

Oil Price Outlook

BBVA Research USA

Houston, TX

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Bottom Line

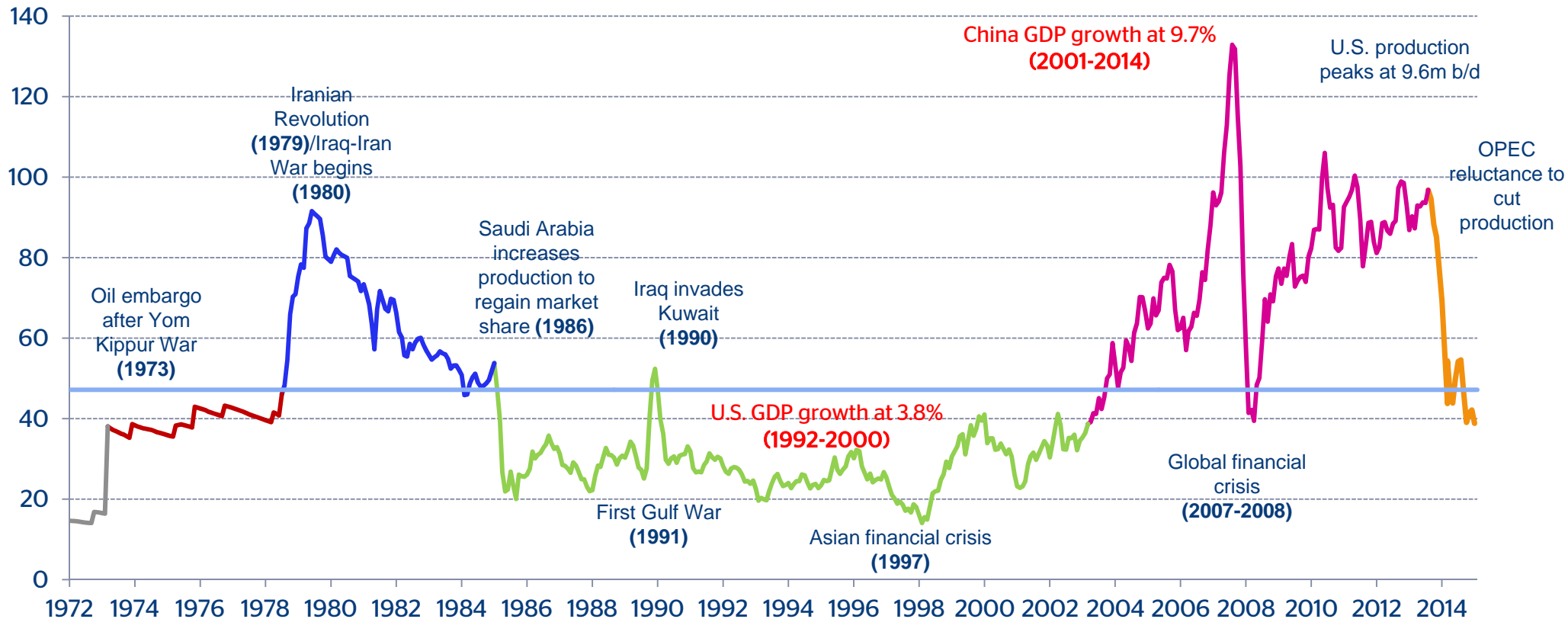
- Market fundamentals are behind oil price drop
- Further declines are likely
- We expect a modest rebound in 2H16-2017
- Long-run equilibrium price around \$60/bbl
- Structural trends limit upside risks

The end of the super cycle

Oil supply and demand dynamics tend to produce long cycles.
The recent oil price decline marks the beginning of a new era

Real Crude Oil Prices

WTI, \$ per barrel, 2009



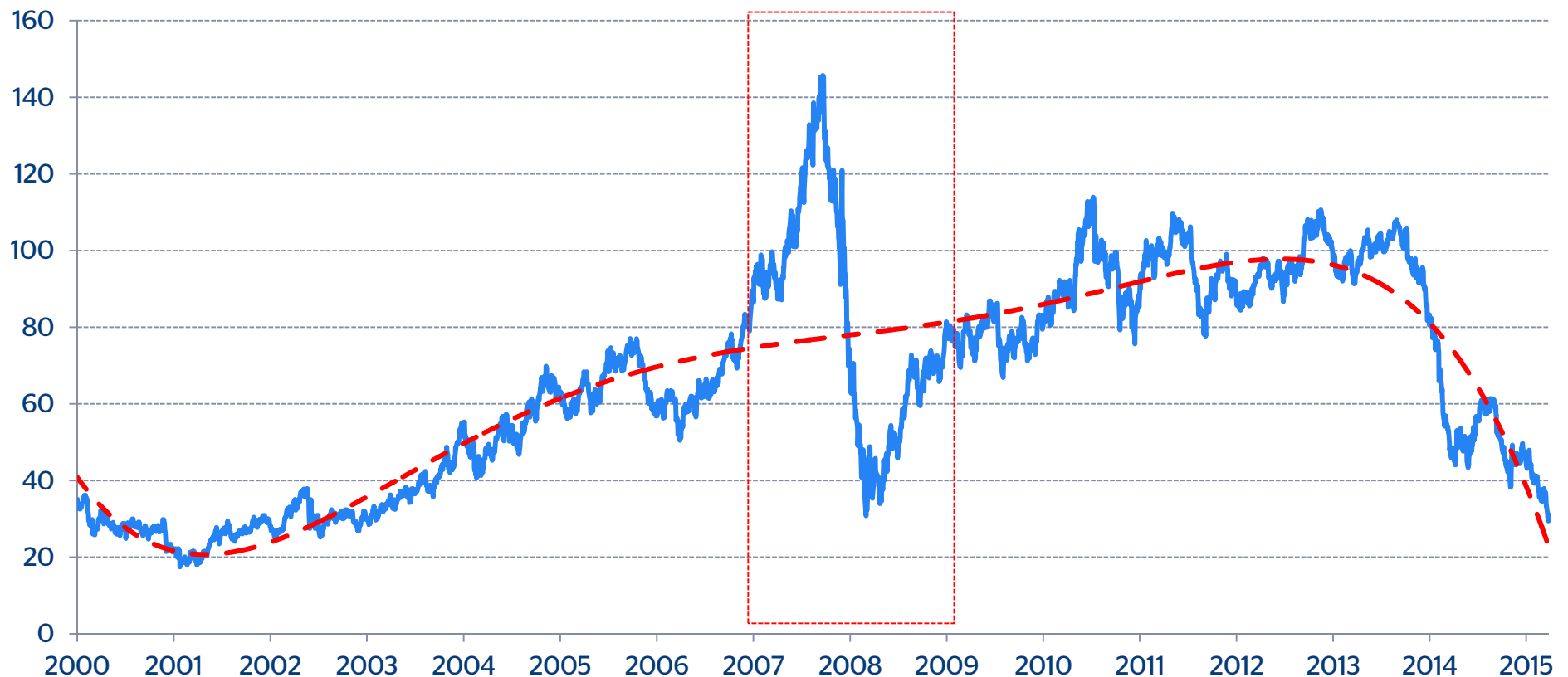
Source: Haver Analytics

The end of the super cycle

The drop of 70% in oil prices since mid-2014 ends an unprecedented 12-year period of price gains driven by sustained growth of non-OECD demand and cheap money that encouraged non-OPEC supply

WTI Spot Price

\$ per barrel

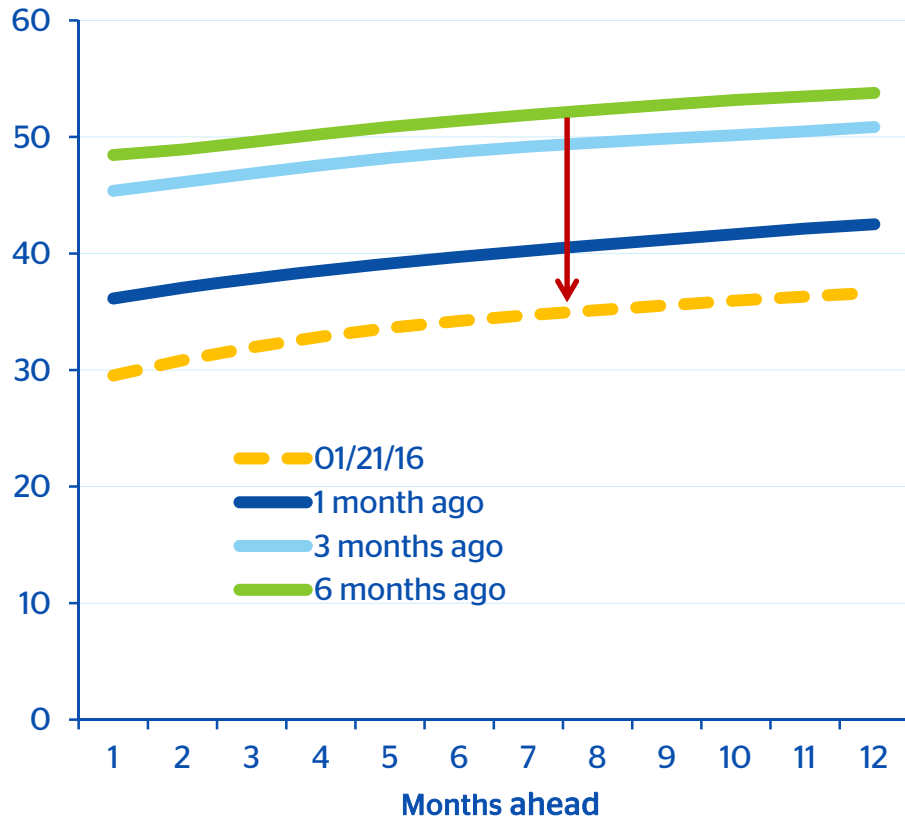


Crude oil futures

Markets continue to reassess expectations to the downside

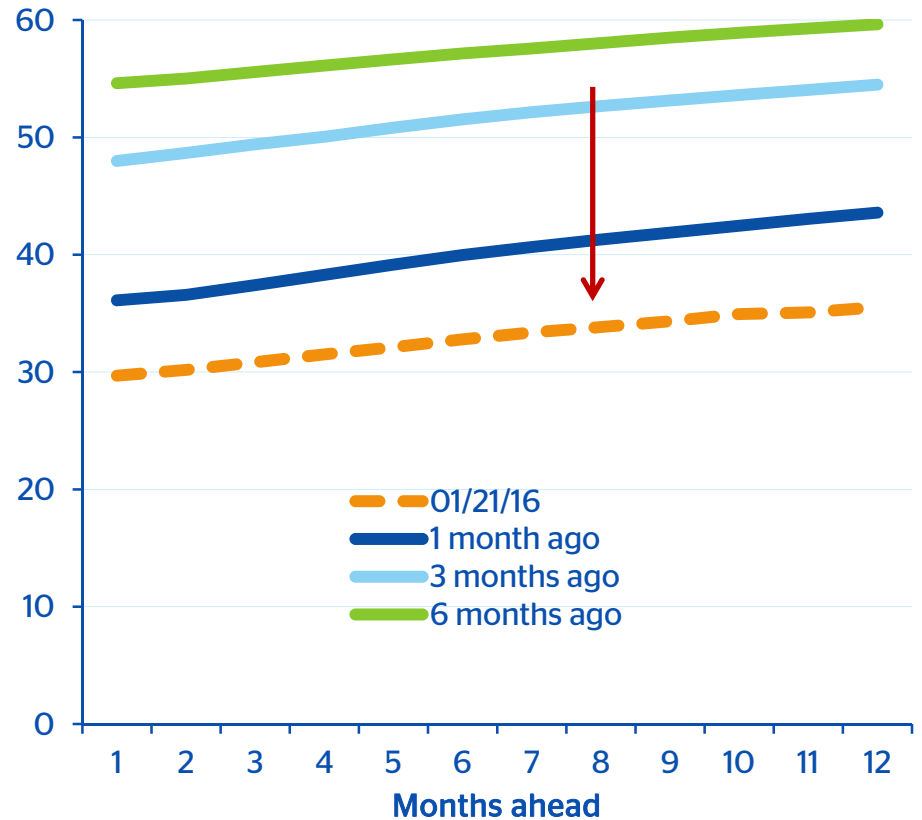
WTI Crude Futures

\$ per barrel



Brent Crude Futures

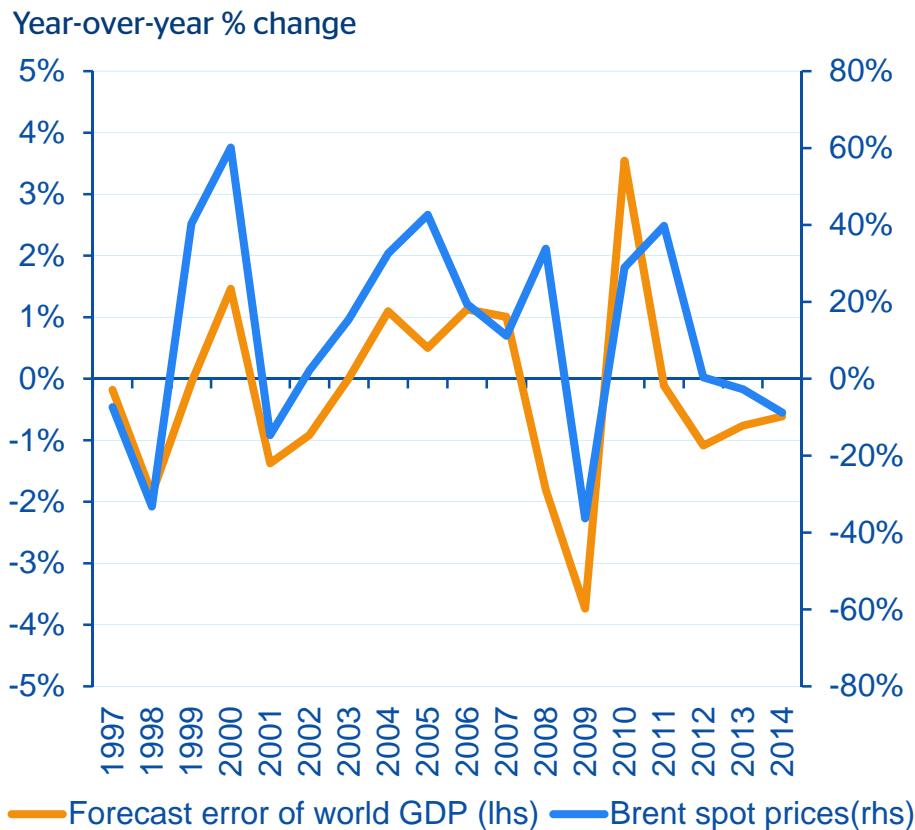
\$ per barrel



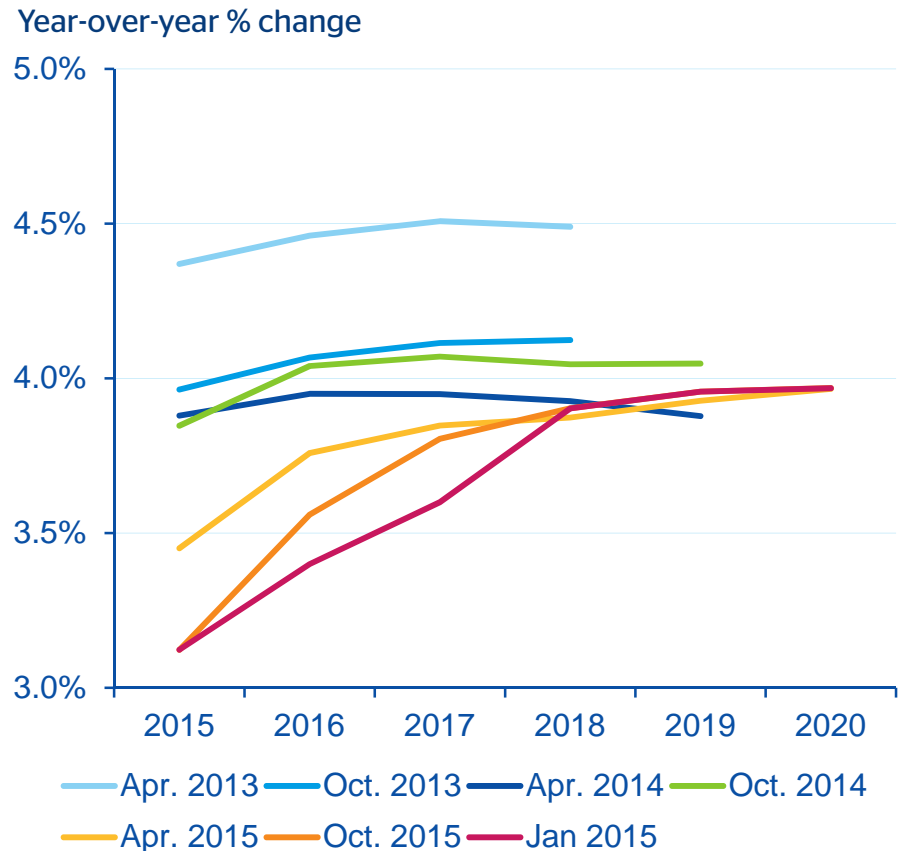
What's behind oil price dynamics?

According to Model Oil-KH*: Deviations from expected demand (surprise) drove the surge in the real price of oil from 2003 until 2008

Oil Price vs. Demand Surprise



IMF: World GDP Outlook



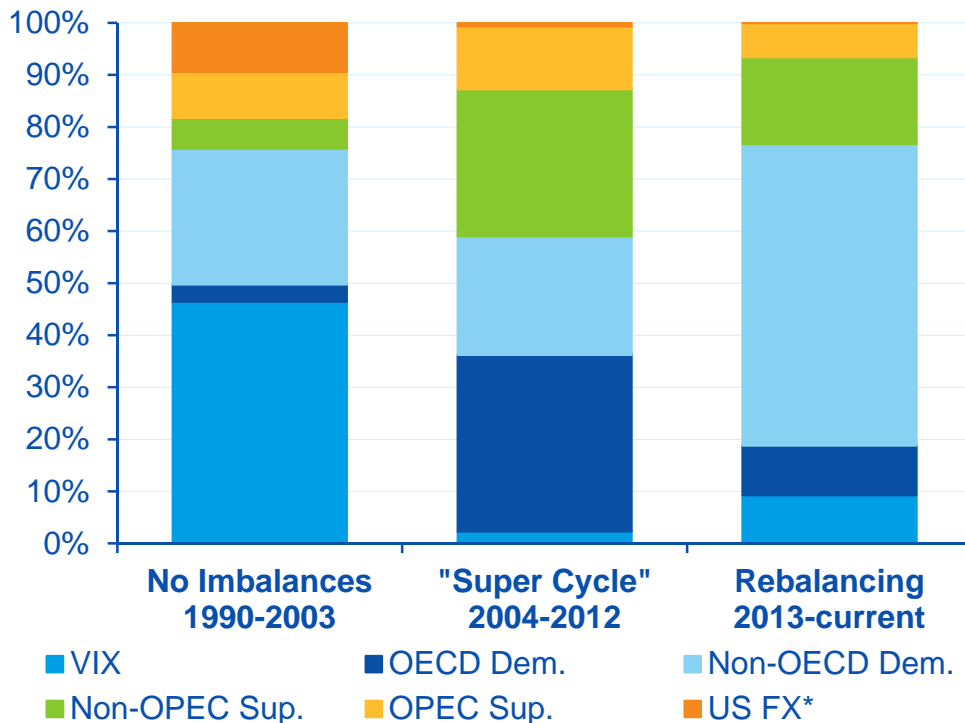
* Kilian and Hicks (2013)
Source: IMF WEO, Haver Analytics and BBVA Research

What's behind oil price dynamics?

According to Model Oil-G*, the drop in oil prices is mainly explained by weaker non-OECD demand

Oil Prices: Model Oil-G**

Error Decomposition of WTI prices 12-steps ahead, %



*Nominal broad-weighted exchange rates (\$)

Although declining in relevance, U.S. supply remains the 2nd most important factor in explaining the current drop in prices

Unlike previous price regimes, financial market volatility and FX movements do little to explain significant drop in prices

The slowing Chinese "Super Cycle" likely explains around 50% of the drop in oil prices since 2014

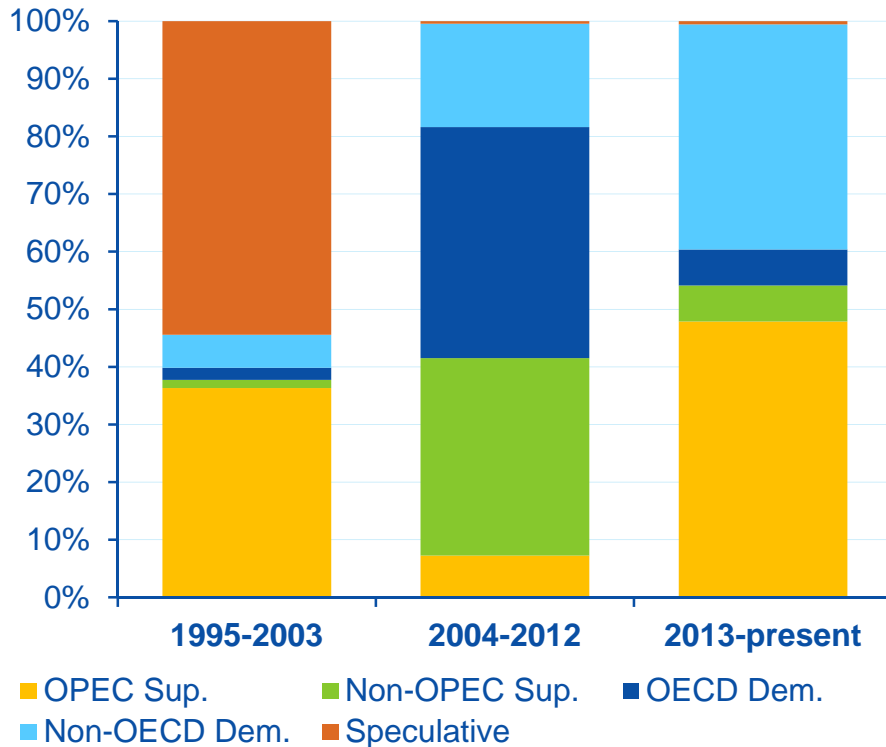
* Model Oil-G captures global market conditions
Source BBVA Research

What's behind oil price dynamics?

According to Model Oil-S*, non-OECD demand has shown increased relative importance since 2013

Oil Prices: Model Oil-S*

Variance decomposition 12 -steps ahead, %



The weight of OPEC supply has sharply increased since 2013

The magnitude of the effects from OPEC supply and non-OECD demand is more balanced

The relative importance of OECD demand declined significantly

Oil prices have largely been driven by fundamentals instead of speculative demand since 2004*

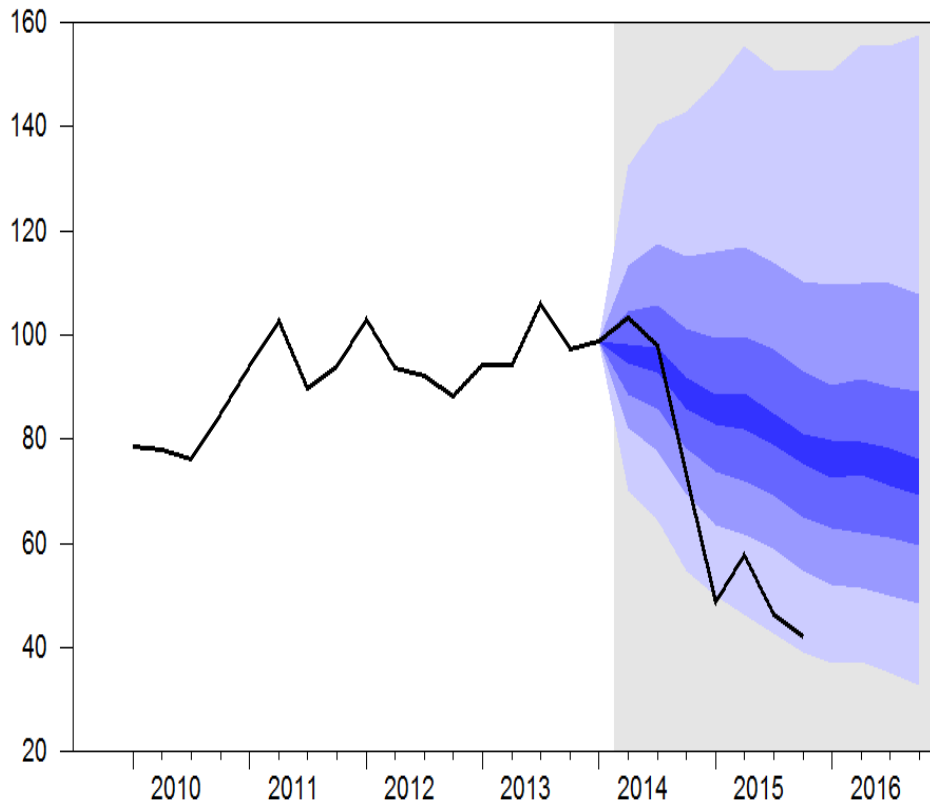
* Kilian, Lutz, and Daniel P. Murphy. "The Role of Inventories and Speculative Trading in the Global Market for Crude Oil." *Journal of Applied Econometrics* 29, no. 3 (2014): 454-478.

What's behind oil price dynamics?

Model Oil-G correctly anticipated a significant drop in oil prices

Oil Prices: Model Oil-G*

In sample forecast, WTI, \$ per barrel



The model anticipated a large drop in oil prices as early as the start of 2014

However, the recent decline falls in the lower range of the confidence interval

This suggests that a fraction of the price drop cannot be explained by fundamentals

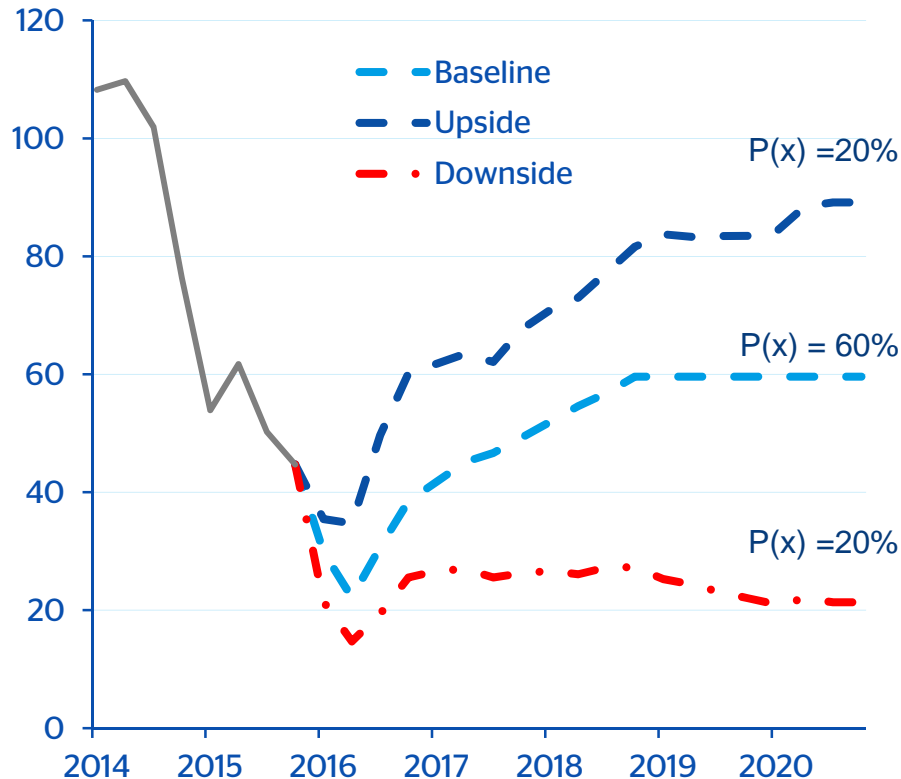
* Model Oil-G captures global market conditions
Source BBVA Research

What's next for oil prices?

Our new baseline scenario implies downward revisions to the short-run with a gradual recovery thereafter

Crude Oil Price Forecasts*

Brent, \$ per barrel



Crude Oil Price Forecasts*

Brent, \$ per barrel, annual average

	Baseline	Upside	Downside
2015	52.6	52.6	52.6
2016	30.3	45.0	20.3
2017	45.7	63.7	26.4
2018	55.7	75.7	26.8
2019	59.6	83.5	23.7
2020	59.6	87.7	21.4

*May be subject to revision

Source: BBVA Research

What's next for oil prices?

1. Oil prices to decline further in 1H16

- OPEC reluctance to cut production
- Additional supply from Iran
- Resilient U.S. crude production
- Dollar appreciation
- Concerns on weaker economic growth

2. Modest rebound in 2H16 and 2017 as non-OPEC production declines

- Better economic outlook
- Lagged effects from lower CAPEX
- Tighter credit conditions and bankruptcies
- Higher risk aversion

3. Limited upside/New equilibrium

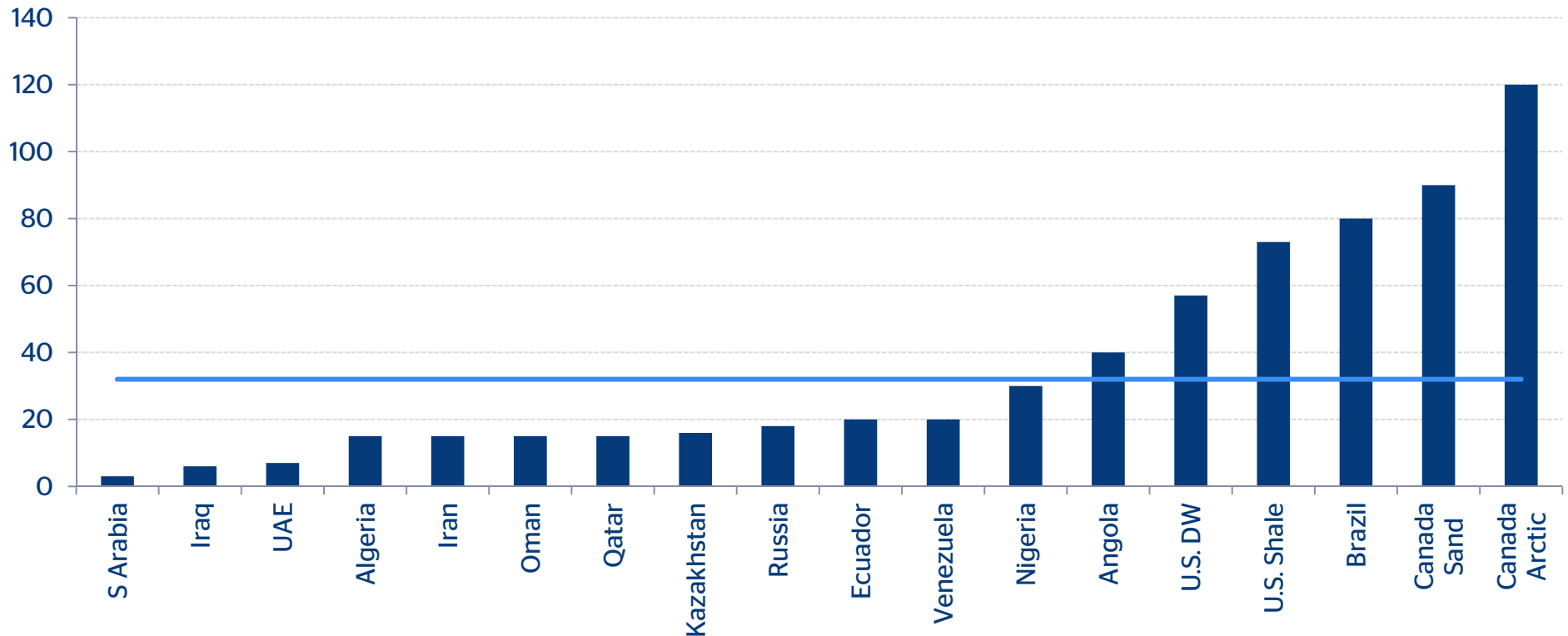
- Supply correction ends
- Market shares stabilize
- Stronger global growth
- Increased productivity and lower production costs
- Greater energy efficiency
- Increase reliance on renewable sources

Oil prices to decline further in 1H16

Given OPEC's low production costs, further price declines cannot be ruled out

Marginal Cost Per Barrel

\$ per barrel

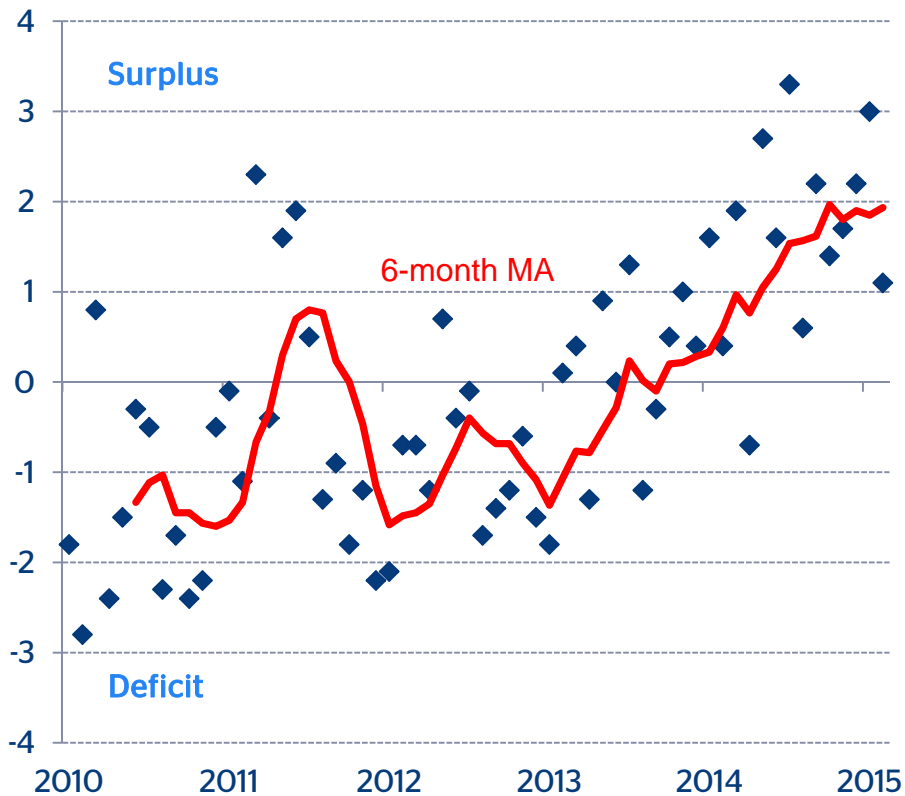


Oil prices to decline further in 1H16

Despite the drastic correction in prices, excess supply persists while inventories remain at all-time highs

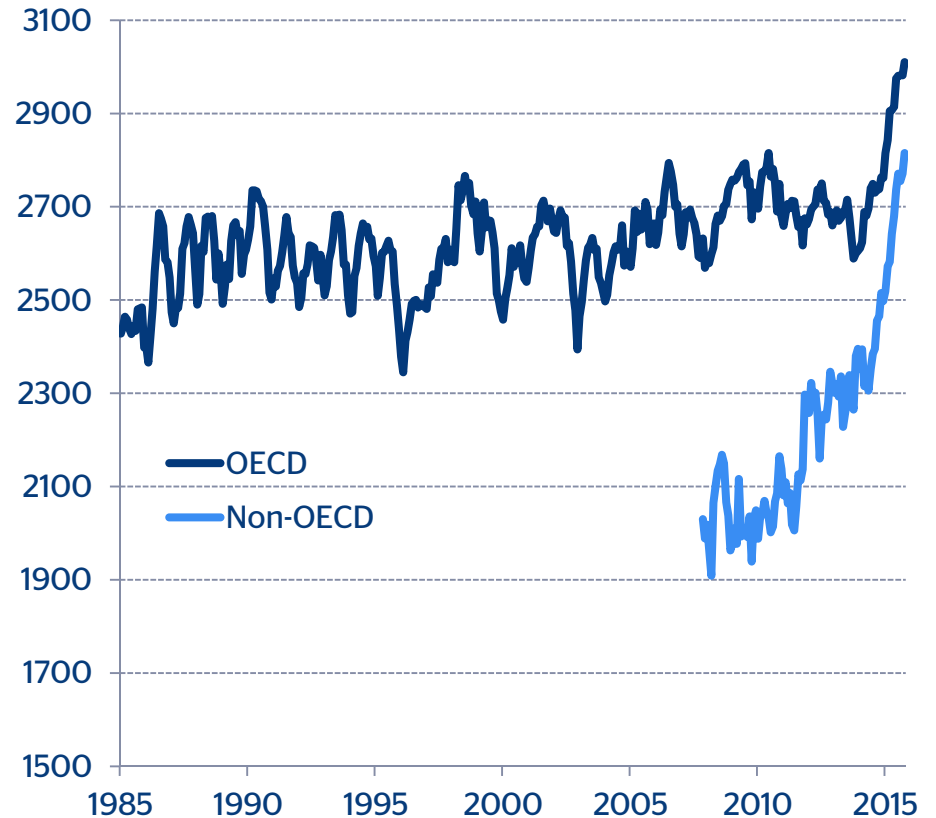
Global Oil Supply and Demand Balance

Million barrels per day



Oil Inventories

EOP, million barrels per day

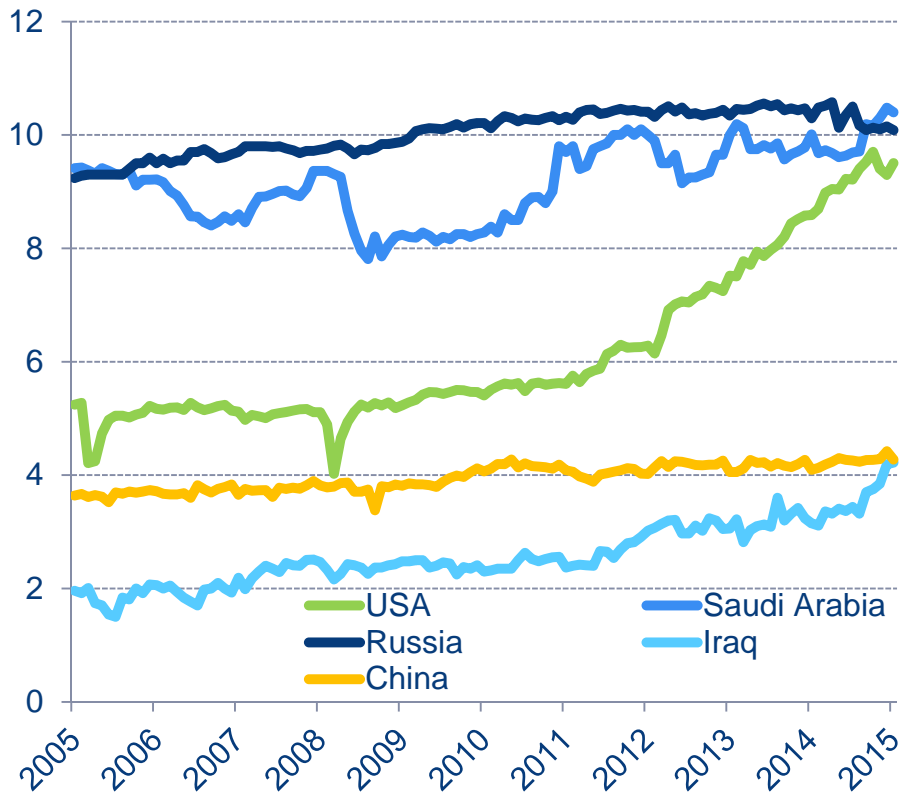


Oil prices to decline further in 1H16

Resilient non-OPEC production exerts downward price pressures.
Potential but unlikely cuts to OPEC production may have limited effects

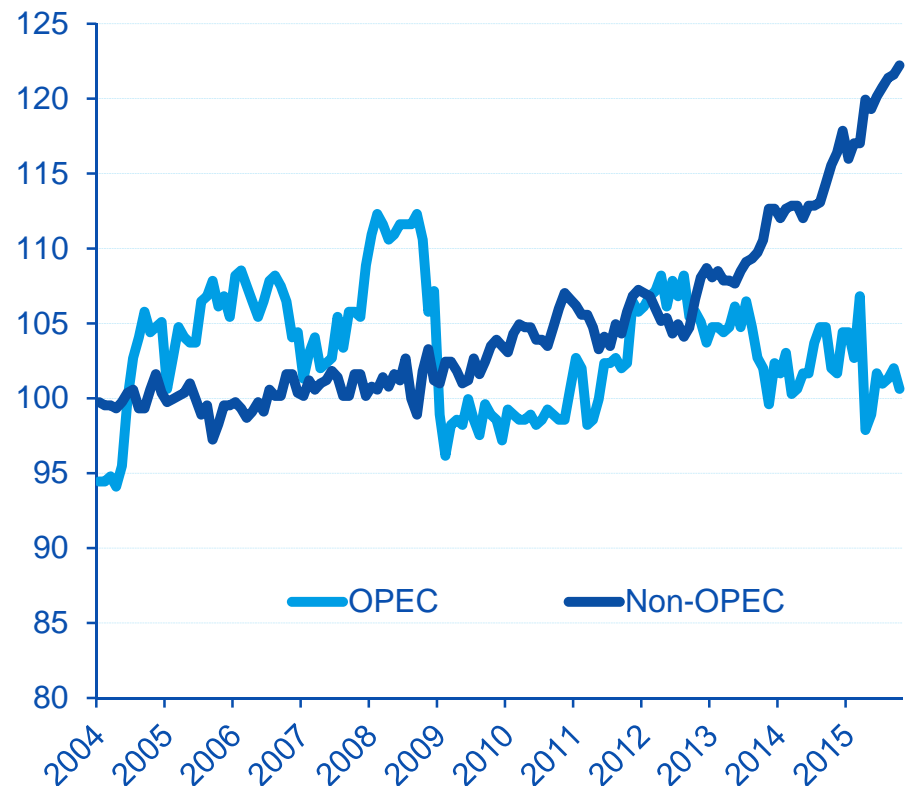
Crude Oil Production by Country

Million barrels per day



Supply of Crude Oil

2004 = 100

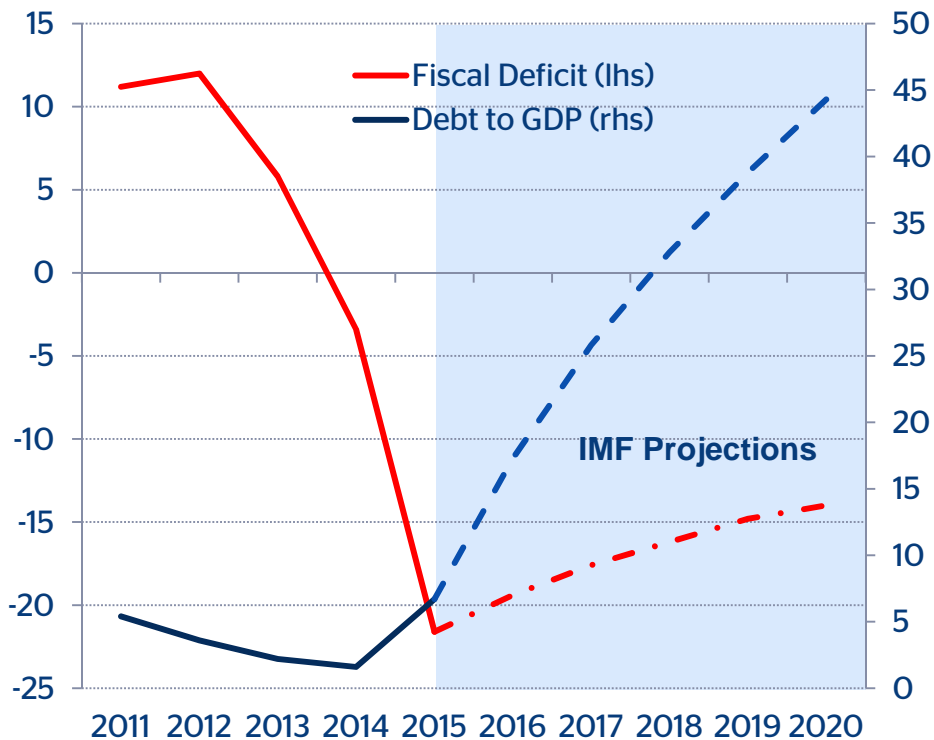


Oil prices to decline further in 1H16

Despite a fiscal breakeven of \$100/bbl, Saudi Arabia can maintain its strategy of gaining market share without severely undermining its economy

Saudi Arabia: Budget Balance and Debt

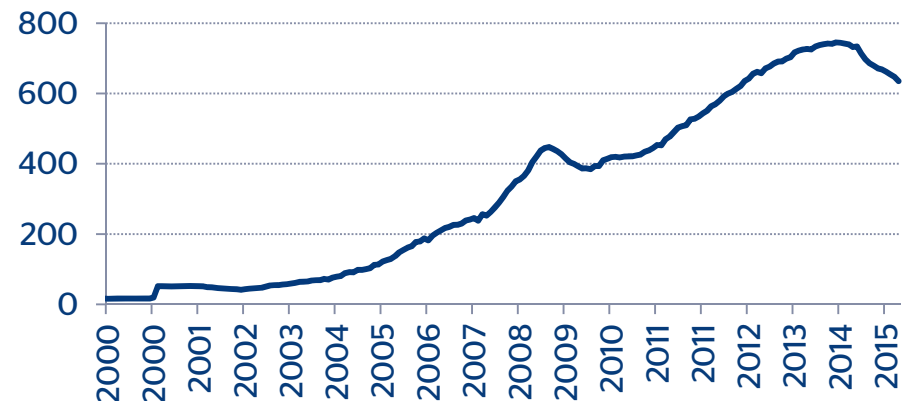
As % of GDP



- Tapping bond markets, spending cuts and privatizations could help alleviate fiscal pressures
- Low Debt/GDP (6.7% in 2015) and high levels of foreign reserves will act as a buffer for the next couple of years

Saudi Arabia: Foreign Reserves

Total minus gold, EOP, Billion US\$

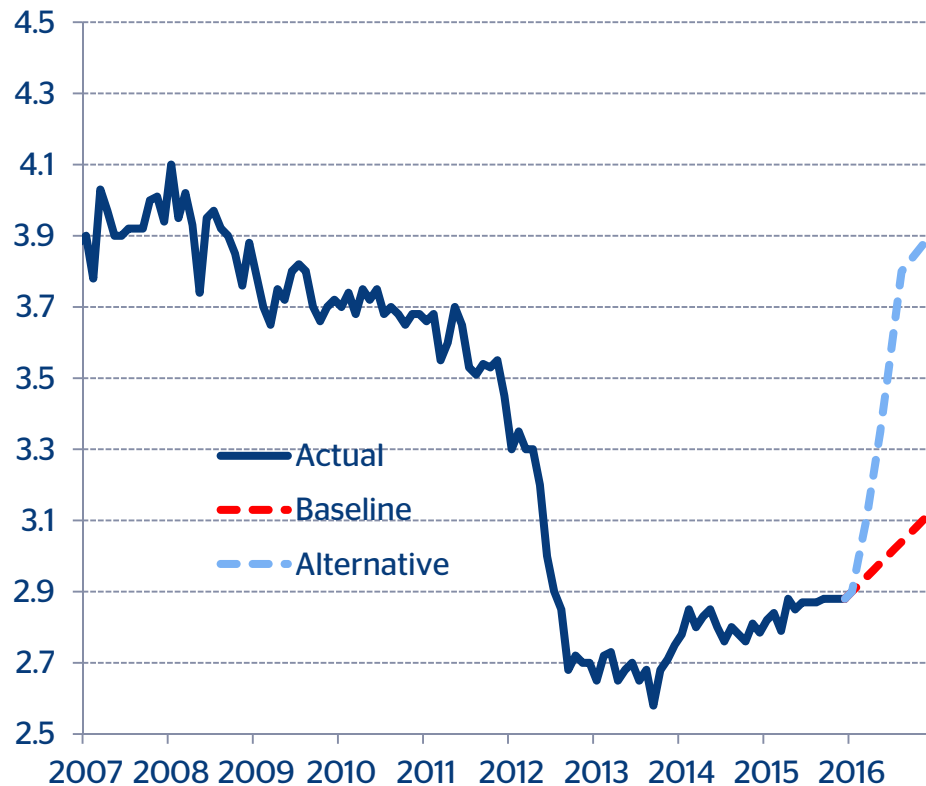


Oil prices to decline further in 1H16

Iran aims to inject an additional 1 million b/d to the market in 2016

Iran: Crude Oil Production

Million barrels per day



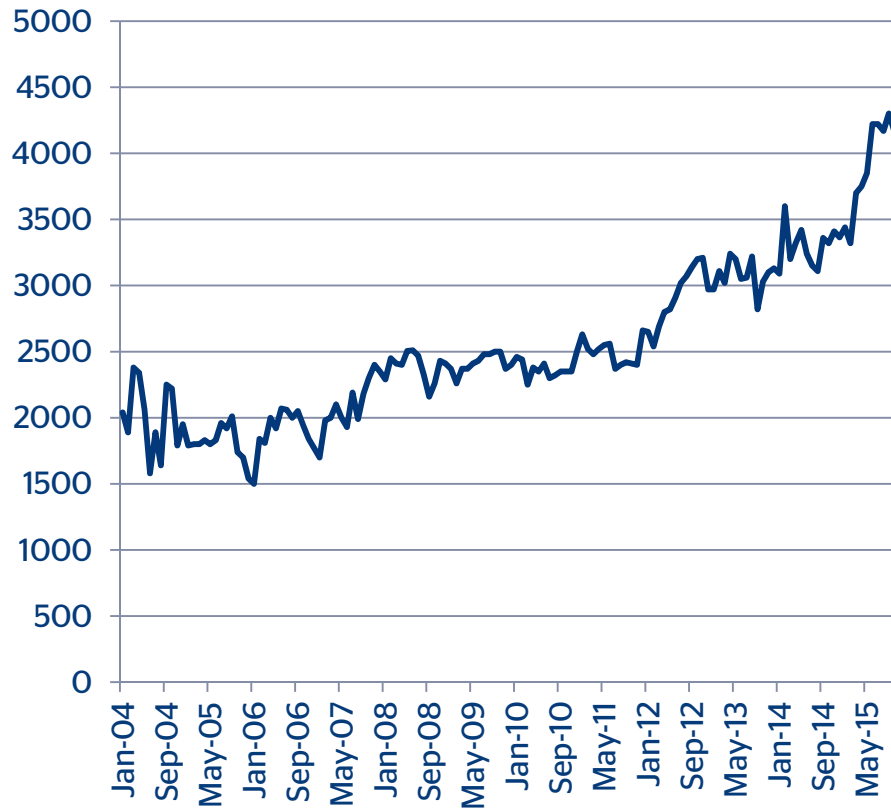
- Tehran aims to increase supply by 2M b/d in addition to its current production of 2.8M b/d; 1M b/d within six months of the sanctions being canceled
- However, achieving an extra 2M b/d would require substantial foreign investment that is still constrained by sanctions
- Iran's rivalry with Saudi Arabia could lead to a "price war," with more crude pumped into the market

Oil prices to decline further in 1H16

OPEC members such as Iraq and Libya need to sell more oil in order to rebuild their economies; cutting production makes no sense for them

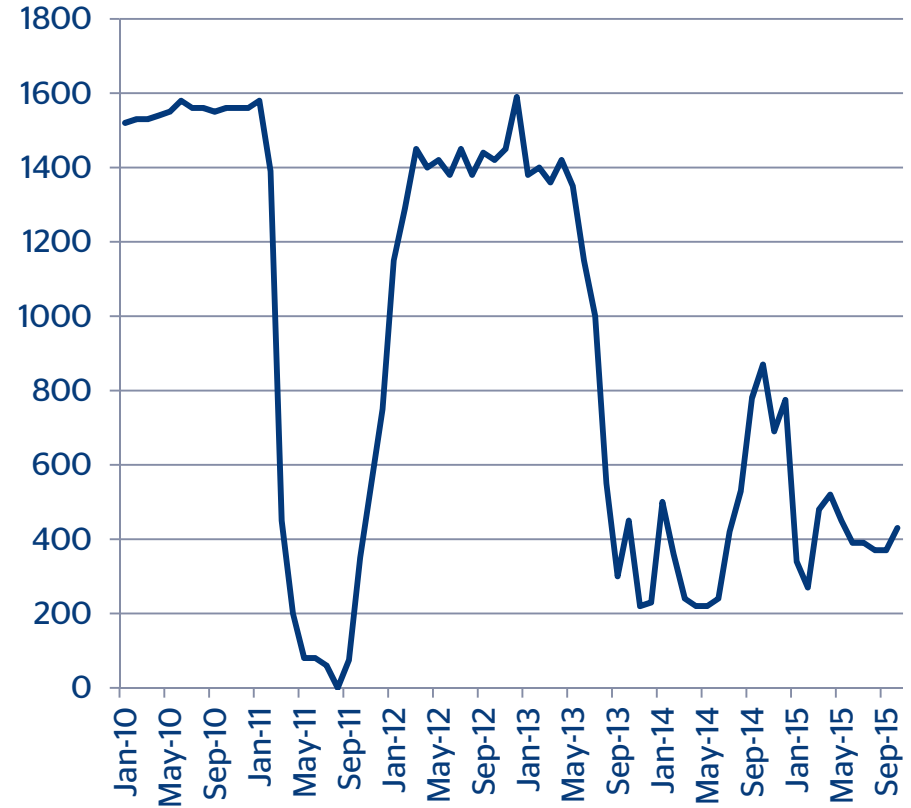
Iraq: Crude Oil Production

Thousand barrels per day



Libya: Crude Oil Production

Thousand barrels per day

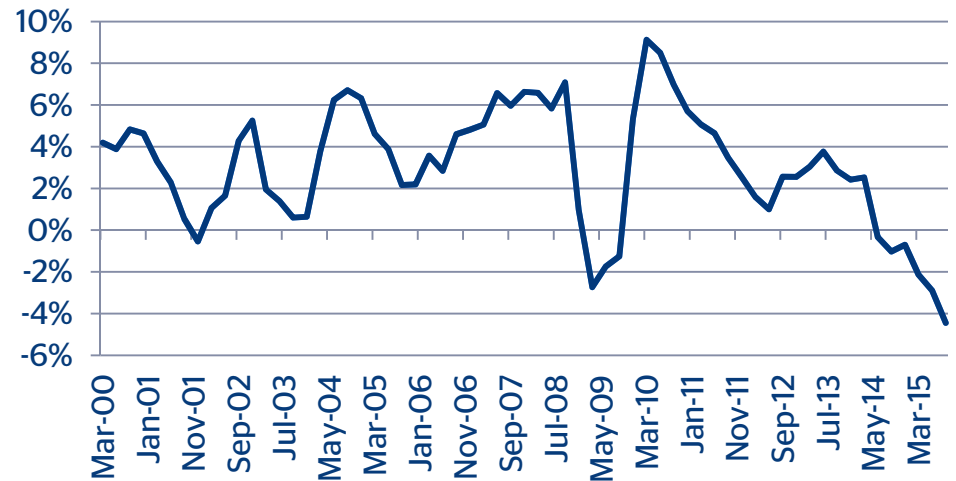


Oil prices to decline further in 1H16

Facing economic weakness, some producers in both OPEC and non-OPEC countries will be severely affected by Saudi Arabia's strategy; however, cutting production is not an option

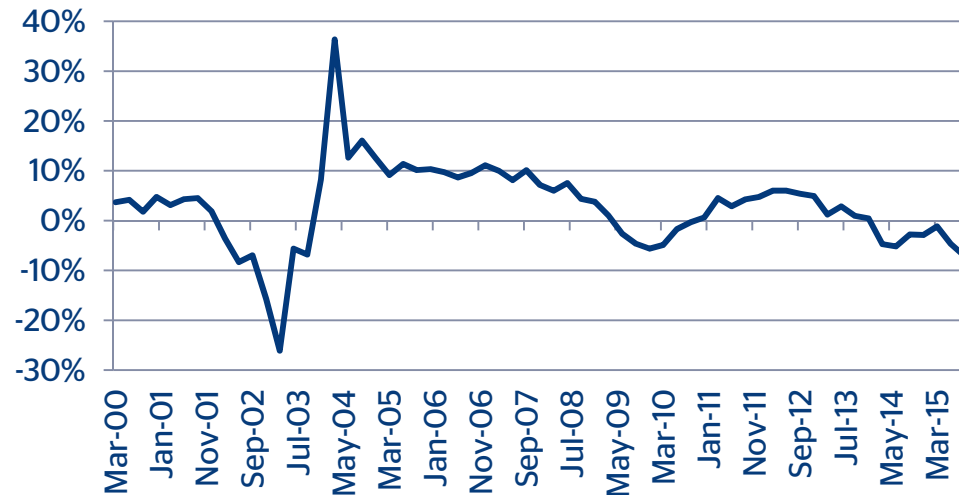
Brazil: Real Gross Domestic Product

(SA, Chained.1995.Reais) Year-over-year % change



Venezuela: Real Gross Domestic Product

(SA, .97.Bolivares) Year-over-year % change



Russia: Real Gross Domestic Product

(SA, Ch.2008.Rubles) Year-over-year % change

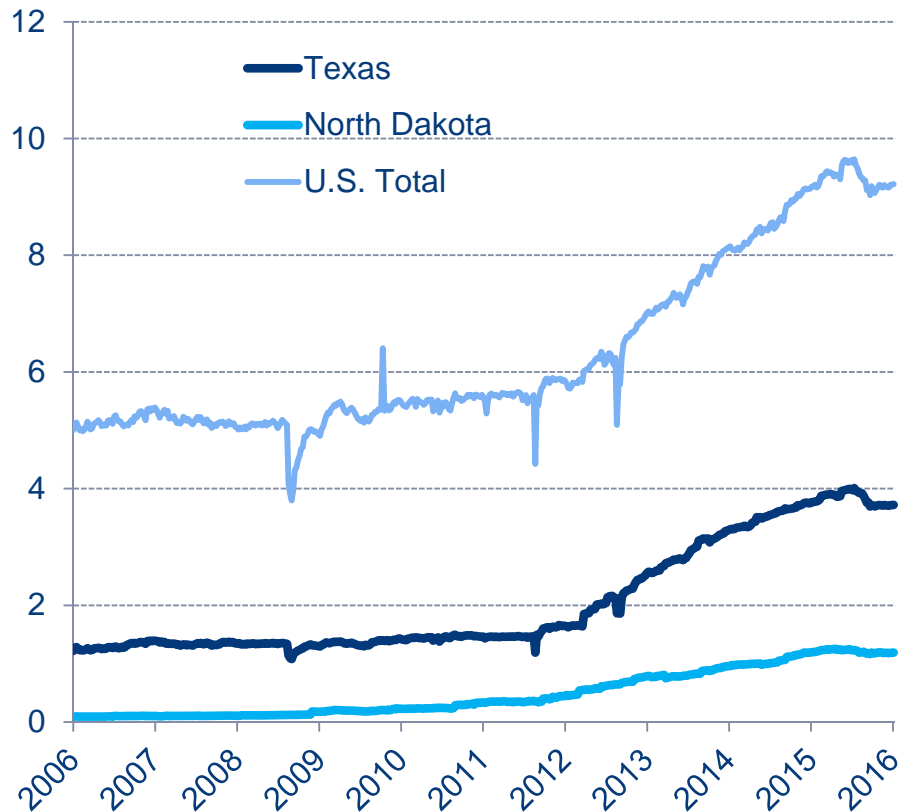


Oil prices to decline further in 1H16

Although O&G investment has reacted immediately, the expected decline in U.S. production has been mild and lagged

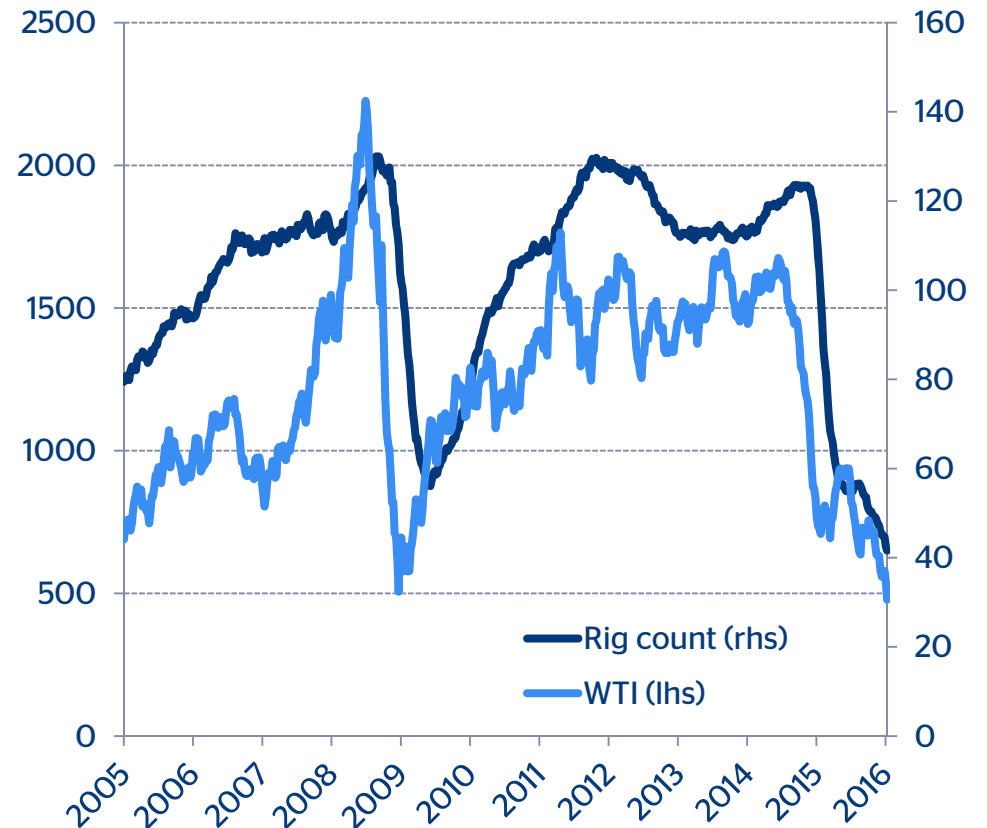
U.S. Crude Oil Production

Million barrels per day



U.S. Active Rig Count and WTI

Units and \$/b

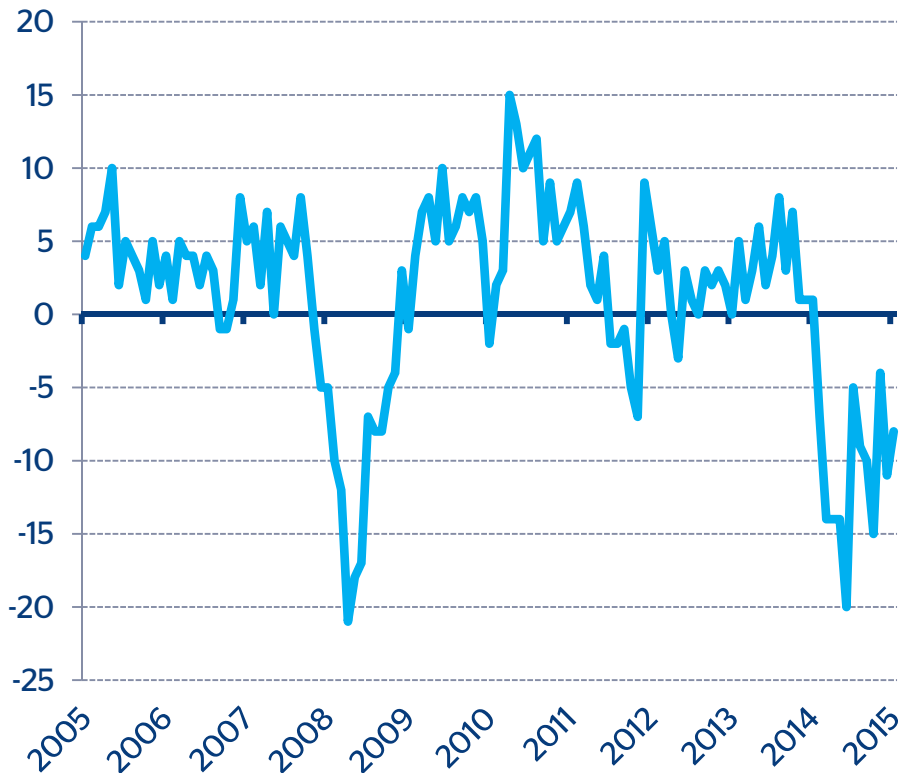


Oil prices to decline further in 1H16

Variable costs have adjusted rapidly, helping operators keep producing

U.S. Nonfarm Payroll

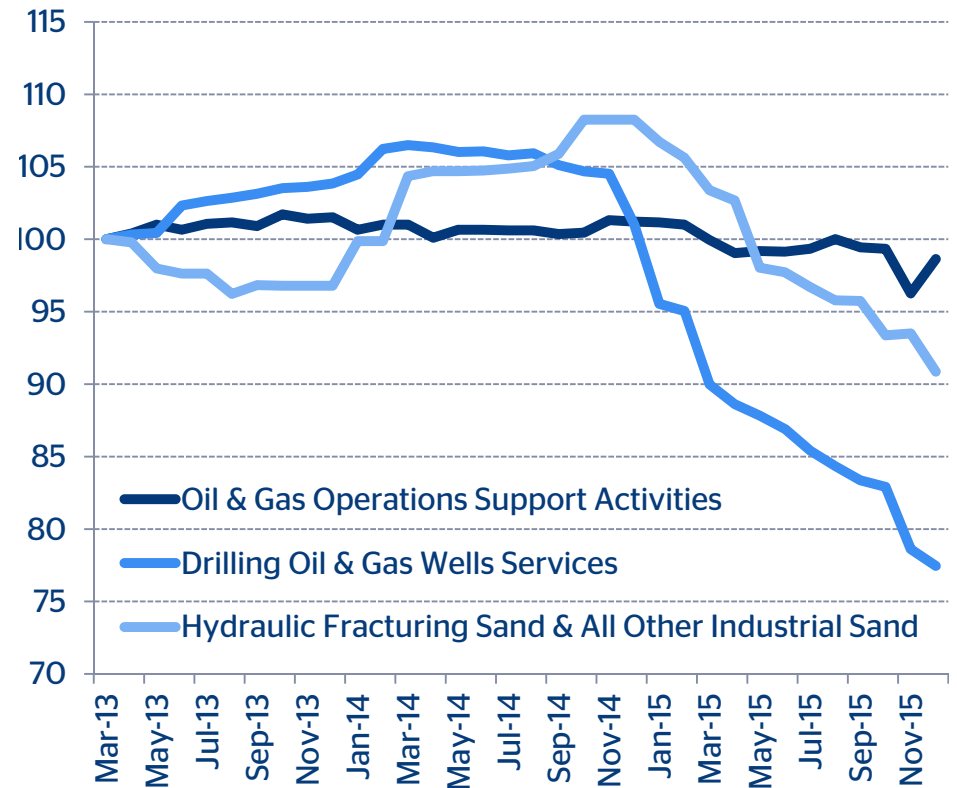
Mining and logging employment, SA, thous.



Source: Haver Analytics

U.S. Producer Price Index

NSA, January 2013 = 100



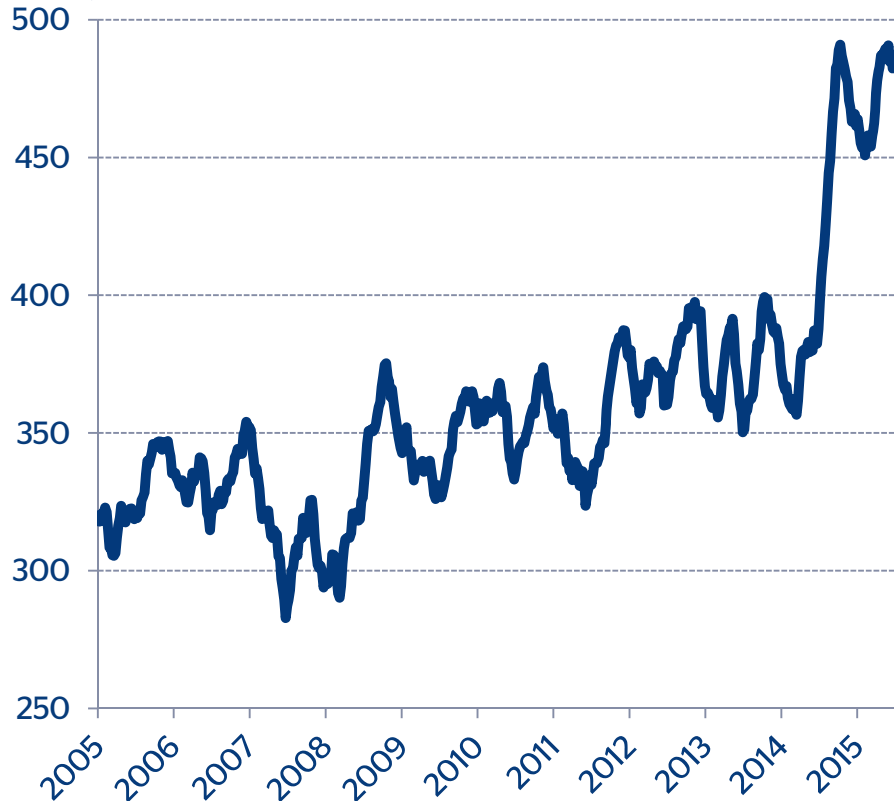
Source: EIA and Haver Analytics

Oil prices to decline further in 1H16

Ample storage capacity has prevented larger cuts to production

U.S. Stocks of Crude Oil Excluding SPR

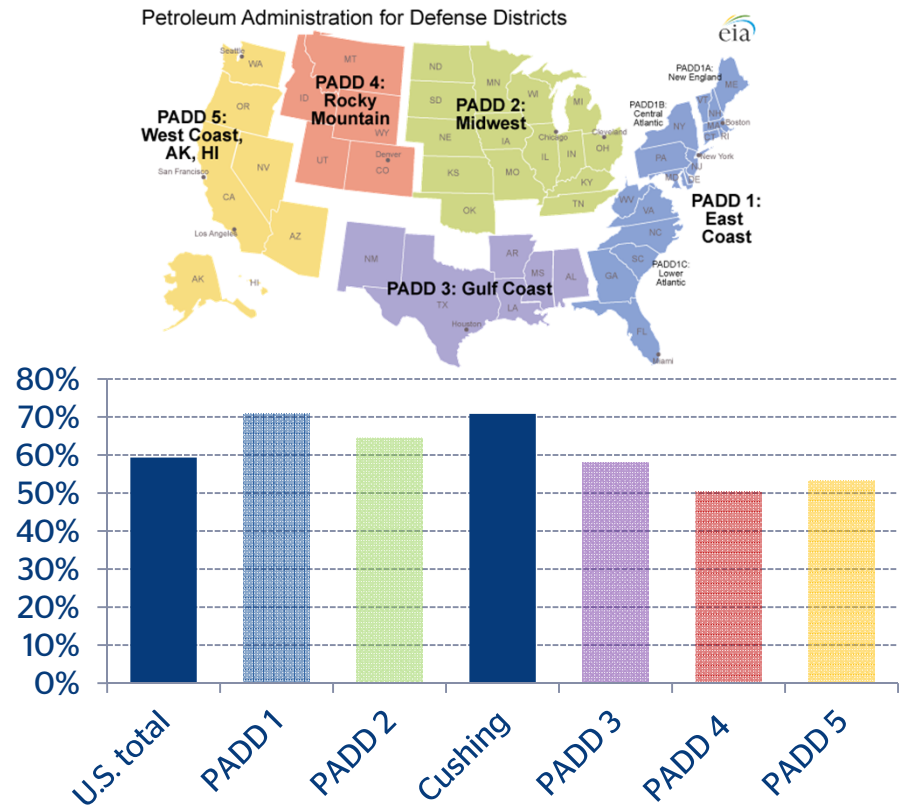
EOP, Million barrels



Source: BBVA Research and Haver Analytics

U.S. Capacity Utilization Rate

September 2015. Refinery and tank and underground capacity, %



* PADD stands for Petroleum Administration for Defense Districts
Source: BBVA Research and Haver Analytics

Oil prices to decline further in 1H16

Dollar appreciation and financial volatility have also added to the downside

Oil Prices and Financial Markets

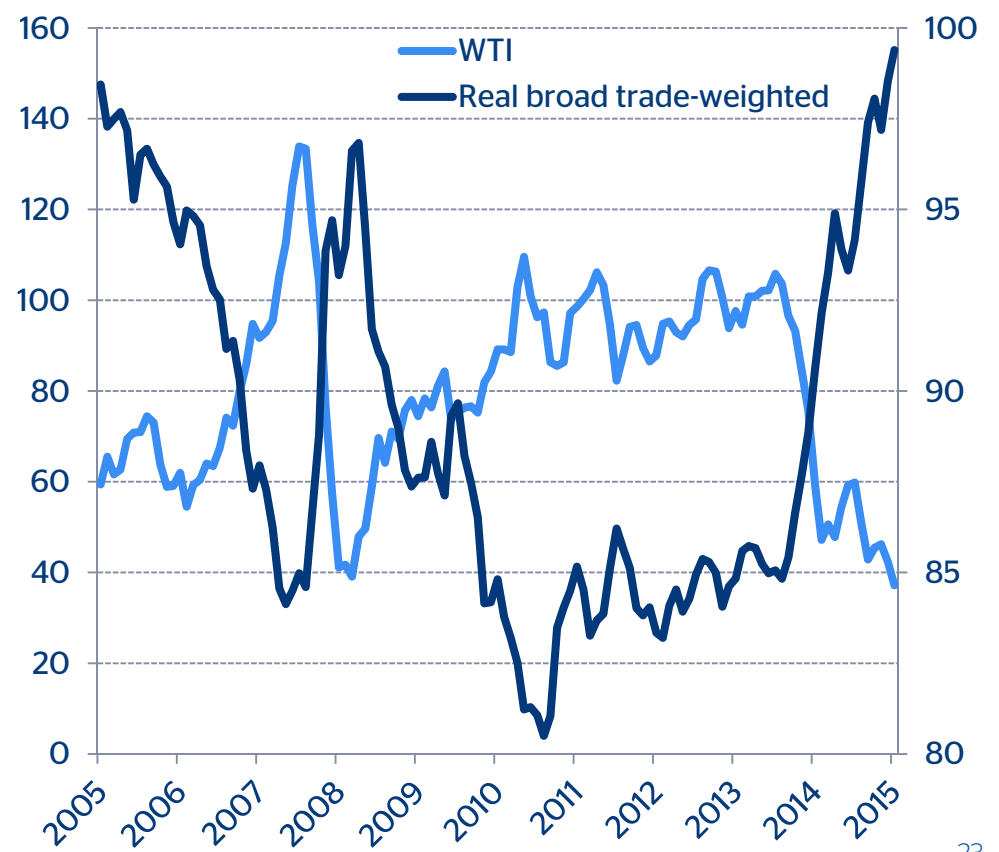
\$ per barrel, Index, Jul-31-64 = 100



Source: Haver Analytics

WTI and U.S. Dollar Exchange Rate

\$ per barrel and Mar-73=100



Source: Haver Analytics

Oil prices to decline further in 1H16

The economic outlook for large emerging economies is consistent with short-term price declines and a modest rebound afterwards

Real GDP Growth

Year-over-year % change

	Estimates	Projections	
	2015	2016	2017
Russia	-3.7	-1.0	1.0
China	6.9	6.2	5.8
India	7.3	7.6	8.0
Brazil	-3.8	-3.0	1.3
South Africa	1.3	0.7	1.8

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2. Modest rebound in 2H16 and 2017 as non-OPEC production declines

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- Lagged effects from lower CAPEX
- Tighter credit conditions and bankruptcies
- Higher risk aversion

3. Limited upside/New equilibrium

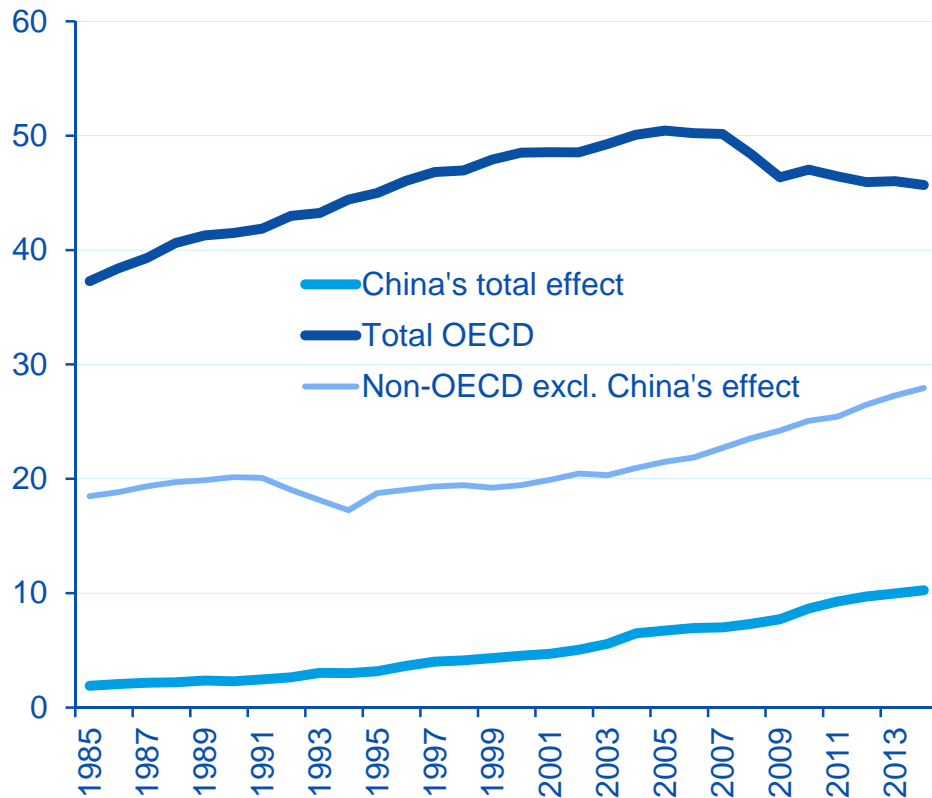
- Supply correction ends
- Market shares stabilize
- Stronger global growth
- Increased productivity and lower production costs
- Greater energy efficiency
- Increase reliance on renewable sources

Modest rebound in 2H16 and 2017

China and other emerging markets will continue to have a large impact on oil markets

Oil Product Demand

Million barrels per day



Oil Product Demand

Annual change, million barrels per day

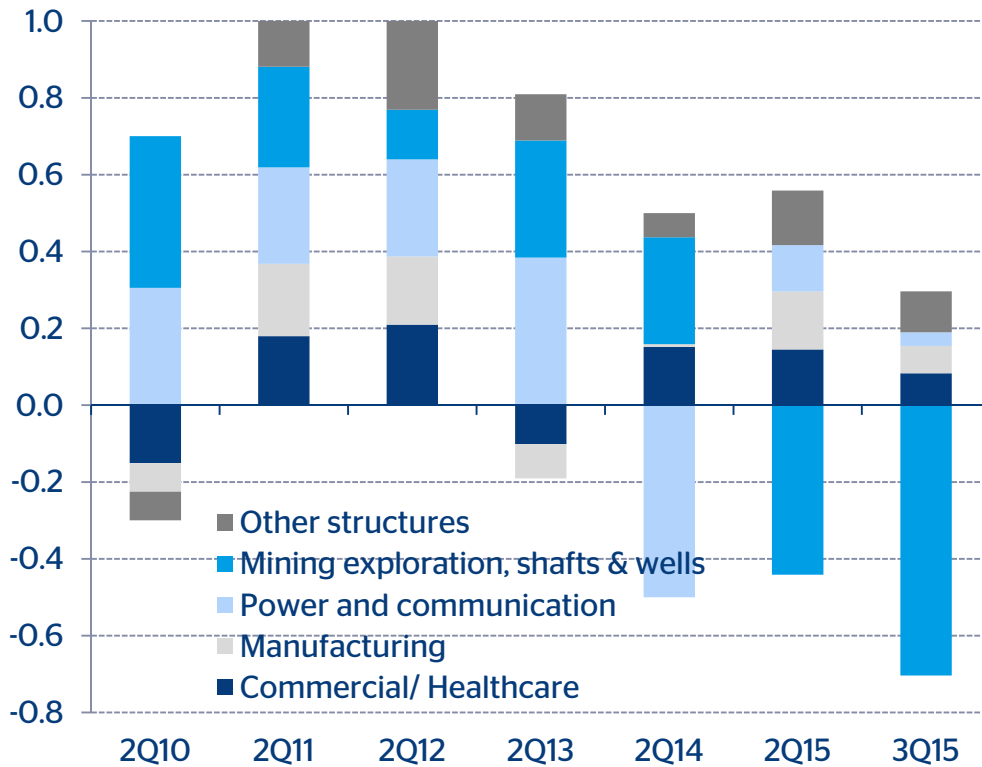


Modest rebound in 2H16 and 2017

In the U.S., fixed investments in O&G structures keep contracting

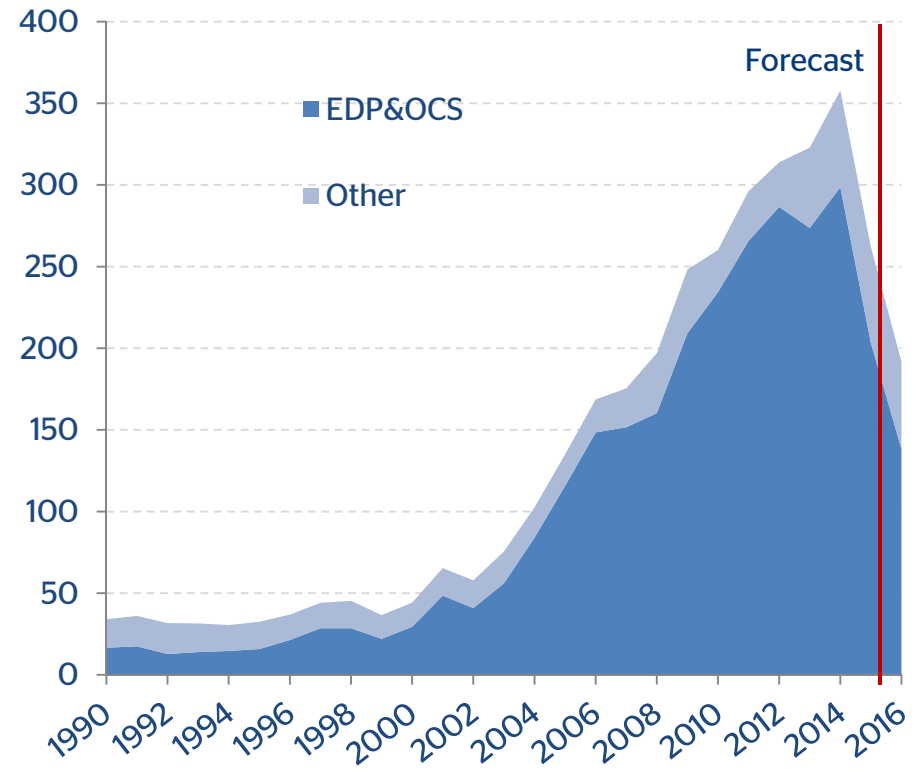
U.S. Real Private Fixed Investment

Contributions to % change by type of structure SAAR, %



Energy Capital Expenditures

\$ billion

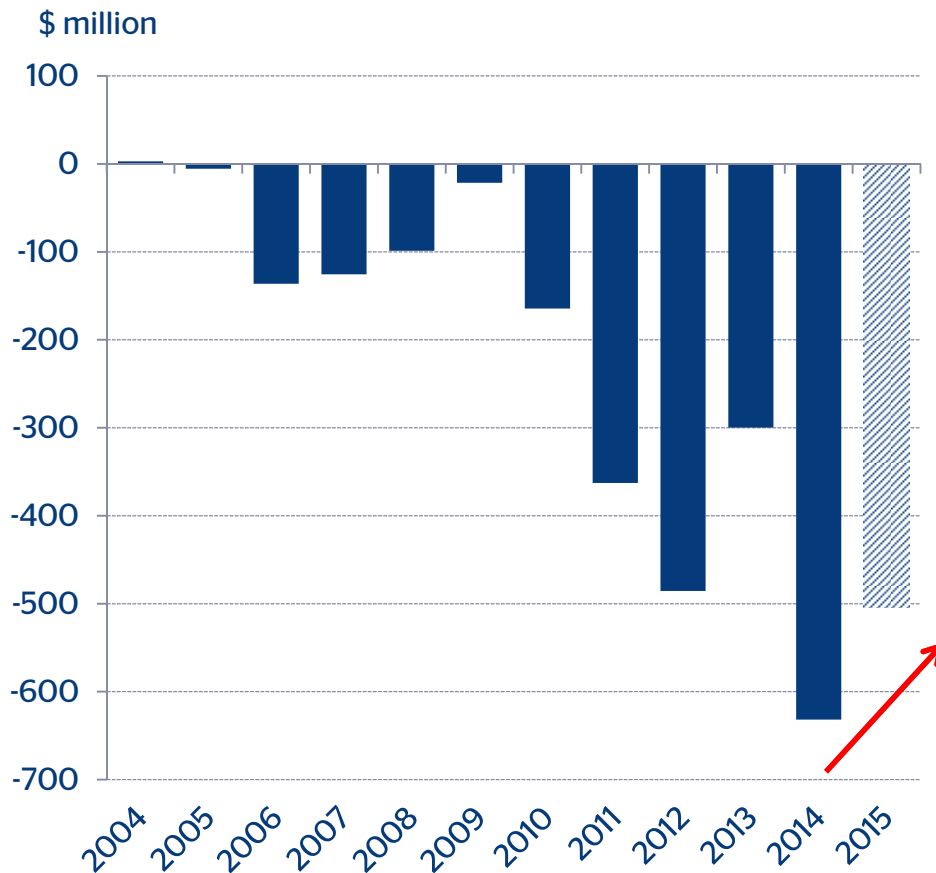


EDP= Exploration, drilling, production including OCS
Other= Refining, Petrochem, Marketing, Pipelines, Mining & Misc

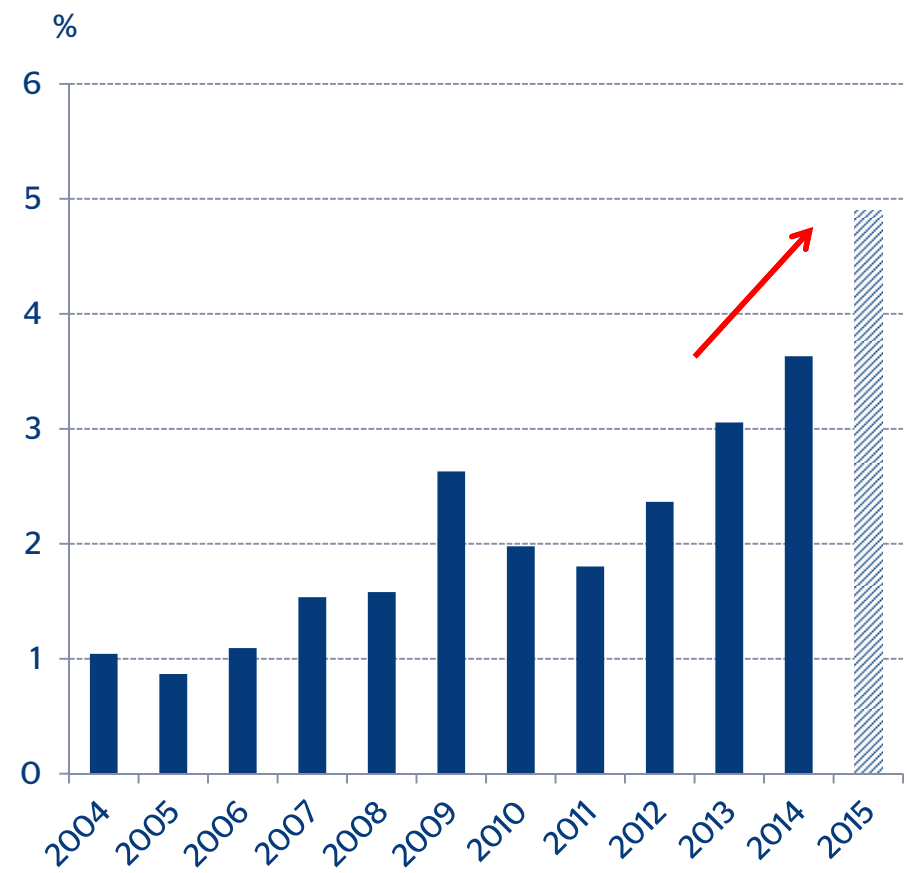
Modest rebound in 2H16 and 2017

An environment of low prices will lead to further reductions in CAPEX

U.S. E&P Median Free Cash Flow (CFO-Capex)



U.S. E&P Median Net Debt to EBITDA

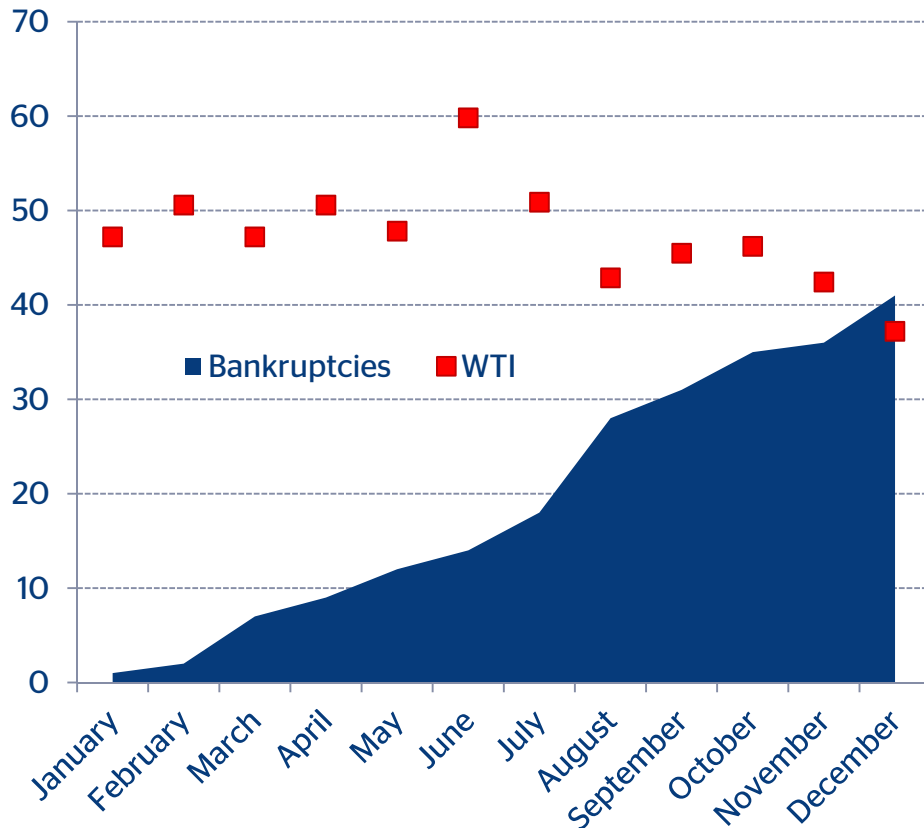


Modest rebound in 2H16 and 2017

Higher likelihood of increasing number of bankruptcies as prices continue to go down

U.S. Bankruptcies in Oil and Gas in 2015

Cumulative number of firms and \$ per barrel



41 companies filed for bankruptcy in 2015

- 41 companies filed for bankruptcy in 2015
- \$16.7 billion in total debt
 - \$8.7 billion in secured debt
 - \$8.0 billion in unsecured debt
- The Fed’s Shared National Credits (SNC) exam rated one in seven syndicated loans in oil and gas >\$20 million as “classified” or in danger of defaulting, totaling \$34.2 billion

Modest rebound in 2H16 and 2017

Coupled with tighter credit standards, more limited access to credit and regulatory changes could result in a broad and deep crisis

How important are the following actions to mitigate the risk of loan losses from oil and gas drilling/extraction?

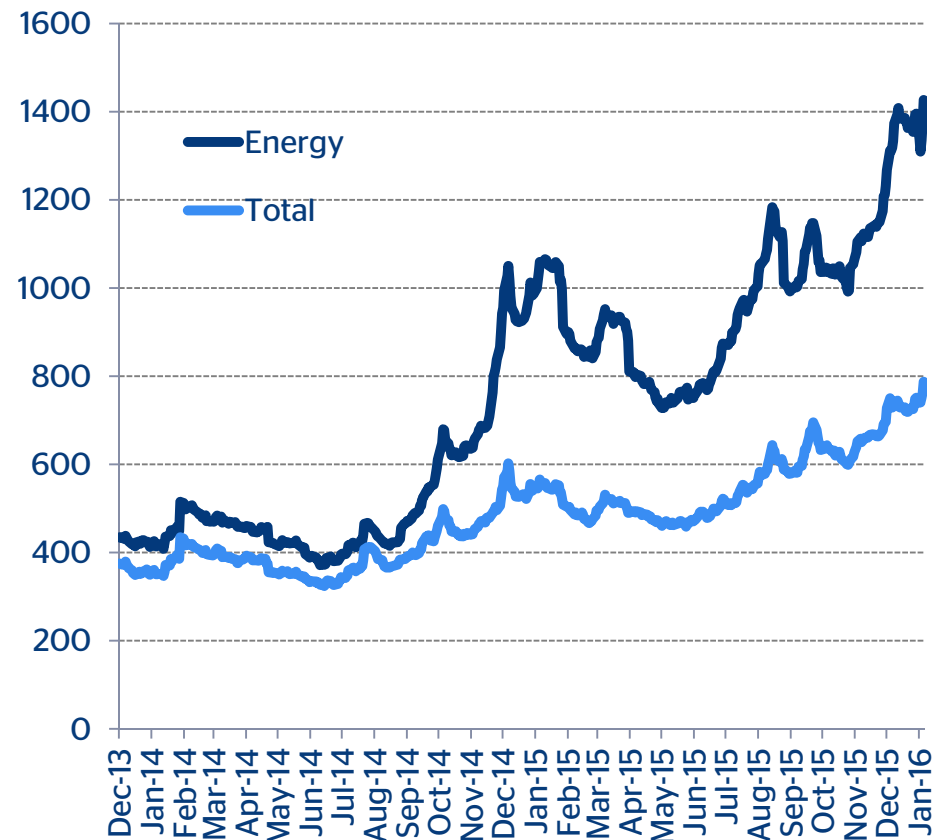
Share of respondents answering somewhat to very important

Tightening underwriting policies on new loans or lines of credit made to firms in this sector	85%
Enforcing material adverse change clauses or other covenants to limit draws on existing credit lines to firms in this sector	60%
Reducing the size of existing credit lines to firms in this sector	85%
Restructuring outstanding loans to make them more robust to the revised outlook for energy prices	60%
Requiring additional collateral to better secure loans or credit lines to firms in this sector	65%
Tightening underwriting policies on new loans or credit lines made to firms in other sectors	30%

Source: Federal Reserve

High Yield Bonds

Option adjusted spreads relative to U.S. treasuries



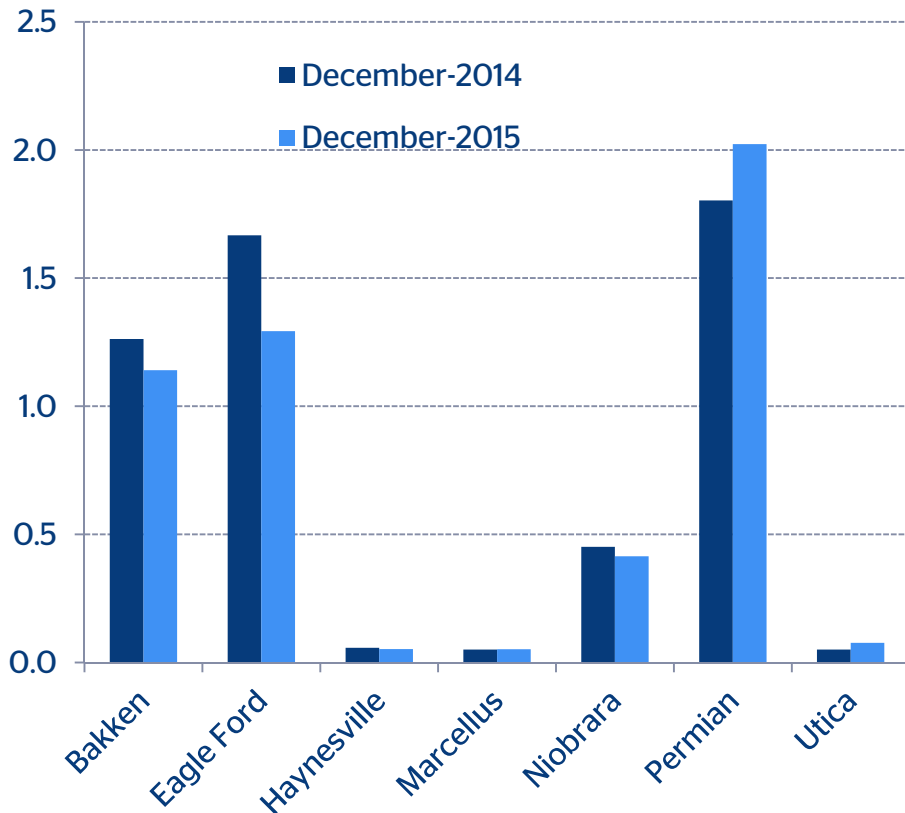
Source: Bloomberg

Modest rebound in 2H16 and 2017

Output is adjusting in most shale plays. We expect around 1 million b/d reduction in total U.S. crude oil production in the next twelve months

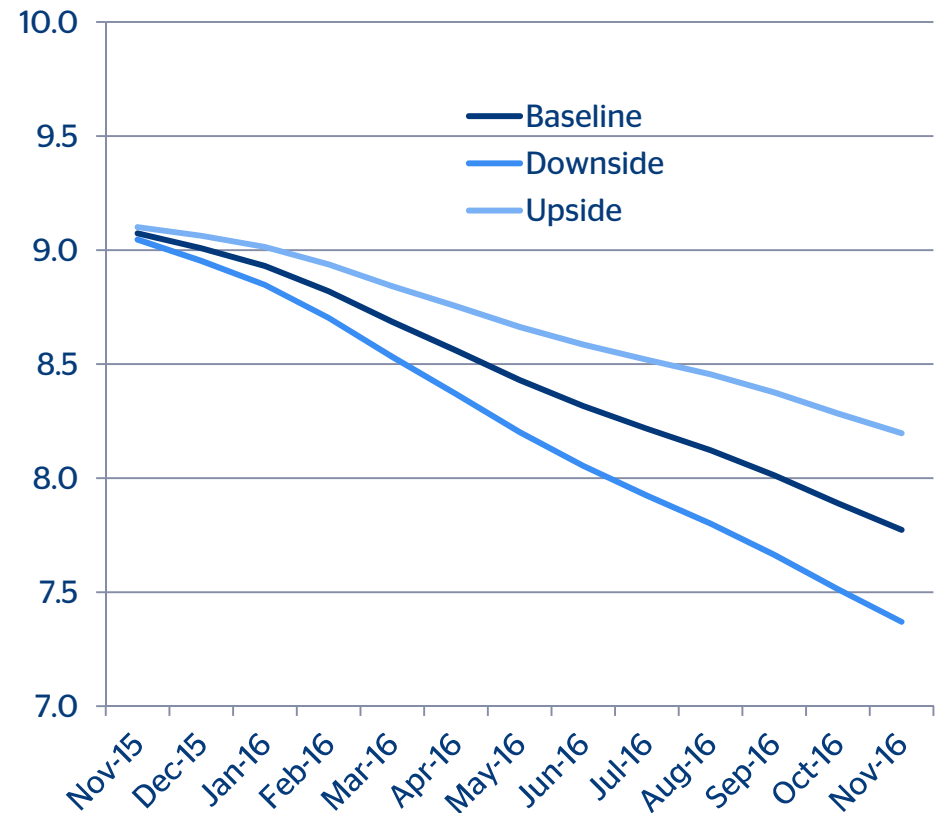
U.S. Total Oil Production by Shale Play

Million barrels per day



U.S. Crude Oil Production Forecast

Million barrels per day



Source: BBVA Research and EIA

Source: BBVA Research

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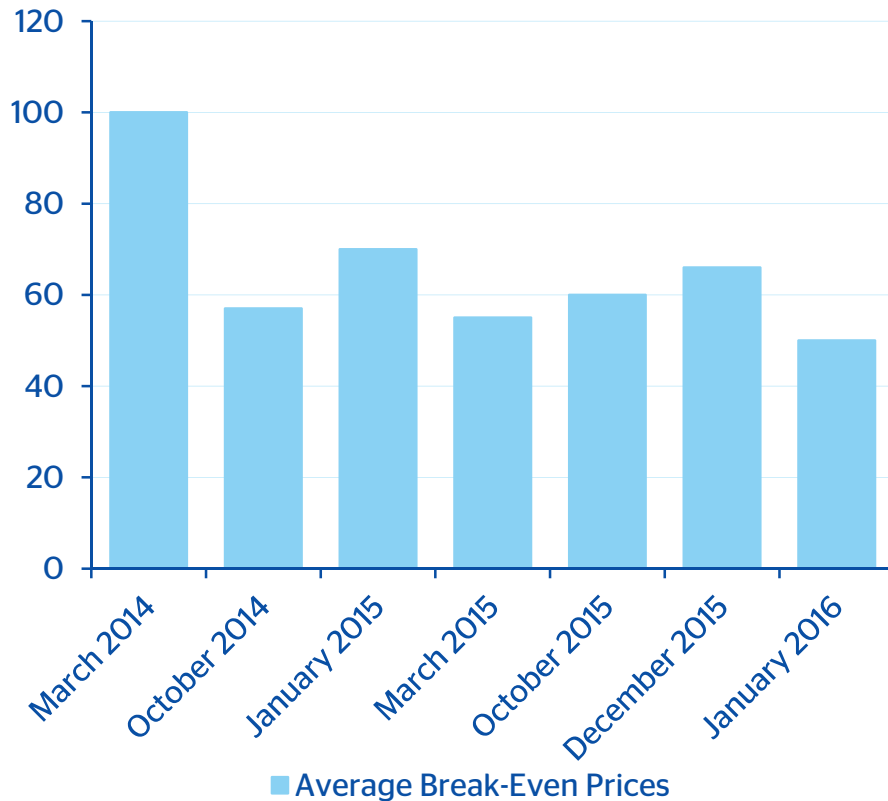
- Supply correction ends
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- Increased reliance on renewable sources

Limited upside

Once U.S. production declines and Saudi Arabia regains market share, oil prices will increase

North America Break-Even Prices (Tight Oil)

\$ per barrel



Saudi Arabia's Priorities

1. Become marginal producer
 - Tight (shale, sand, etc.) oil producers have to be driven out of the market.
2. High oil price
 - Regaining market share will allow Saudi Arabia to seek higher prices in a less competitive market.

Outlook:

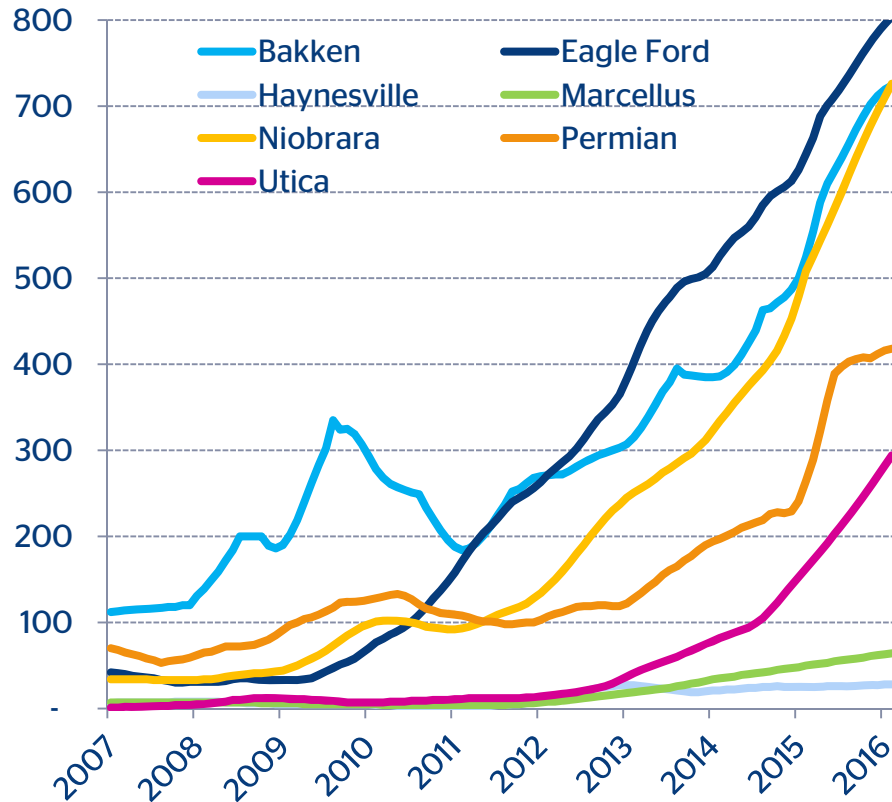
- The equilibrium oil price is likely to be just below the break-even price for tight oil producers.

Limited upside

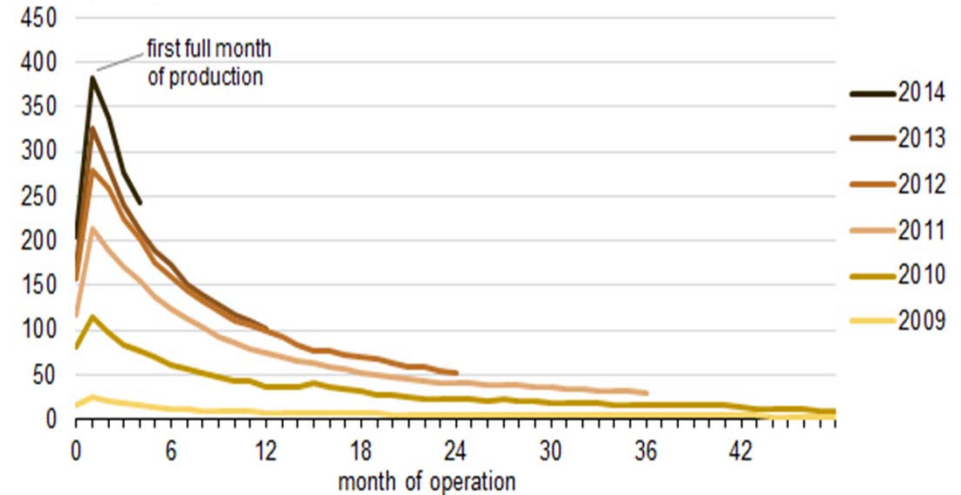
Once oil prices increase, U.S. oil producers will return to the market, limiting the magnitude of the price rebound

Rig Count Productivity

Barrels/ day per rig



Average oil production per well during the first 48 months of operation



In the shale plays, the time between investment decisions and production is relatively short, which prevents the U.S. to be the decisive factor in sustaining a price upturn

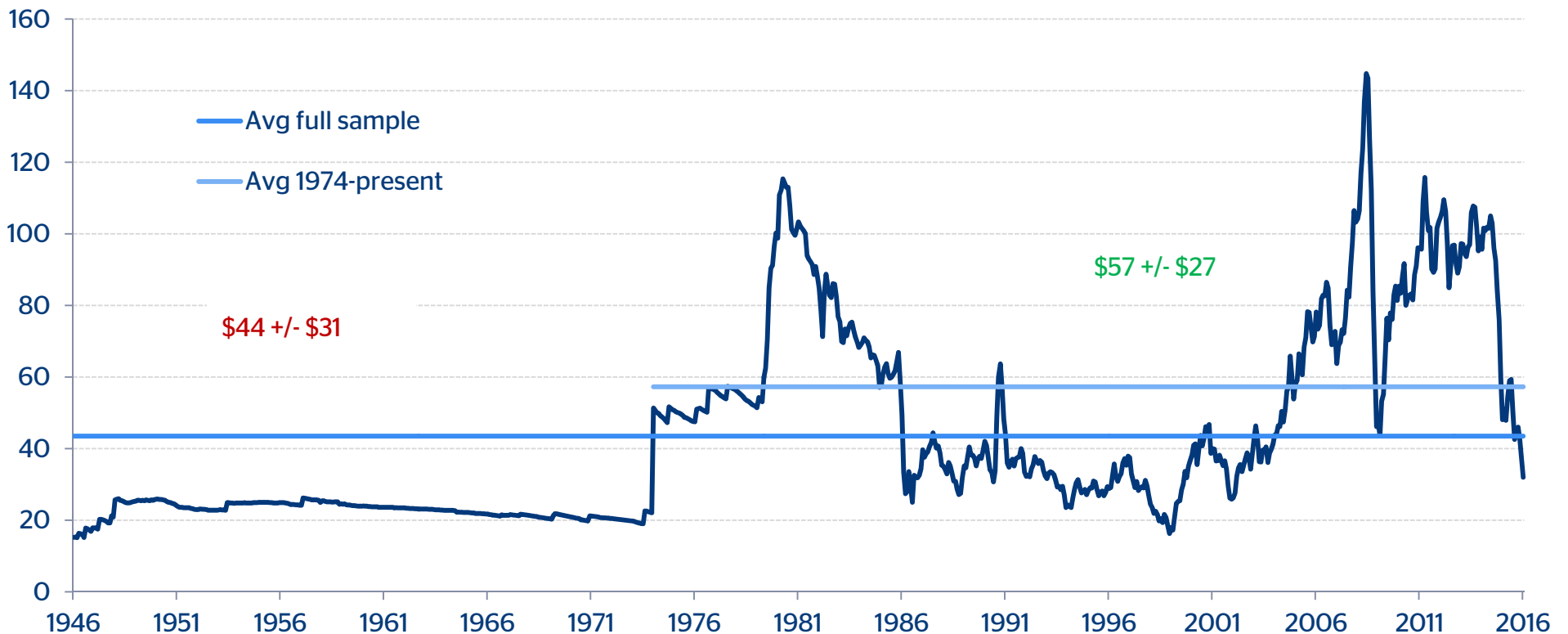
New equilibrium

Everything else equal, the long-run outcome of the price war and the ingenuity of the private sector could result in a price of \$60/bbl.

However...

Real Crude Oil Prices

\$ per barrel, 2016

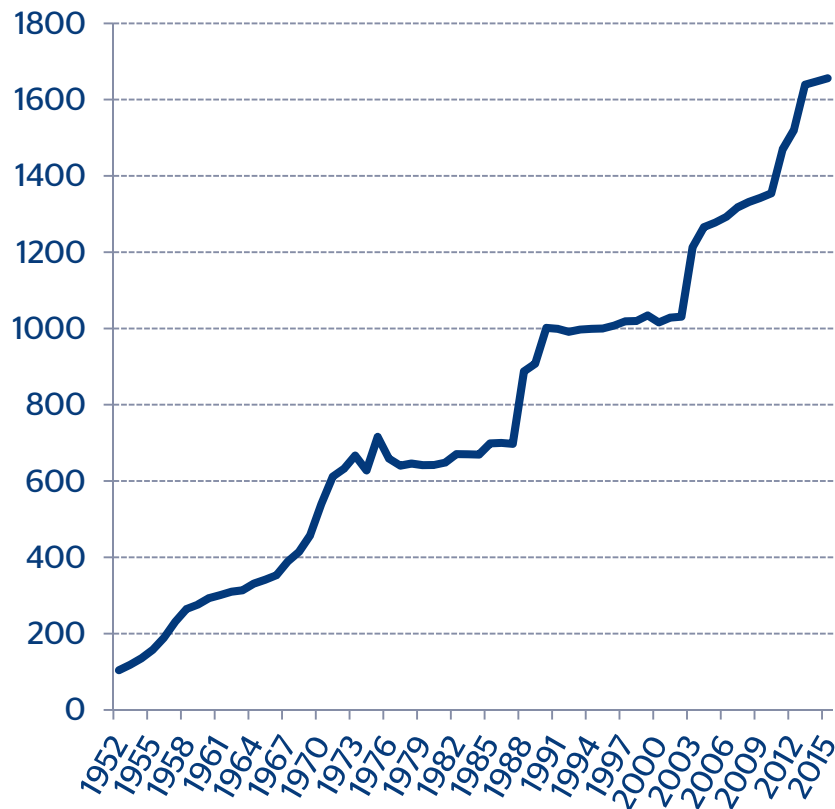


New equilibrium

a.1) “Peak oil” is no longer relevant in an environment of abundant reserves, new players and technological advances

World: Crude Oil Reserves

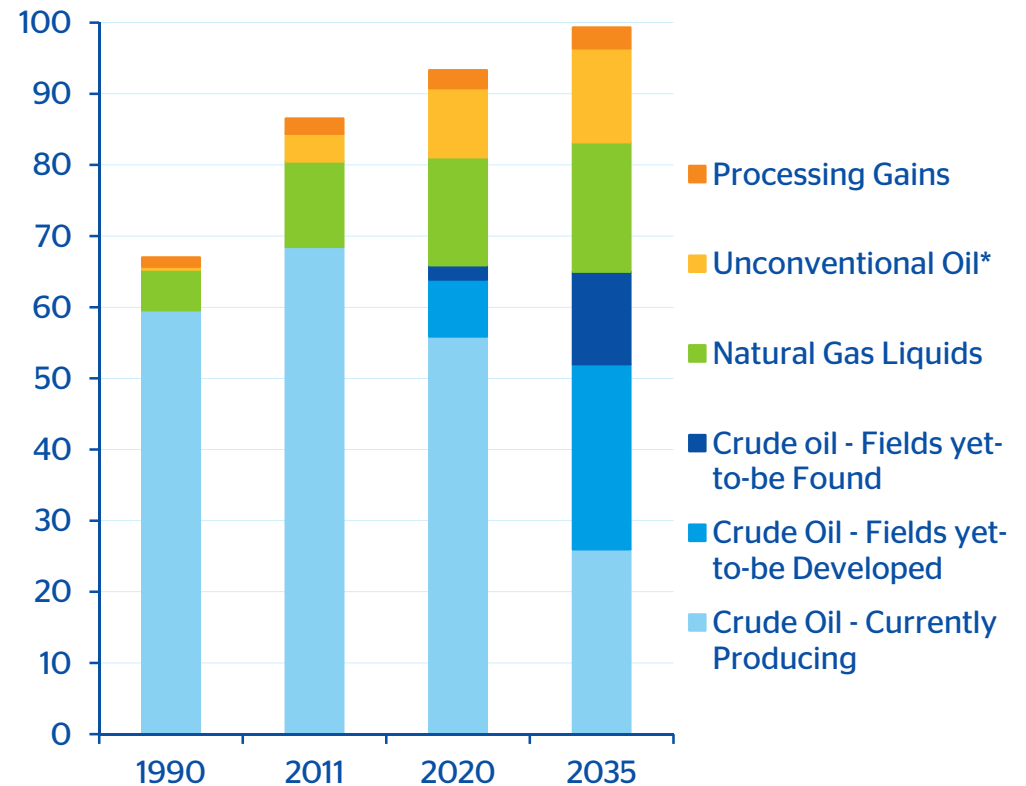
Million barrels



Source: BBVA Research and Haver Analytics

Global All-liquids Production to 2035

Million barrels per day

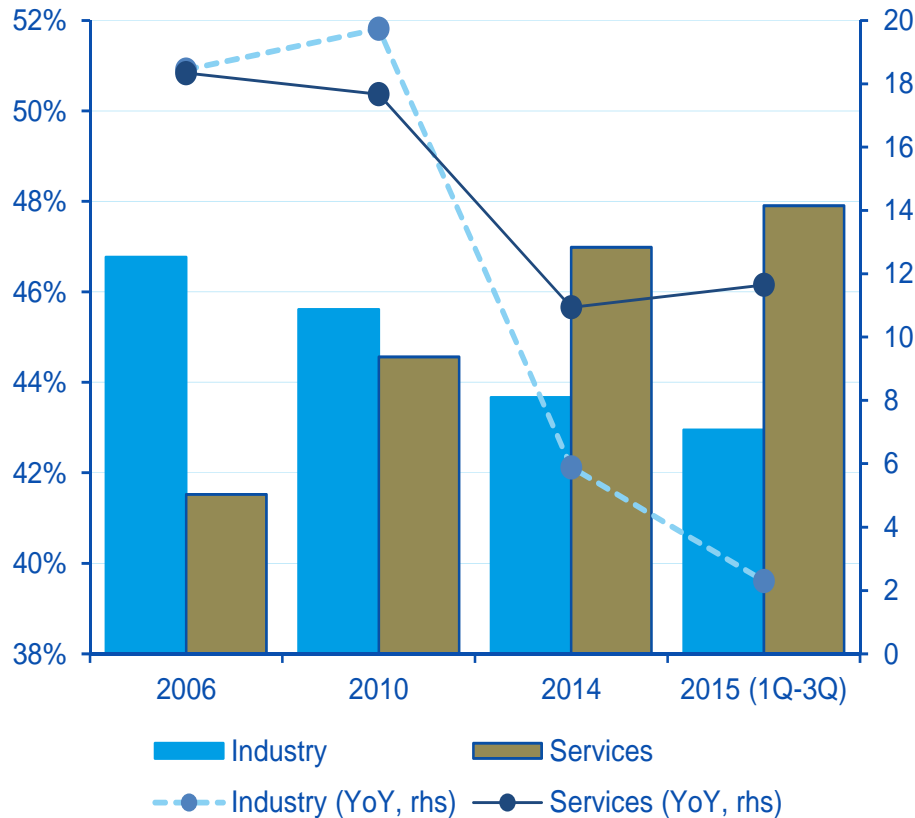


*Unconventional oil includes light tight oil and other.
Source: BBVA Research and International Energy Agency

New equilibrium

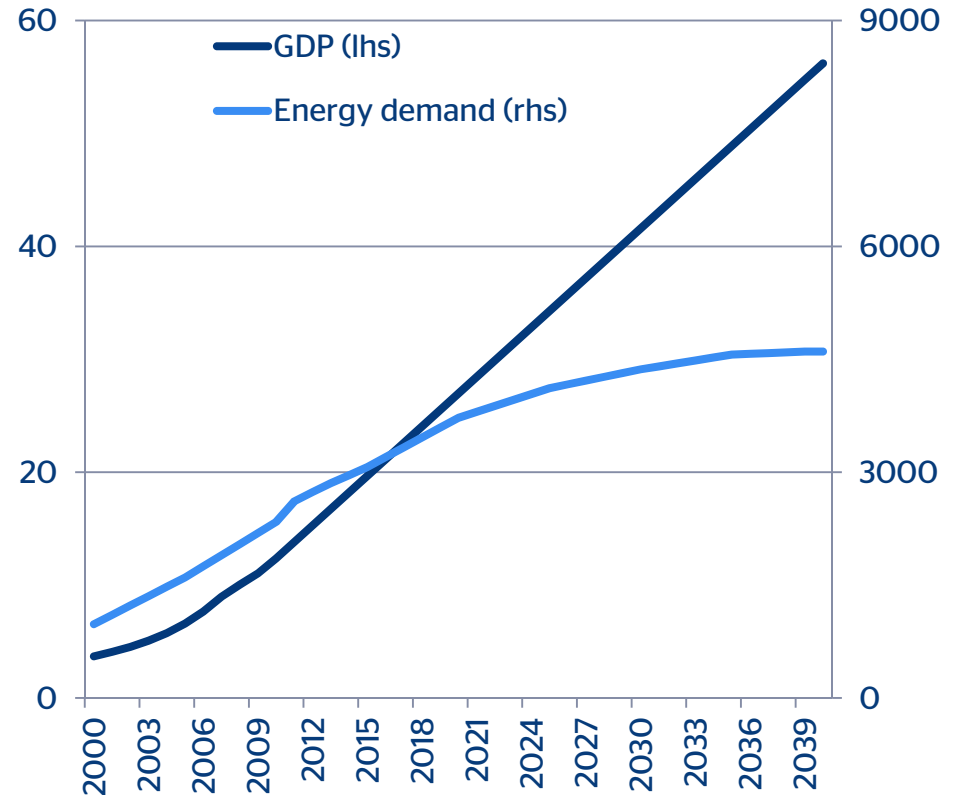
b) China's rebalancing will have far-reaching implications

China: GDP by Sector
% GDP



Source: BBVA Research

China: GDP and Energy Demand
\$tn PPP, and million tonnes of oil equivalent



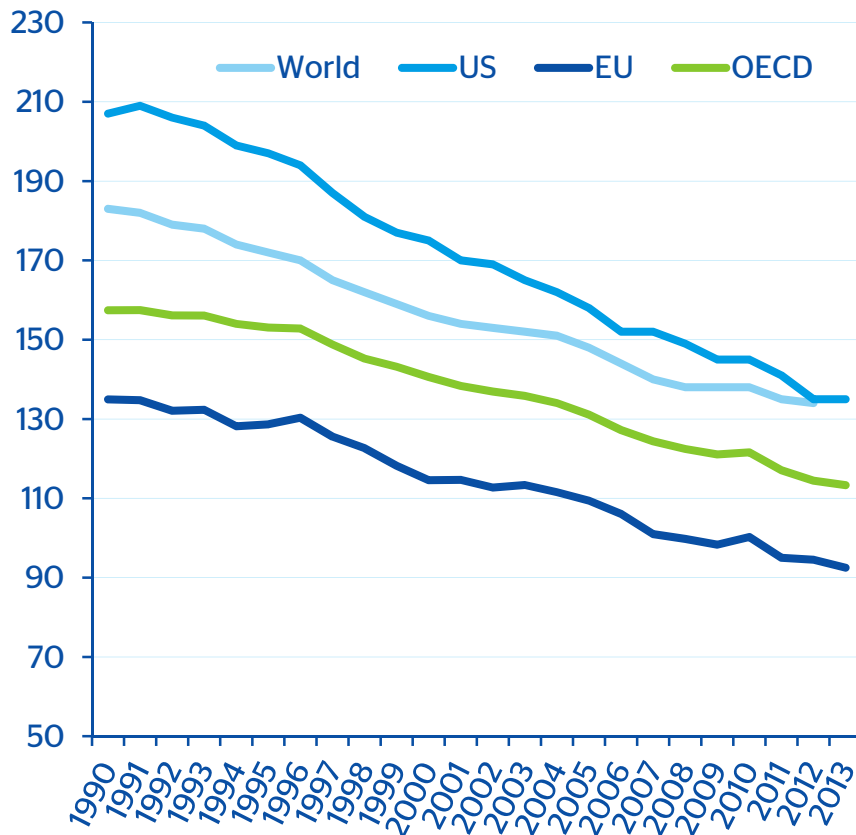
Source: BBVA Research and IEA

New equilibrium

c) Given declining energy dependence, demand from developed countries will be insufficient to bring up oil prices

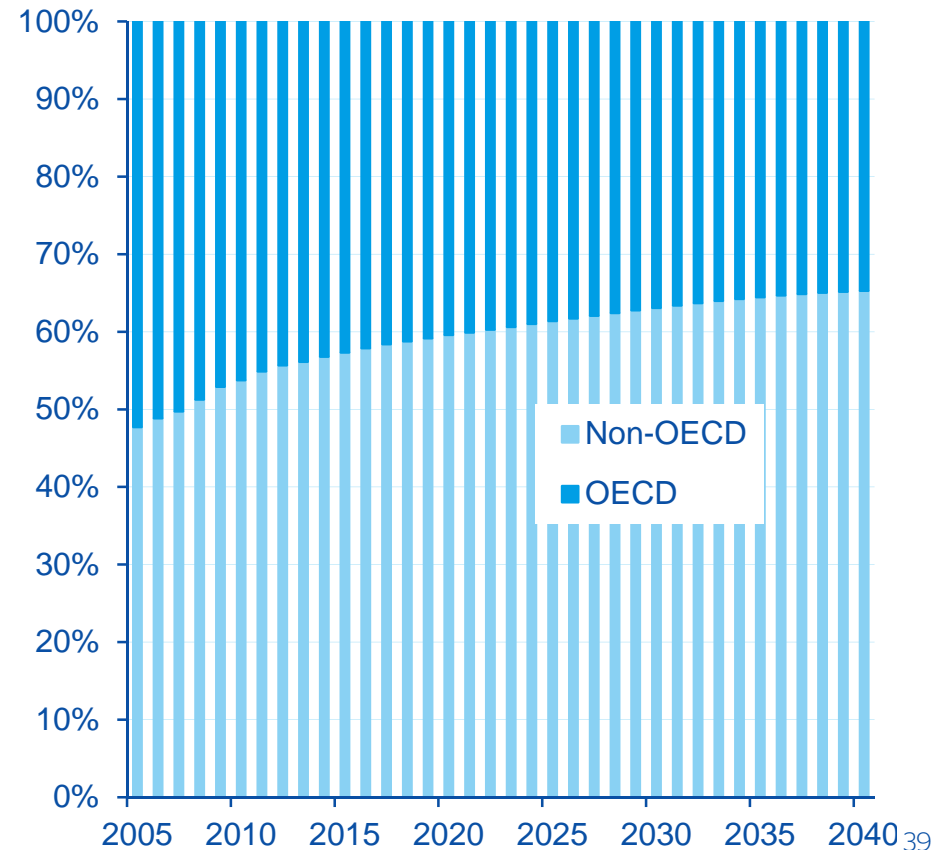
Energy Use per \$1000 of GDP

Kg of oil equivalent, 2011 PPP



Primary Energy Consumption

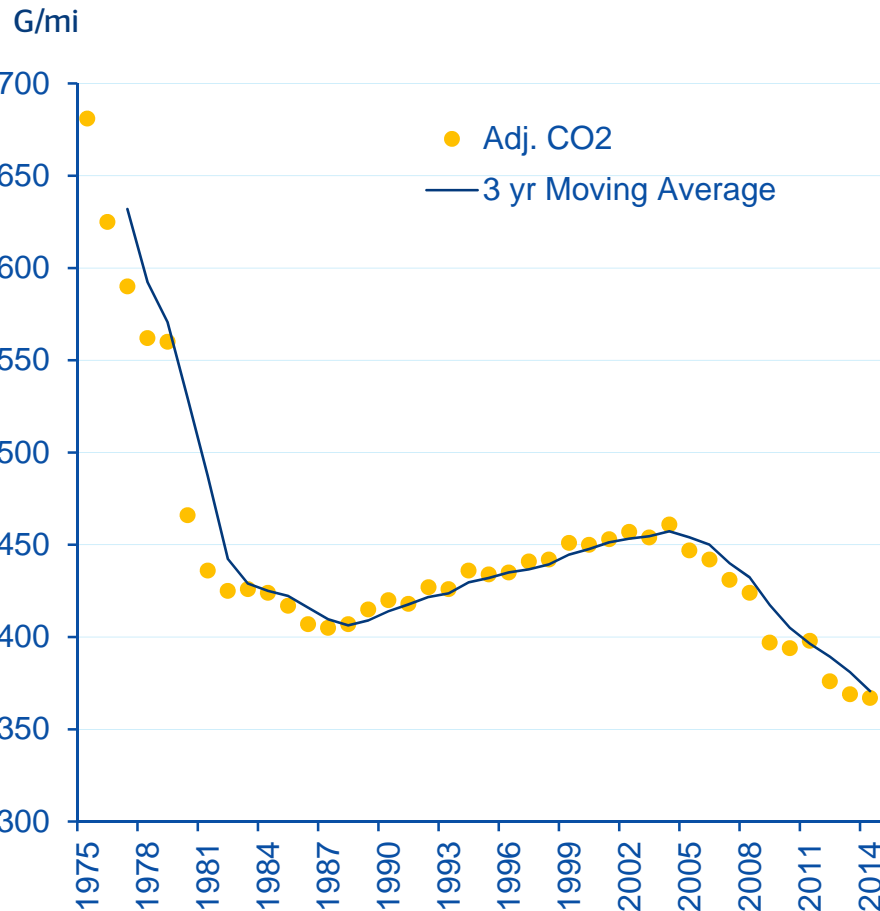
Quadrillion BTU



New equilibrium

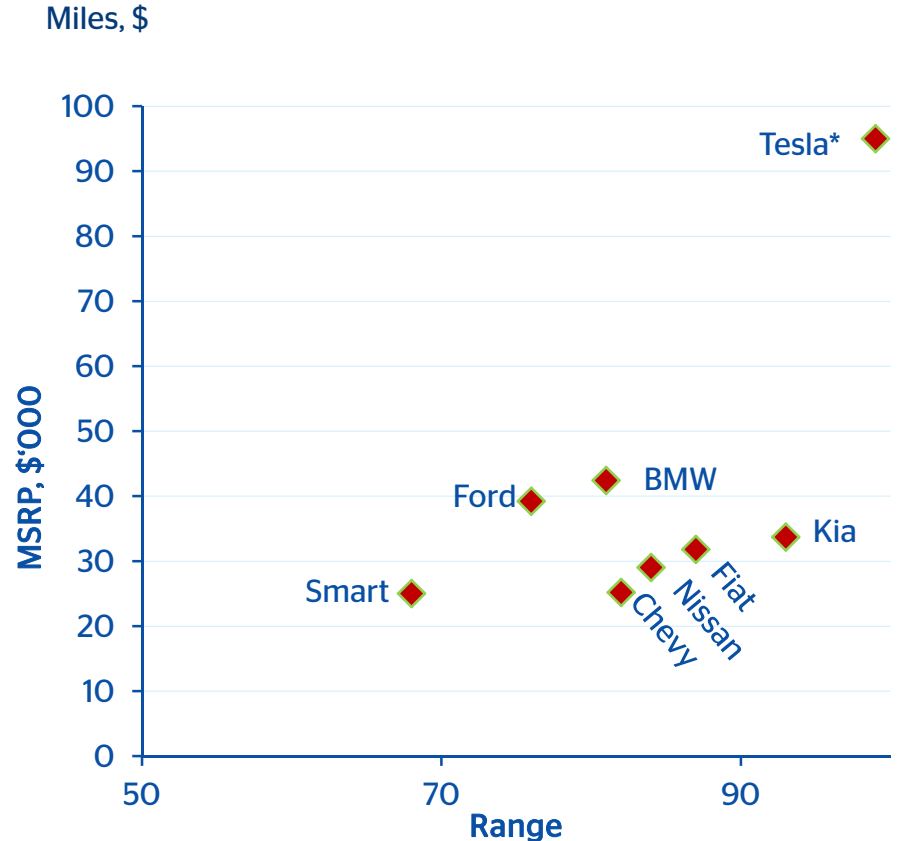
d) Oil and gas industry faces threat from emphasis on reducing vehicle emissions along with fuel economy / affordability of electric vehicles

Adjusted CO₂ Emissions for New Vehicles by Model Year



Source: BBVA Research, EPA

Range and Price of Selected Electric Vehicles



Source: BBVA Research, Company Websites, U.S. Dept. of Energy

*Tesla scaled for fit. Actual range is 279 at MSRP \$105,000.

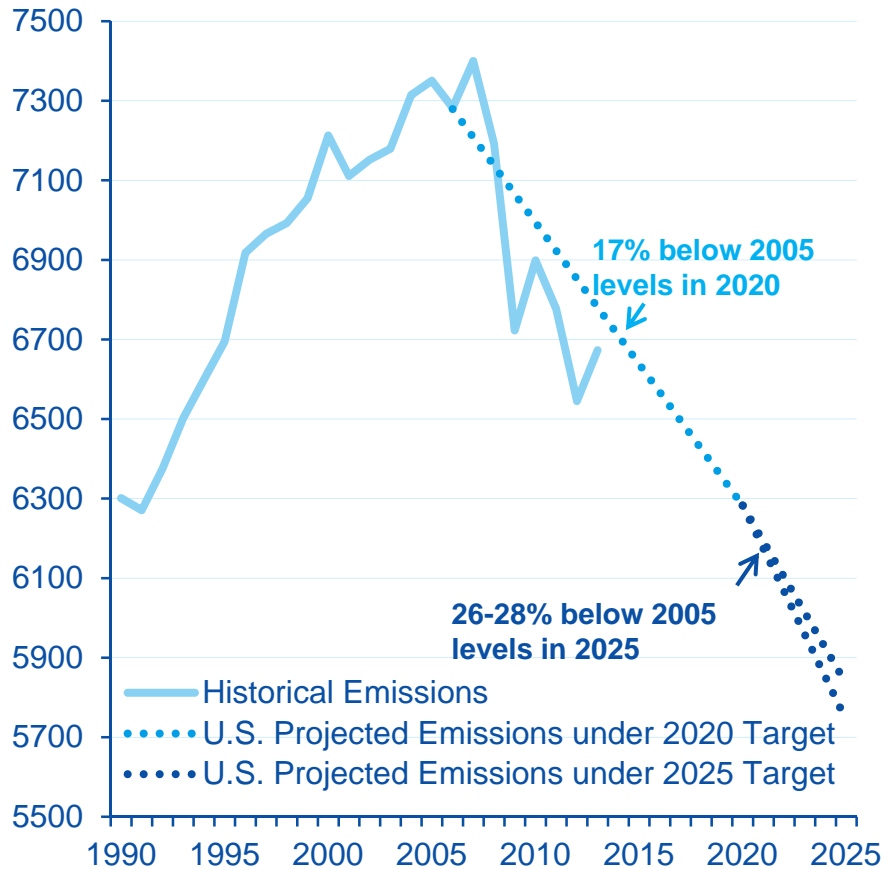
Data provided for 2015 models of Tesla Model S-P85D, Kia Soul Electric, Fiat 500e, Nissan Leaf, Chevy Spark Electric, BMW i3, Ford Focus Electric, Smart Electric

New equilibrium

e) COP21 pledges to reduce or moderate emissions could impact oil and gas demand from top emitters

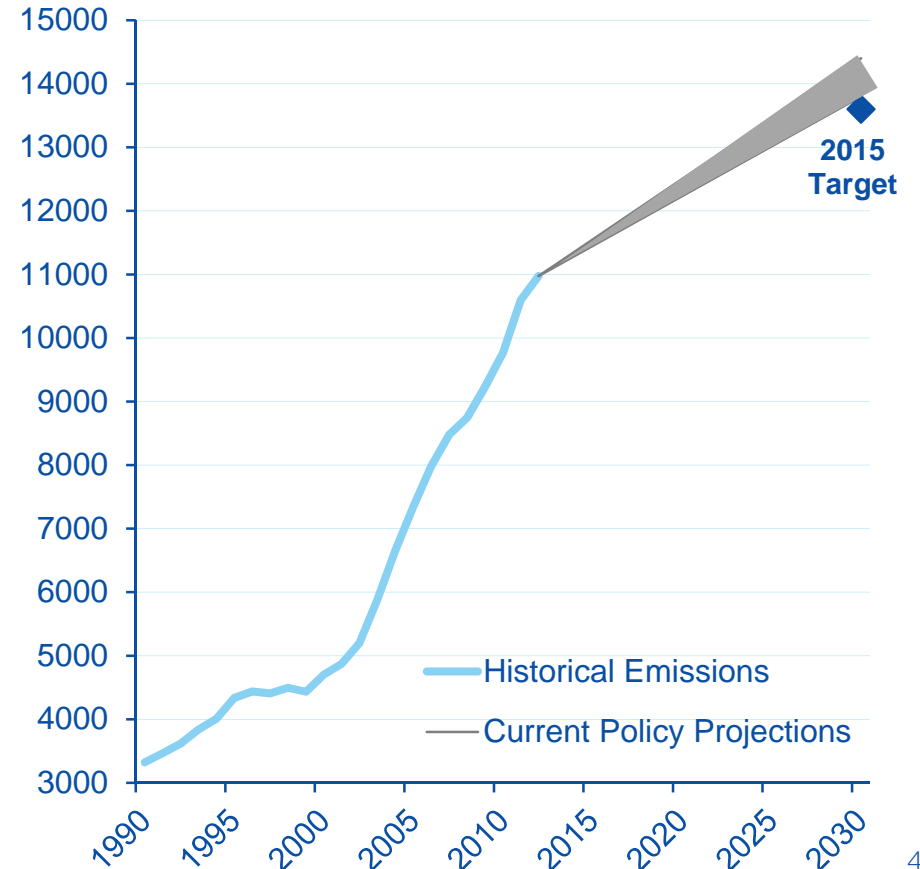
U.S.: Historical and Proposed Greenhouse Gas Emissions

Million metric tons of CO₂ Equivalent



China: Historical and Proposed Greenhouse Gas Emissions

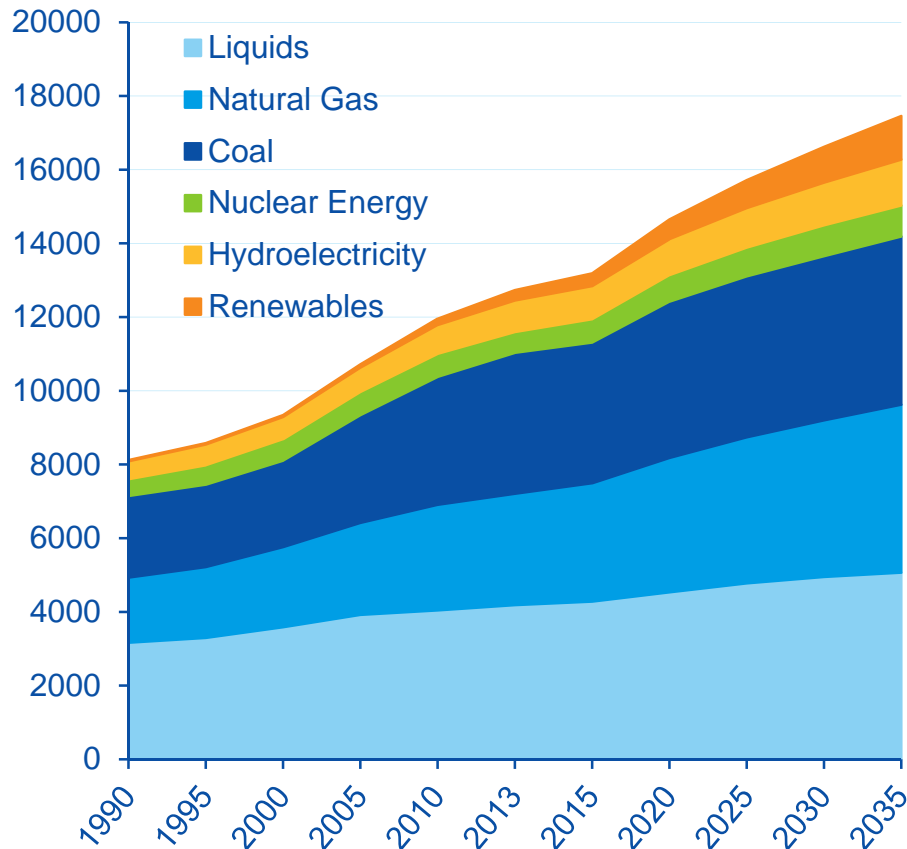
Million metric tons of CO₂ Equivalent



New equilibrium

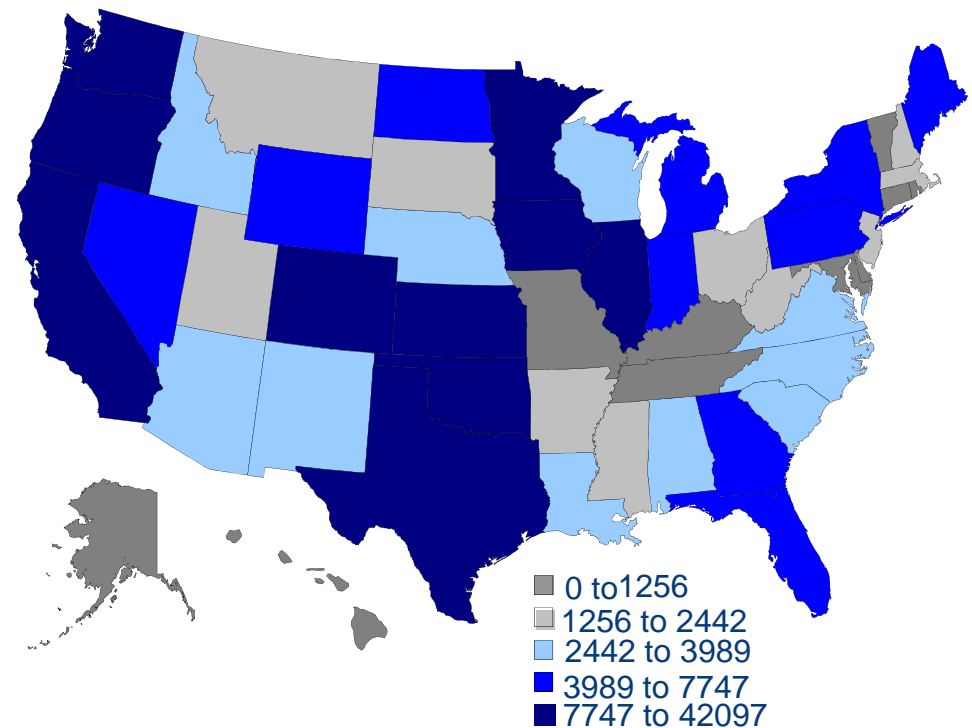
f) Strong renewables activity across U.S. South and West, with worldwide consumption projected to triple by 2035

Worldwide Energy Consumption by Fuel
Million tonnes oil equivalent



Source: BBVA Research, BP

Net Electricity Generation by Renewables*
Thousand MWh



*Not including hydroelectric sources
Source: BBVA Research, EIA

Bottom Line

- Market fundamentals are behind oil price drop
- Further declines are likely
- We expect a modest rebound in 2H16-2017
- Long-run equilibrium price around \$60/bbl
- Structural trends limit upside risks

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