

2018 oil price forecast: who predicts best?

Information document



Since 2007, Roland Berger has published an annual review of available oil price forecasts

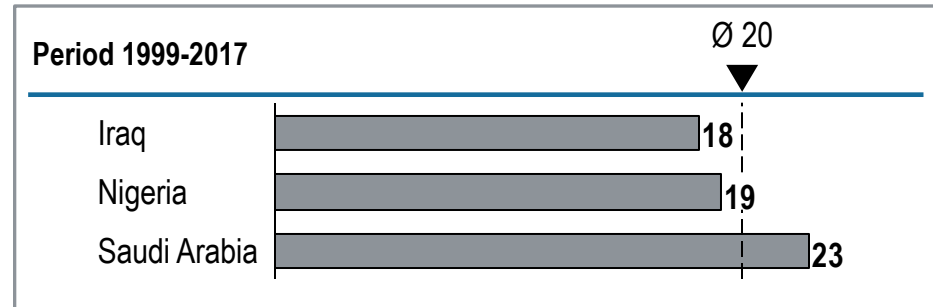
Roland Berger study of oil price forecasts – February 2018, WTI based

- > Since 2007, Roland Berger has published a yearly review of the oil price forecast
- > Major oil exporting countries use a forecasted value of the oil price in their annual budgets
- > We have studied the forecasting track records of the ten largest oil exporting countries from 1999 to 2017
- > The budgeted oil prices of the top-3 most accurate countries are used to forecast the oil price for the year ahead
- > National oil price forecasts are compared to forecasts from the major energy institutions: NYMEX, EIA and OECD

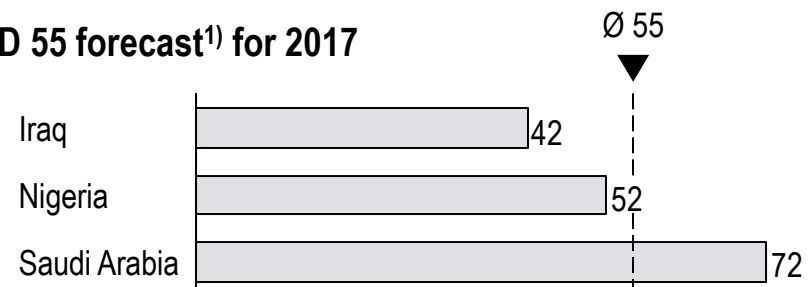
Last year's results

Top-3 most accurate forecasting countries

Average absolute year-on-year oil price forecasting¹⁾ error [%]



USD 55 forecast¹⁾ for 2017



1) To improve comparability, forecasts are adjusted for the ratio of local oil prices to WTI prices (5-year moving average) and for budget deviations (5-year moving average, excluding 2001, 2009 and 2015)

In addition to analyzing forecasting accuracy, Roland Berger's annual review examines current market dynamics

Elements of this year's study

1

Analysis of 2017

Oil price development & market dynamics of 2017

2

Accuracy of oil price forecasts

Analysis of the accuracy of countries and institutions as forecasters of the oil price in 2017 and aggregate over the last years

3

Future oil prices

Forecast of the 2018 oil price based on national and institutional forecasts

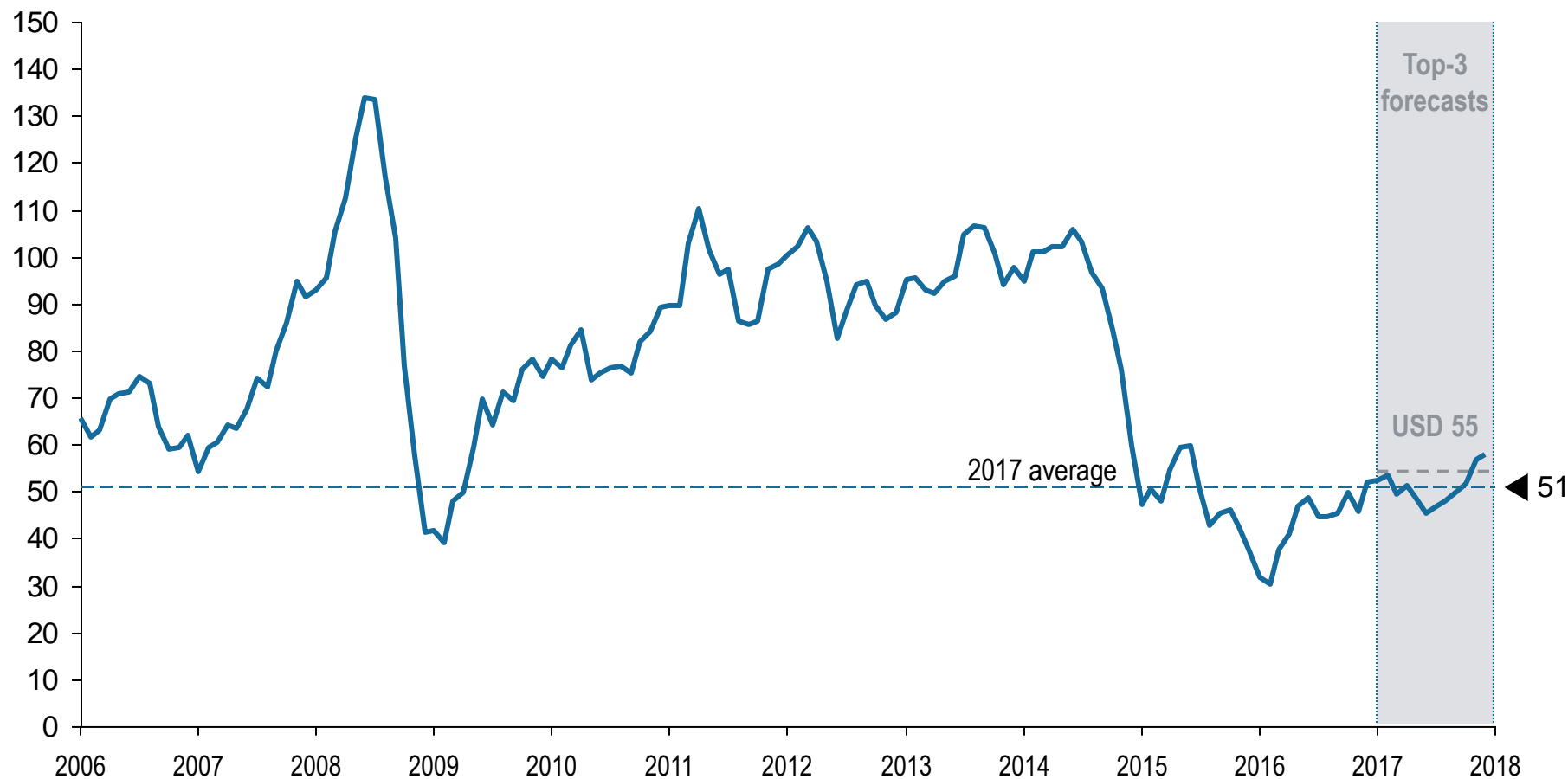
Analysis of market dynamics for future oil supply and demand

1. Analysis of 2017



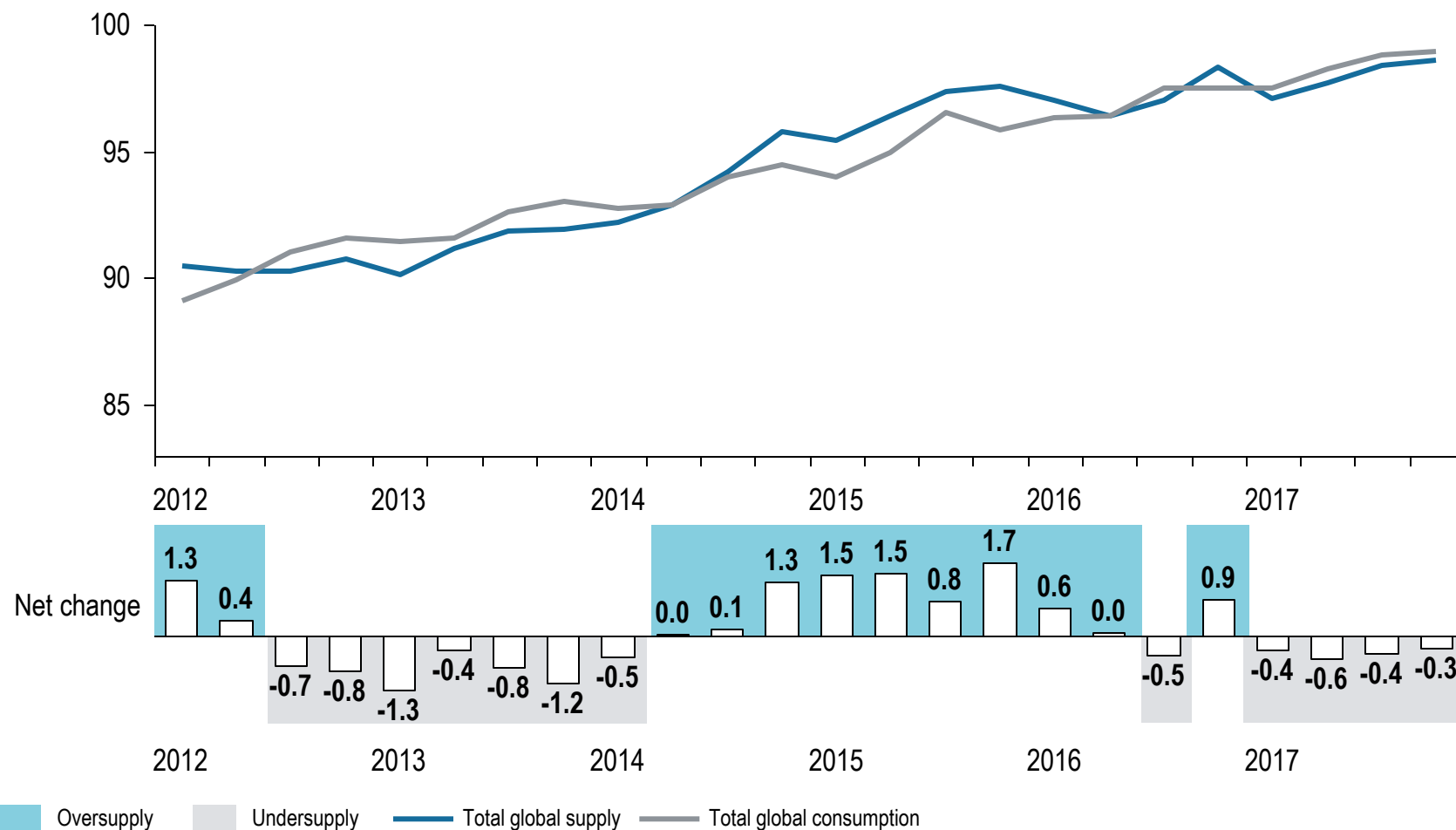
In 2017, the average barrel price was USD 51/bbl, slightly lower than the USD 55/bbl forecasted by the top-3 forecasters

Development of monthly WTI averages [USD/bbl], Jan 2006 – Dec 2017



Both supply and demand grew in 2017 – For the first time since 2013, 2017 saw a consistent period of undersupply

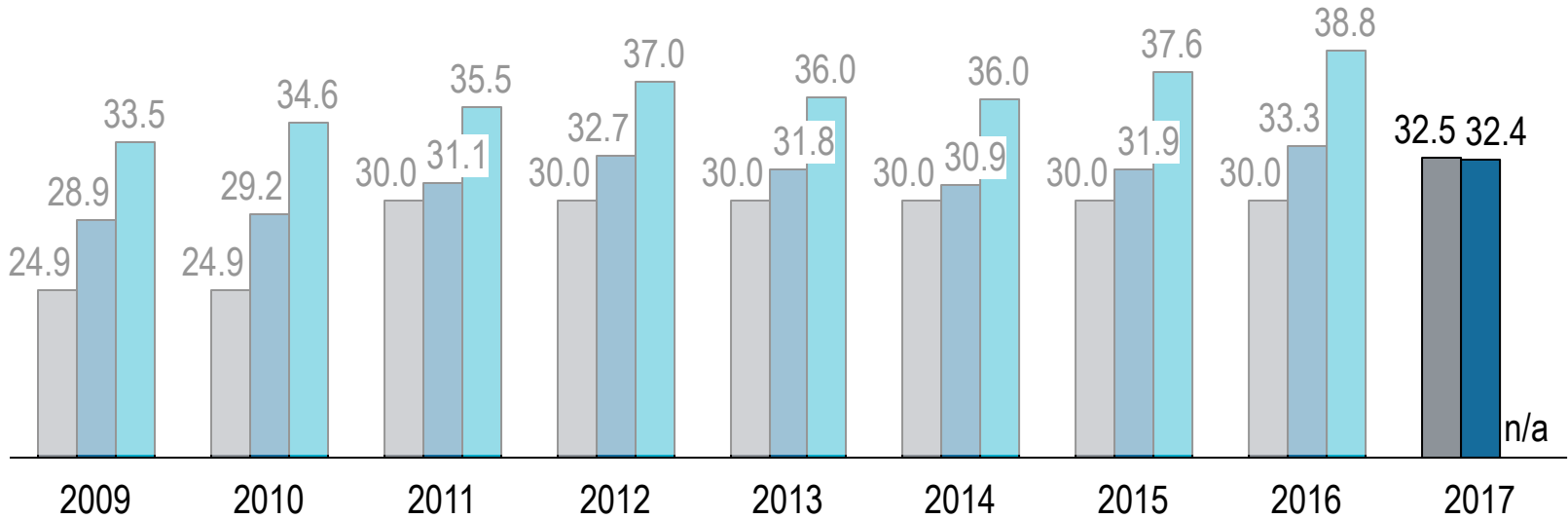
Global supply and demand of oil and net differential [m bbl/day]



Source: EIA; Roland Berger

This undersupply was driven by OPEC's extended production quota, which they are reportedly adhering to

OPEC production quota and actual production [m bbl/day]



Deviation from quota

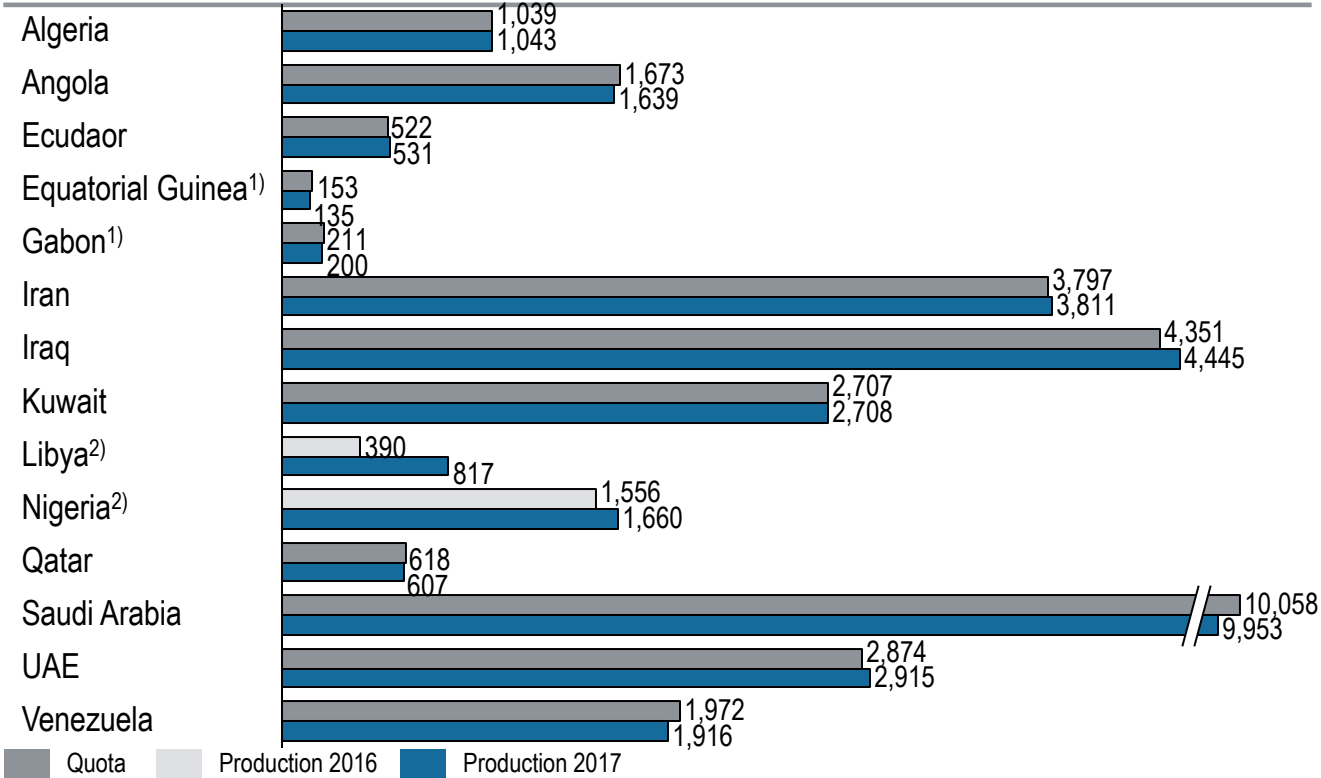
OPEC data	16.4%	17.7%	3.7%	8.9%	6.1%	3.0%	6.2%	10.9%	-0.4%
BP data	34.8%	39.2%	18.3%	23.3%	20.1%	20.1%	25.3%	29.4%	n/a

■ Quota ■ Production – OPEC reports ■ Production – BP statistical review

Overall, OPEC complied with the quota – Libya and Nigeria were excluded from the quota and increased production significantly

OPEC oil production and difference with quota

OPEC oil production 2017 ['000 bbl/day]



Difference with quota

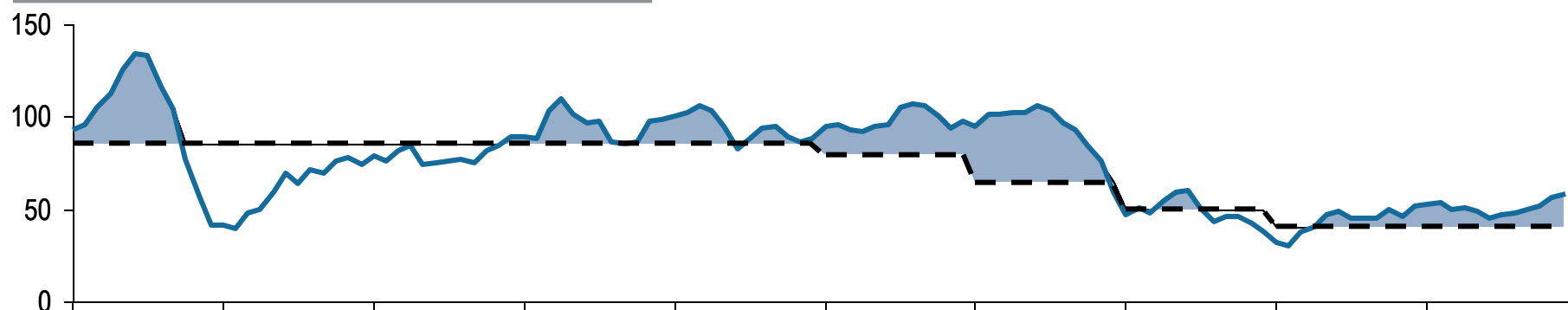
['000 bbl/day]	[%]
4	0.4%
-34	-2.0%
9	1.7%
-18	-11.6%
-11	-5.1%
14	0.4%
94	2.2%
1	0.0%
427	109.5%
104	6.7%
-11	-1.8%
-105	-1.0%
41	1.4%
-56	-2.8%

1) Quota not published; estimated based on overall 4.6% production cut; 2) Excluded from quota due to internal conflicts. 2016 production shown as quota

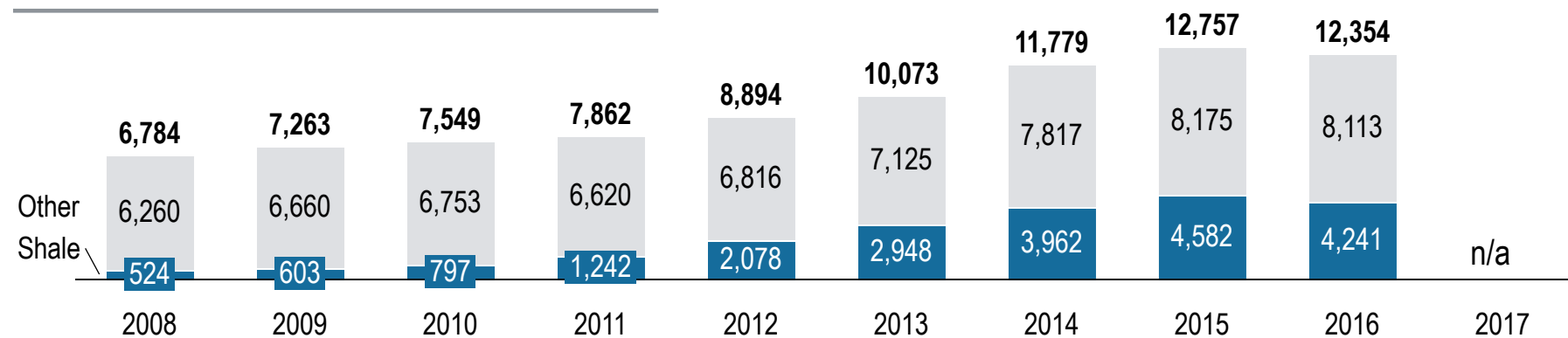
The OPEC production decline was compensated by an increase in swing capacity from US shale oil, which dampened prices

Profitability and growth of US shale oil

WTI price and shale oil profitability [USD/bbl]



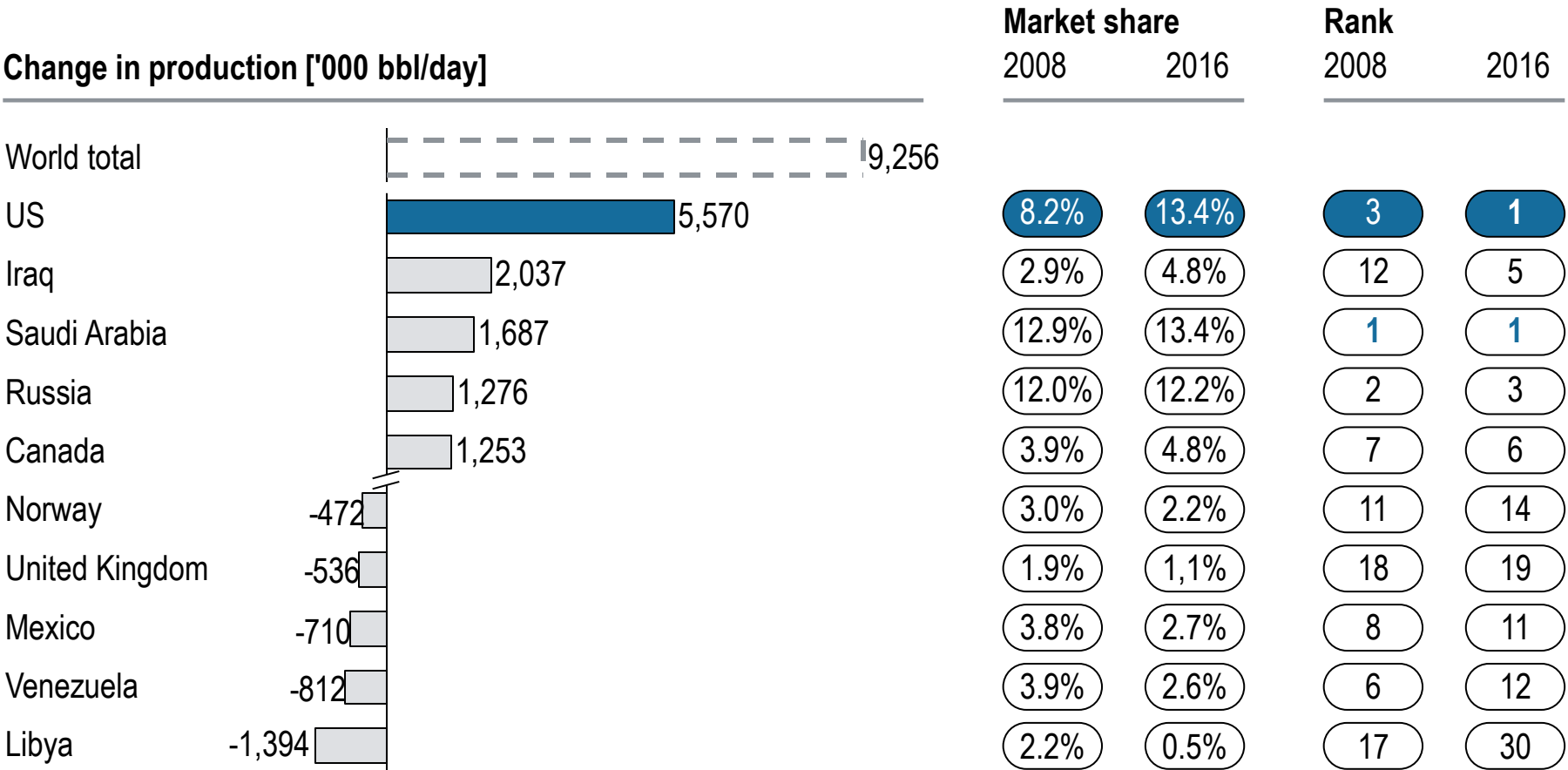
US shale oil production ['000 bbl/day]



— — Indicative break-even price of shale oil Profitability of shale oil US shale oil production

The growth of US (shale) oil production by ~5.6 m bbl/day is the main reason behind the growth in global oil production

Biggest changes in oil production between 2008 and 2016



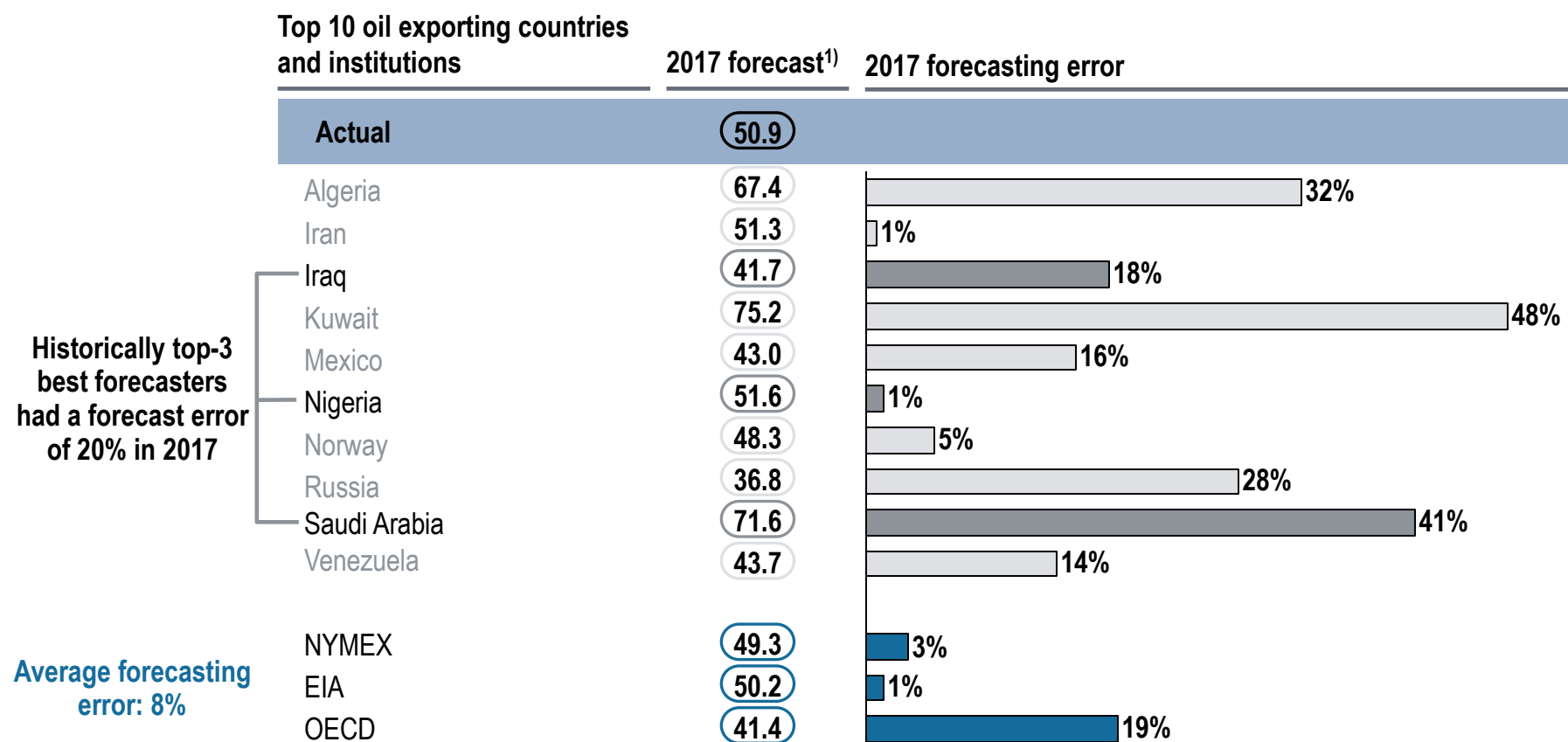
Source: BP Statistical Review of World Energy 2017; Roland Berger

2. Accuracy of oil price forecasts



Saudi Arabia, the historical top forecaster, was much too bullish in 2017 – Institutions remain the better forecasters

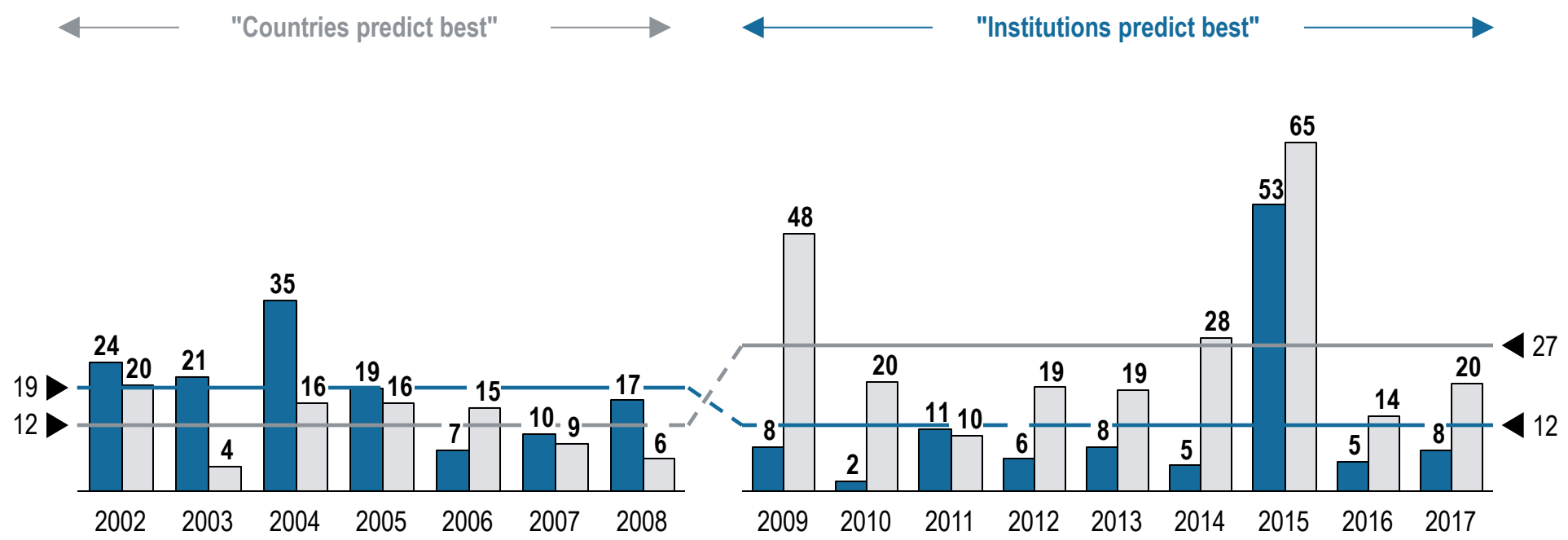
Absolute year-ahead oil price forecasting error, 2017 [%]



1) To improve comparability, forecasts are adjusted for the ratio of local oil prices to WTI prices (5-year moving average) and for budget deviations (5-year moving average, excluding 2015)

In 2009, institutions started forecasting better than oil exporting countries – Since 2012, they are unbeaten

Yearly oil price forecasting error, institutions and top-3 countries¹⁾, 2002-2017 [%]

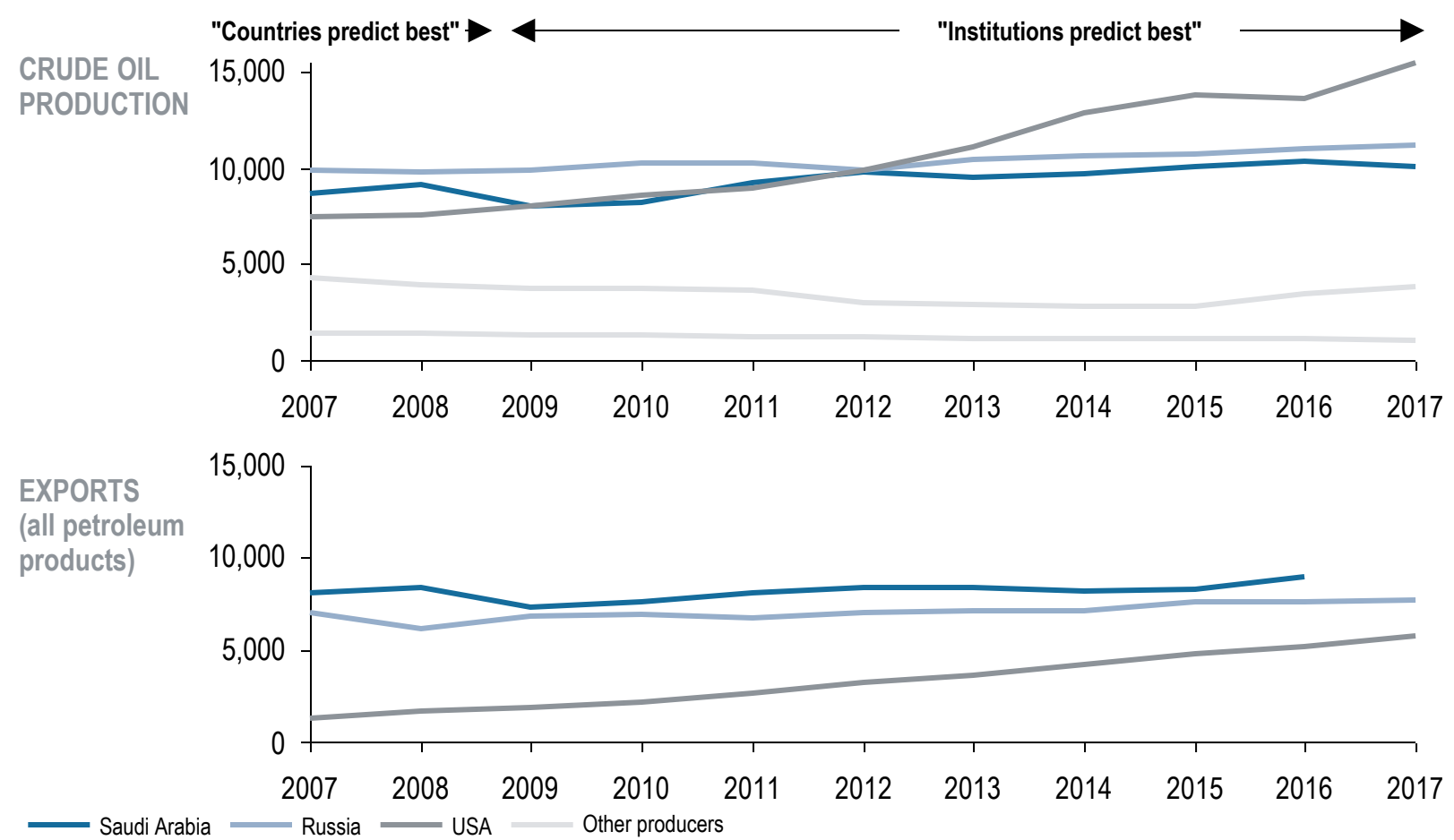


■ Institutions ■ Top-3 most accurate countries

1) Updated top 3 based on up to year n-1. To improve comparability, forecasts are adjusted for the ratio of local oil prices to WTI prices (5-year moving average) and for budget deviations (5-year moving average, excluding 2001, 2009 and 2015)
 Source: Ministry of Finance of selected countries; EIA; NYMEX; OECD; Press reports; Roland Berger

The emergence of institutions as better forecasters coincides with the rise of the US as a major (shale) oil producer and exporter

Crude oil production per country and US exports, 2007-2017 ['000 bbl/day]



Source: OPEC; EIA; Roland Berger

Saudi Arabia's bullish forecast was driven by some misplaced estimates but mainly by management of the public budget

Main drivers behind Saudi Arabia's bullish forecast

1 Management of the public budget

- > Between 1999 and 2016¹⁾, Saudi Arabia's oil price forecast averaged 37% below the actual
 - > The National Transformation Plan (NTP 2020) launched in 2016 has put extra pressure on Saudi Arabia's public budget
 - > A less conservative estimate helps keep the public deficit as small as possible (8.9% of GDP in 2017), since the petroleum sector accounts for 87% of the public budget
-

2 Interpretation of US shale oil break-even price

- > Saudi Arabia had not expected shale oil prices to drop below USD ~75/bbl, so it underestimated US supplies at current oil prices
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3 Outlook on Iran's exports

- > Saudi Arabia expected the oil ban on Iran to be reinstated, removing ~3 m bbl/day²⁾, or 3.8% of the total exported volume, from the market
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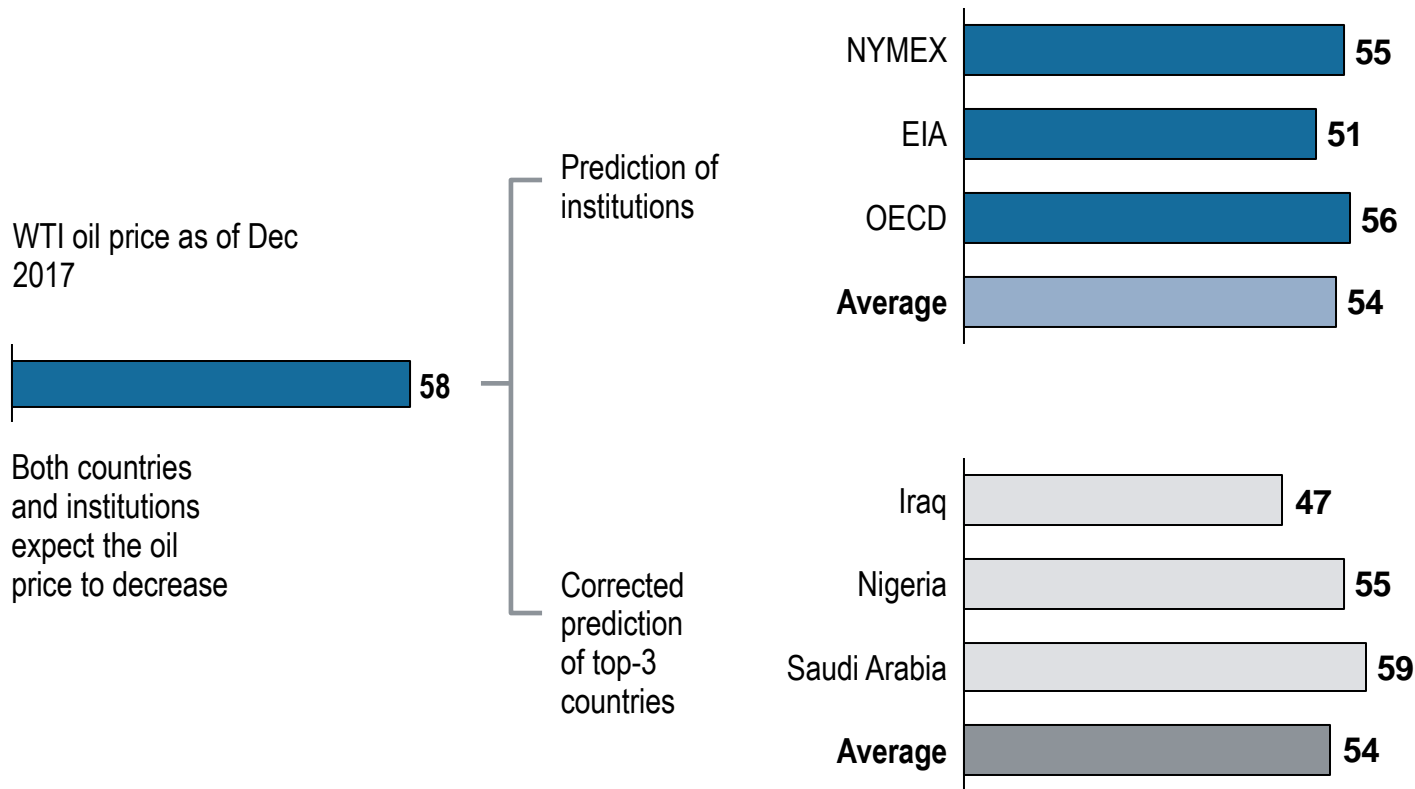
1) Excluding crisis years 2001, 2008 and 2015; 2) Based on Iran's exports of crude oil and petroleum products in 2016

3. Future oil prices



The oil price is now at about USD 58 – For 2018, both institutions and the top-3 most accurate countries predict a price of around USD 54

2018 WTI price forecasts¹⁾ [USD/bbl]

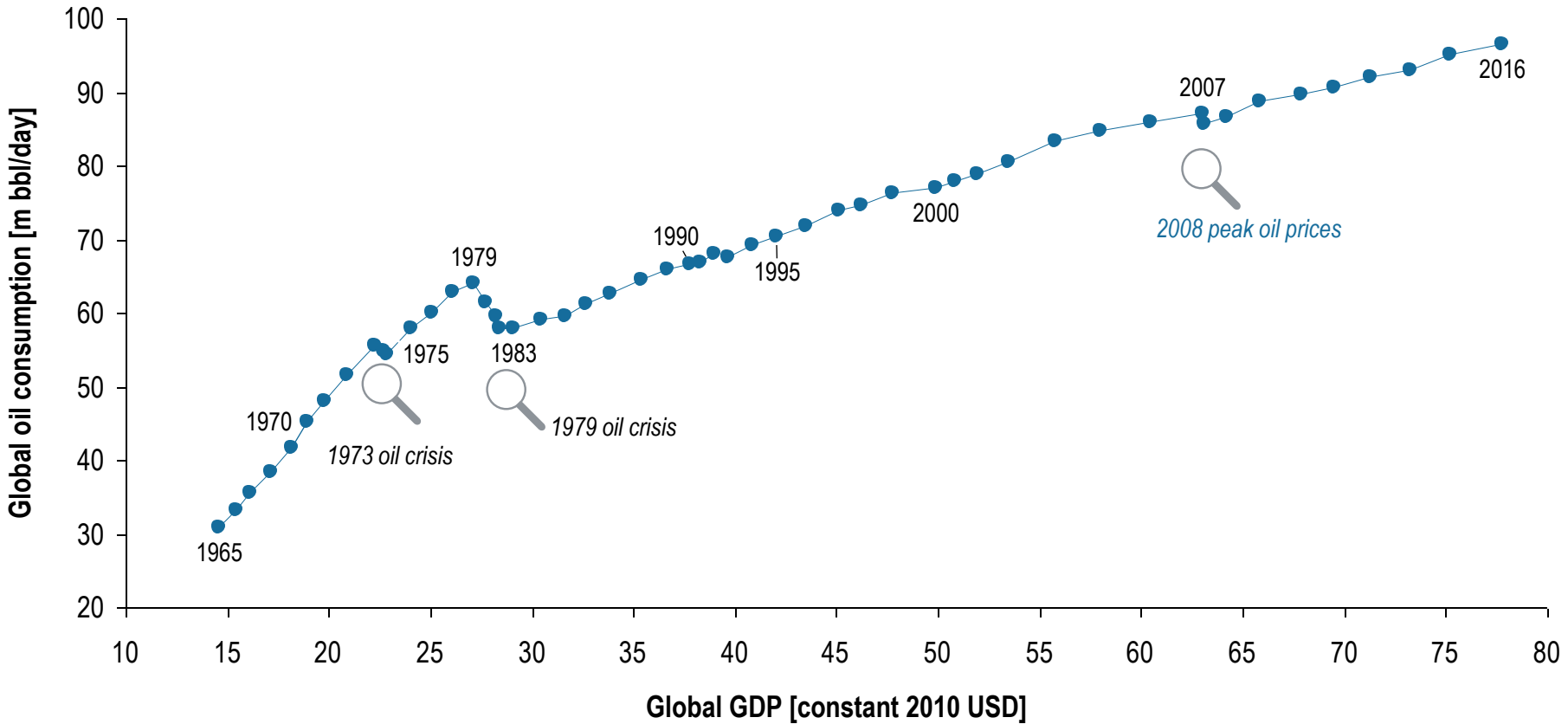


1) Updated top 3 based on up to year n-1. To improve comparability, forecasts are adjusted for the ratio of local oil prices to WTI prices (5-year moving average) and for budget deviations (5-year moving average, excluding 2015)

Source: Ministry of Finance of selected countries; National banks; Press reports; Roland Berger

Historically, global oil consumption has followed global GDP growth

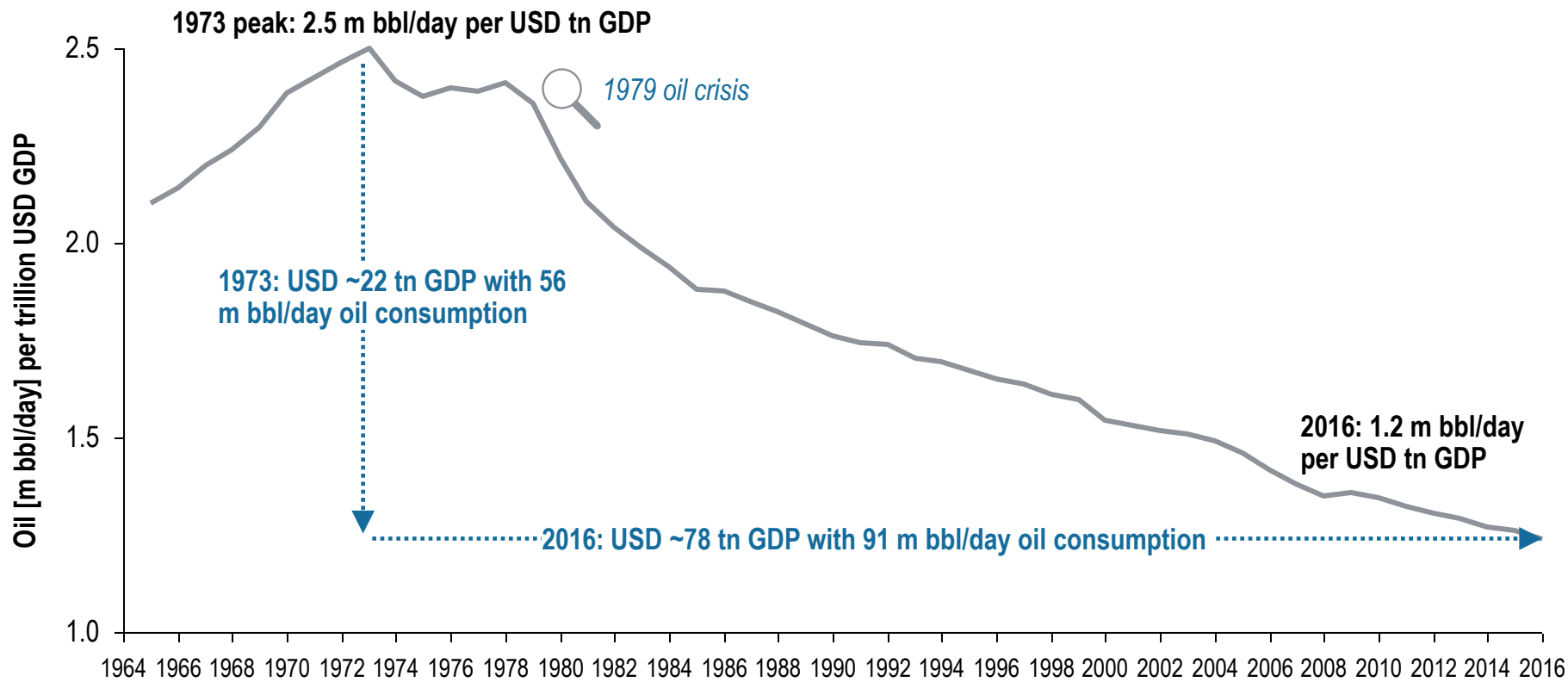
Global oil consumption [m bbl/day] vs. global GDP, 1965-2016¹⁾



1) 2016 forecast based on OECD GDP growth, applied to World Bank data

However, since a peak in 1973, the correlation between oil consumption and GDP growth has weakened

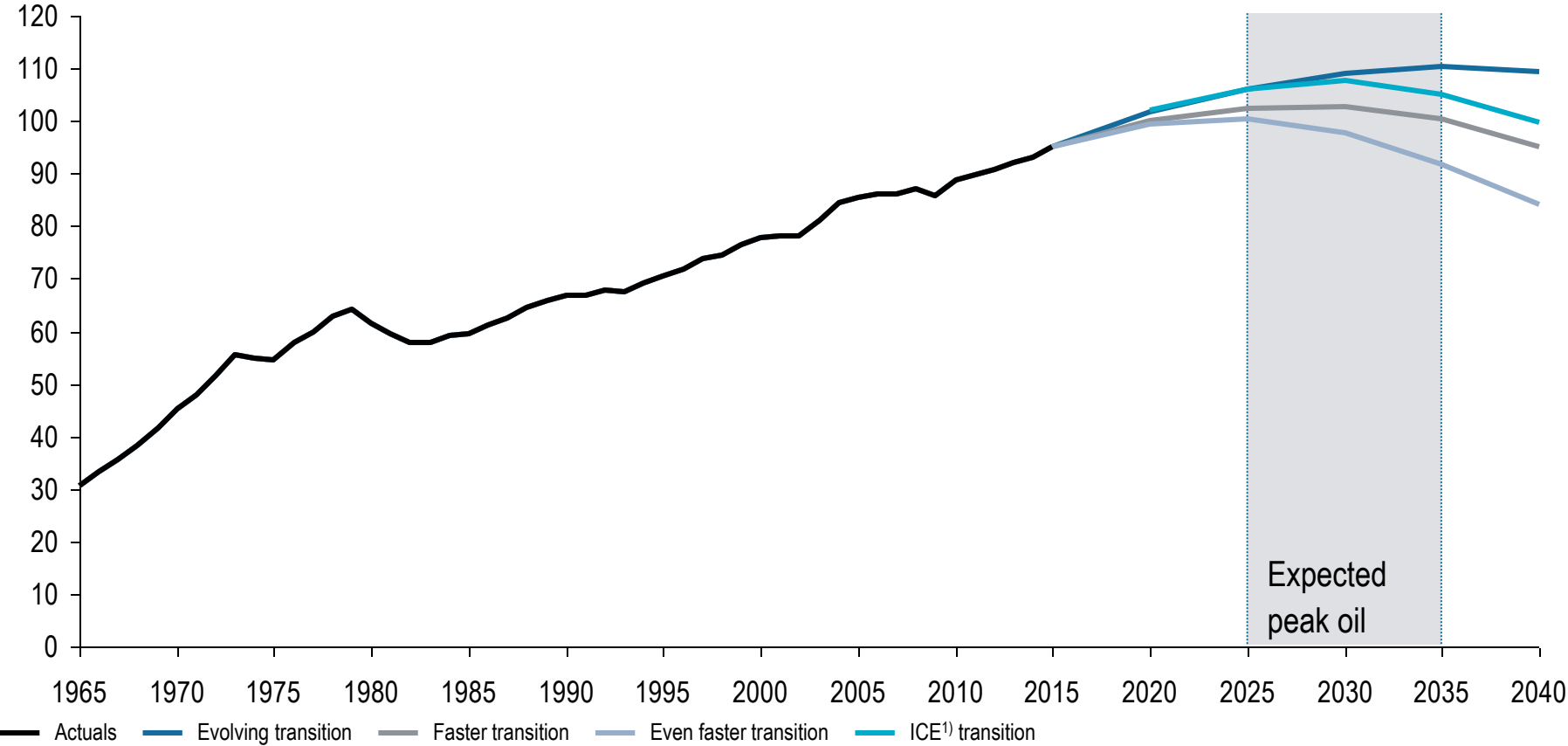
Global oil consumption [m bbl/day] per trillion USD GDP, 1965-2016¹⁾



1) 2016 forecast based on OECD GDP growth, applied to World Bank data

Depending on the scenario, BP predicts global oil demand to peak between 2025 and 2035

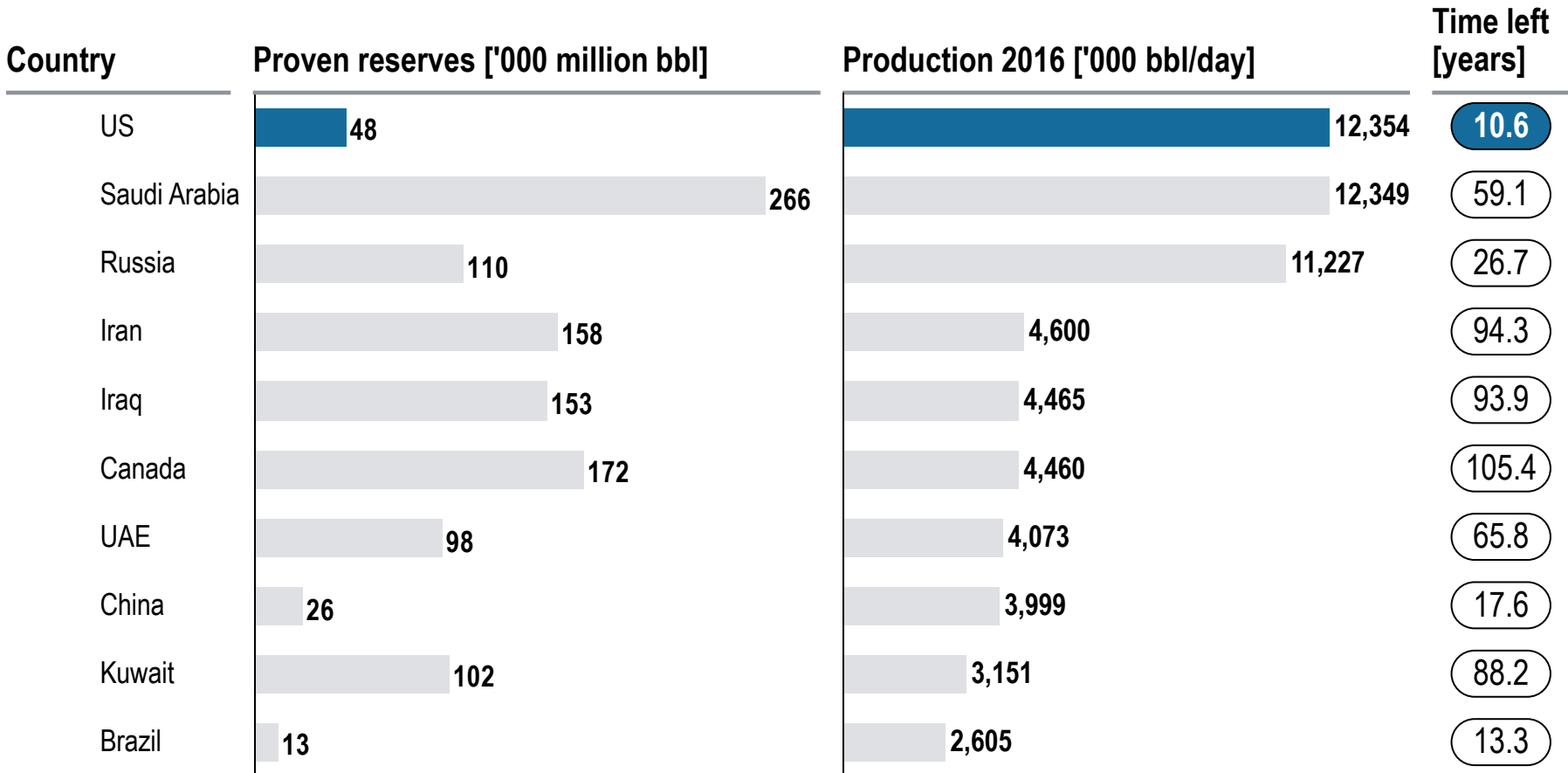
Global oil demand [m bbl/day] per year



1) Internal combustion engine

With its proven reserves, the US can ride it out until peak oil, maintaining pressure on the oil price as a swing supplier

Proven reserves and production rate of 10 biggest oil producing countries



1) Based on years 2006-2016

CEOs of major oil companies generally agree that the oil price will see a slight increase in the coming years

Selection of quotes on the oil price

Lower forever; yeah, that's the mindset. Yeah, to be perfectly honest, I do think we will have quite a bit of movement in the oil price going forward, and **there is a better than 50-50 chance that we will see oil prices trend up**

08-01-2017, Ben van Beurden
CEO, Shell

I don't expect there to be a real spike in the markets, barring some geopolitical event...I've always **said we're in the USD 50-60 range** until the end of the decade

11-13-2017, Bob Dudley
CEO, BP

I think we will most **likely be below USD 70** a barrel

02-07-2018, Eldar Sætre
CEO, Statoil

It's very hard to predict what will be the oil price...We see the prices for the medium term **between USD 65 and USD 55 per barrel**

11-15-2017, Pedro Parente
CEO, Petrobras

A continuation of these market trends, combined with further steady draws in global oil inventories, is now creating the required foundation for further **upward movement in oil prices** and subsequent growth in global E&P investment

10-20-2017, Paal Kibsgaard
CEO, Schlumberger

While **the outlook for commodity prices has improved**, our operating plan remains unchanged and we have already taken clear actions to demonstrate our commitment to maintain discipline and follow our priorities

11-08-2017, Ryan Lance
CEO, ConocoPhillips

Roland
Berger

THINK:ACT

