



Reinventing Exploration

Bain O&G Perspective

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Reinventing Exploration:

The context for change in exploration has reached a critical point, the luxury of looking through cycle to better times is no longer realistic

- The world has moved from resource scarcity to abundance
- Mega greenfield oil and LNG projects are delayed or cancelled
- The 'new economics' for Deepwater oil in particular are fragile
- Some of the industry's best exploration talent is under employed...

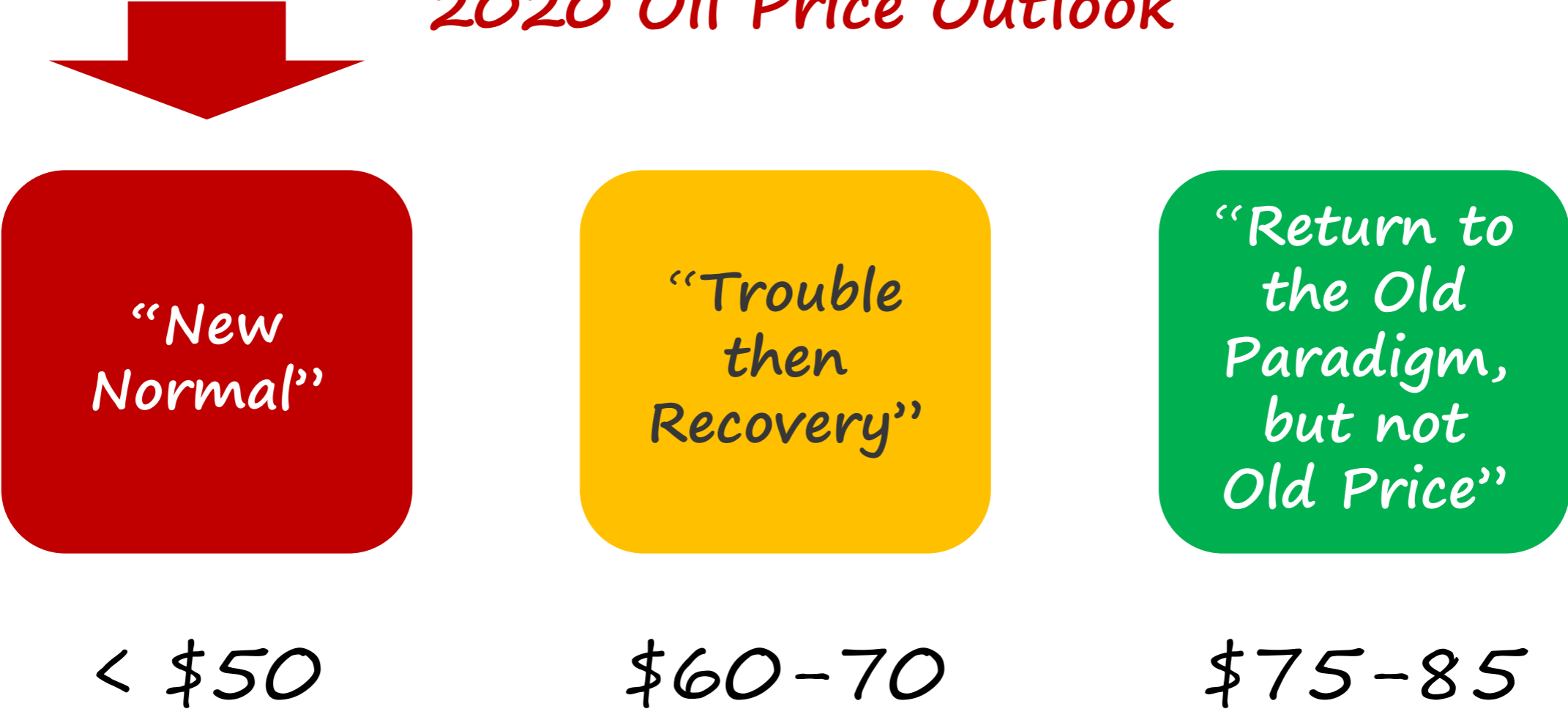


The degree and now duration of the changed upstream oil and gas industry situation suggests we are highly unlikely to return to the past exploration modus operandi



Where is oil price heading? Supply driven scenarios

2020 Oil Price Outlook



Source: Bain Oil & Gas



Reinventing Exploration: Oil and gas price weakness driving profound change

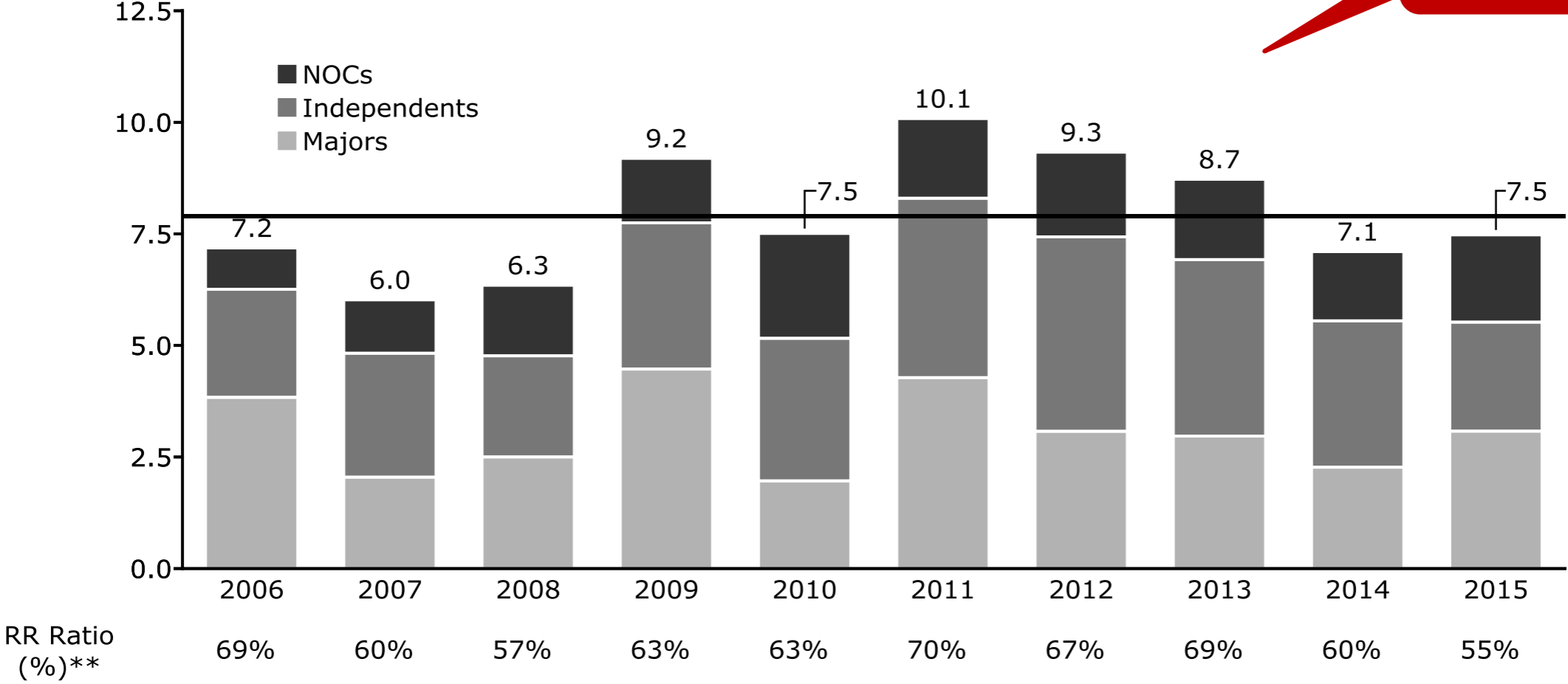
- Capacity contraction, headcount reductions 10-40%, CAPEX 25% and Opex 12% YoY reductions 2014-16, Exploration 50% down
- Challenged, below breakeven operational delivery but in places asset productivity up by as much as 15% (UK North Sea)
- Capacity contraction and headcount reductions continue... challenged HSE
- Further capital expenditure reductions required for those with weak balance sheets and cash flow concerns. NOC IPO speculation
- New field development economics evident, but fragile not yet resilient
- Activity shifting from long cycle (3-5 years) to short cycle (1-2 years)
- Gas prospects and markets very changed, sombre LNG mood, new entrants and new value chain collaborations changing the game
- M&A market remains difficult to conclude transactions



HISTORY: Leading explorers* added 80bnboe through extensions and discoveries 2006-15

Reserve Additions through Extensions and Discoveries
(Billion boe)

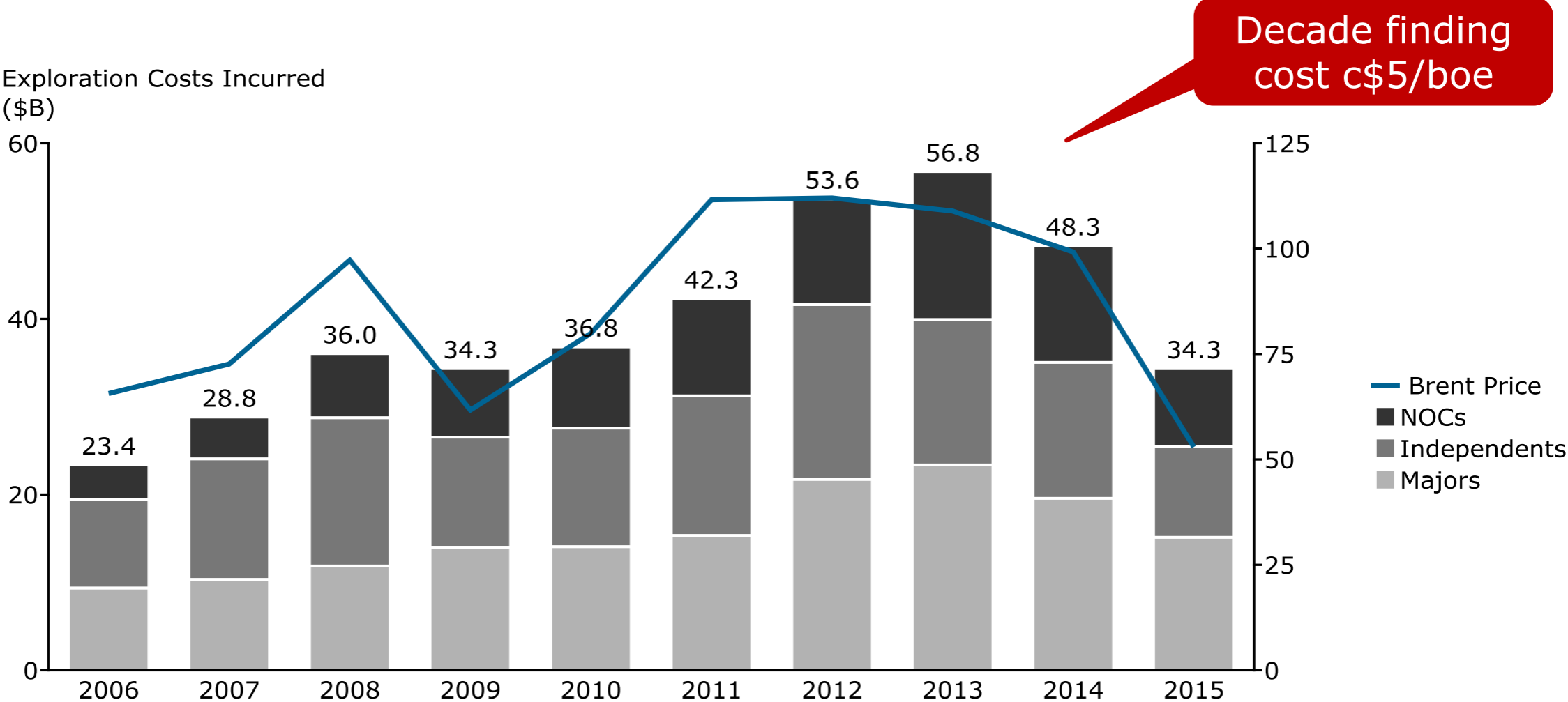
Decade average
63% RRR



Note: *Industry Group is comprised of BP, Chevron, ExxonMobil, Shell, Total, Rosneft, PEMEX, Petrobras, CNOOC, Anadarko, Apache, BHP Billiton, Chesapeake, ConocoPhillips, Devon Energy, ENI, Statoil, Lukoil and Marathon Oil; ** Extensions & Discoveries over Total Oil & Gas Production (3 year weighted average).

Source: Bain Oil & Gas Benchmarking Database

HISTORY: The group incurred decade total \$395bn Exploration costs reacting quickly to oil price changes, c\$5/boe



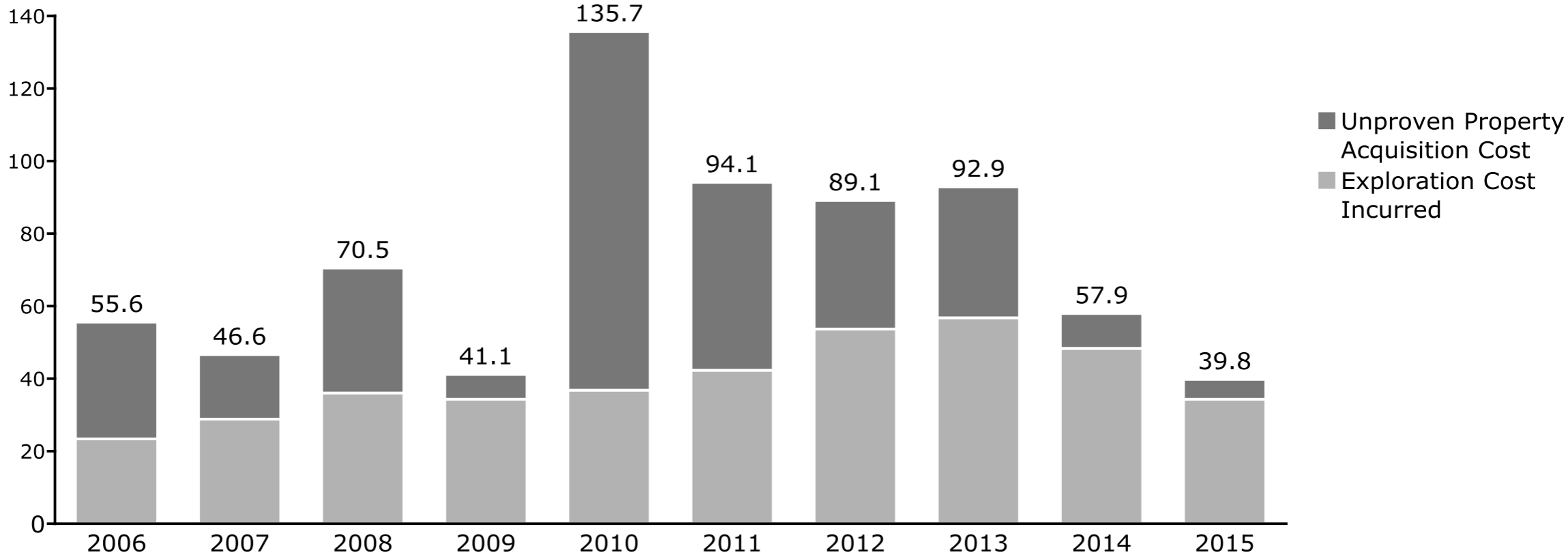
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Source: Bain Oil & Gas Benchmarking Database

HISTORY: Unproven property acquisition costs push decade industry exploration investment to \$720bn, rapid '14- '15 decline

Decade finding cost c\$9/boe

Exploration Cost Incurred and Unproven Property Acquisition Cost (2006-2015, \$B)

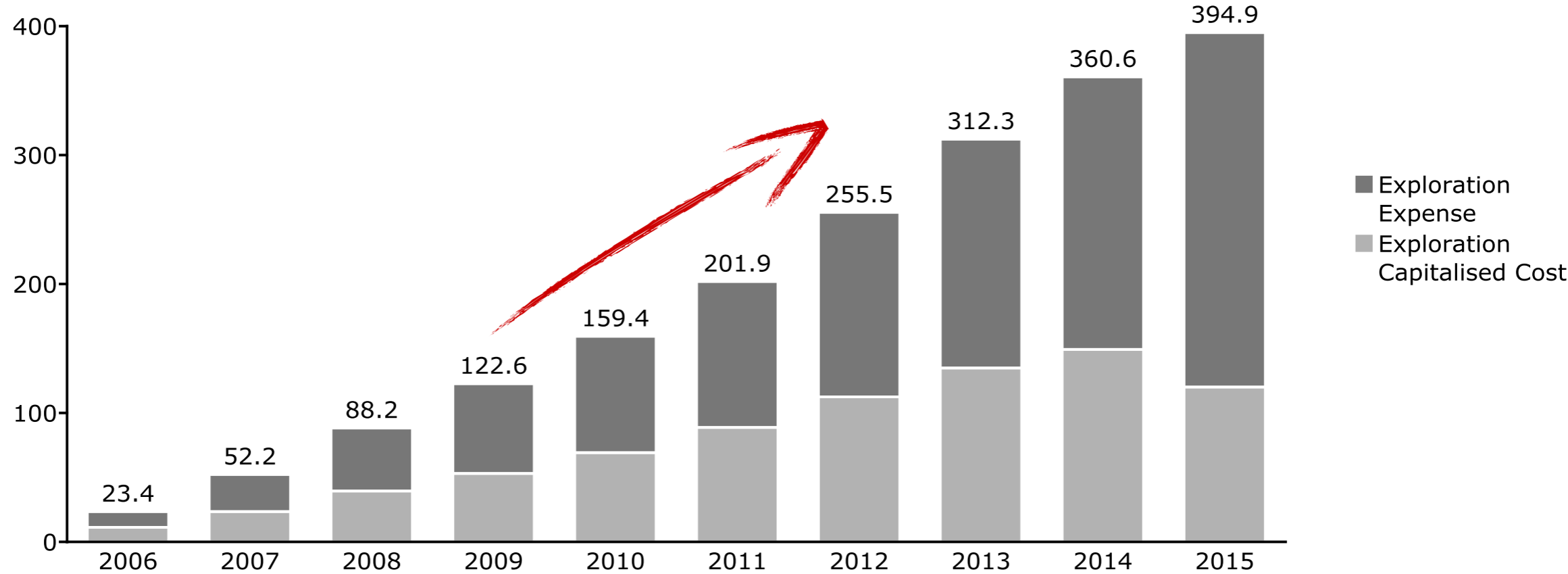


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Source: Bain Oil & Gas Benchmarking Database

HISTORY: Cumulatively, industry expensed 70% of exploration costs incurred since '06, with \$120bn on the balance sheet

Cumulative Exploration Capitalised Cost and Expense (\$B)



Note: *Industry Group is comprised of BP, Chevron, ExxonMobil, Shell, Total, Rosneft, PEMEX, Petrobras, CNOOC, Anadarko, Apache, BHP Billiton, Chesapeake, ConocoPhillips, Devon Energy, ENI, Statoil, Lukoil and Marathon Oil

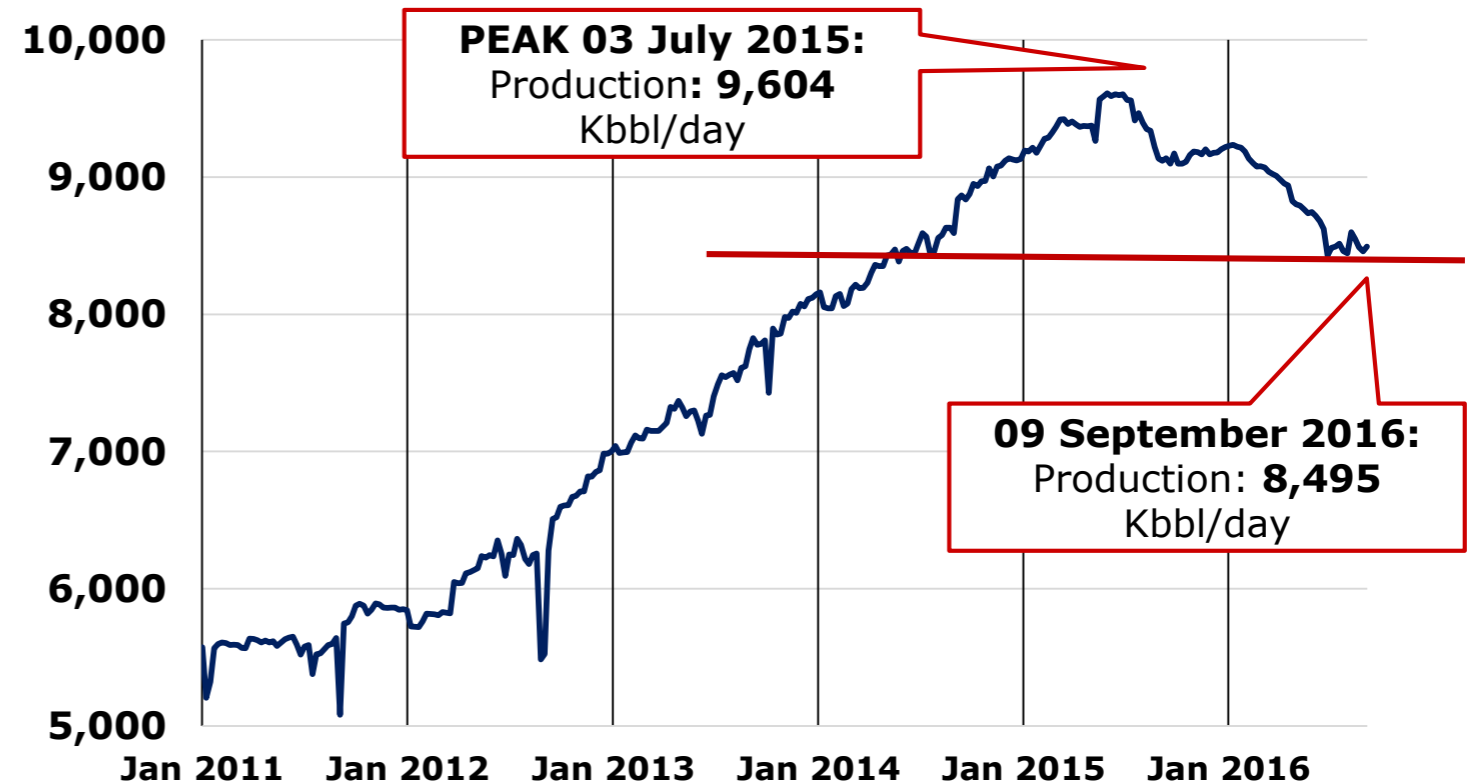
Source: Bain Oil & Gas Benchmarking Database



Shifting Activity Levels: US oil production a year of decline after a five years of ramp up

- Industry keenly watch US oil activity and production levels
- Oil Rig Count: 416 units early September 2016
 - 1,609 in Oct 2014 - highest figure since reports started
 - Average number of oil rigs in 2015: 759
- Natural Gas rig count: 89 units early September 2016
 - All-time high of 1,606, reached in late summer 2008
 - Average 2015 natural gas rigs: 226

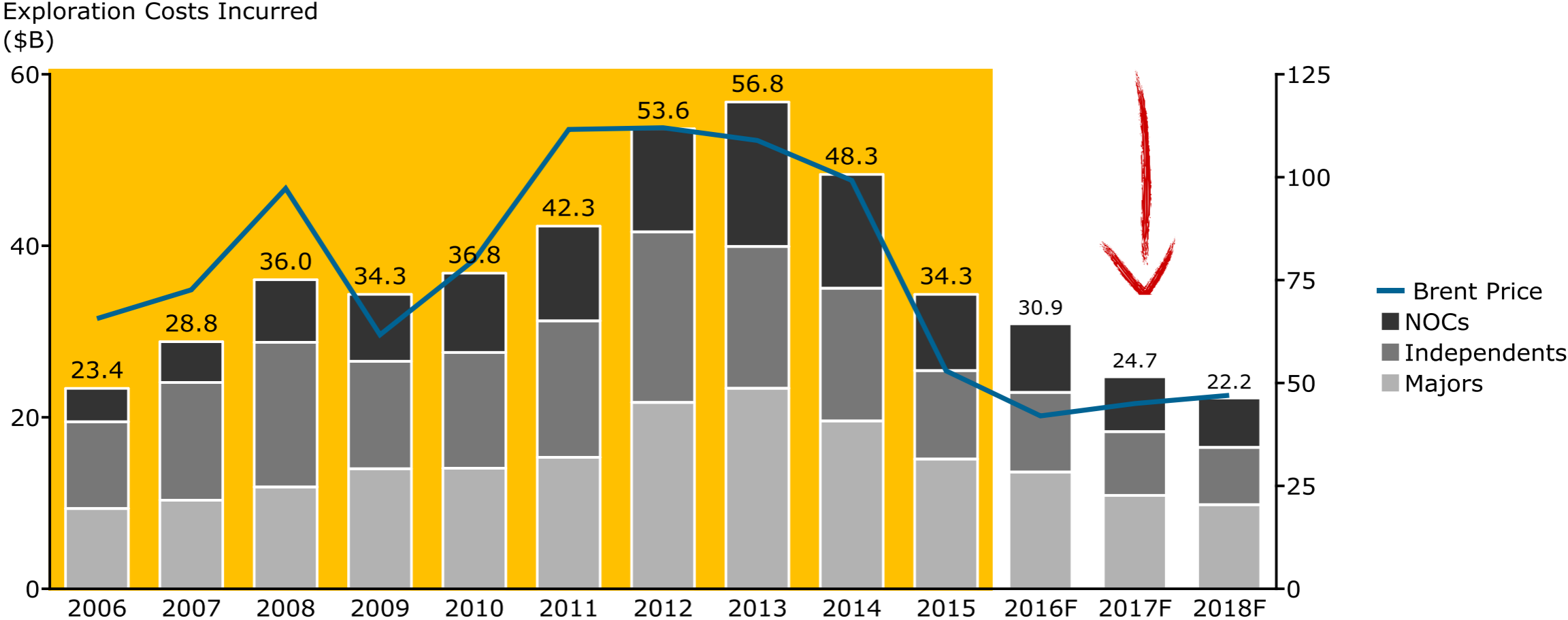
WEEKLY U.S. FIELD PRODUCTION OF CRUDE OIL (THOUSAND BARRELS PER DAY)



Source: Baker Hughes, EIA



FUTURE: With sustained low oil prices, exploration affordability will likely fall below 2006 spend levels by 2018: **BUT** can it remain productive?



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Source: Bain Oil & Gas Benchmarking Database

FUTURE Reinventing Exploration: To survive and thrive Exploration teams will need to operate very differently in the next five years

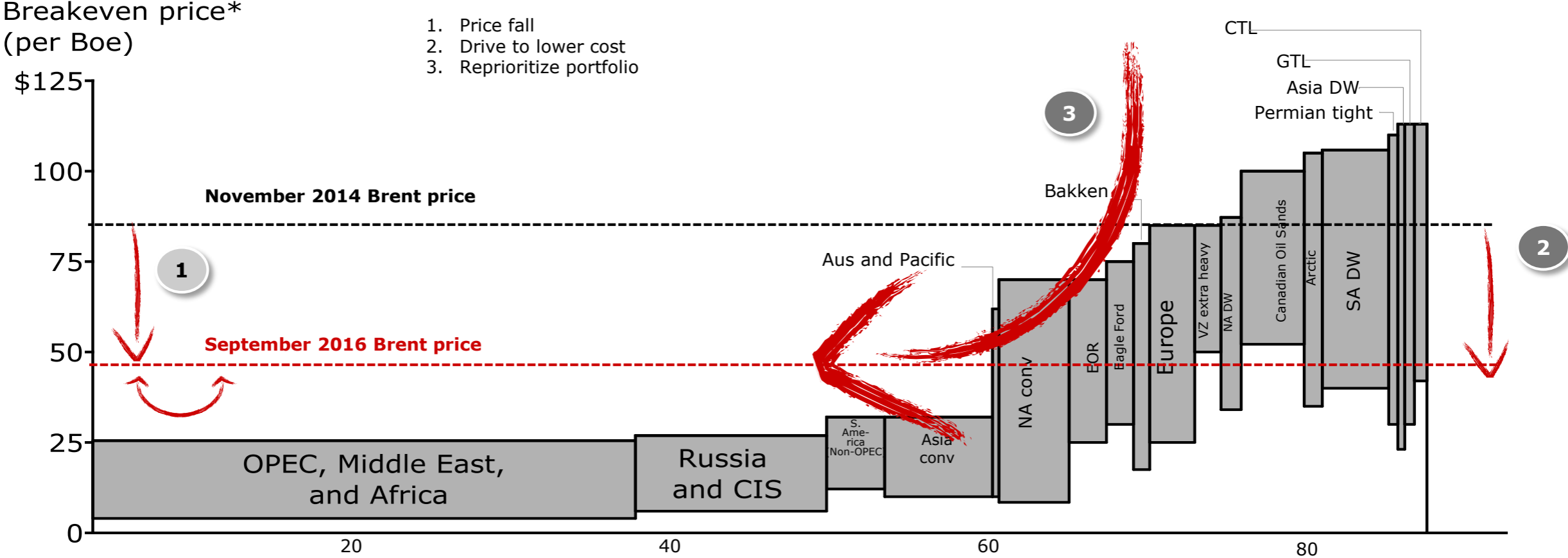
- a. Reset the exploration mission and business objectives, move away from contingent resource add, put de-risked P1 projects on the conveyor belt
- b. Redefine exploration risk, value, investment appetite and cost structure (in a new normal oil price and deflated activity cost environment)
- c. Define real portfolio needed to drive value; clean 'up or out' long term or newly stranded exploration assets. Re think mega prospects
- d. Create operating and deliver on plans that drive the right kind of exploration activity and link to development and operations teams
- e. Identify and invest in capabilities and alliances that really add value
- f. Build operating models to meet short cycle goals and mid term efficiency

Source: Bain Oil & Gas



FUTURE Being Competitive: Exploration requirements, aim at the right place in the supply cost curve for oil, gas and LNG projects

Global oil production supply curve



Source: Bain Oil & Gas

FUTURE Being Competitive: Exploration requirements

STANDARDISE AND INTEGRATE



SHIFT TO SHORT CYCLE



COST EFFECTIVE AND EFFICIENT



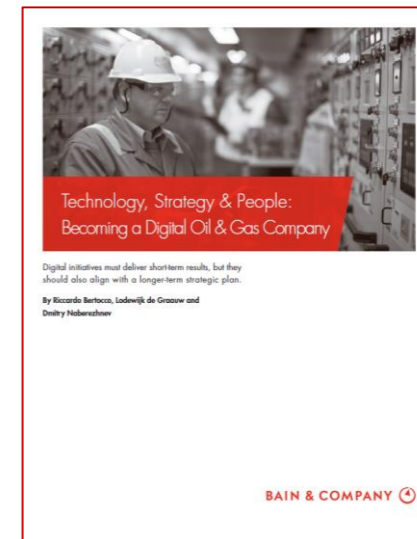
SPEED AND REDUCED COMPLEXITY



DIGITAL INNOVATION



*Examples: Aerospace,
Engineering, Power,
Retail, Insurance and
Hospitality sector
disruptors*



Source: Bain Oil & Gas



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