Fourth IEA-IEF-OPEC Symposium on Energy Outlooks

IEF Secretariat, Riyadh
22nd January 2014

Session I
OPEC medium- and long-term oil outlook
Outline

- Key assumptions
- Reference case projections
  - Medium-term to 2018
  - Long-term to 2035
- Scenarios
  - Upside supply
  - Economic growth
- Downstream issues
- Some important questions arising from the outlook
Reference Case: key assumptions

- **Oil prices**
  - Stable, $110/b medium-term
  - In 2035, real price is $100/b in 2012 prices
  - Cost of marginal barrel a key factor

- **Economic growth**
  - Medium-term
    - Slower recovery from recession, downside risks
    - High debt burden in developed countries
    - By 2015-18 global growth reaches 3.8-3.9% p.a.
    - Developing Asia economy share: 28% in 2012 to 44% in 2035
  - Long-term
    - Demographics and productivity trends
    - Average global growth 2013-35 of 3.5% p.a.

- **Energy policies also shape the Reference Case**
Energy use will continue to rise, oil will remain the leading fuel for some time, gas use rises strongest

- Energy use rises by 52%
- Fossil fuels remain above 80% of supply
- Oil initially retains largest share
- Each fossil fuel converges to 26–27%

Shale gas increasingly important as a source of energy…

…but many potential barriers to rise in supply
World oil demand outlook in the Reference Case

Medium-term oil demand outlook in the Reference Case

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD</td>
<td>46.0</td>
<td>45.6</td>
<td>45.4</td>
<td>45.2</td>
<td>45.0</td>
<td>44.8</td>
<td>44.6</td>
</tr>
<tr>
<td>Developing countries</td>
<td>37.8</td>
<td>38.9</td>
<td>40.1</td>
<td>41.1</td>
<td>42.2</td>
<td>43.3</td>
<td>44.4</td>
</tr>
<tr>
<td>India</td>
<td>3.7</td>
<td>3.8</td>
<td>3.9</td>
<td>4.0</td>
<td>4.2</td>
<td>4.4</td>
<td>4.6</td>
</tr>
<tr>
<td>China</td>
<td>9.7</td>
<td>10.1</td>
<td>10.4</td>
<td>10.8</td>
<td>11.1</td>
<td>11.5</td>
<td>11.9</td>
</tr>
<tr>
<td>Eurasia</td>
<td>5.0</td>
<td>5.1</td>
<td>5.2</td>
<td>5.3</td>
<td>5.3</td>
<td>5.4</td>
<td>5.4</td>
</tr>
<tr>
<td>World</td>
<td>88.9</td>
<td>89.6</td>
<td>90.7</td>
<td>91.6</td>
<td>92.5</td>
<td>93.5</td>
<td>94.4</td>
</tr>
</tbody>
</table>

- Medium-term oil demand rises by an average of 0.9 mb/d p.a.
- Similar to WOO 2012
- Developing countries key to growth
- Long-term oil demand reaches 108.5 mb/d by 2035
- 88% of increase in demand is in developing Asia
- Transportation sector is key
- Diesel: the dominant product growth
World liquids supply outlook in the Reference Case

- Non-OPEC rises to 62 mb/d by 2035: Brazil, Caspian, biofuels, oil sands are key to growth
- Increase of non-crude liquids supply 75% of increase in demand
- OPEC crude share stays in the range 31–35%, below 2012 levels

### Medium-term liquids supply outlook in the Reference Case

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD</td>
<td>21.1</td>
<td>21.7</td>
<td>22.3</td>
<td>22.8</td>
<td>23.0</td>
<td>23.3</td>
<td>23.3</td>
</tr>
<tr>
<td>of which: tight oil</td>
<td>2.5</td>
<td>3.3</td>
<td>3.9</td>
<td>4.4</td>
<td>4.7</td>
<td>4.9</td>
<td>4.9</td>
</tr>
<tr>
<td>DCs, excl. OPEC</td>
<td>16.3</td>
<td>16.5</td>
<td>16.9</td>
<td>17.4</td>
<td>17.8</td>
<td>18.4</td>
<td>18.7</td>
</tr>
<tr>
<td>Eurasia</td>
<td>13.4</td>
<td>13.5</td>
<td>13.7</td>
<td>13.9</td>
<td>14.0</td>
<td>14.1</td>
<td>14.2</td>
</tr>
<tr>
<td>Total Non-OPEC inc. proc. gains</td>
<td>52.9</td>
<td>53.9</td>
<td>55.1</td>
<td>56.4</td>
<td>57.3</td>
<td>58.2</td>
<td>58.6</td>
</tr>
<tr>
<td>OPEC (incl. NGLs)</td>
<td>36.8</td>
<td>36.2</td>
<td>35.9</td>
<td>35.5</td>
<td>35.6</td>
<td>35.6</td>
<td>36.0</td>
</tr>
<tr>
<td>OPEC crude</td>
<td>31.1</td>
<td>30.3</td>
<td>29.9</td>
<td>29.2</td>
<td>29.0</td>
<td>28.8</td>
<td>29.2</td>
</tr>
</tbody>
</table>

- Primary recent driver: tight oil…
- …but tight oil plateaus (decline rates, environmental concerns)
- Non-OPEC supply rises by almost 6 mb/d 2012-2018
- OPEC crude stabilizes around 29 mb/d, then rises again from 2018

### Long-term liquids supply outlook in the Reference Case

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD</td>
<td>21.1</td>
<td>22.8</td>
<td>23.4</td>
<td>23.7</td>
<td>23.9</td>
<td>24.1</td>
</tr>
<tr>
<td>of which: tight oil</td>
<td>2.5</td>
<td>4.4</td>
<td>4.7</td>
<td>3.9</td>
<td>3.3</td>
<td>2.7</td>
</tr>
<tr>
<td>DCs, excl. OPEC</td>
<td>16.3</td>
<td>17.4</td>
<td>19.1</td>
<td>19.4</td>
<td>19.2</td>
<td>19.2</td>
</tr>
<tr>
<td>Eurasia</td>
<td>13.4</td>
<td>13.9</td>
<td>14.3</td>
<td>14.6</td>
<td>14.9</td>
<td>15.3</td>
</tr>
<tr>
<td>Total Non-OPEC inc. proc. gains</td>
<td>52.9</td>
<td>56.4</td>
<td>59.3</td>
<td>60.4</td>
<td>60.9</td>
<td>61.6</td>
</tr>
<tr>
<td>OPEC (incl. NGLs)</td>
<td>36.8</td>
<td>35.5</td>
<td>37.2</td>
<td>40.5</td>
<td>43.9</td>
<td>47.1</td>
</tr>
<tr>
<td>OPEC crude</td>
<td>31.1</td>
<td>29.2</td>
<td>29.9</td>
<td>32.3</td>
<td>34.8</td>
<td>37.5</td>
</tr>
</tbody>
</table>
Upside supply scenario explores impacts upon OPEC

- Higher tight oil supply in North America and in other countries
- Higher supply from other crude oil and NGLs, especially Brazil and Russia
- Higher supply from biofuels
- 5.7 mb/d additional non-OPEC supply by 2035

Global tight oil supply in the upside supply scenario

- OPEC crude supply would be below 28 mb/d until 2021 and 32 mb/d by 2035
- This path may not be sustainable
Economic growth scenarios stress uncertainties

- Downside risks and upside potential for economic growth
- In downside scenario, oil demand remains below 100 mb/d
- Main decline in developing countries
- Future need for OPEC crude would be less than today in downside growth scenario
- But there is also upside potential, with demand reaching 116 mb/d by 2035
Restoring refining margins may mean closing over 10 mb/d of crude distillation capacity

- More than 9 mb/d of new distillation capacity globally in the period to 2018
- New refining projects exceed the incremental ‘call on refining’
- Closures of around 8 mb/d are needed by 2018 and 10 mb/d by 2020 (assuming utilization rates of 85%)

*Global oil demand, refining capacity and crude runs, 1980–2018

*Spare capacity based on assumed 85% utilization rate, accounting for already closed capacity.
Demand increases in Asia-Pacific will re-distribute the flow of crude oil and refined products

- Growing Asian crude oil imports offset import declines of the US & Canada and Europe
- Projections underscore the Middle East’s future role as the major crude oil exporter
- Overall eastward shift of future oil movements
Some key questions

_Economy_

- What are the scars of the recession?
- Is downside risk greater than upside potential?
- Sustainability of high growth in emerging economies

_Demand_

- How will efficiency, technology, policies, affect oil use in the transportation sector?
- Is LNG set to become a fuel for trucks and large vessels?
- How will oil use evolve in the petrochemicals sector?

_Supply_

- How will shale gas and tight oil supply potential play out?
- How rapidly can advanced biofuels become commercial?
Thank you