THOMAS DEWHURST COMMEMORATIVE LECTURE

Sir Peter Holmes, Former CEO, Royal Dutch/Shell Group

The past twenty years have seen rapid change throughout the oil and gas industries. The next quarter of a century is likely to see different but just as significant changes. Sir Peter Holmes reviews the main features of what may happen in the petroleum industry.

Typical Industry Crude Price Views
Money of the day - Arabian Light or equivalent

Fig. 1.
**Crude Oil Prices 1900 - 1993**

(Constant 1993$/bbl)

Fig. 2.

**Price of Arab Light Crude**

(Dubai 1986 onwards)

Fig. 2.
World Population

Fig. 6.

The Demographic Transition

Fig. 7.
World Primary Energy Consumption
1860 - 1990

Fig. 8.

World Primary Energy Consumption
by Fuel Type

Fig. 9.
Alternative Fuels - some considerations

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Vehicle hardware</th>
<th>Distribution/handling</th>
<th>Safety</th>
<th>Refuelling time</th>
<th>Vehicle range</th>
<th>Lubrication</th>
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<td>●●●</td>
<td>●●</td>
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Other factors to be taken into consideration include cost and CO₂ emissions

Fig. 10.

Oil Demand

<table>
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<th>1970</th>
<th>1979</th>
<th>1990</th>
<th>2020</th>
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<tr>
<td>USA</td>
<td>14.7</td>
<td>17.7</td>
<td>16.0</td>
<td>14 - 18</td>
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<tr>
<td>Rest of OECD</td>
<td>18.3</td>
<td>22.1</td>
<td>19.7</td>
<td>21 - 24</td>
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<tr>
<td>Non-OECD</td>
<td>6.3</td>
<td>10.6</td>
<td>15.6</td>
<td>34 - 49</td>
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<tr>
<td>East Bloc</td>
<td>6.9</td>
<td>12.8</td>
<td>12.8</td>
<td>14 - 21</td>
</tr>
<tr>
<td>of which: CIS</td>
<td>5.3</td>
<td>9.1</td>
<td>8.2</td>
<td>7 - 11</td>
</tr>
<tr>
<td>Ref. fuel/sundries</td>
<td>1.2</td>
<td>1.8</td>
<td>1.5</td>
<td>2 - 3</td>
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<tr>
<td>Total</td>
<td>47.4</td>
<td>65.0</td>
<td>65.7</td>
<td>85 - 115</td>
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</table>

Fig. 11.
WOCA Oil Demand

![WOCA Oil Demand graph](image)

LDC Oil Demand

<table>
<thead>
<tr>
<th>Year</th>
<th>mb/doe</th>
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<tbody>
<tr>
<td>1970</td>
<td>6.3</td>
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<tr>
<td>1990</td>
<td>15.5</td>
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<tr>
<td>2020</td>
<td>NF 49.0 B 33.8</td>
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</tbody>
</table>

Fig. 12.

Fig. 13.
Oil Demand Trends for LDC Regions

![Graph showing oil demand trends for different regions from 1980 to 1996.](image)

Fig. 14.

Projected Oil Intensities

![Graph showing projected oil intensities from 1980 to 2000.](image)

Fig. 15.
Oil Demand by Sector

Fig. 16.

Asia-Pacific Development Progression 1960-1990
(GDP/Capita, 1990 Prices, US$)

Fig. 17.
CIS Supply/Demand Balance

Fig. 18.

Oil Demand Trends in Four Major Non-OECD Countries

Fig. 19.
OECD Gasoline Prices and Taxes (US$/litre)

Fig. 20.

World Passenger Cars Registered

Fig. 21.
Car Intensity Changes 1988/96

GDP per capita (1000 1980 US$)

Fig. 22.

World Passenger Cars Registered
New Frontiers

Fig. 23.
Automobile Fuel Economy
New Car Fleet Averages

Fig. 24.

WOCA Oil Supply

Fig. 25.
### OPEC Members Compared

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (millions)</th>
<th>GDP 000$ per head</th>
<th>Reserve/Prod. ratio (years)</th>
<th>Oil Exports as % total export revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.Arabia</td>
<td>17</td>
<td>7</td>
<td>86</td>
<td>94</td>
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<tr>
<td>Kuwait</td>
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<td>17</td>
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<td>93</td>
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<tr>
<td>UAE</td>
<td>2</td>
<td>19</td>
<td>119</td>
<td>69</td>
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<td>Iran</td>
<td>60</td>
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<tr>
<td>Iraq</td>
<td>18</td>
<td>2</td>
<td>521</td>
<td>92</td>
</tr>
<tr>
<td>Qatar</td>
<td>0.5</td>
<td>15</td>
<td>29</td>
<td>95</td>
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<td>186</td>
<td>0.7</td>
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</tbody>
</table>

*All data 1992, except Iraq (1990) and Gabon (1991)*

*Sources: EIU, OPEC Statistical Bulletin*

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### OPEC Crude Production Capacity vs Call on OPEC

*(Forecast capacity reflects known plans)*

![Graph showing OPEC Crude Production Capacity vs Call on OPEC](image)

*Fig. 27.*
OPEC’s Oil Export Revenues

Proven Oil Reserves

Soviet Union and Eastern Europe
Others
Other OPEC
Saudi Arabia
Iraq
Kuwait
Iran

Fig. 28.

Fig. 29.
World Liquid Fuels Production New Frontiers

Fig. 30.

World Proven Gas Reserves 1990
mrd m3

Total World 119340

USSR 43300

China & East Europe 1415

Asia & Australasia 8020

South America 4815

West Europe 5245

Africa 8550

Middle East excl. Iran 21220

Fig. 31.
Gas Consumption and Internationally Traded Gas
1990

![Pie chart showing Indigenously consumed gas (85%), International Trade (15%), Pipeline (11%), and LNG (4%).]

Fig. 32.

Capital Investment of the World Oil Industry
New Frontiers

Average annual investment
billion $ (1990)

![Bar chart showing the share of total investment for different decades: 1960's (4.5%), 1970's (4.5%), 1980's (3.5%), 1990's (2.0%), 2000's (3.5%), 2010's (3.5%).]

Fig. 33.