

Exploration Update

EAG, 2 December 2005

Exploration Update

- How big is the yet-to-find potential?
- Are we on track to find/produce it?
- What are we already doing?
- Should we be doing more?

How big is the yet-to-find potential?

- DTI Estimates (July 2005)
 - Explain DTI approach/data sources
- How much?
 - Risk
 - Dynamic, disparate views
- Where?
- Licensed/unlicensed?

DTI YTF Estimates

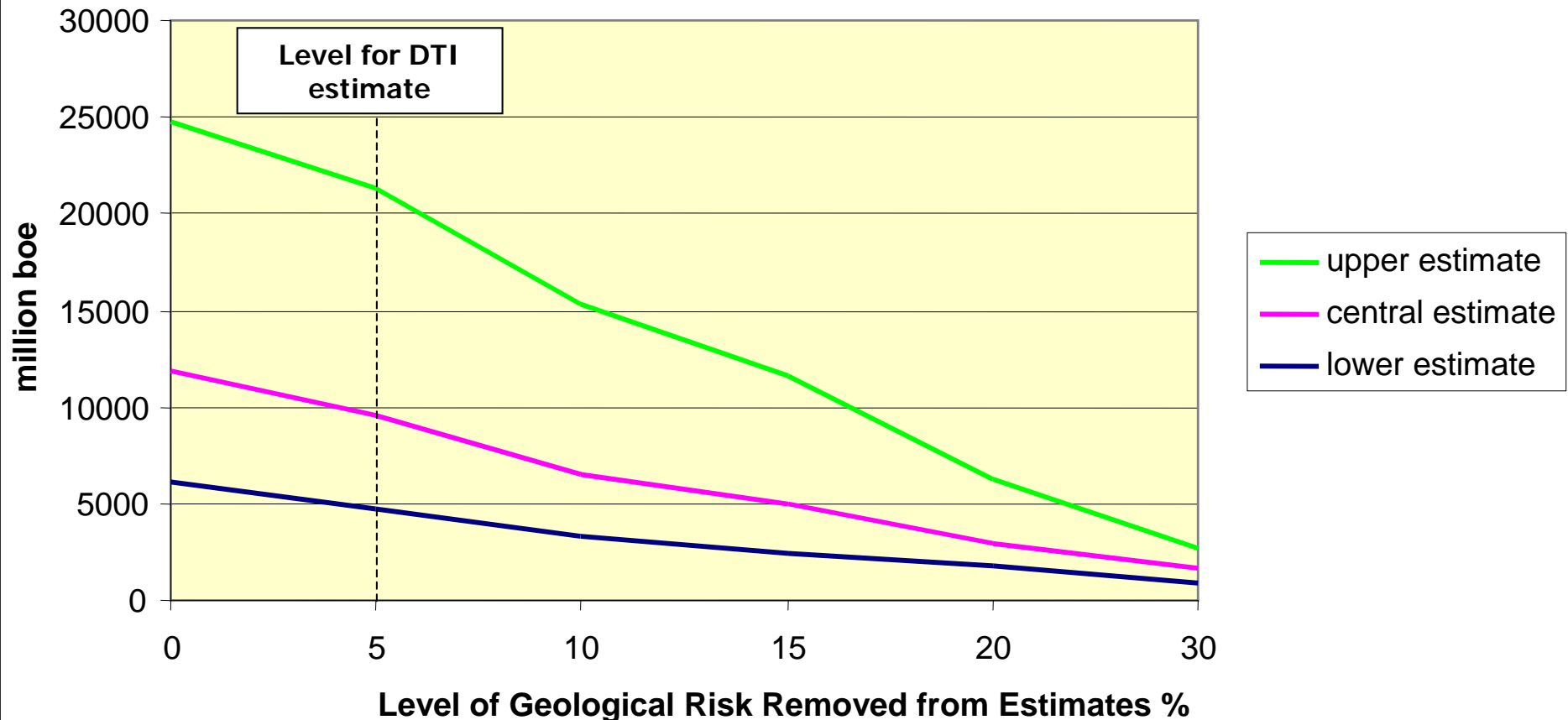
- Based on statistical assessment of undiscovered potential resources in mapped leads
- Geological risk is assigned by play and also to each individual lead; for each geological basin, the risk factors are calibrated to drilling results
- Database includes leads mapped by DTI and leads and prospects mapped by oil companies, mainly extracted from Licence Round application documents and Fallow Block submissions
- Little new mapping is done by DTI in licensed acreage so there are gaps in the mature areas of the UKCS with little prospect data; company data have been used to populate these areas

DTI YTF Estimates

- The size of these estimates depends on the perceived *geological* risk assumed to constrain drilling activity; the latest DTI estimates are based on 5% geological risk i.e. they assumed no prospects with a geological risk (Chance of Success, CoS) of more than 1 in 20 will be drilled
- The West of Scotland estimates are speculative since detailed studies in that area have not been carried out

How big is the yet-to-find potential?

Undiscovered Oil and Gas Resources in the UKCS
shown at different levels of Geological Risk



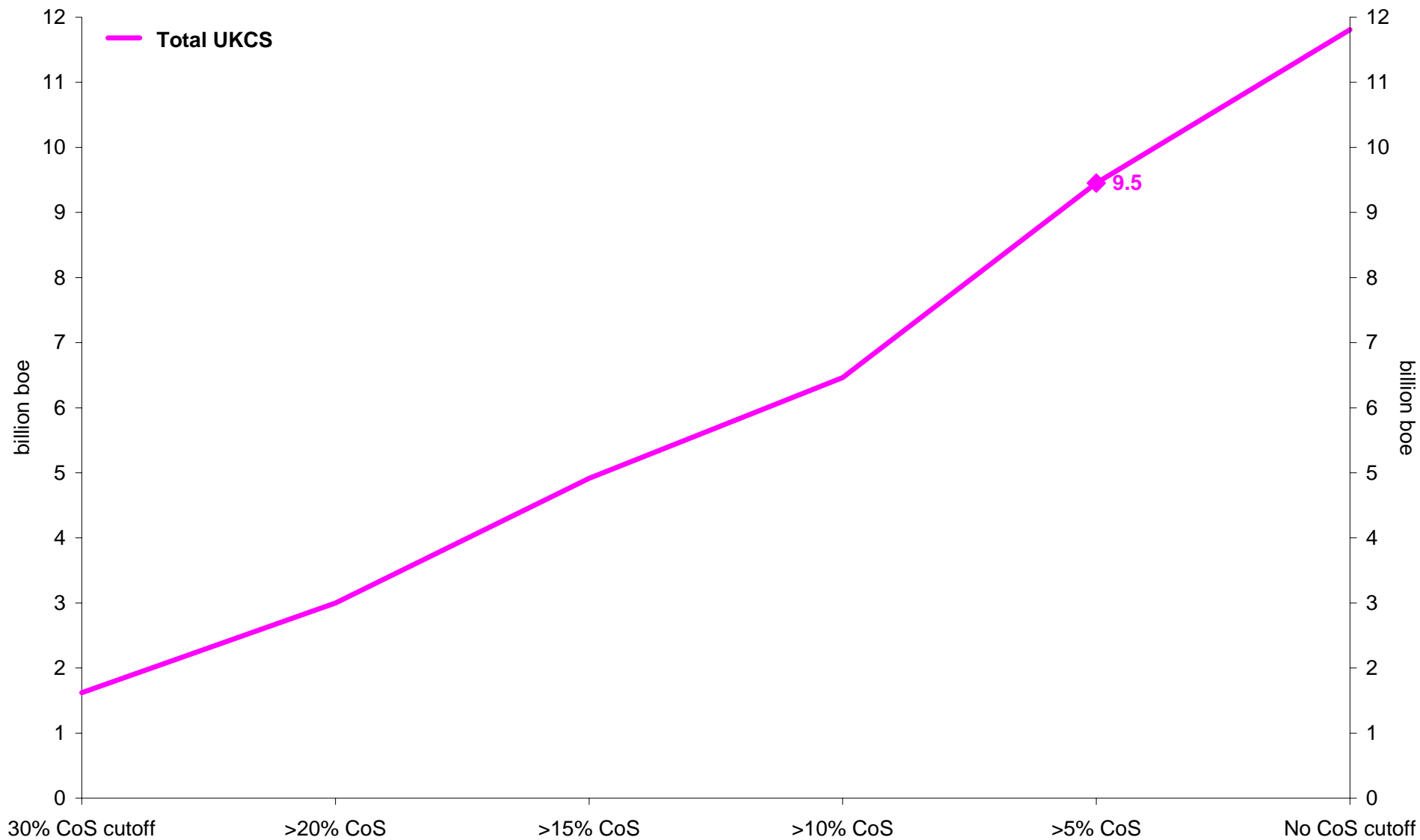
DTI YTF Estimates

- DTI's estimates for ***technically recoverable undiscovered resources as at the end of 2004*** were presented in July 2005 as:
 - a **Low – Mid – High range** for the UKCS as a whole of **4.8 – 9.5 – 21.3 billion boe**, of which
 - 0.6 – 1.9 – 5.8 billion boe were West of Shetland and
 - 0.1 – 1.2 – 4.2 billion boe were West of Scotland, leaving
 - **4.1 – 6.5 – 11.3 billion boe in the North Sea, Irish Sea and onshore**

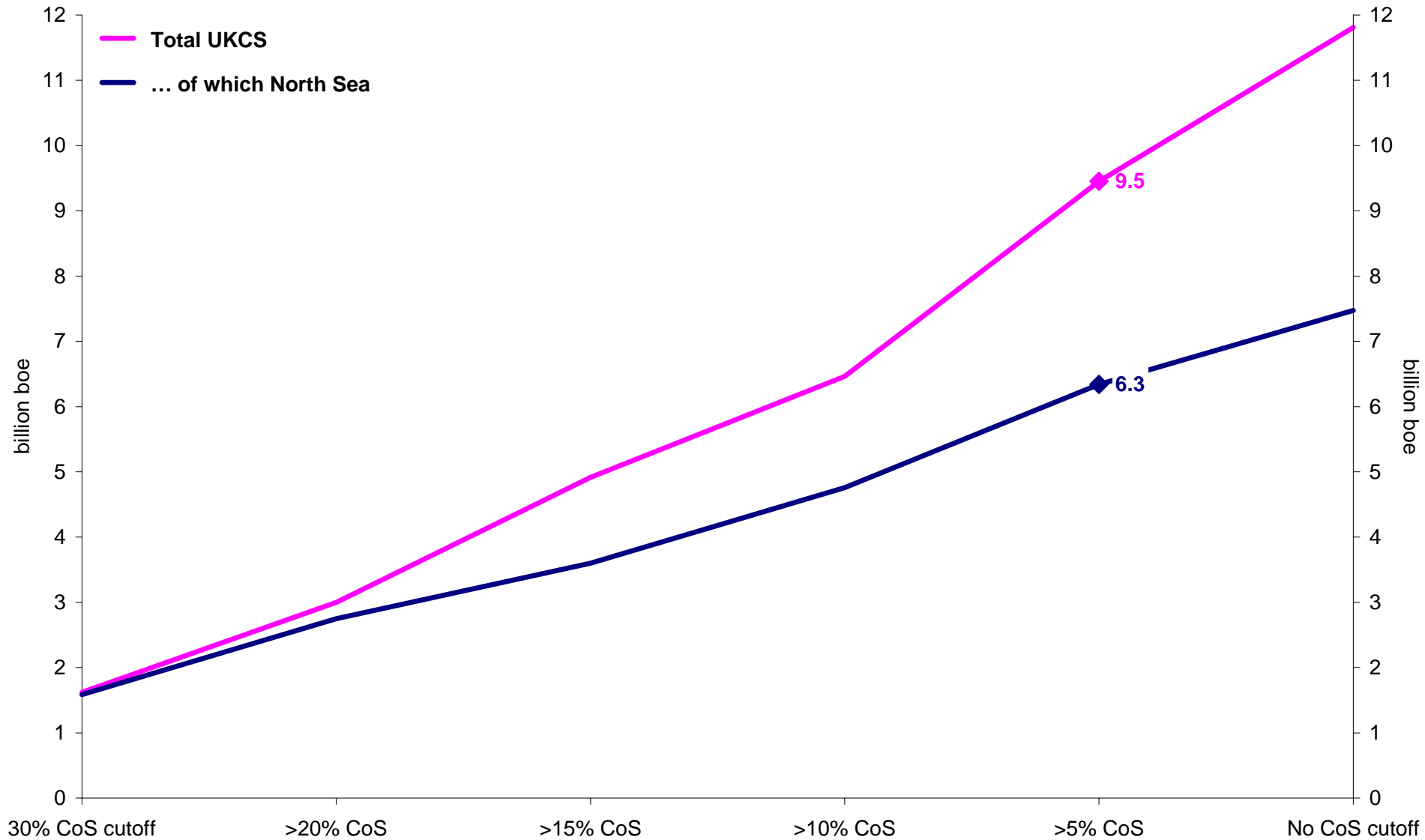
Government Health Warning

- Estimates of undiscovered resources must be treated with caution
- They provide only a broad indication of the ultimate remaining potential
- The Low and High limits of these ranges should not be regarded as minima or maxima
- The Mid range figures do not imply that these volumes are the most likely to be discovered
- Nevertheless, will now concentrate on those ...

Estimated Undiscovered Oil and Gas Resources in the UKCS as at end 2004 shown at different levels of Geological Risk (Chance of Success, CoS)



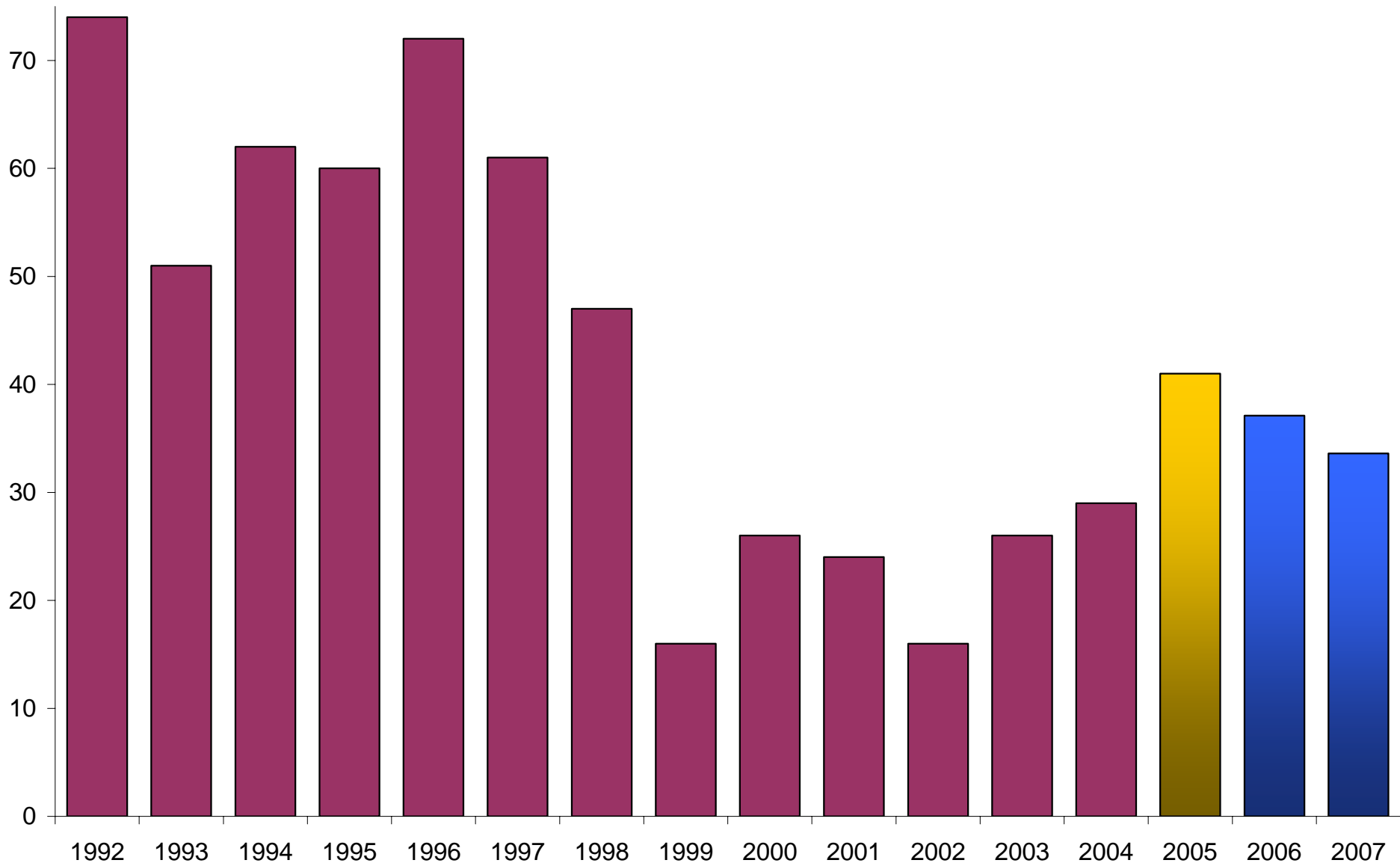
Estimated Undiscovered Oil and Gas Resources in the UKCS as at end 2004 shown at different levels of Geological Risk (Chance of Success, CoS)



Are we on track to find/produce the yet-to-find potential?

- Activity Levels – past, present and future
 - DTI data/E&A Survey
- Reserves Discovered
 - Wood Mackenzie data
- Projected Production from Discoveries
 - Assumed exploration drilling levels
 - Assumed success rates/discovery sizes etc
 - Unified Reserves Model
 - Alex Kemp's latest modelling

Numbers of offshore exploration wells drilled annually including sidetracks



Activity Levels

- The previous chart shows historic DTI data on the number of exploration (E) wells spudded each year including geological sidetracks (i.e. where the intent was to acquire new geological data)
- The estimate of 41 E wells in 2005 assumes 8 in Q4 in line with the final quarter of most recent years
- DTI/UKOOA E&A Survey in early 2005 coincidentally reported 41 certain E wells in 2005 (excluding sidetracks); the weighted total for 2005 was 57 but that was always unlikely given constraints on rig availability and rig rates
- Projected E well numbers in 2006 and 2007 are based on the E&A Survey weighted totals (excluding sidetracks) plus, respectively, 5 and 10 wells

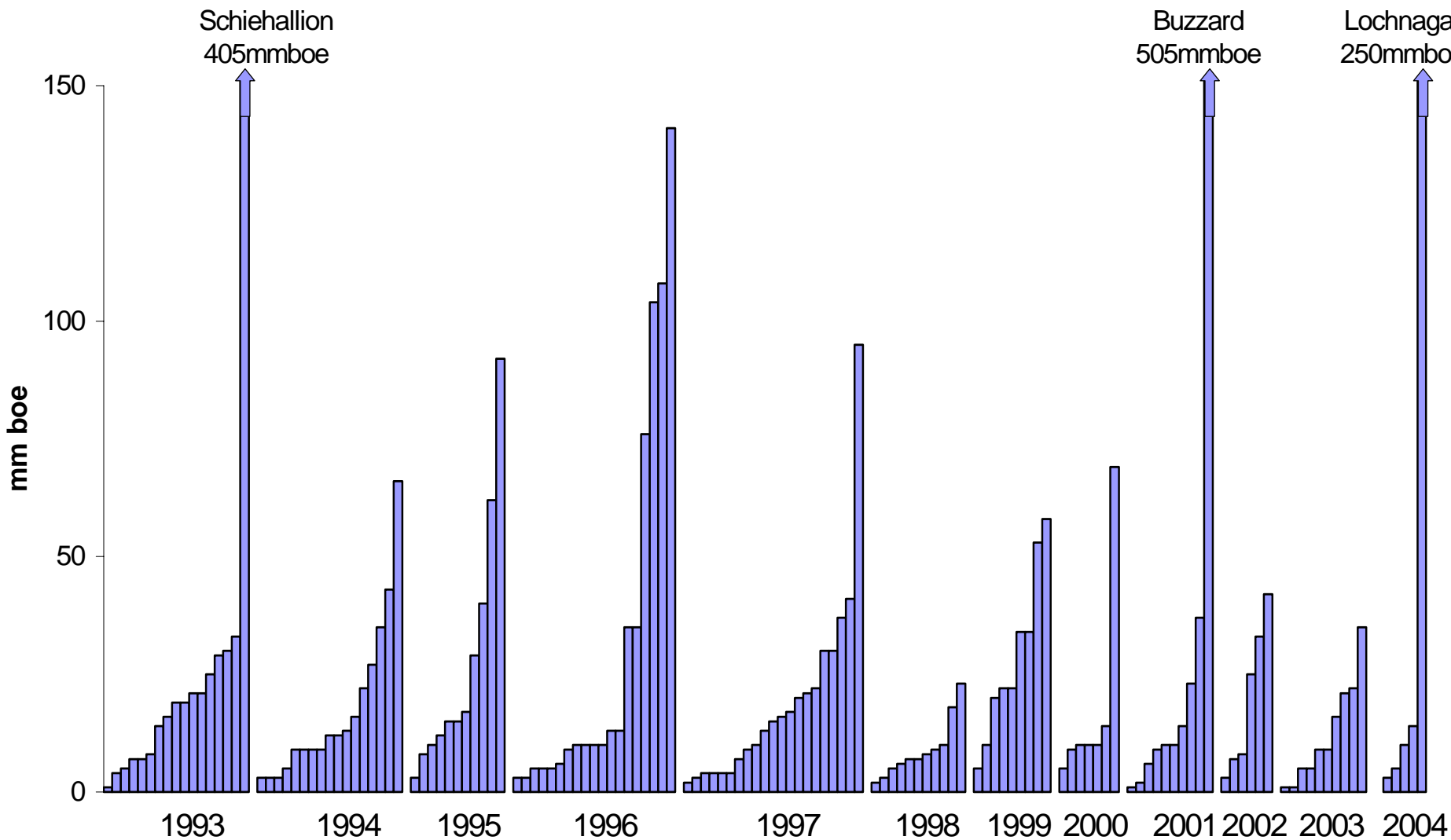
Reserves Discovered

- Recent exploration drilling activity has been at the lower end of the range considered by the Economic Advisory Group in 1999 (i.e. 25 E wells/year) but – thanks at least partly to Buzzard – production from new discoveries has been more in line with expectations for the higher case (i.e. 50 E wells/year)
- Recent experience can be summarised thus:

	Exploration	Dry	Commercial Discoveries	Commercial Success	Average Commercial Discovery (mmboe)	Technical Discoveries	Technical Success	Average Technical Discovery (mmboe)
Total/Average	Wells	Holes	Total	Rate Total		Total	Rate Total	
1994-98	262	185	35	13%	30.8	42	16%	14.5
1999-03	114	73	17	15%	51.5	24	21%	14.6
1994–2003	376	258	52	14%	37.6	66	18%	14.5

Source: Wood Mackenzie Multi-Client Study "Global Oil and Gas Risks and Rewards 2004"

UKCS Discoveries 1993–2004



Source: UKOOA analysis of Wood Mackenzie data, discoveries ranked by size within year; includes both commercial and technical reserves; there is no public estimate of Lochnagar (Rosebank) reserves by the operator (Chevron)

Projected Production from Discoveries

- Modelling results based on assumed exploration drilling levels, success rates, discovery sizes etc
- Two recent assessments:
 - Unified Reserved Model
 - Alex Kemp's latest modelling
- Results from both are presented in terms of cumulative production by date given, *not* reserves discovered by that date

Projected Production from Discoveries

UKCS Yet-to-Find Reserves projected to be *recovered* by 2035

Unified Reserves Model	billion boe
Current Activity Case	5.1
High Activity Case	6.0

Alex Kemp's latest modelling (excludes future incrementals)

25 E wells in 2005 declining to 15 in 2028 (\$20/bbl / 18p/therm case)	3.4
31 E wells in 2005 declining to 20 in 2028 (\$25/bbl / 24p/therm case)	4.1
38 E wells in 2005 declining to 27 in 2028 (\$30/bbl / 28p/therm case)	5.0
44 E wells in 2005 declining to 33 in 2028 (\$35/bbl / 32p/therm case)	5.4
50 E wells in 2005 declining to 38 in 2028 (\$40/bbl / 36p/therm case)	6.1

Unified Reserves Model

Yet-to-Find Reserves projected to be recovered by dates given

	Current Activity Case			High Activity Case		
	North Sea	West of Shetland	Total UKCS	North Sea	West of Shetland	Total UKCS
billion boe (% of "screened" reserves)						
2015	0.4 (8%)	0.2 (11%)	0.6 (8%)	0.6 (11%)	0.2 (11%)	0.8 (11%)
2035	3.5 (60%)	1.6 (100%)	5.1 (69%)	4.4 (76%)	1.6 (100%)	6.0 (82%)
Total "screened" reserves (based on DTI Mid Case)	5.7 (6.1)	1.6 (2.8)	7.3 (8.9)	5.7 (6.1)	1.6 (2.8)	7.3 (8.9)
Assumes:	Declining E&A drilling rate from average (over the last 4 years)			Increase in E&A drilling rate by 25% in 2005 and flat to 2019 before declining		

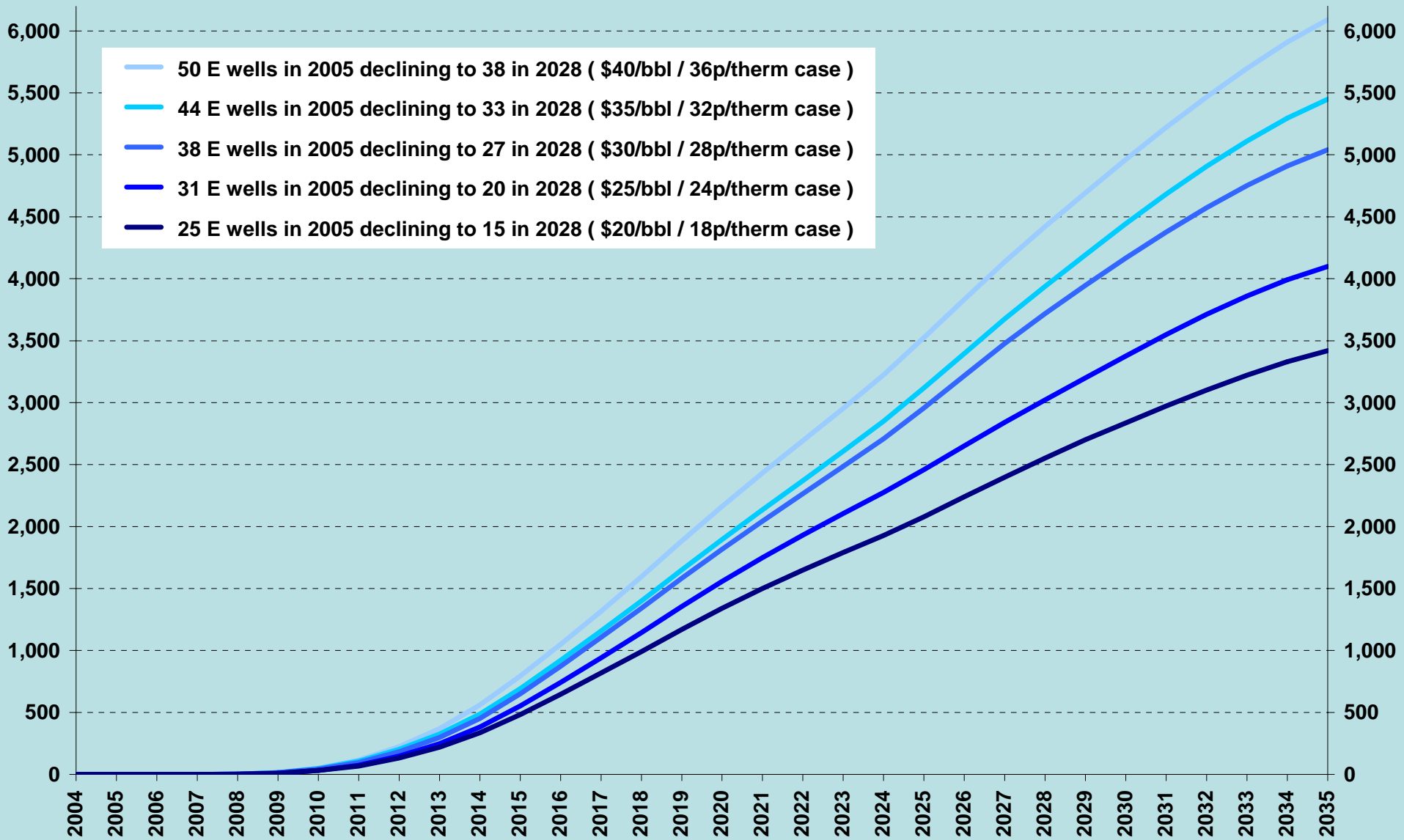
Source: February 2005 UKOOA paper "The Window of Opportunity for the UKCS" which describes the reserves "model" developed in 2004 as part of the PILOT "Brownfields Studies" by, and with data from, UKOOA, Wood Mackenzie and DTI; screened reserves exclude West of Scotland and onshore

Unified Reserves Model

- The previous table shows **cumulative production** projected by 2015 and 2035 for "current" and "high activity" cases together with the percentage of "screened" reserves that would be produced by those dates
- The reserves *discovered* by 2015 would be far greater than the reserves *produced* by that date (which amount to only 8% of the North Sea's screened YTF Reserves)
- **[It would be helpful if UKOOA could document the time profile of reserves discovery (as distinct from production) implicit in the modelling, perhaps at 5 yearly intervals]**

Cumulative UKCS Oil and Gas Production from Exploration

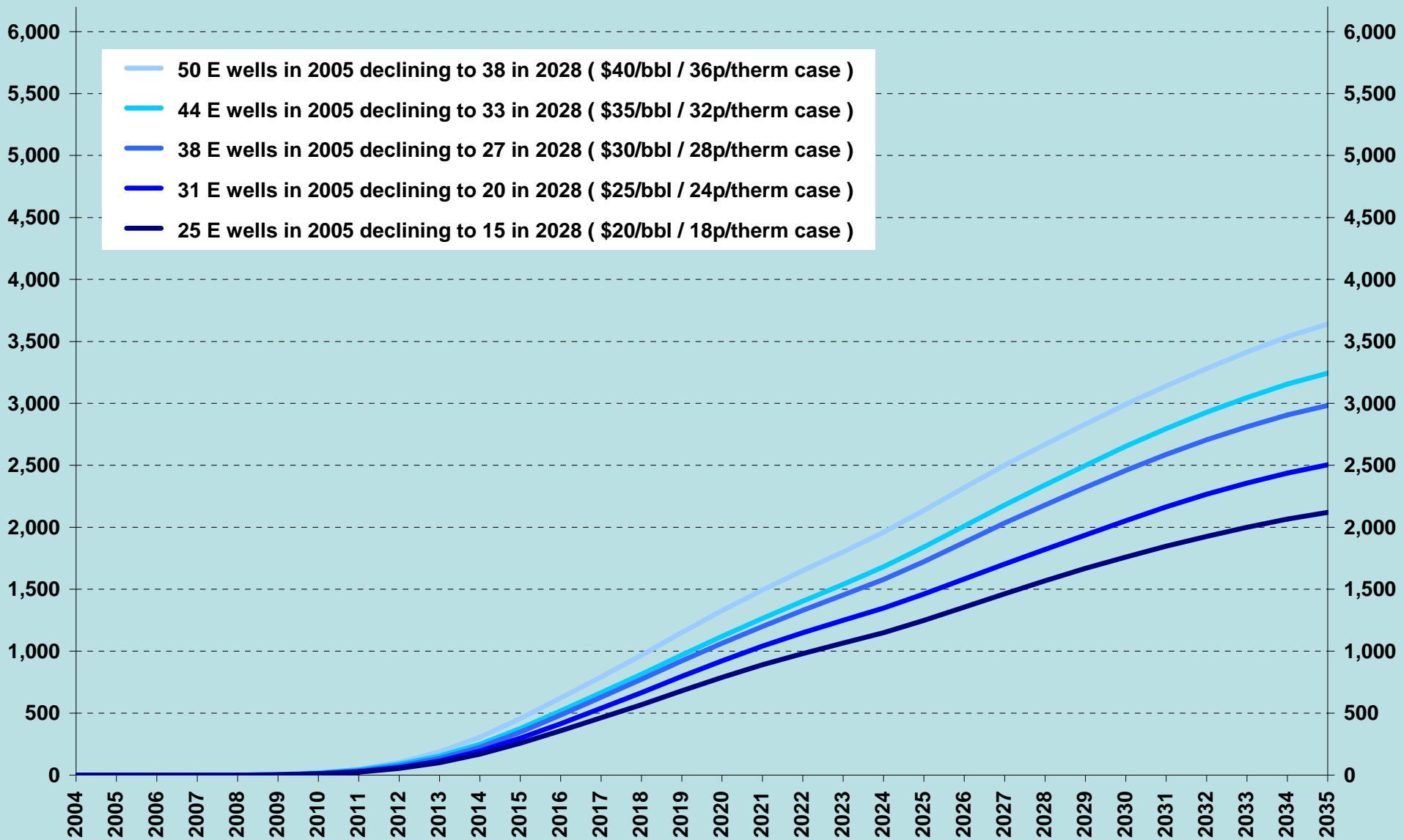
– excluding future incrementals (million boe)



Source: A G Kemp & L Stephen (May 2005, "Prospects for Activity Levels in the UKCS to 2030: the 2005 Perspective", North Sea Study Occasional Paper 98)

Cumulative UKCS Oil & NGL Production from Exploration

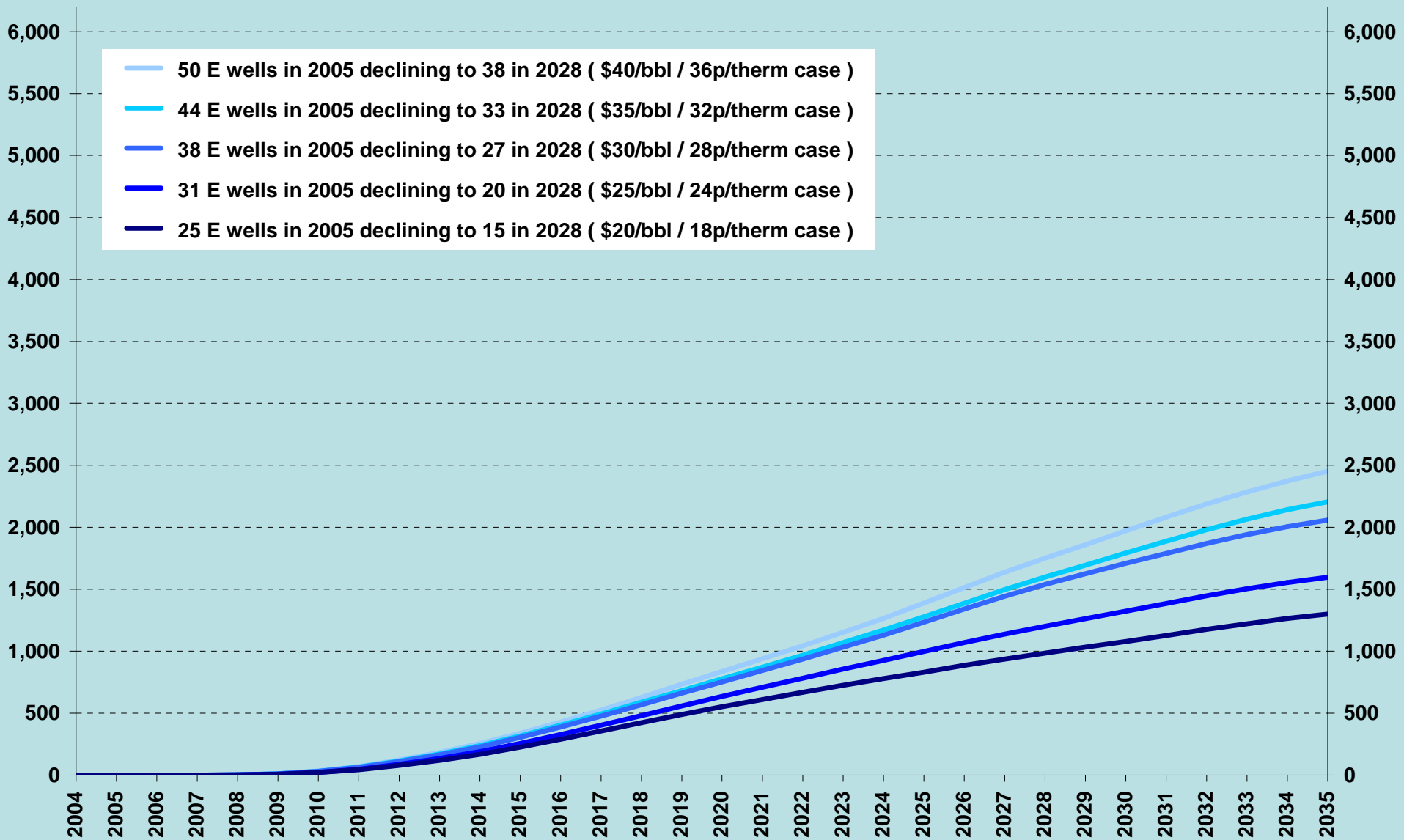
– excluding future incrementals (million barrels)



Source: A G Kemp & L Stephen (May 2005, "Prospects for Activity Levels in the UKCS to 2030: the 2005 Perspective", North Sea Study Occasional Paper 98)

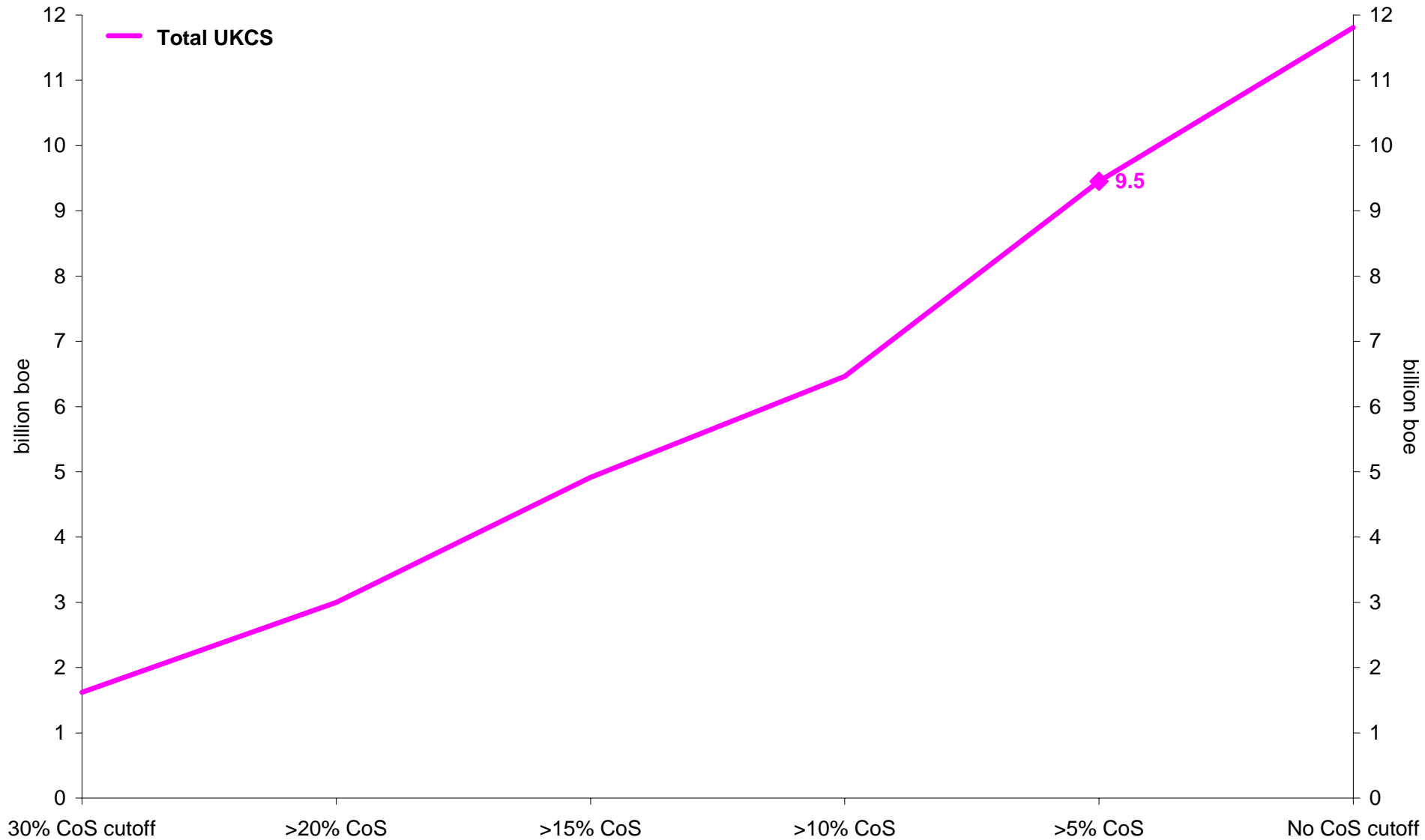
Cumulative UKCS Gas Production from Exploration

– excluding future incrementals (million boe)

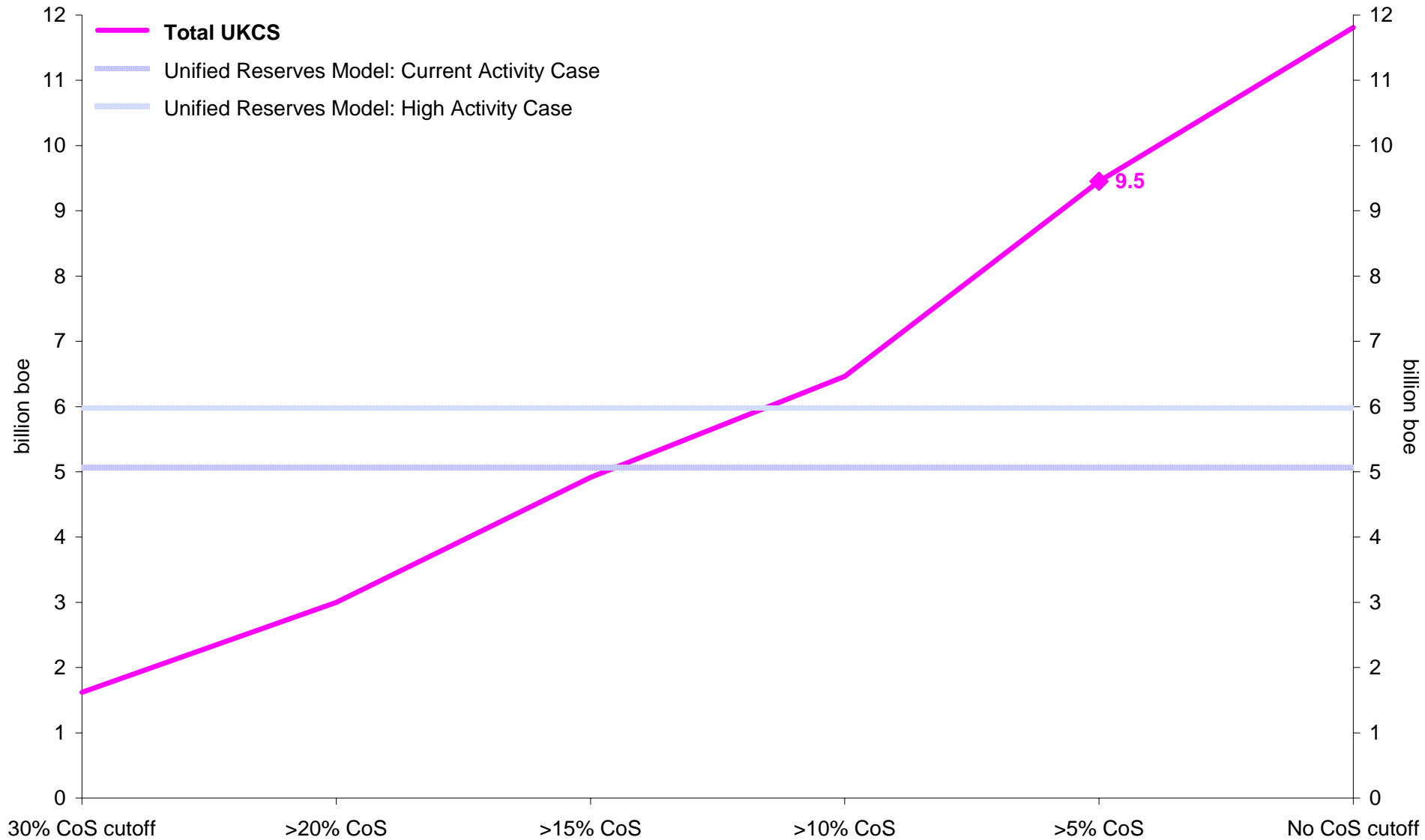


Source: A G Kemp & L Stephen (May 2005, "Prospects for Activity Levels in the UKCS to 2030: the 2005 Perspective", North Sea Study Occasional Paper 98)

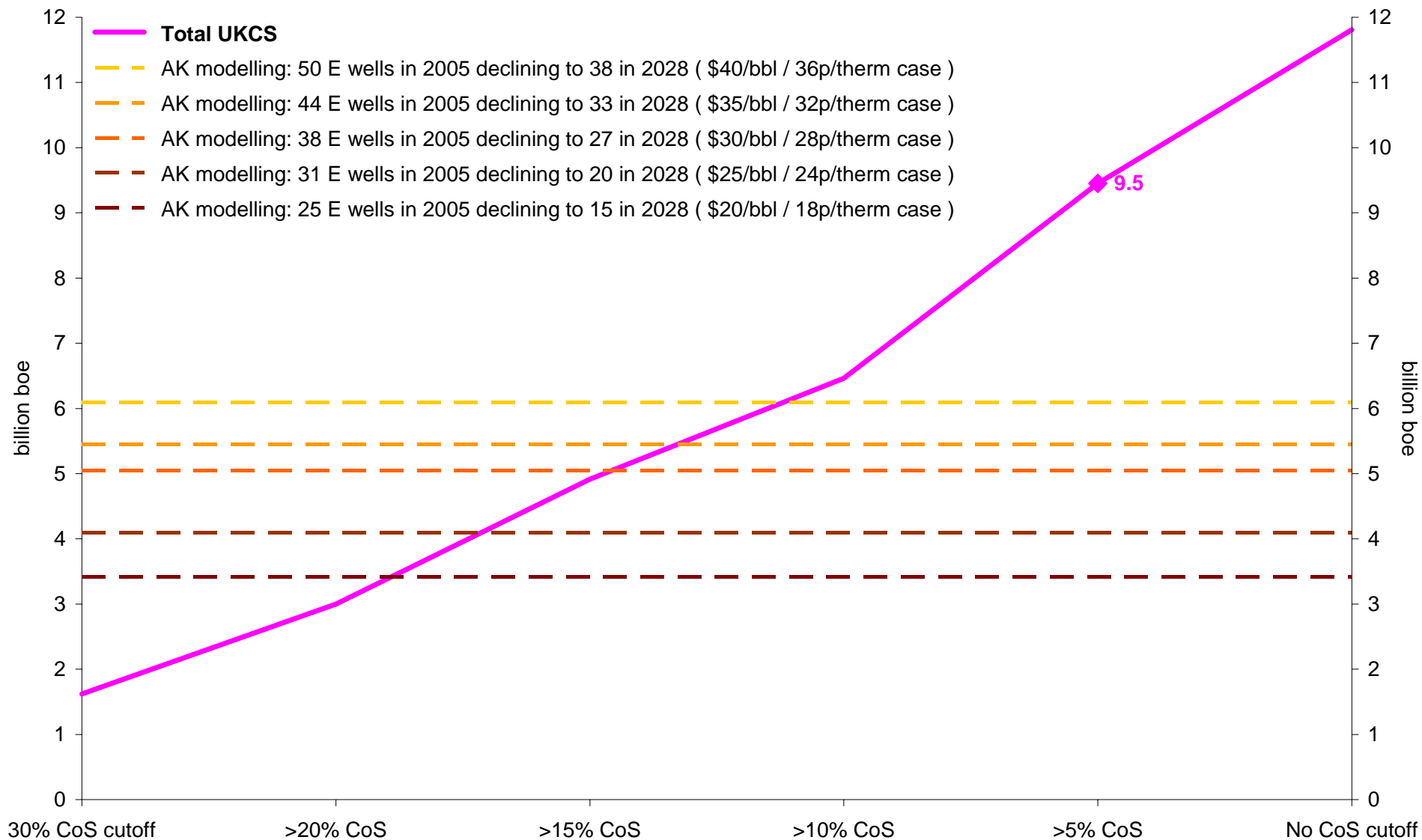
Estimated Undiscovered Oil and Gas Resources in the UKCS as at end 2004 shown at different levels of Geological Risk (Chance of Success, CoS)



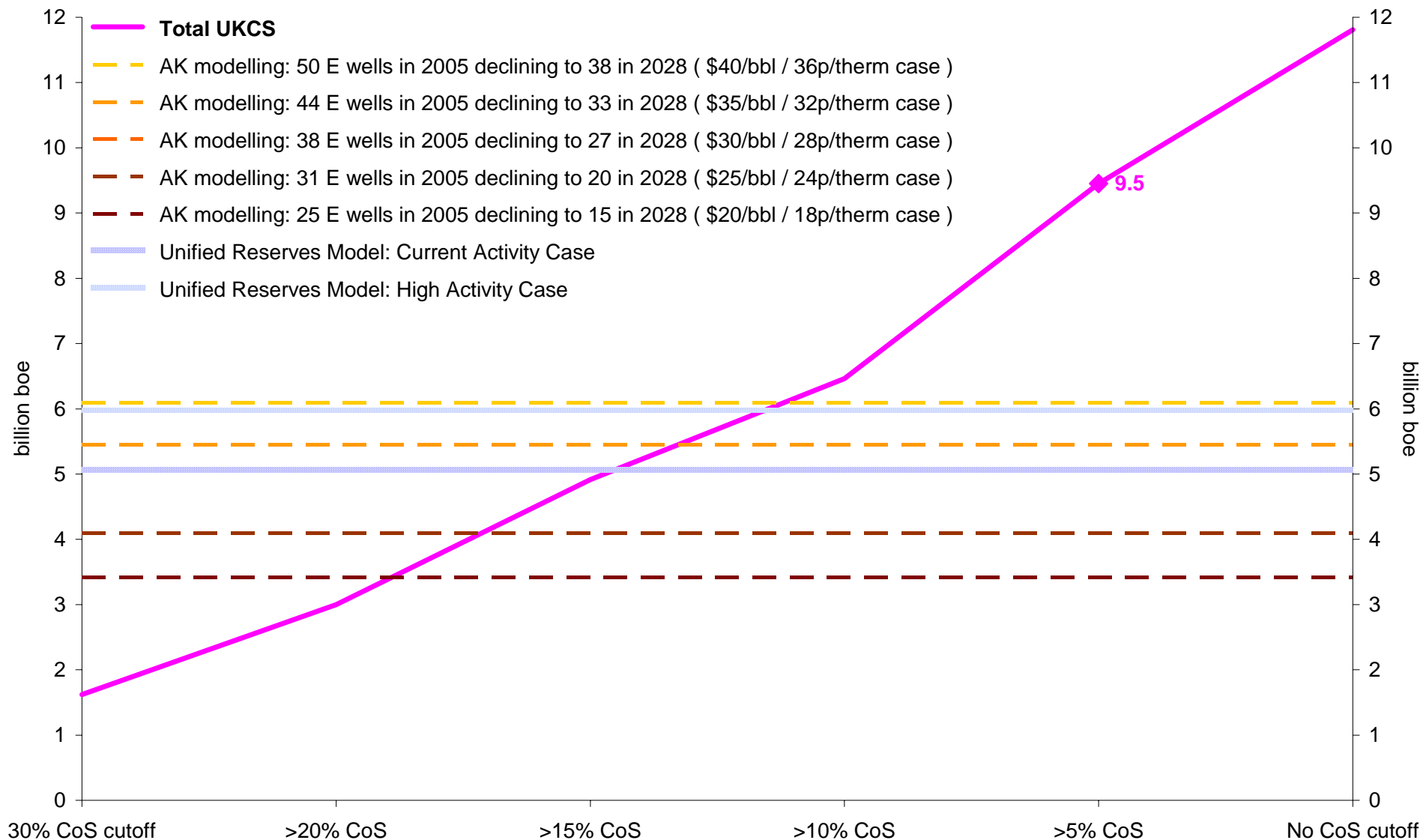
Estimated Undiscovered Oil and Gas Resources in the UKCS as at end 2004 shown at different levels of Geological Risk (Chance of Success, CoS)



Estimated Undiscovered Oil and Gas Resources in the UKCS as at end 2004 shown at different levels of Geological Risk (Chance of Success, CoS)



Estimated Undiscovered Oil and Gas Resources in the UKCS as at end 2004 shown at different levels of Geological Risk (Chance of Success, CoS)



What are we already doing?

- PILOT Initiatives
 - Fallow Initiatives
 - Licensing
 - Prospective acreage made available by recent Rounds – only West of Scotland not yet available (Strategic Environmental Assessment required, speculative resource anyway)
 - More Licensees (new entrants have been encouraged, facilitated by new Promote Licence)
 - Future Rounds ...

Should we be doing more?

- Access to acreage does not seem to be a blocker; but is access to data (still)?
- The current UKCS fiscal regime is neutral, especially with Exploration Expenditure Supplement, introduced following the 2003 Exploration Review – but is there (still) a Capital Gains Tax issue inhibiting asset churn?
- Recent and expected exploration activity seems to be consistent with the bulk of the risked yet-to-find potential of the UKCS being found and produced in the next 30 years or so, assuming it is economically right to drill only 1 in 5 or, at most, 1 in 10 *geological* chances of success