

Bernstein Energy

Finding Petroleum: The Significance of Deep Water to Global Supply

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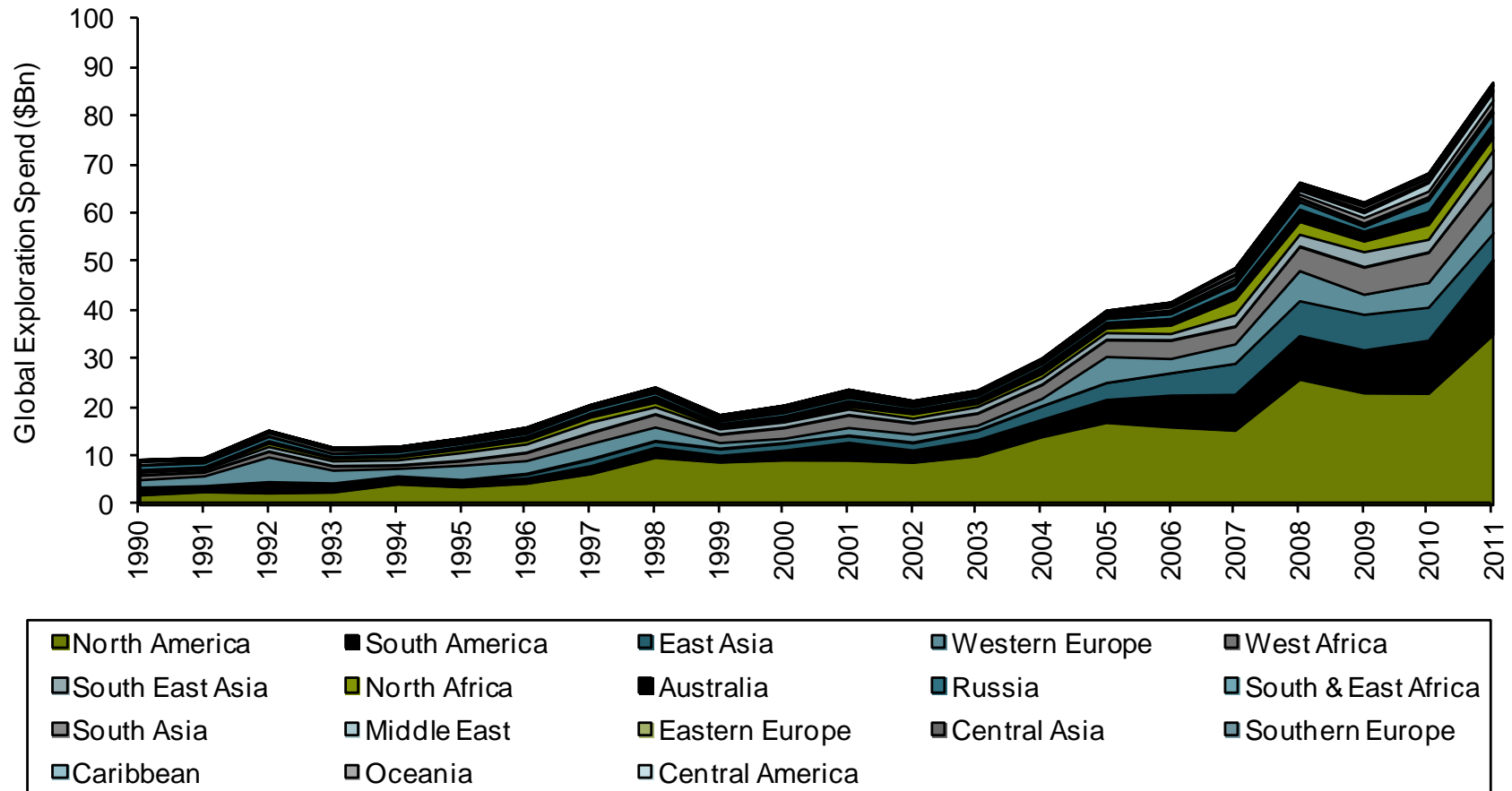
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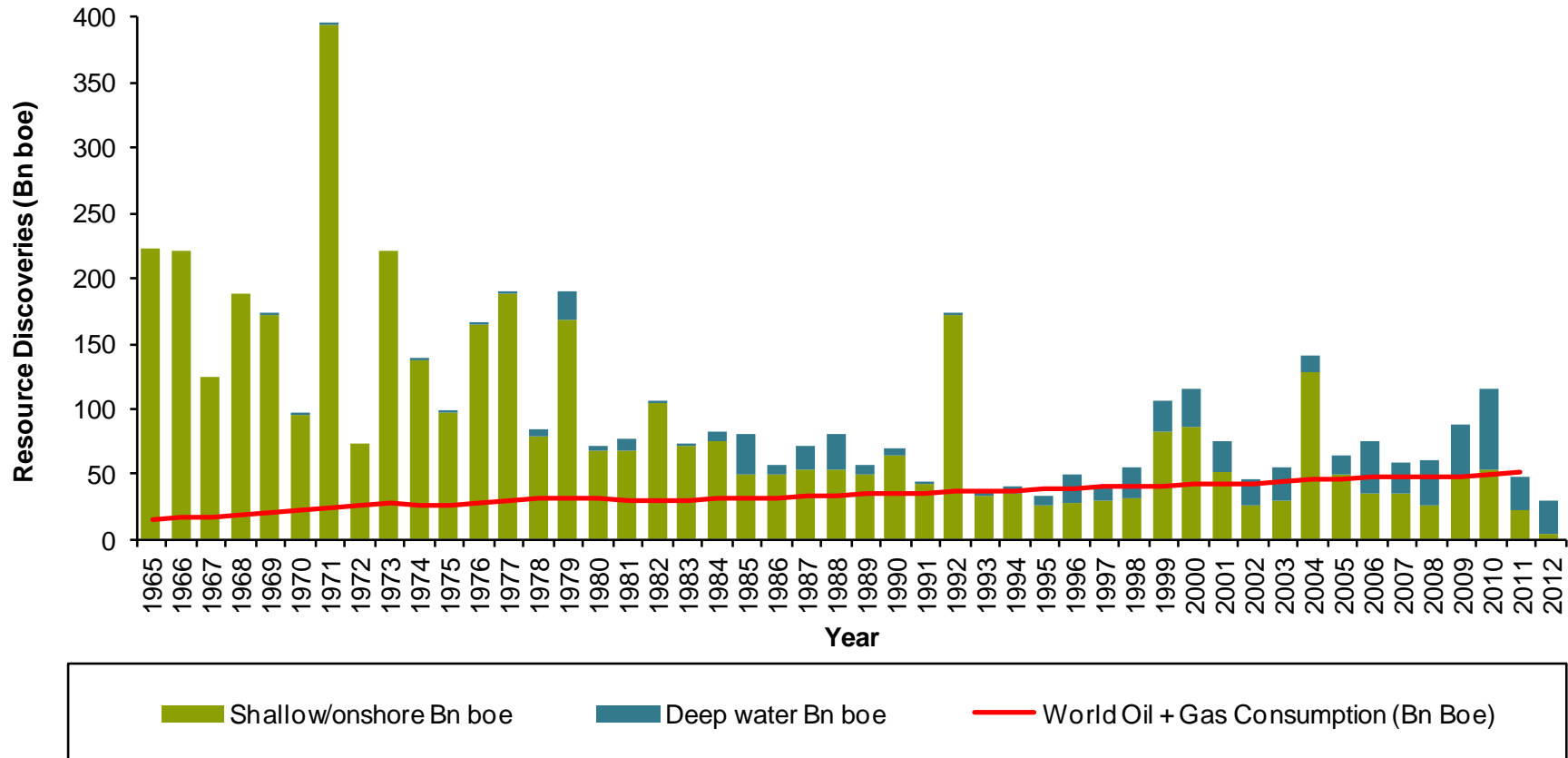
Industry appetite for exploration continues to remain high

Global Exploration Spend



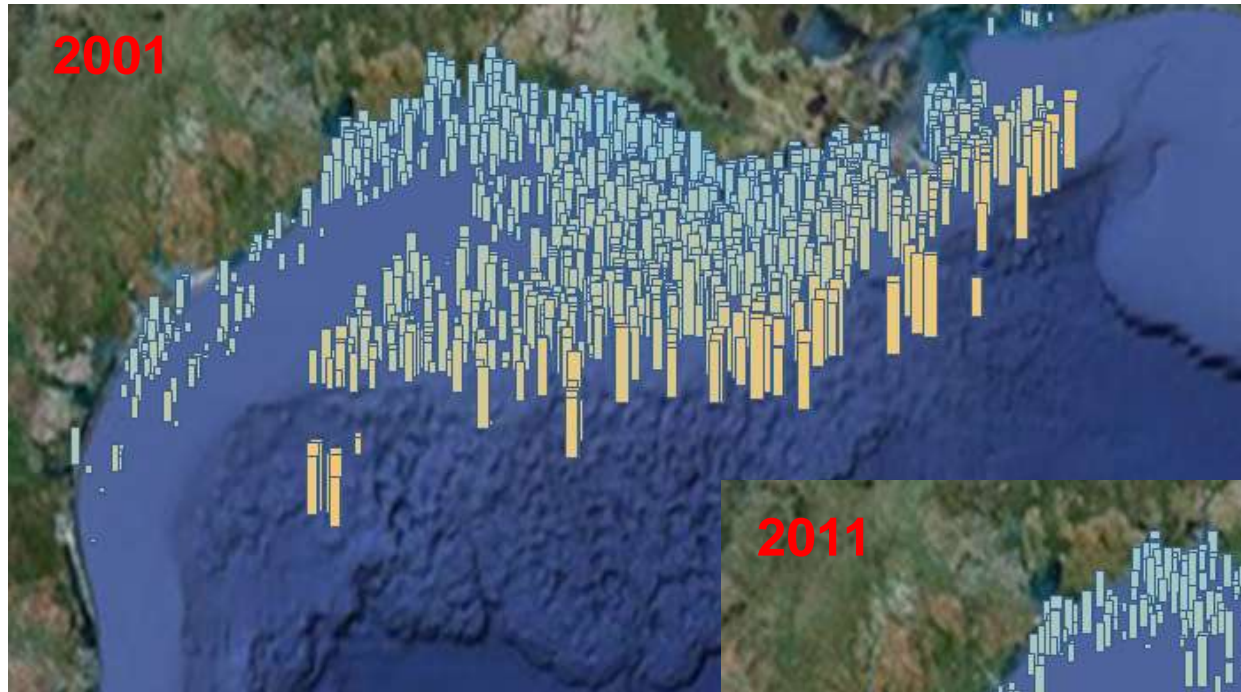
Source: Rystad, Company Reports and Bernstein Analysis

Over the last 10 years almost 50% of global discovered conventional oil & natural gas resources have come from deepwater

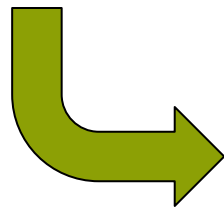
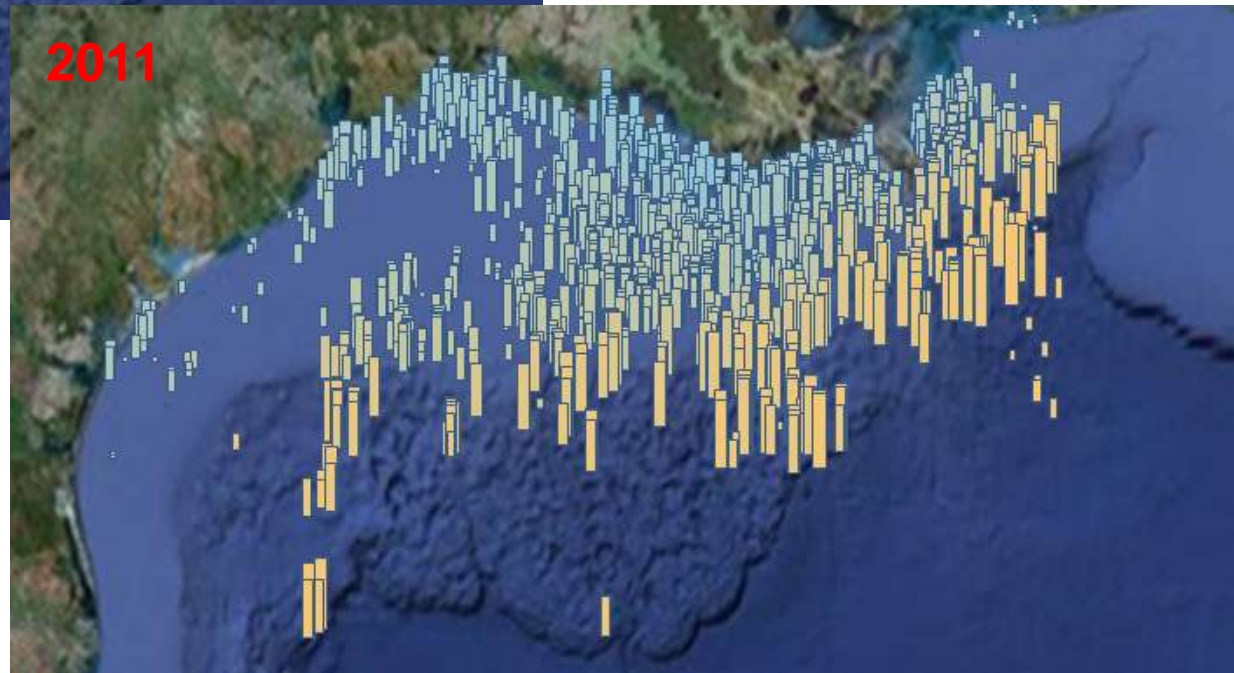


Source: IHS, AAPG, Company Reports and Bernstein Analysis

The GoM has moved from predominantly shallow-water pro/aggradational plays into deepwater fans and turbidite systems

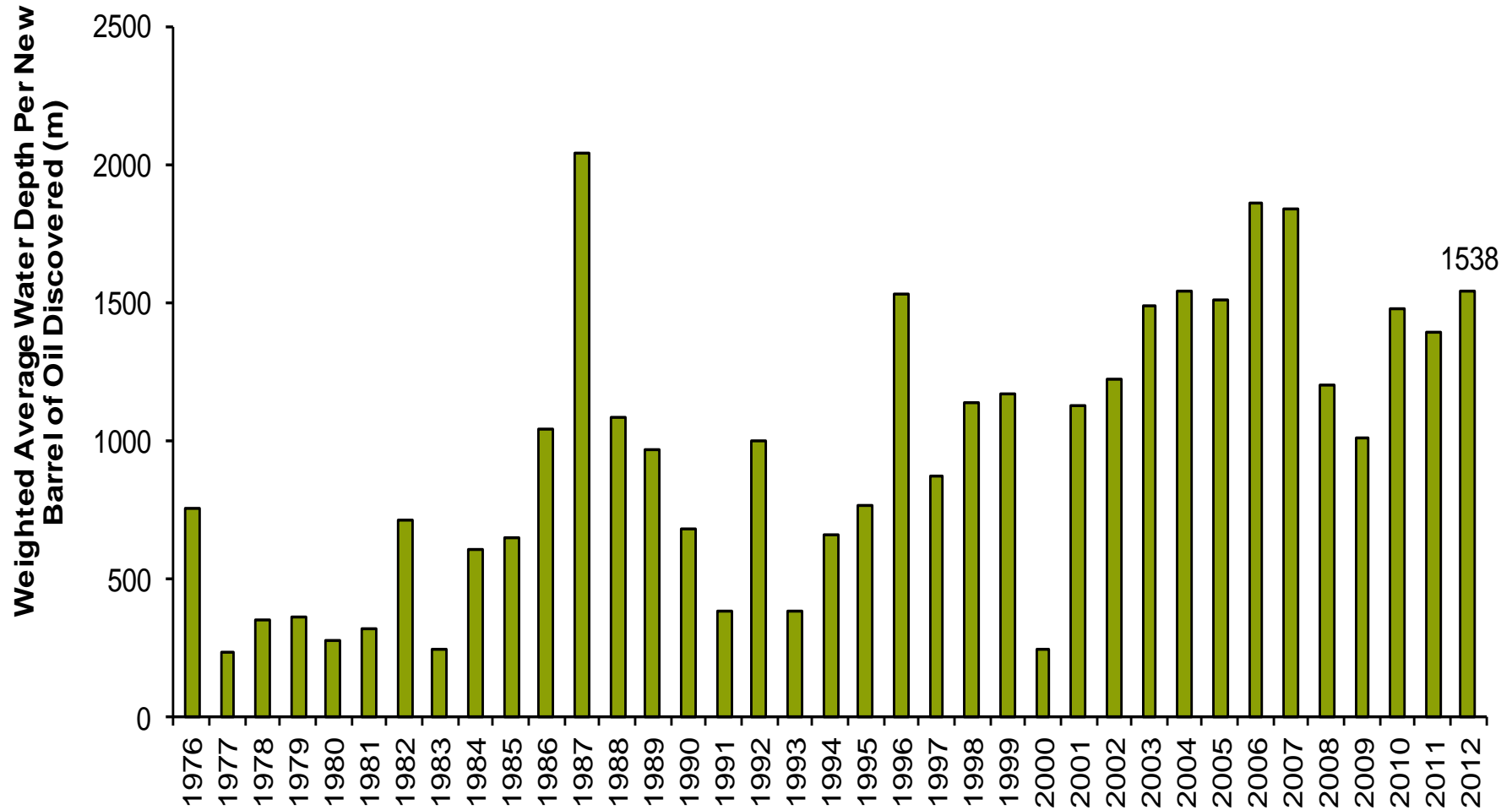


History of Gulf of Mexico Production



Source: BOEM, Bernstein Mapping

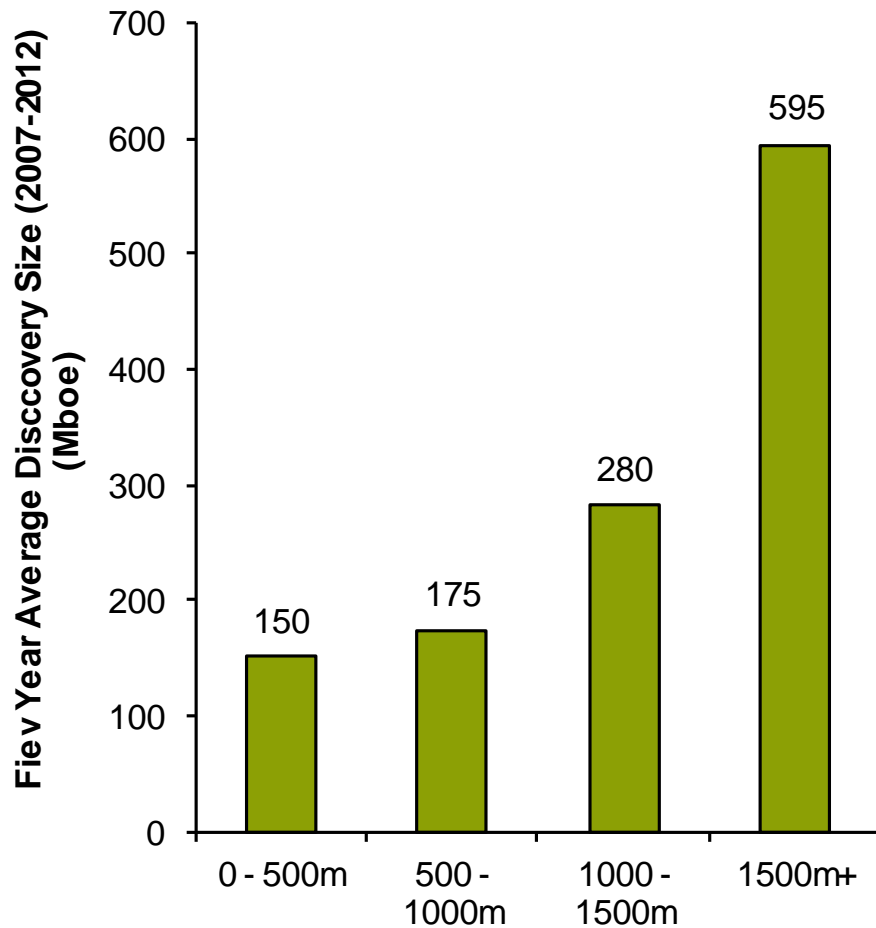
The “average barrel” discovered so far in 2012 is at 1500m of water depth



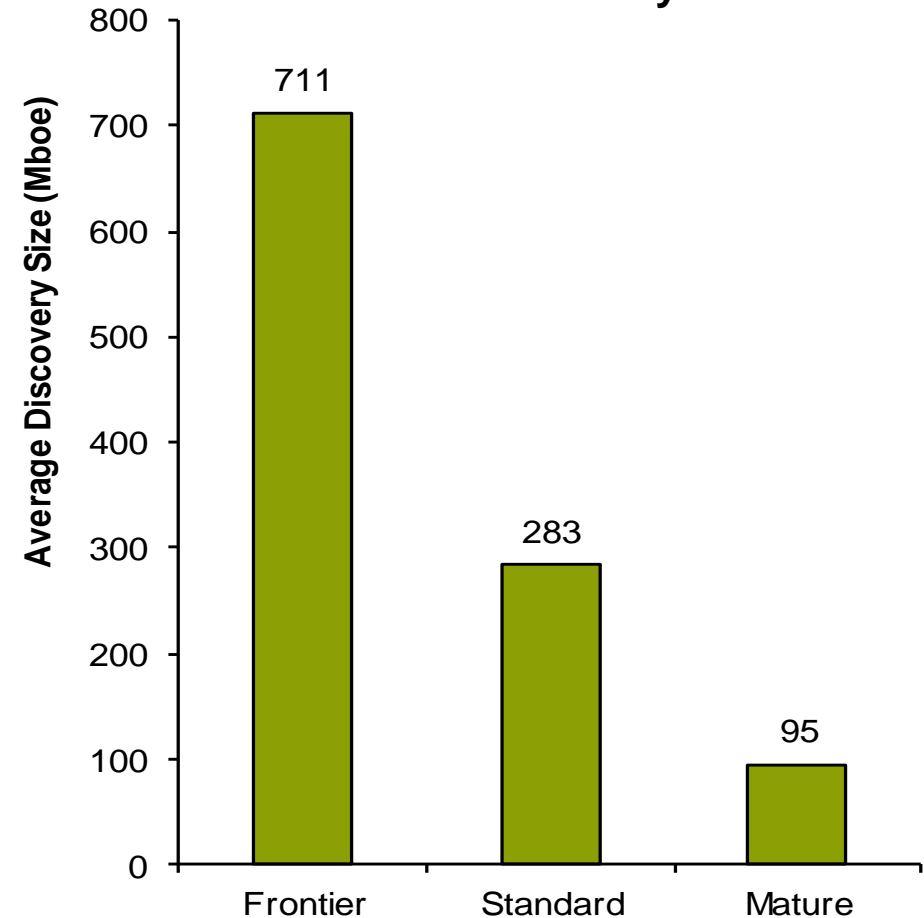
Source: World Oil, IHS, Company reports and Bernstein estimates

Deepwater and frontier areas have yielded the largest discoveries recently

Average Discovery Size By Water Depth Band

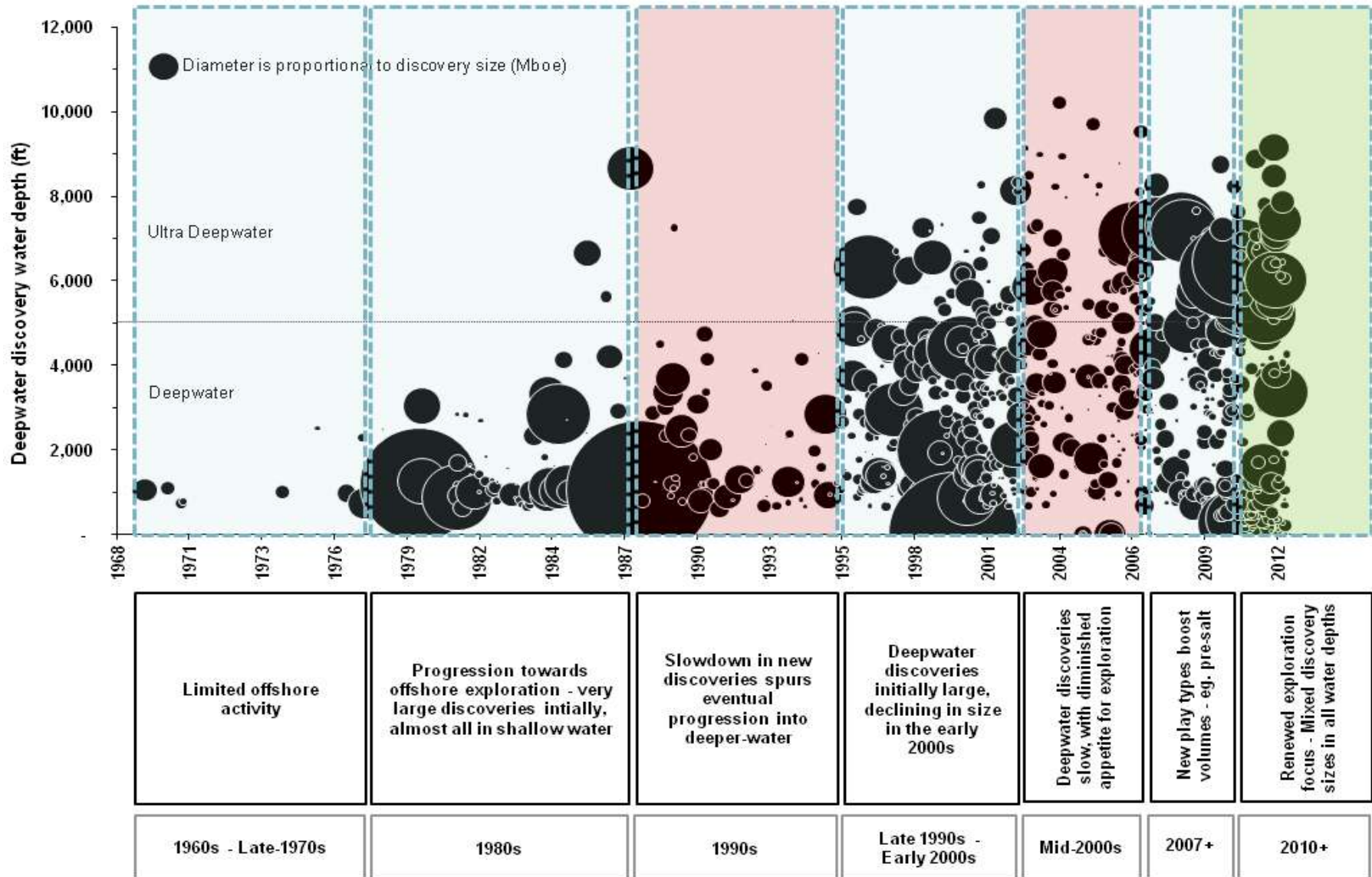


Average Discovery Size By Play Maturity



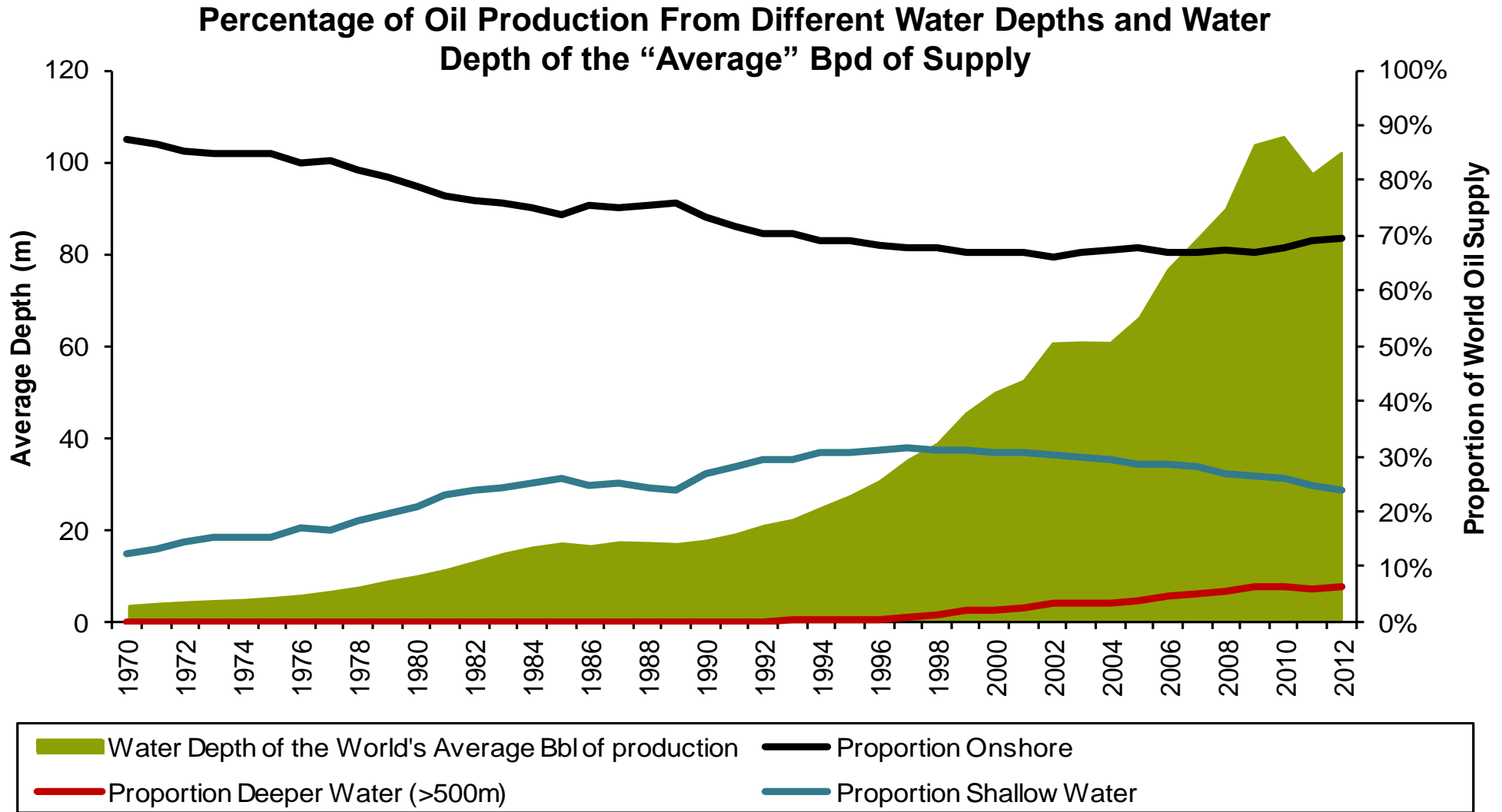
Source: World Oil, IHS, Company reports and Bernstein estimates

We have entered a phase of exploration characterised by large discoveries within every water depth category



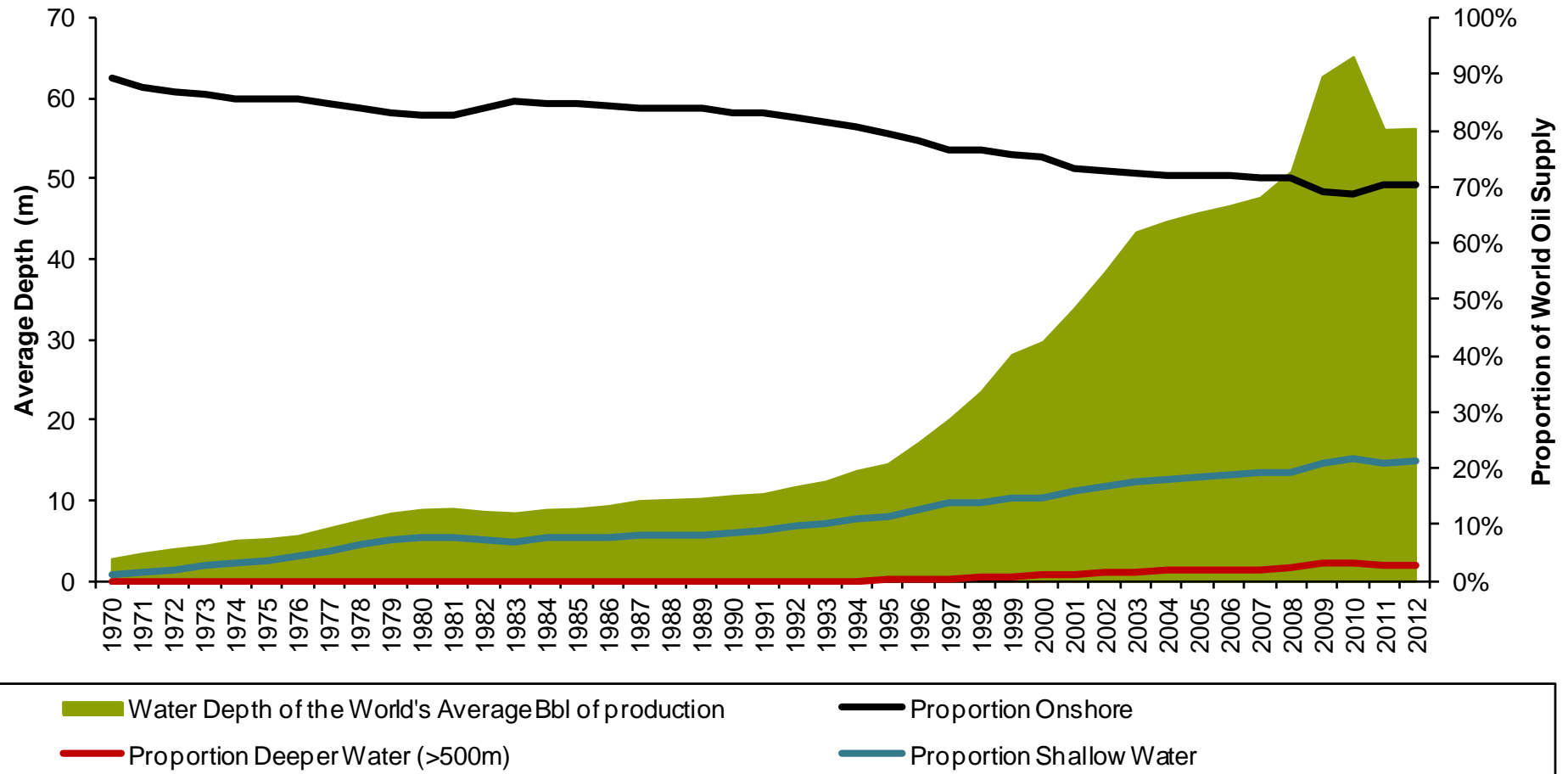
Source: World Oil, IHS, Company reports and Bernstein estimates

The world's "average oil bbl" is produced in 100m of water, with c70% produced onshore, c24% in shallow water & 7% from deeper water



The world's "average gas bbl" is produced in 60m of water, with c70% produced onshore, c21% in shallow water & 3% from deeper water

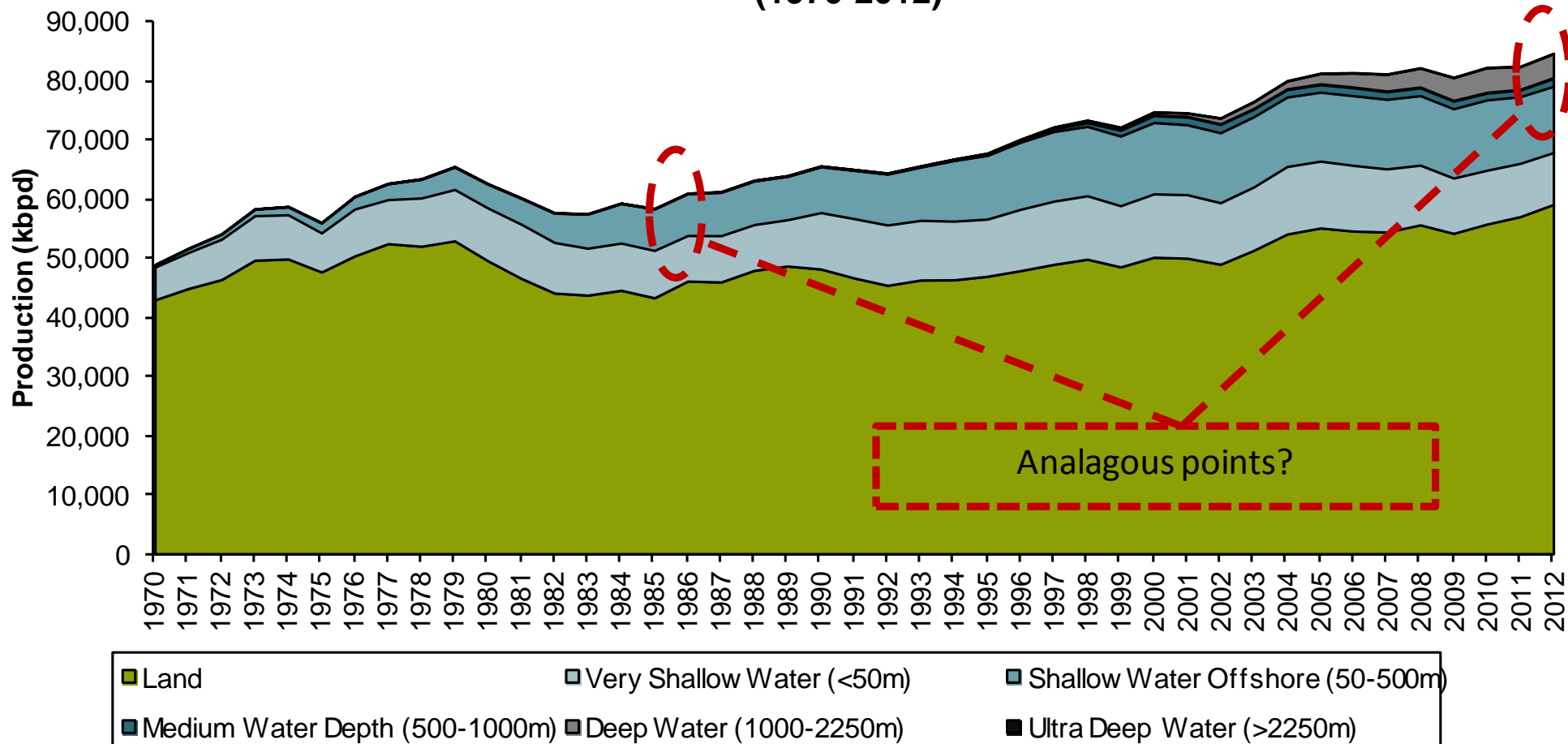
Percentage of Natural Gas Production From Different Water Depths and Water Depth of the "Average" Bpd of Supply



Source: Rystad Energy, Bernstein Analysis

Is the outlook for deepwater supply today like the history of shallow water offshore production in the 1970s?

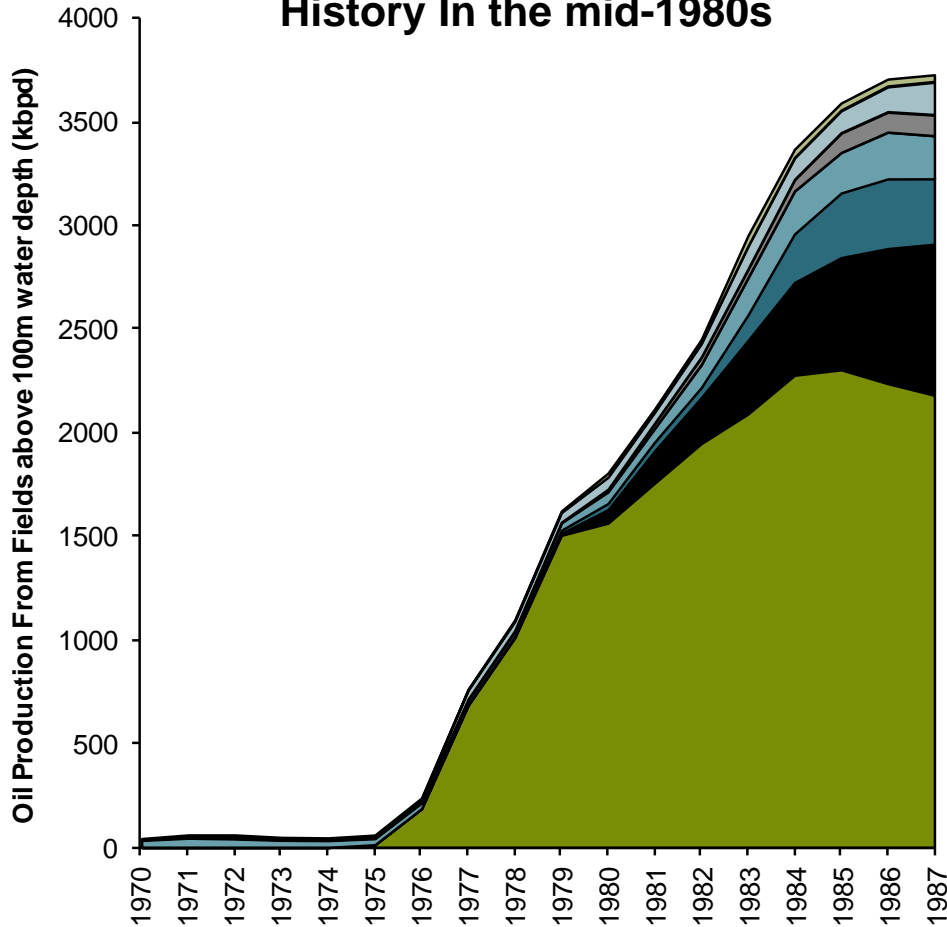
Production from Different Categories of Water Depth (1970-2012)



Source: Rystad Energy, Bernstein Analysis

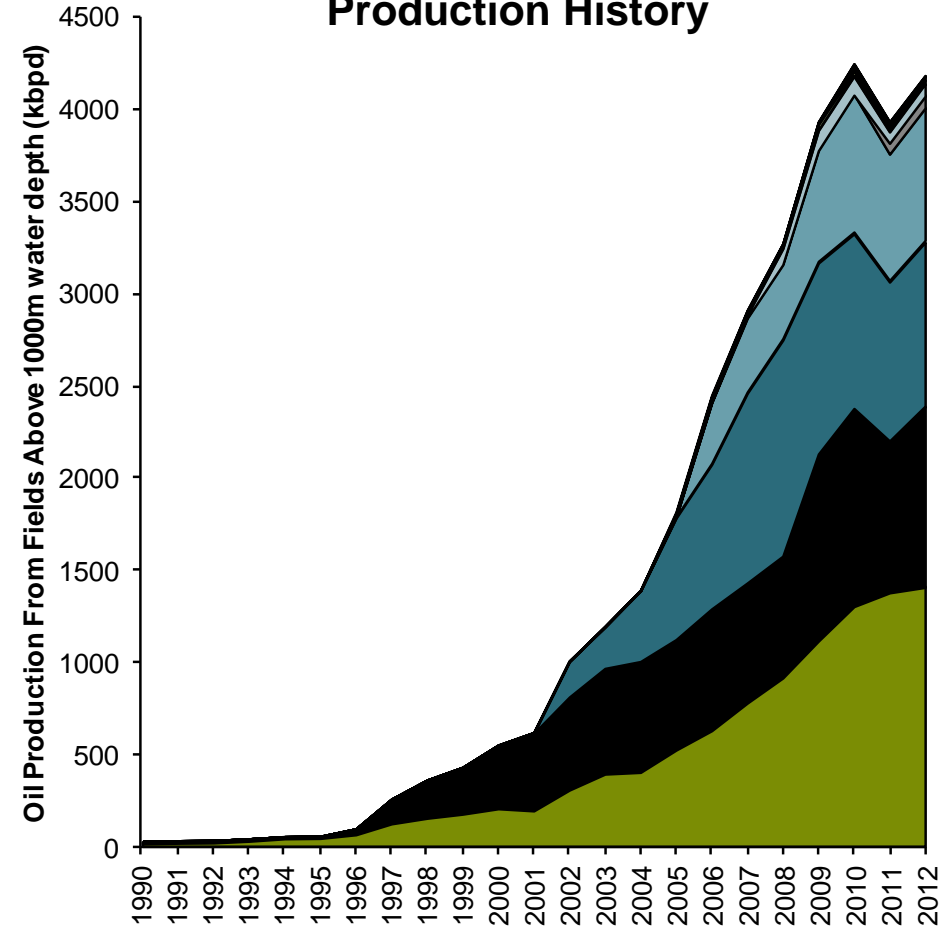
Is deepwater oil production today like offshore production in the mid-80s?

Offshore (>100m) Oil Production History In the mid-1980s



United Kingdom ■ Norway ■ Brazil ■ United States ■ Azerbaijan ■ Other

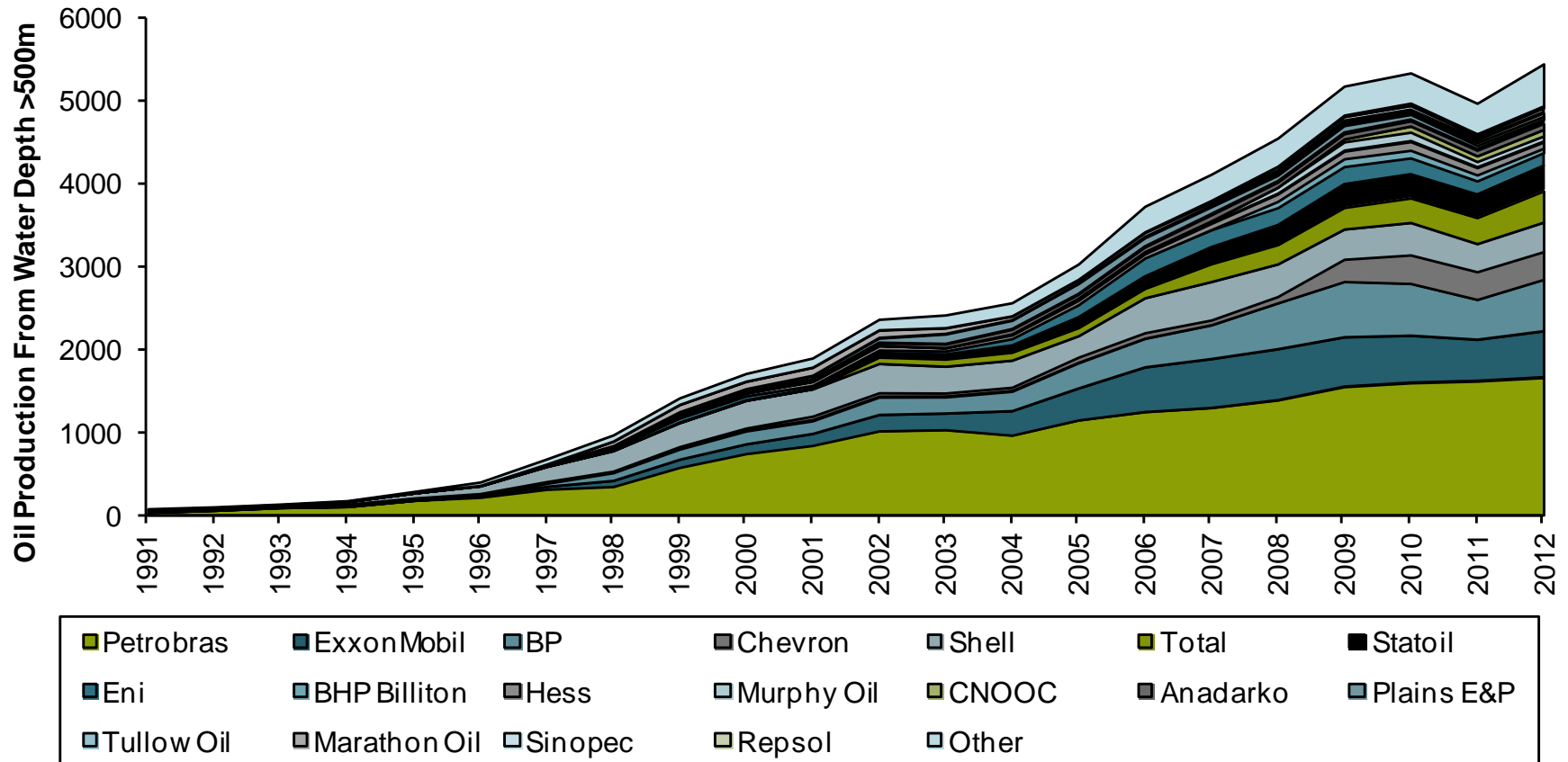
Deepwater (>1000m) Oil Production History



■ Brazil ■ United States ■ Angola ■ Nigeria
 ■ Ghana ■ Malaysia ■ Cote d'Ivoire ■ India
 ■ Congo ■ Indonesia

Source: Rystad Energy, Bernstein Analysis

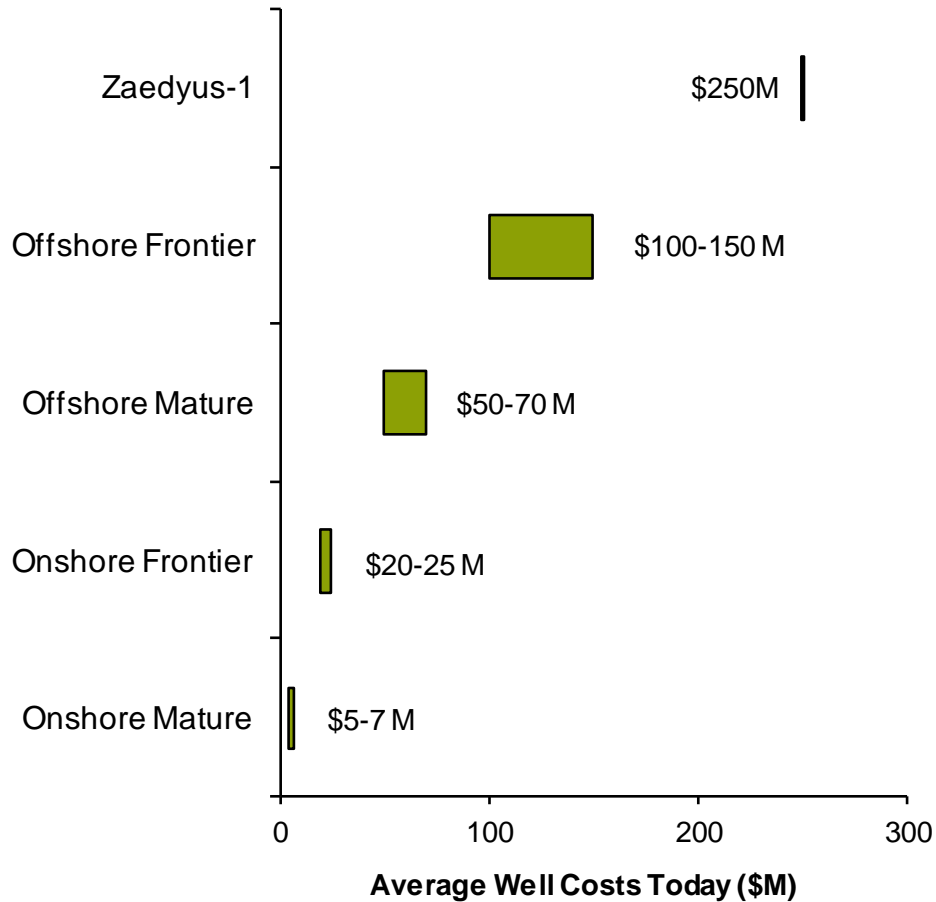
Deepwater oil production remains the realm of the Majors



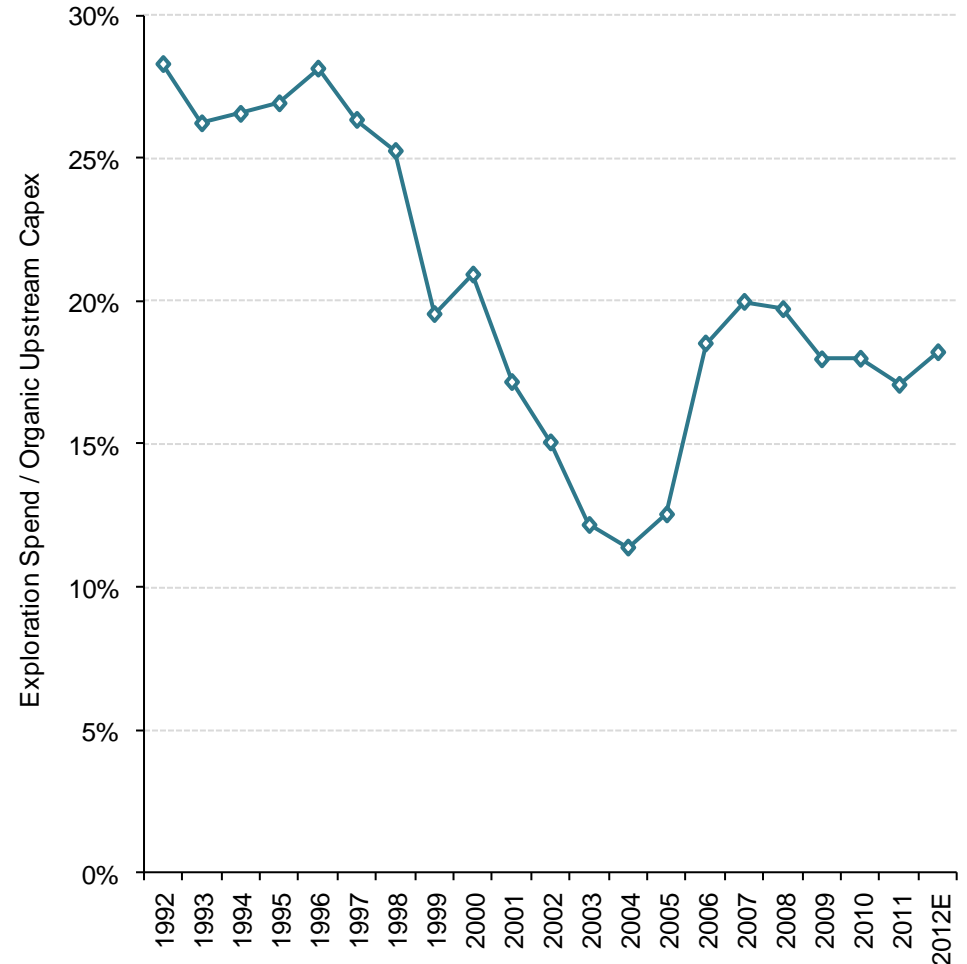
Source: Company reports and Bernstein Analysis

Offshore exploration and development may be more expensive than onshore, but the Majors want to do more of it

Costs of Onshore vs Offshore Exploration



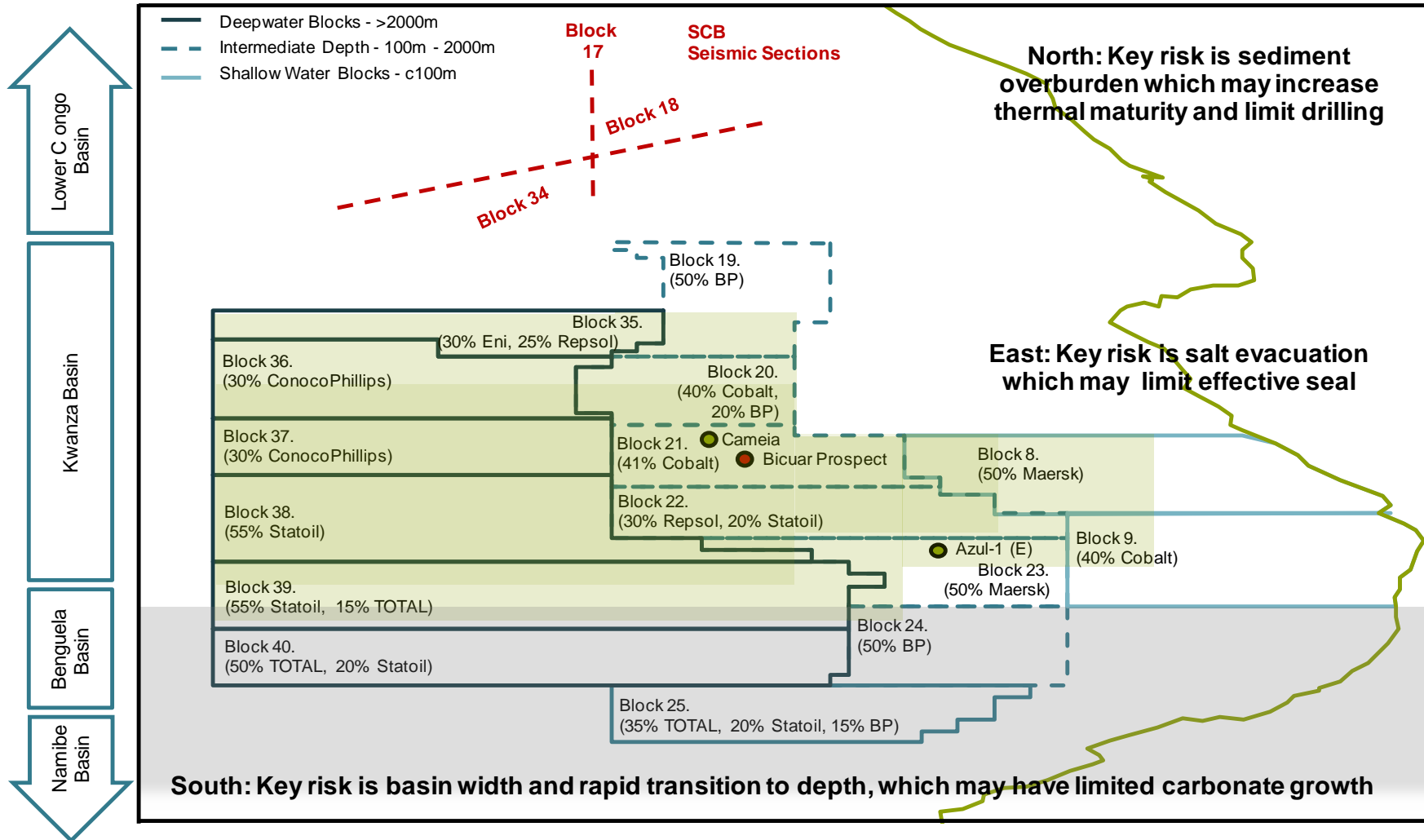
European Integrations' Spending on Exploration as a % of Upstream Capex



Source: Company Reports, Bernstein Analysis

The Majors have rushed in to secure sub-salt Angolan acreage

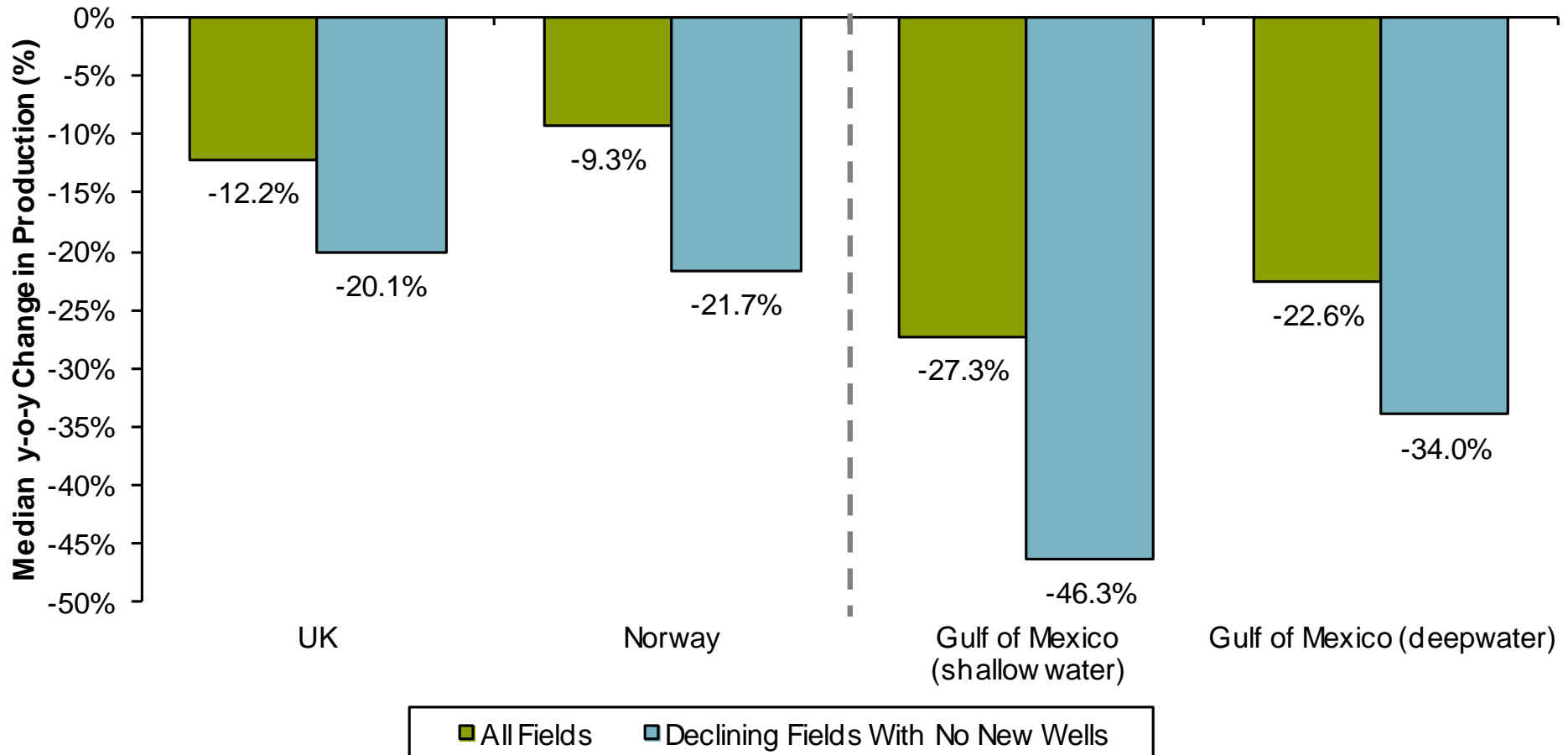
Kwanza Basin Pre-Salt Acreage By Holder



Source: Sonangol, Company Reports, Bernstein Analysis

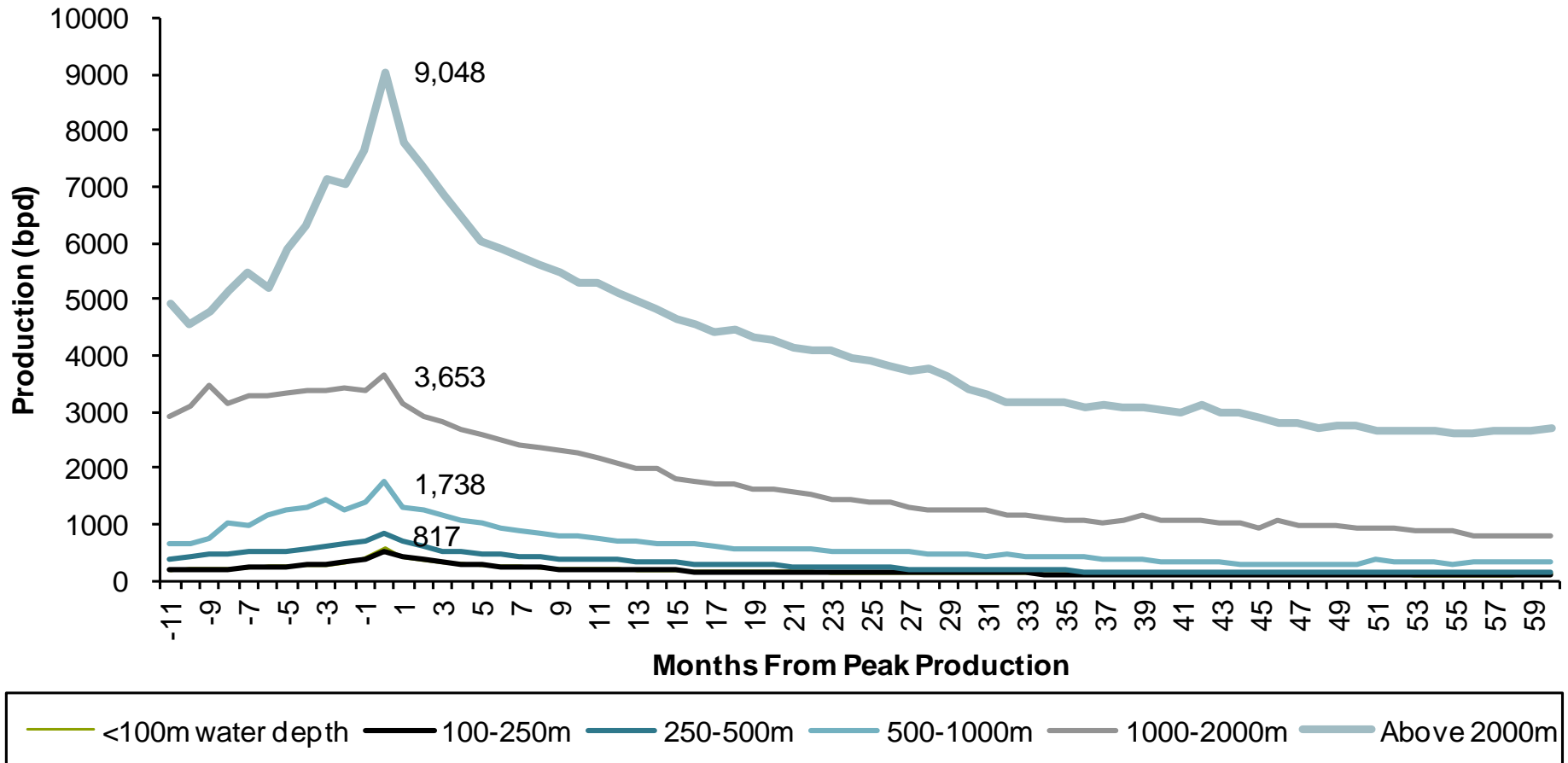
Deepwater developments are associated with high decline rates – though it varies by basin

Average Decline Rates By Basin



Source: BOEM, DECC, NPD, Bernstein Analysis

Production profiles from GoM wells categorized by water depth

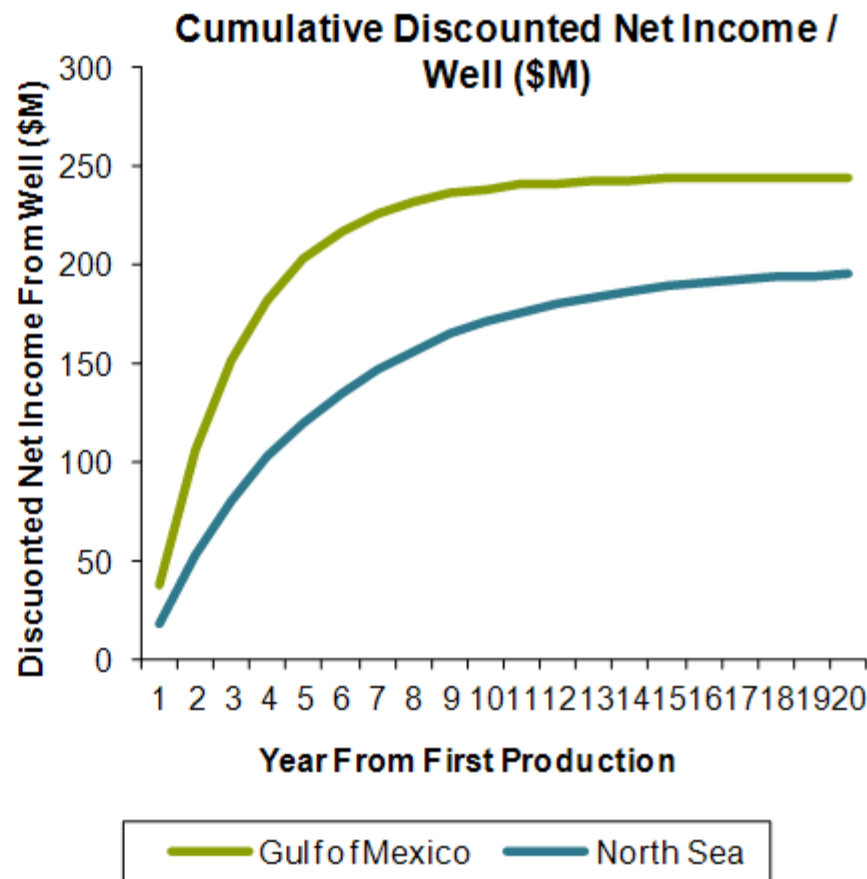
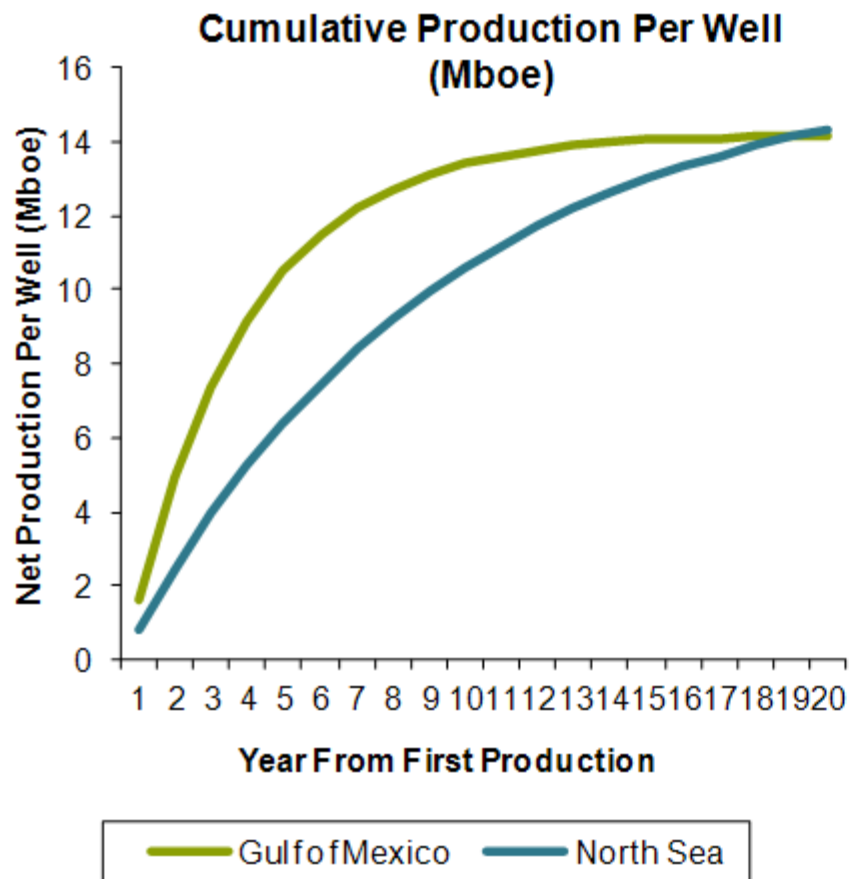


Source: BOEM, Bernstein Analysis

The “peakier” production profile of a GoM well is actually more valuable than that of a lower-peak:lower-decline North Sea counterpart

GoM wells have higher production and higher decline rates, so each barrel is recovered sooner on average...

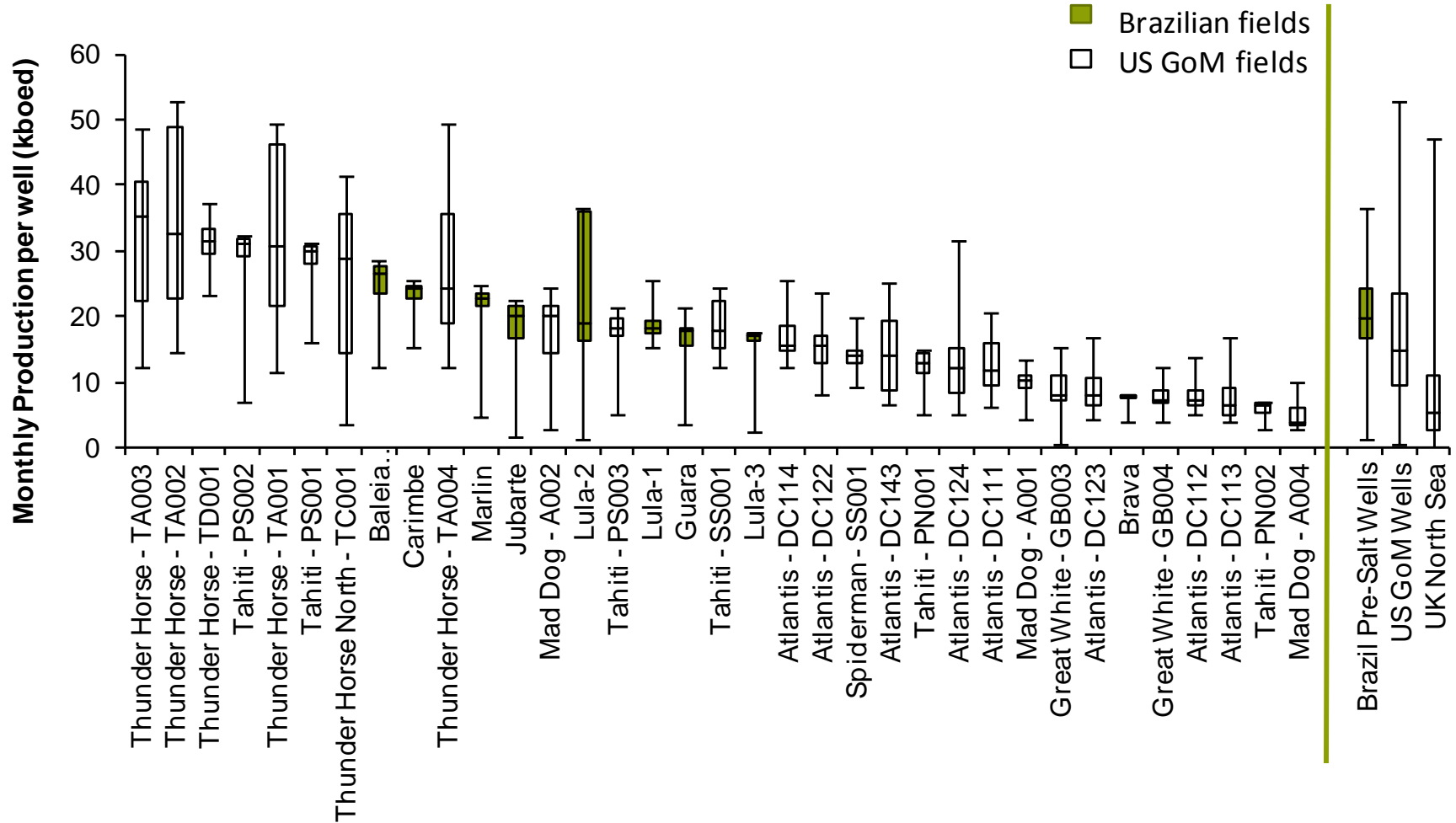
...The maths of discounting cash flows therefore yields a higher discounted stream of income for the GoM



Source: BOEM, DECC, Company Reports, Bernstein Analysis

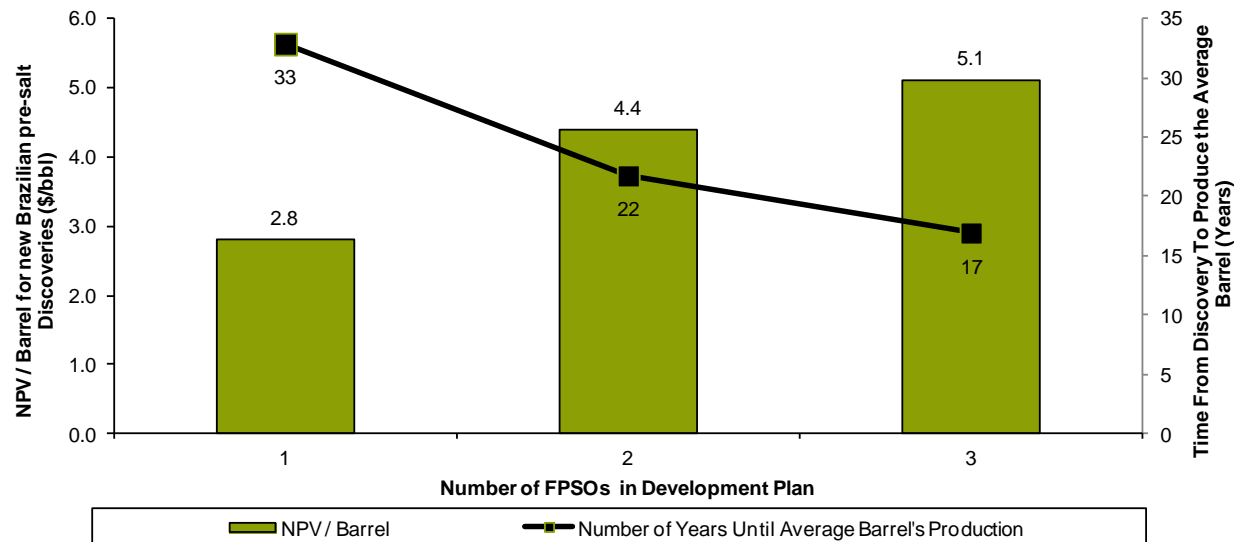
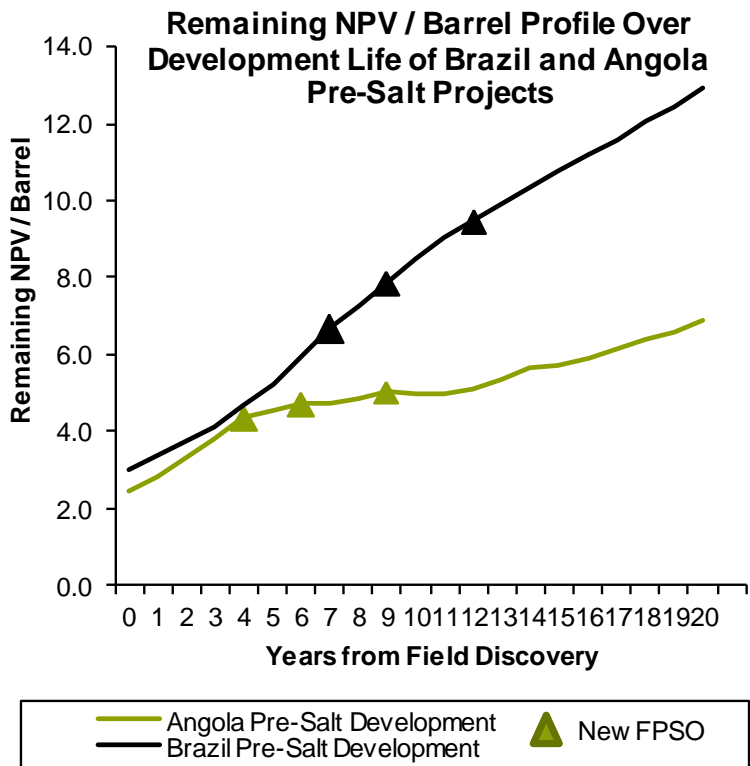
Source: BOEM, DECC, Company Reports, Bernstein Analysis

Compared with US GoM deepwater / subsalt Phase I production wells, Brazil's pre-salt has 5kbpd faster flow rates and less variability in output



Source: Pre-salt.com, Company reports, BOEM, Bernstein estimates

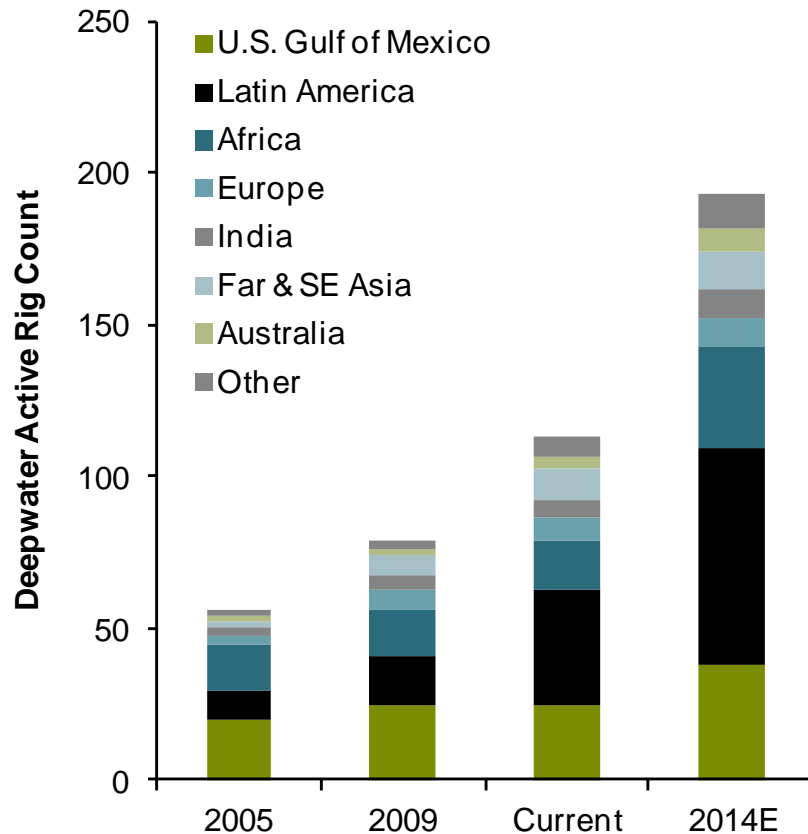
NPVs of deepwater developments such as Brazil can be highly attractive, especially if FPSO deployment is rapid and flow rates remain strong



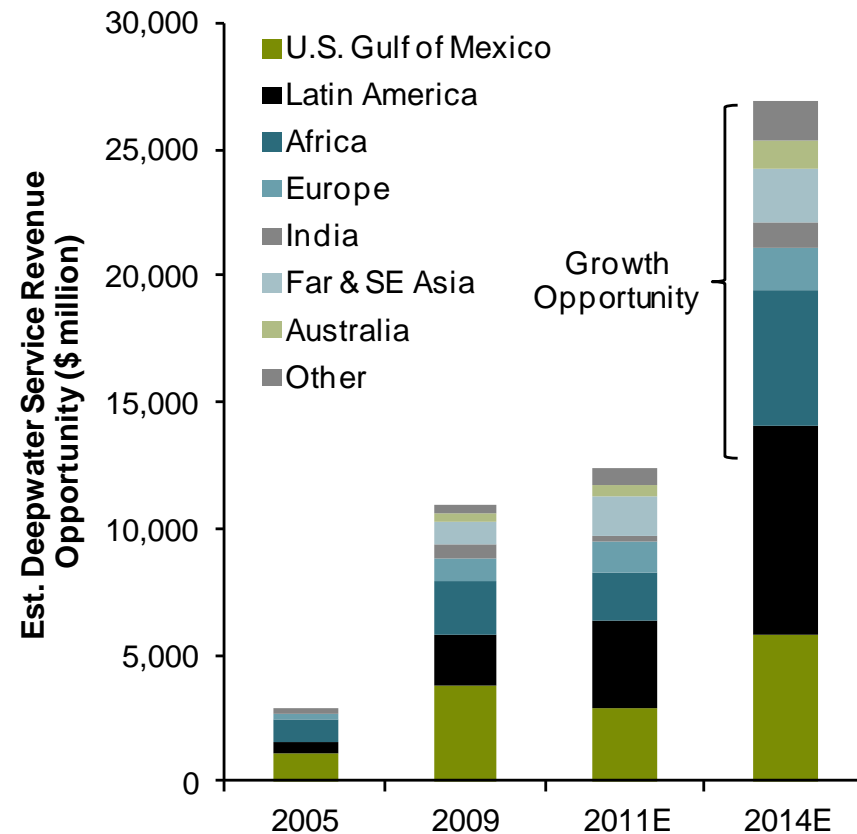
Deepwater Revenue Opportunity

- Based on normalized deepwater rate of \$400,000/day and 95% utilization, we estimate the deepwater revenue opportunity for oil services industry to rise to \$27 B in 2014

Deepwater Rig Count by Region



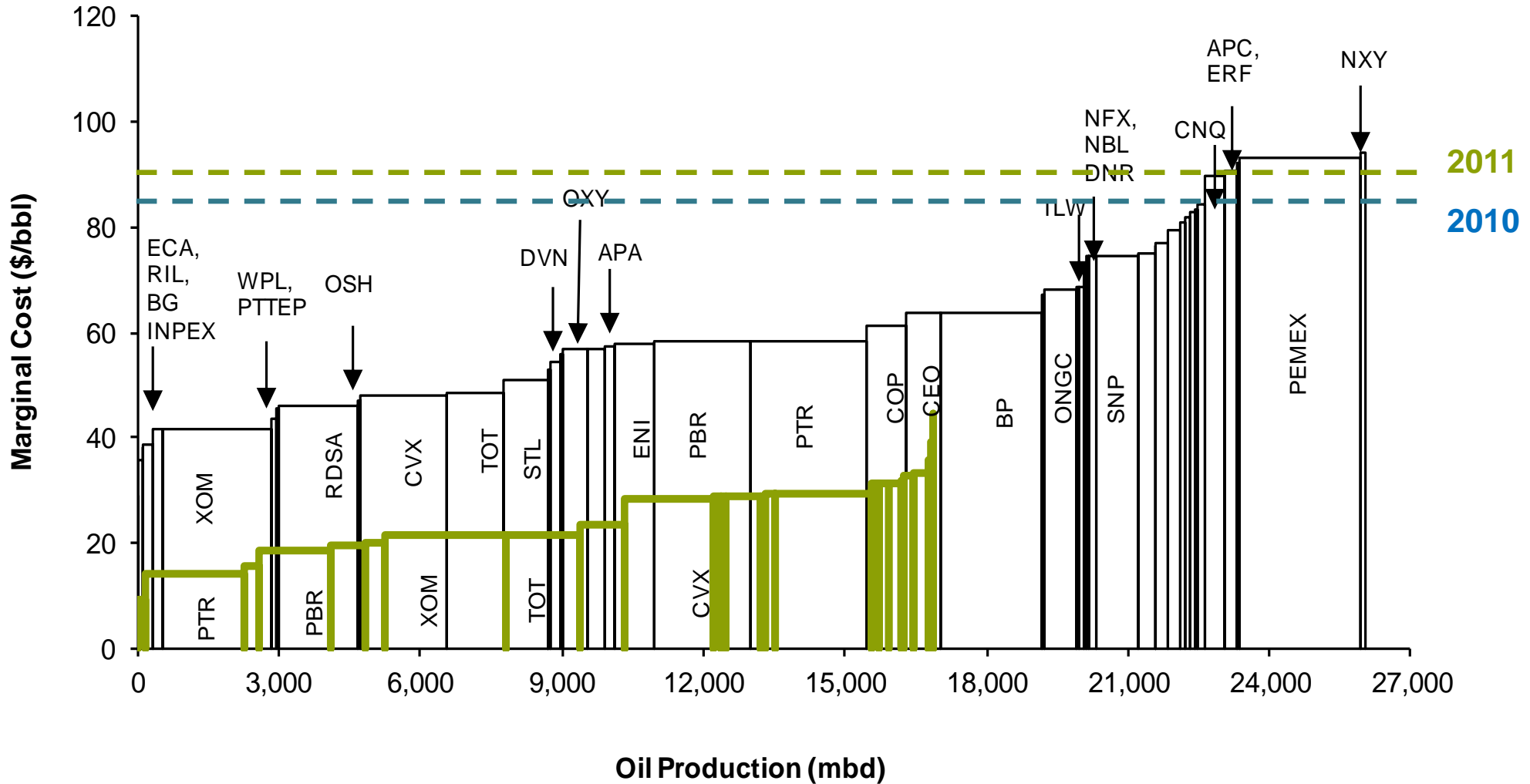
Estimated Deepwater Revenue Potential for Services



Source: ODS-Petrodata and Bernstein estimates

The Marginal Cost of Supply is the best predictor of oil prices justified by the fundamentals and was c\$90 / barrel in 2011

Marginal Cost of Supply Curve



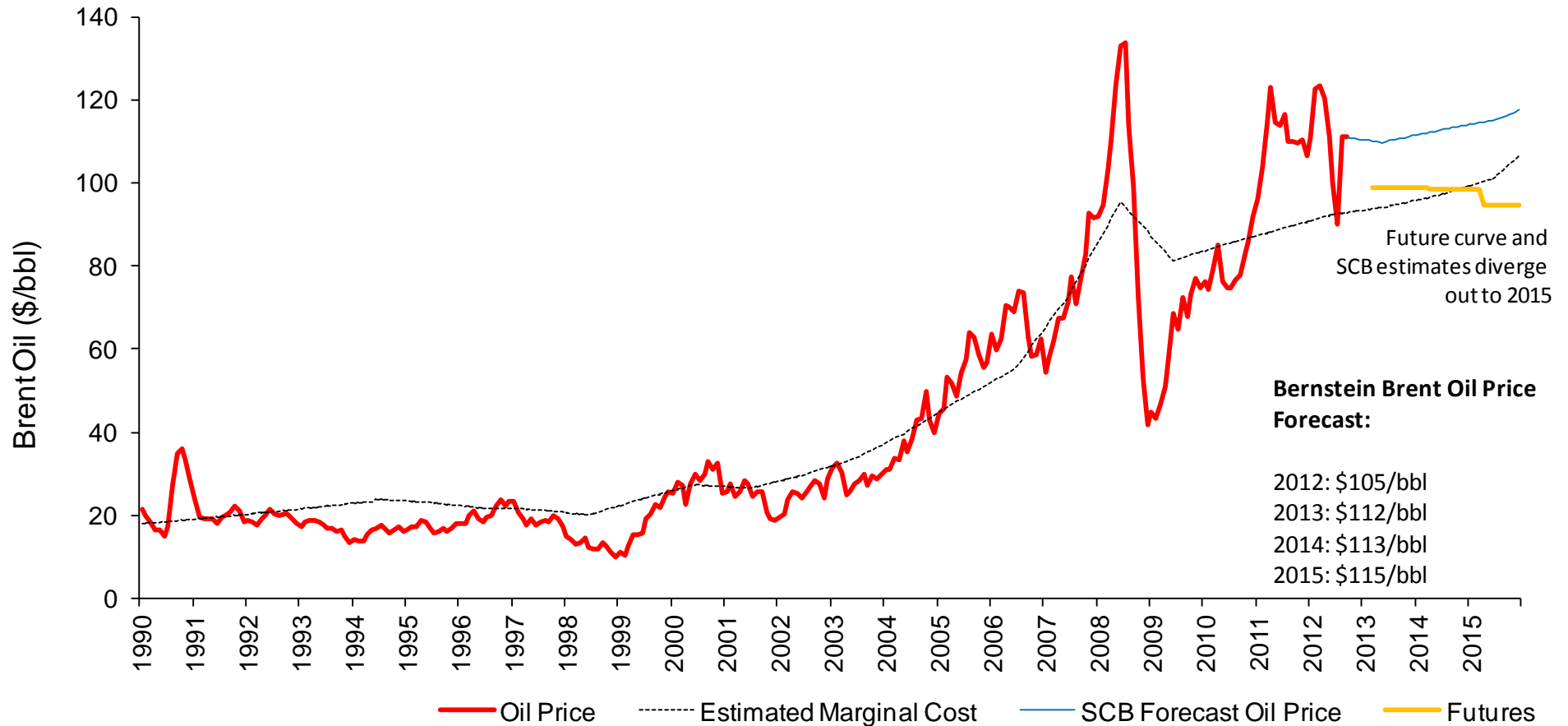
Source: Company Reports, Bernstein Estimates

The marginal cost of oil production has risen 14%/yr for the past decade

US \$/bbl	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	10Yr CAGR
WTI	25.96	26.17	31.06	41.51	56.59	66.09	72.23	99.92	61.99	79.51	95.05	14%
Brent	24.40	25.02	28.87	38.32	54.51	65.42	72.71	97.69	62.04	79.73	111.05	16%
Revenue	14.33	15.70	19.62	28.66	38.24	44.89	48.75	60.97	40.93	51.93	65.64	16%
Resalization Spread	10.07	9.32	9.25	9.66	16.27	20.53	23.96	36.72	21.11	27.80	45.41	16%
Production Costs	3.51	3.97	4.76	6.10	7.71	9.15	10.53	16.78	13.32	16.73	21.14	20%
Exploration Expense	0.63	0.63	0.68	0.82	0.92	1.27	1.70	1.91	1.85	1.78	1.99	12%
DD&A	2.61	3.38	3.55	4.54	5.07	6.04	7.18	8.76	8.40	9.22	9.86	14%
SG&A & Other	0.54	0.87	0.73	1.10	1.72	1.56	1.89	2.40	2.15	1.89	2.89	18%
Income Tax	2.97	2.96	3.89	8.50	11.91	13.93	14.44	14.36	6.82	10.21	13.41	16%
<i>Implied CT Rate</i>	42%	43%	39%	53%	52%	52%	53%	46%	45%	46%	45%	
Net Income	4.07	3.90	6.00	7.59	10.92	12.94	13.02	16.76	8.40	12.11	16.36	15%
<i>Net Income Margin</i>	28%	25%	31%	26%	29%	29%	27%	27%	21%	23%	25%	
Unit Costs	7.29	8.84	9.73	12.57	15.41	18.02	21.30	29.85	25.72	29.61	35.88	17%
Organic F&D Costs	5.10	5.79	6.55	10.32	12.67	13.32	16.54	20.22	10.94	15.76	17.45	13%
RRR (3 Year Average)	130%	132%	119%	114%	101%	105%	101%	98%	108%	115%	129%	
Cash Flow (Pro-Forma)	7.31	7.90	10.24	12.95	16.91	20.25	21.89	27.43	18.65	23.11	28.20	14%
FCF	0.60	(1.35)	1.84	2.35	2.70	1.42	2.50	3.19	(0.30)	(3.74)	2.84	17%
Capex	6.71	9.26	8.40	10.60	14.21	18.83	19.39	24.24	18.95	26.85	25.36	14%
Re-Investment Ratio	92%	117%	82%	82%	84%	93%	89%	88%	102%	116%	90%	
Marginal Cost	25.30	29.50	36.27	45.17	57.55	54.39	63.81	96.14	67.80	83.23	92.26	14%
Cash Cost	9.69	9.72	12.45	15.00	21.66	23.04	24.35	32.36	24.02	28.87	39.65	15%
WTI/ Marginal Cost	1.03	0.89	0.86	0.92	0.98	1.22	1.13	1.04	0.91	0.96	1.03	
Brent/ Unit Cost	3.35	2.83	2.97	3.05	3.54	3.63	3.41	3.27	2.41	2.69	3.10	

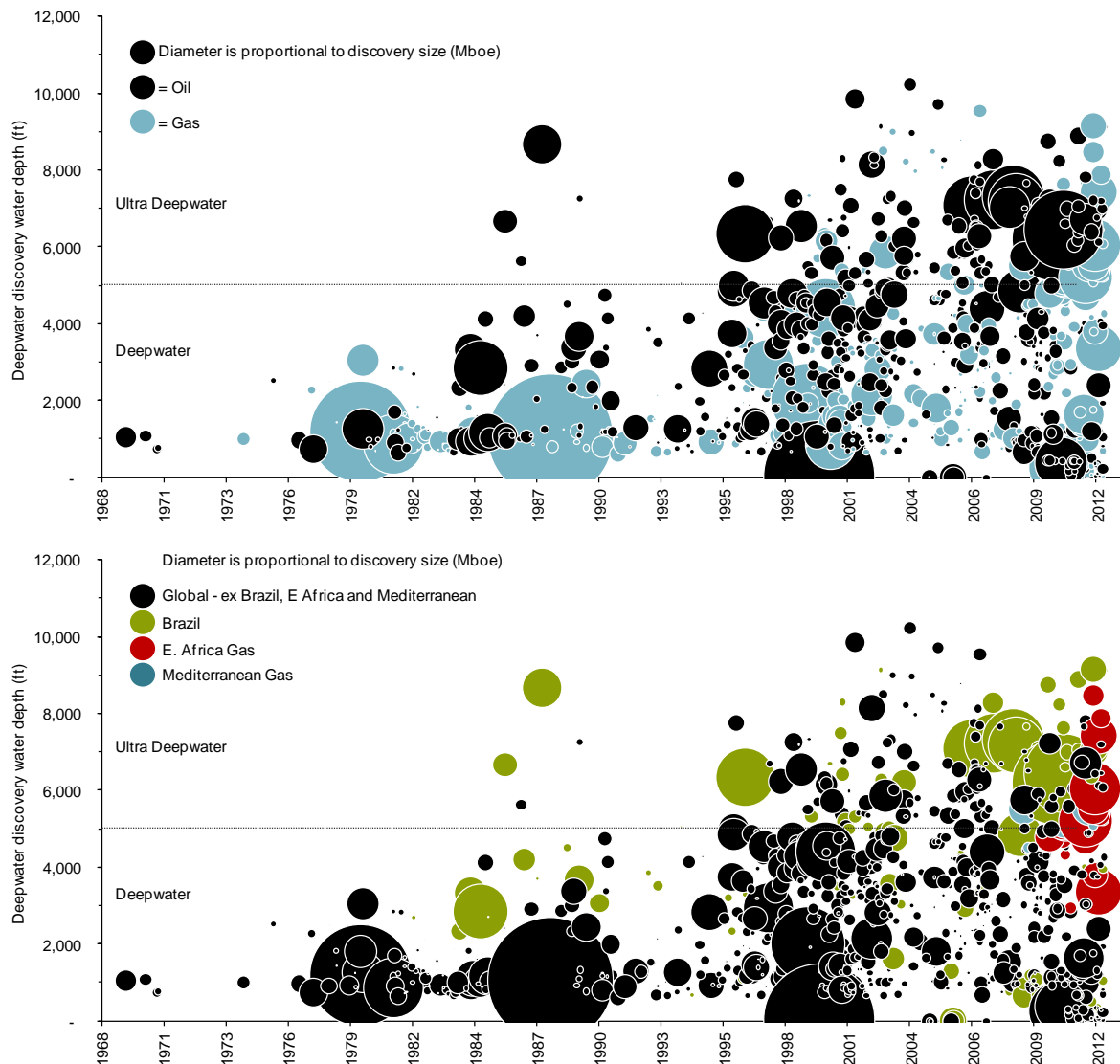
Source: Company Reports, Bernstein Estimates

Oil Prices Should Continue Their Upward Trend From Here



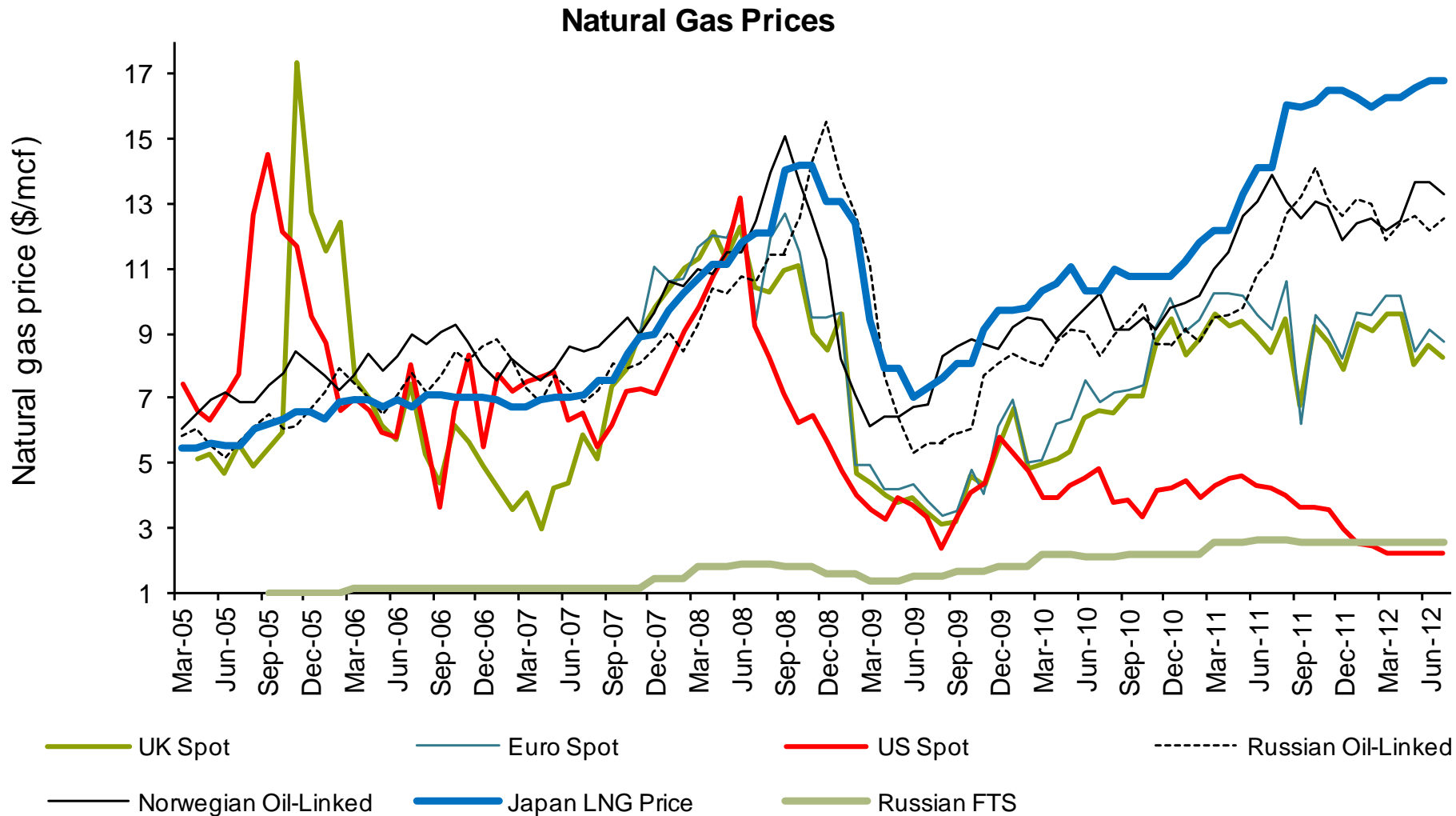
Source: Bloomberg and Bernstein estimates

While deepwater exploration investment and success has risen, it is increasingly about natural gas



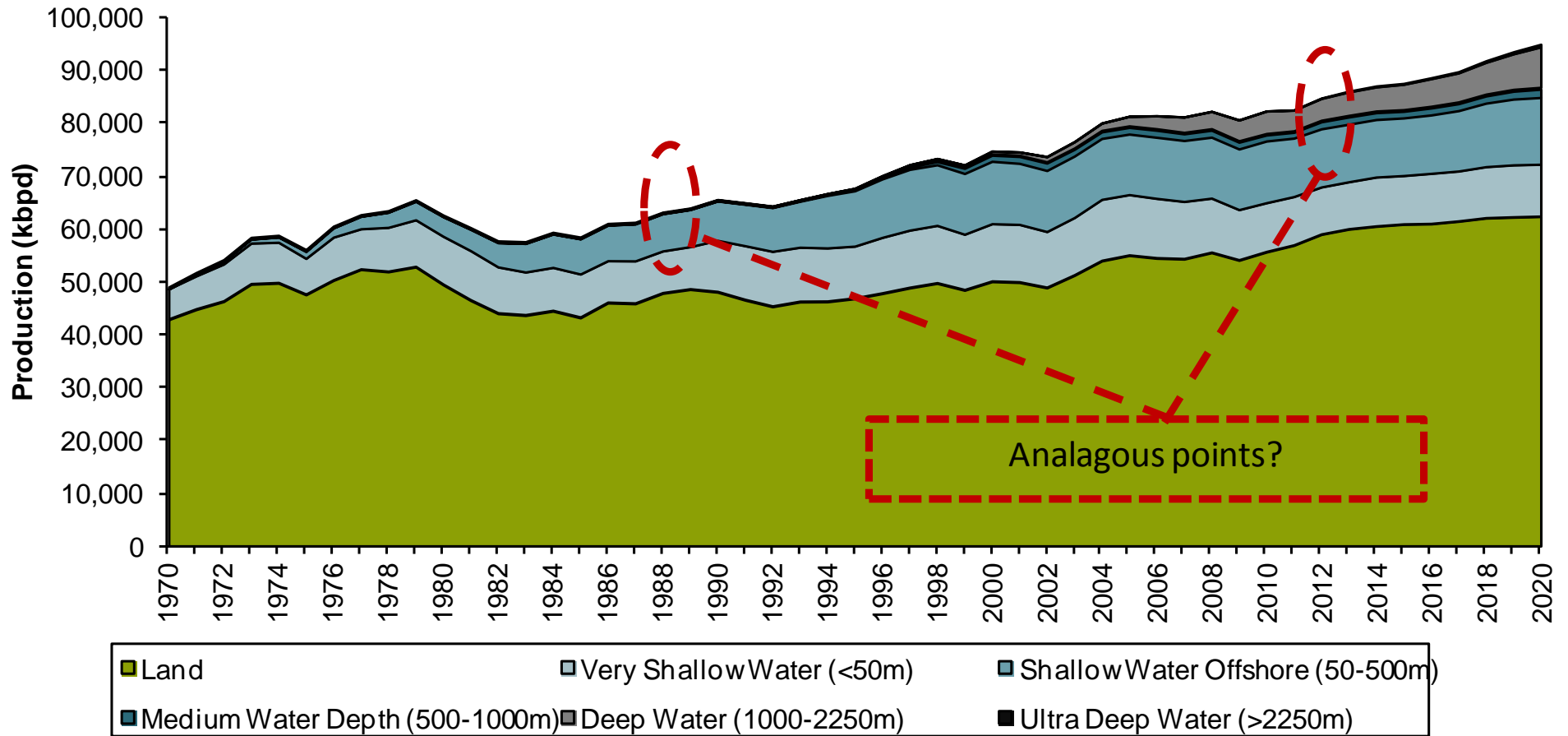
Source: IHS, Press reports, Company reports and Bernstein Analysis

If gas prices stay at these elevated levels in Asia and Europe then companies are still willing to develop these resources



Source: IHS, Press reports, Company reports and Bernstein Analysis

The Future of Deepwater Production



Source: Company reports and Bernstein Analysis

Disclosure Appendix

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Market-Perform: Stock will perform in line with the market index to within +/-15 pp in the year ahead.

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