Repsol Economic Research Department. Antonio Merino Chief Economist

“Crude Oil Outlook”

Seventh IEA_IEF_OPEC Symposium on Energy Outlooks
IEF Headquarters
Riyadh, Saudi Arabia, February 2017
Discussion Points

- Price Forecast
- Demand Dynamics: Long term forecast and facts
- Supply Dynamics: Integrated, Unconventional and OPEC
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- Price Forecast
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Price Forecast
Oil Price Scenarios

Crude Price Official Agencies Outlook

* Short term prices from the EIA's Short Term Energy Outlook
** Prices are calculated through lineal interpolation from IEA perspectives in the WEO2016. Nominal prices assume inflation of 2% per year from 2015. IEA forecasts OECD Crude oil import costs, which was 2.1 US$/Bbl below Brent in average in the 2006-2015 period. In this regard, 2.1 US$/Bbl is added to IEA estimation in nominal terms to obtain Brent perspectives.
*** OPEC Reference Basket price

Source: International Energy Agency (IEA), U.S. Energy Information Administration, OPEC and Repsol Economic Research Department
Crude Price Official Agencies Outlook

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Discussion Points

- Price Forecast

- Demand Dynamics: Long term forecast and facts

- Supply Dynamics: Integrated, Unconventional and OPEC
Demand Dynamics

long-term population growth projection:

Annual Growth of Working Age Population (%)

Source: UN and Repsol Research Department
Demand Dynamics

In the long term, oil demand growth forecasts hover around 0.7% -1%.

Source: Different sources and Repsol Economic Research Department
Demand Dynamics

Demand growth is outstripping last years behavior at rates comparable to the 1986-2004 avg. growth. Lower prices → higher demand, moreover part of the increase in disposable income was used to reduce debt.

Source: International Energy Agency (IEA), IMF and Repsol Economic Research Department
Demand Dynamics

Demand growth is outstripping last years behavior at rates comparable to the 1986-2004 avg. growth. Lower prices → higher demand, moreover part of the increase in disposable income was used to reduce debt.
Demand Dynamics: disruptive changes ahead?
The total World Vehicle Park will virtually double from 1.2 billion vehicles in 2015 to 2.1 billion vehicles in 2040. Electric vehicles with 0.3% share in 2015 will increase to 30% in 2040 (around 710 million vehicles).

Source: Bernstein Energy, WEO 2016 (IEA) and Repsol Economic Research Department
Discussion Points

- Price Forecast
- Demand Dynamics: Long term forecast and facts
- Supply Dynamics: Integrated, Unconventional and OPEC
Supply Dynamics: integrated oil companies
Companies “Top 42” Capex & Production quarterly data. (Lagging production 8 Q)

Capex and production (moving average 4 quarters)

Source: Bloomberg and Repsol Economic Research Department
Supply Dynamics: integrated oil companies
Companies “Top 42” Capex & Production quarterly data. (Lagging production 8 Q)

Capex and production (moving average 4 quarters)

Source: Bloomberg and Repsol Economic Research Department
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Supply Dynamics: Unconventional in the U.S.

Production per well has increased steadily, considering the main oil U.S. plays aggregation.

Monthly Maximum Production per New Oil Well in Main Shale Oil Plays

- Bakken + Eagle Ford + Permian
  - Well weighted average

Source: Drilling Info and Repsol Economic Research Department
Supply Dynamics: Unconventional in the U.S.

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**Monthly Maximum Production per New Oil Well in Main Shale Oil Plays**

**Bakken + Eagle Ford + Permian**

Well weighted average

Source: Drilling Info and Repsol Economic Research Department
Supply Dynamics: Unconventional in the US. Independent Oil Companies
Production growth during the frack revolution

Source: Bloomberg and Repsol Economic Research Department
Supply Dynamics: Independent Oil
Production growth during the frack revolution demanded high and stable prices
Supply Dynamics: Independent Oil
To come back to past production growth we will need high prices.. but...
Supply Dynamics: Independent Oil
To come back to past production growth we will need high prices. But due to cost reductions...
Supply Dynamics: Independent Oil

To come back to past production growth, due to cost reduction we will need other prices. The rate of growth in productivity per well remains stable....
Supply Dynamics: Independent Oil

However, E&P costs and oil prices co-move. And some of the reduction in costs should be considered cyclical no STRUCTURAL

<table>
<thead>
<tr>
<th></th>
<th>Price</th>
<th>Cost</th>
</tr>
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<tbody>
<tr>
<td>96 → 98</td>
<td>-56%</td>
<td>-19%</td>
</tr>
<tr>
<td>00 → 01</td>
<td>-47%</td>
<td>-17%</td>
</tr>
<tr>
<td>06 → 07</td>
<td>-22%</td>
<td>-14%</td>
</tr>
<tr>
<td>08 → 09</td>
<td>-70%</td>
<td>-20%</td>
</tr>
<tr>
<td>14 → 16</td>
<td><em>-70%</em></td>
<td><em>-34%</em></td>
</tr>
</tbody>
</table>

* From máx 2014 to min 2016

Source: Thomson Reuters and Repsol Economic Research Department
Supply Dynamics: Unconventional in the U.S. Independent Comp.
Financing needs: divestments and Operating cash flows of independent oil companies

Capex, Operation Cash Flow, Asset Sales and Financial needs
(moving average 4 quarters)
Supply Dynamics: Independent oil and unconventional in the U.S.
The long term sustainability: CAPEX and Operating CF

Organic Capex as % of Operating Cash Flow (moving average 4 quarters)
Company Analysis: Independent Oil

The real sustainability: Operating Cash Flow and CF from Investment

Organic Capex and CF from Investment as % of Operating Cash Flow
(moving average 4 quarters)

Source: Bloomberg and Repsol Economic Research Department
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Supply Dynamics: OPEC and net oil exporters

The fiscal accounts are the drivers

Public Balance (%GDP), average 2005-14 and 2016

Source: Oxford Economics and Repsol Research Department
Supply Dynamics: OPEC and net oil exporters
The fiscal accounts are the drivers

Public Balance (%GDP), average 2005-14 and 2016

Source: Oxford Economics and Repsol Research Department
Supply Dynamics: OPEC and net oil exporters

The fiscal accounts are the drivers

Public Balance (%GDP), average 2005-14 and 2026 (Brent Futures price)

Source: Oxford Economics and Repsol Research Department
Supply Dynamics: OPEC and net oil exporters

The fiscal accounts are the drivers

Public Balance (%GDP), average 2005-14 and 2026 (Brent IEA NP Scenario Price)

Source: Oxford Economics and Repsol Research Department
Main messages

- Uncertain oil price outlook, but most forecaster agree on an increasing oil price path
- Demand data support high sensitivity to prices and continuous growth
- Conventional production depend on investments and investment on operating cash flows and cash flows on prices, these facts implies higher prices are needed
- Unconventional revolution is marching on as the same productivity speed than in the past. It will need higher prices and also be aware of the cyclality of cost evolution
- Finally, most oil exporters have an incentive to improve its finals account through production agreements
Thank you