Coal Forum
Report on this year's work

Presentation by:
John Harris,
John Topper,
David Brewer,
Nigel Yaxley
(with a contribution to the slides from Niall Crabb).

Coal UK Conference February 2008

Coal Forum First Overview Report published August 2007 - www.berr.gov.uk/energy/sources/coal/forum/page37276.html.

Coal Forum

- Established in October 2006 as part of the Energy Review.
- *'The Government will convene a coal forum to bring together coal-fired generators, coal producers and suppliers, power plant suppliers, trade unions, small businesses and other parties in order to help them to find solutions to secure the long-term future of coal-fired power generation and UK coal production.*
- *The forum will facilitate dialogue within the industry and work to ensure that we have the right framework, consistent with our energy policy goals, to secure the long-term contribution of coal-fired power generation and optimise the use of economical coal reserves in the UK.'*

‘The Energy Challenge’, DTI, July 2006, Para 4.27’

Structure

- The full Coal Forum met five times between November 2006 and October 2007 and has a programme of continuing dialogue during 2007/08

- Four sub-groups were established to address key areas of concern identified by the Forum members –

  - **Future Generation – Chaired by John Topper, Chief Executive, IEA Clean Coal Centre;**
  - **Infrastructure – Chaired by Dorothy Thompson, Chief Executive, Drax Power Ltd;**
  - **Planning – Chaired by Niall Crabb, Director Scottish Coal, and**
  - **World Markets – Chaired by Nigel Yaxley, Managing Director, CoalImp.**

- Each sub-group met independently and reported its conclusions back to the full Forum.

- The Minister for Energy attends Coal Forum meetings and the Secretariat is supplied by BERR.

- A summary of the work of each groups follows.

Present Work

- The Future Generation (Chair John Topper) and Infrastructure (Chair David Brewer) sub-groups will continue to meet – with the Infrastructure being on a more adhoc basis.

- World Markets will be the subject of periodic updates from Nigel Yaxley to the main Coal Forum meeting.

- A new Coal Production sub-group has been formed, Chair Dr Barrie Jones, to pick up some of the Planning sub-groups outstanding work and other issues specifically impacting on future indigenous coal production (deep mine and surface mining).

- More on the new focus at the conclusion.

Summary of First Year

- The Forum published its Overview Report, which summarised its first phase of work, on Friday 31 August 2007 – www.berr.gov.uk/energy/sources/coal/forum/page37276.html.
- It was agreed by all that the Forum has improved understanding and communication between the various sectors of the industry and with government during its initial period of operation.
- The Forum and its sub-groups have carried out much useful work contributing towards its objectives.
- What follows is an indication of the individual conclusions reached by each sub-group.
- The climate generally appears much improved e.g. better prices paid for deep mine indigenous coal, greater success with surface mining planning applications, a coal based Carbon Capture and Storage demonstration project but many issues remain.

The Future Generation Sub-group UK Coal Forum

John Topper, Managing Director IEA Clean Coal Centre
Chair Coal Forum Future Generation Sub-group

Coal UK Conference 2008

john.topper@iea-coal.org.uk

Remit of the Future Generation sub-group

- Report to the Forum on impacts of clean coal technologies (CCT) and carbon capture and storage (CCS) on the demand for UK indigenous coal based on existing work in this area. To include timescales for predicted demand.

- Propose scenarios for future coal-based generation to 2025 and predict coal usage.

- Identify opportunities for clean coal technologies in the UK, including CCS.

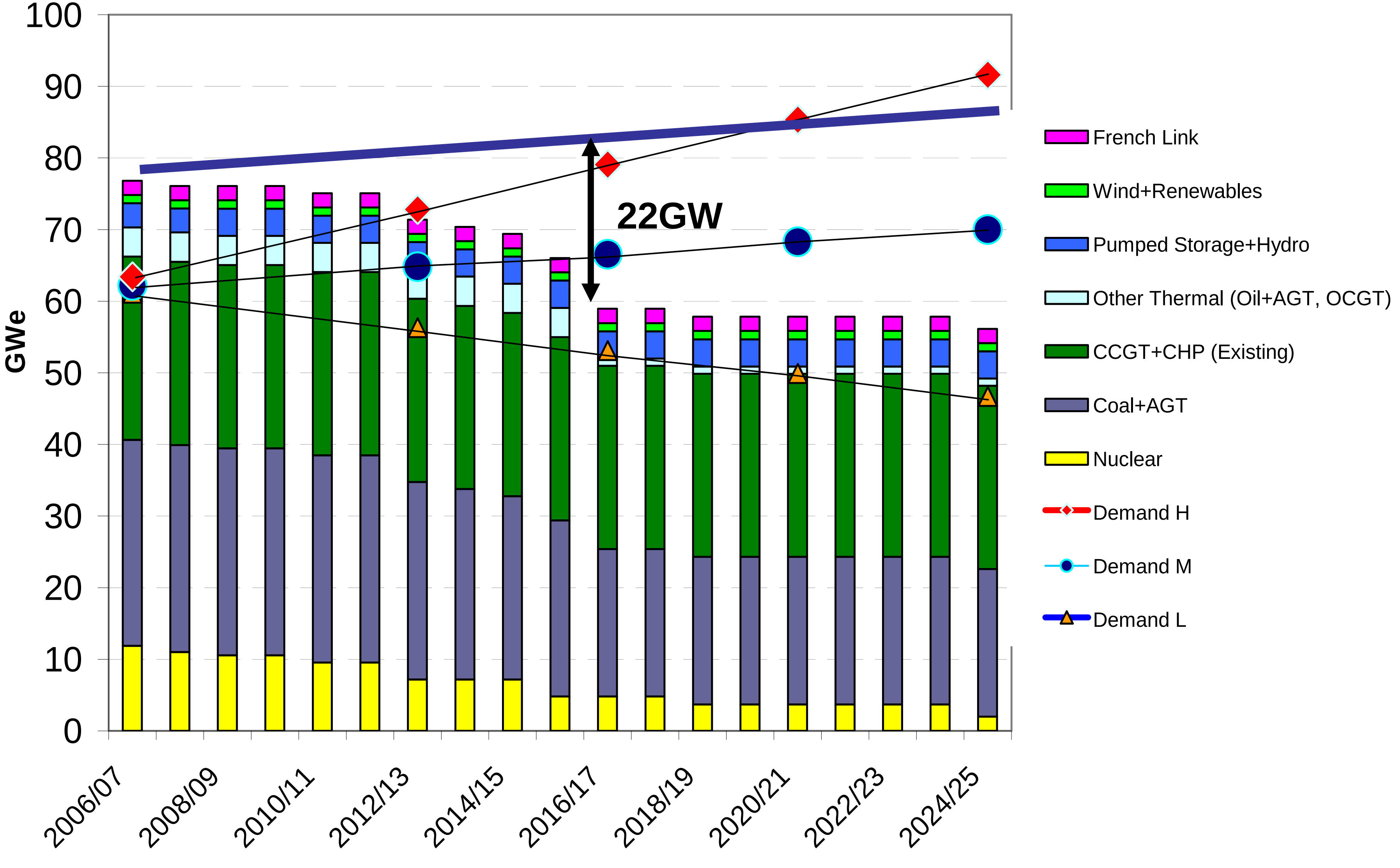
- Identify gaps/hurdles preventing/delaying investment in Clean Coal.

- Review R,D, and D landscape, and identify opportunities for international collaboration and external funding.

Representation in Future Generation Sub-Group

- BERR
- Coal Authority
- EdF Energy
- Scottish and Southern
- E On
- AEP
- Drax
- Progressive Energy
- UK Coal
- Miller Mining
- Coal Importers Association
- British Assocn of Colliery Management
- National Union of Mineworkers
- Coalpro
- Doosan Babcock
- Alstom

Generation Addition Needed by 2016/7



Scenarios considered

- **Zero Coal 0 GW**
- **Low Coal 5 GW**
- **Medium Coal 10 GW**
- **High Coal 15 GW**
- **….. by 2016 with balance of 22GW being**

Leads to a 58% dependence on gas in 2016

Would maintain current capacity mix

All scenarios would give about 40% reduction in CO_2 emissions if fitted with CCS by 2025

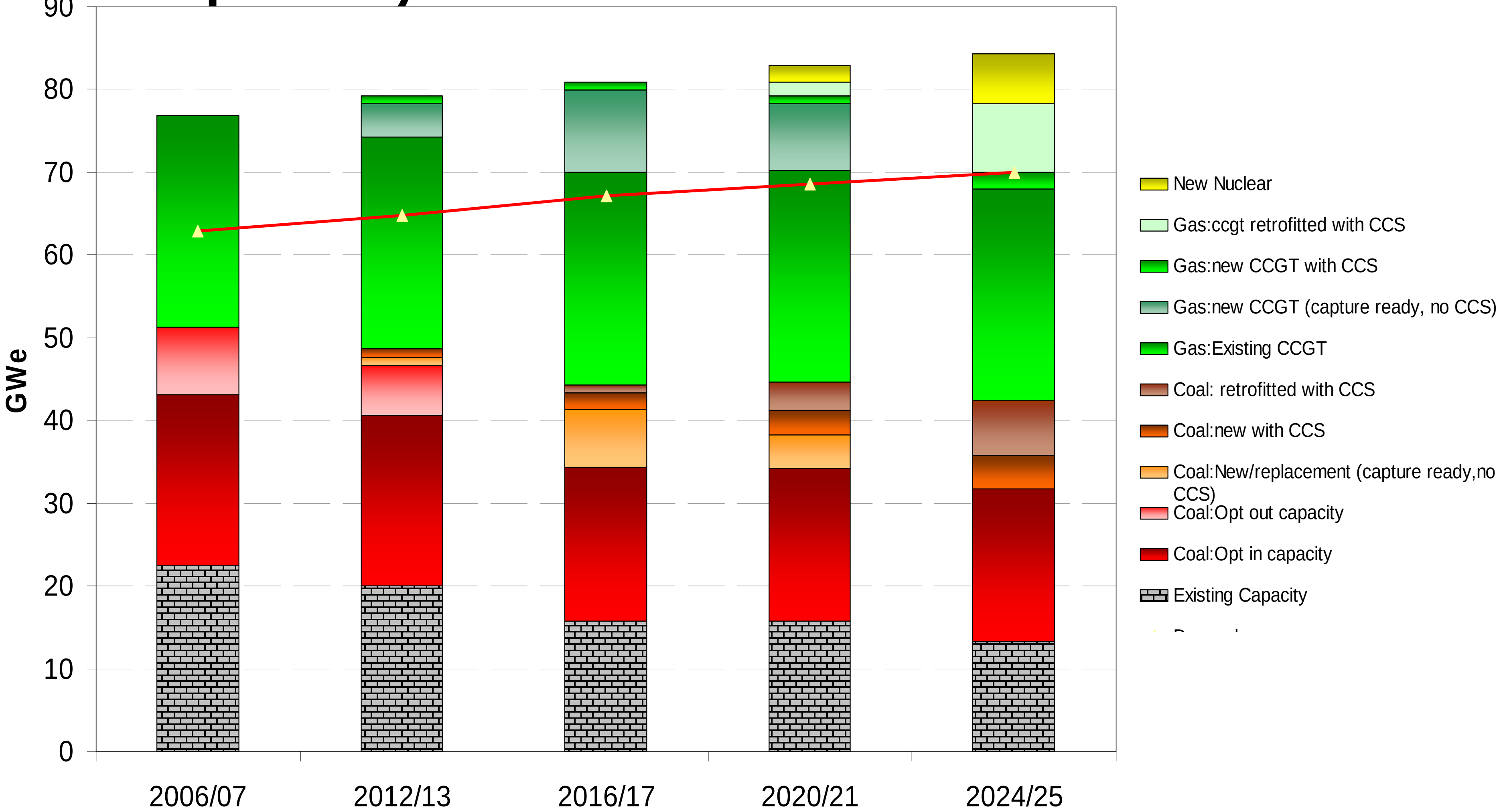
Scenario assumptions for CCS

- New coal and gas plants include a small number with CCS, and the rest (coal and gas) are assumed to be “capture-ready”.

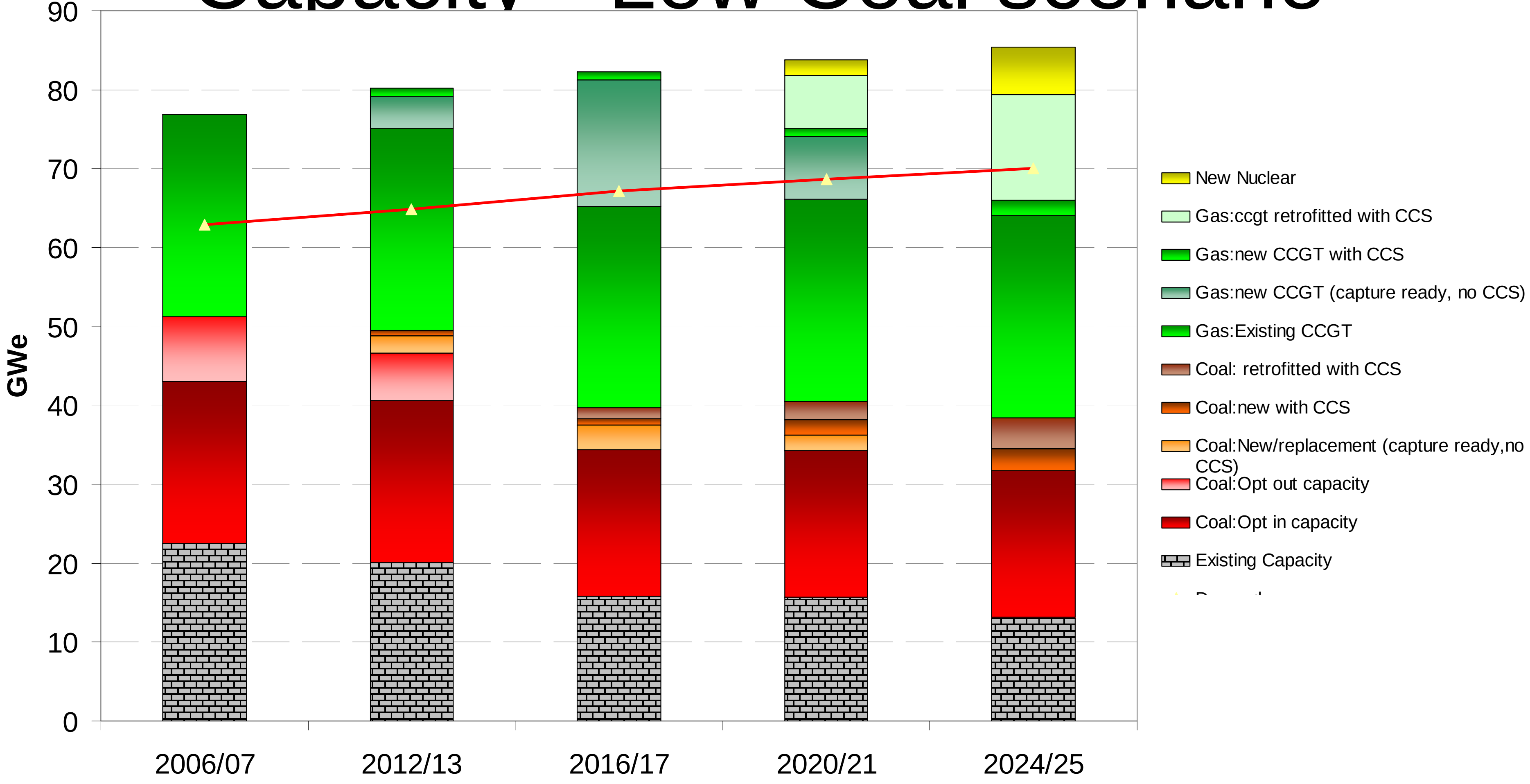
- All capture-ready plants are progressively fitted with CCS from circa 2016, completed by 2025.

- Load factors for nuclear and CCS are assumed to be high; other plant loads are adjusted to match JESS total annual generation (TWh)

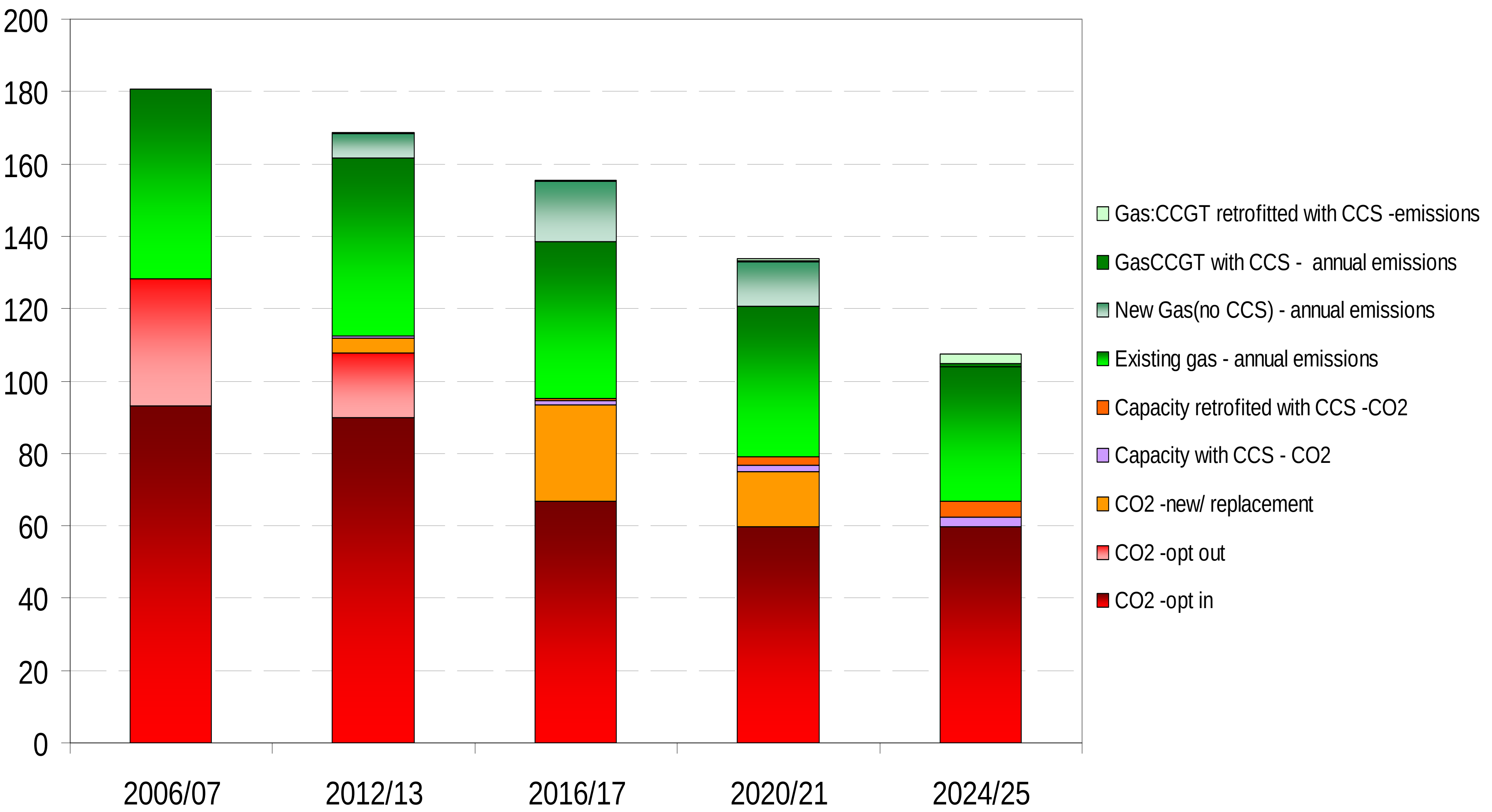
Potential Mix of Generation Capacity - Medium Coal Scenario



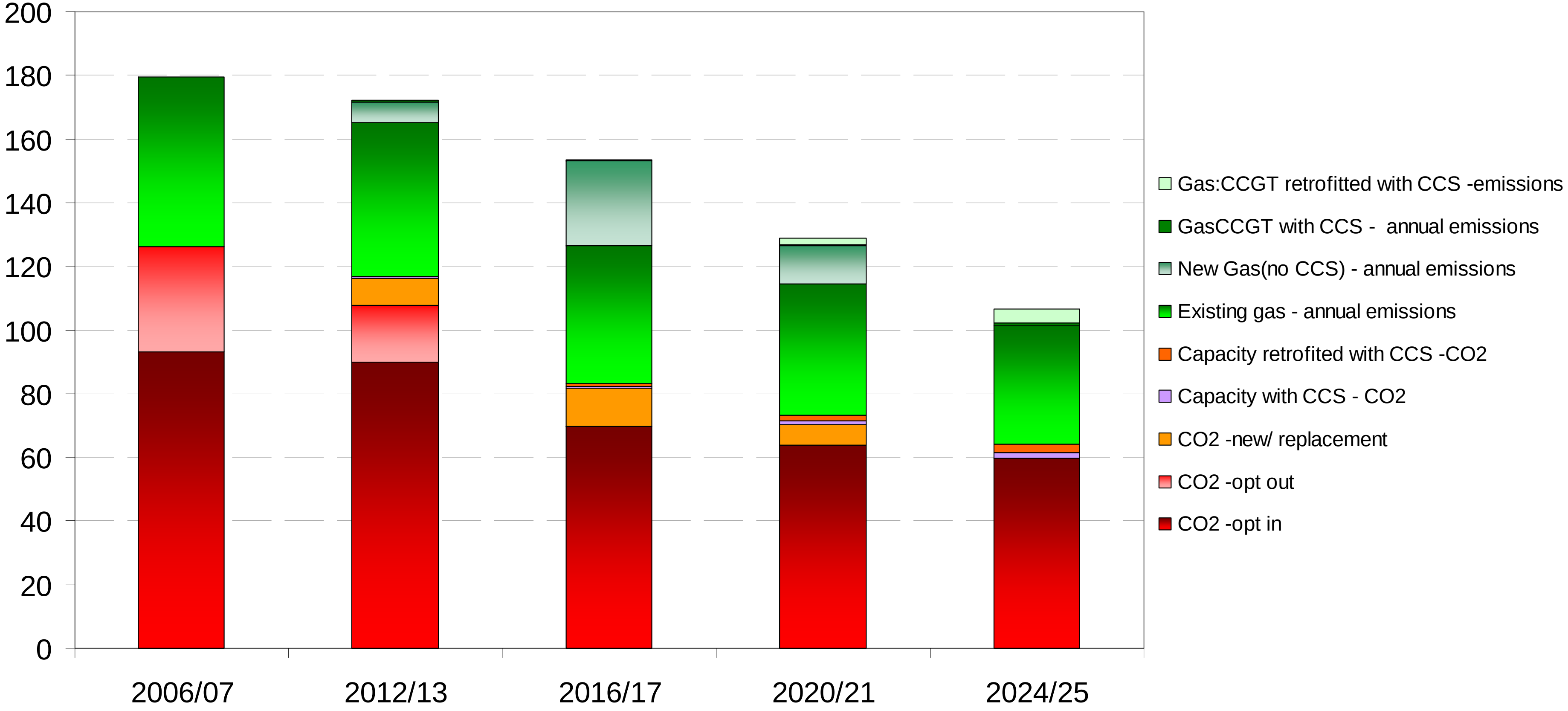
Potential Mix of Generating Capacity - Low Coal scenario



CO_2 Emissions in Mt– Coal Medium



CO2 emissions in Mt – Coal low



Outcome for UK coal supply

- All the demand estimates are 2-3 times the current supply

- The "Low Coal" demand is at least twice the current UK indigenous supply (18-20 Mt/year).
- "High Coal" scenario grow to exceed the maximum coal burn in recent years (57 Mt in 2006).
- In the case of the Zero Coal scenario, coal usage falls to 47 Mt/year in 2012/13, and 32 Mt/year from 2016/17.
- In 2020/24, CO_2 emissions are reduced by 42% compared to 2006/07 with little difference between the *High*, *Medium*, and *Low* coal scenarios because by 2025 all new coal and gas plants (all assumed to be capture ready) are fitted with CCS.

UK power plant plans- coal

	Location	Size/Technology		Status
New Capacity				
Powerfuel	Hatfield	2 x 430MW IGCC with Capture		Section 36 consent. FEED study starting
E.ON	Killingholme	450-500MW IGCC with CCS		Internal feasibility study underway
Centrica	Teesside	800 MW IGCC with CCS		FEED study started
Conocco	Immingham	IGCC/CHP/petcoke		Study
RWE npower	Blyth	New build ASC (Capture ready) 3x800 MW		Scoping Report submitted 11/05/07
Replacement / Retrofit				
SSE	Ferrybridge	1 or 2 x 500MW ASC Retrofit (Capture Ready)		FEED study well advanced
RWE npower	Tilbury	1600MW ASC (Capture Ready)		Scoping Report submitted 13/3/07
E.ON	Kingsnorth	2 x 800MW ASC (Capture Ready)		Section 36 applied for 11/12/06
Scottish Power	Longannet and Cockenzie	ASC retrofit (capture ready), up to 3390MW		Feasibility study announced 17/05/07

UK power plant plans- coal

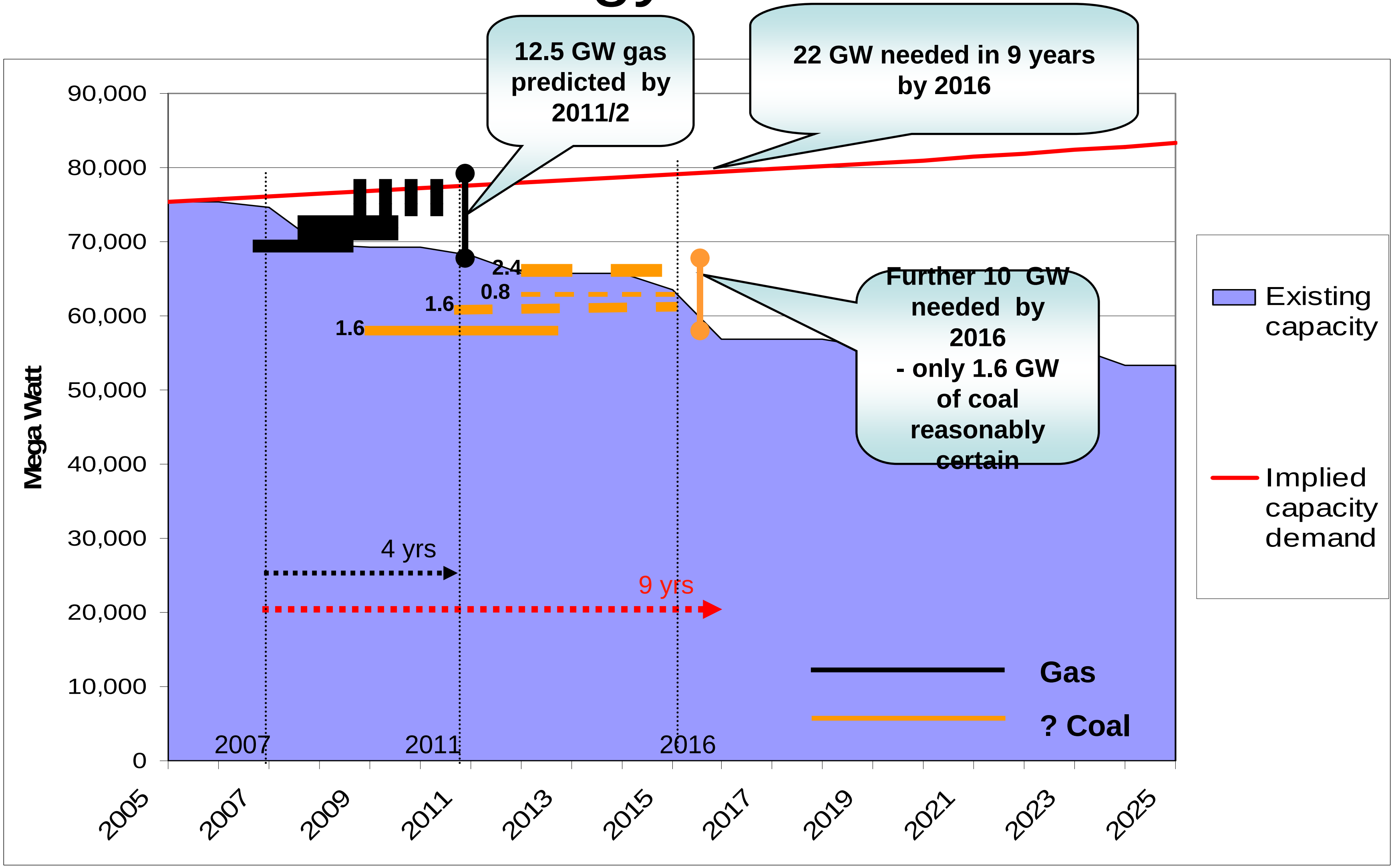
	Location	Size/Technology		Status
New Capacity				
Powerfuel	Hatfield	2 x 430MW IGCC with Capture		Section 36 consent. FEED study starting
E.ON	Kingsnorth	2 x 800MW ASC (Capture Ready)		Section 36 applied for 11/12/06
Scottish Power	Longannet and Cockenzie	ASC retrofit (capture ready), up to 3390MW		Feasibility study announced 17/05/07

Government CCS Competition

Government plans:

- **Call for proposals in November 2007**
- **Focus on Advanced supercritical pulverised coal and Post combustion capture (including Oxyfuel)**
- **Will announce winners by early 2009**
- **Want to see first CCS Demonstration operating by 2014**

Current Situation based on BERR Energy Markets Outlook



Key Issues

- Delay and uncertainty in setting a more encouraging framework for coal = dependence on imported gas
- Targets for a <u>portfolio</u> in the power generation mix rather than piecemeal intentions for each sector, eg renewables, nuclear.
- No discrimination against coal in favour of gas eg in requiring CCS or in allocation of CO2 allowances
- Changes in LCPD not unduly prejudicial to existing plant and indigenous coals
- Support for underpinning R&D
- Shortage of trained engineers and technicians
- Log jam in major equipment supply
- Considerations related to CO2 pipelines

Infrastructure (Chair Dorothy Thompson) and Planning (Chair Niall Crabb) Sub-Groups

Presented by

David Brewer

(Chair Infrastructure sub-group 2008)

Infrastructure Sub-Group

- The Forum identified infrastructure issues, particularly ports and railways, as a potential major constraint on coal production, imports and use, with implications for security of supply

Infrastructure Sub-Group

Remit:

- To examine and report to the Forum on any constraints likely to be imposed on the use of coal by the transport infrastructure, over a time span to 2020
- To examine and report to the Forum on any port capacity constraints which might undermine the ability to sustain or expand import levels necessary to support coal's likely share of the energy market, over a time span to 2020
- To suggest ways in which any constraints might be avoided

Infrastructure Sub-Group

Representation:

- Generators
- Coal Producers
- Coal Importers/Traders
- Rail Freight Operators
- Network Rail
- Port Operators
- BERR, DfT.
- Scottish Government, Welsh Assembly.
- TUC

Infrastructure Sub-Group

Issues identified – general:

- A range of high-low coal burn needed to be considered
- Specific regional flows might be important, both imported and indigenous
- Location of new/replacement coal-fired generating capacity (and of LCPD closures)

Infrastructure Sub-Group

Issues identified – rail capacity and charges:

- Network Rail’s Freight Route Utilisation Strategy and consequent “pinch points”
- Network Rail’s investment plans and the framework for third party investment
- Office of the Rail Regulator – proposed changes to Track Access Charges

Infrastructure Sub-Group

Issues identified – port capacity:

- Overall port capacity broadly adequate. Main difficulty is rail capacity ex the ports.

  But:

- Long lead times and complexities of obtaining planning consents for capacity expansions
- Significance of source region of coal imports and implications for variations in vessel sizes

Infrastructure Sub-Group

Consideration of Rail Capacity Issues

Paper by Network Rail on ESI coal movements

Concerns expressed by the Sub-Group:

- Absence of resilience requirements
- No analysis of maintenance requirements
- No clarity on investment plans
- No information on framework for private investment

But recognised:

- Network Rail in middle of investment review
- Variability of movements inevitable but need to “smooth” flows as much as possible

Infrastructure Sub-Group

Consideration of Track Access Charges Proposals – Presentations by ORR

Concerns expressed by the Sub-Group:

- Cap for variable use charge too high
- ORR’s view that ESI coal can bear freight-only line charges represents discrimination vis-vis other freight traffic
- Displacement of coal by gas at the margin
- Possible distortion of competition because of historic locations of supply points and power stations
- Coal spillage charge not properly cost reflective

Infrastructure Sub-Group

Consideration of Port Capacity Issues

Presentations by Peel Holdings on Port Capacities and ABP on Planning Issues

Reflections by the Sub-Group:

- Main bottleneck is rail capacity ex the ports
- But investment still required to cater for variabilities in regional flows and import sources
- Investment to respond quickly requires thorough reform of the planning system
- Also an issue for the Planning Sub-Group and paper presented to that Group

Infrastructure Sub-Group

Latest Position

- Network Rail's new freight investment plan is the largest ever. Specific proposals made for ESI coal schemes and a reserve for other schemes – proposals invited
- Increasing efficiency by Network Rail has reduced ORR's proposals for variable and freight-only lines Track Access Charges – may be no net increase. "Spreading" of freight-only line charges addresses distortion issue
- Government's proposals for reform of planning system for major infrastructure projects should address port capacity investment issue over time

Infrastructure Sub-Group

Ongoing Issues

- ORR and Network Rail asked to reconsider principle of, and approach to coal spillage charge
- Network Rail asked to provide more information and clarity on framework for private investment
- Further ESI coal investment proposals?
- Possible extension of membership to other users, e.g Corus

Planning Sub-Group

- At the first meeting of the Forum, one of the key issues raised was the effect of "planning" on the ability of business to meet demands set on it.
- These demands particularly included security of supply when doubts were being raised about how reliable imported coal might be in the future.

Planning Sub-Group

Important to stress that:

- this was not just from the indigenous coal producers, but also from
- the electricity generators (ability to obtain indigenous coal and to an extent, constraints on their own development)
- port operators (ability to import coal and transport to power station)

Planning Sub-Group

- Adoption of a 20 Mt/year indigenous production to 2030 “yardstick”.
- This would serve as focus to judge whether the Forum was meeting it’s objective to “*secure the long-term future of coal-fired power generation and UK coal production*”

Planning Sub-Group

- Concern that ‘planning issues’ were a major factor in finding *solutions to secure the long-term future of coal-fired power generation and UK coal production,* and
- to *optimise the use of economical coal reserves in the UK*

Planning Sub-Group

Extreme examples included:

- A widespread sympathy for Miller-Argent in their 10+year battle for Ffos-y-Fran (most know the reasons)
- The Port Operators suggesting that 10 years was the norm in their sector
- Through to the Planning Authorities stating that whilst application standards had improved, there were still examples of poor preparation

Planning Sub-Group

Much of the Sub-Group’s work was readily agreed, with a raft of recommendations for:

- Highlighting skills and experience shortage;
- Provision of performance statistics;
- Updating the Code of Practice re applications, consultations and standards;
- However, there were a number of significant issues covered.

Planning Sub-Group

A key area agreed was to improve liaison between National Govt, Local Govt and Industry:

- More effective consultation on Development Plans;
- More consistency of approach to the recognition of coal extraction, across Authorities;
- More consistency of approach to determination of applications;
- More effective addressing of public perceptions against “opencast mining”.

Planning Sub-Group

- Another was provision of up to date resource information to, and use by, Mineral Planning Authorities.
- This is key to
  - ensuring that essential policies are included in Plans
  - ensuring a programme of future working sites (i.e. “to *secure the long-term future of … UK coal production*”)
  - avoiding sterilisation by other development.

- Coal Authority to assist including extending their coal resource mapping.

Planning Sub-Group

- However, the main issue discussed was the “presumption against” opencast coal and deep mine extraction in MPG3 and SPP16.
- In depth discussion of planning position.

Planning Sub-Group

- Concluded that it was not the appropriate time to seek to re-write the Guidance.
- A “Statement of Need” was drafted and is set out in the report published (para 6.6).
- Concerns could be overcome by a recognition of ‘need’ for indigenous coal to
  - offset security of supply issues, and
  - achieve the objective *“to secure the long-term future of … UK coal production … and optimise the use of economical coal reserves in the UK*

Planning Sub-Group

The White Paper text included supportive statements:

- *continuing access to UK produced coal benefits the generating industry and other coal users and can help to manage potential risk from international coal markets,* and
- *making the best use of UK energy resources, including coal …contributes to our security of supply goals*
- *the Government believes that these factors reflect a value in maintaining access to economically recoverable reserves of coal.*

(slight abbreviation of the quotes for brevity)

Planning Sub-Group

- Whilst much still to do by everyone within, or relying on, the Planning System.
- The Coal Forum and the Planning Sub Group really did expose <u>all</u> the issues to a full debate – in front of the Minister.
- Rare to get such a chance and achieve a recognition of those issues.

World Markets Sub-Group

Nigel Yaxley

Managing Director CoalImp

Chair, World Markets Sub-Group

World Markets Sub-Group – Remit

- Current and future world market for coal
  - Stability
  - Political risks
  - Price movement/volatility
  - Non-price issues affecting demand
- UK security of supply implications
  - Relative costs imported/UK mined
- Review scenarios and assumptions on future UK demand for coal

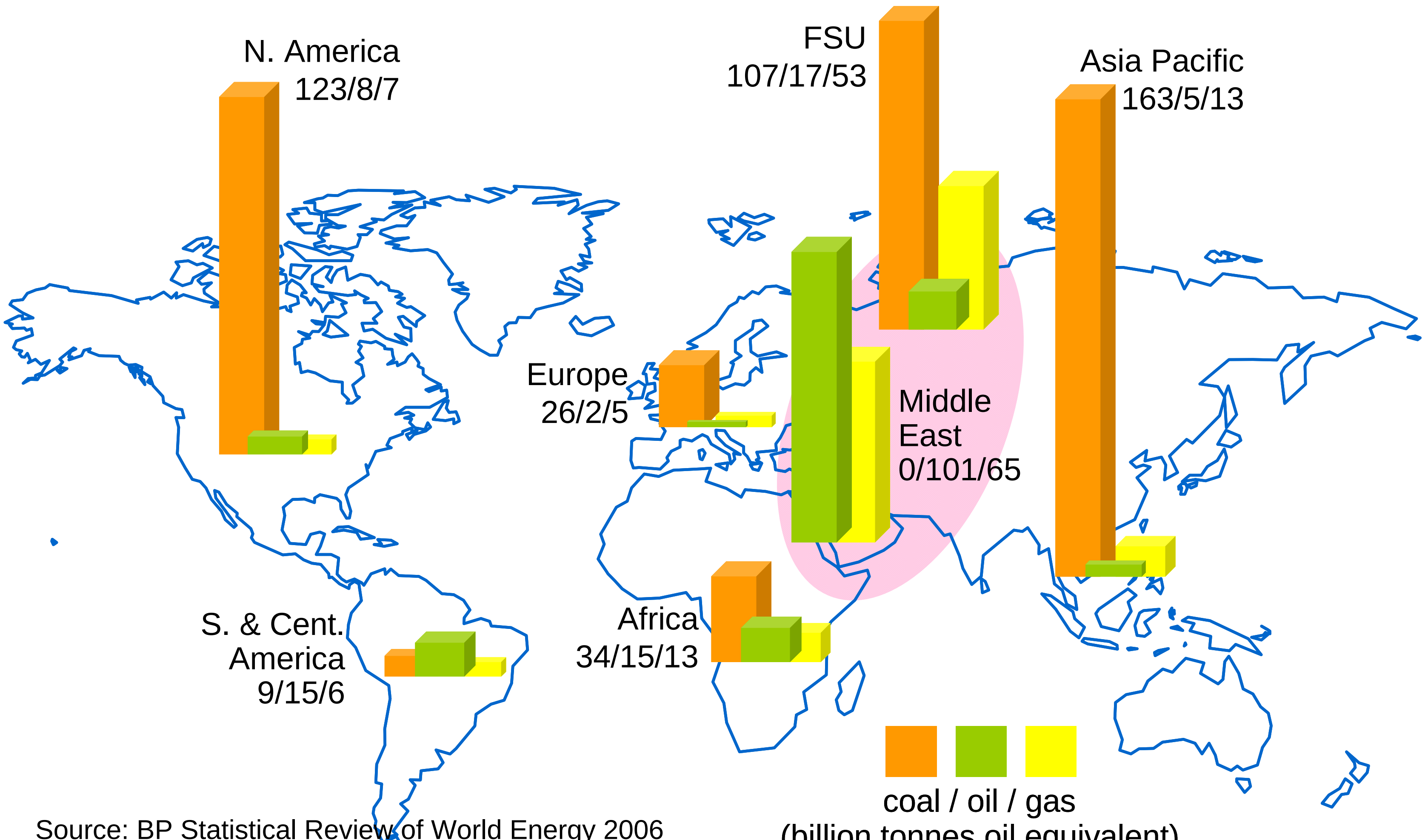
Membership

- UK generators
- UK and international suppliers
- Unions
- Future Generation Sub-Group representative
- Consultants/experts
  - IEA/IEA Clean Coal Centre
  - CoalInk (McCloskeys' consultancy)
  - BERR

Key Areas of Work

- Long-term considerations
- Identify information sources
  - World coal reserves
  - Supply and demand forecasts
  - Cost curve data
  - Price forecasts
- Assess and compare information in context of sub-group remit
- Consider and identify issues and risk factors affecting world supply/prices

Global Energy Reserves – 2005



Source: BP Statistical Review of World Energy 2006

Proved Recoverable Reserves of Hard Coal at End of 2005

Rank	Country	Reserves (Million Tonnes)	Country Share	Cumulative Share
1	USA	218,818	30.1%	30.1%
2	Russia	97,470	13.4%	43.5%
3	PR China	95,902	13.2%	56.7%
4	India	91,631	12.6%	69.3%
5	Australia	66,800	9.2%	78.4%
6	South Africa	48,751	6.7%	85.1%
7	Kazakhstan	28,151	3.9%	89.0%
8	Ukraine	16,239	2.2%	91.2%
9	Poland	8,354	1.1%	92.4%
10	Colombia	6,611	0.9%	93.3%
	World	727,484		100.0%

Source: BGR

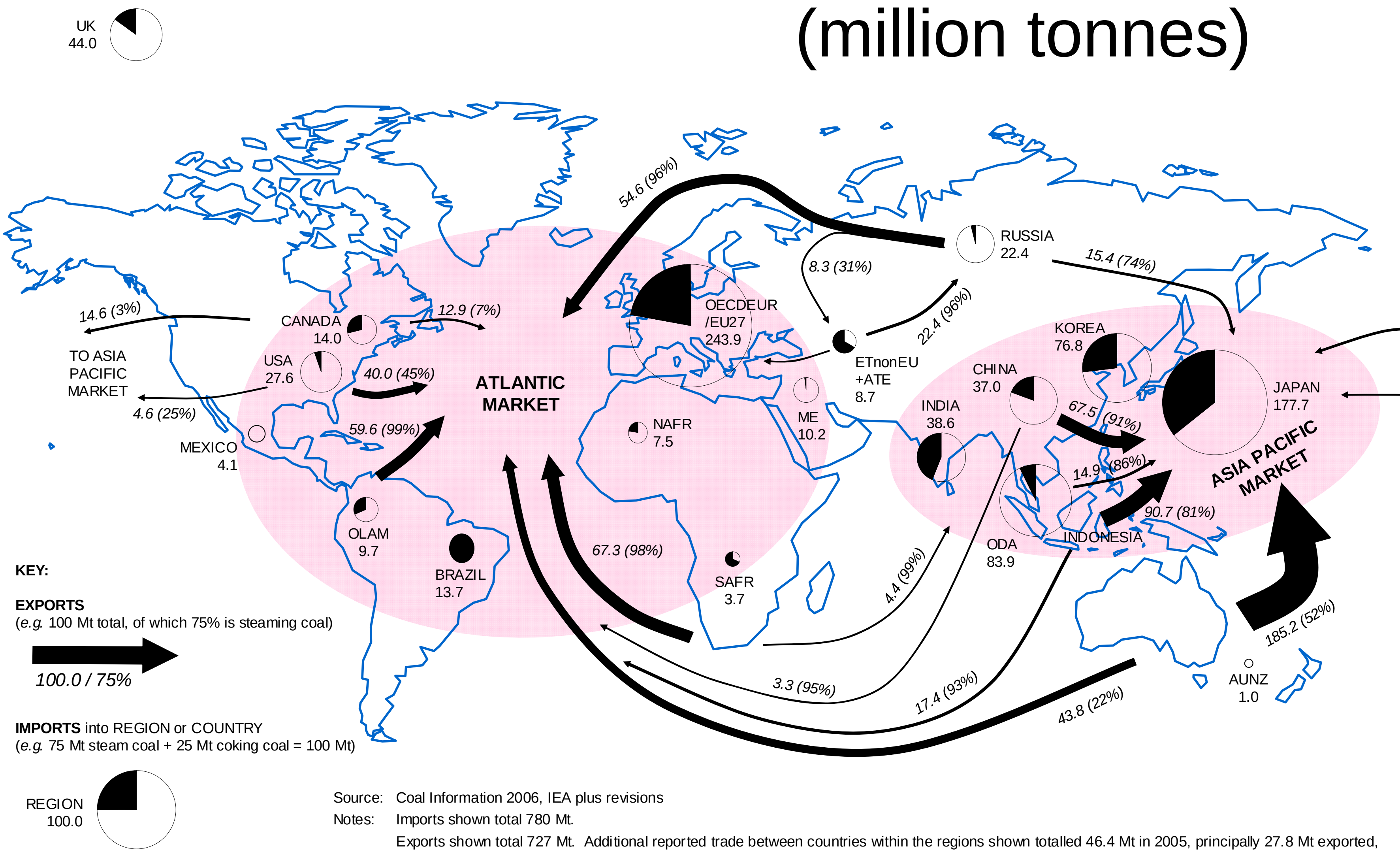
World Energy Council Triennial Reserves Update (October 2007)

- “While questions regarding the size and location of reserves of oil and gas abound, coal remains abundant – and broadly distributed around the world”
- Available in more than 70 countries and in each major world region
- Global proved recoverable coal reserves 847.5 billion tonnes (end 2005)
  - 143 years supply at current rate of consumption
  - 6.8% lower than total reported at end-2002
  - “More of a refinement than a revision”
- “It is clear that coal will be with us for many decades if not centuries, to come”

Hard Coal Trade 2005

3 May 07

(million tonnes)



Source: Coal Information 2006, IEA plus revisions

Notes: Imports shown total 780 Mt.

Exports shown total 727 Mt. Additional reported trade between countries within the regions shown totalled 46.4 Mt in 2005, principally 27.8 Mt exported, mainly to other countries within the EU, from Poland, the Czech Republic and Norway, plus transfers through Netherlands totalling 7.4 Mt.

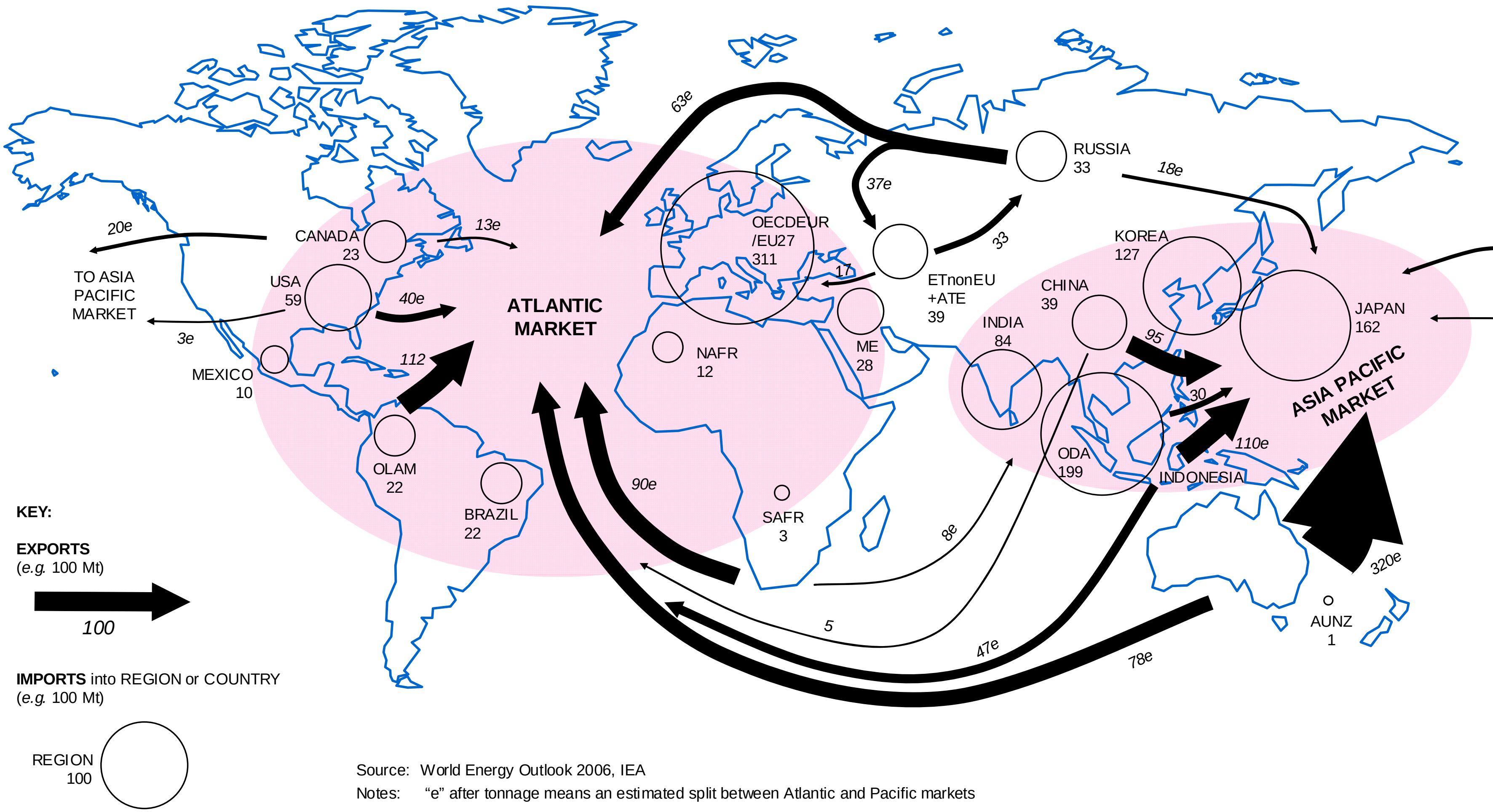
Approximately 9.5% of the world coal trade shown was overland, principally USA to Canada, and Russia to Europe, but also within the regions shown.

Source: IEA

Hard Coal Trade in Reference Scenario, 2030

3 May 07

(million tonnes)

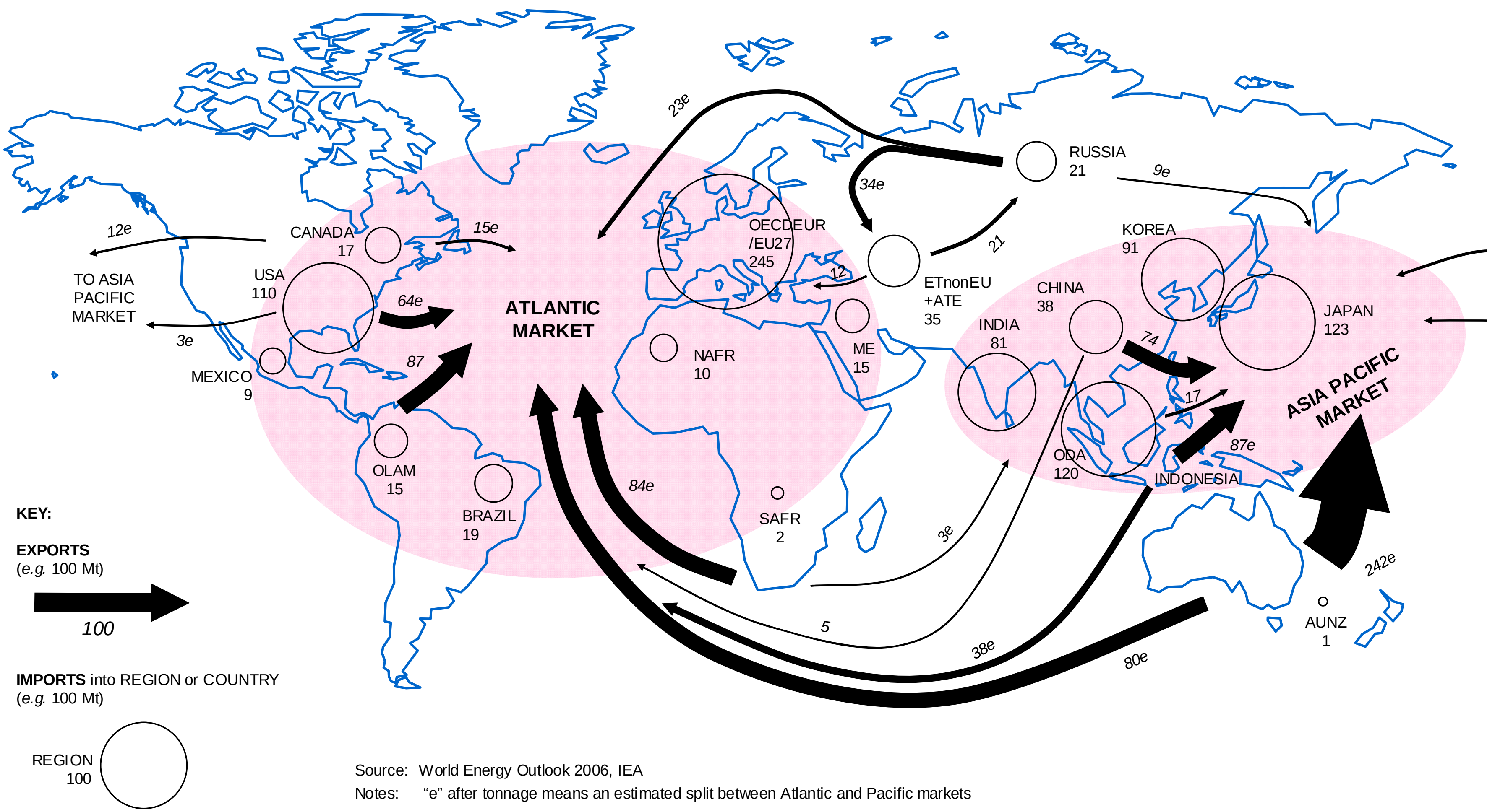


Source: World Energy Outlook 2006, IEA

Notes: "e" after tonnage means an estimated split between Atlantic and Pacific markets

Source: IEA

Hard Coal Trade in Alternative Policy Scenario, 2030 (million tonnes)



Source: IEA

Issues and Risk Factors

- Reliability of growth forecasts for China, India, Brazil etc.
  - Self-sufficiency of China
  - Scale of Indian imports
- Increased own use of coal in exporting countries
  - Eg Russia, Indonesia, South Africa
- Half of worlds reserves in USA, Russia and China
- Mining costs – less accessible reserves
- Impact of social/safety issues
- Russian costs and infrastructure issues
- Volatility of sea freight
- Changes in shipping fleet
- Exchange Rates
- Climate change policies
- LCPD etc

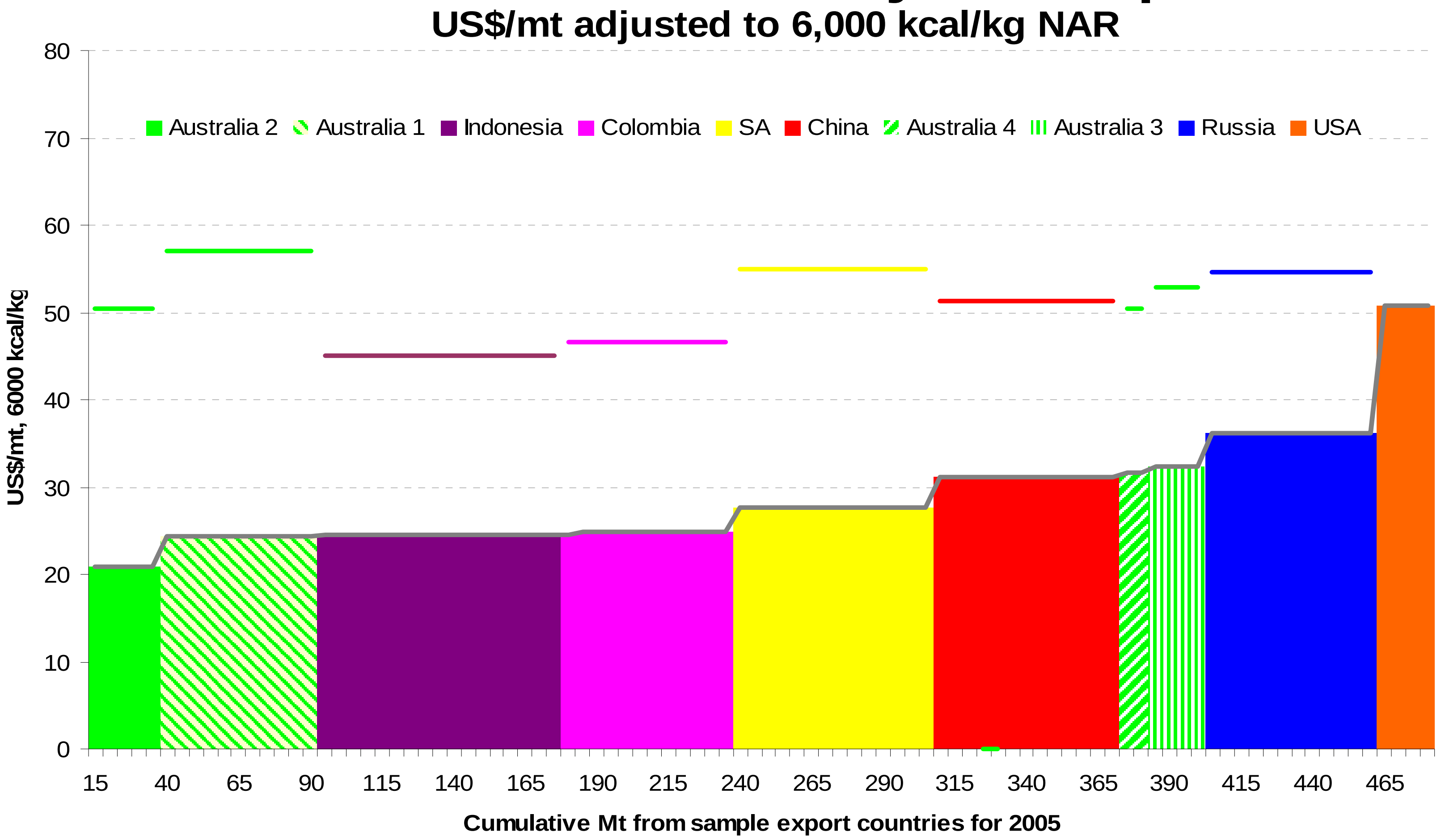
… and related comments

“The Sub-Group considered that the international reserve base is sufficient, and the international market sufficiently flexible and robust, to cope with such issues, but a combination of these could lead prices to trend towards the upper levels of the envelope of forecasts and could also lead to greater price volatility. In the case of any major demand growth it may take some time for the market to normalise.”

“..the shipping market generally responds well to price signals and corrects accordingly over time (although seaborne trade of other dry bulk materials will also dictate/extend the normalisation period). ”

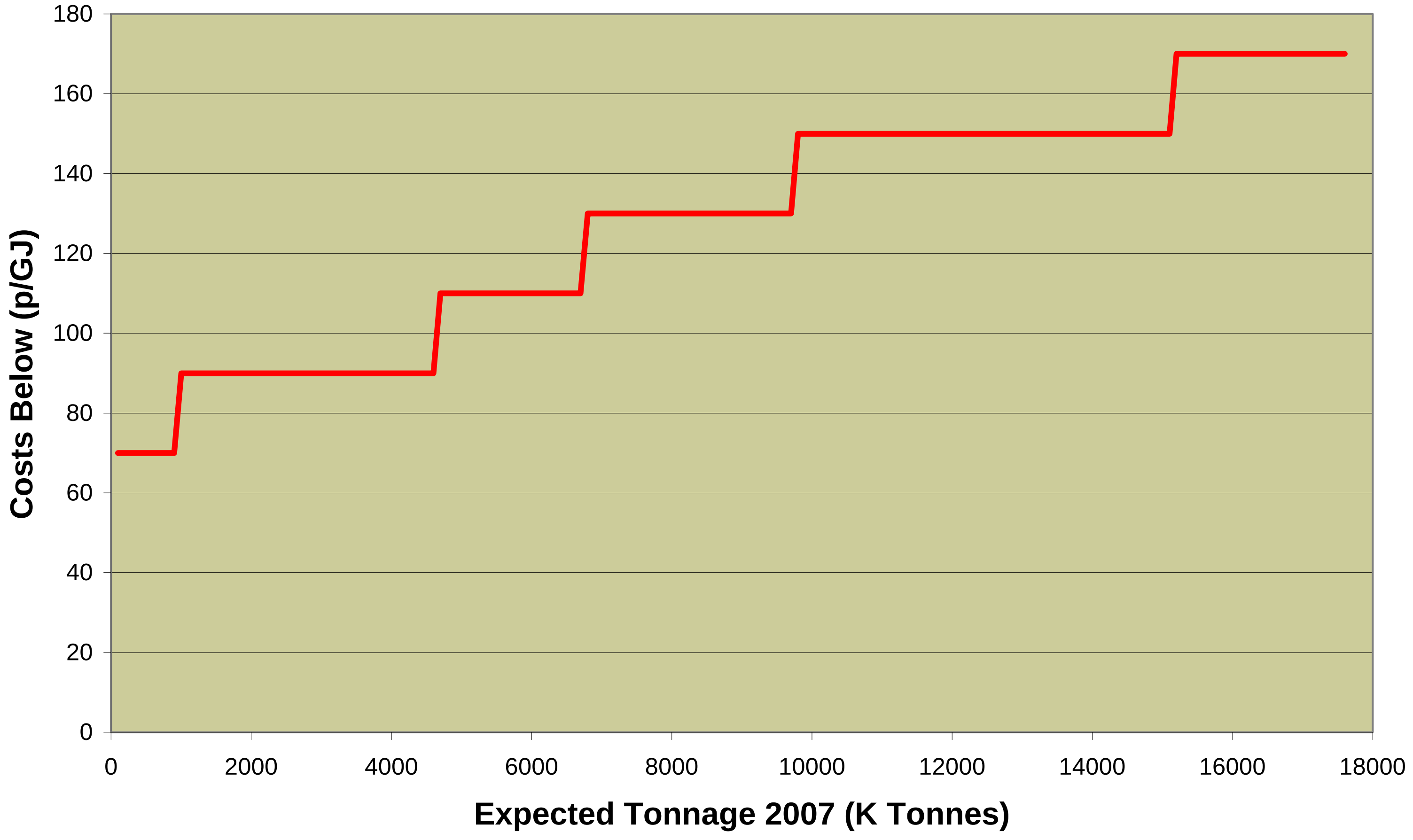
“.. the current supply pattern represents a market solution …… the international market is sufficiently flexible and robust to respond to a shortfall of Russian supply or an attempt to charge excessive prices. ”

FOB Cash Cost and Price of World Steam Coal from Major Exporters

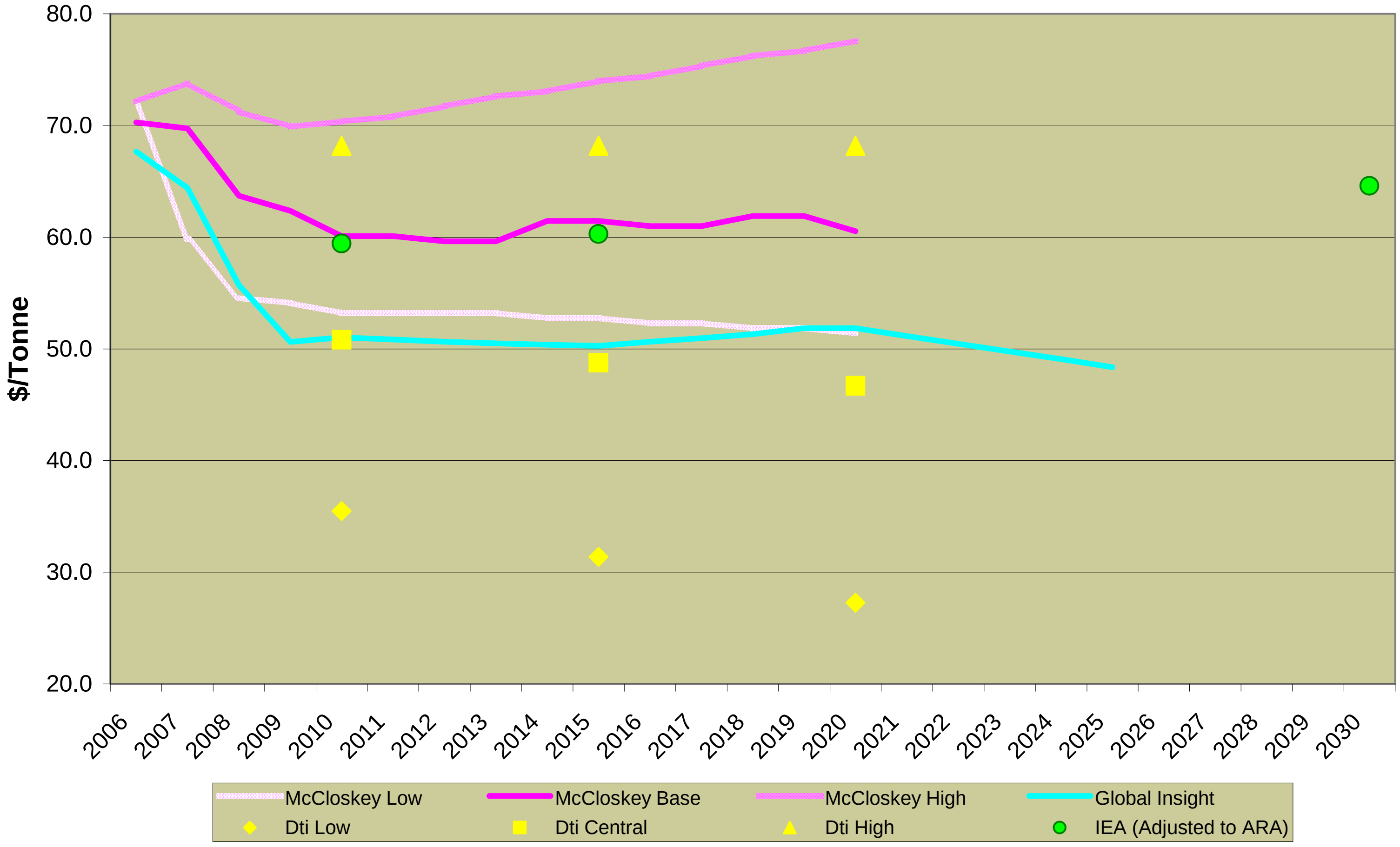


Source: IEA Clean Coal Centre

Indigenous Coal Cost Curve

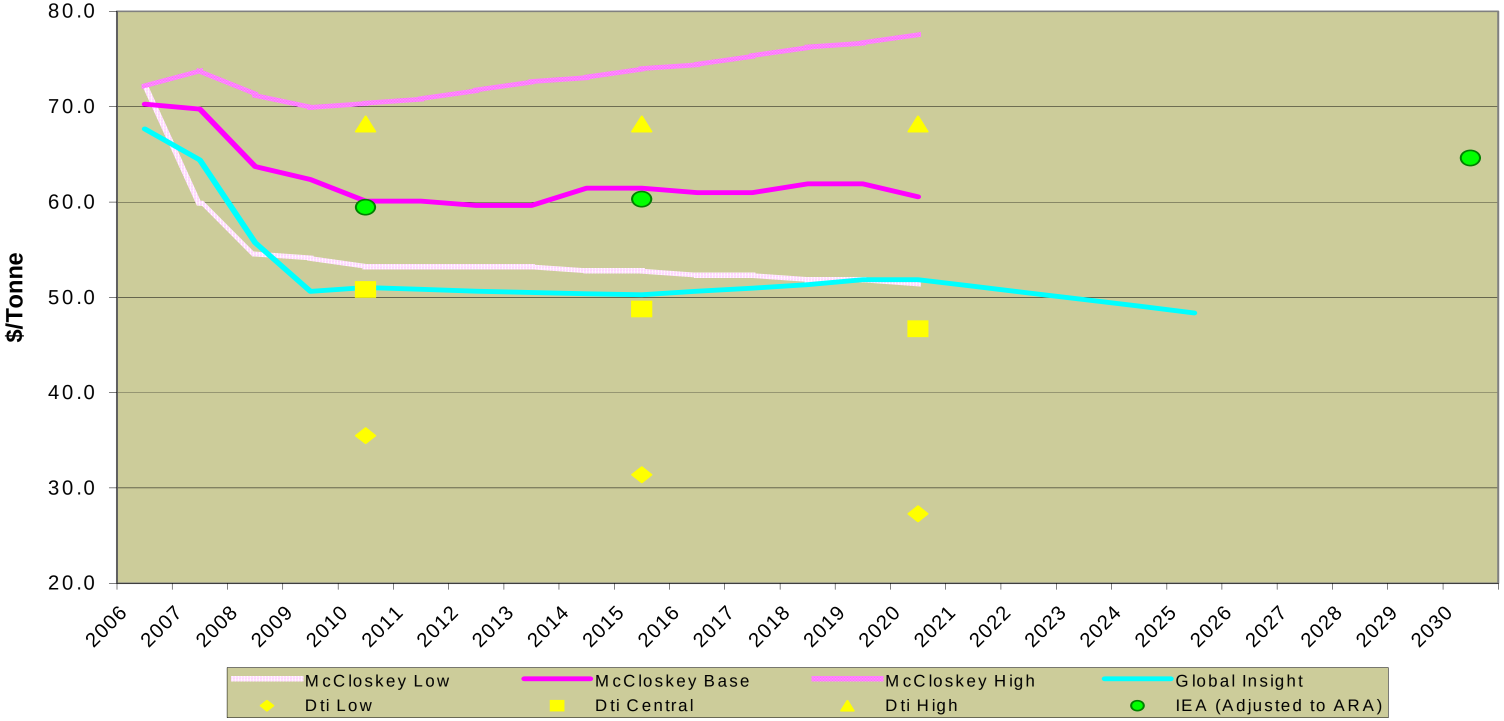


Comparison of Price Forecasts as at early 2007……………….

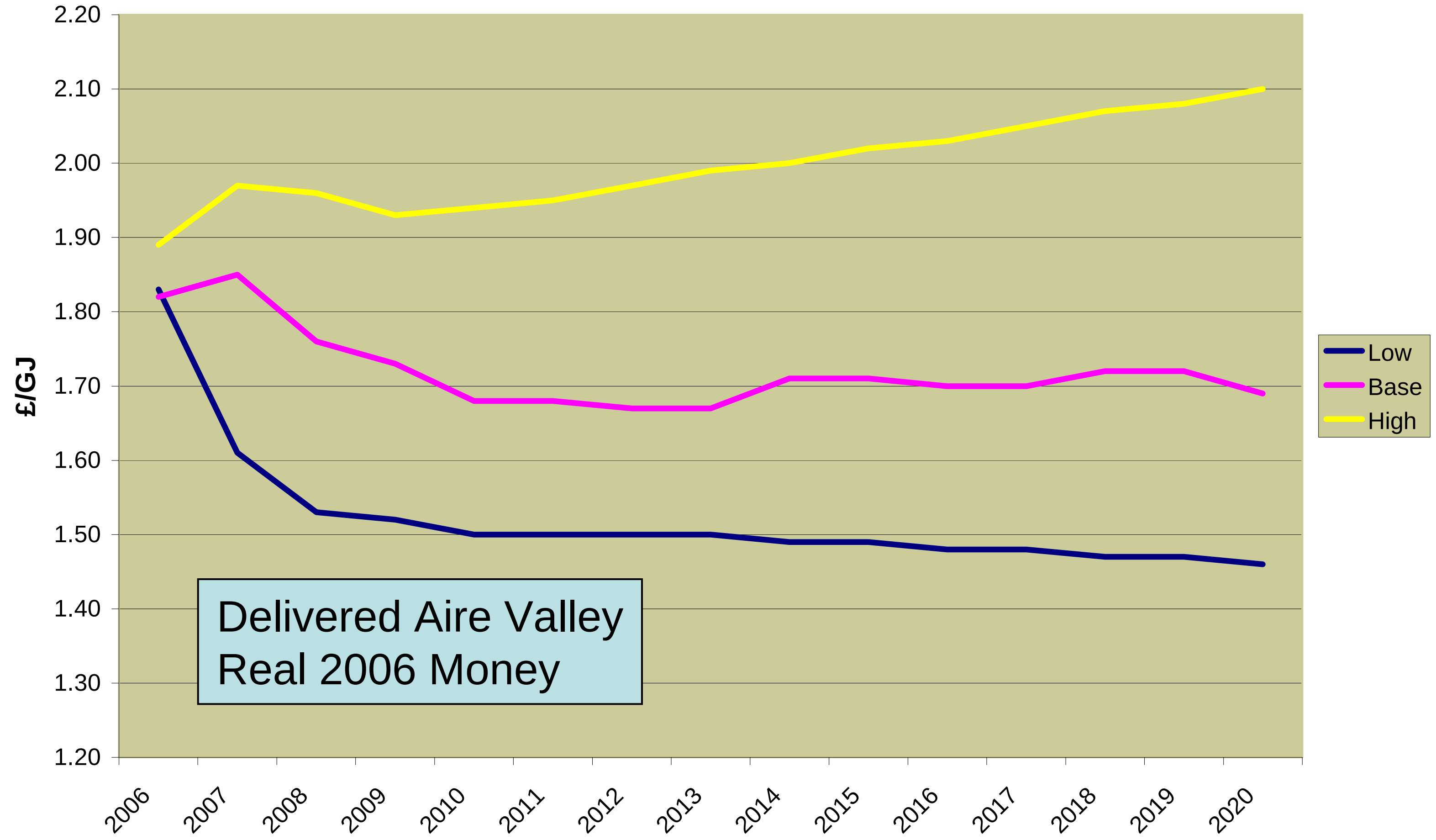


……And what happened next

End December 2007
$127.40 ARA

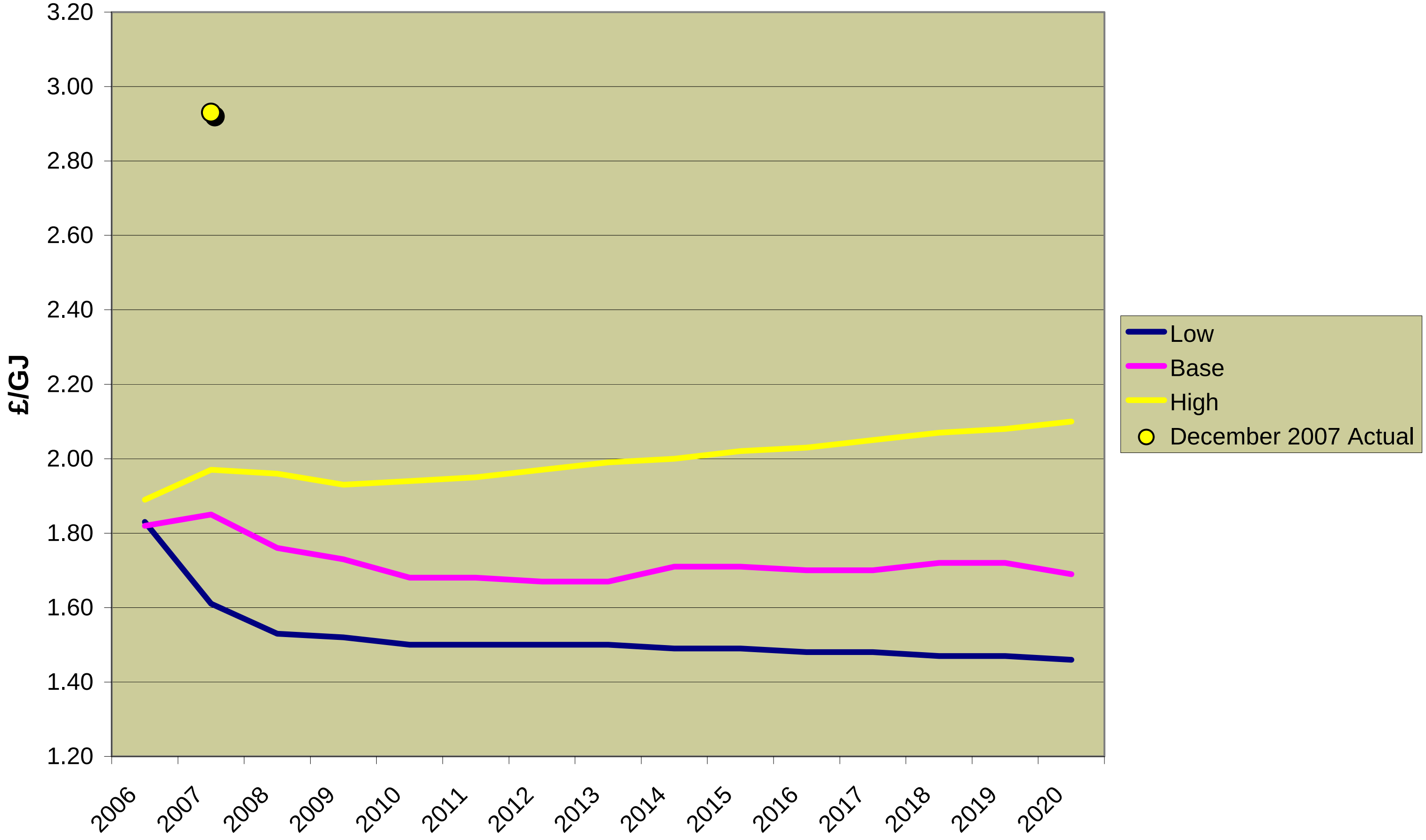


Aire Valley Delivered Price Forecasts (as at early 2007)…



Source: McCloskey Coal

… and with December 2007 Aire Valley Marker Price



Source: McCloskey Coal

Sub-Group Conclusions in Overview Report

- World Coal Reserves
  - Most abundant fossil fuel
  - Over 900 bn tonnes - more than 160 years*
  - Supply of coal can be regarded as secure
- Significant coal imports are expected to continue
- On prices and competitiveness of indigenous production….

> "…both opencast coal and deep mined coal from UK sources would be able to compete on equivalent delivered price to inland power stations. However, investment in new areas of coal in established deep mines would not be attractive at the lower end of this price scale and, if the forecast of $60 is indeed the top of the range, then new deep mine production capacity would not be created."

* NB WEC Revision

The Present

- Phase Two of the Forum commenced in October 2007 under the new Chair John Harris (Chair Coal Authority 1999-2007).

- The Forum continues to present a unique chance for coal producers generators, unions, equipment manufactures and government to examine the opportunities and challenges facing coal in the UK and jointly to bring forward ways of strengthening the industry and to discuss the issues relating to the future of coal fired generation in relation to the challenge of climate change.

- Work is focussed through three newly formed sub groups -
  - Coal Production - Chaired by Dr Barrie Jones,
  - Future Generation - Chaired by Dr John Topper, and
  - Infrastructure (chaired by David Brewer).

- Look at the review report published in August 2007 (see the BERR website – www.berr.gov.uk) which rehearses the key issues.

The Present

- A programme of activity for 2007/08 has been agreed and is underway through the three sub-groups with presentation/dialogue in the Coal Forum itself.

- The focus has become very sharp re the place of coal in the future energy mix because of
  - Security of supply (20 Mt/year of indigenous coal equates to more than c. 10% of electricity generation).
  - Climate change (Carbon Capture and Storage/emissions reduction for electricity generation).

- Later in 2008 a further review report of some kind will be issued – Watch This Space.

Coal Forum

- Established in October 2006 as part of the Energy Review.

- *'The Government will convene a coal forum to bring together coal-fired generators, coal producers and suppliers, power plant suppliers, trade unions, small businesses and other parties in order to help them to find solutions to secure the long-term future of coal-fired power generation and UK coal production.*

- *The forum will facilitate dialogue within the industry and work to ensure that we have the right framework, consistent with our energy policy goals, to secure the long-term contribution of coal-fired power generation and optimise the use of economical coal reserves in the UK.'*

‘The Energy Challenge’, DTI, July 2006, Para 4.27’