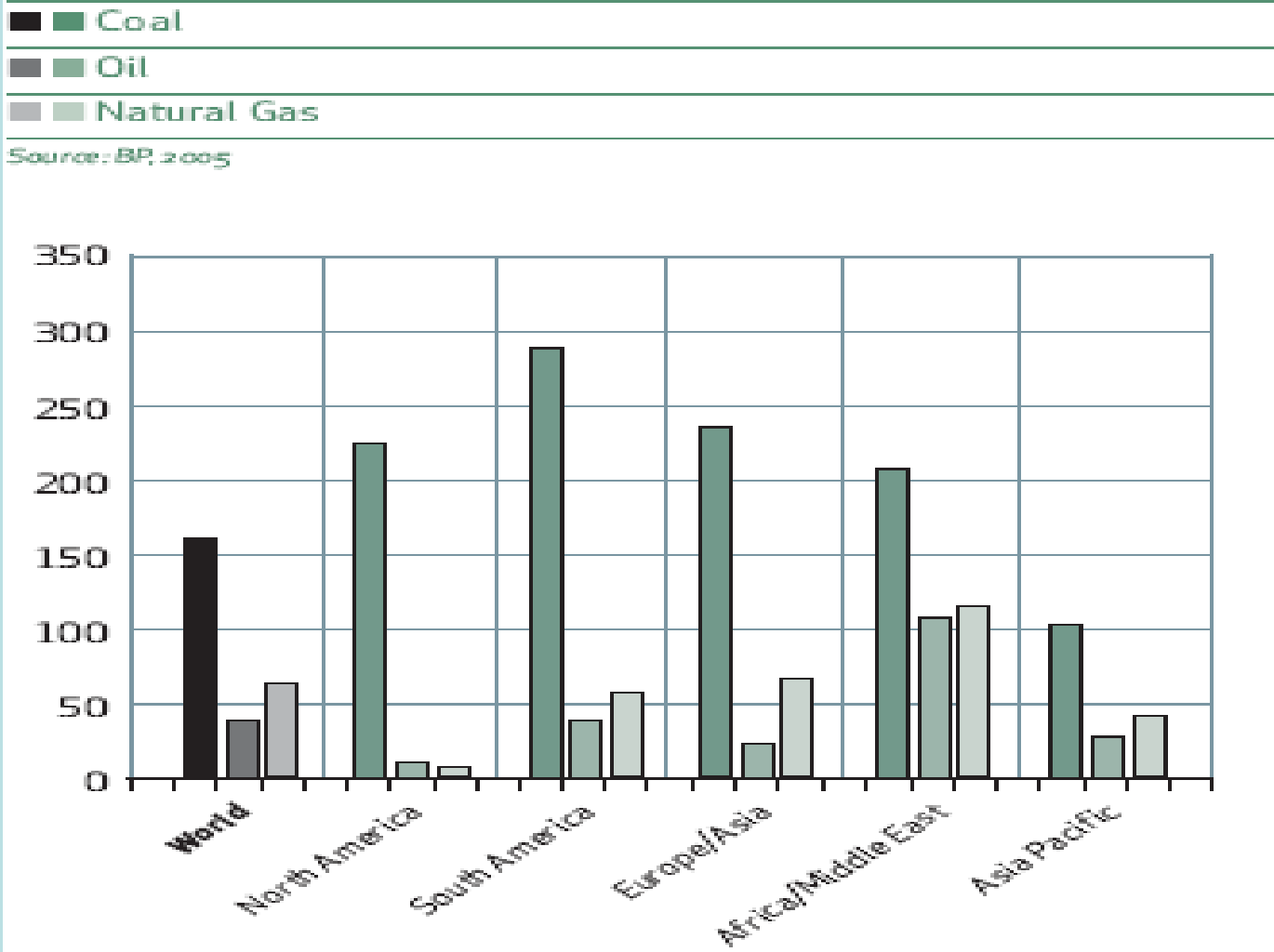


The Generation Gap



.....the UK needs major
investment in new generating
capacity.....

Reserves/Production Ratios



The case for coal fired power

- Abundance of coal
- Proven technologies for generation
- Wide choice of coal suppliers and geography (including UK!)
- Low cost
- Can be stored
- Can generate flexibly
- No major safety/waste issues

Stern Review – for HM Treasury

- Climate change risks to economic and social activity are similar to those associated with the great wars
- It is difficult or impossible to reverse them
- Climate change threatens access to water, food production, health, use of land etc
- The poorest countries and people will suffer earliest and most
- The costs of stabilisation at 500-550 ppm CO₂ are ca 1% of GDP by 2050
- Power sector should be 60-75% decarbonised by 2050
- CCS allows continued use of fossil fuels without damage
- Establishing a carbon price is essential policy measure
- Policies are required to support low carbon technologies
URGENTLY

.....there is a need for investment
in coal power – with carbon
capture.....

The Opportunity for Gasification

- Greater diversity of fuels, and fuel sources
- Renewed interest in coal to liquids
- High CO₂ concentration, pressure
- Proven carbon capture processes
- Offers hydrogen co-production
- Natural gas replacement possible
- Use of proven technology throughout

The Hatfield Power Project

- Owned by Powerfuel Plc
- New investment in colliery secured
- 51% shareholding from Kuzbassrazrezugol (KRU), Russia
- KRU – world top 10 coal exporter
- Powerfuel is first major acquisition for KRU outside Russia

Hatfield, South Yorkshire



The Hatfield IGCC Project

- Colliery in Yorkshire, NE England
- Access to potential 100 million tonnes coal
- Has planning permission and partial government consent to build IGCC power station – only UK coal station with consents in place
- 25 miles from North Sea (for CCS/EOR)
- Cluster of power stations in area

The Hatfield Power Project

Core Project

- Ca 900 MW (gross) coal fired IGCC
- Current target generation 2012
- Carbon capture from outset
- £1 billion project financing

Other features

- Hydrogen available for transport use
- Could supply syngas to CCGTs, (nat gas grid?)
- Bio-ethanol investment on site

Key Issues

- Engineering work
- Contracting strategy
- Development of CO₂ infrastructure
- Regulatory issues in North Sea
- Long term allocation of units in ETS
- Protocol for release of ETS units for CCS
- Government support framework

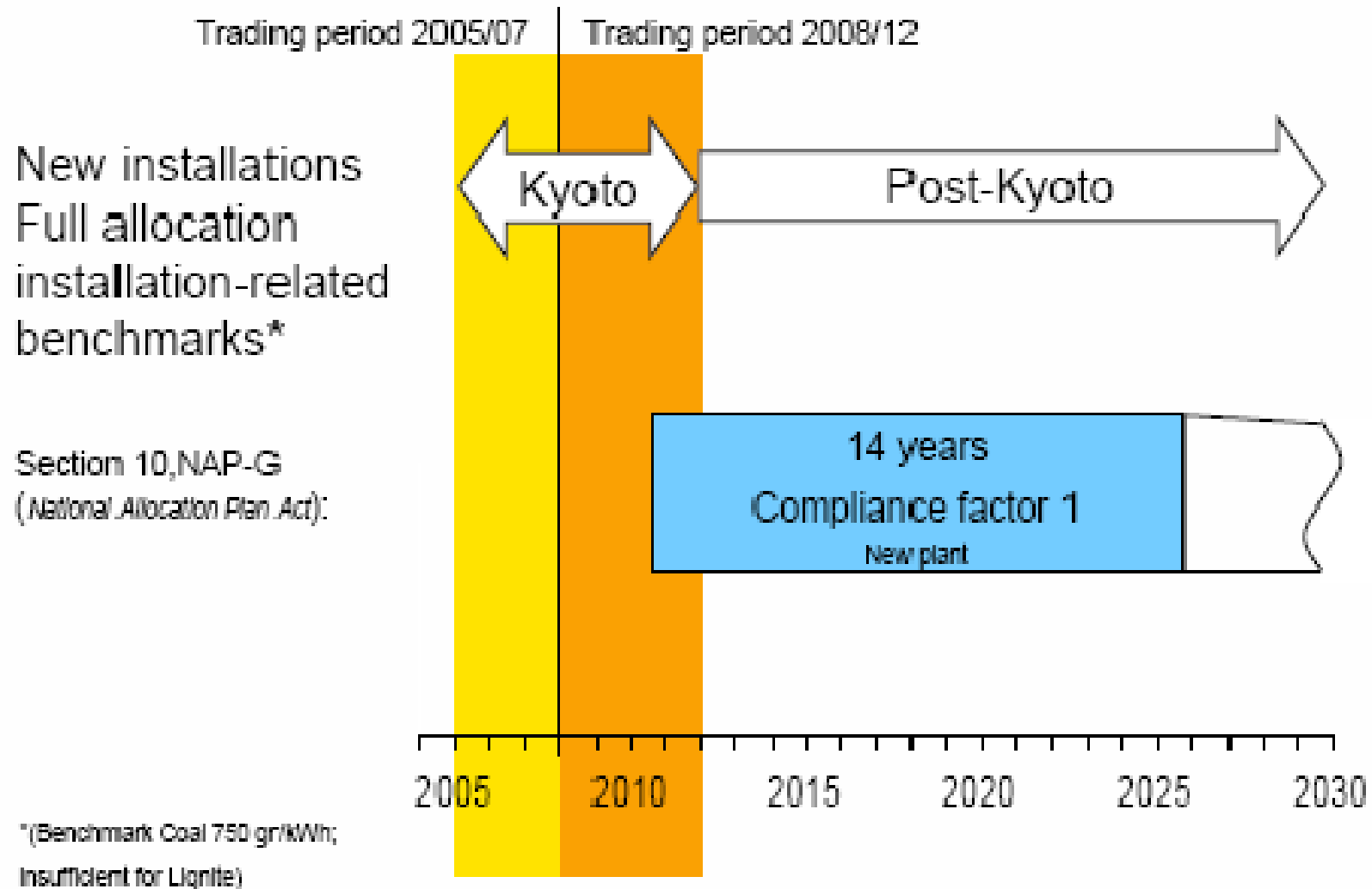
.....the issue of EU ETS
allocations.....

CO₂ Emissions and ETS Allocations

1000MW Coal fired Power Station	CO₂ Emissions Million tonnes p.a.	Free ETS Allocation Million p.a. units	Value of Allocation @ €25/t	CO₂ Emissions Saved Million tonnes p.a.
Existing (old) coal UK station	6.8	4.1	€102 m.p.a.	0
New UK – e.g. Hatfield	0.6	2.1	€53 m.p.a.	5.4

Source – Clean Coal Task Group

Emission trading regime in Germany gives longer term certainty



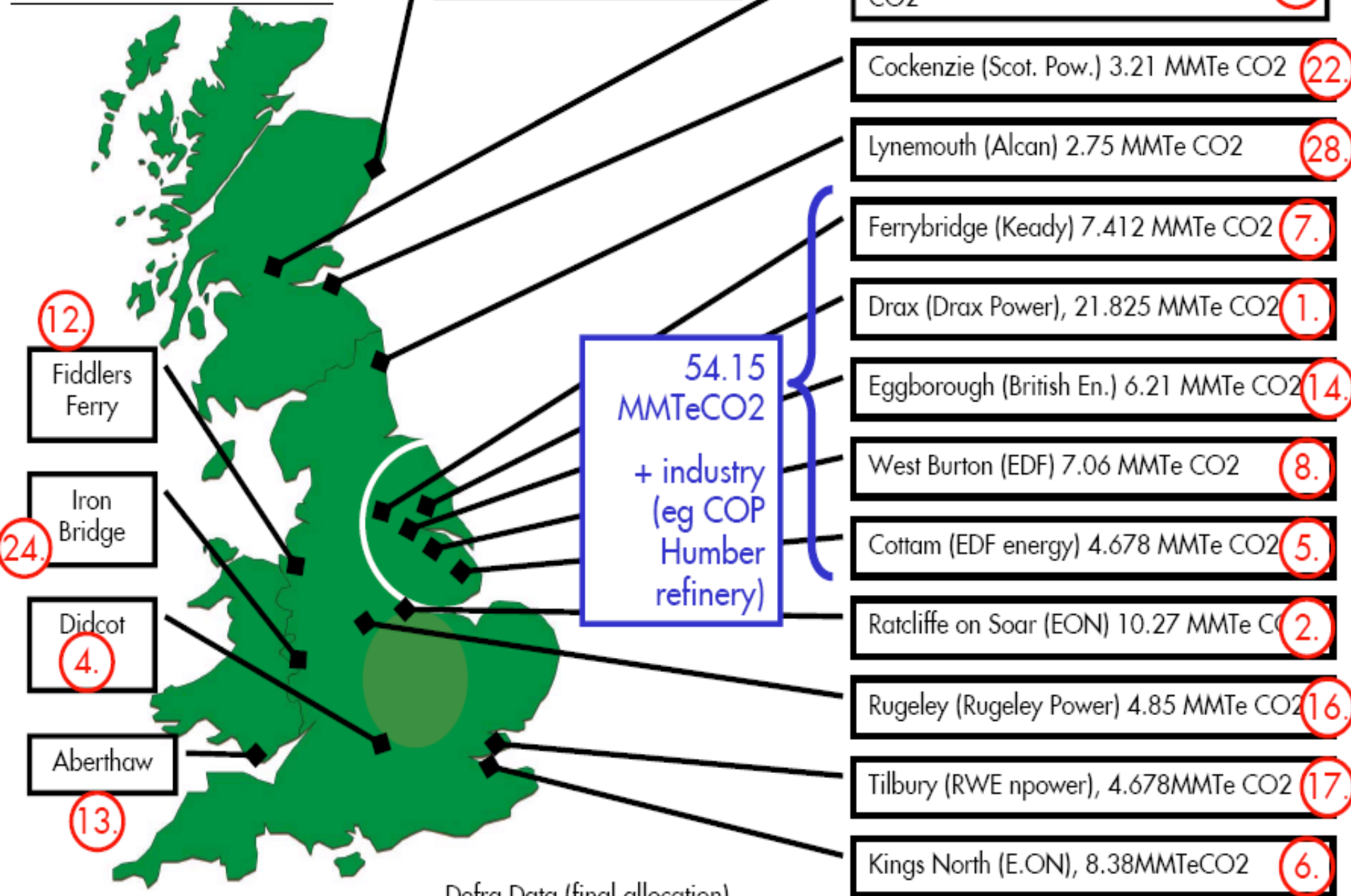
CO₂ Emissions and ETS Allocations

1000MW Coal fired Power Station	CO₂ Emissions Million tonnes p.a.	Free ETS Allocation Million p.a. units	Value of Allocation @ €25/t	CO₂ Emissions Saved Million tonnes p.a.
*Existing (old) coal UK station	6.8	4.1	€102 m.p.a.	0
*New UK – e.g. Hatfield	0.6	2.1	€53 m.p.a.	5.4
New German Station	5.6	5.6	€140 m.p.a.	0

*Source – Clean Coal Task Group

....the CO₂ transport
infrastructure issue...

2003 Emissions from Power Sector



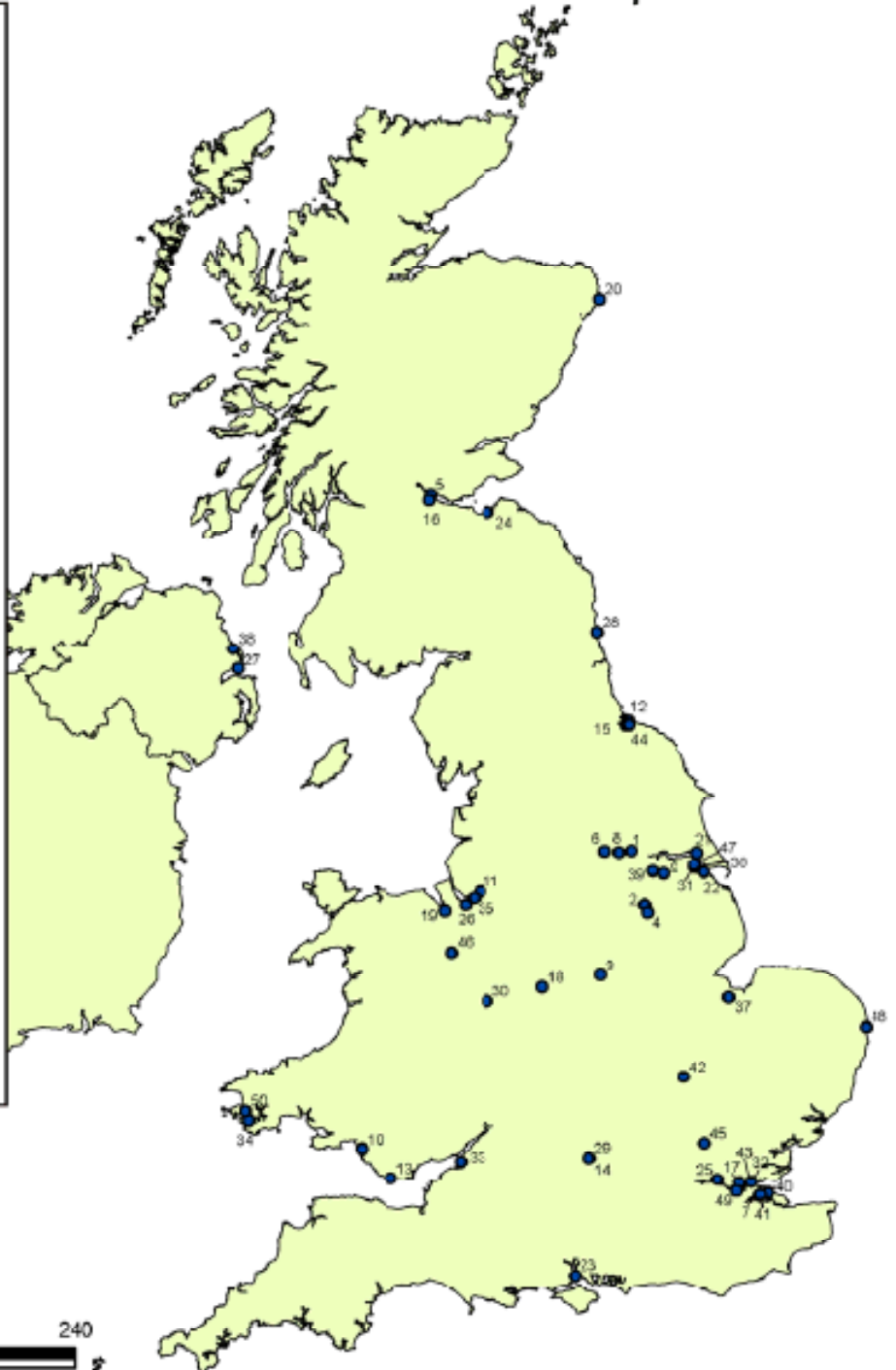
Defra Data (final allocation)

Legend

● 50 Largest UK industrial sources of carbon dioxide

In descending order of emissions:

1. Drax Power Station
2. West Burton Power Station
3. Ratcliffe on Soar Power Station
4. Cottam Power Station
5. Longsight Power Station
6. Ferrybridge 'C' Power Station
7. Kingsnorth Power Station
8. Eggborough Power Station
9. Scunthorpe Steel Works
10. Port Talbot Works
11. Fiddlers Ferry Power Station
12. Redcar Steel Works
13. Aberthaw Power Station
14. Didcot A Power Station
15. Teesside Power Station
16. Grangemouth Comalex
17. Tilbury B Power Station
18. Rugeley Power Station
19. Connah's Quay Power Station
20. Peterhead Power Station
21. Salthill Cogeneration CO LTD
22. Centrica S110 LTD
23. Fawley Refinery
24. Cokerzie Power Station
25. Barking Power Station
26. Stanlow Refinery/Petrochemicals
27. Kilroot Power Station
28. Alcan Aluminium UK LTD
29. Didcot B Power Station
30. Ironbridge Power Plant
31. Humber Refinery
32. Coryton Refinery
33. Avonmouth LNG Facility
34. Pembroke Refinery
35. Rockarage Power Station
36. Lindsey Oil Refinery
37. Sutton Bridge Power Station
38. Ballylumford Power Station
39. Keelby Power Station
40. Medway Power Station
41. Damhead Creek Power Station
42. Little Barford Power Station
43. Coryton Power Station
44. Huntsman Olefins Plant
45. Rye House Power Station
46. Lyme and Wood Pits
47. Killingholme A Power Station
48. Great Yarmouth Power Station
49. Northfleet Cement Works
50. Millerd Havon Refinery



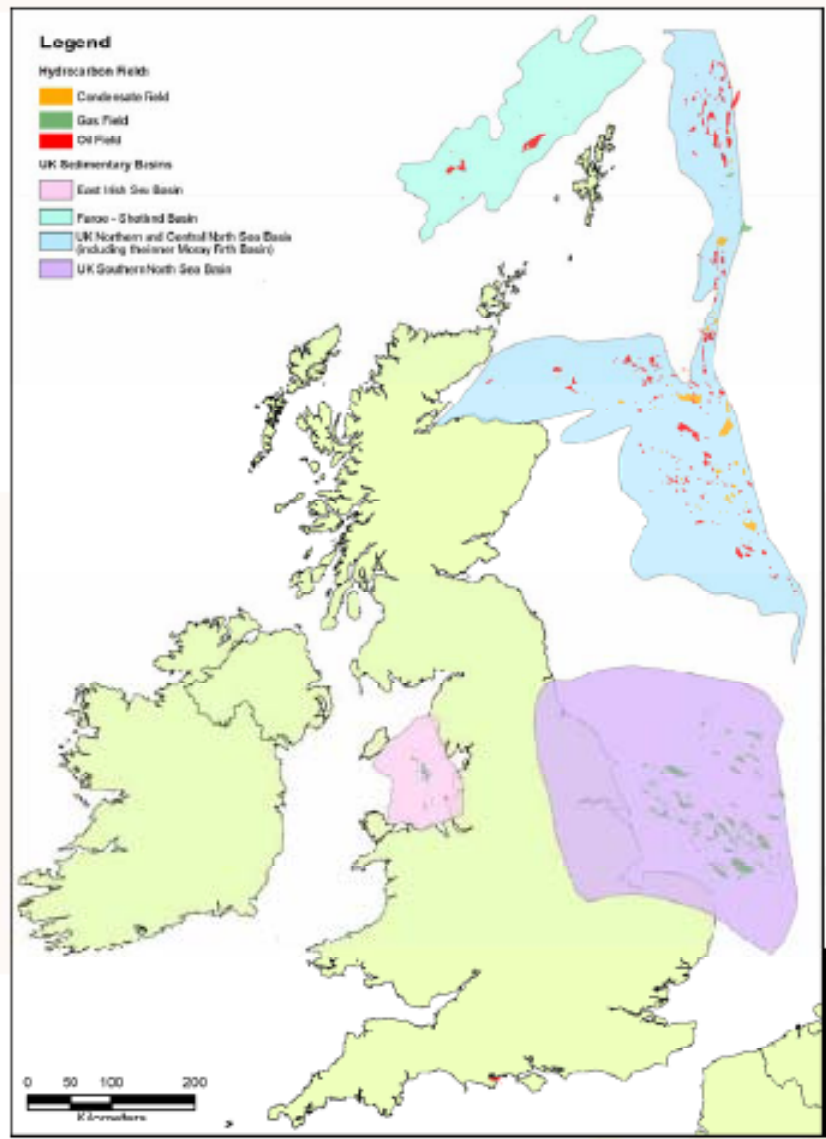
Clusters of sources

1. At and around Humberside
2. Thames estuary
3. Merseyside
4. Forth estuary



Sinks

- Oil fields
- Gas fields
- Gas/condensate fields
- Saline-water-bearing reservoir rocks (saline aquifers)
- Coal seams



Low Carbon Electricity for the UK

Wind, Hydro and DF1

Miller CO2 line

Future links to Norway

Brent Gullfaks area

Phase 4

Beryl area

Phase 3

Miller Kingfisher Brae area

Phase 2

Forties Nelson Howe area

Phase 1

Ekofisk Valhall area

Future links to Denmark

UK CO2 Northward Pipeline. Sized for max EOR demand from participating fields in all Phases. Needs to be optimised on phased demand. Phase 1: 460km; Phase 2: 120km; Phase 3: 90km; Phase 4: 170km.

Humberstone CO2 gathering hub

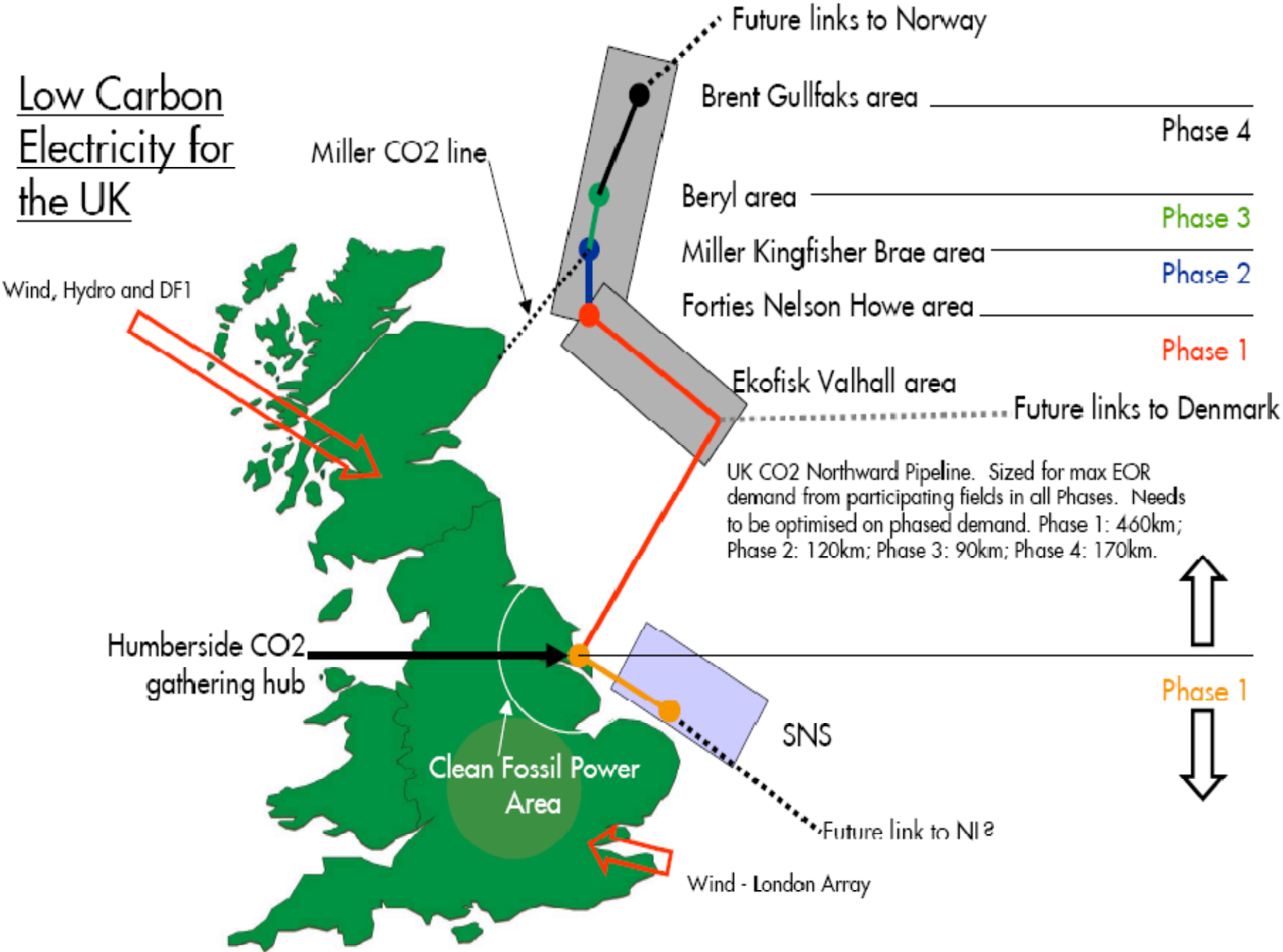
Clean Fossil Power Area

SNS

Phase 1

Future link to NI²

Wind - London Array

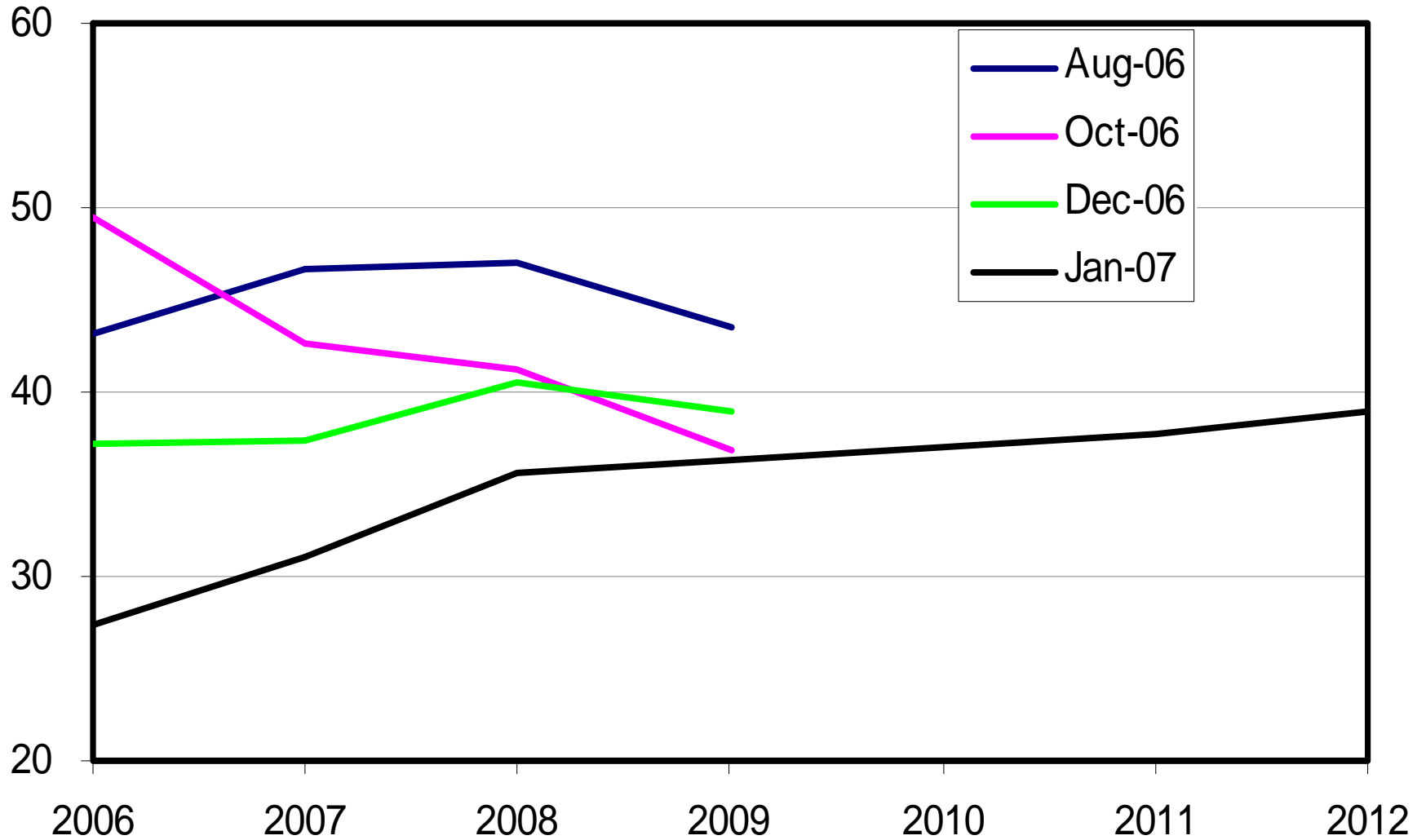


Strong progress

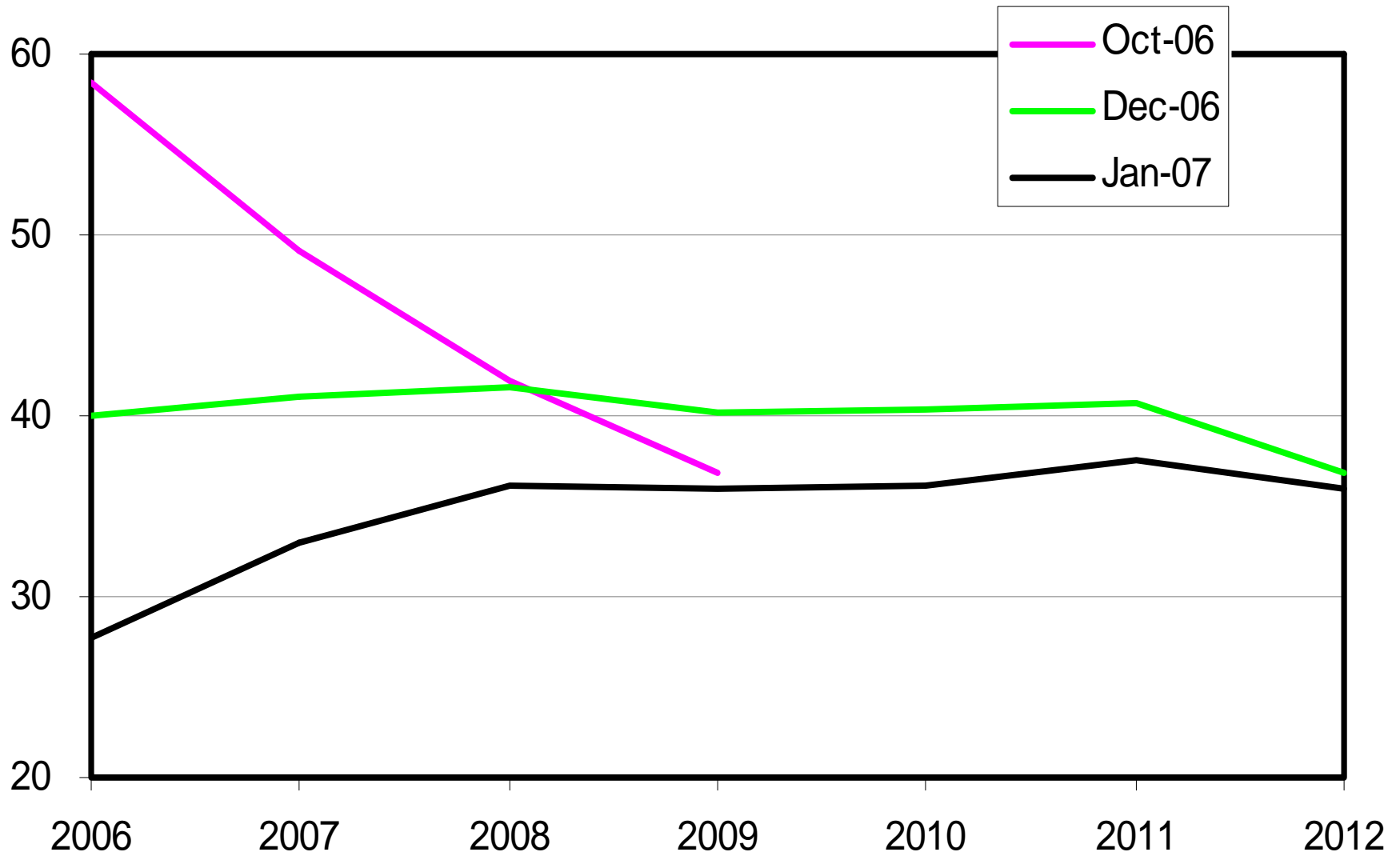
- Gasifier licence agreement signed
- Shell technology selected
- Connection agreement with National Grid
- Prelim design package complete April 07
- Discussions re CO2 line continue
- FEED work being initiated

UK Base Load Price (£/MW)

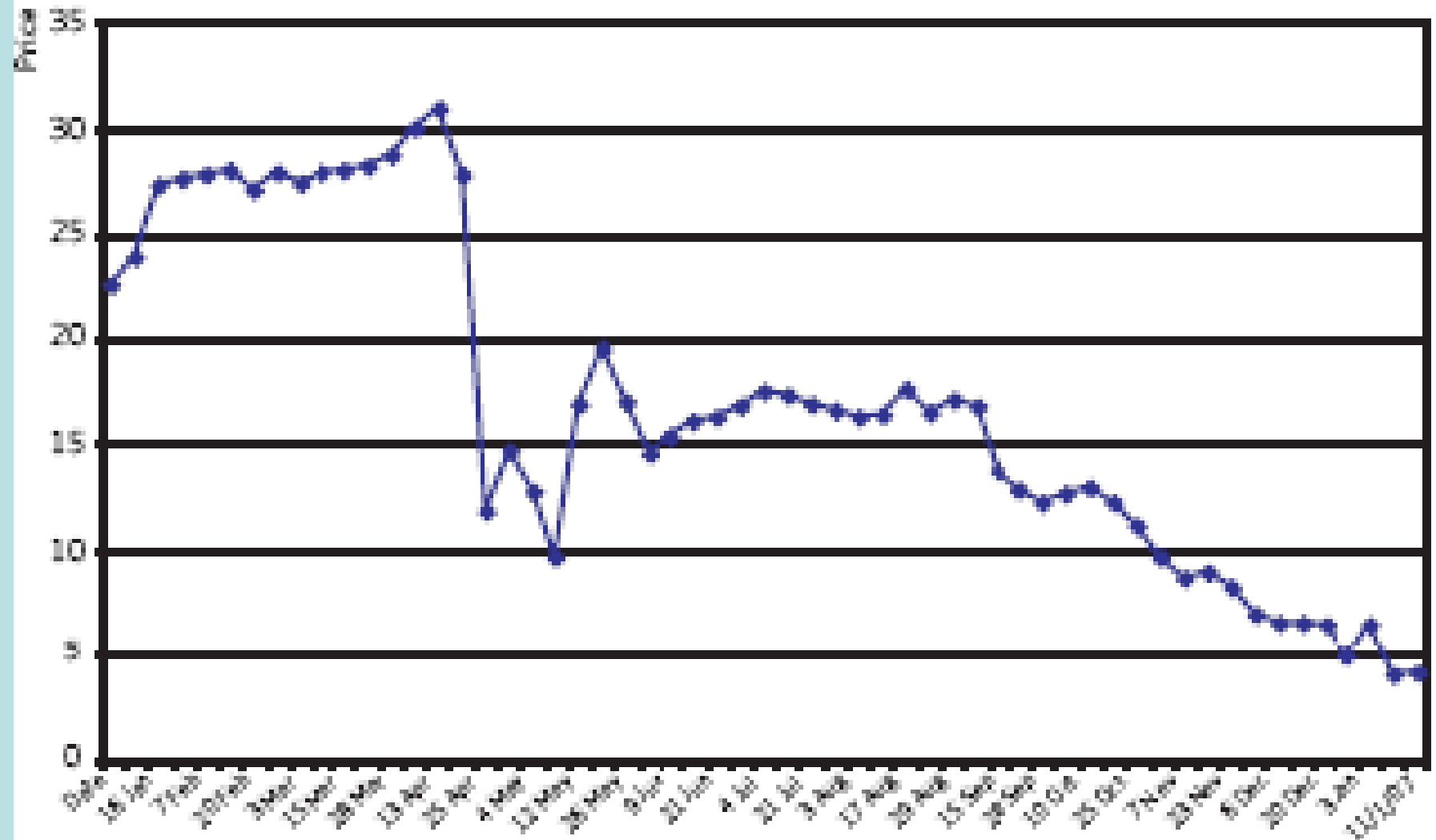
Annual TWA - Nominal



UK NBP Price (p/therm) Annual TWA - Nominal



Market Price of EU Allowances in €/t, 2006-07



Source: Point Carbon

Current big risks

- Lack of Government support framework
- Lack of CO2 disposal infrastructure

The Hatfield Vision

- To be the first commercial coal fired power station in the world to generate with carbon capture

Modelling the Hatfield Project

- Advanced modelling techniques
- Costs based on preliminary engineering
- Coal contract key advantage
- Market data subject to change
- Based on 2006 data – a robust project
- But ETS pricing is not bankable