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FUELING THE FUTURE

Alaska Oil and Gas Association
Anchorage

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Outline

- Context and Key Questions
- What is the Future Outlook for Oil Markets?
- Where are LNG Markets Heading?
- How are Governments Responding to Low Oil Price?
- What Next?



Context and Key Questions

Three “Transitions” Underway

1. “BRIC Era” (2004-2014) to “Shale Era” – Demand to Supply

- From strong growth in emerging markets leading to strong oil market and high prices....
- ...to over-supplied oil market and weak prices
- Breakthroughs on shale gas and shale oil
- “New Mediocre” in world economy - today

2. China's transition

- “Industrial/exporter” to “services/consumer society”
- Structural problems
- “Policy mistakes”-- and dilemmas

3. Paris Climate Conference

- Transition to “lower carbon future”
- 185+ nations with carbon reduction plans

Future expectations are shaped by beliefs ... which have proven to be incorrect ...

- 1. In early 1980s common belief prices would be \$100 by 1990-2000.**
- 2. High (\$40s) oil would lead to recession (1980s- mid 2000s: oil price was in \$20s)**
- 3. Economic crisis come from emerging markets, not developed markets**
- 4. US oil production would never stop declining**
- 5. OPEC always supports price through supply management**
- 6. Oil supply is scarce (“peak oil”) and will increasingly rely on Middle East**
- 7. Oil demand will be strong for many years because more Chinese will be driving cars —and China’s economy will be strong for many years to come**

Source: IHS Energy. Numbered for ease of reference, not in order of importance or other reasons.

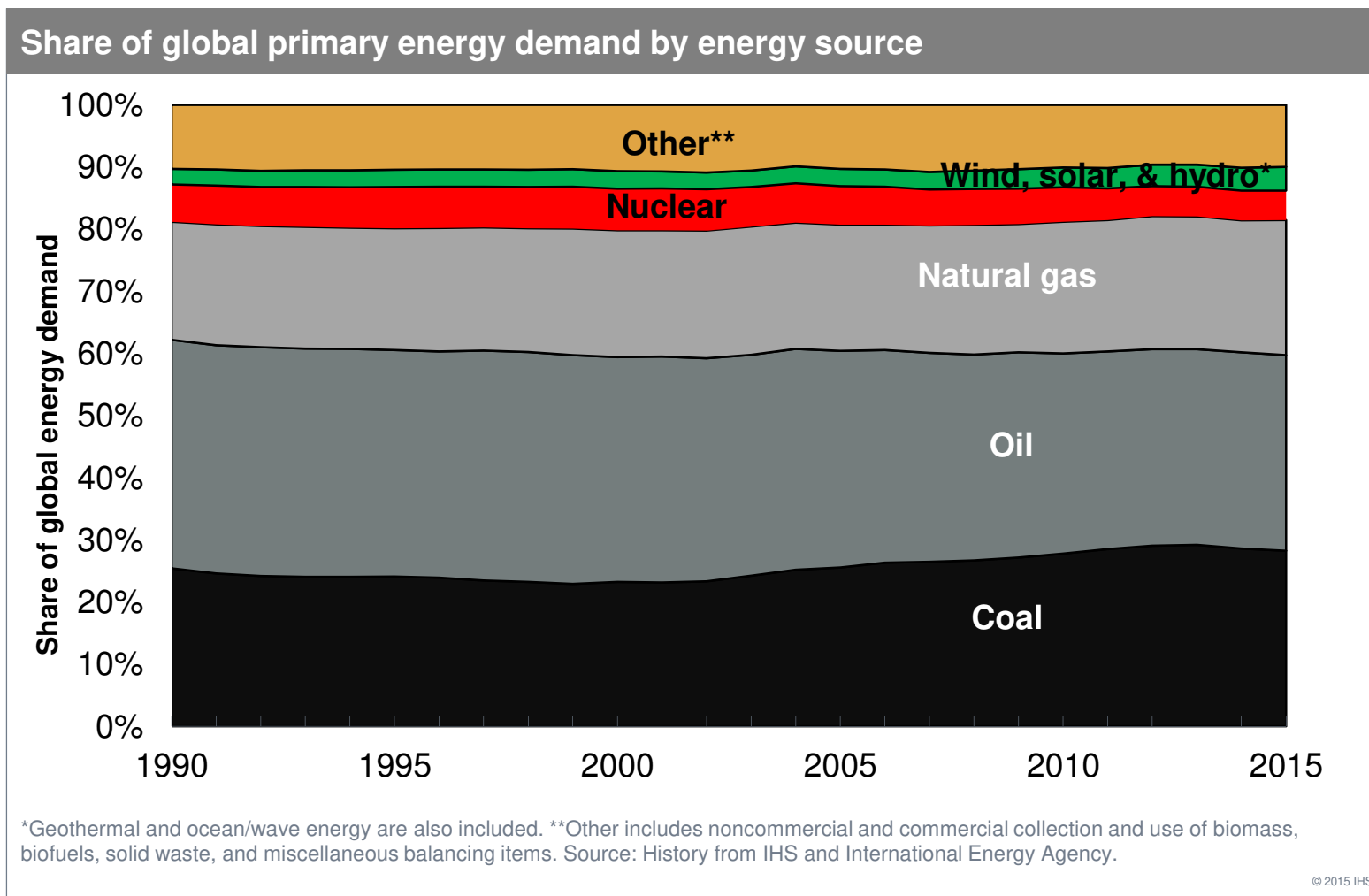
Questions for the energy market in 2016 and beyond



- 1. What is the timing of the crude oil price recovery?**
- 2. At what price level will growth in US crude oil production return?**
- 3. OPEC does not exist as we knew it. What does this mean for oil supply and the oil market?**
- 4. Is a peak in global oil demand approaching?**
- 5. Are we approaching a “Global Gas Reset”? What is the future for LNG?**
- 6. What will be the impact on energy mix of efforts to address climate change and local pollution?**

Note: Issues numbered for ease of reference and not necessarily order of importance.

The share of fossil fuels in the global energy mix has been remarkably steady at around 80% for over two decades





Oil Markets

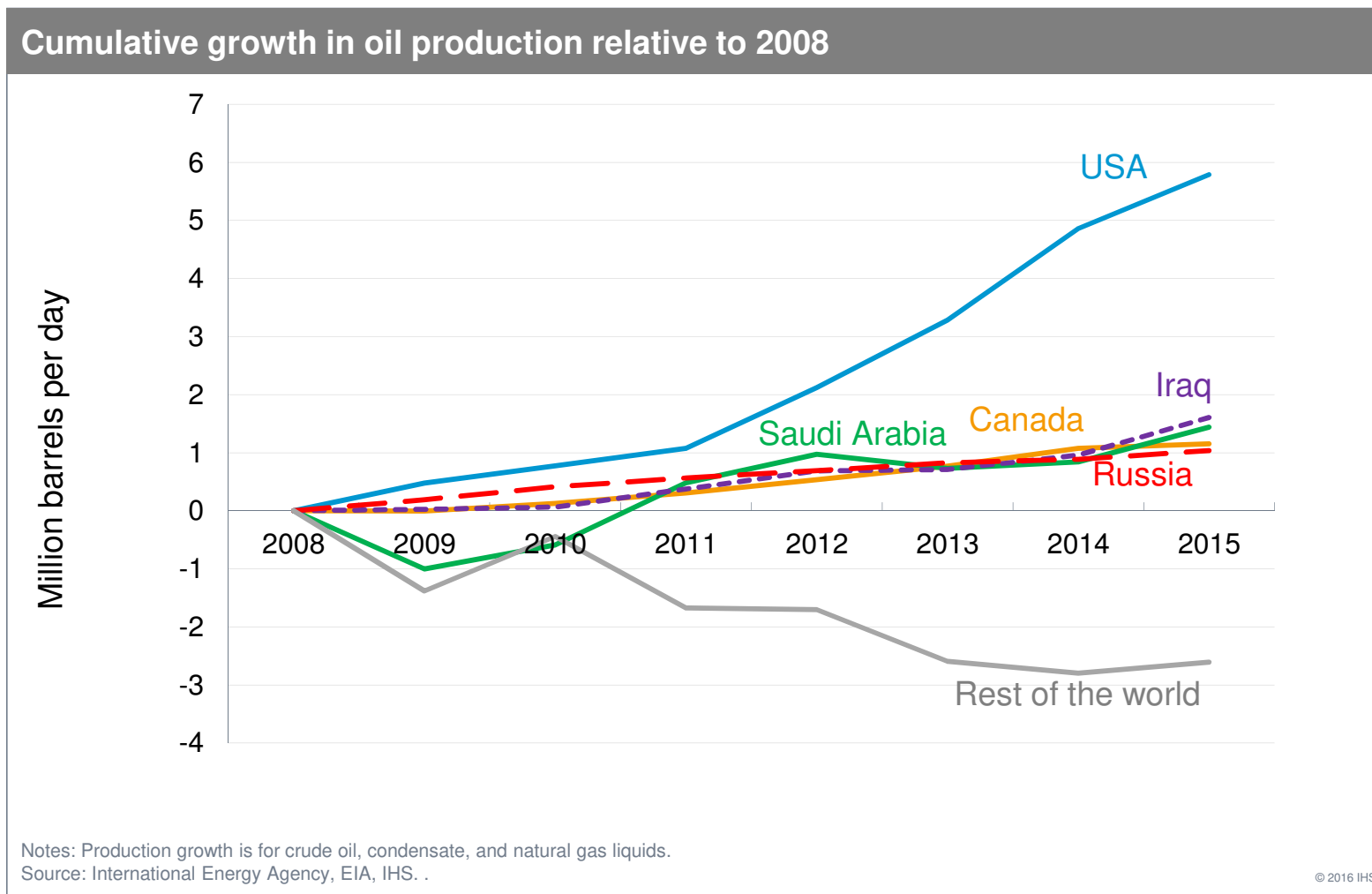
Snapshot of global oil fundamentals and prices

Snapshot of global oil fundamentals and price outlook					
	2013	2014	2015	2016	2017
FUNDAMENTALS					
World economic growth (from previous year)	2.5%	2.7%	2.6%	2.6%	3.1%
World oil (liquids) demand growth* (from previous year in MMb/d)	1.3	0.5	1.6	1.2	1.4
Non-OPEC liquids supply growth* (from previous year in MMb/d)	1.3	2.1	1.4	-0.8	0.8
Call on OPEC crude* (annual average in MMb/d)	32.4	30.5	30.4	31.9	32.2
OPEC production* (annual average in MMb/d)	31.2	31.0	32.1	32.5	32.5
PRICES					
Dated Brent (annual average per barrel)	\$ 109	\$ 99	\$ 52		
WTI (annual average per barrel)	\$ 98	\$ 93	\$ 49		
<small>*This outlook is based on our April 2016 balances, which we plan to release along with our monthly Global Crude Oil Markets <i>Market Briefing</i>. Notes: OPEC production includes production from all current members (including Indonesia). Liquids supply includes crude oil, condensate, and natural gas liquids (NGLs). Liquids demand includes all refined products, blended biofuels, synthetic fuels, as well as liquefied petroleum gases (LPGs) and ethane. Call on OPEC crude = total global liquids demand - non-OPEC liquids supply - OPEC condensate and NGL supply - processing gains - biofuel supply - other liquids supply. OPEC spare capacity is for crude oil only. Figures are rounded. MMb/d = Million barrels per day. Source: IHS, Argus Media Limited</small>					

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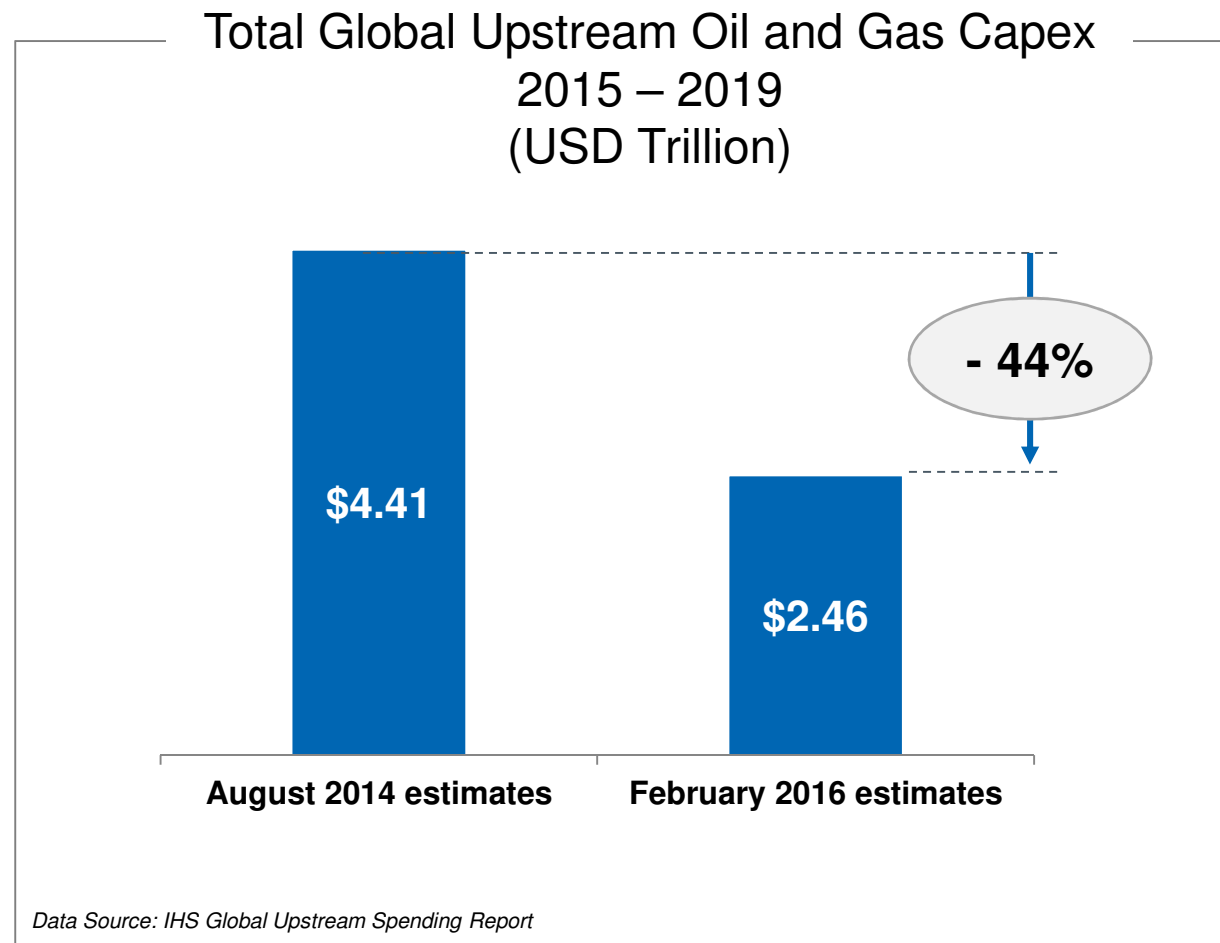
How do you upend the order of the global oil market?

See the stunning growth in USA production from 2008-15



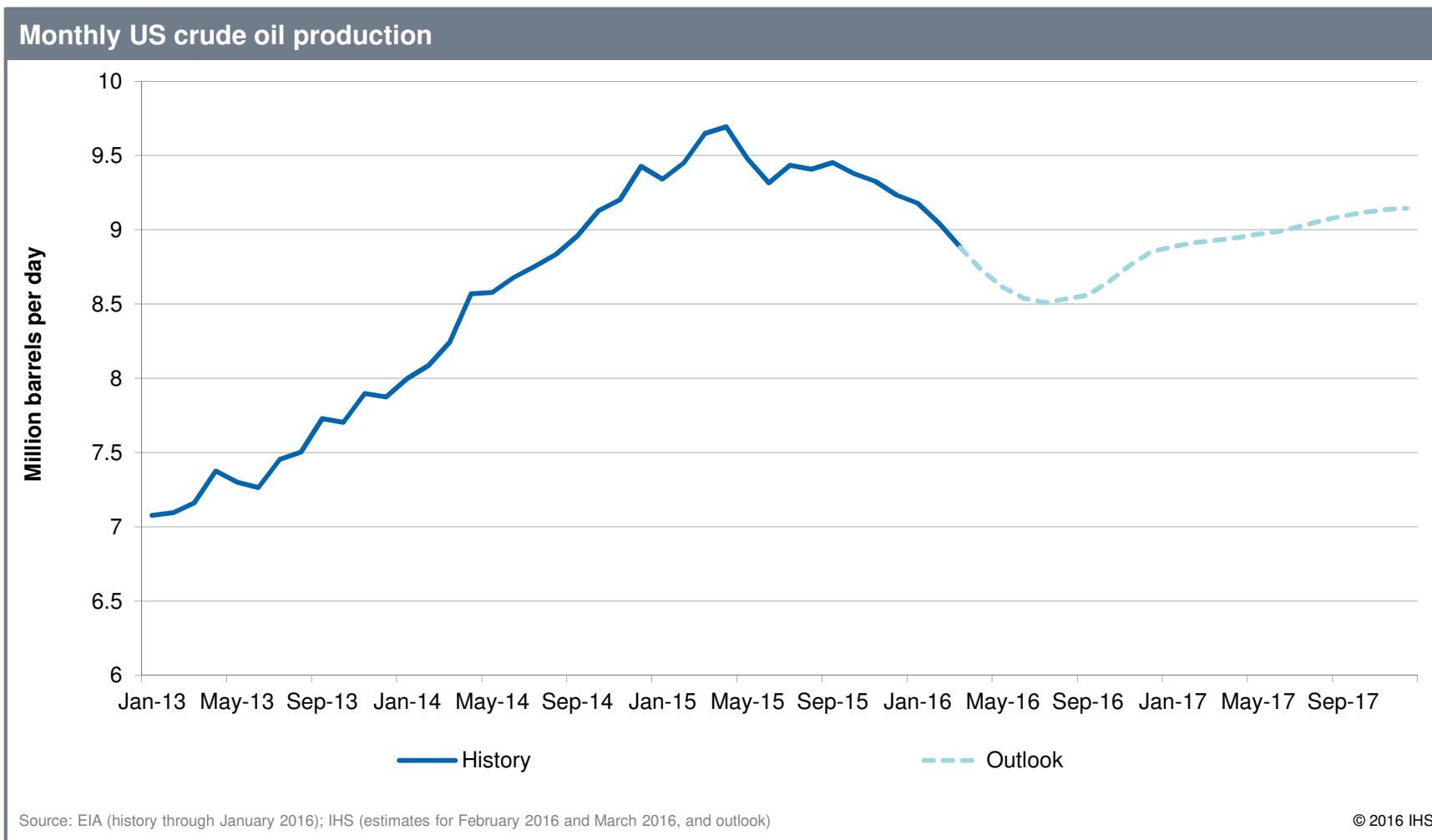
The \$2 trillion global upstream spending cut

Global upstream oil and gas capital expenditures (capex) forecast for 2015-19 is down \$2 trillion since the oil price collapse. About half of the cut is due to service cost reductions. The other half due to activity reduction.

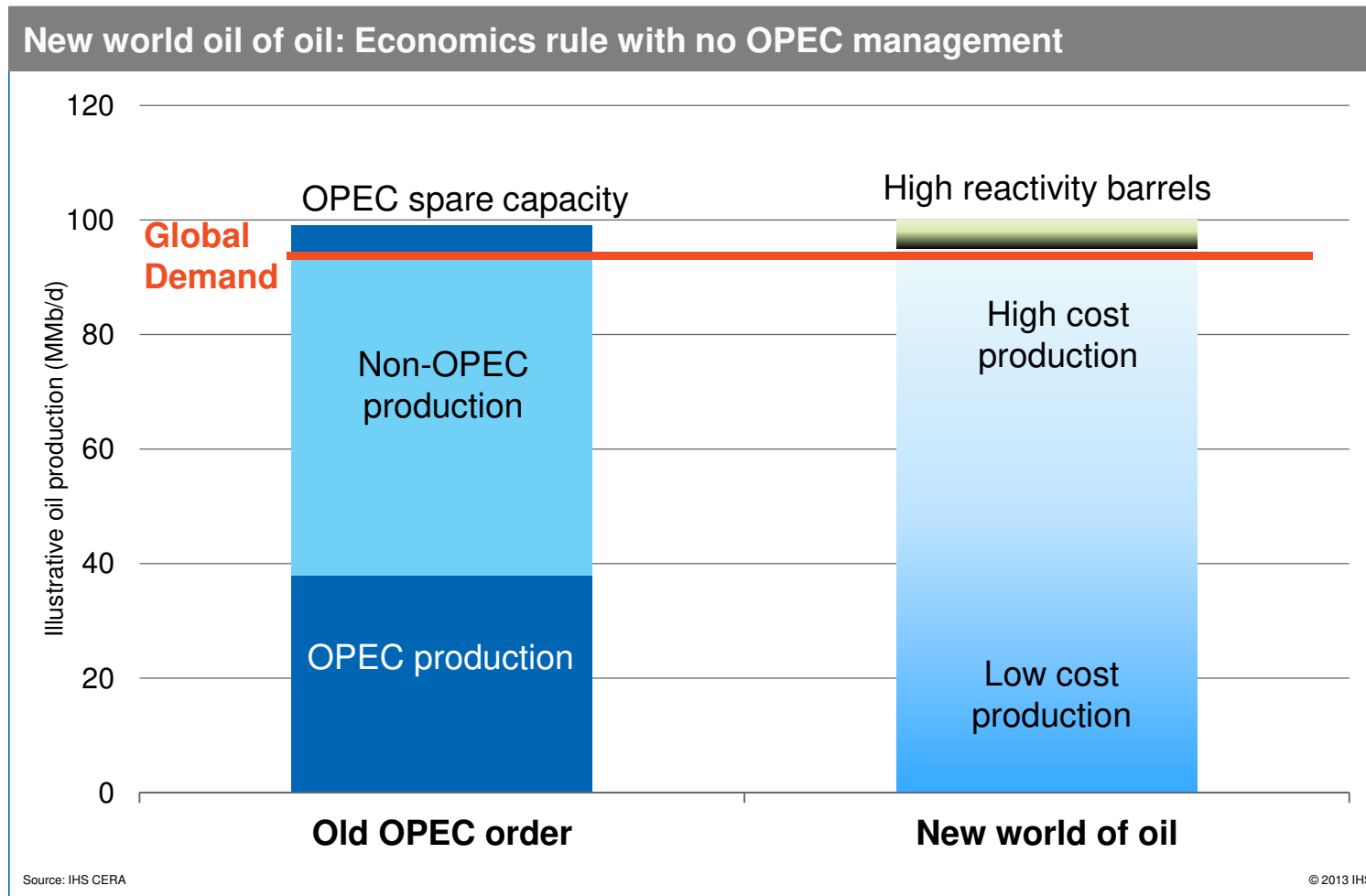


US crude oil production

Declines expected to continue for the next few months as sharp drop in activity reverberates across the US onshore

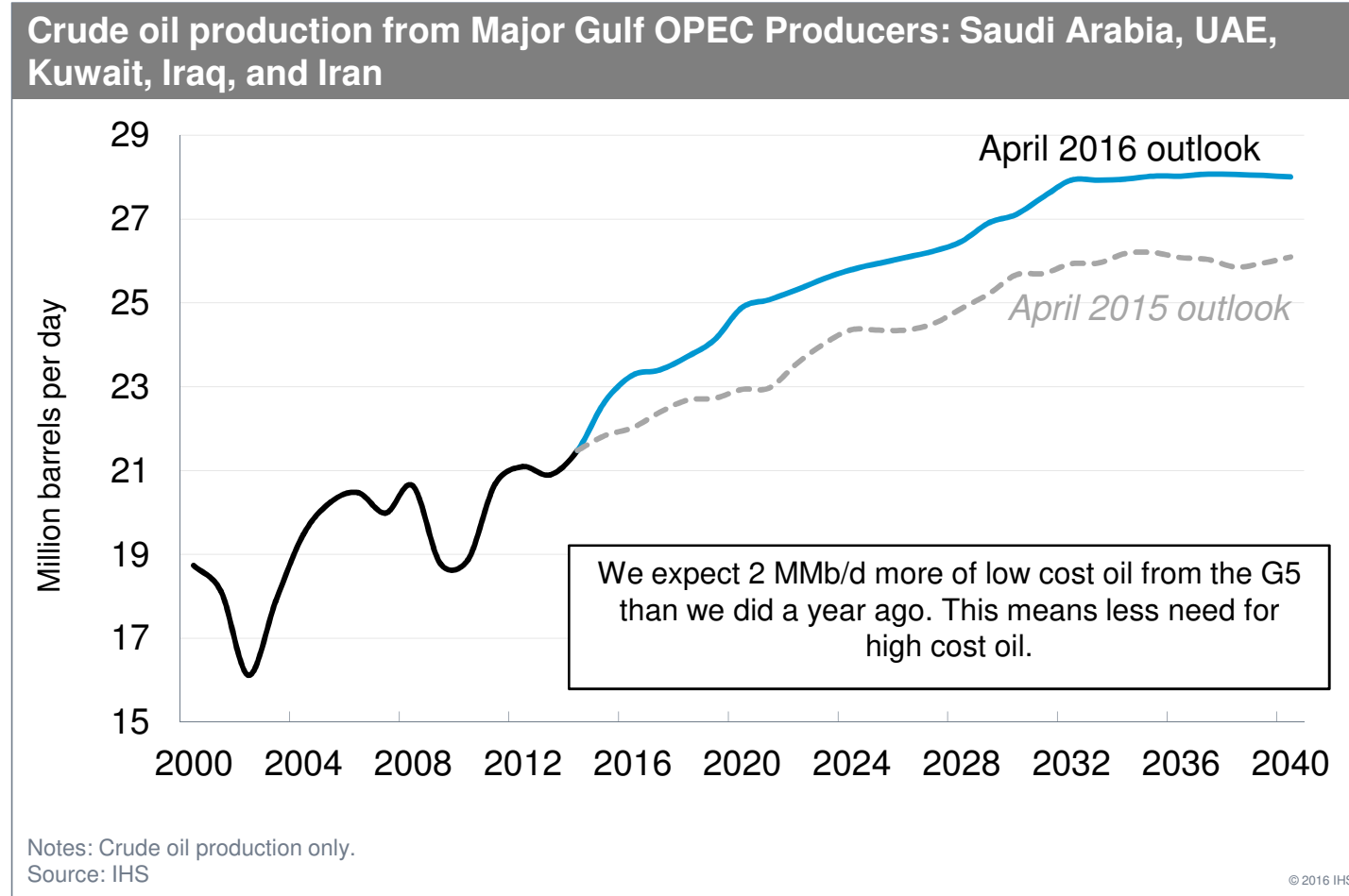


New world of oil: On supply side, economics rule with no OPEC management



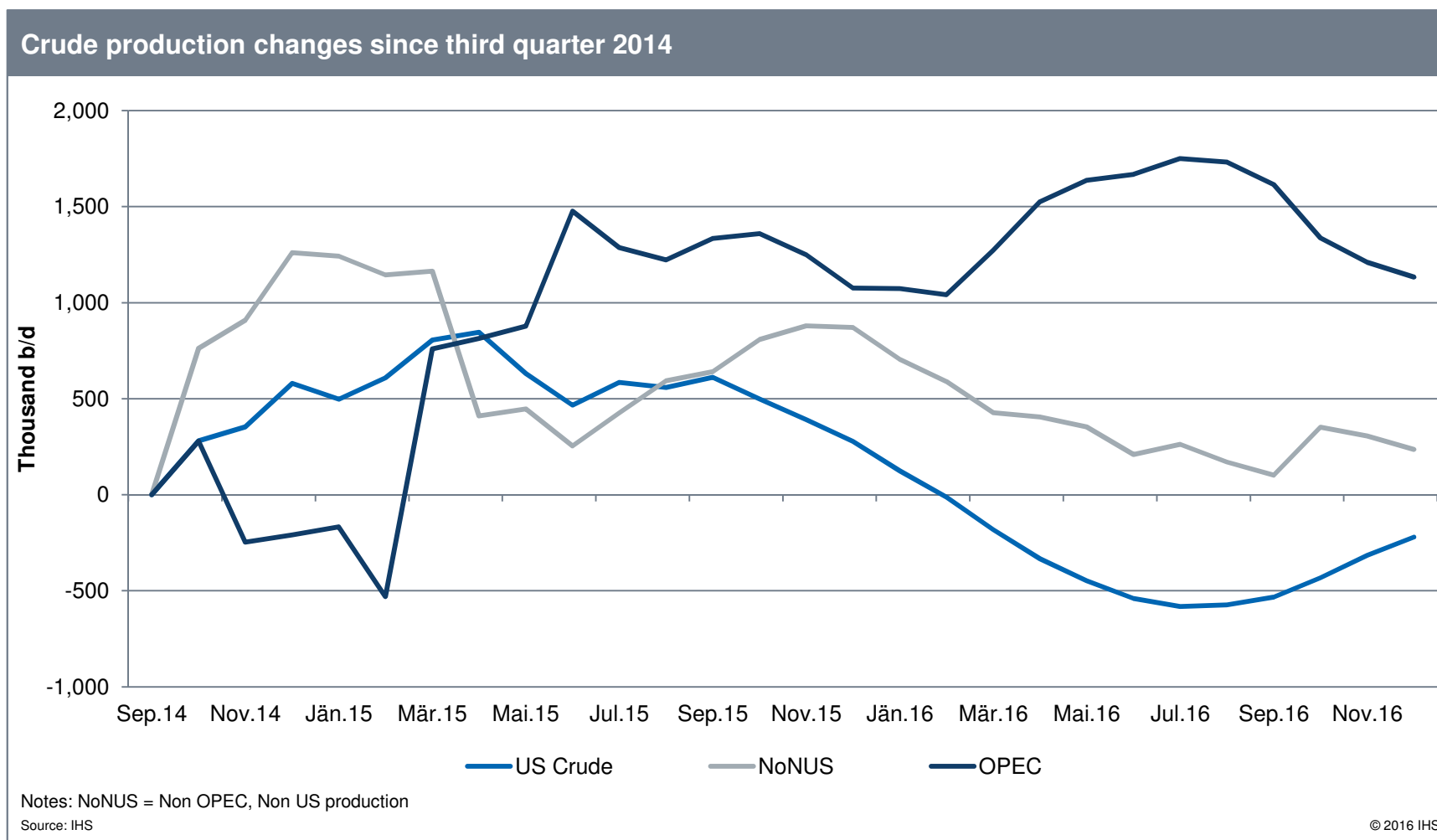
OPEC does not exist as we knew it: More low cost oil from “G5” will be in the market in the new world of oil

G5 = Major Gulf producers (Saudi Arabia, Iran, Iraq, UAE, and Kuwait)



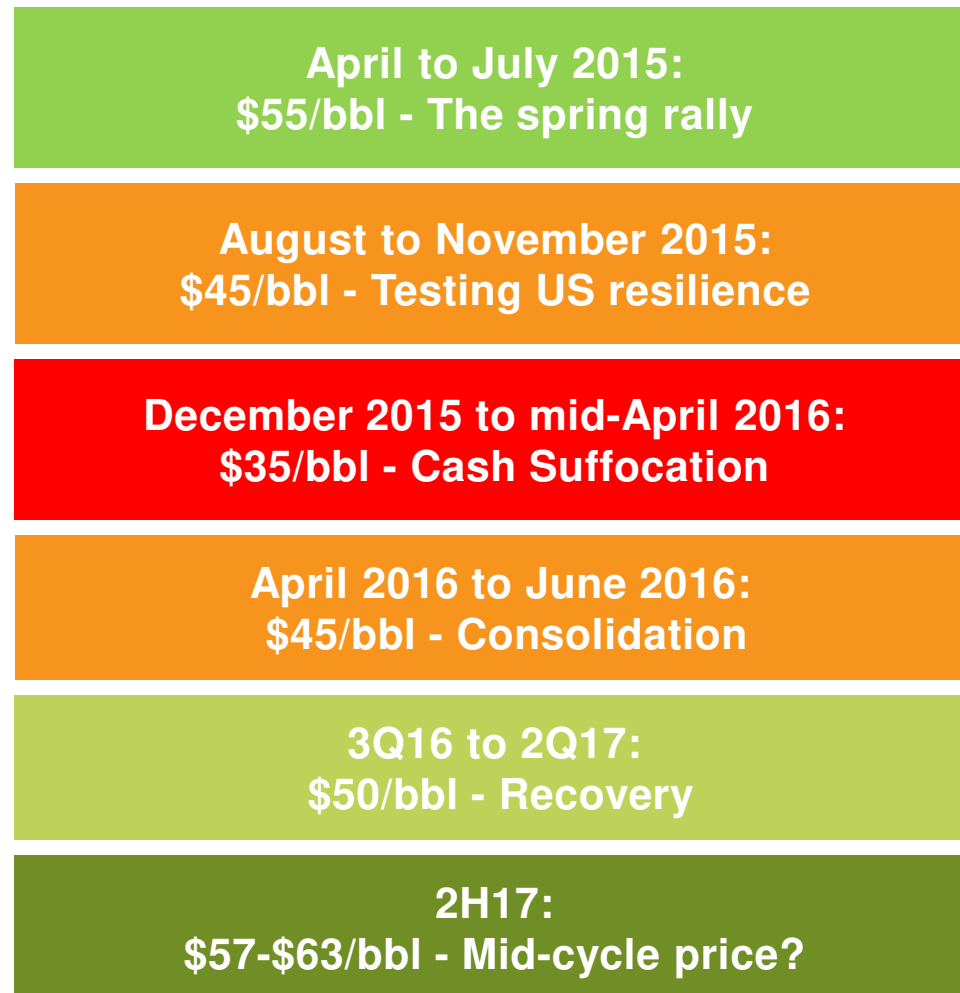
We expect 2 MMb/d more of low cost oil from the G5 than we did a year ago. This means less need for high cost oil.

The three production types reveal three stories of policy, production, persistence — US finally set to fall sharply



Charting the Path to Market Rebalancing

The road from consolidation to mid-cycle prices goes through Riyadh



Key crude oil market messages

1. **The beginning of the end of the oil supply glut will be in third quarter 2016**
2. **Key to eliminating the supply glut is further declines in US crude oil production through at least 3Q 2016**
3. **Prices of \$45/bbl or higher in first half 2016 would slow the global rebalancing process.**
4. **More than expected supply of “political barrels” could prolong supply glut**
5. **Low-cost producers have incentive to expand output. Without effective OPEC supply management, there is no real or imagined “floor price”**

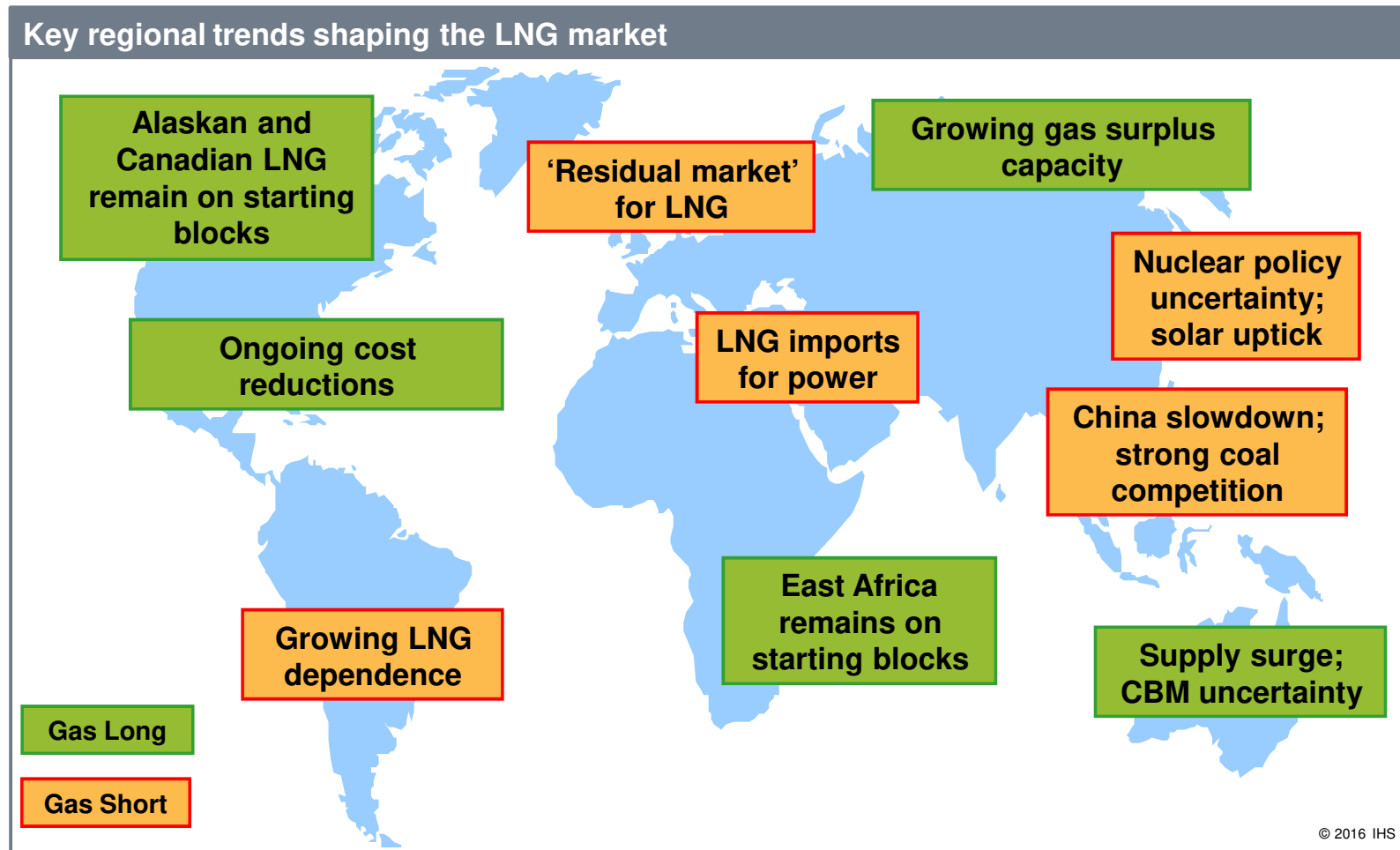


LNG

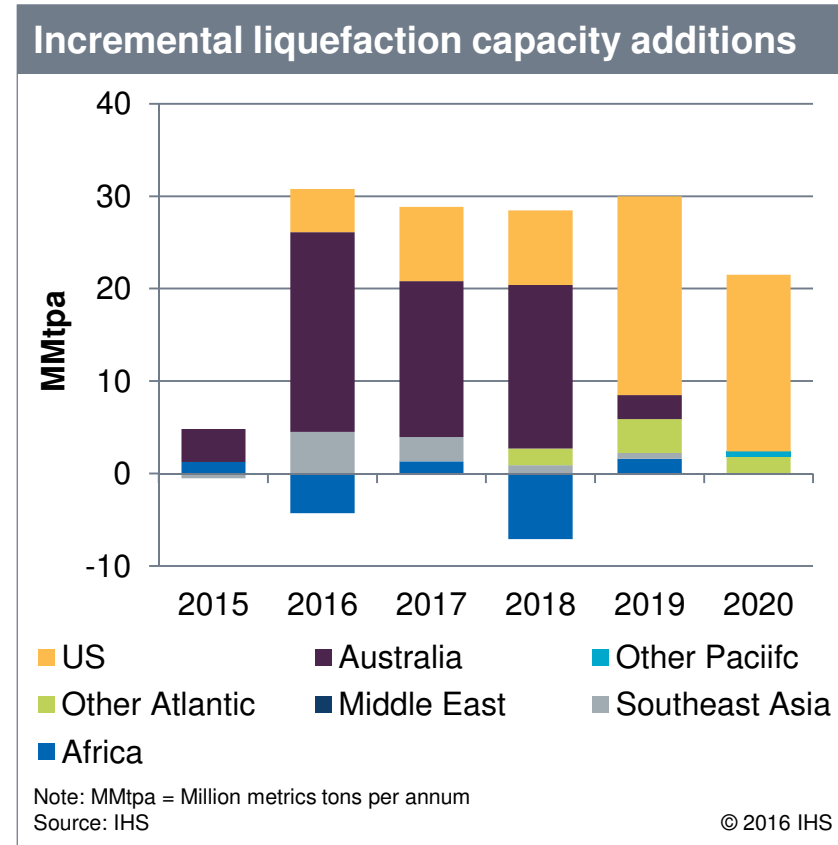
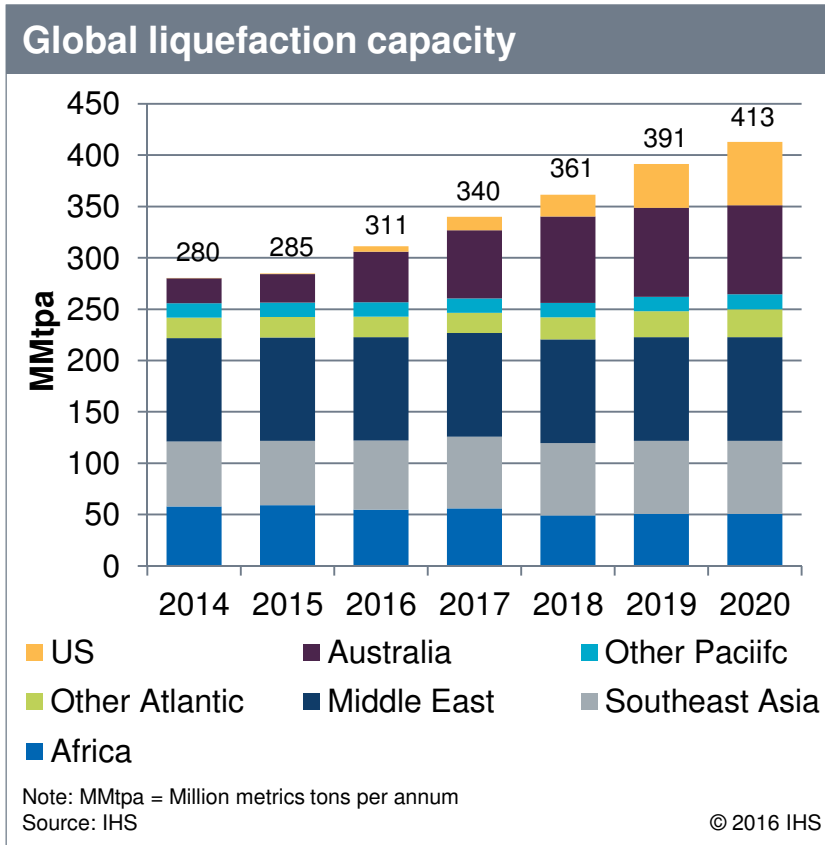
A Bear Market for LNG

- Supply capacity increasing by 50% in the next 5 years.
- Demand is much weaker than anticipated in core importing markets.
- Prices could fall very low for an extended period of time. Variable cost of LNG will influence how low prices can go and how much US production might be shut-in.
- Europe will serve as the key LNG market balancer.
- Key implications in the near term:
 - Weak outlook for new Final Investment Decisions (FIDs)
 - Aggregators key to market balancing
 - Heightened optimization of LNG trade
- Liquefaction project FIDs in the longer term will be impacted by these changing market dynamics.

Global gas snapshot – May 2016

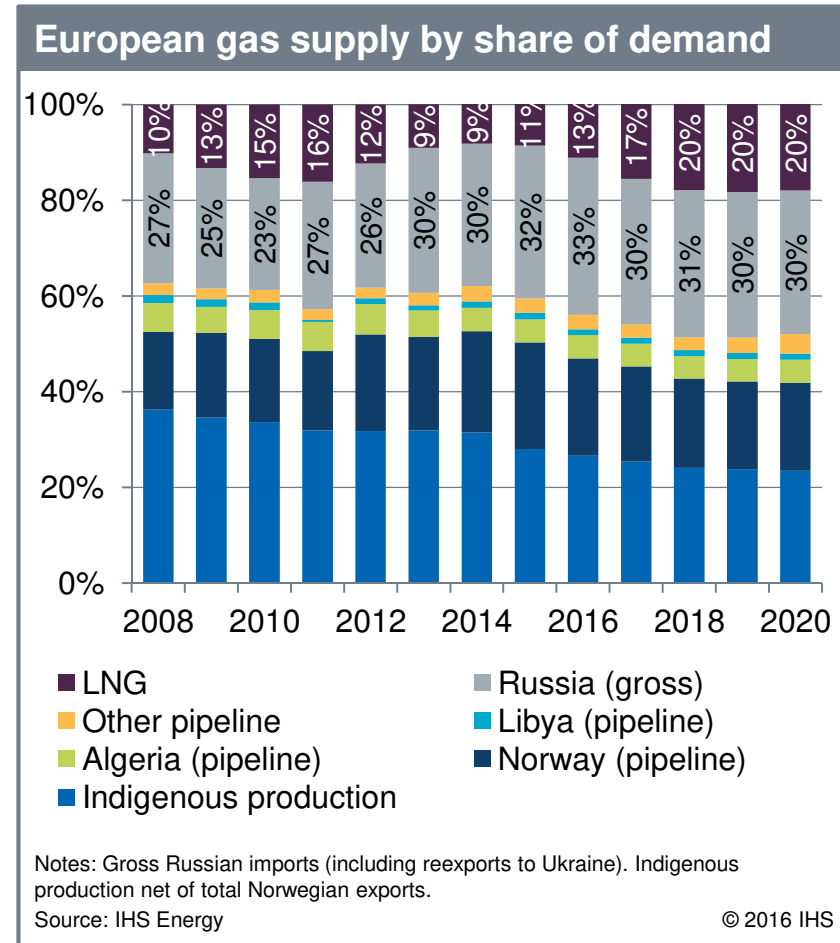
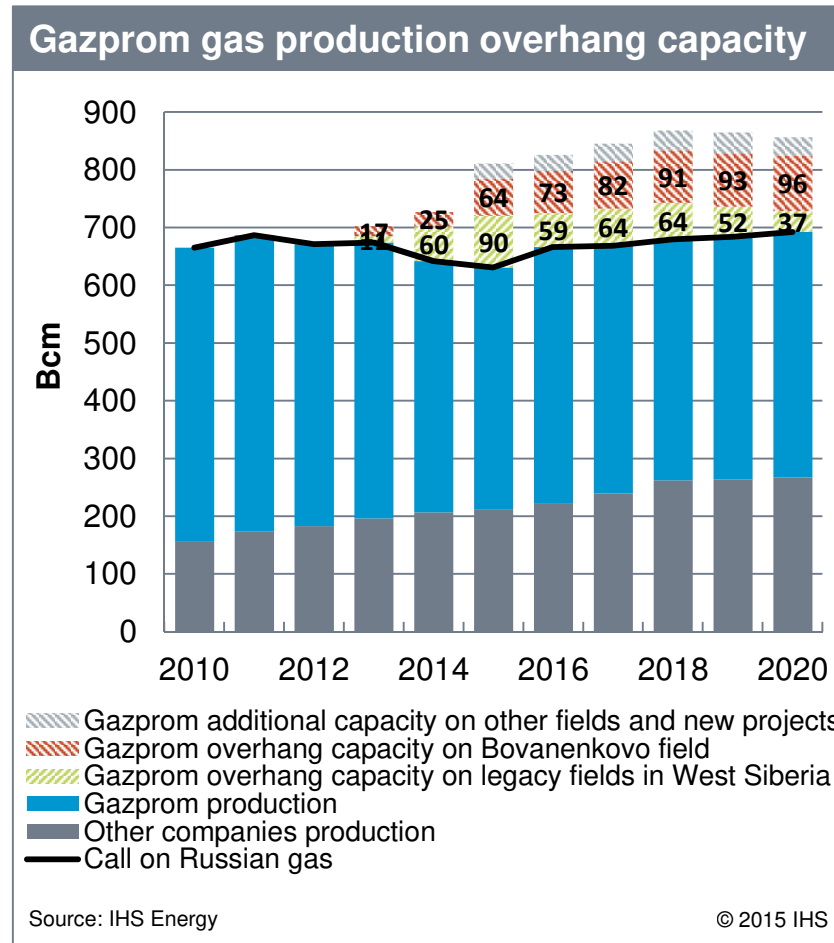


The LNG supply step-up is just starting and will be sustained



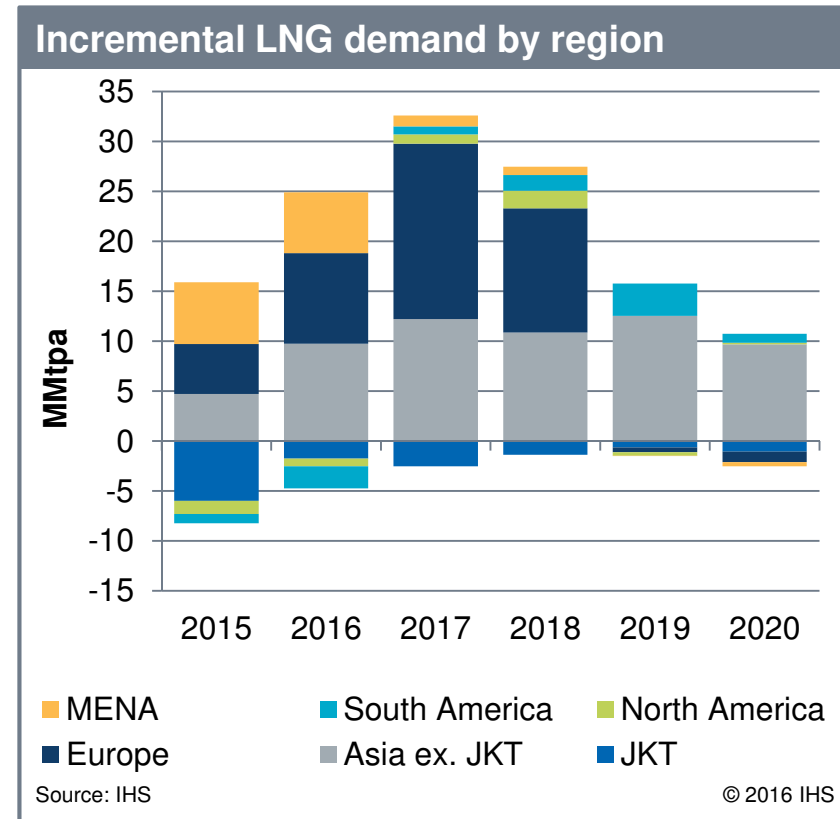
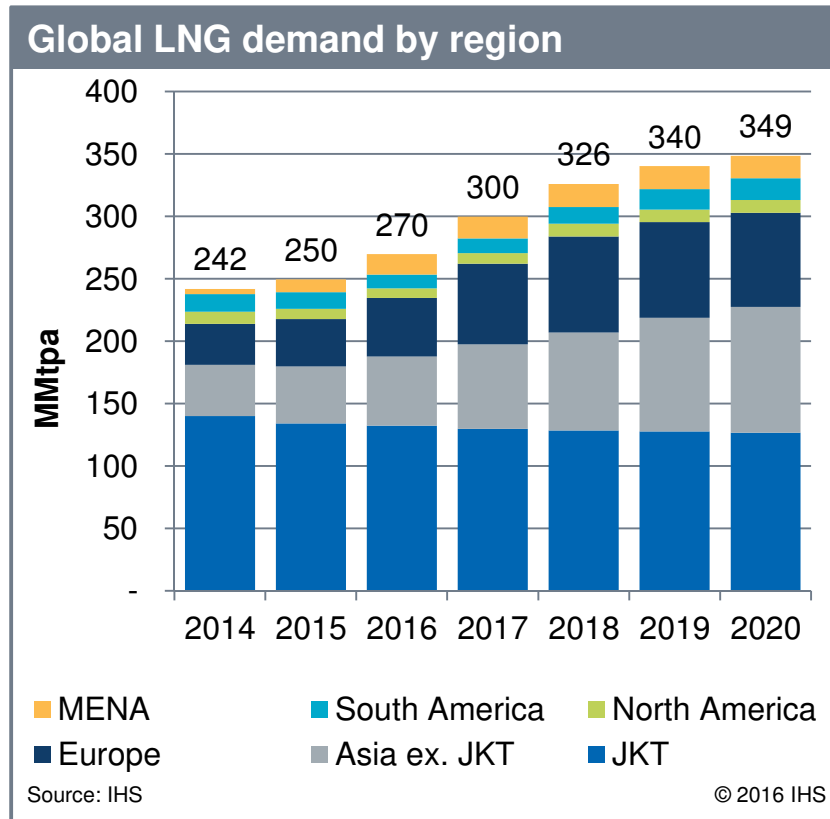
- Australia and the US Lower-48 are set to increase liquefaction capacity by ~50% by 2020.

'It's not just LNG': Russian surplus capacity is growing



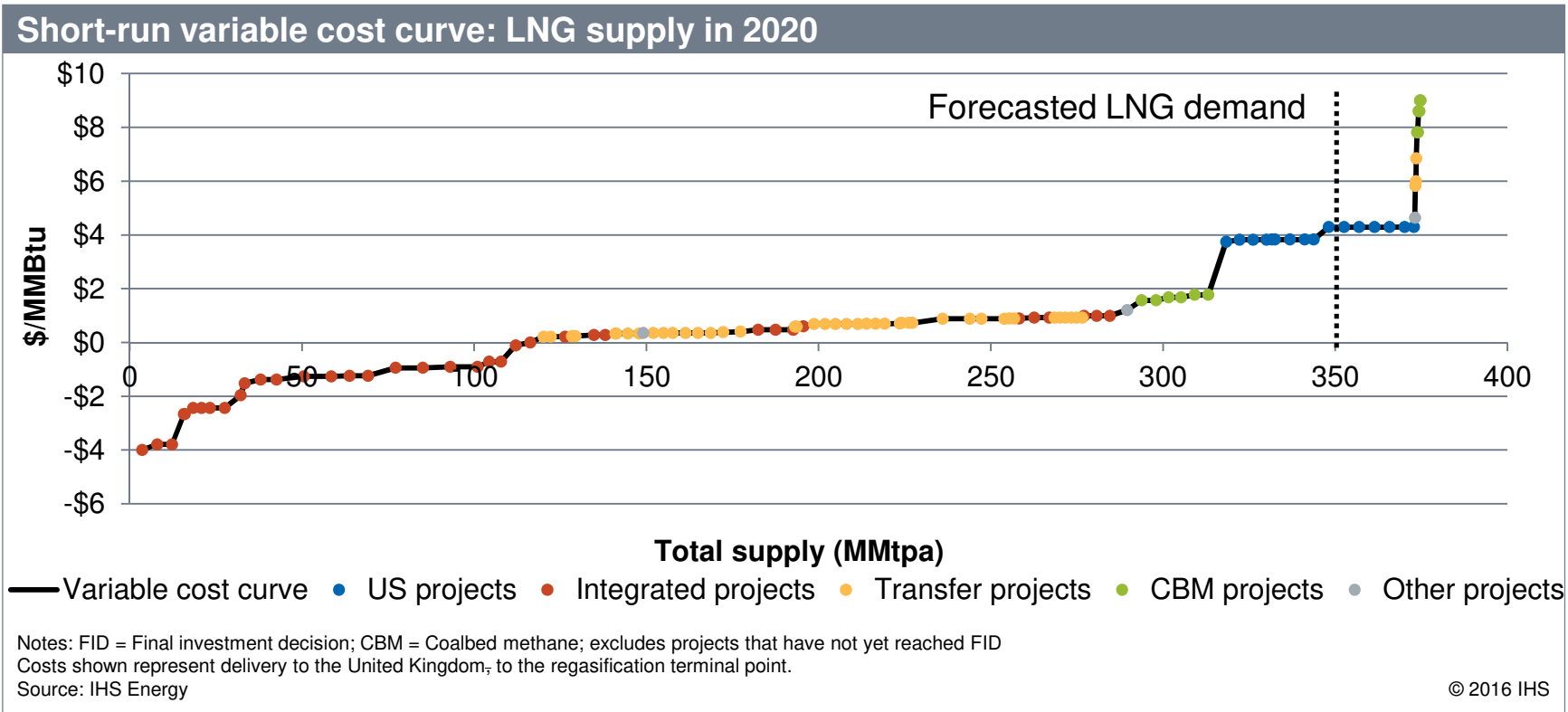
- Russia will defend a 30% market share in Europe.

Europe and China will be the largest source of incremental demand growth



- Europe in particular will have to play a key role in managing excess LNG as oversupply intensifies since other major importers are facing structural and economic demand constraints. But there is a limit to how much it can absorb.

Variable cost of LNG: US Lower-48 establishes price floor

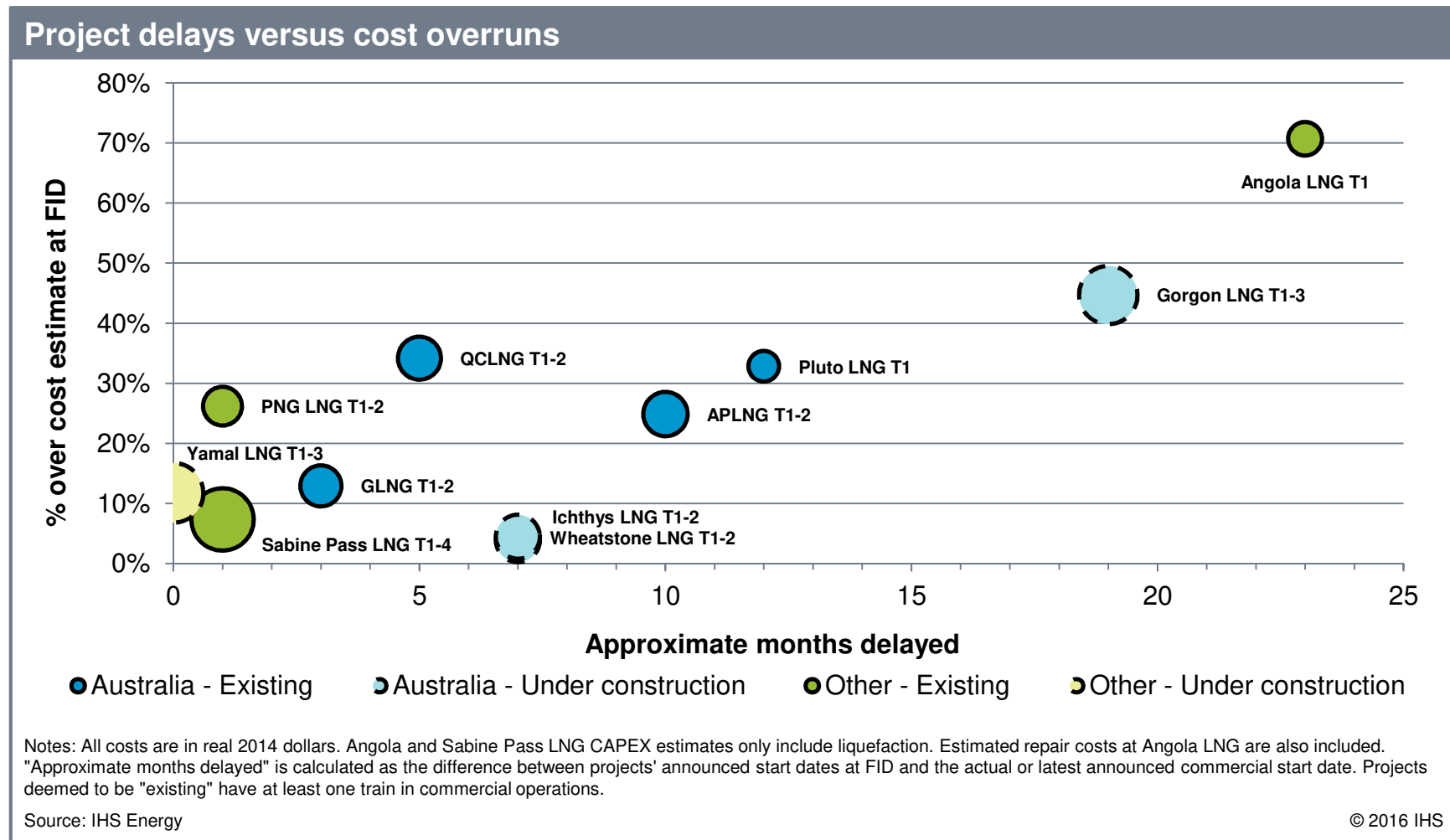


- Most non-US producers will not see a price signal to shut-in large volumes of production. US LNG will balance the oversupply at the end of the decade; as much as 35% will be unutilized in certain years.
- European gas prices will limit how much US LNG will be needed on the market.

Complicating factors for new FIDs

- Finding buyers is still a key milestone needed for bring a project to FID.
 - With so much excess LNG in the market, even if demand recovers buyers can dip into the spot market.
 - We expect a sustained spot price discount to oil-indexed prices which will discourage buyers from committing to new supply.
- Project developers will likely focus on controlling costs. While upstream costs are coming down in line with oil prices, it is unclear how quickly liquefaction costs will respond to the commodity price downturn.
- Developers that are involved in the current wave may be too jaded by their current experience to justify new projects of their own, or they may simply be too financially constrained. Thus, new developers and financiers are likely preparing for lower investment returns if they reach FID.

Complexity of liquefaction project development can lead to costly cost over-runs and delays



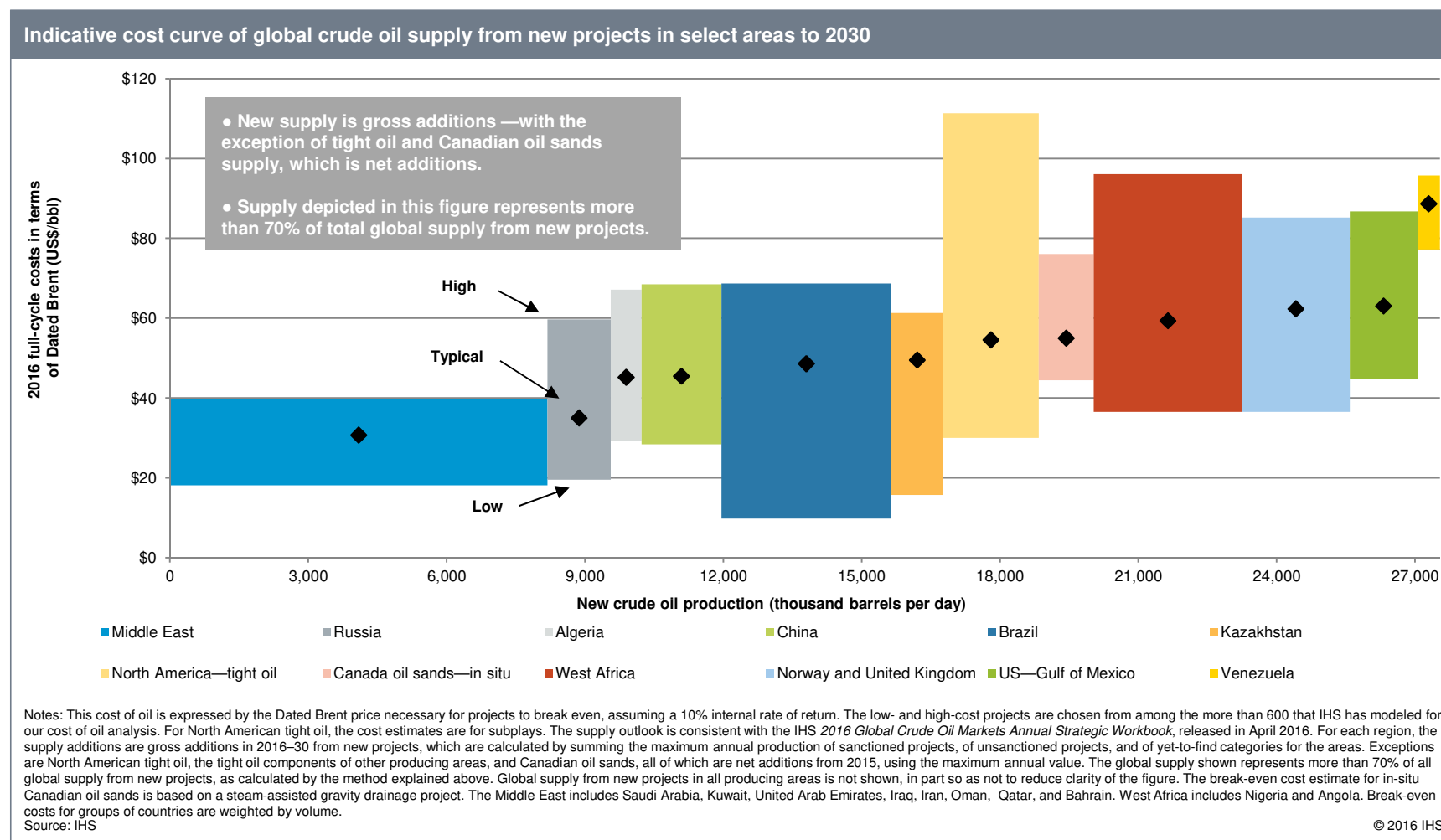
How will the global LNG market balance?

- Most non-US producers will not shut-in production since variable costs are low.
- Europe will play a key role in managing excess LNG as the oversupply intensifies since other major importers are facing structural and economic demand constraints.
- US LNG will help balance the oversupply particularly towards the end of the decade. European gas prices will limit how much US LNG will be needed on the market.
- After multiple years of low prices, new demand markets are expected to materialize.
- With LNG and gas prices lower for a long period, we expect a hiatus in new, large-scale liquefaction FIDs. Some smaller-scale projects might be able to find a way to FID, but these are likely one-off instances.
- After the market returns to a more balanced state post-2022, liquefaction project developers will face a new norm in buyer behavior.
- Despite their supply-long position in the coming years, LNG aggregators will still play a critical role in underpinning new supply for when market shifts back into balance.

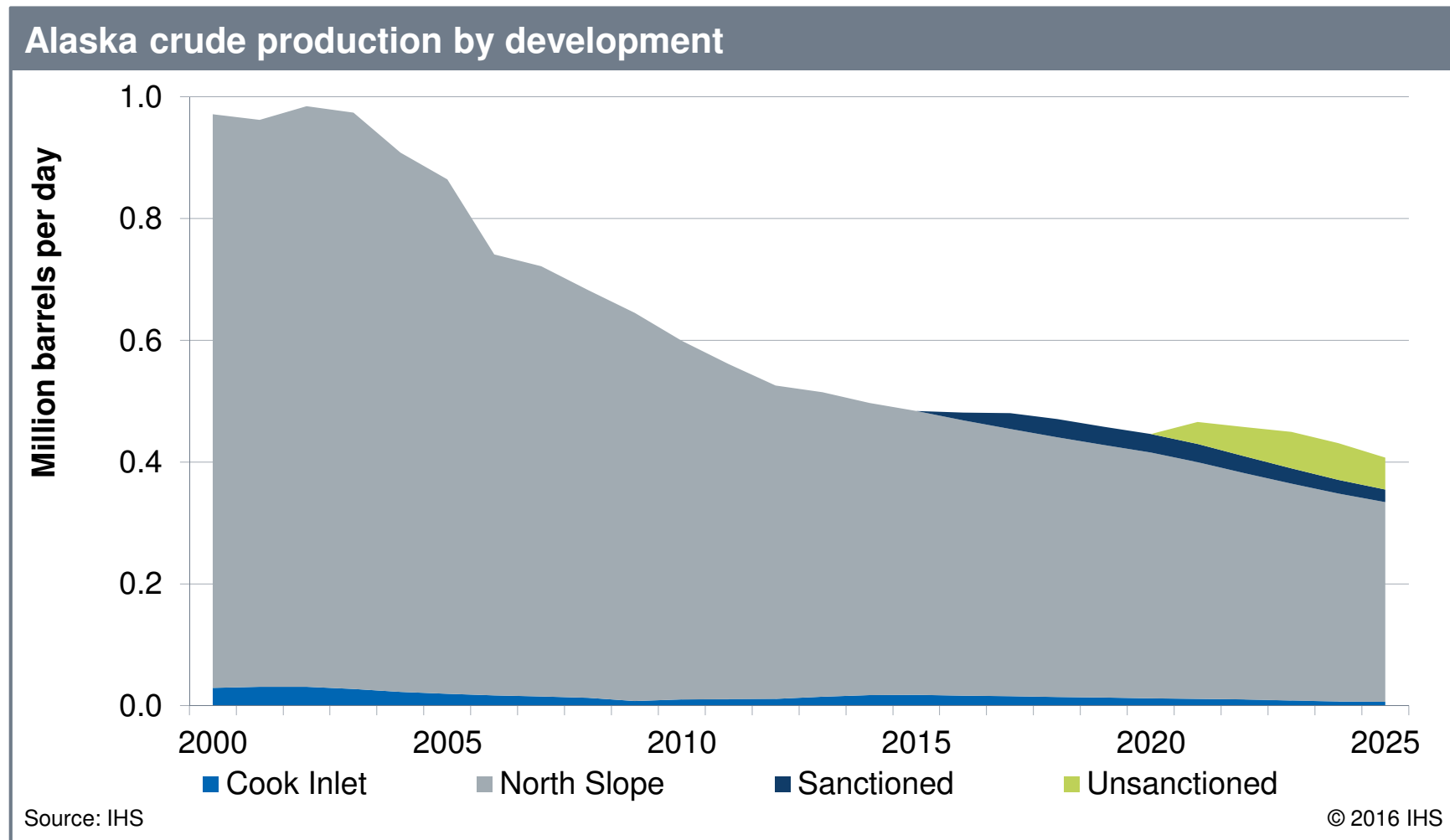


Government Response to Low Oil Prices

Indicative global crude oil supply cost curve

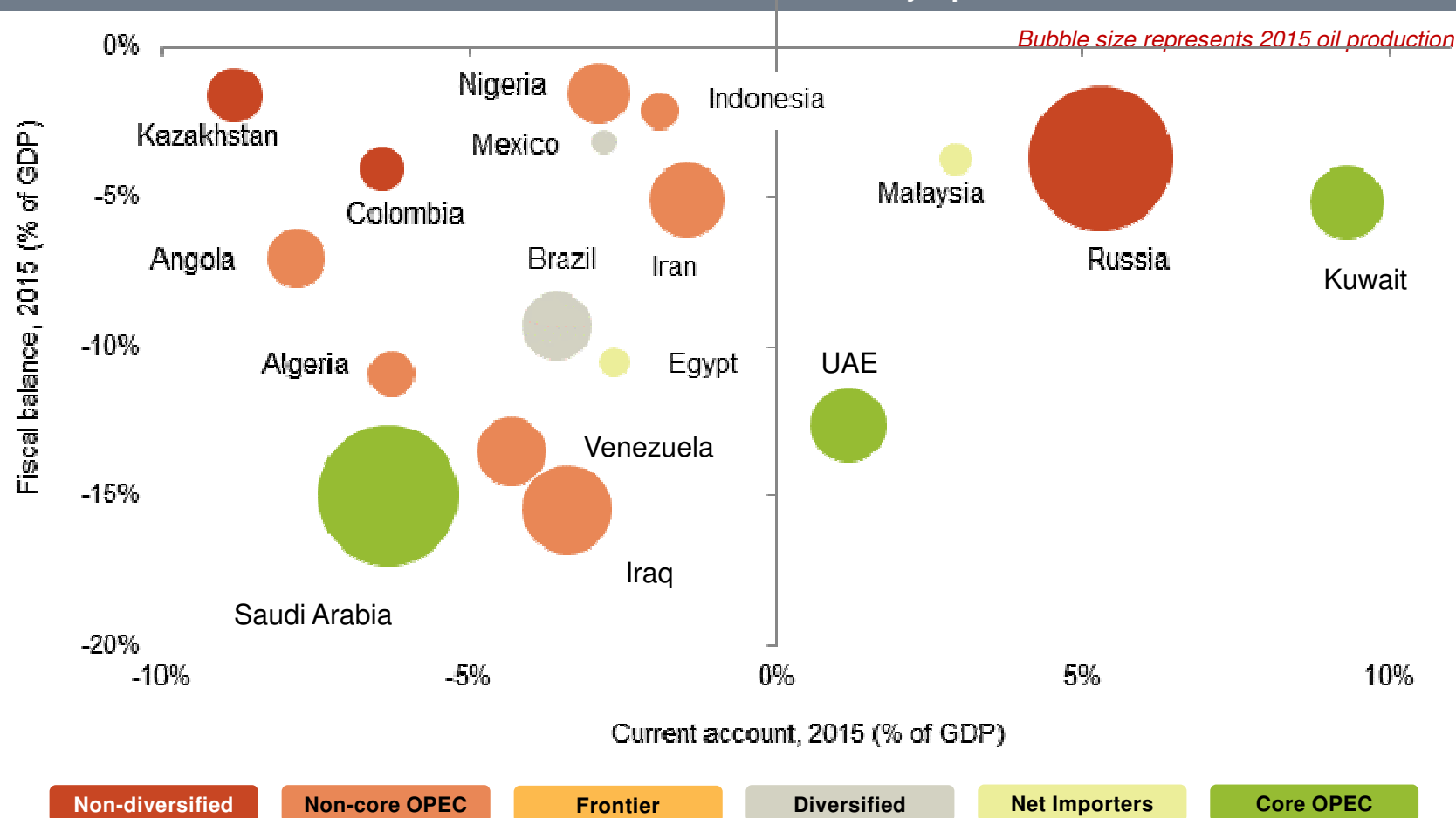


Alaska Supply Outlook



Low oil and gas prices create significant fiscal and current account pressures on major producing countries

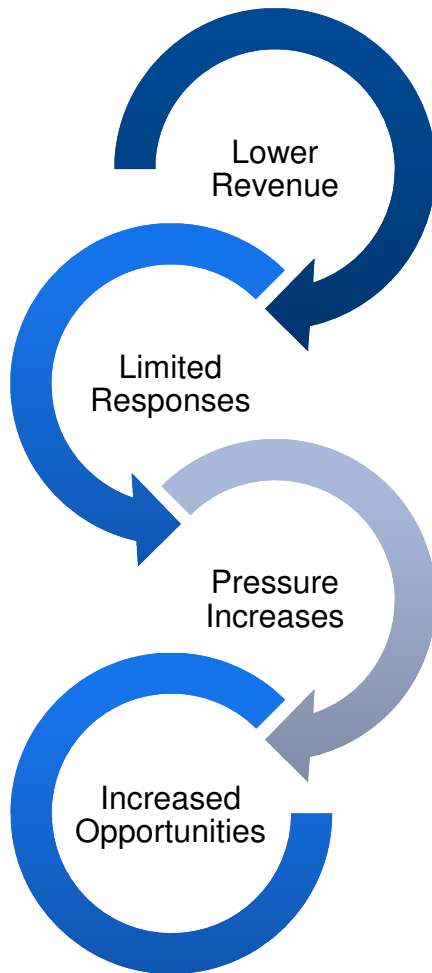
Fiscal and current-account deficits are a common theme across major producers



Source: IHS

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For non-diversified producers, investor “retrenchment” will help drive future improvement in terms



Inertia

As prices began to slide many producing countries adopted a wait and see approach until falling currency values and weakening budget and current account balances forced some of the more seriously affected undertook modest counter measures to temper the effects .

Financial preservation

Initial steps include drawing down financial reserves to defend the currency and cutting spending and imports. Increased fiscal pressure prompts producers to focus on capturing additional rent through contract amendments to increase government take and tightening fiscal terms to increase revenue. NOCs in some countries begin to cut capex and to prune sell non-strategic upstream assets

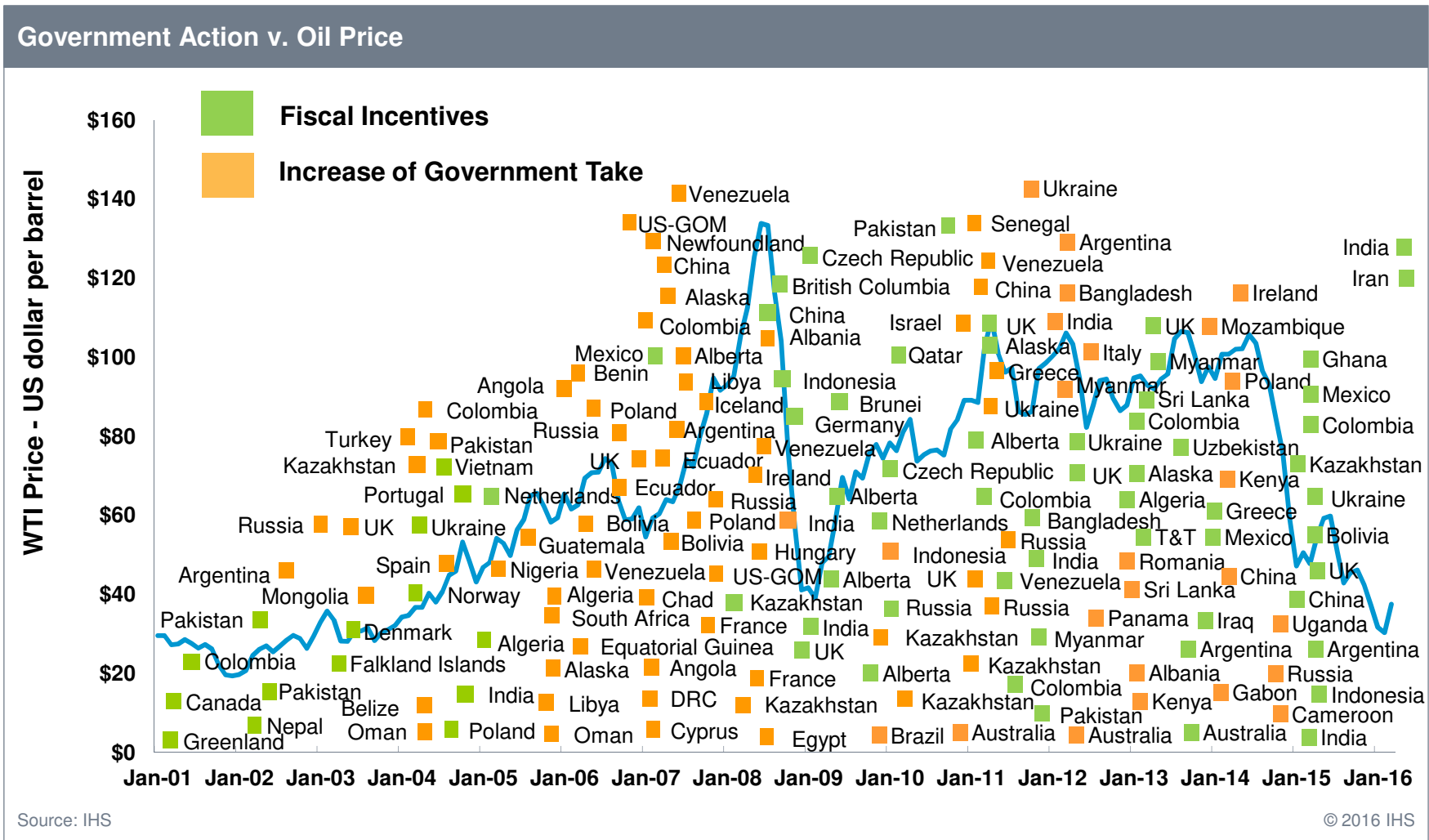
Investor reaction

As prices remain low, the weakening of fiscal and current account balances and the gradual exhaustion of financial reserves, combined with cut backs in spending by hard pressed investors, convince some governments that different approaches must be considered if dramatically worse outcomes are to be avoided.

Government reversal

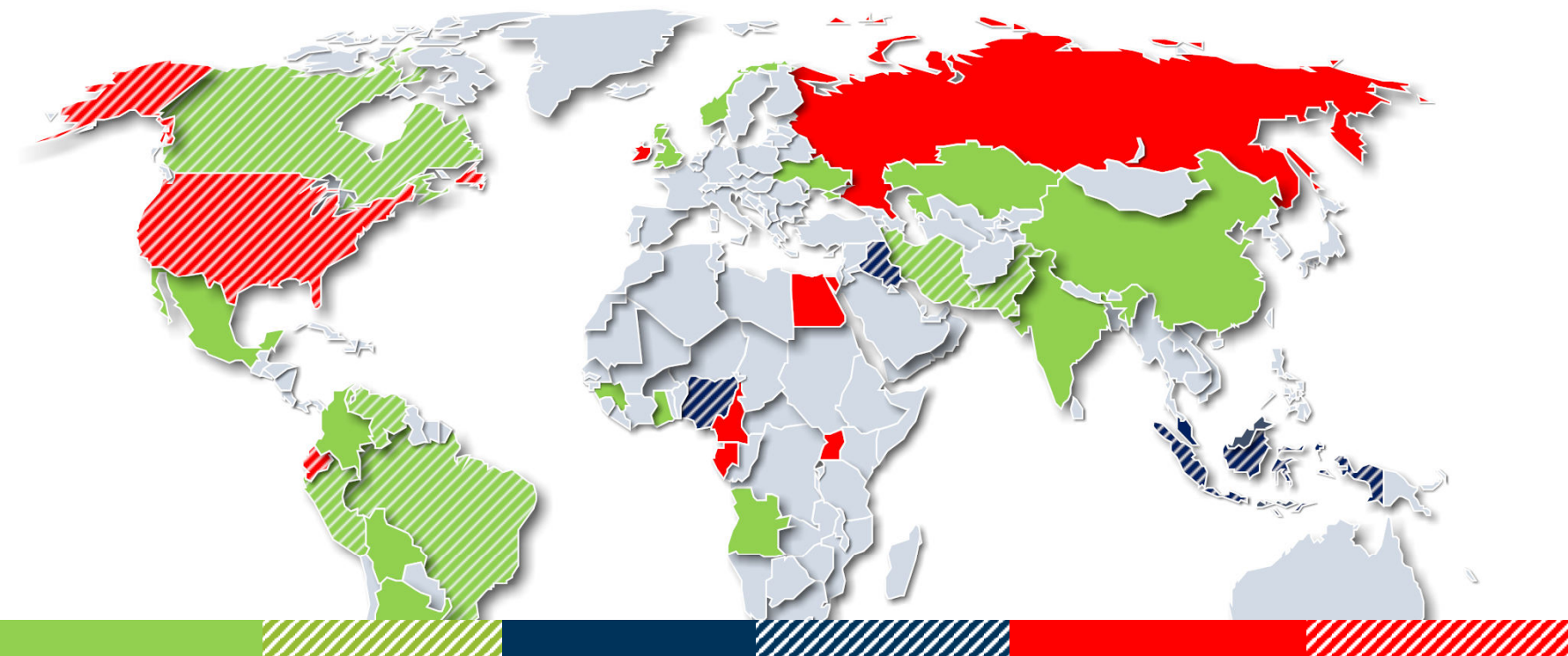
As pressures continue to mount some countries will be compelled to reverse earlier steps including the tightening of fiscal terms. Others may opt for different approaches including opening the upstream and privatizing non-core functions of the NOC to minimize cash outflows and maintain investment

Government Reaction to Market Changes Lookback to the Future?



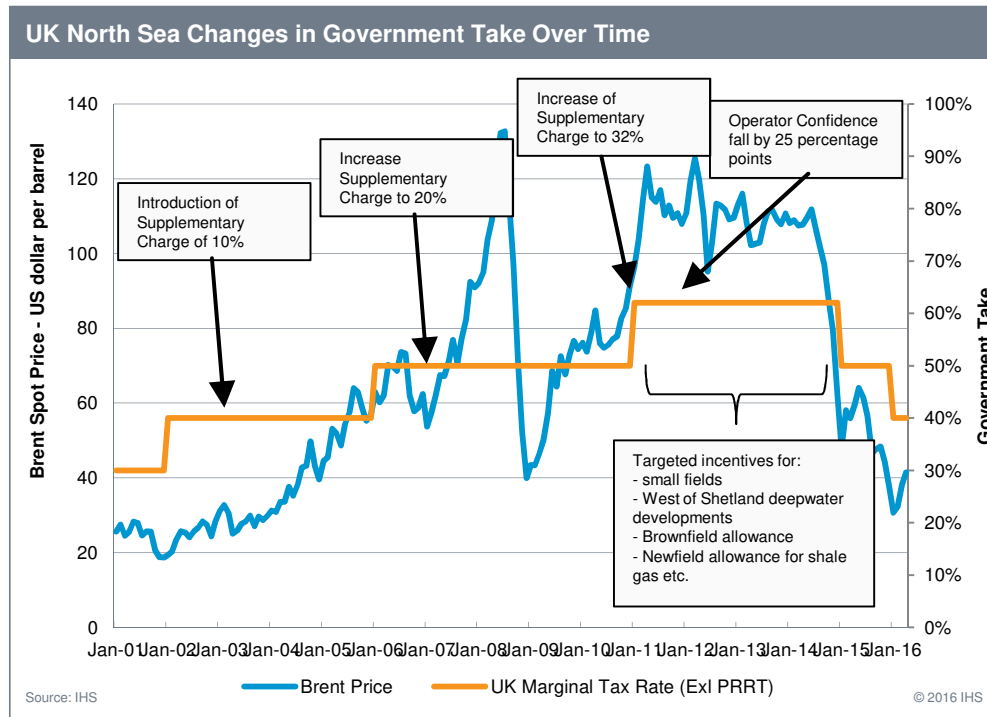
Changes in Fiscal Terms

Mixed reactions and varying degrees of impact and focus



Improved Terms		Potential Improvement		Mixed Measures	Potential Mixed Measures	Tightening of Terms		Potential Tightening of Terms
Angola	Argentina	Alberta	Brazil	Malaysia	Iraq	Egypt	Cameroon	Alaska
Bolivia	Colombia	Ecuador	Iran		Nigeria	Ireland	Russia	Newfoundland & Labrador
China	Ghana	Pakistan	Peru		Indonesia	Uganda	Uzbekistan	US Federal
India	Kazakhstan	Venezuela						
Mexico	Norway	US-North Dakota						
UK	Ukraine							

UK Sector of North Sea Government Take and Investor Reaction



UK Supplementary Charge rate reduced from 32% to 20% from January 2015 and to 10% from January 2016, reducing the marginal rate of tax for all but the oldest PRT-paying fields (see below) from 62% (2011-2014) to 40% (2016)
NB: UK Ring Fence Corporation Tax rate unchanged at 30%

Basin Allowance (an uplift) equal to 62.5% of “qualifying investment capital” incurred after March 2015 is deductible for **Supplementary Charge**

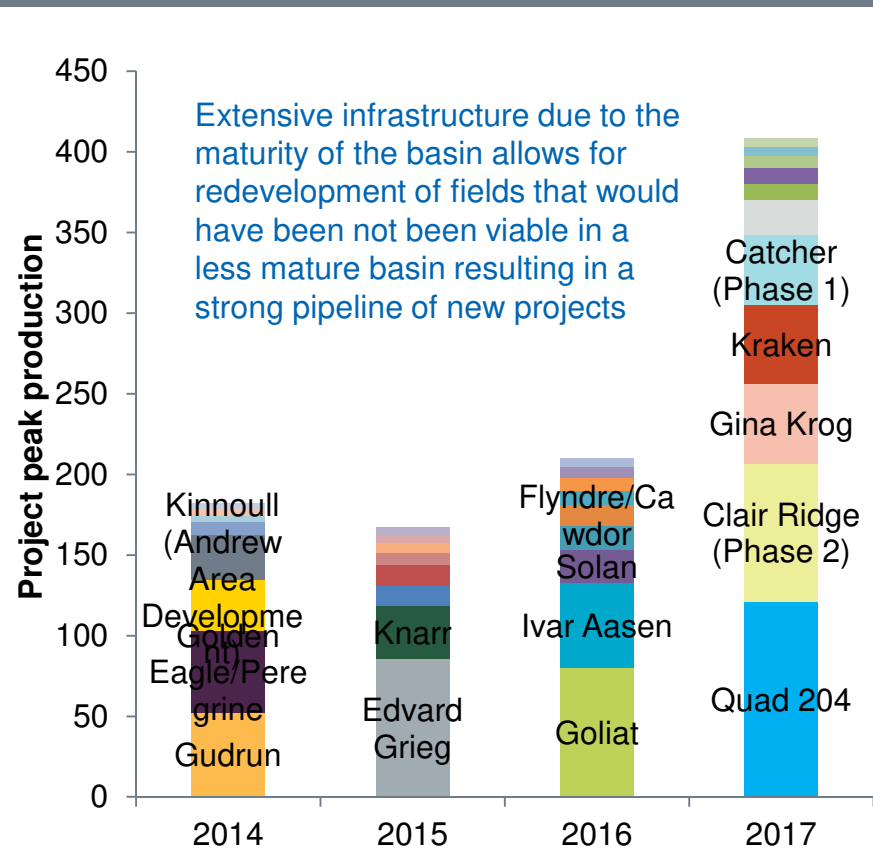
UK Petroleum Revenue Tax (PRT) rate reduced from 50% to 0% (zero percent) from January 2016, reducing the marginal rate of tax for fields subject to this levy from 81% (2011-2015) to 40% (2016)

- Long period of underinvestment
- While government revenue increased investment in North Sea declined
- In 2013 and 2014 investment in brownfields in mature basins intensifies
- The 2015 basin allowance is replacing all the various incentives introduced during the 2012-2014 period.

North Sea Fighting The Storm With An Army of Sanctioned Projects

Declines to remain shallow in 2016 and 2017

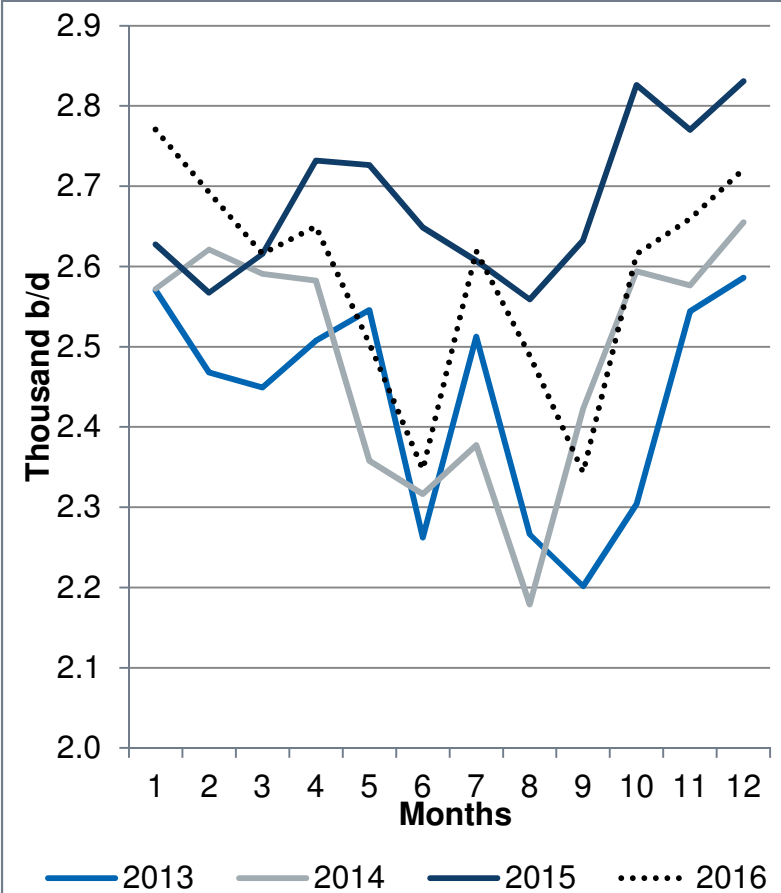
North Sea major oil project additions



Source: IHS

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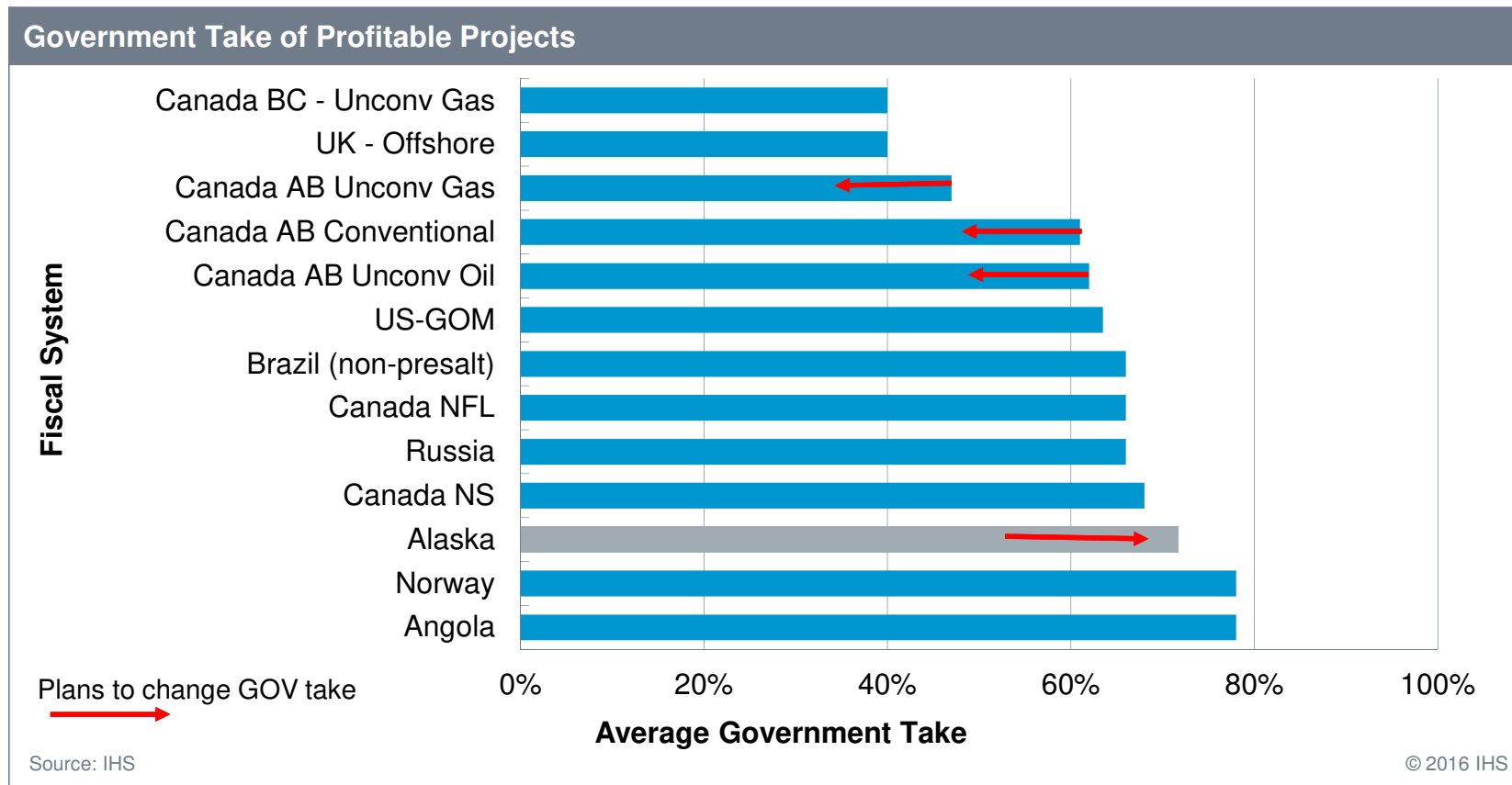
North Sea production "swings" driven by maintenance



Source: IHS

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Government Take of Select Peer Group



Trends in Government Respond to Low Oil Prices

- Changes to fiscal terms in response to low oil prices have been muted:
 - Governments face domestic pressures to making concessions for investors
 - Introducing legislation for new E&P terms is typically a drawn-out process
- Some established producers have improved terms for investors:
 - A major driver is maturity of the resources base
- Non-diversified (e.g. Russia) and less-established (e.g. Uganda) producers have failed to improve terms for investors:
 - Non-diversified producers focusing on financial preservation; decline of E&P investment required to shift policy emphasis from near-term revenue to resource development
 - Less-established producers lack understanding of investor decision processes and feel populist pressure to maximize domestic benefits
- Many governments contemplating reducing role of domestic NOCs



What Next?

Who wins and loses in energy's future?

1. **Many companies struggling to survive**
2. **Short-cycle oil—is it here to stay?**
3. **Long-lead time projects—such as large offshore projects—face severe challenges.**
4. **Onshore projects with short drilling to production times have the upper hand—at least for now**
5. **Global gas market has strong growth prospects, but not necessarily high upstream margins.**
6. **Consumers win—greater choice and competition among energy suppliers for market share**

Points are numbered for ease of reference and not necessarily in order of importance.

Will the future be different from the past?

- **Fossil fuels have held a remarkably steady share of around 80% of the global energy mix for decades**
- **The high share of fossil fuels is due to their abundance, energy density, infrastructure, and competitive costs**
- **Oil's future will be shaped by transport and the future of gas by power generation**
- **There will be more choices because of energy from wind, solar, and batteries – technology, price and policy will shape choices**



Thank You!



For more information about this presentation and IHS Energy in general, please contact

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