Energy Insights

Global oil prices and market outlook

Workshop discussion
Bangkok, 29 July 2015

Objectives for today

1. Discuss **historical trends**, and how we got to here
2. Provide a set of **oil price scenarios** that could happen in the next years
3. Share an **oil supply and demand outlook** on how market could balance
4. Discuss possible **implications for Thailand**

SOURCE: Energy Insights

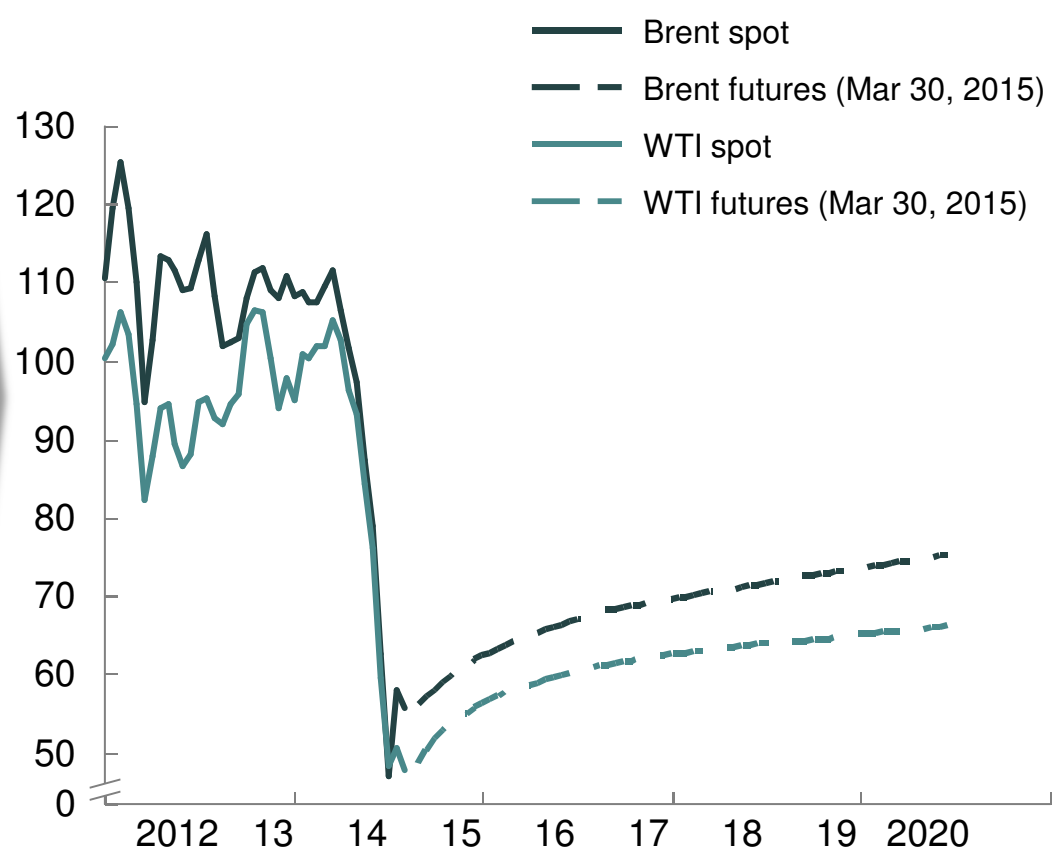
The recent oil price drop is a result of weak demand and high supply, intensified by OPEC's decision not to cut its output

A **Weakening global oil demand growth** as a result of lower than expected GDP growth in developing countries, especially China, and slow economic recovery in Europe

B **Supply glut**, especially in the Atlantic Basin, due to strong growth in US output and recovery in political wildcard producers (e.g. Libya)

C **OPEC inaction** as Middle Eastern exporters continue to produce and protect market share in Asia against rising competition from W. Africa and S. America that are pushed out of the Atlantic Basin due to US LTO boom

Brent and WTI monthly[1] prices and futures
USD per barrel

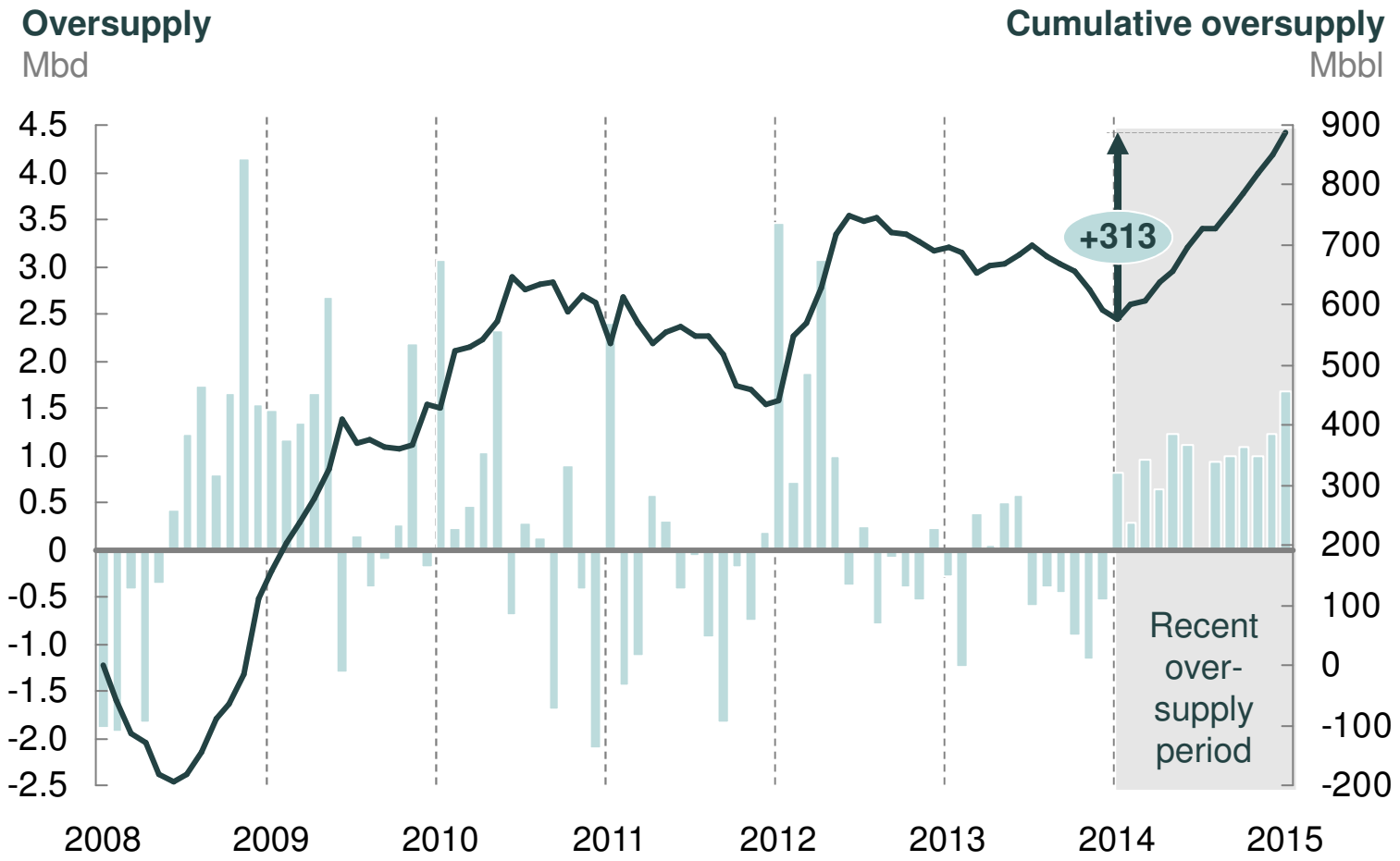


1 Mar 2015 spot prices are YTD average to Mar 30

SOURCE: Bloomberg, Platts, Energy Insights

B-A The 2014 oversupply averaged about 1.0 Mbd, implying 313 Mbbl additions to global stocks since Jan 2014

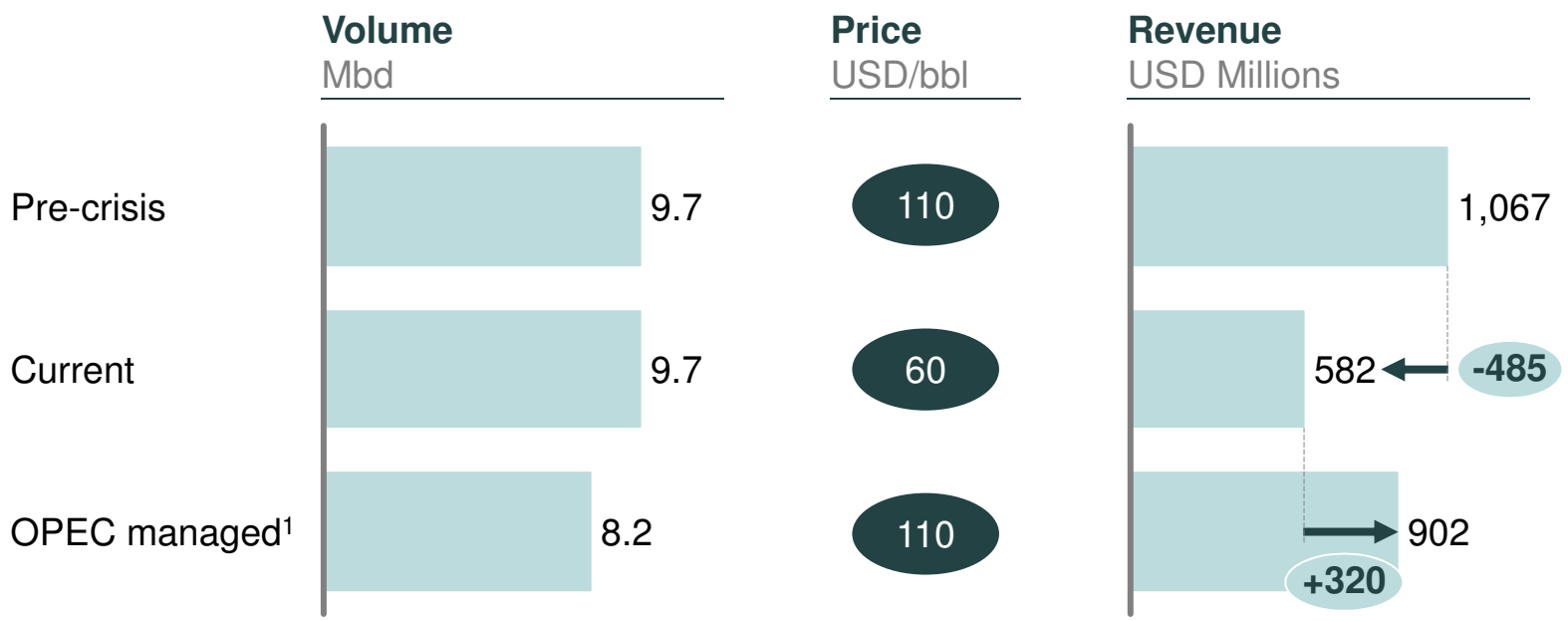
Global petroleum products consumption minus total liquids supply



SOURCE: EIA Short-Term Energy Outlook Dec 2010, Dec 2014, team analysis

C A calculation of Saudi's rent shows inaction does not maximize near-term revenues, suggesting inaction has more to do with the long-term

Saudi Arabia's oil revenue estimates



- Current oil price decline is costing Saudi ~$500million a day vs pre-crisis
- Cutting ~15% of production could have given OPEC an additional $320 million per day, if prices were to increase to 75/bbl, revenue after cut would be the same as current one
- Current revenues are ~ $200 million below the estimated fiscal breakeven (~$800 million[2])
- Assuming Saudi has market power, current action is not aimed at max. short-term returns

1 Assumes that cutting 1.5 mbd would have kept prices at historical levels
2 Estimated by multiplying current production (9.7 mbd) by fiscal breakeven price of $82/bbl

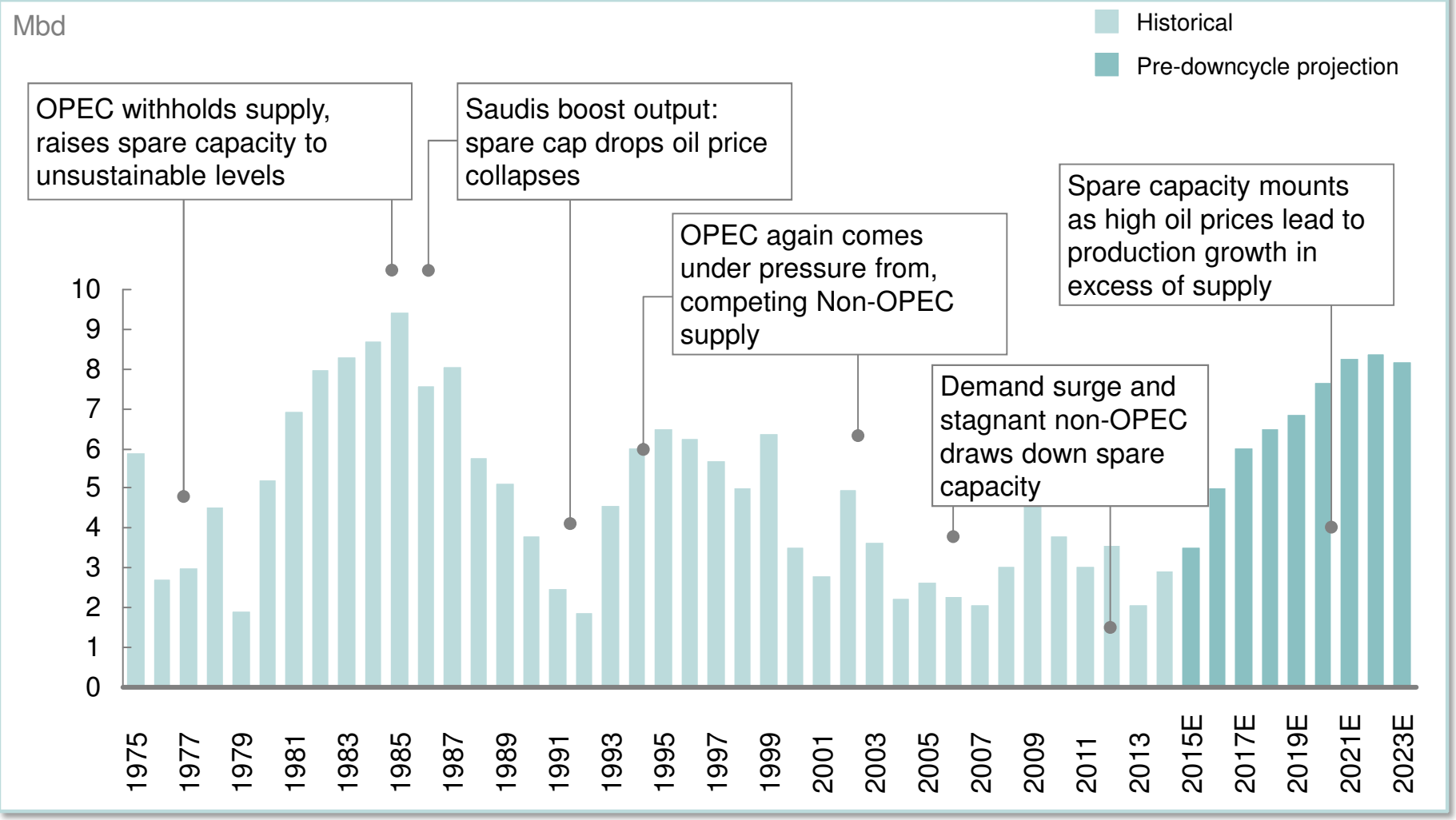
SOURCE: IMF, team analysis

C Some see 8 reasons why Saudi hold back

A radical move was needed	1. Low oil prices halt investment by high-cost producers. OPEC have stopped to give a “price guarantee”. Fracking and refracking will lose access to bank loans they depend upon. Big capex projects will be questioned 2. May limit the dramatic improvement in fuel efficiency and emerging shift from oil. Oil lost the power segment in the 1970s. Now it was at risk of losing half the transportation segment
Can manage it	3. Saudi costs are $5 - 6 per barrel. US shale is $70, with a range from $40 to $90. Oil-sand-based is at $80 - $90 a barrel. Saudi Aramco and other GCC countries make a lot of money at $50. 4. The FX reserves of about $900 billion are one-fifth larger than its GDP and ~4x its annual budget – provides the buffer to wrung others out of the market.
Builds markets	5. Cheap oil helps build markets in China and India, where future energy demand is concentrated. Asia already buys over two-thirds of Saudi oil exports, while the Americas now take less than one-fifth 6. Discourage Chinese and Indian plans to develop domestic fracking and impede progress toward self-sufficiency of oil supply
Support political ambitions	7. Countries negatively affected are enemies and competitors; Syria, Russia and Iran, Venezuela not close, Nigeria a competitor for the China market. Low prices benefit American, Chinese, and Indian consumers and deepen their addiction to oil 8. Demonstrate Saudi and OPEC relevance – and remove expectation that Saudi will carry the burden

C …and stop a trend towards high spare capacity that could recreate the long-term oil price slump of the 1980's

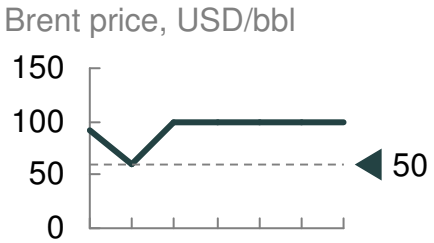
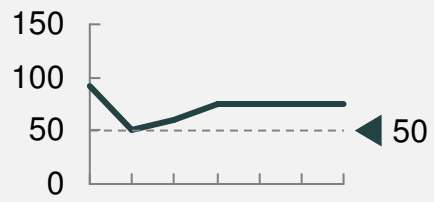
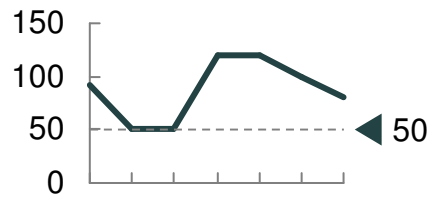
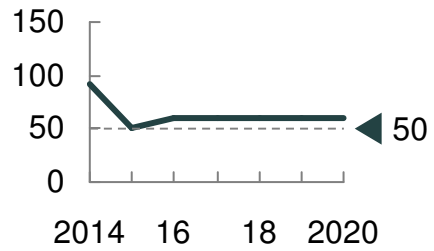
Global crude oil spare capacity



SOURCE: OPEC, IEA. Credit Suisse, Energy Insights

There are multiple price scenarios that could occur

Reference case

Scenarios		What do you need to believe for this scenario to occur
V-shaped Recovery		▪ Major supply disruptions in Venezuela/Russia/Brazil due to economic turmoil or Middle East due to political instability ▪ OPEC members agree to jointly curtail production ▪ Low oil prices drive immediate demand growth in Asia and OECD countries
U-shaped Recovery		▪ Longer downturn cause delays to mega projects (e.g., Deepwater, oil sands) and slowdown in LTO ▪ OPEC production cut only after enough non-OPEC supply gets delayed or out of the market ▪ Mitigated short-term jump in global demand, dampened long-term growth due to energy efficiency
Under-investment		▪ Under-investment in new projects during 2015-16 downcycle creates an under-supplied market in the mid term ▪ Low oil prices in 2015-2016 drive immediate demand growth in Asia and OECD countries
Supply Abundance		▪ Technology disruption or large factor costs adjustments drive down brekeven cost for new production to $50-60/bbl levels ▪ OPEC members continue to protect market share ▪ Global GDP and oil demand slow down or starts to decline as a result of accelerate energy efficiency or regulation

SOURCE: Energy Insights

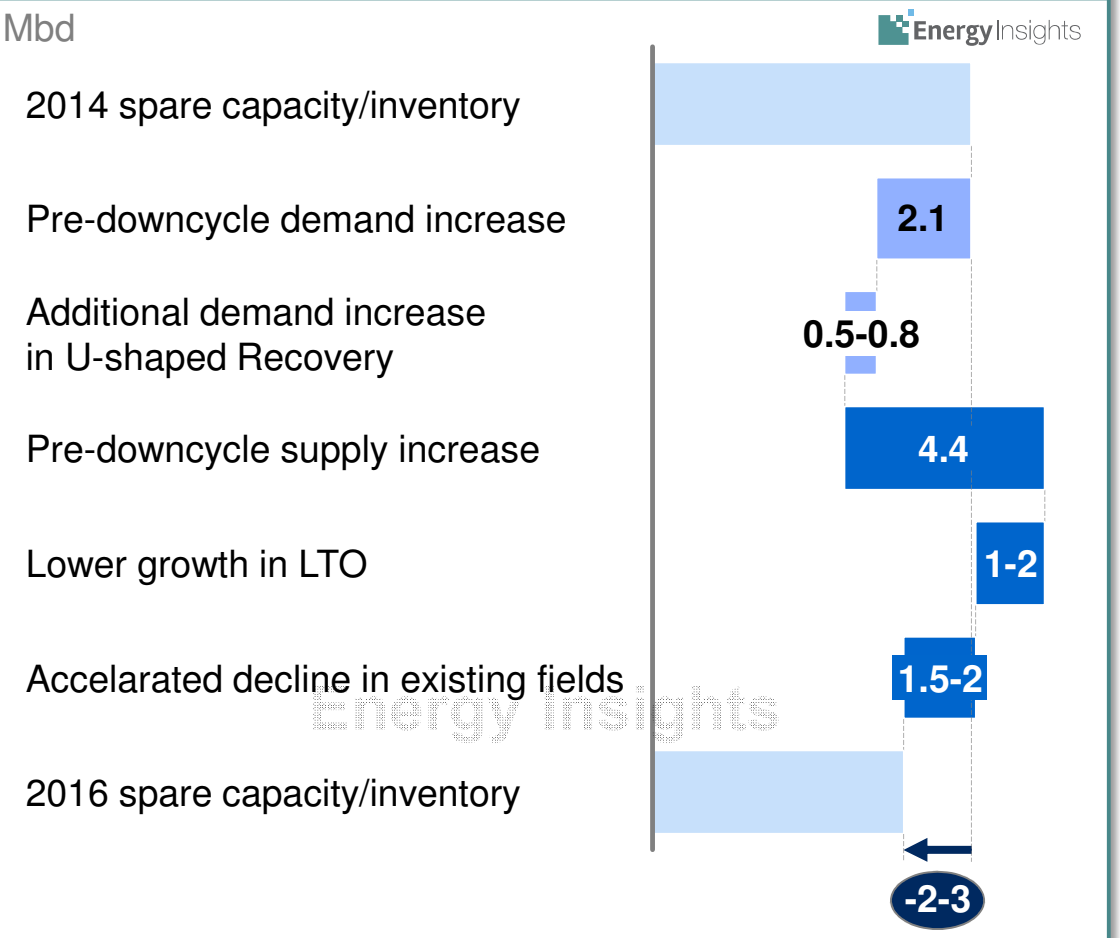
In the short-term, decreases in oversupply will set the timeline for price recovery and affect OPEC behavior

Spare capacity
Demand changes
Capacity changes

Key drivers

- A 2-3 Mbd decrease in oversupply could be seen over 2015-2016, driven by
  1. Increasing demand
  2. Change in new LTO capacity
  3. Decline of conventional production
4. OPEC can keep low prices until sufficient capacity has exited to maintain future spare capacity at a level where OPEC can regulate pricing (~3 Mbd in the long term)
5. In the very short term, prices could experience volatility due to multiple uncertainties

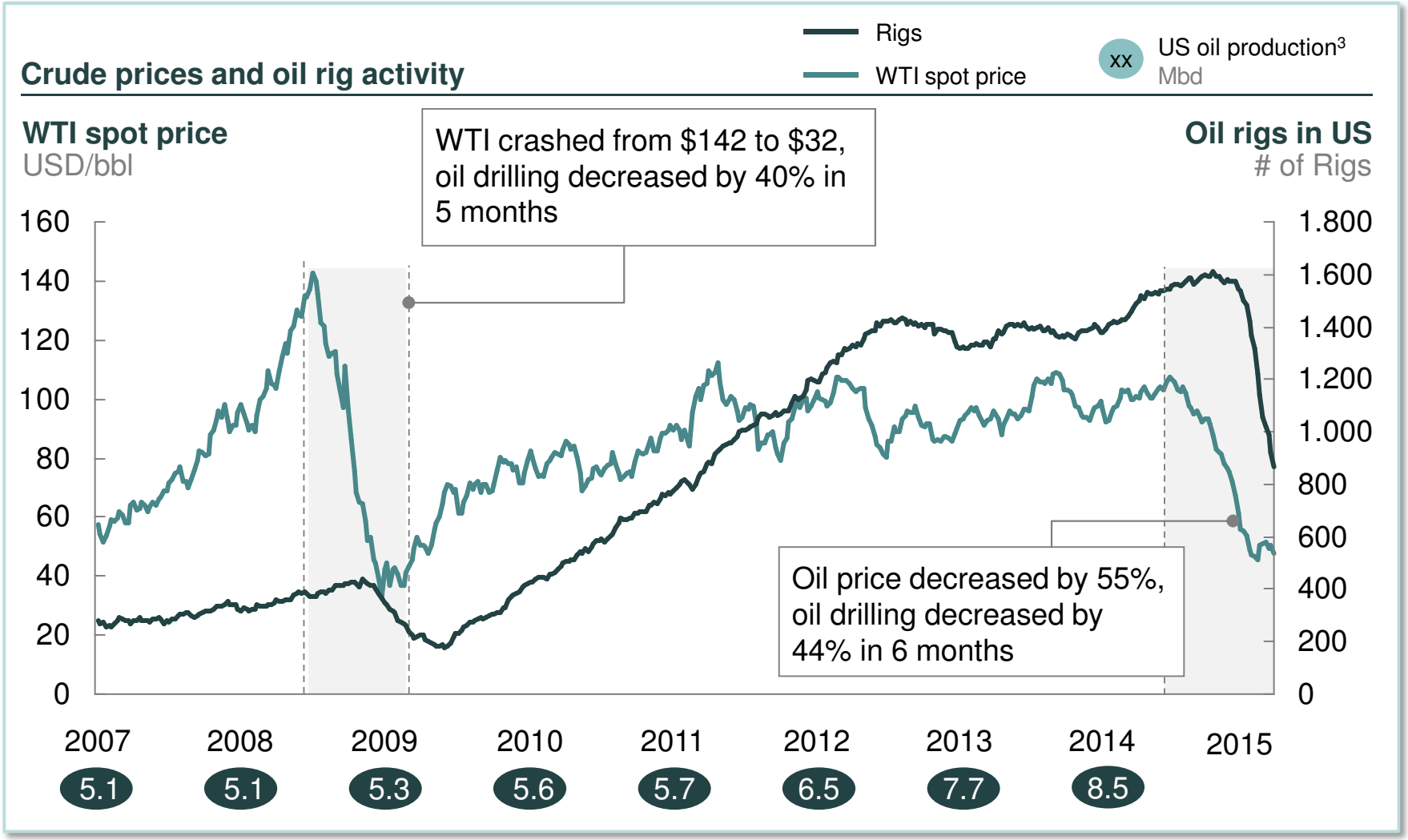
Global capacity in U-shaped Recovery, 2014-2016



1 Incremental decline of 4% of the 2014 production for conventional onshore, conventional shelf, and heavy oil
2 LTO capacity originally expected to increase by 1.5 Mbd in 2015 and 1.1 Mbd in 2016

SOURCE: Energy Insights

2 LTO drilling has historically been highly elastic to crude prices, and current situation follows precedent



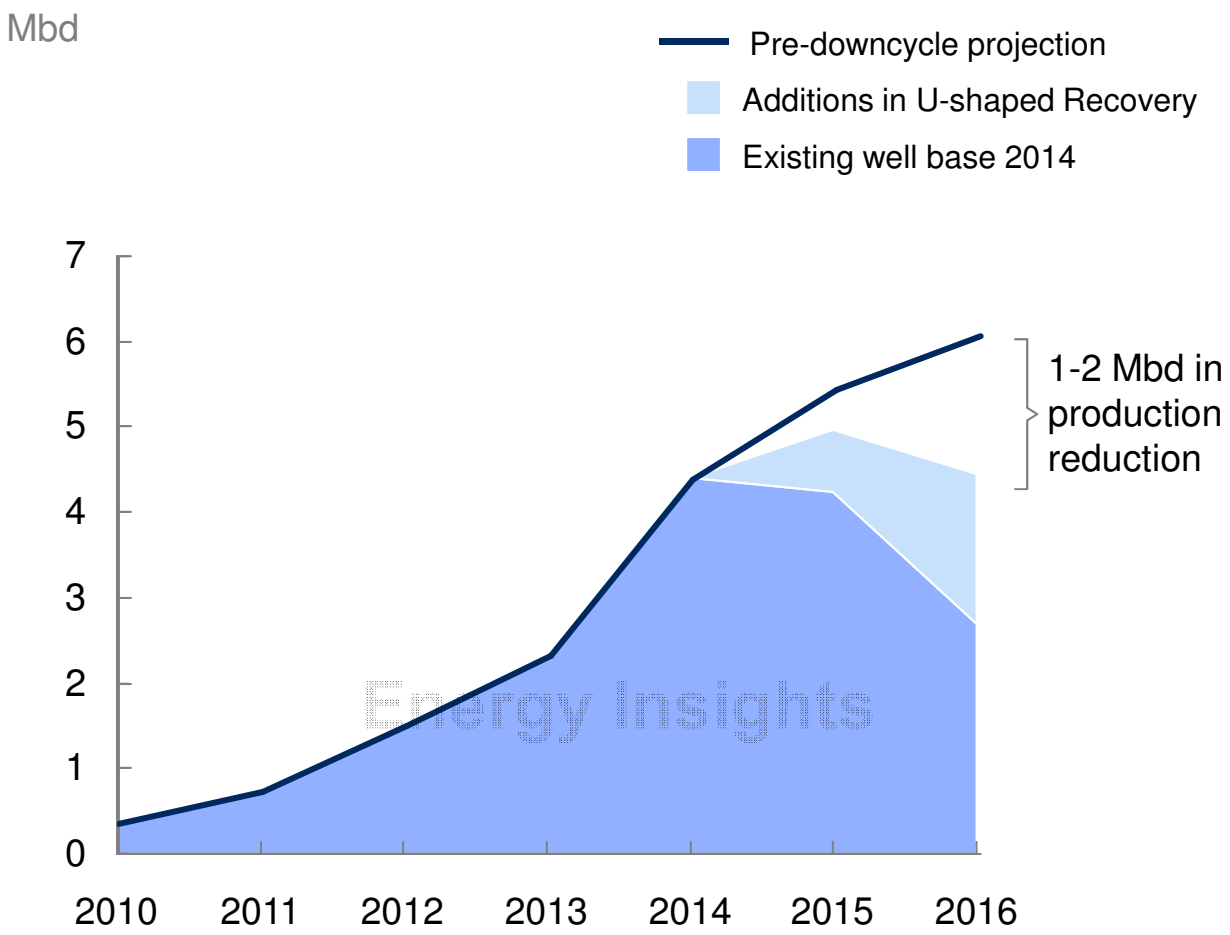
1 Includes Bakken, Eagle Ford, Sprayberry, Avalon Bonespring, Mississippi Lime and Niobrara in the Sprayberry/Wolfcamp play 2 Includes vertical drilling activity for fractured oil wells 3 Includes crude oil and condensate, excludes NGLs

SOURCE: EIA, Baker Hughes, Energy Insights North America Supply Model

2 North America LTO production would decline in 2016, while in the pre-downcycle outlook it was growing to over 6 Mbd

U-SHAPED RECOVERY

US and Canada light tight oil production



Despite the sharp decrease in number of rigs, LTO production is expected to grow in 2015 and decline slightly in 2016 due to

- High-grading of activity (focus on more prolific basins)
- Increased rig efficiency
- Cost deflation
- Continued IP learning

SOURCE: Energy Insights

5 Short-term prices are vulnerable to multiple uncertainties that can cause volatility in the next 1-2 years

Short-term uncertainty	Description	Impact on prices
Storage capacity	▪ Physical storage space is being filled as oil inventories keep rising, and could be poured back into the market	▪ Push prices down further as traders will stop storing and start selling, therefore flooding the market (deeper U-shape)
Iran embargo lifting	▪ Iran can ramp-up exports quickly and add up to 1 Mbd in the next 18 months if the nuclear talks succeed and sanctions are lifted	▪ Worsen oversupply and push the prices lower than expected (prolonged U-shape)
Instability in Middle East	▪ Production from Iraq might get cut if the existing security threats spread to the broader region and start affecting the giant oil fields in the South	▪ Cause a supply shock and the prices might go up quicker than expected (V-shape recovery)

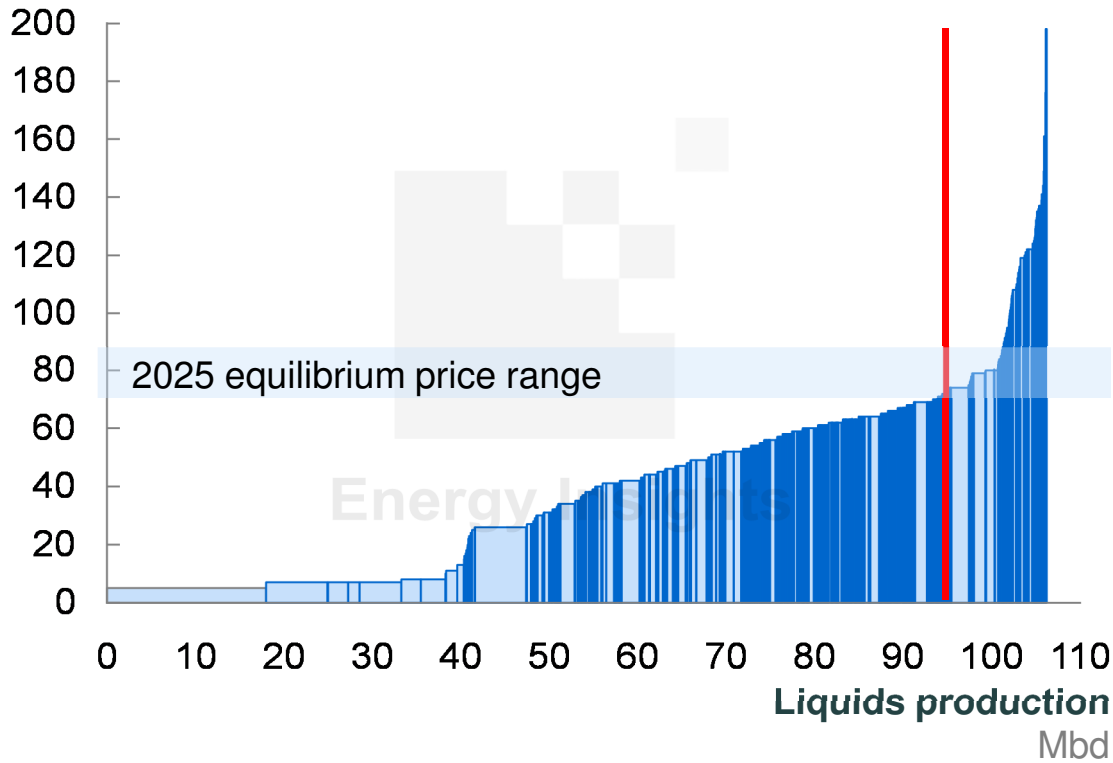
SOURCE: Energy Insights

In the long-term, we can see a crude price equilibrium around $70-85/bbl assuming OPEC maintains a ~40% market share

Key drivers

- The market clears at USD 70-85/bbl in the long-term as supply-demand balances through
  1. Dampened long-term demand growth
  2. Continued LTO growth
  3. Delays and cancellations in oil sands and deepwater projects
4. OPEC maintains market share above 40% and modulates production to keep the prices in check
5. In long-term, the tail of the cost curve is very steep therefore small changes in demand can cause big price shifts

Global liquids cost curve[1] in U-shaped Recovery, 2025



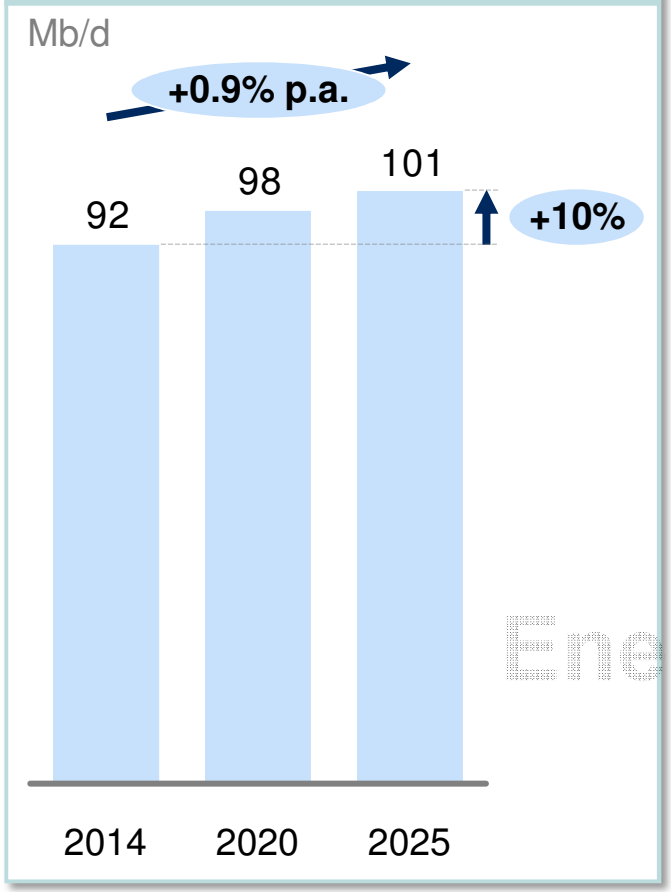
1 Includes technical cost (capex, opex, exploration cost) and government take (taxes and royalties); cash cost for existing fields and full life cycle cost for new fields developments

SOURCE: Energy Insights

1 Long-term demand growth will be dampened by high energy efficiency improvements and fuel share loss

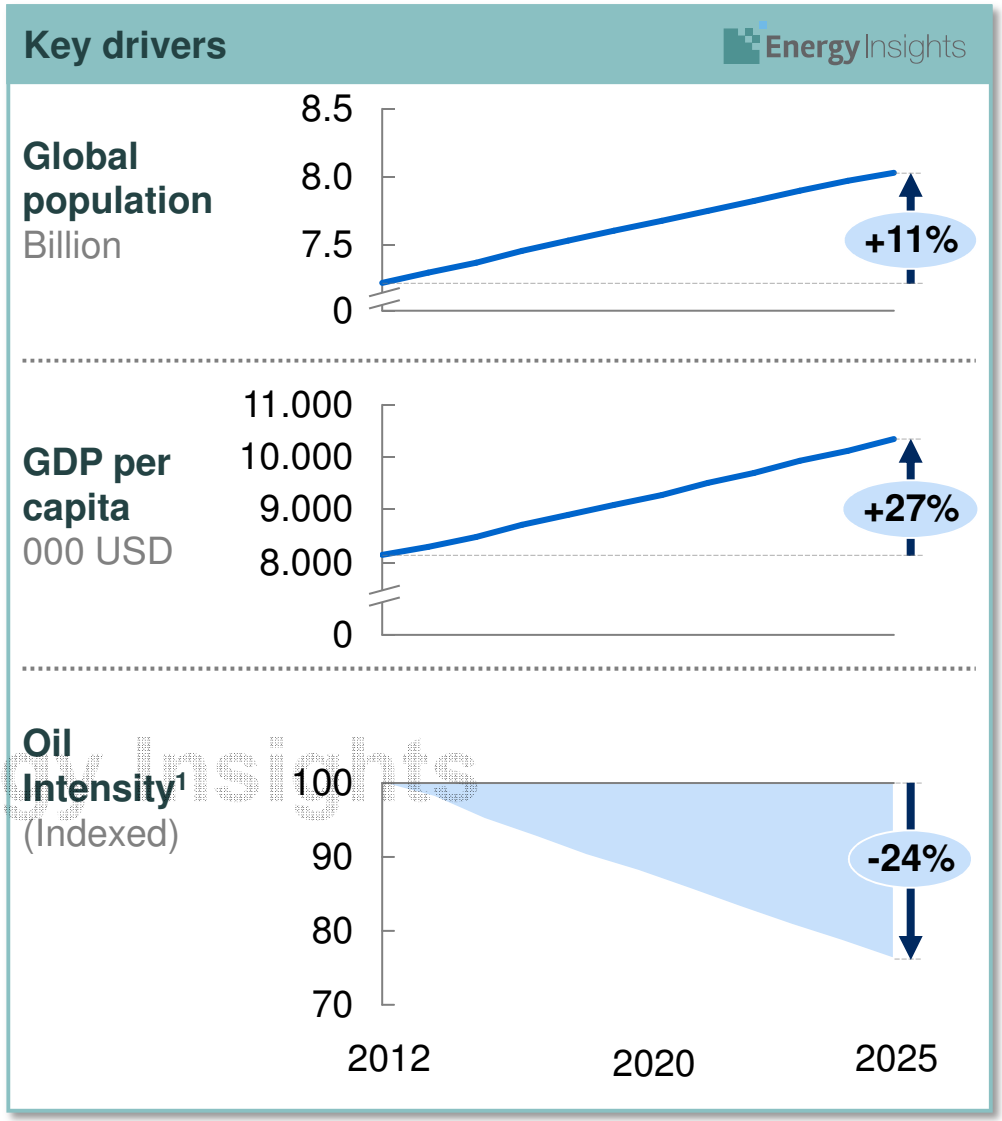
U-SHAPED RECOVERY

Global liquids demand



Key drivers

Energy Insights



1 Oil Intensity is defined as Oil/GDP

SOURCE: Energy Insights

1 Light Vehicles remain stagnant, while Chemicals, Aviation and Trucks in developing markets are expected to drive the majority of demand growth

U-shaped Recovery, Mbd

SOURCE: Energy Insights

2 Global liquids supply will grow by ~4.5 Mbd in 2020, and ~8 mbd to 2025 driven by unconventionals, deepwater, and political wildcards

U-SHAPED RECOVERY

Mega trends		Sources of growth to 2020, Mbd	Sources of growth to 2025, Mbd
	2014 supply capacity[1]	96.1	96.1
Unconv. revolution	LTO	2.8	3.9
	Oil sands	0.7	1.1
	Unconv gas	0.4	0.6
Offshore challenge	Deepwater	1.8	4.8
	Shallow water[2]	0.1	-0.6
Political wildcards	Iraq	1.2	1.7
	Iran	0.2	0.2
	Other[3]	0.2	0.4
Other	Other OPEC	-0.6	-0.8
	RoW	-4.1	-7.1
	NGLs	1.1	2.1
	Other liquids[4]	1.4	2.4
	Final supply capacity	101.2	104.6

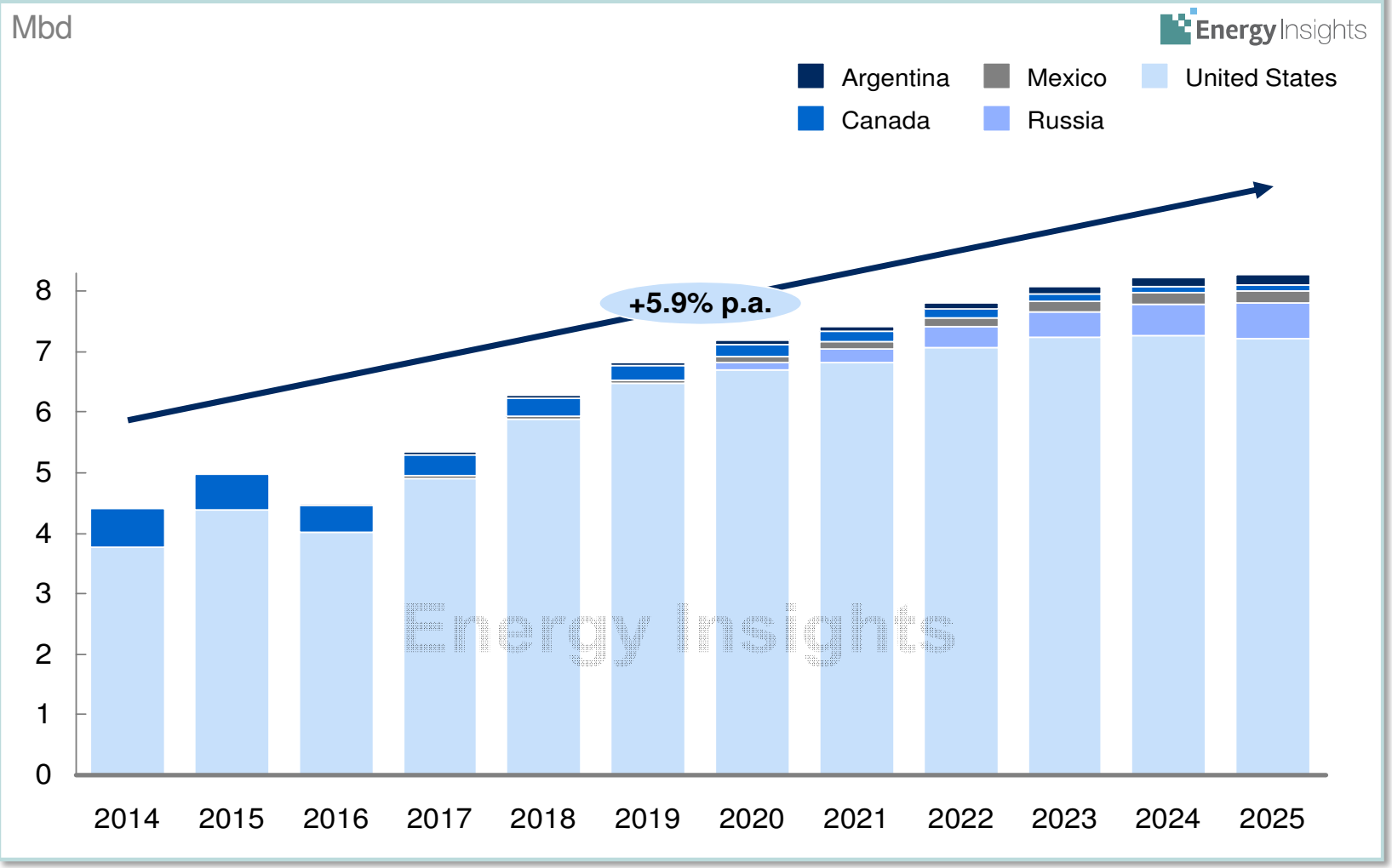
In U-shape Recovery, up to 20%[5] of current crude and condensate production will need to be replaced by 2020 due to natural decline. The rate is around 25-30%[5] by 2025

1 Includes crude, condensate, NGLs, other liquids, refinery gains and spare capacity 2 Excludes shallow water production in Iran and Venezuela 3 Includes Venezuela and Libya 4 Includes biofuels, CTLs, GTLs and refinery gains 5 Reflects accelerated decline in existing fields, and assumes minor growth in Iranian output

SOURCE: Energy Insights

2 Global light tight oil production will grow by 5.9% p.a. through 2025 adding ~4 Mbd

Global light tight oil production outlook



SOURCE: Energy Insights, EIA AEO 2013

Oil market – Implications for Thailand

For the country

- Take advantage of current low oil price environment to steadily **phase out domestic fuel subsidies**
- Use lower spend on oil imports as opportunity to **re-balance budget**
- Leverage increasing oil supplies around the world to **diversify supply options**

For upstream players

- Focus on **cost reduction** in existing and new assets, fostering **operational excellence** and sharing of basin-level performance metrics
- Explore **upstream assets M&A** opportunities with attractive valuations or upside potential

SOURCE: McKinsey