

THE WORLD OIL MARKET

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With the Bush administration busily moving military forces to the Gulf region, the sense of an impending war has begun to make an impact on the world petroleum markets. The price of crude oil to be delivered in February 2003 in the New York Mercantile Exchange has risen to US\$33.36 per barrel, hitting a record high since November 2000. Further the futures price for crude also climbed to US\$31.66 as people worrying about the impending war prepared against any contingency.

The increase in prices due to a possible war with Iraq is a reflection of the importance of the Middle East as a major reserve and source of supply of the world's oil. The importance of the Middle East in the world oil market is one of the reasons why the justifications offered by the United States of America for a possible war with Iraq are looked upon with a degree of skepticism. A brief description of the world oil market in terms of the major producers, consumers, exporters and importers would explain the justification for the degree of skepticism on the US argument for war on Iraq.

OPEC VS. NON-OPEC

Member of the Organization of Petroleum Exporting Countries (OPEC) countries include: Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

Members share some key characteristics that allow them, as a group, to have a significant influence on world oil markets, despite their lack of monopoly over world oil production:

- Members are important oil exporters; they are very large producers and very small consumers. Not counting Indonesia, member's net exports averaged 85% of total oil production in 2001. (Refer Table 1.) Hence, member's interests are very different from most non-OPEC countries, including the United States (which is the world's largest producer, consumer and importer).
- Member's oil industries are mostly nationalized, allowing OPEC member's political establishments to increase or decrease oil production. Through managing the world's oil supply, OPEC can work to increase or decrease world oil prices to help meet the group's economic and /or political goals. Member governments rely heavily on oil revenues.
- The lion 's share of the world's spare oil production capacity lies in the OPEC countries. Non-OPEC countries hold approximately a combined 500,000 barrels per day (bbl/d) of spare oil production capacity at any given time, while OPEC spare production capacity estimates for 2002 are as high as 8 million bbl/d (including Iraq).
- According to 2002 estimates, 80% of the world's proven reserves are located in OPEC member countries.

- Production, or “lifting” costs are far lower in OPEC countries than in most non-OPEC countries. Prolonged periods of low oil prices make the world more reliant on cheaper-to-produce OPEC oil.

Table 1: Dependency of OPEC member countries on Petroleum Exports

Dependency on Petroleum Exports		
	Country	Value of petroleum exports/Value of total Exports*100 (In million US \$)
1)	Libya	97.26%
2)	Kuwait	92.40%
3)	Iran	89.00%
4)	Saudi Arabia	86.24%
5)	Nigeria	82.53%
6)	Iraq	79.70%
7)	Venezuela	74.06%
8)	Qatar	67.96%
9)	Algeria	61.62%
10)	United Arab Emirates	54.13%
11)	Indonesia	16.35%

In contrast to OPEC countries, non-OPEC countries share the following characteristics:

- Most non-OPEC countries are net oil importers. Of the 96 non-OPEC countries for which data was available (from the Energy Information Administration), 67 (71%) were net oil importers in 2001. Even large producers can also be large importers. The seven largest non-OPEC producers in 2001 had net average exports of 15% of total oil production.
- Most major non-OPEC countries have private oil sectors (Mexico is one notable exception); the political establishment generally has very little control over production levels. Companies react to international price expectations, exploring and drilling more and in higher cost areas when prices are high, and focusing on lower-cost production when prices are low.
- Private companies keep very little spare production capacity. Hence, in the case of a significant world oil production disruption, OPEC (rather than private oil companies) would be the primary immediate source of additional oil to displace the loss.
- Non-OPEC lifting costs tend to be higher than OPEC lifting costs, which makes non-OPEC production more vulnerable to price collapses. Prolonged periods of low prices can drive higher cost producers out of business, and make major oil companies focus less on higher cost areas.

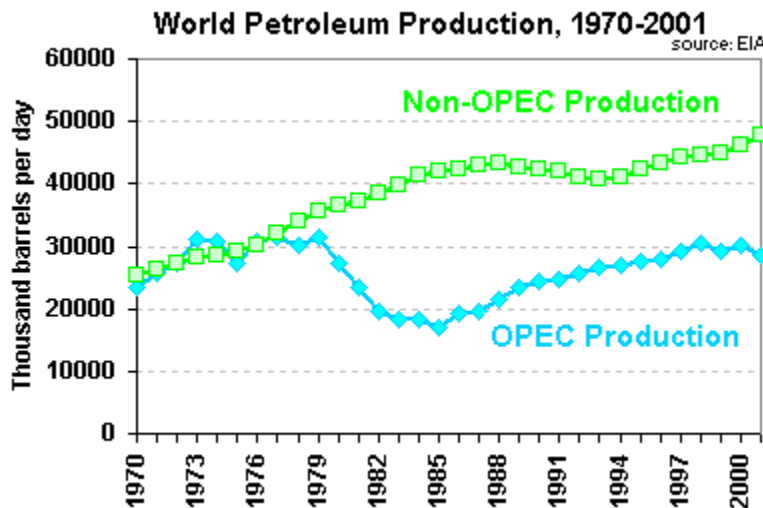


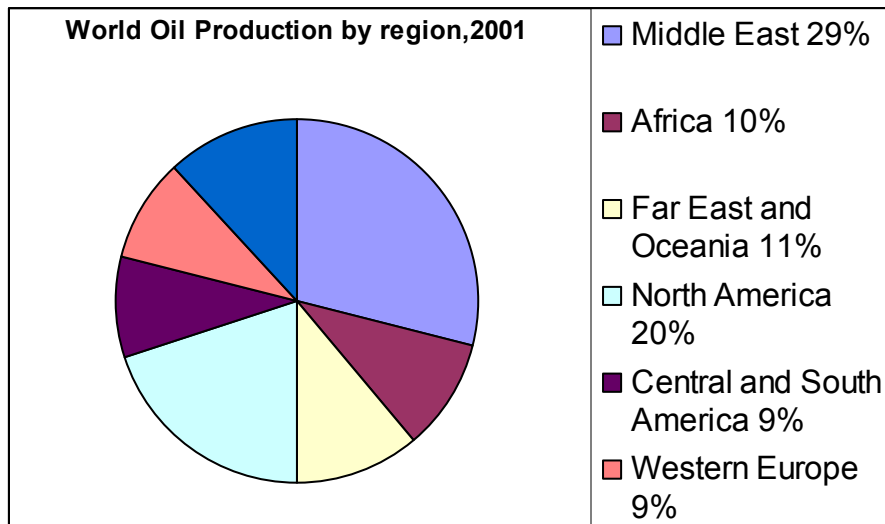
Figure1

WORLD OIL PRODUCTION

World Oil production by region, 2001:

In the year 2001, the Middle East was the largest producing region with 29% of total world production. North America accounted for 20%, with the remaining 51% dispersed fairly evenly throughout the world. (Figure 2)

Figure 2:

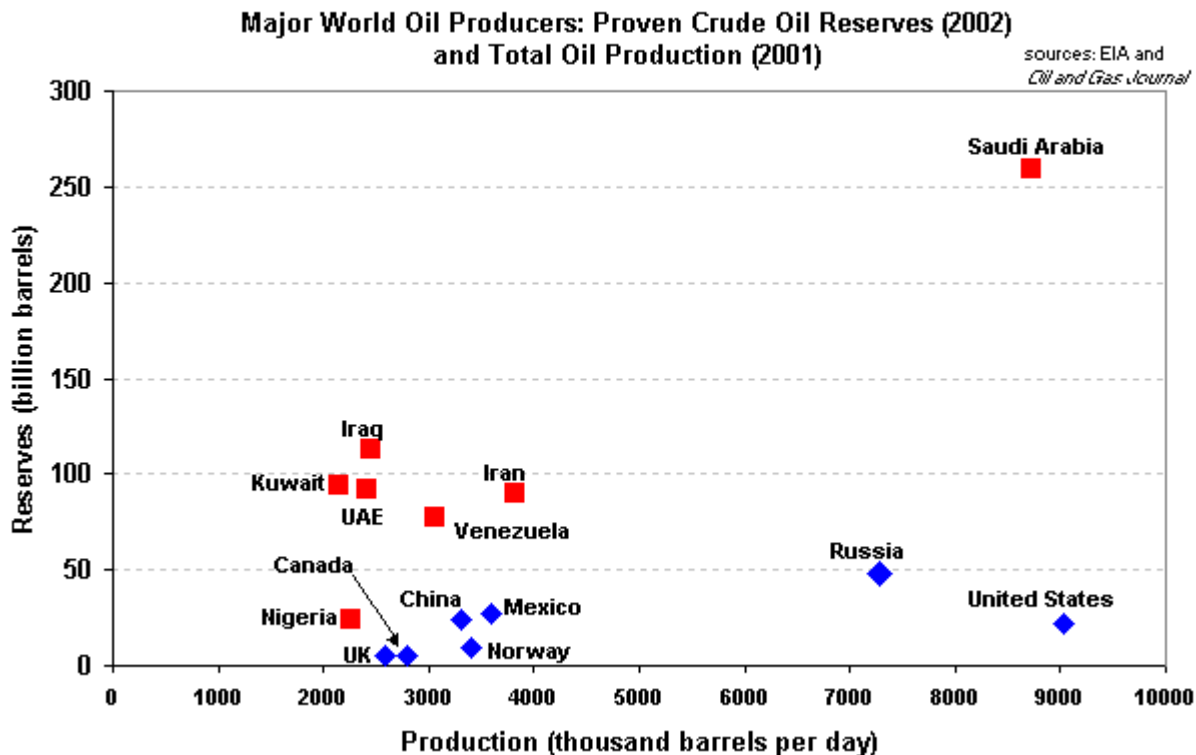


PROVEN CRUDE OIL RESERVES

The location of proven world crude oil reserves is far more concentrated in OPEC countries than current world oil production. Of the world's 1.03 trillion barrels of proven reserves, 819 billion barrels (80%) are held by OPEC. Because non-OPEC countries' smaller reserves are being depleted more rapidly than OPEC reserves, their overall reserves-to-production ratio -- an indicator of how long proven reserves would last at

current production rates -- is much lower (about 15 years for non-OPEC and 80 years for OPEC). This implies increased OPEC production as a proportion of world production over the long term.

Figure 3:



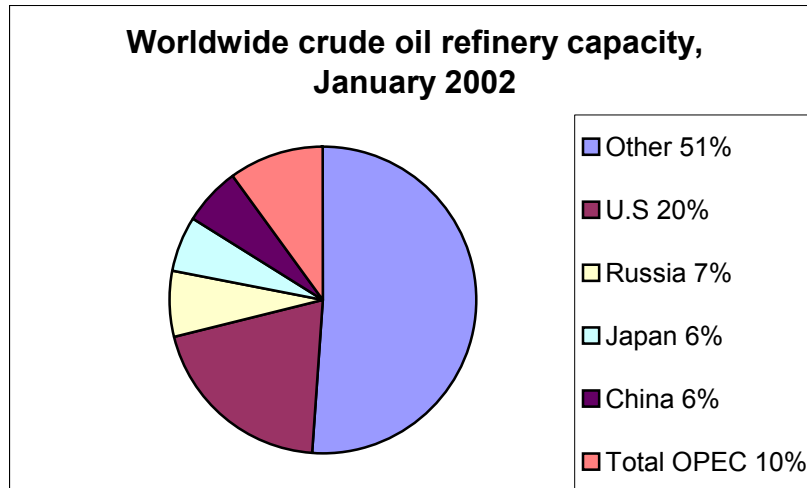
Refined products

As of January 2002, 72.7 million bbl/d of the world's 81.2 million bbl/d of crude oil refinery capacity was located in non-OPEC countries. Countries with high petroleum demand tend to have large refinery capacities. The U.S. has far more refinery capacity than any other country, with 143 of the world's 732 refineries, and a crude oil refinery capacity of about 16.6 million bbl/d. Russia's refinery capacity stands at an estimated 5.4 million bbl/d. Japan (4.8 million bbl/d) and China (4.5 million bbl/d) are the only remaining countries with refinery capacities exceeding 3 million bbl/d.

There are several countries that are important to world trade in refined petroleum products despite very low (or non-existent) levels of crude oil production. For instance, Caribbean nations have very limited oil production (170,000 bbl/d in 2000), but refinery capacity of about 1.6 million bbl/d. Much of this refined product is exported to the United

States. Other countries that are important sources of refined petroleum products yet have very limited domestic production include the Netherlands, South Korea and Singapore.

Figure 4:



World Oil Production by country, 2001:

Of the 14 countries that produced more than 2 million barrels per day in 2001, seven were OPEC members. The remaining seven were not OPEC members, including United States of America (the world's largest oil producer for the year), Russia, Mexico, China, Canada, Norway and the United Kingdom.

In terms of country wise production, United States is the largest producer, followed by Saudi Arabia, Russia, Iran and Mexico (Table 2). But a mere enumeration of the top oil producers by itself cannot explain the dynamics of the oil market. A listing of the top world oil net exporters are essential to have the grasp of the dynamics of the world oil market in terms of dependence and control.

Non-OPEC production is expected to rise the next 1-3 years, with the greatest increases in the former Soviet Union, including Russia and the countries bordering the Caspian Sea; and in North America with Mexico, Canada and the United States of America all expected to grow.

Table 2: Country wise oil production, 2001

Top World Oil Producers, 2001*		
	Country	Total Oil production** (Million barrels per day)
1)	United States	9.02
2)	Saudi Arabia	8.73
3)	Russia	7.29
4)	Iran	3.82
5)	Mexico	3.59
6)	Norway	3.41
7)	China	3.30
8)	Venezuela	3.07
9)	Canada	2.80
10)	United Kingdom	2.59
11)	Iraq	2.45
12)	United Arab Emirates	2.42
13)	Nigeria	2.26
14)	Kuwait	2.15

The countries highlighted in [Blue](#) are members of OPEC

*Table includes all countries with total oil production exceeding 2 million barrels per day in 2001

** Total Oil Production includes crude oil, natural gas liquids, condensate, refinery gain, and other liquids.

Top World Oil Net exporters, 2001:

Of the world's top net exporters, OPEC countries are more strongly represented. Nine of the twelve countries exporting more than one million barrels per day in 2001 were OPEC members. Russia, Norway, and Mexico are the world's largest non-OPEC exporters. The U.S is the world's largest importer. China is also a net importer, while Canada and United Kingdom are smaller net exporters.

Table 3: Country wise Net Export of Oil

Top World Oil Net Exporters, 2001*		
	Country	Net Oil exports (Million barrels per day)
1)	Saudi Arabia	7.38
2)	Russia	4.76
3)	Norway	3.22
4)	Iran	2.74
5)	Venezuela	2.60
6)	United Arab Emirates	2.09
7)	Nigeria	2.00
8)	Iraq	2.00
9)	Kuwait	1.80
10)	Mexico	1.65
11)	Libya	1.24
12)	Algeria	1.24

*Table includes all countries with net exports exceeding 1 million barrels per day in 2001.

The countries highlighted in Blue are OPEC countries

World Oil Consumption, 2001:

Of the 76.0 million bbl/d of oil that the world consumed in 2001, OPEC countries together consumed about 5.8 million bbl/d, or 8%. Most of the world's largest oil consumers are also net oil importers. Of the world's top ten oil consumers in 2001, only Russia and Canada were net oil exporters. Brazil, the world's sixth-largest consumer, imported about 560,000 bbl/d. The remaining top consumers also are listed as the world's largest oil importers.

Table 4: Country wise Consumption of Oil

Top World Oil Consumers, 2001*		
	Country	Total Oil Consumption (Million barrels per day)
1)	United States	19.7
2)	Japan	5.4
3)	China	4.9
4)	Germany	2.8
5)	Russia	2.5
6)	Brazil	2.2
7)	South Korea	2.1
8)	France	2.0
9)	Canada	2.0
10)	India	2.0

* Table includes all the countries that consumed more than 2 million bbl/d in 2001

The interesting features of Table 4 are:

- There is not a single OPEC country in the top ten oil-consuming countries. This is in fact a reflection of the level of development of their economies in terms of the development of industry, transport, communications etc., particularly those areas which are significant consumers of oil
- The only developing countries in the top ten oil consumers are China, Brazil and India. This reflects the fact that economic development processes in these countries are characterized by an intensive and increasing use of oil and thereby increasing dependence on oil.
- Of the top ten oil consumers, only four come in among the top ten producers of oil for the year 2001- U.S, China, Russia and Canada. Of these U.S and China consume more than what they respectively produce, making them dependent on imports.
- Russia, Brazil and Canada are the only net exporters among the top ten oil consumers, with Russia being the only one among the top ten oil producers.

Top World Oil Importers, 2001:

Table 5: country wise Import of Oil

Top World Oil Importers, 2001*		
	Country	Net Oil Imports (Million barrels per day)
1)	United States	10.8
2)	Japan	5.4
3)	Germany	2.7
4)	South Korea	2.1
5)	France	2.0
6)	Italy	1.7
7)	China	1.6
8)	Spain	1.5
9)	India	1.3

* Table includes all countries that imported more than 1 million bbl/d in 2001

The interesting features of the Table 5 are:

- Seven of the top nine importers are present in the list of the top ten Oil consumers. The two countries not in the list of ten highest oil consumers but in the high importers list are Spain and Italy.
- Seven of the nine members are OECD (Organization for Economic Cooperation and Development) countries, the exceptions being China and India.
- China and India are the only developing nations in this importers list. It implies that their development process is highly vulnerable to the supply of oil from the rest of the world as well as price volatility in the oil market.

Measure of dependency on Oil Imports:

The dependency of a country on oil imports can be expressed as a ratio between the country's imports and its total consumption.

The following table provides the import to consumption ratio for the top consumers of oil for the year 2001.

Table 6: Measure of Dependency on Oil Imports

Measure of Dependency on Oil Imports		
	Country	Imports of Oil/Consumption of Oil*
1	Japan	1.00
2	South Korea	1.00
3	France	1.00
4	Germany	0.96
5	India	0.65
6	United States	0.55
7	China	0.33
8	Brazil	0.25
9	Russia	0
10	Canada	0

* If Imports can be denoted by M and consumption of Oil by C. M/C varies between 0 and 1.

Non-OPEC production coordination with OPEC:

A few non-OPEC countries that share some traits of OPEC countries sometimes coordinate their production policies with OPEC. While non-OPEC restrictions are very small, the participation of these non-member countries are more likely to pressurize the member countries to adhere to their own output restriction policies. Therefore, non-OPEC coordination with OPEC often carries significance beyond what the output data might imply. The section will consider the coordination of some of the non-OPEC countries with OPEC.

Mexico:

Mexico has had more involvement with OPEC than any other major non-OPEC oil producing country. Since 1997, Mexico has attended most of OPEC's meetings (more than any other non-OPEC country). Mexico has made seven pledges to restrict exports since 1997. Mexico was a key player in organizing OPEC's 1998 production cuts, as Mexican officials negotiated between OPEC members Saudi Arabia and Venezuela (these countries had been at odds over production agreements). Like OPEC member countries, Mexico's oil sector is in public hands, with 100% government-owned PEMEX being the only oil company in Mexico. This allows the government to control oil production and export decisions. Mexico's output restrictions generally apply to *exports* rather than total production, and PEMEX data show that the targets are usually kept.

Russia:

Russia has attended many of OPEC's meetings since 1997 and has made three commitments to reduce production and/or exports in coordination with OPEC. Russia was the world's largest oil producer until oil production collapsed in 1992. Production has rebounded since 1998, and the country soon could be in a position to regain its status as

the leading global producer. Oil production in Russia is mostly in the hands of the private sector, while government-owned Transneft controls the pipeline network.

There is often considerable ambiguity regarding whether Russia's reduction pledges are for production or export cuts. It is also unclear from what level of production Russia intends to cut, or for how long.

Norway:

Norway does not generally participate in OPEC meetings, but the world's third-largest exporting country has adjusted its production in coordination with OPEC on three occasions since 1998. While the Norwegian oil sector historically has been state-dominated through 100% state-owned Statoil and majority state-owned Norsk Hydro, major restructuring is augmenting the role of the private sector. Norsk Hydro is no longer majority state-owned, and the Norwegian government began selling shares of Statoil in the spring of 2001. Additionally, many private international oil companies are active in Norway.

Because Norway is an extremely small oil consumer, its reduction commitments affect production rather than exports (the domestic market would not be large enough to absorb extra production resulting from shut-in exports).

Oman:

Oman is a smaller Persian Gulf oil producer that has attended most of OPEC's meetings in the last few years. Since 1997, Oman has made three commitments to reduce production, in cooperation with OPEC. State-controlled Petroleum Development Oman (PDO) dominates the country's oil sector.

Angola:

Angola, sub-Saharan Africa's second-largest oil producer (behind OPEC member Nigeria), has attended a few of OPEC's recent meetings. Angola made its first-ever commitment to reduce production in December 2001, promising to cut 22,500 bbl/d. This decision came after OPEC's November 14, 2001 decision to make its 1.5 million bbl/d production cut contingent upon non-OPEC pledges to cut production by 500,000 bbl/d. Angola's oil production began to rise in late 2001, with the start up of its new Girassol field.