CNPC RIPED 60th Anniversary

The Transformation of E&P

Whole Basin Strategies targeting known reservoirs and searching for source rock

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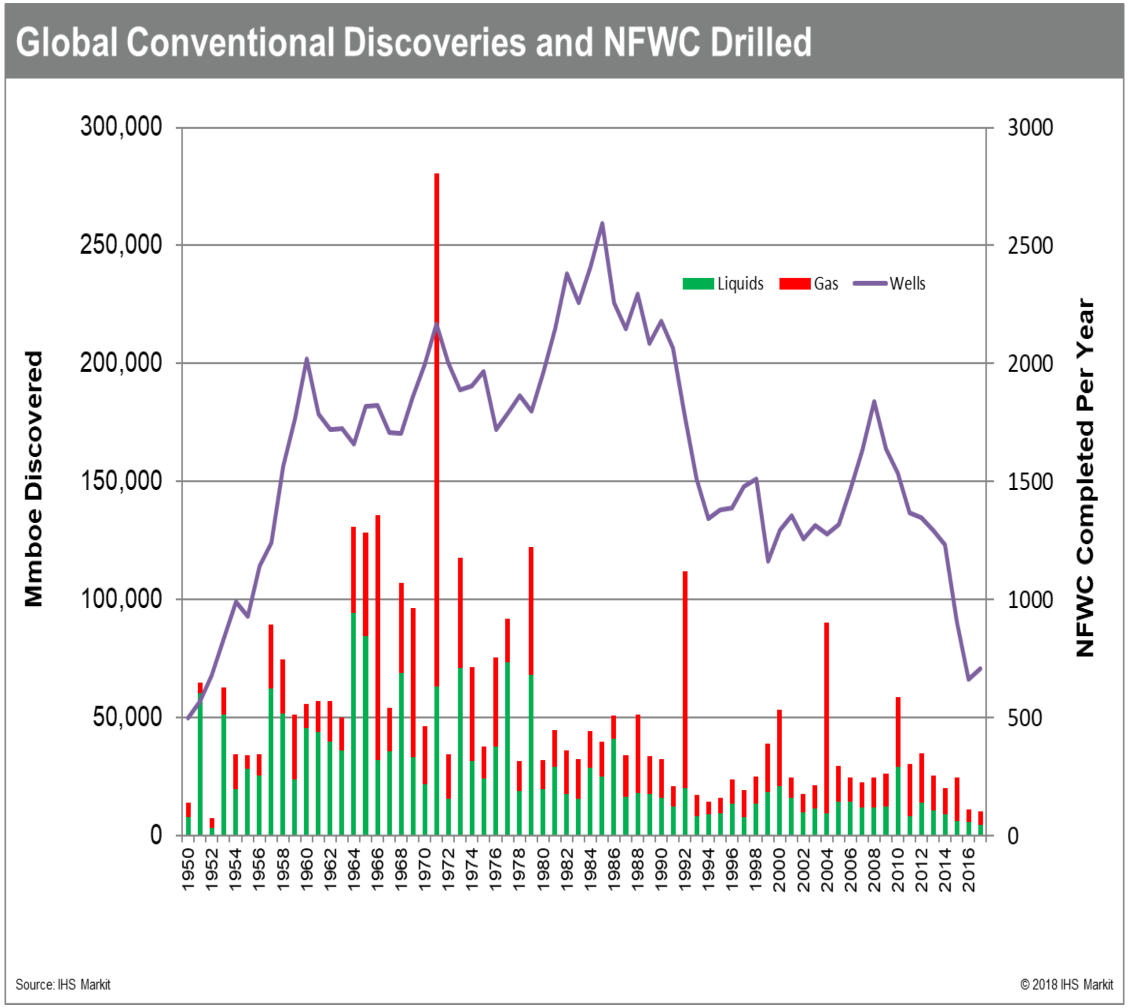
Jerry Kepes, Executive Director, Upstream Research
jerry.kepes@ihsmarkit.com

New Field Wildcats and discoveries lowest since 1950’s

- 2016 and 2017 results clearly impacted by reduced drilling.
- Cost reduction only partially offsets effects of lower price.
- Many companies are focused on shorter cycle projects (see onshore US unconventionals) rather than exploration - deep water opportunities that involve longer term investment commitments.
- We do not anticipate a return to the higher level of conventional exploration seen in the 2000-2015 period.

What does the future in E&P look like?



* As of 4 July 2018, Conventional, 2P Estimated Recoverable Resources, Excludes Onshore and Shelf Lower 48 US and Canada Onshore. Source: IHS Markit Upstream E&P

The best time for Explorers, but for most others, the choice is

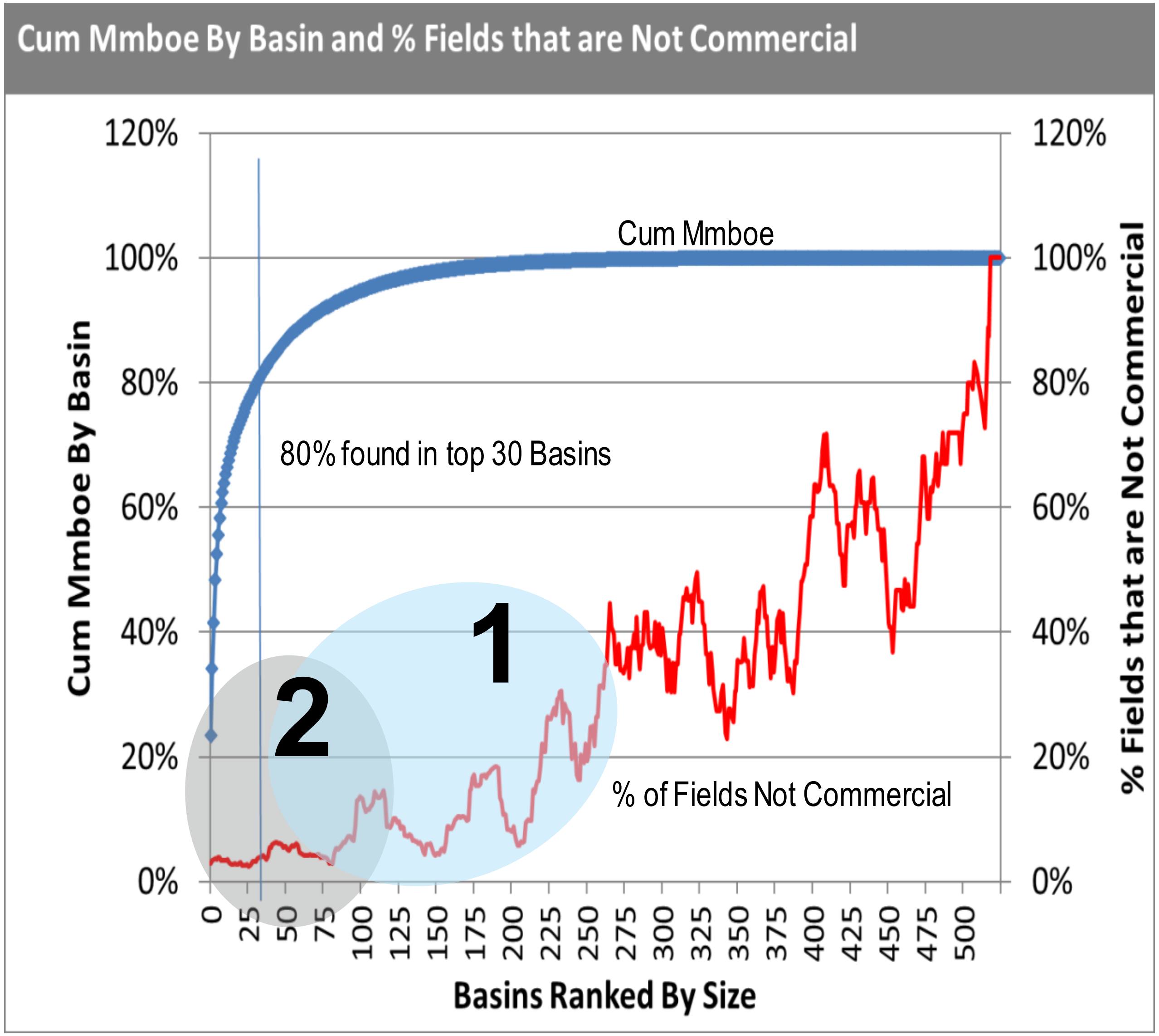
Stepping back:

- Basin quality varies greatly - 80% of recoverable resources found in top 30 basins.
- Remaining 500+ contain 20%
- These poorer basins have a higher proportion of non-commercial fields.

Two choices:

1. For explorers, the best time to explore is the next 10 years.
2. For most others, the choice of Whole Basin Strategies.

Globals and large International NOCs will pursue both



Objective: convert more of the world's discovered resources to reserves

Whole Basin Strategies

- Commercial and operational tool kit that targets multiple petroleum systems and stacked reservoirs, with material reserves / resources.
- Strategic intent: exploit the full geographic and stratigraphic limit of the basin.
- Target larger basins with materiality, working petroleum systems, multiple reservoirs, existing infrastructure and service sector capacity. The largest of these are Super Basins.
- Targets include now largely depleted good-quality conventional reservoirs, un- and under-exploited shale and tight conventional reservoirs, where short cycle barrels may be developed and produced. Basins may have under-explored areas (see E&P openings).
- There is extensive data - knowledge of the geologic framework is greatest.

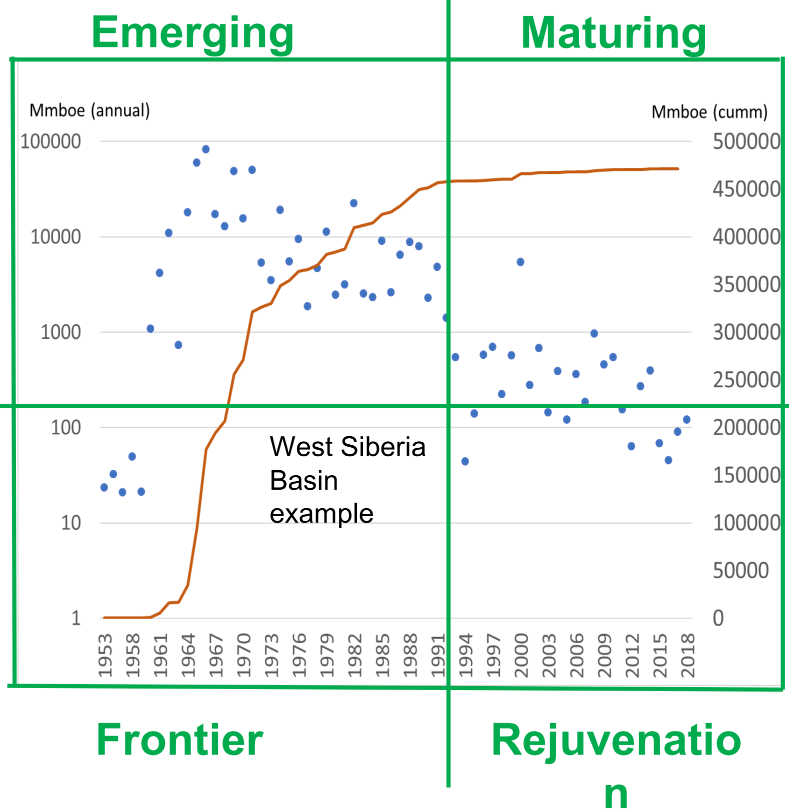
Convert more of the world's discovered resources to reserves by pursuing barrels from lower quality reservoirs, using cutting edge technologies in the process

Appendix

Fewer operators pursue larger potential in Frontier-Emerging phase basins*; more pursue incremental volumes in Maturing phase basins with big potential upside in basins with Rejuvenation potential

- Medium to larger Independents and NOCs (less extent Globals due materiality) target Emerging phase basins given higher entry cost.
- Success rate over 50% - 50 – 75% of potential found in this and frontier stage.

- Depending on asset quality, Globals to smaller specialist companies will target **Maturing** phase basins, which will be responsible for an increasing percentage of conventional volumes given portfolio shifts, cycle compression and existence of proximal infrastructure.
- Success rate 40% and dropping. Emphasis on recovery improvement.



- Global explorers and selective NOCs will target **Frontier** phase basins (esp. deepwater) due to prospect materiality and ability to build a substantial position.
- Success rate measured at 10% - better if signs of HC's and if certain geological elements are present.

- Specialist Independents drive transition to **Rejuvenation** phase – Significant increase in recovery due to unconventional drilling or IOR/ EOR practices. Can target tight, conventional resources not just unconventional resources.
- Preference for short cycle E&P exposure – favors known unconventional and conventional reservoirs proximal to infrastructure.

IHS Markit Customer Care

CustomerCare@ihsmarkit.com
Americas: +1 800 IHS CARE (+1 800 447 2273)
Europe, Middle East, and Africa: +44 (0) 1344 328 300
Asia and the Pacific Rim: +604 291 3600

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