

## **MIDDLE EAST OIL: WHAT'S THE ALTERNATIVE?**

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### **INTRODUCTION**

In pursuit of freedom from their long standing reliance on Middle East oil, the United States and other major industrialized nations are combing the earth for alternative sources of oil supplies in Russia, the Caspian Basin, West Africa, North America, Latin America, North Sea and even the deep waters of the Atlantic.

The end of the Cold War has opened Russia and the former Soviet Republics of Central Asia and the Caspian Basin to new deals. Advances in drilling technology are opening up fields in waters as deep as 5,000 feet, where oil lies as much as two miles beneath the ocean bed.

From the Caspian to Brazil, oil is flowing from new fields. Non-OPEC producers now produce close to half the global supply. Giant oil platforms are rising like steel archipelagos off West Africa, Mexico and Brazil. At \$25 a barrel, many ventures are affordable - even in "ultra-deep waters" around the Atlantic rim. Can any of these oil provinces substitute for Middle East Oil? While all of these oil supply regions sound good, their supply potential is more limited than is generally understood, which mean only Middle Eastern oil will be available in large enough quantities to satisfy world demand.

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## RUSSIA

Russia is aspiring to overtake Saudi Arabia in oil production and to become the largest crude oil supplier to the United States. Russia and the United States have been discussing a strategic oil partnership, inspiring heady talk of major US investment in Russian oilfields, which were left in disrepair by the Soviets. Yet it remains to be seen how big a supplier Russia can be. Soviet geologists who mapped Russian oilfields in great detail, had ignored cost considerations that are standard in Western surveys. Soviet reserve estimates offer no clue as to how much the actual proven oil reserves of Russia are or how much of these reserves can be extracted at reasonable cost. Russia is currently producing at full capacity, taking advantage of the high crude oil prices. In 2002 Russia produced 7.69 million barrels a day (mbd) and exported 3.00 mbd.<sup>1</sup> At best it can raise its production capacity to 8.5 mbd by 2008, but that necessitates multi-billion dollar investments and advanced western technology. Moreover, Russia's export routes are reaching capacity as production rises, creating an imminent need to build several major pipelines, ports and storage terminals to break the bottleneck.

### 1. Russian Crude Oil Proven Reserves

It is evident that oil has to be found before it can be produced, meaning that production has to mirror discovery after a time lag. To know the discovery trend, however, calls for valid information on the size of the reserves, which may be under- or over-reported. In the case of the former Soviet Union (FSU) the traditional reserves assessment is different from western practice and is based on the ability to produce rather than it being economic to produce.<sup>2</sup>

Russia's proven crude oil reserves were estimated at 60 billion barrels (bb) at the end of 2002.<sup>3</sup> However, Russian oil officials claim that a comprehensive study undertaken in 2002 showed that proven Russian oil reserves were between 97 bb and 119 bb depending on oil price assumptions. Ultimate potential is estimated at 200-250 bb.<sup>4</sup>

Russia used to classify reserves in five categories: A, B, C1, C2 and D. Various attempts have been made to equate Russian classifications with western ones – none wholly satisfactory. One method of resolving the problem is to deflate Russian discovery trends (reserves) to establish the

<sup>1</sup> BP Statistical Review of World Energy, June 2003, p.6 & 18

<sup>2</sup> J.H.Laherrere, *IS FSU Oil Growth Sustainable?*, Petroleum Review, April 2002, p.29

<sup>3</sup> BP Statistical Review of World Energy, June 2003, p.4.

<sup>4</sup> Petroleum Review, April 2003, p.18

best fit with production trends. A good fit between the discovery and production trends is achieved by reducing the reported reserves by 45%. Such an adjustment is further justified by the fact that the FSU reserve base was strongly exaggerated due to inclusion of reserves and resources that are neither reliable nor technologically or economically viable.<sup>5</sup>

In fact, reserves of the combined A, B and C1 classes in the Russian classification roughly equate with proven, probable and much of the possible reserves under the traditional western system. Only 26.4 bb (54%) of the 49.4 bb of the combined A+B+C1 reserves of five Russian companies, may qualify as proven reserves in a US sense.<sup>6</sup>

Further evidence for downgrading the reported reserves comes from decline analysis of individual fields. For example, the largest Russian oilfield – Samotlor in Western Siberia – has already produced about 19 bb, with production having fallen to no more than 400,000 barrels a day (b/d) from a peak of 3.4 mbd in 1980. The field is reported to contain 28 bb, but extrapolation of the present decline gives an ultimate recovery of only about 20 bb. The field was in fact overproduced from 1983 to 1986 to meet the dictates of a Soviet 5-Year Plan.<sup>7</sup>

## 2. Russian Crude Oil Production

In 2002 Russia produced 7.69 mbd and exported an estimated 3.00 mbd. The government plans to raise Russia's production to 8.51 mbd by 2005. But this target can't be achieved before 2008 and only with multi-billion dollar investments and western technology (see Table 1).

**Table 1**  
**Current & Projected Russian Crude Oil Production, Consumption & Export (mbd)**

Year	2000	2001	2002	2003	2005	2010
Production	6.54	7.05	7.69	7.69	7.97	8.71
Consumption	2.47	2.46	2.52	2.53	2.60	3.00
Exports	2.25	2.46	3.00	3.29	3.78	5.71

*Sources: BP Statistical Review of World Energy, June 2003./ petroleum Intelligence Weekly / Petroleum Review, August 2003 / Author's projections.*

<sup>5</sup> Jean H. Laherrere, *Is FSU Oil Growth Sustainable?* P. 29

<sup>6</sup> Jean H. Laherrere, Forecasting Future Production with Past Discoveries (presented at OPEC seminar: "OPEC and the Global Energy Balance: Towards a sustainable Energy Future", Vienna

<sup>7</sup> Jean H. Laherrere, *Is FSU Oil Growth Sustainable?* P. 30

Russia is a major player in the global oil market as it is the world's largest producer and exporter after Saudi Arabia and holds 5.7% of the world's proven reserves. Energy exports represent more than 20% of Russia's GDP and roughly 50-60% of its total currency earnings.<sup>8</sup>

Russia's resumption of its leading role as a major oil-producing power has coincided with the political and strategic changes that followed the 9/11 terrorist attacks on the US. Developments since September 2001 have deepened the United States' sense of vulnerability to imported oil supplies, particularly from the Middle East. Within this context, an energy partnership between the world's largest oil consumer (US) and the world's second largest producer and exporter (Russia) is slowly taking shape.<sup>9</sup>

But despite this growing enthusiasm to forge an energy partnership between Moscow and Washington, the prospect of massive volumes of Russian oil flooding the US market is not a realistic one. In 2002, the Arab Gulf supplied the US with 2.59 mbd, or 23% of its oil imports, while Russia's oil exports to the US were insignificant amounting to only 90,000 b/d.<sup>10</sup> And despite fundamental changes in and expansion of Russia's energy sector, its oil production and exports are still restrained by economic, political, and geographical obstacles. These include hesitant reform, lack of foreign investment, inadequate transportation infrastructure, and relative shortage of proven reserves (in comparison with the Middle East). Russia's oil industry has yet to overcome these significant economic, political, and logistical obstacles.

### 3. Securing Russian Access to Export Markets

Russia's export routes are reaching capacity as production rises, creating an imminent need to build several major pipelines, ports and storage terminals to break the bottleneck.

With so much revenue at stake – money to rebuild the Russian economy and the oil and gas industry, Russia must secure its access to energy export markets. The vulnerability of Russia's energy-export corridors is a formidable concern. Whereas all of its export routes used to go through Soviet or Warsaw Pact territory, most exports must now cross NATO or prospective NATO countries. All Black Sea oil must clear the narrow Bosphorus Strait, which, although considered an international

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<sup>8</sup> Amy Myers Jaffe & R Manning, "Russia, Energy & the West, Survival, Vol. 43, No. 2, 2001, p.134

<sup>9</sup> Gawdat Bahgat, Oil in the Middle East: Prospects & Challenges, Pacific & Asian Journal of Energy, Tata Energy Research Inst, June 2002, p.57

<sup>10</sup> BP Statistical Review of World Energy, June 2003, p.18

passageway, is ultimately policed by NATO member Turkey.<sup>11</sup> The remainder exits Russia via the Druzhba pipeline system that crosses Ukraine before entering Slovakia and Hungary with connections to Poland, Germany and the Czech Republic, and also through the newly opened Russian oil-loading facility at Primorsk on the Gulf of Finland.

Russia needs port capacity of 240 million tons a year (4.82 mbd). But existing facilities can manage only two-thirds of that amount, and Russia has little alternative but to ship through the Baltic ports or, to a lesser extent, through Ukraine and the Black Sea. Eventually some 29 million tons of crude oil (582,000 b/d) from Timan Pechora Basin in Russia's far north, is expected to pass through Primorsk, bypassing the main current outlet for oil from northern Russia, the terminal at the Latvian port of Ventspils on the Baltic Sea.<sup>12</sup> It is estimated that it will take Russia until 2010 before its able to expand its port capacity to 4.82 mbd.

## THE CASPIAN BASIN

The Caspian Sea oil potential is vastly overrated. Early estimates compared ultimate Caspian oil reserves to those of the Arab Gulf, but have since fallen to less than one tenth that size. Apart from the limited size of the reserves, Caspian oil is very costly to find, develop, produce and transport to world markets.<sup>13</sup> A simple examination of the ratios of estimated undiscovered reserves to identified reserves will show that this ratio is much greater for the Caspian Basin than for any other part of the world.<sup>14</sup>

### 1. Caspian Oil Reserves

The proven oil reserves of the Caspian region (Azerbaijan, Kazakhstan, Turkmenistan and Uzbekistan) amount to 17.1 bb making the Caspian an oil province comparable to the North Sea.

Estimates of 40-60 bb as the ultimate reserve base of the Caspian region are judged to be reasonable by most geologists familiar with the region. However, these estimates assume that drilling will take place.

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<sup>11</sup> Amy Myers Jaffe & R Manning, *Russia, Energy & the West*, pp.134-135

<sup>12</sup> *International Herald Tribune*, 3 Jan, 2002, p.15

<sup>13</sup> Fadhil J Chalabi, *Gulf Oil vs the Oil of the Caspian* (published by ECSSR, Abu Dhabi, UAE, 2000) p.155

<sup>14</sup> F.E. Banks, *The World Oil Market: From Myth to Meaning* (Lecture, Christiansborg, Denmark, 10/30/02)

Drilling requires huge investments and the transportation of huge rigs over excruciatingly difficult routes.<sup>15</sup>

From this reserve analysis one can safely predict that by 2010 the Caspian should be producing 2-3 mbd. However, Continued Caspian energy investment would still depend on three factors: first, a global price in excess of \$20/barrel (in real terms); second, the Absence of major political dislocations; and, third, the need to address, with some urgency, the serious deficiencies of the Caspian energy support infrastructure.

With a long-term production potential that would contribute roughly 3% to future global oil supply by 2010, the Caspian will never be a strategic alternative to the Arab Gulf. It is destined to play a supporting, rather than deciding, role in supplying global oil markets in the future.<sup>16</sup>

## 2. Production & Export Potential

In 2002, total Caspian oil production reached 1.65 mbd with net exports amounting to 855, b/d. However, a 1998 International Energy Agency (IEA) study on Caspian oil and gas presented two scenarios for oil production, domestic consumption, and export potential of Kazakhstan, Azerbaijan, Turkmenistan and Uzbekistan over 2000-2020 (see Table 2).

**Table 2**  
**Oil Production, Domestic Consumption & Net Exports**  
**(mbd)**

	2000	2005	2010	2020
<b>High Case</b>				
Production	1.35	2.45	3.89	6.18
Consumption	0.53	1.26	1.55	2.61
Net exports	0.66	1.19	2.34	3.57
<b>Low Case</b>				
Production	1.35	1.93	2.77	4.84
Consumption	0.53	1.06	1.26	1.86
Net exports	0.66	0.87	1.51	2.98

*Sources: IEA's 1998 Caspian Oil & Gas Study / BP Statistical Review of World Energy, June, 2003.*

<sup>15</sup> T. Adams, *Caspian Oil Realities*, No. 23, Royal Inst of International Affairs, London, 09.01, pp.1-2

<sup>16</sup> M. Salameh, *Can Caspian Oil Challenge the Supremacy of Arab Gulf Oil?*, pp.43-44

How do these projected export figures for the Caspian Sea compare with exports of other OPEC and non-OPEC producers? In 2002, Caspian oil exports amounted to 855,000 b/d while non-OPEC producers exported 7 mbd. OPEC exports from the Arab Gulf, on the other hand, were 19.7 mbd, from North Africa 2.61 mbd, from West Africa 2.95 mbd, and from South America 2.06 mbd. In 2020, Caspian oil exports are projected to reach 3.57 mbd (high-case) or 2.98 mbd (low-case), compared to with 41.8 mbd from the Arab Gulf. In no case would Caspian exports in 2010 or in 2020 measure up to the very large exports from the Arab Gulf (see Table 3).

**Table 3**  
**World Oil Exports: 2002-2020**  
**(mbd)**

Country / Region	2002	2020
North Sea	3.91	1.90
Russia	3.00	6.00
Other non-OPEC	7.00	3.80
OPEC of which		
Arab Gulf	19.66	41.80
North Africa	2.61	2.70
West Africa	2.95	4.00
South America	2.06	4.30
Caspian Sea	0.86	3.28

*Sources: IEA's 1998 Oil & Gas Study / BP Statistical Review, June 2003.*

### 3. Caspian Sea Oil & World Oil Prices

The future of the Caspian Sea and its impact on Gulf oil will depend crucially on oil prices and on the investment policies of the major producers of the Gulf region itself. At low price levels of \$13-\$14/b, Caspian oil will have little chance of expanding. Low prices squeeze investors' profits so much that there will be no economic incentive to invest in new projects. By contrast, prices of \$20/b and above would expand Caspian oil production to an extent similar to the North Sea. Nominal fixed and variable costs per barrel in the Caspian Basin are on average four times those of the Gulf.<sup>17</sup>

<sup>17</sup> *Ibid.*, pp.42-43

More important perhaps are the geopolitical problems and high costs of transporting crude oil from the Caspian through the world market. At present, the transportation cost to the Black Sea is more than \$4.5/b plus the cost of freight to European destinations.

Today the fully built-up cost for a barrel of Caspian oil is roughly \$12 - \$15. This compares well with the North Sea but is still three to four times more than the equivalent barrel in the Arab Gulf. Future Caspian built-up costs should fall to \$10/b.<sup>18</sup> With a price, say \$17/b, and with the share of profits being 80% in favour of the host governments and 20% of the oil companies, the profit margin of investment would be under \$1/b, which will never justify the investment economically.

While higher oil prices will undoubtedly encourage investment in high-cost regions like the Caspian Basin, price is not the only major factor influencing the speedy development of Caspian oil resources. Rather, a host of complicated economic, logistical, and geopolitical obstacles block the region's ability to become a major oil-producing province of the magnitude of the Arab Gulf or even the North Sea or Latin America. Such logical obstacles mean that while its oil resources may be geologically equivalent to the North Sea, the region's output is unlikely to reach that potential. North Sea production has risen from roughly 2 mbd in 1980 to 5.79 mbd today, or 8% of the current world demand. By contrast, after two decades of development and an investment of \$13 bn, Caspian oil production currently amounts to 2% of the world demand.<sup>19</sup>

#### WEST AFRICA

Another promising oil province is West Africa (mainly Nigeria & Angola). In 2002, West Africa exported 2.95 mbd. By 2010 West African oil exports are projected to reach 3.5 mbd, roughly 4% of global oil supplies. West Africa's proven reserves are currently estimated at 33.8 bb with Nigeria accounting for 24 bb of the total and Angola for 5.4 bb.

**Table 4**  
**West Africa's Current & Projected Production,**  
**Consumption, Net Exports & Reserves (2002-2010)**

	2002	2010
Production (mbd)	3.84	4.87
Consumption (mbd)	0.89	1.37
Net Exports (mbd)	2.95	3.50
Proven Reserves (bb)	33.80	34.24

Sources: *BP Statistical Review of World Energy, 06/03/Petroleum Review, 05/03*

<sup>18</sup> Terry Adams, *Caspian Oil Realities*, p.1.

<sup>19</sup> M Salameh, *Can Caspian Oil Challenge the Supremacy of Arab Gulf Oil?*, *Pacific & Asian Journal of Energy (PAJE)* 12 (1), p.40



West Africa has emerged as a major diversification source for the Asia-Pacific economies since the 1990s because most of West African crude oil is low-sulphur and also because many refineries in the Asia-Pacific region are designed to process locally produced low-sulphur crude. As a result, crude oil imports by Asia-Pacific countries from West Africa have soared from a mere 42,000 b/d in 1990 to 1.04 mbd in 2002.<sup>20</sup> As the West African producers expand production capacity in the coming years, so would their crude oil exports to the Asia-Pacific region. In 2002, the United States imported 1.12 mbd of West African oil. By 2010, the United States could be importing 1.8 mbd of oil from West Africa.

However, the extent of the diversification process could be constrained by the production and export capacities of West African producers. West Africa has a limited potential for increasing production and export capacities beyond 4.87 mbd and 3.50 mbd respectively by 2010. Nevertheless, it will probably remain an important diversification source of the United States and Japan's oil imports for many years to come.<sup>21</sup>

## **NORTH AMERICA**

In June 2002, the United States negotiated a "North American Energy Initiative" with Canada and Mexico aimed at creating a more effectively integrated North American energy market, which in recent years has already amounted to more than \$50 bn a year.<sup>22</sup> Indeed, both countries have been major suppliers of oil to the United States for the last several years. In 2002, Mexico exported 1.53 mbd of crude to the United States with Canada exporting another 1.94 mbd of crude oil and products.

### **1. Proven Oil Reserves**

The combined proven reserves of the United States, Mexico and Canada stood at 49.9 bb at the end of 2002.

To this could also be added an estimated 308 bb of Canadian oil sand reserves, considered recoverable with today's technology and economics. In 2002, Sand oil production reached 740,000 b/d, with about 60% being exported to the United States. With more than US\$20 bn in new projects announced for the next few years, oil production from Canada's oil sands

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<sup>20</sup> BP Statistical Review of World Energy, 06/03, p.18

<sup>21</sup> M. Salameh, *Quest for Middle East Oil: The US vs the Aisa-Pacific Region*, Elsevier: Energy Policy 31 (03). P. 1089

<sup>22</sup> Joseph Dukert, *New Initiatives in North American Energy Cooperation*, IAEE Newsletter, 2<sup>nd</sup> Quarter, 03, p.4

is projected to rise to 1.6 mbd by 2015.<sup>23</sup>

The technology for extracting oil from tar sands exists but extraction costs are high, currently around \$9-\$13/b. However, these costs have lately been re-evaluated to be higher. The real problem, however, is the slow extraction rate. Despite a \$20 bn-investment in Canada's tar sand production, only 740,000 b/d of sand oil was produced in Canada in 2002. Tar sand oil is three times as labour-to-energy intensive and ten times as capital-to-energy intensive as conventional crude oil.

## 2. The North American Energy Trade

The energy interdependence between the three North American countries is even stronger in natural gas than in oil. In 2002, Canada supplied 16% of the US gas needs. In addition, Canada exports as much as two-thirds of its crude oil production (more than 1.4 mbd) as well as 500,000 b/d of refined products to the United States annually.<sup>24</sup>

The energy trade between the US and Mexico has substantially expanded in the last several years. In 2002, the US supplied Mexico with 18% of its gas needs and 14% of its petroleum products and imported in return 8% of its crude oil needs. At this rate Mexico could be importing half of its gas needs by 2010. For the foreseeable future the country is likely to remain a net gas importer.<sup>25</sup>

Mexico needs to invest billions of dollars to upgrade and modernize its oil and gas infrastructure. The State-run Petroleos Mexicanos (Pemex) has neither the capital nor the technology to extract the amount of gas Mexico desperately needs. According to Pemex, Mexican oil output will decline by 33% within the next five years unless investments of \$33 bn are made in oil and gas exploration. Therefore, there is no substitute to opening the door to private and foreign investments. This means that the Mexican constitution must be amended to allow foreign participation in energy production.

Mexico's future as an oil exporter depends on the success of the ongoing remedial work on its offshore Gulf of Mexico Cantarell fields, which contain the country's largest known oil reserves and which traditionally have provided some 75% of total national oil production. In 1996, well productivity plummeted, in some cases to one-fourth of previous levels, signalling a dramatic decline in reservoir pressure. Now after more than two years of nitrogen injection, the Cantarell pressure has stabilized according to Pemex. Pemex hopes to raise its offshore

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<sup>23</sup> Petroleum Review, 04/03. p. 26

<sup>24</sup> J. Dukert, New Initiatives in North American Energy Cooperation. P.5

<sup>25</sup> Maria Kielmas, Waiting for a New Dawn, Petroleum Review, 03/03. pp16-17

production from the current 2.7 mbd and 1.5 bn cf/d to 3.2 mbd and 2.5 bn cf/d by 2006.<sup>26</sup>

In summary, Canada and Mexico have limited oil production and export capacities and can't, therefore, satisfy US growing oil needs in the long-term, let alone global needs. The combined oil export capacity of both countries could, at best, be increased by from the current 3.4 mbd to 4.0 mbd by 2010. However, some experts have considerable doubts about Mexico's ability to maintain its oil exports even at current levels because of stagnating production and accelerating domestic consumption. Similarly, many of the claims dealing with Canada's Alberta tar sands are designed to attract investment dollars to the region. The unvarnished truth is that neither the tar sands of Alberta, nor the tar sands of anywhere else have lived up to their grandiose publicity.

And despite the North American Energy Initiative, continental oil independence is certainly not realistic within the next two to three decades. In fact, if the projected shortfalls between oil production and consumption for all three countries are combined, the total rises from 9.32 mbd in 2002 to 13.88 mbd by 2010 (see Table 5).

**Table 5**  
**North America's Current & Projected Production**  
**Consumption & Net Imports ( 2002-2020)**  
**(mbd)**

	2002	2005	2010	2015	2020
Production	14.16	12.29	11.90	10.50	10.00
Consumption	23.48	24.68	25.78	29.22	31.14
Net Imports	9.32	12.39	13.88	18.72	21.14

*Sources: US Energy Information Administration (EIA), Annual Energy Outlook 2002 / BP Statistical Review of World Energy, June 2003 / Author's Projections.*

## LATIN AMERICA

With a total of 98.6 bb of proven oil reserves, Latin America is a major oil province. In 2002, Latin American countries produced 6.65 mbd but only exported 2.0 mbd, the bulk of which came from Venezuela. By

<sup>26</sup> Simon Tegel, *The World Eyes Mexico's Success*, *Petroleum Review*, 08/02,p.21

2010 Latin America could be exporting 3.0 mbd, mostly from Venezuela and Colombia, possibly rising to 4.30 mbd by 2020 (see Table 6).

**Table 6**  
**Latin America's Current & Projected Production,**  
**Consumption & Net Exports (2002-2020)**  
**(mbd)**

	2002	2010	2020
Production	6.65	7.95	9.40
Consumption	4.59	4.95	5.10
Net Exports	2.06	3.00	4.30

*Sources: BP Statistical Review of World Energy, June 2003 / Author's Projections.*

## 1. Venezuela

Venezuela is by far Latin America's biggest crude oil producer and exporter accounting for 49% of total production and 77% of exports. Venezuela boasts proven conventional oil reserves of 77.8 bb and additional 272 bb of recoverable heavy and extra heavy reserves. Extra heavy oil production is projected to reach 600,000 b/d by 2005. An estimated 262,000 b/d of 8 to 8.5 API of extra-heavy oil is currently being produced. This crude oil is diluted and upgraded into a higher-quality crude with a very low-sulphur content for export.<sup>27</sup>

Venezuela's current oil production capacity is estimated at 3 mbd allowing it to export some 2.4 mbd.

However, Venezuela's state-owned company, PDVSA, has an ambitious 5-year plan to raise capacity to 5.5 mbd by 2006. It involves expenditure of up to \$43.3 bn by PDVSA and foreign investors. However, Venezuela does not have that size of funds. And given current political circumstances in the country, the foreign investors would not be that keen to invest either. Venezuela's plan to expand capacity to 5.5 mbd is, therefore, unrealistic. At best, Venezuela could raise capacity to 4 mbd by 2010.<sup>28</sup>

<sup>27</sup> Petroleum Review, 04/03, p.26

<sup>28</sup> Priscilla Ross, Venezuelan Wake-up Call, Petroleum Review, 06/02, p.20

## 2. Brazil

Brazil's National Oil Company "Petrobras" is going ahead with \$12 bn worth of development projects in the Campos Basin over the next four years, which it hopes, should make Brazil self-sufficient in oil by 2005. Brazil currently produces 1.5 mbd with the Campos Basin accounting for about 80% of total production. With current consumption running at 1.85 mbd, Brazil has to import more than 400,000 b/d of oil.

## 3. Colombia & Ecuador

Oil production in Colombia has dropped about 9% over the past 12 months to an average of 601,000 b/d from 627,000 b/d in 2001. New field developments are sparse, as foreign operators have quit the country because of the escalating violence. Current Colombian oil exports amount to only 385,000 b/d. The other important producer in Latin America is Ecuador. It produced an average of 410,000 b/d in 2002 and exported 279,000 b/d.

In summary, Latin America's crude oil exports could, at best, be projected to rise from 2.06 mbd currently to 4 mbd by 2010 (mainly from Venezuela), rising to 4.30 mbd by 2020.

## THE ASIA-PACIFIC REGION

The Asia-Pacific region is the world's largest importer of crude oil. In 2002, the Asia-Pacific region imported 13.41 mbd, or 72% of its oil needs, 70% of which came from the Middle East. By 2010, the region could be importing an estimated 23 mbd, or 79% of its needs, some 95% of which will also come from the Middle East (see Table 7).

**Table 7**  
**Current & Projected Crude Oil Demand, Supply**  
**& Imports in the Asia-Pacific Region, 2000-2010**  
**(mbd)**

	2000	2001	2002	2003	2005	2010	% of change 2000-2010
Production	7.76	7.80	7.99	7.71	7.46	6.84	- 12
Consumption	20.94	21.00	21.40	22.47	24.80	29.50	+ 41
Net Imports	13.18	13.20	13.41	14.76	17.34	22.66	+ 72

*Sources: BP Statistical Review, June 2003 / US Department of Energy / Institute of Energy Economics (IEEJ), Japan / IEA / Author's Projections.*

An economic and strategic watershed was reached in 1993 when China, then the world's sixth largest oil producer, became a net oil importer, leading many analysts to ponder on the implications of this development.

### 1. China Oil Factor

China's spectacular economic growth has led to a growing dependence on oil imports which in 2002 amounted to 2.04 mbd, or 38% of its oil needs, 39% of which came from the Middle East. With China's annual economic growth rate projected to stay at or near its current level of 7% per annum, this trend is set to continue into the future. By 2005 China will need to import 3.17 mbd, or 50% of its oil needs, rising by 2010 to 6.35 mbd, or 74% of its needs. By then China would have overtaken Japan to become the world's second largest oil importer after the United States (see Table 8).

**Table 8**  
**China's Production, Consumption & Net Oil Imports, 2000-2010**  
**(mbd)**

	2000	2001	2002	2003	2005	2010	% of Change 2000-2010
Production	3.25	3.31	3.39	3.30	3.23	2.21	- 32
Consumption	4.99	5.03	5.37	5.69	6.40	8.56	+ 72
Net Imports	1.74	1.72	1.98	2.39	3.17	6.35	+265

*Sources: BP Statistical Review, June 2003 / IEA / East-West Center, Honolulu, USA / Author's Projections.*

The rapid growth in crude oil imports has significantly altered China's position in the world oil market. China now accounts for 7% of global oil consumption compared to 3.6% in 1991, whilst its share of world production only amounts to 4.6%.

### 2. Asia-Pacific Middle East Energy Connection

The dominant trend in the Asia-Pacific region is one of growing oil dependence on the Middle East. This lends urgency to the question of how the various Asian countries would handle their respective reliance on energy imports. Where would 29.5 mbd that the Asia-Pacific region is

projected to need by 2010 come from, and how would such demand affect world oil markets, energy security and, not least, the price of oil?

In the current transparent and increasingly globalized oil markets, oil commerce has come to be shaped by transport costs rather than political relationships. As a result, a two-forked global oil market has emerged: oil supplies from the Middle East gravitating to the Asia-Pacific region, while supplies from the Western Hemisphere (Mexico, Venezuela, Canada and Colombia) and the Atlantic Basin (the North Sea and West Africa) heading towards the US market. Indeed, the Asia-Pacific region is likely to take 95% of its total oil imports from the Middle East by 2010.<sup>29</sup>

The implications for the Middle East /Asia-Pacific oil connection are evident. Asians are investing in upstream oil and gas sectors in the Middle East, while Middle East exporters are investing in downstream Asian activities. As the oil and gas relationship with the Asia-Pacific region expands over the coming decade, there will be an enormous volume of capital flows into the Middle East producers by 2010, estimated by some accounts at \$165 bn annually and growing. This is based on imports of some 22.6 mbd from the Middle East by 2010 at \$20/b.<sup>30</sup> The huge volume of capital flows will enable Middle Eastern producers to expand their production capacity faster than otherwise, thus enhancing global oil supplies.

### 3. The North Sea

The North Sea is one of the world's key energy reservoirs. Proven reserves stood at 15 bb at the end of 2002. In 2002, the North Sea produced 5.8 mbd and exported 3.9 mbd (see Table 9).

**Table 9**  
**North Sea: Production, Consumption & Exports, 2002-2020**  
(mbd)

	2002	2003	2005	2010	2020	% change 2002-2020
Production	5.80	5.33	4.89	4.17	3.73	- 36
Consumption	1.88	1.86	1.85	1.85	1.85	- 2
Exports	3.91	3.47	3.04	2.32	1.90	- 63

*Sources: BP Statistical Review of World Energy, June 2003 / Petroleum Review, August 2003 / Author's Projections.*

<sup>29</sup> R.A. Manning, *The Asian Energy Predicament, Survival*, Vol 42,#3, Spring 00,pp.79-80

<sup>30</sup> M. Salameh, *Quest for Middle East Oil: The US vs the Asia-Pacific Region*, pp. 1087-1088

The continuing development of hydrocarbon resources from the North Sea can be attributed to two factors: first, the region provides an attractive investment climate for international oil companies; second, impressive improvements in technology have led to reduced costs of production, discovery of new fields, and delay in the maturity of existing ones. Furthermore, drilling technology has allowed access to those hydrocarbon reservoirs in the North Sea that were earlier considered uneconomic to develop.<sup>31</sup> Given the attractive investment climate and the benefits of advanced technology, oil and gas production the North Sea has risen steadily in the early 2000s. Indeed, in 2000, oil production exceeded 6 mbd for the first time before falling back to 5.8 mbd in 2002. Still, advanced technology can't make up for the lack of resources. The declines in mature fields are predicted to outweigh the gains from newer, smaller fields from 2003 onwards, indicating a long-run decline in production from the North Sea.

The above analysis shows that the major oil provinces in the world could neither match the proven reserves of the Middle East nor its production and export capacities (see Table 10).

**Table 10**  
**Proven Reserves: The Middle East versus Other Major Provinces (bb)**

Asia-Pacific	38.70
Caspian Basin	17.10
North America	49.90
North Sea	15.00
Russia	60.00
Latin America	98.60
West Africa	33.80
<b>Total</b>	<b>313.10</b>
<b>Middle East</b>	<b>685.60</b>

*Sources: BP Statistical Review of World Energy, June 2003.*

Moreover, the combined deficit in the oil demand-supply balance of all the other major oil provinces is projected to rise from 9.95 bb in 2002 to 20.01 bb in 2010 reaching 34.20 in 2020, compared with net exports of 17.96 bb from the Middle East in 2002 rising to a projected 24.10 bb in 2010 and 41.80 bb by 2020 (see Table 11).

<sup>31</sup> Gawdat Baghat, *Oil in the Middle East: Prospects & Challenges*



**Table 11**  
**The Middle East versus Other Major Oil Provinces:**  
**Current & Projected Production & Exports / Imports 2002-2020 (bb)**

	2002			2010			2020		
	Prod	Dmnd	Exp	Prod	Dmnd	Exp	Prod	Dmnd	Exp
Asia-Pacific	7.99	21.40	-13.41	6.84	29.50	-22.66	4.87	37.41	-32.54
Caspian	1.65	0.79	0.86	3.33	1.33	2.00	4.84	1.56	3.28
North America	14.16	23.48	-9.32	11.90	25.78	-13.88	10.00	31.14	-21.14
North Sea	5.89	1.98	3.91	4.17	1.85	2.32	3.75	1.86	1.90
Russia	7.69	2.52	3.00*	8.71	3.00	5.71	9.00	3.00	6.00
Latin America	6.65	4.59	2.06	7.95	4.95	3.00	9.40	5.10	4.30
West Africa	3.84	0.89	2.95	4.87	1.37	3.50	5.60	1.60	4.00
Total	47.87	55.65	-9.95	47.77	67.78	-20.01	47.46	81.67	-34.20
Middle East	23.29	5.33	17.96	30.10	6.00	24.10	48.52	6.72	41.80

- *The balance between Russia's production and exports in 2002 amounting to 2.17 mbd is used in barter trade between Russia and its neighbours, probably because of a lack of export outlet capacity.*

*Sources: BP Statistical Review of World Energy, June 2003 / IEA / US Energy Information Administration (EIA), Annual Energy Outlook 2002 / Author's Projections.*

## DISCUSSIONS & CONCLUSIONS

In the aftermath of the first oil crisis in 1973, the United States and other major oil consuming countries have encouraged exploration for oil in areas outside the Middle East. Thus since then, exploration and development operations have accelerated all over the world including the North Sea, West Africa, Latin America and lately the Caspian Basin.

But despite the increasing supplies from the North Sea, Russia, Latin America, North America, West Africa and the Caspian Basin, none of the these oil provinces could, individually or collectively, provide an

alternative to Middle East oil. While all of these oil supply regions sound good, their supply potential is more limited than is generally understood, which mean only Middle Eastern oil will be available in large enough volumes to satisfy world demand. By 2010 the Middle East could be producing more than 30 mbd and exporting some 24 mbd. This contrasts with a projected production of 47.77 mbd by all the other major oil provinces and a projected demand of 67.78 mbd, thus creating a deficit of 20.01 mbd in 2010, rising to 34.20 mbd by 2020.

The Middle East region has four major advantages over other regions.

1. It holds more proven reserves than all the other regions combined and accounts for 69% of the world's proven reserves.
2. Oil extraction costs in the Middle East are the cheapest in the world. The marginal costs of production are usually just a fraction of current prices. This means that it is more profitable to produce oil in the Middle East than anywhere else in the world.
3. Oilfields in the Middle East are located close to international markets and connected by well-developed transportation routes.
4. Most of the world's spare oil production capacity is located in the Middle East. The region has at present 75%, or 4 mbd, of the global spare capacity. This can be seen as an insurance policy against temporary shortages in the world's oil supplies.

Given the above advantages, there is a growing global reliance on Middle East oil. As a result, the Middle East will continue to be the center of gravity as far as the oil market is concerned. For the foreseeable future, any new American ventures will reshape the oil market only at the margin. Even the sole superpower can't change that.

However, in spite of these promising prospects, several challenges have emerged in the past few years that threaten the Middle East's prominent standing in the global oil market. These include the inability of the national oil companies within the Middle East to provide the necessary financial resources, managerial expertise, and modern technology to bring the new streams into production and the competition from other oil-producing regions, particularly the North Sea, Russia and the Caspian Basin. The opening up of the Middle East oil industry to foreign participation and investments could be the first step towards revitalizing that industry and maintaining the oil supremacy of the Middle East in the 21<sup>st</sup> century.