OPEC oil: meeting consumer needs in the early 21st century

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Dubai

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Organization of the Petroleum Exporting Countries
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Was 2004 a landmark year?

- Prices rise while market well-supplied!
- Downstream bottlenecks
- Energy demand shift towards Asia
- Stagnant growth in non-OPEC supply
- Increasing market anxiety over forward capacity tightness
- Geopolitical tensions

⇒ All these act as a driving force behind rising activity of non-commercials: speculative investment fervor in oil (€ commodities)
OPEC Reference Basket yearly average price Nominal and real terms Base: 2004=100, US$/b

/* inflation and exchange rate adjusted.*/
OPEC R. Basket price in nominal & in real terms

<table>
<thead>
<tr>
<th>Year</th>
<th>Nominal</th>
<th>Adjusted Band (exchange &amp; inflation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>27.4</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>23.1</td>
<td>25.3</td>
</tr>
<tr>
<td>2002</td>
<td>24.4</td>
<td>25.0</td>
</tr>
<tr>
<td>2003</td>
<td>28.1</td>
<td>25.8</td>
</tr>
<tr>
<td>2004</td>
<td>36.0</td>
<td>27.9</td>
</tr>
<tr>
<td>2005*</td>
<td>43.7</td>
<td>28.7</td>
</tr>
</tbody>
</table>

*/ year to date.
Reflecting an equilibrium price range that satisfied producing countries and consuming nations.

Unstable period

Stability within the band

Unusual price hike signaling new episode?
OPEC Reference Basket Price
(US$ / b)

Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
OPEC R. Basket price in nominal & in real terms

Nominal
Adjusted Band (exchange & inflation)
*/ Average up to 30 March 2005.

* Average up to 30 March 2005.

Year | Average since 2000
--- | ---
2000 | 27.4
2001 | 23.1 25.3
2002 | 24.4 25.0
2003 | 28.1 25.8
2004 | 36.0 27.9
2005* | 43.7 28.7

*/ year to date.
Global oil demand growth
(year-on-year change, mb/d)

<table>
<thead>
<tr>
<th></th>
<th>aagr %</th>
<th>avg growth (mb/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72-05</td>
<td>1.4</td>
<td>1.0</td>
</tr>
<tr>
<td>87-05</td>
<td>1.6</td>
<td>1.2</td>
</tr>
<tr>
<td>94-05</td>
<td>1.8</td>
<td>1.4</td>
</tr>
<tr>
<td>03-05</td>
<td>2.8</td>
<td>2.0</td>
</tr>
</tbody>
</table>
World oil market growth 2004: forecast versus actual
Average annual figures \( mb/d \)

<table>
<thead>
<tr>
<th></th>
<th>Forecast in March 2004</th>
<th>Estimate in March 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003</td>
<td>2004</td>
</tr>
<tr>
<td>World demand</td>
<td>78.3</td>
<td>79.7</td>
</tr>
<tr>
<td>Non-OPEC supply</td>
<td>52.2</td>
<td>53.8</td>
</tr>
<tr>
<td>Difference</td>
<td>26.1</td>
<td>25.9</td>
</tr>
</tbody>
</table>

Revision of annual change 2004 versus 2005

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>World demand</td>
<td>+1.4</td>
<td>+2.6</td>
<td>+1.2</td>
</tr>
<tr>
<td>Non-OPEC supply</td>
<td>+1.6</td>
<td>+1.4</td>
<td>–0.2</td>
</tr>
<tr>
<td>Difference</td>
<td>–0.2</td>
<td>+1.2</td>
<td>+1.4</td>
</tr>
</tbody>
</table>

Upward Revision on 2005: “a - (b+c)” (mb/d)

Revision components of the "a-(b+c)" : 1.5 mb/d

<table>
<thead>
<tr>
<th>OPEC NGL</th>
<th>Non-OPEC supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.2</td>
<td>0.4</td>
<td>1.3</td>
</tr>
</tbody>
</table>

27.4

29.0
Change in fundamentals?
Strong growth in Chinese oil requirements:

- GDP growth rate (%)

- Oil demand growth rate (%)

- Oil demand growth (mb/d)
  - 2002: 0.3, 2003: 0.5, 2004: 1.0, 2005: 0.6
Apparent demand for Diesel oil in China (mb/d)


mb/d

1000  1200  1400  1600  1800  2000  2200  2400  2600  2800  3000  3200  335  528


mb/d

1000  1200  1400  1600  1800  2000  2200  2400  2600  2800  3000  3200  335  528


mb/d

1000  1200  1400  1600  1800  2000  2200  2400  2600  2800  3000  3200  335  528


mb/d

1000  1200  1400  1600  1800  2000  2200  2400  2600  2800  3000  3200  335  528


mb/d

1000  1200  1400  1600  1800  2000  2200  2400  2600  2800  3000  3200  335  528


mb/d

1000  1200  1400  1600  1800  2000  2200  2400  2600  2800  3000  3200  335  528
OPEC production capacity & additions (mb/d)

<table>
<thead>
<tr>
<th></th>
<th>Jan 04</th>
<th>Jan 05</th>
<th>End 05</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>30.8</td>
<td>31.8</td>
<td>33.7</td>
<td>34.7</td>
</tr>
<tr>
<td>Addition to</td>
<td>0.4</td>
<td>1.1*</td>
<td>1.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production*</td>
<td>28.2</td>
<td>29.3</td>
<td>30.3</td>
<td>30.3</td>
</tr>
<tr>
<td>Spare capacity (vol)</td>
<td>2.6</td>
<td>2.5</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Spare capacity (%)</td>
<td>8.4</td>
<td>7.9</td>
<td>10.2</td>
<td></td>
</tr>
</tbody>
</table>

*/ End 05 production is estimated required OPEC volumes.
### Average annual real GDP growth rates (PPP), % pa

<table>
<thead>
<tr>
<th>Reference (DAU)</th>
<th>2004-05</th>
<th>2006-10</th>
<th>2004-25</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD</td>
<td>3.0</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>DCs</td>
<td>5.5</td>
<td>5.0</td>
<td>4.8</td>
</tr>
<tr>
<td>China</td>
<td>8.9</td>
<td>6.5</td>
<td>6.2</td>
</tr>
<tr>
<td>FSU</td>
<td>7.0</td>
<td>3.7</td>
<td>3.7</td>
</tr>
<tr>
<td>World</td>
<td>4.6</td>
<td>3.5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

- **Average growth in the OECD** economies of 2.4% pa over the period 2004–2025
- **For developing countries**, considerable technological catch-up potential
- **China** is a significant uncertainty but expected to **remain fastest growing region**

**Economic growth in the reference case is relatively optimistic regarding the long-term health of the world economy**
"Dynamics-as-usual": observed patterns, no new strong policy drives

Oil demand increases by an average of 1.5 mb/d annually

Four-fifths of the increase in demand of 28 mb/d over the period 2005–2025 comes from developing countries

Transportation continues to be the dominant source of growth (~60 %)

Many uncertainties: GDP, technology, policy – substantial downside risks

Issue of security of demand
Annual growth in oil demand, 2004-2025, Reference, mb/d pa

<table>
<thead>
<tr>
<th></th>
<th>World</th>
<th>Asia</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP Growth (%)</td>
<td>3.5</td>
<td>4.7</td>
<td>6.2</td>
</tr>
<tr>
<td>Oil Demand Growth (%)</td>
<td>1.6</td>
<td>2.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Oil Demand Growth (mb/d)</td>
<td>1.5</td>
<td>0.76</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Asia: 66% of DCs increase, especially China & India
huge potential (e.g. low vehicle ownership)
But possible constraints: infrastructure, policies

OECD
- OECD Pac.
- W. Europe
- N. America

DCs
- OPEC & other exp.
- Latin America, Africa & M.E.

Transition economies
- China
- other FSU

2004-2025
Annual growth in oil demand by sector (mb/d)
Renewal of oil resources

Cumulated production: 1278
Proved reserves: 1059
New discoveries and extensions: > 730

Non recovered oil: 2810

Improved recuperation: 803
292

Highly heavy oils and asphaltic sands: 5000 (in place)

* Present average yield
** Forecast average yield (towards 2020)

Source: IFP/Direction des Etudes Economiques
World cumulative oil production and the resource base

Source: USGS and OPEC estimation.
**Oil Production Outlook, mb/d**

<table>
<thead>
<tr>
<th>Reference (DAU)</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD</td>
<td>21.7</td>
<td>21.0</td>
<td>20.6</td>
<td>19.9</td>
</tr>
<tr>
<td>DCs excl. OPEC</td>
<td>17.6</td>
<td>18.5</td>
<td>18.8</td>
<td>18.3</td>
</tr>
<tr>
<td>Russia &amp; Caspian</td>
<td>13.3</td>
<td>14.6</td>
<td>15.2</td>
<td>15.6</td>
</tr>
<tr>
<td>Non-OPEC</td>
<td>54.8</td>
<td>56.5</td>
<td>57.2</td>
<td>56.7</td>
</tr>
<tr>
<td>OPEC (incl. NGLs)</td>
<td>35.0</td>
<td>40.3</td>
<td>46.8</td>
<td>54.5</td>
</tr>
<tr>
<td>World</td>
<td>89.9</td>
<td>96.8</td>
<td>104.0</td>
<td>111.3</td>
</tr>
</tbody>
</table>

- Short- to medium term, non-OPEC production continues to rise, plateaus at **55-57 mb/d**
- Key sources of increase: Latin America, Africa, Russia and Caspian
- Russian exceptional growth not sustainable (infrastructure constraints): eventually plateaus at **11 mb/d**
- OECD production expected to decline
- Rate of increase in non-OPEC supply subject to considerable uncertainty.
- OPEC increasingly supplies incremental barrel
- Low economic growth scenario would lead to significant drop in OPEC production required.
- Also: significant medium term uncertainties.
The bulk of incremental supply to meet demand growths will come from OPEC, in particular the ME:

- To meet increase in overall demand
- To replace natural declines in production
- To cope with unexpected shortages (adequate spare capacity)

⇒ Oil must & can be cleaner, safer and more efficient
The bulk of incremental supply to meet demand growths will come from OPEC, in particular the ME:

- To meet increase in overall demand
- To replace exhausted reserves
- To cope with unexpected shortages (adequate spare capacity)
OPEC response
Accelerated expansion of OPEC production capacity

Announced capacity plans

Base production

High

Low

mb/d

2004 2005 2006 2007 2008 2009 2010
What about medium- to long-term outlook?

Drivers of uncertainties over future supply and demand growth and future scale of investment that will be required:

- The world economy
- Energy policies impacting supply/demand
- Technology developments
- Oil price path
Cumulative OPEC investment requirements: Huge uncertainties in future oil demand translate into huge uncertainties and risks for future OPEC investment.

- If OPEC balances the market, the uncertain volume requirements translate into huge ranges of anticipated capital outlay needs.
- Already by 2010 an estimated uncertainty of $25 billion exists between the reference case and the low economic growth case.

Impact of lower economic growth:
- 2010: $70-95bn
- 2015: $122-173bn
- 2020: $185-269bn
- 2025: $258-382bn
Industry much better-off with underlying consensus on handling major issues of mutual concern

Big advances in recent years, especially in Asia

1st Round Table of Asian Oil and Gas Ministers, New Delhi

International Energy Forum Secretariat, Riyadh

Annual dialogue with China, Japan, South Korea

Joint OPEC/non-OPEC meeting in Oman in October
## Oil Demand & Net Oil Requirements in Asia 2010-2020, (mb/d)

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2020</th>
<th>% pa</th>
<th>mb/d</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oil demand</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OECD Pacific</td>
<td>8.7</td>
<td>8.9</td>
<td>0.5</td>
<td>0.04</td>
</tr>
<tr>
<td>South Asia</td>
<td>4.0</td>
<td>6.4</td>
<td>7.5</td>
<td>0.33</td>
</tr>
<tr>
<td>South-East Asia</td>
<td>5.1</td>
<td>6.9</td>
<td>4.8</td>
<td>0.26</td>
</tr>
<tr>
<td>China</td>
<td>8.3</td>
<td>11.6</td>
<td>5.6</td>
<td>0.49</td>
</tr>
<tr>
<td><strong>Total Asia</strong></td>
<td>26.1</td>
<td>33.8</td>
<td>4.1</td>
<td>1.12</td>
</tr>
<tr>
<td><strong>Asian share in total World</strong></td>
<td>29%</td>
<td>33%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Oil supply</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OECD Pacific</td>
<td>0.7</td>
<td>1.0</td>
<td>7.2</td>
<td>0.05</td>
</tr>
<tr>
<td>China</td>
<td>3.6</td>
<td>3.6</td>
<td>0.3</td>
<td>0.01</td>
</tr>
<tr>
<td>Other Asia</td>
<td>2.6</td>
<td>2.5</td>
<td>0.0</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Total Asia</strong></td>
<td>6.9</td>
<td>7.1</td>
<td>0.9</td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Total Asia Net oil import req.</strong></td>
<td>19.2</td>
<td>26.7</td>
<td>5.2</td>
<td>1.06</td>
</tr>
<tr>
<td><strong>OPEC supply</strong></td>
<td>35.0</td>
<td>46.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OPEC share in total World</strong></td>
<td>39%</td>
<td>45%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Thank you