

HASKAYNE
CASL

Canadian Centre for Advanced
Supply Chain Management and Logistics



OLIVER WYMAN

Four Emerging Supply Chain Themes for 2017

North American Shale

May 30, 2017



Introduction

Who is Oliver Wyman ?



FUN FACTS

Global Management Consultancy

2016 Revenue: ~\$1.6 Billion

Employees: ~3,500

Emerging Energy Vertical (~100)

Strong Horizontal SC Practice (~250)

Oliver Wyman offices

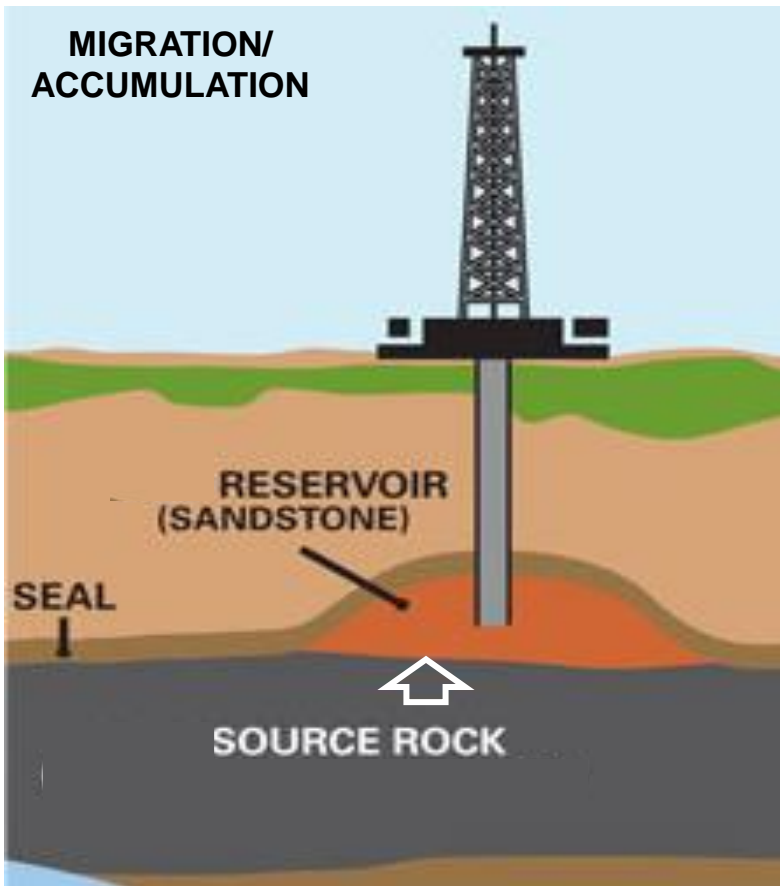
● Energy expertise

● Other Oliver Wyman offices

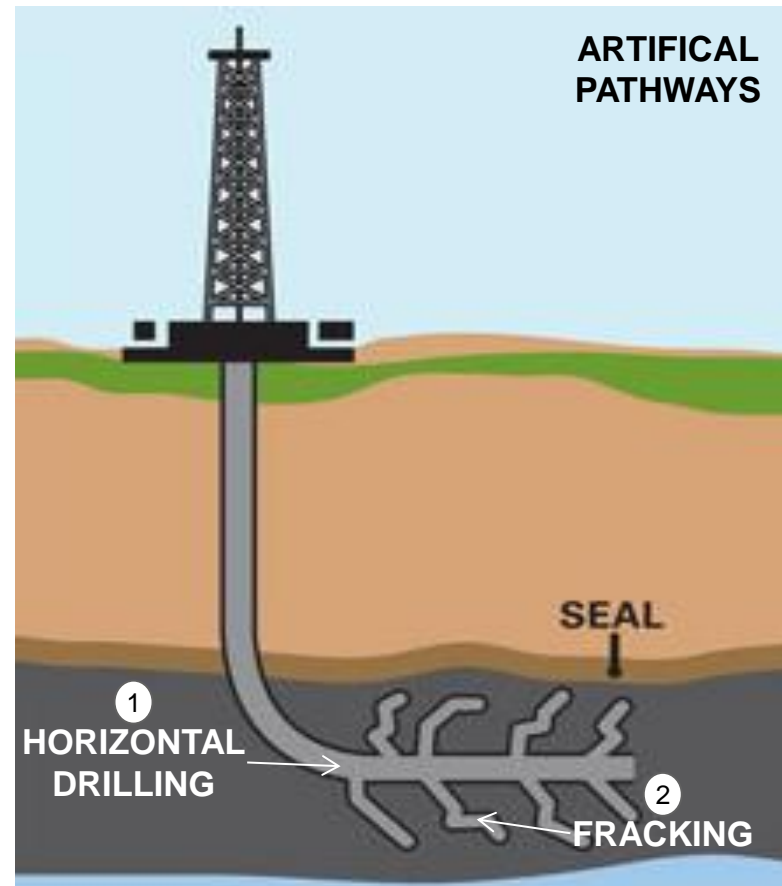
Recap: What is Shale ?

A technology play intended to exploit hydrocarbon bearing rock which is otherwise too impermeable to permit flow

Conventional Play



Unconventional Play



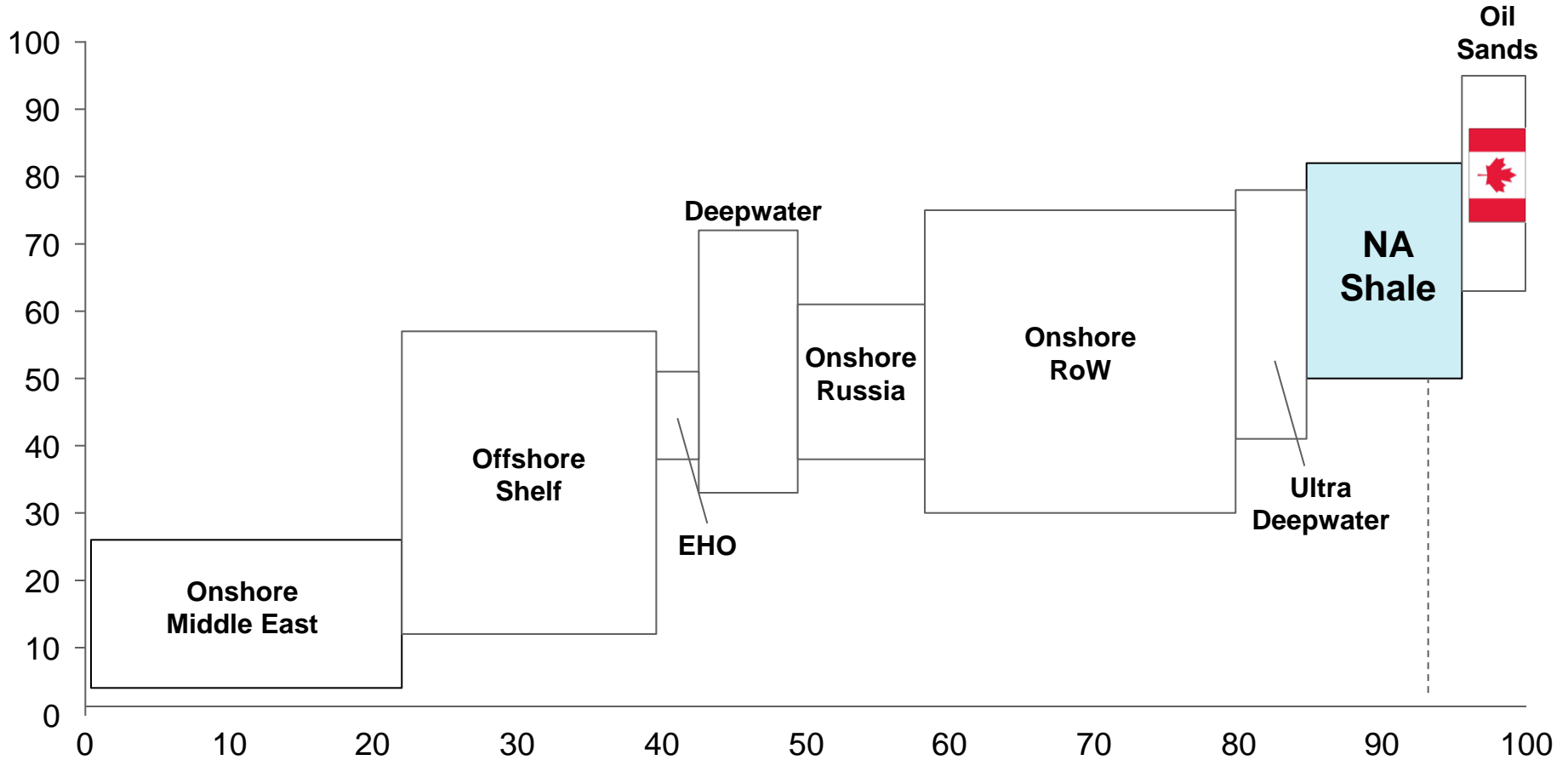
The simple idea is that if you don't have a reservoir, you make one

NA Shale – Getting to Materiality

Back in mid-2014, while production was substantial, NA Shale was still a marginal supply option, with a full cycle cost of ~USD 70-80/bbl ...

Global Liquids Supply Curve, Circa mid-2014

Cost: \$USD/BOE vs Production: MMBOE/d

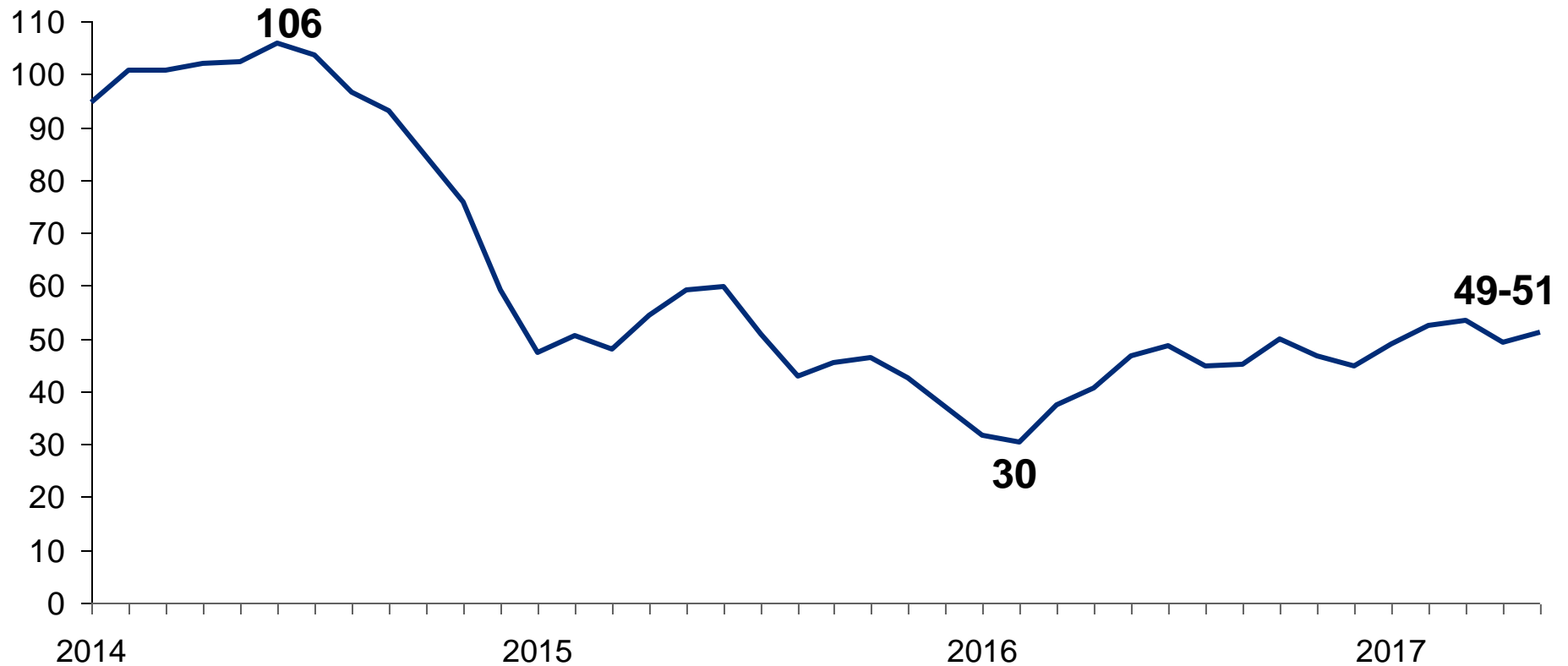


... back then, Shales future was uncertain

NA Shale – The Impetus

As everyone knows, oil prices crashed in late 2014 and have reset at roughly half their previous levels

WTI Oil Price
\$USD/BBL

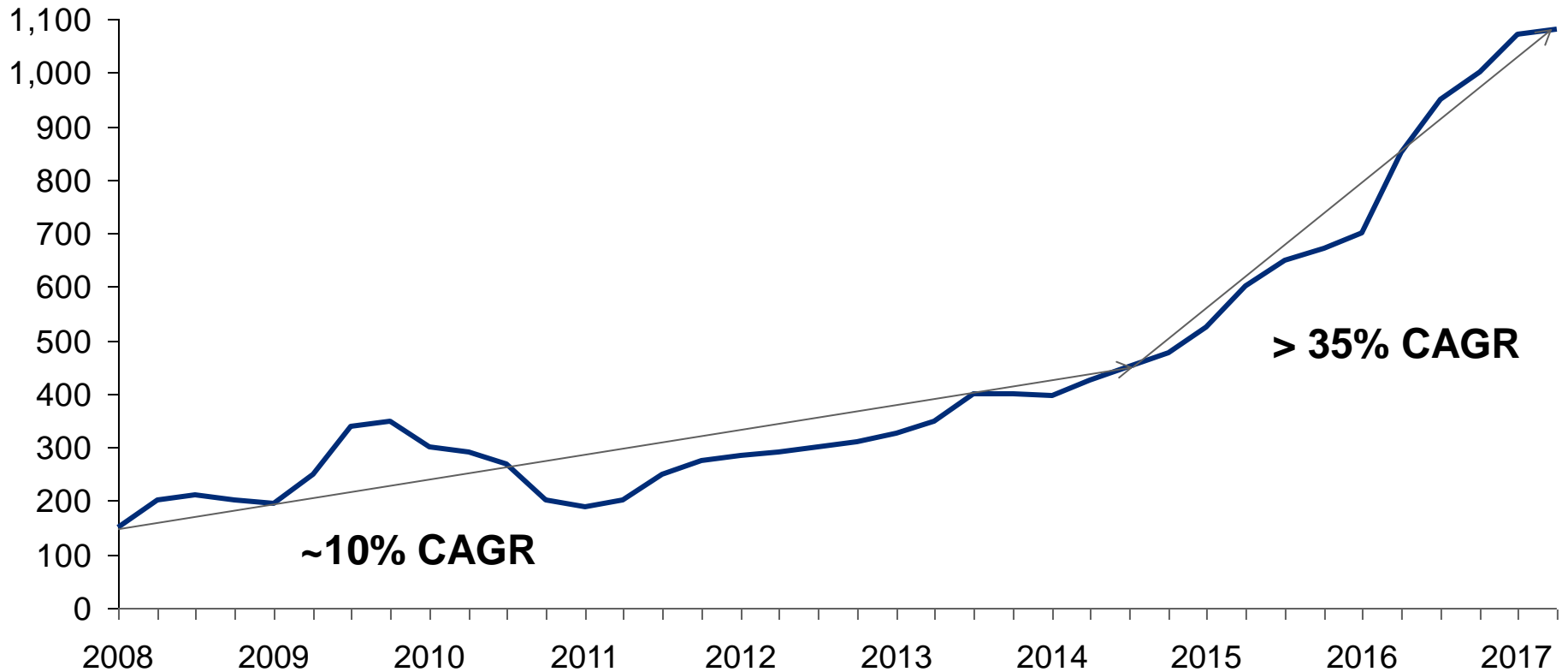


NA Shale – The Response (1/2)

Necessity has been the mother of invention – with productivities compounding, delivering orders of magnitude improvement

Incremental Oil Production per Rig
Barrels/day, per rig month (Average rig)

Bakken
Example/Proxy

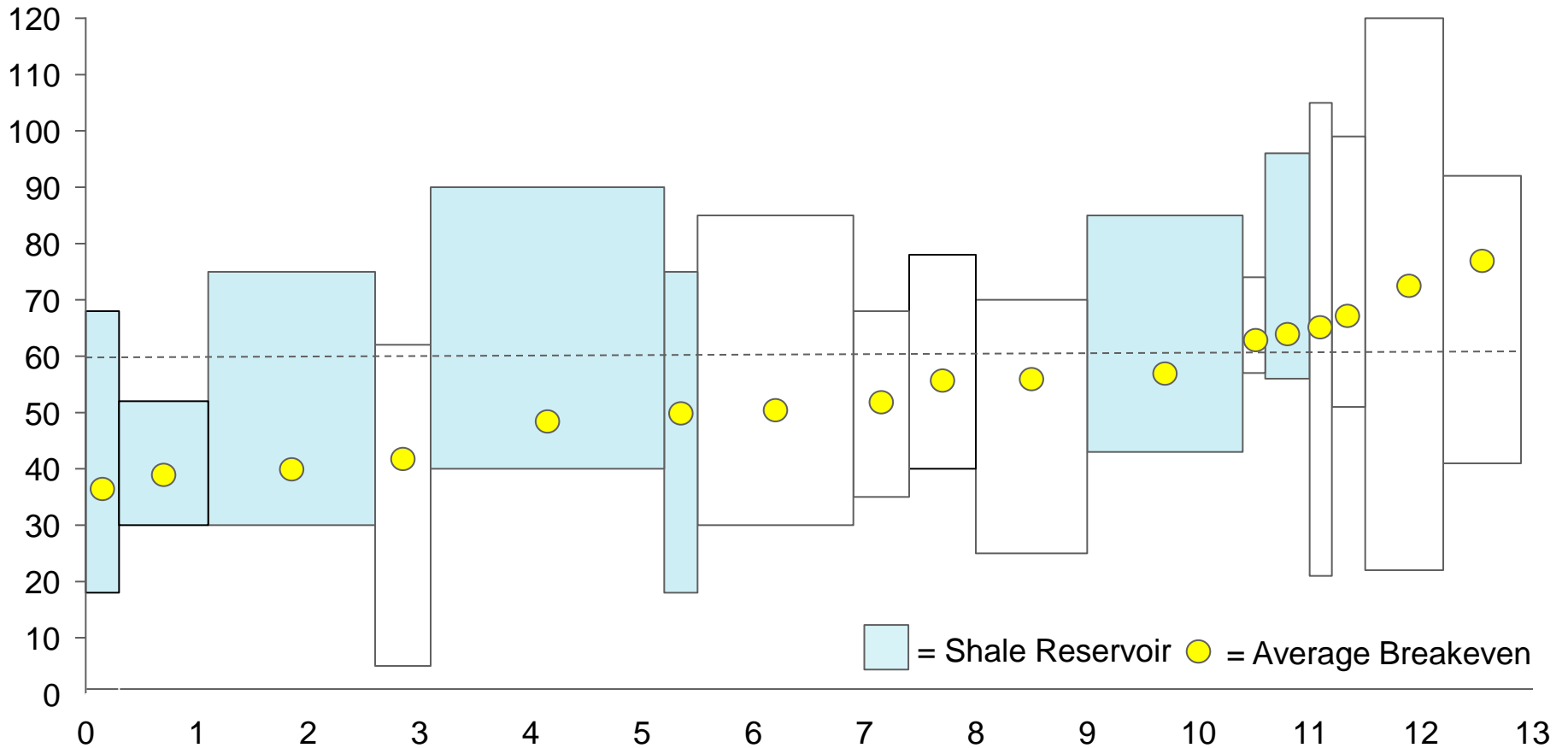


NA Shale – Response (2/2)

NA Shale is now the lowest cost incremental supply option & will dominate the near term future of the global Oil & Gas industry

Global Incremental Crude Supply Curve, 2017

Cost: \$USD/BOE vs Production: MMBOE/d

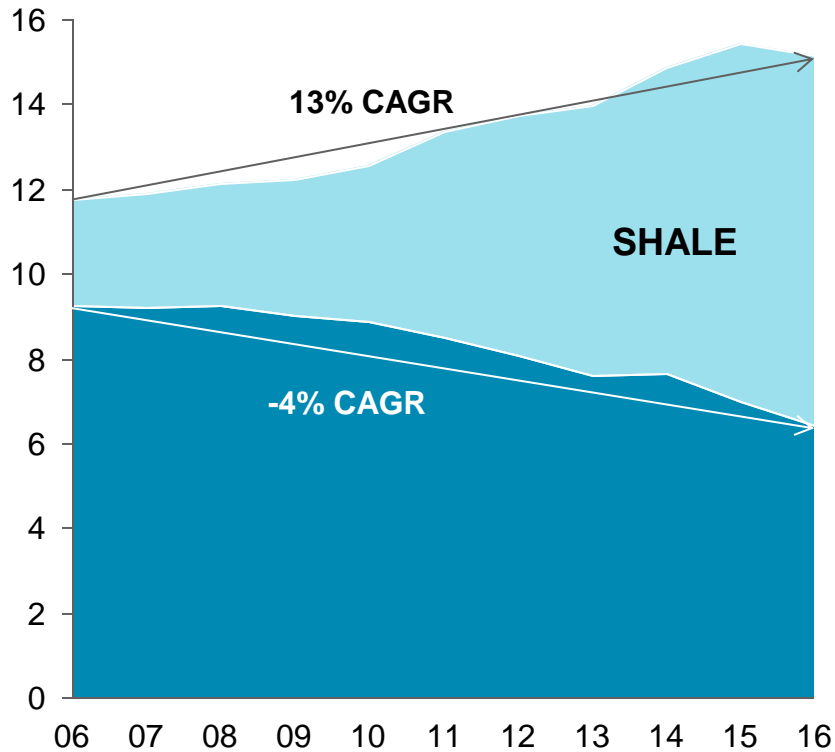


NA Shale – Materiality

It represents an unprecedented production change; in North America or anywhere else

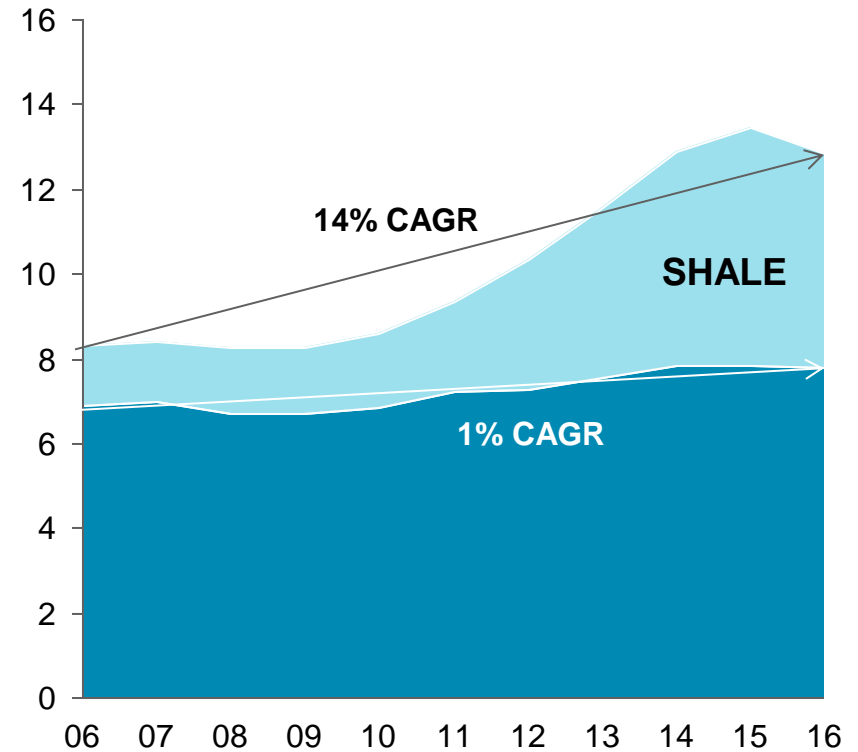
US & Canada: Gas Production

Bcf/d



US & Canada: Oil Production

MMbbl/d

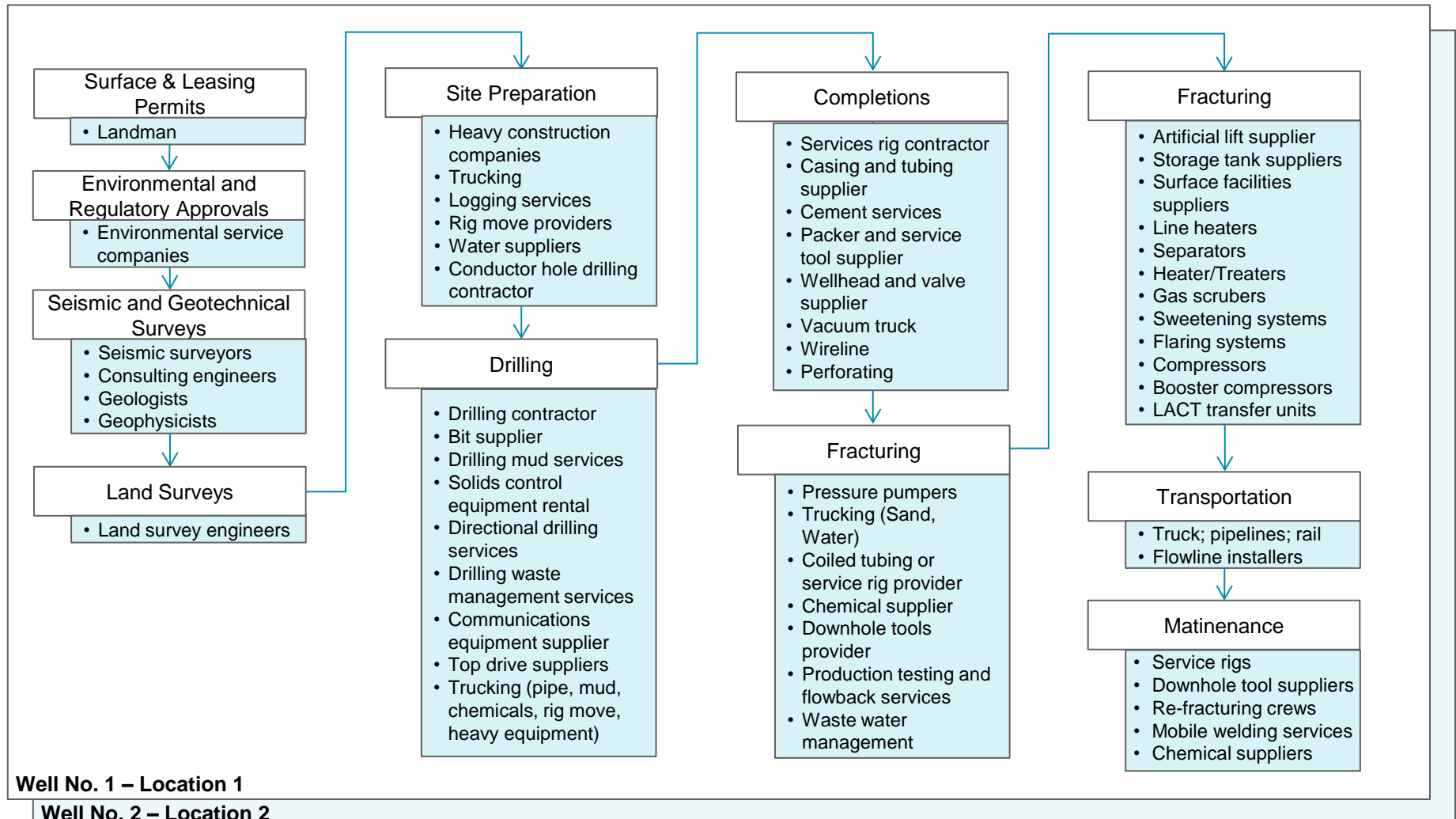


Last 10 years ~ \$1.5 Trillion in investment, Last 5 years – NA Shale has satisfied all incremental global oil demand

NA Shale - How did we get here ?

We got better at virtually every step in the Supply Chain (innovation, efficiency)

Shale Program: Sequence of Activities

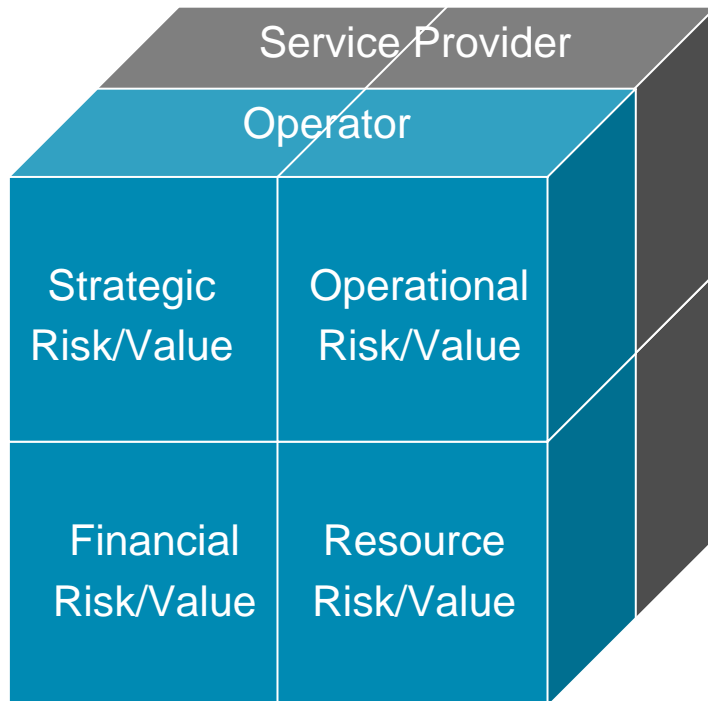


NA Shale – How its changing the Supply Chain conversation

Shale isn't simply about exploiting unconventional reservoirs – its about exploiting reservoirs in a very different way, relative to the 'norm'

Key Elements of the Supply Chain Conversation ...

... and How this changes with Shale



Dimension	Conventional	Shale
Planning Cycle	Annual	Rolling semi-annual
Execution Adjustments	Semi-Annual	Monthly
Design & Equipment Standards	Annual (best)	Quarterly
Work scale/ scope	Steady state/ mature	Evolving/ – nascent process
Supplier Ecosystem	Well known, mature	Evolving
Contract Strategy	Full outsource; bundled pricing	Partial outsource; partial unbundling
Contractor Interaction	Transactional	Selective partnering
Internal Expectation	Manage contracts; share risk, not gain	Deliver value; share risk with intent to share gain

NA Shale – Four Emerging Themes

We are beginning to see four overlapping themes emerge in our conversations with Operators and Suppliers

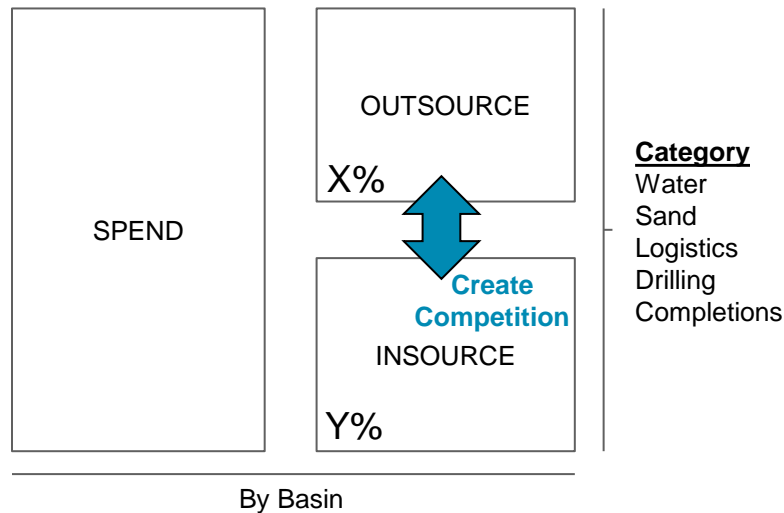
Theme	Key Questions
Degree of Vertical Integration (going into business against my suppliers)	Where to integrate and how much of internal demand/basin to integrate
Character of Strategic Relationships (How can greater joint value be extracted)	Materiality, degree of joint innovation, degree of joint planning Gain/value/risk sharing magnitude, gain/value/risk sharing process, tenure (when to revisit),
What to Commoditize	Impact on suppliers, impact on technology development
Price Risk Management	“Buy Side” cost management through contract and/or synthetic instruments

These themes are not new to Supply Chain, but how we handle them now is becoming quite novel

Theme 1: Vertical Integration

Where and how can “Insourcing” (1980’s), be best utilized to drive long term value

Notional Framework



Purpose

- To use internal supply option(s) to control and/or modulate external market pricing for outsourcing the same spend

Advantages

- Drives strong savings in overheated markets
- Often protects schedule, which can be as important as cost

Disadvantages

- Typically undercapitalized, so need to avoid areas where innovation is required. In trouble if holding assets through disruptive technology change
- ‘Hostage’ to internal demand

Encana: Sand Example



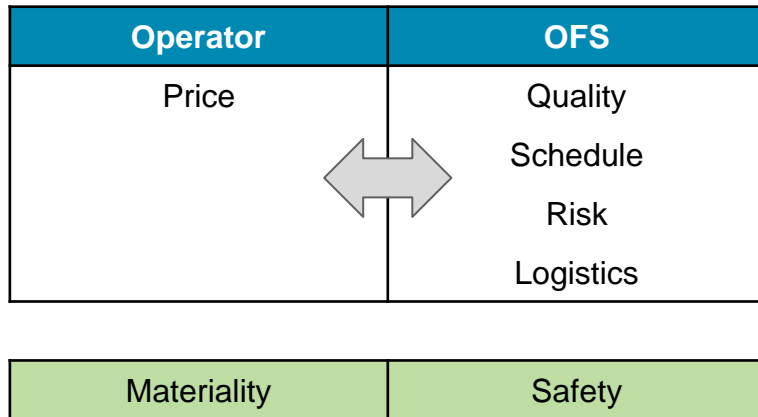
- Build end to end supply chain
- Own and/or control key management points, notably contracts and pricing
- Self-manage logistics/schedule (joint planning)
- It does not constitute all of their sand demand

... it is an increasingly prevalent tool used by independent Shale players

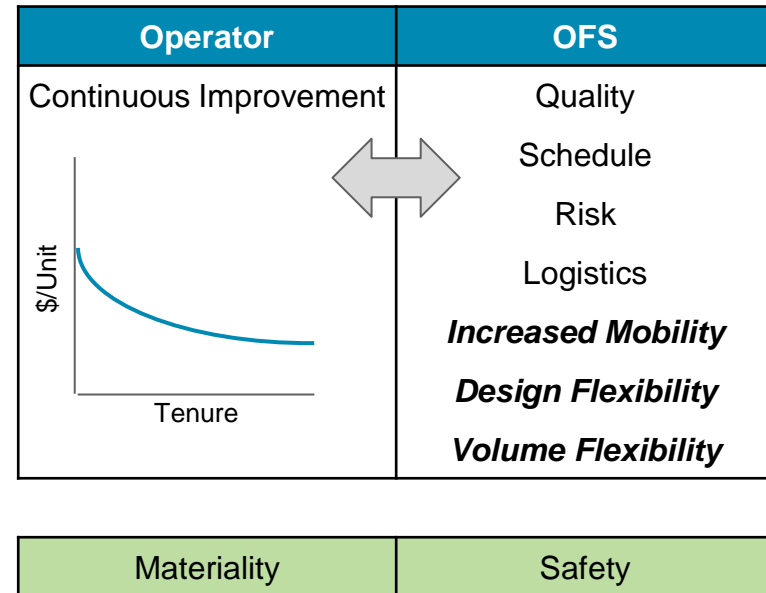
Theme 2: Strategic Relationships

How can risk transfer create value for all involved ?

“Old” Deal Framework



“New” Deal Framework



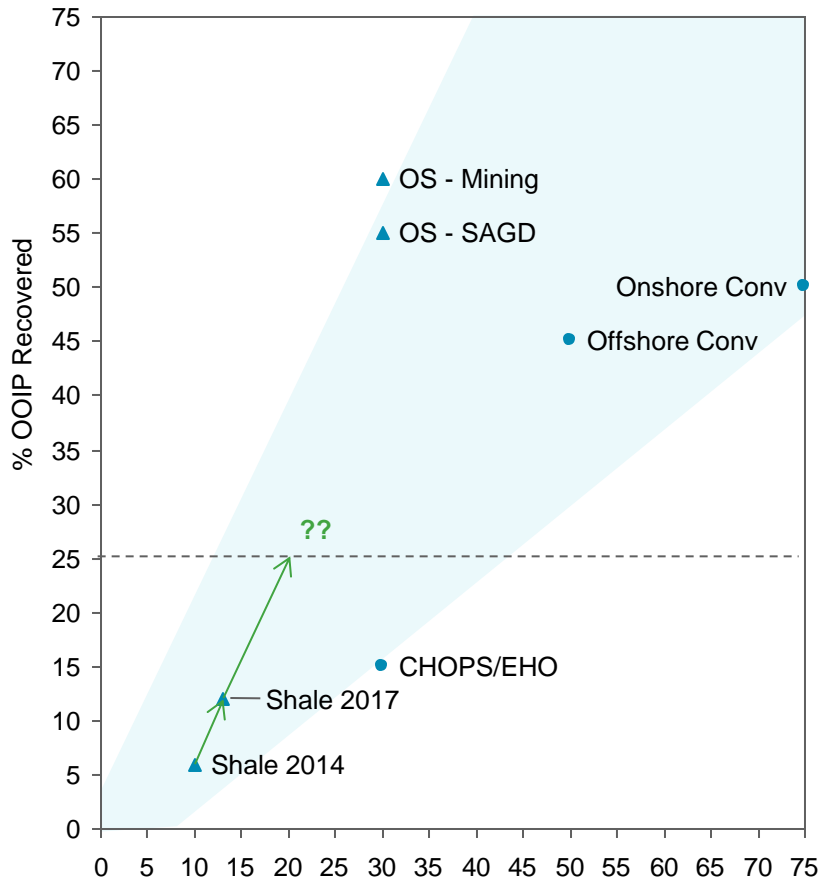
Success stems from Strong Management

- Implementation issues around CI, especially as you span multiple basins
- “New” deals drive a much greater resource need – from both parties, both in quantity and quality
- CI is never as smooth as the curves show, its experimental and will have setbacks

Theme 3: Commoditization

Careful what you commoditize – for nascent industries, these decisions could come back to haunt you

Play Type, Maturity versus OOIP
(% of OOIP Recovered, Years in Use)



Comments

- Commoditization is a standard outcome, absent other influences, of applying professional supply chain practices to spend categories
- However, Shale is in its relative infancy, with still some significant headroom to run before it approaches any reasonable level of maturity
- This would suggest that careful thought needs to be put into practices that will stress a supply chain caught in the flux of a developing technology
- The story of cement !

Theme 4: (Price) Risk Management

Where can hedging be applied on the Operators 'buy'/ Services 'sell' side ?

Situation

- Upstream firms take strong positions on whether to manage 'sell side' pricing, and if so, what to do
- Supply Chain manages price risk through contracts, but in times of great price stress, either up or down, these contracts tend to be renegotiated, undermining their original risk allocation
- OFS service (less so product) pricing is highly correlated to the price of oil and gas ($R^2 > 0.80$)
- Other important exposures playing into key cost inputs
 - Water
 - Iron ore
 - Labour
 - Logistics

Discussion

- Apparent mismatch on price risk with supplemental and/or complimentary positions which can be taken to mitigate buy side risks, independent of the contract
- Requires extending PRM capabilities to cover buy side activity, something most Marketing groups are relatively unfamiliar with

Closing Remarks

Now – more than ever, superior Supply Chain capability is becoming a critical enabler to competitive advantage

Simple Ideas

- Supply Chains deliver on needs. If needs are in flux, so is the supply chain
- Shale has different and evolving needs, to which supply chain professionals need to respond
- In an emerging technological context, its not always TCO that carries the day, but rather value creation – which requires space for innovation
- Moreso than ever, Shale is driving a need for senior supply chain professionals to manage complicated relationships in highly volatile contexts
- Those who do this well, can achieve a differentiated market position



OLIVER WYMAN

THANK YOU

