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## Persian Gulf Oil and Gas Exports Fact Sheet

*In 2002, the Persian Gulf countries (Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates) produced about 25% of the world's oil, while holding nearly two-thirds of the world's crude oil reserves. OECD gross oil imports from Persian Gulf countries averaged about 10.6 million barrels per day (bbl/d) during 2002, accounting for 27% of the OECD's total gross oil imports. Besides oil, the Persian Gulf region also has huge reserves (1,923 trillion cubic feet -- Tcf) of natural gas, accounting for 36% of total proven world gas reserves.*



### GENERAL BACKGROUND

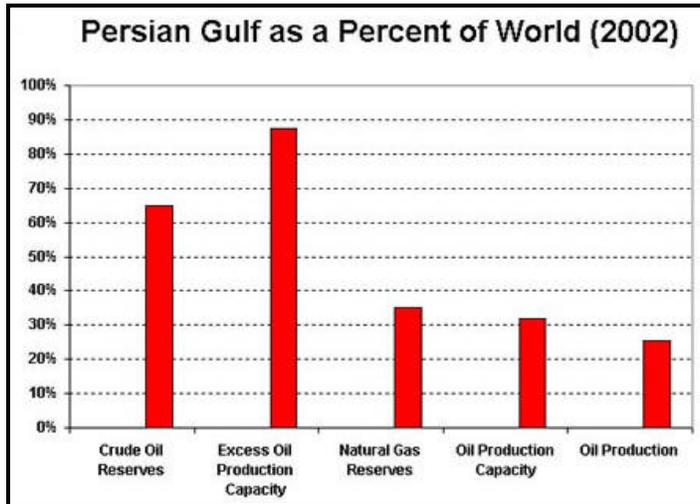
The Persian Gulf, also known as the Arabian Gulf, is a 600-mile-long body of water which separates Iran from the Arabian Peninsula, and one of the most strategic waterways in the world due to its importance in world oil transportation. At its narrowest point (the [Strait of Hormuz](#)), the Gulf narrows to only 34 miles wide.

There have been, and continue to be, significant territorial disputes between Persian Gulf countries. Besides the Iraqi invasion of Kuwait in August 1990, and before that the Iran-Iraq War from 1980 to 1988, another important dispute is between the UAE and Iran over ownership of three islands --

Abu Musa, Greater Tunb Island, and Lesser Tunb Island, all strategically located in the [Strait of Hormuz](#). The three islands were effectively occupied by Iranian troops in 1992. In 1995, the Iranian Foreign Ministry claimed that the islands are "an inseparable part of Iran." Iran rejected a 1996 proposal by the Gulf Cooperation Council (GCC) for the dispute to be resolved by the International Court of Justice, an option supported by the UAE. In early 1996, Iran took further moves to strengthen its hold on the disputed islands. These actions included starting up a power plant on Greater Tunb, opening an airport on Abu Musa, and announcing plans for construction of a new port on Abu Musa. In September 2000, Iran stated its willingness to resume talks with the UAE on the dispute. In March 2000, *Jane's Defence Weekly* reported that satellite images of Abu Musa and the Tunbs did not show any evidence that Iran had fortified the islands militarily, or turned them into "unsinkable aircraft carriers capable of closing the (Hormuz) Strait during a crisis." On December 31, 2001, the GCC issued a statement reiterating its support for the UAE's sovereignty over Abu Musa and the Tunbs, declared Iran's claims on the islands as "null and void," and backed "all measures...by the UAE to regain sovereignty on its three islands peacefully."

In February 1991, Iraqi troops, before being expelled from Kuwait by coalition forces, dumped millions of barrels of oil into the Persian Gulf, creating an environmental crisis and also threatening desalination plants in the region. During the Iran-Iraq War, oil tankers were attacked in the Persian Gulf by both Iraq and Iran, leading in part to the U.S. decision in 1987 to "reflag" Kuwait tankers and also to increase U.S. naval forces in the Persian Gulf.

On March 20, 2003, a U.S.-led coalition began attacks on Iraqi targets, followed by a ground invasion. By mid-April, U.S. forces entered Baghdad, Mosul, Kirkuk, and other Iraqi cities, while securing important oilfields in the northern and southern parts of the country. The war in Iraq began just over a year after President Bush, in his January 2002 State of the Union address, labeled Iraq (along with Iran and North Korea) as members of an "axis of evil" that supported terrorism and were developing weapons of mass destruction. This speech came five months after the terrorist attacks of September 11, 2001, the worst such attack ever on U.S. soil.

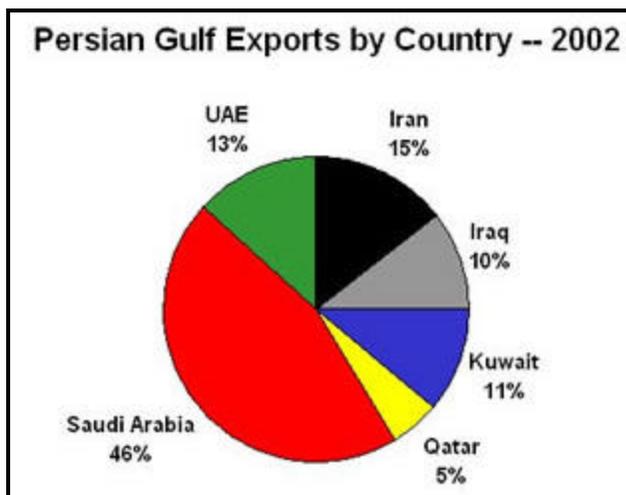


**OIL AND GAS RESERVES, PRODUCTION, CAPACITY**

The Persian Gulf contains around 674 billion barrels of proven oil reserves, representing approximately two thirds of proven, conventional world oil reserves, and 1,923 Tcf of natural gas reserves (35% of the world total). Also, at the end of 2002, Persian Gulf countries maintained about 22.3 million bbl/d of oil production capacity, or 32% of the world total. Perhaps even more significantly, the Persian Gulf countries normally maintain an overwhelming share (around 90%) of the world's excess oil production capacity (note: as of April 2003, following the Iraq war, excess world oil production capacity was only around

0.7-1.2 million bbl/d, all of which was located in the Persian Gulf region). Excess production capacity is important because, in the event of an oil supply disruption, such as the recent Venezuela, Iraq, and Nigeria situations, this oil can be brought online to compensate.

In 2002, Persian Gulf countries had estimated net oil exports of 15.5 million bbl/d of oil (see pie chart). Saudi Arabia exported the most oil of any Persian Gulf country in 2002, with an estimated 7.0 million bbl/d (45% of the total). Also in 2002, Iran had estimated net exports of around 2.3 million bbl/d (15%), followed by the United Arab Emirates (2.1 million bbl/d -- 13%), Kuwait (1.7 million bbl/d -- 11%), Iraq (1.6 million bbl/d -- 10%), Qatar (0.8 million bbl/d -- 5%), and Bahrain (0.01 million bbl/d -- 0.1%).



According to the Energy Information Administration's *International Energy Outlook 2002*, Persian Gulf oil production is expected to reach about 30.7 million bbl/d by 2010, and 42.9 million bbl/d by 2020, compared to about 21.7 million bbl/d in 2000. This would increase Persian Gulf oil production capacity to 35% of the world total by 2020, up from 28% in 2000.

**Offshore Persian Gulf Oil Development**

Major offshore Persian Gulf oil fields include Khafji and Hout, both of which are connected to Saudi Arabia's Safaniyah, the world's largest offshore oilfield (with estimated reserves of 19 billion barrels). Saudi offshore Persian Gulf production includes Arab

Medium crude from the Zuluf (over 500,000 bbl/d capacity) and Marjan (270,000 bbl/d capacity) fields and Arab Heavy crude from the Safaniya field. The Doroud 1&2, Salman, Abuzar, Foroozan, and Sirri fields comprised the bulk of Iran's offshore output, all of which is exported. Iran plans extensive development of existing offshore fields and hopes to raise its offshore production capacity sharply. Iran's national oil

company (NIOC) has expressed interest in developing five oil and gas fields in the Hormuz region (Henjam A -- HA, HB, HC, HD, and HE), which, according to NIOC, hold an estimated 400 million barrels of liquids (oil, natural gas condensates, etc.) and have production potential of 80,000 bbl/d.

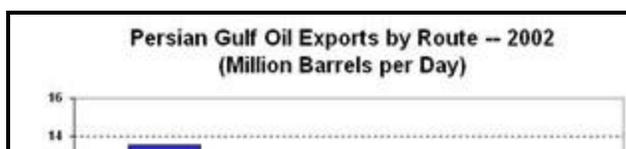
### Offshore Persian Gulf Natural Gas Development

Besides oil, the Persian Gulf region also is important because it contains huge reserves (1,923 Tcf) of natural gas, with Iran and Qatar holding the world's second and third-largest reserves (behind Russia), respectively. This likely will become increasingly important in coming years, as both domestic gas consumption and gas exports (by pipeline and also by liquefied natural gas -- LNG -- tanker) increase. In late 2000, Saudi Arabia resolved a long-standing offshore Persian Gulf border dispute with Kuwait, opening the door to development of the huge (13-Tcf) Dorra gas field, which lies in waters straddling Iranian, Saudi, and Kuwaiti territories. Most of Qatar's gas is located in the North Dome Field, which contains 380 Tcf of in-place and 239 Tcf of recoverable reserves, making it the largest known non-associated gas field in the world. The Qatari government believes that the country's economic future lies in developing this vast gas potential. Currently, Qatar has two LNG exporters: Qatar LNG Company (Qatargas); and Ras Laffan LNG Company (Rasgas). The \$10 billion Dolphin Project is expected to supply gas, beginning in 2005, from Qatar's North Dome to the United Arab Emirates, and Oman. Pakistan also could be supplied by Dolphin at some point in the future, although at present this seems unlikely.

Another major Persian Gulf offshore gas project is Iran's huge South Pars field. Current estimates are that South Pars contains 280 Tcf of gas (some estimates run as high as 500 Tcf), of which a large fraction will be recoverable, and over 17 billion barrels of liquids. Development of South Pars is Iran's largest energy project, and already has attracted around \$20 billion in investment. Natural gas from South Pars largely is slated to be shipped north via the planned 56-inch, \$500 million, IGAT-3 pipeline (a section of which is now being built by Russian and local contractors), as well as a possible IGAT-4 line, and then reinjected to boost oil output at the mature Aghajari field (output peaked at 1 million bbl/d in 1974, but has since fallen to 200,000 bbl/d), and possibly the Ahwaz and Mansouri fields (which make up part of the huge Bangestan reservoir in the southwest Khuzestan region). South Pars natural gas also could be exported, both by pipeline and possibly by liquefied natural gas (LNG) tanker.

In February 2003, Oil Minister Zanganeh officially inaugurated Phases 2 and 3 of South Pars development, which began to come onstream in September 2002. Already, Phases 2 and 3 reportedly are producing around 2 Bcf per day of natural gas, and 85,000 bbl/d of condensates. . On September 29, 1997, Total (now TotalFinaElf) had signed a \$2 billion deal (along with Russia's Gazprom and Malaysia's Petronas) to explore South Pars and to help develop the field during Phase 2 and 3 of its development. In July 2000, Italian firm ENI had signed a \$3.8 billion deal with Iran to develop the South Pars region for gas. The deal reportedly was the largest between Iran and a foreign company since the 1979 Islamic Revolution.

In addition to South Pars, Iran aims to develop the 6.4-Tcf, non-associated Khuff (Dalan) reservoir of the Salman oil field, which straddles Iran's maritime border with Abu Dhabi, where it is known as the Abu Koosh field. NIOC is seeking to develop the Khuff reservoir, which could lead to the production of 500 Mmcfd of non-associated gas, along with the 120,000 bbl/d of crude oil that is now being produced from a shallower reservoir. Also, the 47-Tcf North Pars development will be integral to Iran's long-term gas utilization plans. Development plans call for 3.6 Bcf/d of gas production, of which 1.2 Bcf/d would be re-injected into the onshore Gachsaran, Bibi Hakimeh, and Binak oil fields. The other 2.4 Bcf/d would be sent to the more mature Agha Jari oil field.



### OIL FLOWS Strait of Hormuz

In 2002, the vast majority (around 88%) of oil exported from the Persian Gulf transited by tanker through the

**Strait of Hormuz**, located between Oman and Iran. By far the world's most important oil "chokepoint," accounting for transit of around two-fifths of all world traded oil, the Strait consists of 2-mile wide channels for inbound and outbound tanker traffic, as well as a 2-mile wide buffer zone. Closure of the Strait of Hormuz would require use of longer alternate routes (if available) at increased transportation costs. Such routes include the 4.8-million-bbl/d-capacity East-West Pipeline across Saudi Arabia to the port of Yanbu, and the Abqaiq-Yanbu natural gas liquids line across Saudi Arabia to the Red Sea. The 13.6 million bbl/d or so of oil which transit the Strait of Hormuz goes all over the world, eastwards to Asia (especially Japan, China, and India) and westwards (via the Suez Canal, the Sumed pipeline, or around the Cape of Good Hope in South Africa) to Western Europe and the United States. Another route for Saudi oil exports which reportedly has been under consideration is through Yemen to the Gulf of Aden.

### **Bab al-Mandab**

Oil heading westwards by tanker from the Persian Gulf towards the Suez Canal or Sumed pipeline must pass through the Bab al-Mandab. Located between Djibouti and Eritrea in Africa, and Yemen on the Arabian Peninsula, the Bab al-Mandab connects the Red Sea with the Gulf of Aden and the Arabian Sea. Any closure of the Bab al-Mandab could keep tankers from reaching the Suez Canal/Sumed Pipeline complex, diverting them around the southern tip of Africa. This would add greatly to transit time and cost, and effectively tie up spare tanker capacity. In December 1995, Yemen fought a brief battle with Eritrea over Greater Hanish Island, located just north of the Bab al-Mandab. The Bab al-Mandab could be bypassed by utilizing the East-West oil pipeline. However, southbound oil traffic, which totaled about 1 million bbl/d in 1997, would still be blocked. In addition, closure of the Bab al-Mandab would effectively block non-oil shipping from using the Suez Canal, except for limited trade within the Red Sea region.



### **Suez/Sumed Complex**

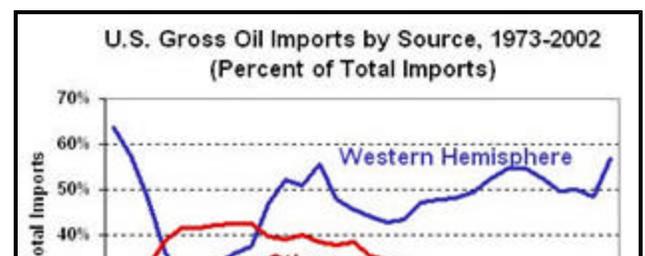
After passing through the Bab al-Mandab, oil en route from the Persian Gulf must pass either through the Suez Canal or the Sumed Pipeline complex in Egypt. Both of these routes connect the Red Sea and Gulf of Suez with the Mediterranean Sea. Over 3 million bbl/d of Persian Gulf oil exports transit the Suez Canal/Sumed complex, destined mainly for Europe and the United States. Any closure of the Suez Canal and/or Sumed Pipeline would divert tankers around the southern tip of Africa (the Cape of Good Hope), adding greatly to transit time and effectively tying up tanker capacity.

### **Other Export Routes**

In 2002, around 1.9-2.2 million bbl/d (12% -14%) of oil from the Persian Gulf was exported via routes besides the Strait of Hormuz. This oil was exported mainly: 1) via the Saudi East-West pipeline to the port of Yanbu on the Red Sea (about 1 million bbl/d); 2) via pipeline from Iraq's Kirkuk oil region to the Turkish port of Ceyhan (about 0.5-0.8 million bbl/d); 3) by pipeline via Syria (around 0.2 million bbl/d); 4) by various means (smuggling by truck and small boat, for instance) to a variety of destinations, including Kurdish areas of northern Iraq, Turkey, Jordan, Iran, India, and Pakistan; and 5) by truck to Jordan.

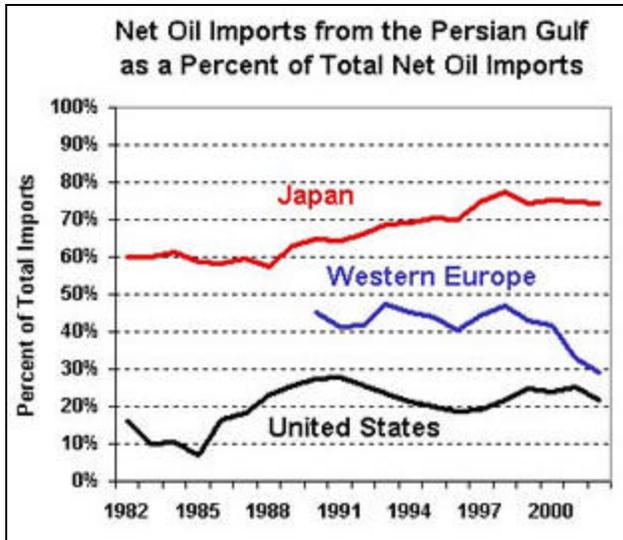
### **OECD Oil Imports from the Persian Gulf**

U.S. gross oil imports from the Persian Gulf fell during 2002, to around 2.3 million bbl/d (almost all of which was crude), from 2.8 million bbl/d in 2001. The vast majority of Persian Gulf oil imported by the United States came from Saudi Arabia (69%), with significant amounts also coming from Iraq (20%), Kuwait (10%), and small amounts (less than 1% total)



from Qatar and the United Arab Emirates. Iraqi oil exports to the United States fell sharply in 2002, to around 442,000 bbl/d, compared to 795,000 bbl/d in 2001. Saudi exports fell from 1.66 million bbl/d in 2001 to 1.55 million bbl/d in 2002. Overall, the Persian Gulf accounted for about 22% of U.S. *net* oil imports, and 11% of U.S. oil demand, in 2002.

Western Europe (defined as European countries belonging to the Organization for Economic Cooperation and Development -- OECD) averaged 2.3 million bbl/d of oil imports from the Persian Gulf during 2002. This represented a decrease of about 0.4 million bbl/d from the same period in 2001. The largest share of Persian Gulf oil exports to Western Europe came from Saudi Arabia (51%), with significant amounts also coming from Iran (27%), Iraq (13%), and Kuwait (6%).



Japan averaged 3.9 million bbl/d of net oil imports from the Persian Gulf during 2002. Japan's oil imports from the Persian Gulf as a percentage of demand were down just slightly relative to 2001, at about 75%. Japan's dependence on the Persian Gulf for its oil supplies has increased sharply since the low point of 58% in 1986. During 2002, around 31% of Japan's Persian Gulf imports came from Saudi Arabia, 30% from the United Arab Emirates, 14% from Iran, 13% from Kuwait, 11% from Qatar, and around 1% from Bahrain and Iraq combined.

**Net Oil Imports from the Persian Gulf Region**

	As % of Demand			As % of Total Net Oil Imports		
	US	W. Europe	Japan	US	W. Europe	Japan
1982	10.4%	NA	58%	16.1%	NA	60%
1983	10.4%	NA	60%	10.1%	NA	60%
1984	10.4%	NA	61%	10.6%	NA	61%
1985	10.3%	NA	58%	7.1%	NA	59%
1986	9.7%	NA	58%	16.7%	NA	58%
1987	8.8%	NA	59%	18.1%	NA	60%
1988	8.7%	NA	57%	23.2%	NA	58%
1989	9.4%	NA	64%	25.8%	NA	63%
1990	11.3%	29%	66%	27.4%	45%	65%
1991	11.0%	27%	64%	27.7%	41%	64%
1992	10.4%	26%	66%	25.6%	42%	66%
1993	10.3%	29%	69%	23.3%	47%	69%
1994	9.7%	25%	70%	21.4%	45%	69%
1995	8.8%	23%	70%	19.8%	44%	70%
1996	8.7%	21%	69%	18.8%	41%	70%
1997	9.4%	23%	75%	19.1%	44%	75%

1998	11.3%	26%	75%	21.8%	47%	77%
1999	12.6%	22%	73%	24.8%	43%	74%
2000	12.6%	21%	75%	23.8%	42%	75%
2001E	13.9%	18%	76%	25.0%	33%	76%
2002E	13.9%	15%	73%	21.7%	29%	75%

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## LINKS

For more information from EIA on the Persian Gulf, please see:

[EIA - Country Information on Bahrain](#)

[EIA - Country Information on Iran](#)

[EIA - Country Information on Iraq](#)

[EIA - Country Information on Kuwait](#)

[EIA - Country Information on Qatar](#)

[EIA - Country Information on Saudi Arabia](#)

[EIA - Country Information on the United Arab Emirates](#)

Links to other U.S. government sites:

[2002 CIA World Factbook](#)

[U.S. Department of Energy's Office of Fossil Energy's International section \(Near East and South Asia\)](#)

[U.S. State Department Bureau of Near Eastern Affairs](#)

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[Columbia University Gulf/2000 project](#)

[Columbia University Gulf/2000 project: Persian Gulf map](#)

[Planet Arabia.com](#)

[Middle East News Online -- Persian Gulf](#)

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