CSIS

Center for Strategic and International Studies
1800 K Street N.W.
Washington, DC 20006
(202) 775-3270
Acordesman@aol.com

The Gulf and Transition

US Policy Ten Years After the Gulf War:

The Challenge of Creating and Effective Energy and Development Policy

Anthony H. Cordesman
Arleigh A. Burke Chair in Strategy

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Introduction

This transition study reflects the result of a long-standing project on Gulf net assessment, funded in part by the Smith Richardson Foundation. This project has already produced some eight books, including two major studies of Iranian and Iraqi military forces published in 1999 – Iraq and the War of Sanctions and Iran's Military Forces in Transition (Praeger 1999). Additional detailed briefings and supporting data on the military balance in the Gulf, energy and economic trends. Iranian and Iraqi proliferation, and Gulf arms transfers can be found on the CSIS web page at www.csis.org under the sections market as "Gulf in Transition" and "Strategic Assessment.

This volume is intended to support US policy making and the reader should be aware that the sources used are deliberately chosen to rely as heavily as possible on current official US government documents and reports, unclassified intelligence reporting and estimates, and official international institutions like the World Bank. The goal is to provide data that policy makers are familiar with and can trust. The author, however, is solely responsible for the conclusions and suggestions made in this analysis and no attempt was made to coordinate its content with either any officials or experts in the US government or other policy analysts in the CSIS.

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I. Introduction

The United States enjoys many advantages in the Gulf. In the ten years that have followed the Gulf War, Iran's political regime has become more moderate, and President Khatami's regime has ended much of Iran's support for terrorism and political adventures in the Gulf. Iran has not carried out the conventional military build-up that many feared after its defeat in the Iran-Iraq War. While it has continued to acquire weapons of mass destruction; it has done so at a relatively slow rate.

Iraq is still under the UN sanctions that have prevented any major conventional arms imports since mid-1990. Its forces remain large, but much of their equipment is becoming obsolescent and they lack the combat-trained manpower that won the Iran-Iraq War. While Iraq also is a proliferator, the UN Special Commission (UNSCOM) and International Atomic Energy Agency (IAEA) have deprived it of most of its stocks of chemical and biological weapons and missiles, and of its larger facilities to make chemical, biological and nuclear weapons.

The US maintains close military ties to the Southern Gulf states. It has improved many of its forward command and control and power projection capabilities in the region, and has sharply improved its precision strike capability. It no longer faces any risk of a Russian or external threat in the Gulf region and the Caspian and Central Asia now act as a buffer between the Northern Gulf and Russia. US naval power dominates Gulf waters, the Indian Ocean, and Red Sea. The US has strong coalition partners in Britain and Egypt.

Gulf oil and gas exports flow freely to the US and world markets, and while prices rise and fall, there are have been no recent interruptions in supply. Saudi Arabia, the world's largest oil exporter, has pursued an export strategy that calls for relatively moderate prices, and the Arab-Israeli peace talks have made enough progress to largely eliminate the threat of new oil embargoes and ease US and Arab tensions over US support of Israel.

Growing Challenges for US Policy

At the same time, the Gulf is scarcely stable and the US faces major and growing challenges that the next Administration must address:

- The US and the world economy are becoming steadily more dependent on imports of Gulf oil and gas. This is not simply a matter of direct imports, but of imports of manufactured goods from Europe and Asia that are dependent on Gulf oil for energy. Oil prices remain erratic, but they are rising. US oil production is declining, and there are no near-term prospects that the US can reduce its growing dependence on energy imports.

- This increased global dependence on Gulf oil exports presents a number of regional problems. Two key Gulf oil producers – Iran and Iraq – face major problems in maintaining and increasing their oil and gas production capacity because of UN and US sanctions. Other key oil producers – such as Saudi Arabia – may lack the capital and incentives to increase production by the amounts needed to meet world demand at moderate prices.

- There are significant political and ideological forces that can divide the US from its Gulf allies, and which affect the challenge posed by Iran and Iraq. The Arab-Israeli conflict remains a source of tension, and the search for a final settlement over issues like Jerusalem, raises issues of fundamental religious concern to states like Saudi Arabia. Islamic extremism remains a problem, challenging both moderate regimes and the US presence in the Gulf.

- Societal change involves a number of destabilizing forces. High levels of population growth and a lack of economic diversification have cut real per capita income by more than 40% since the height of the oil boom in the early 1980s. Hyper-urbanization is breaking down the traditional social structure. A lack of relevant education, welfare and a weak work ethic, and dependence on foreign labor has left the Southern Gulf without new jobs for many of its young men and women. Direct and disguised unemployment are high, often in excess of 25%, in nations undergoing a youth explosion and where more than 60% of the population is under 25 years of age. There are no immediate signs of major political and social unrest in the Southern Gulf, but there are powerful structural problems.

- More than two decades have elapsed since the fall of the Shah of Iran. Much of the fervor of the Iranian revolution has been lost, and Iran has now established good or correct relations with all of its Gulf neighbors except Iraq. Democratic elections have brought a comparatively moderate president and Majlis to power, and Iran has improved its relations with Europe as well as the Southern Gulf. US-Iranian relations, however, remain tense over Iran's proliferation, opposition to US ties to the Southern Gulf states, opposition to the Arab-Israeli peace process, and support of violent anti-Israeli movements like the Hizbollah and Hamas. Iran remains a potential military threat, and its efforts to acquire nuclear weapons and missiles with IRBM and ICBM-like ranges may allow it to pose a future threat to Europe and the United States.

- Nearly a decade has elapsed since the Gulf War, and Iraq remains a hostile power. It is now contained by UN sanctions, and a strong British and US military presence in the Southern Gulf and Turkey. There is no practical prospect for normalized relations with Saddam Hussein and little near-term prospect that he can be removed from power. The UN inspection regime has effectively collapsed and the economic sanctions

regime is eroding. In part because economic sanctions have helped cause hardship for the Iraqi people and in part because of the need for Iraqi oil ensure moderate oil prices. Iraq almost certainly continues its efforts to develop chemical, biological, and nuclear weapons, and long-range missiles and has stocks of some chemical and biological weapons.

- The improvement in US bilateral military relations with the Southern Gulf states has not been matched by adequate improvements in either the individual national forces of the Southern Gulf countries, or in regional cooperation. While many individual force elements have improved, no Southern Gulf ally has established balanced, combat-capable forces focused on the necessary missions. Military progress within bodies like the Gulf Cooperation Council has been slow, and successes in areas like mine warfare have been offset by delays in developing cooperative air defense systems and a failure to organize the effective defense of the upper Gulf.

- The US advantage in conventional warfighting capability has led nations all over the world to examine forms of asymmetric warfare that might counter the advantages the US has gained from new military tactics, technology, and the "revolution in military affairs." While Iran and Iraq, and various extremist and terrorist movements have so far made only limited progress in this area, the US must increasingly adapt its forces to deal with the threat posed by asymmetric warfare.

- Proliferation is a growing regional threat. Iranian and Iraqi efforts to create chemical, biological, and nuclear weapons, coupled with their development of long-range missile forces have a potentially destabilizing effect on the region. This confronts the US with the need to try to restrain any new capabilities, find ways to encourage arms control, and develop counter-proliferation capabilities to deter the use of weapons of mass destruction and defend its forces and allies against such attacks.

- The US faces internal problems in funding the level of military capability it needs to remain a global superpower. Providing a forward presence in the Gulf and suitable power projection capabilities, are only parts of this larger problem. The fact remains that the US has far smaller forces than it had at the time of the Gulf War, and is still attempting to find the right level of defense spending and military capability to meet its commitments in the Gulf.

- The cutbacks in European power projection capability have been substantially more severe compared to those of the US. Britain, however, still maintains a significant presence in the Gulf. The European Defense Initiative may change this situation, but the US faces the need to redefine coalition warfare in ways that focus on real world power projection capabilities.

Key Issues the Next Administration Must Address

Some of these issues transcend US policy in the Gulf, and others must remain the responsibility of its Southern Gulf allies. The Arab-Israeli peace process is important to Gulf stability, and maintaining the US position in the Gulf, but it must be dealt with as a separate, issue for US policy. The US needs to recognize the demographic, economic, and internal political problems in the Southern Gulf, but the US cannot restructure the society and economies of its allies. The United States can only encourage its allies' own efforts towards internal reform.

The Need for an Effective US Energy Policy

The remaining security issues, however, have a direct and focused impact on US policy in the Gulf, and will force the US to make major changes in its policies over the next few years. One key area is the need for a more effective energy policy. The US needs to reexamine its growing dependence on Gulf energy and the security implications of that dependence. It needs to understand the broad trends that can affect regional stability, and to determine what, if anything, US policy can do to influence them.

There are four major issues US policy must address in order to develop an effective energy policy:

- *The strategic implications of the shifts taking place in world oil production, and in the shift in Gulf oil exports from a US and European-oriented market to one focused on Asia*. The increases that the US projects in Gulf exports indicate that the volume of Gulf oil exports will more than double by 2020, and that most of the increase in these exports must move by sea to Asia. The end result will be a far more fragile infrastructure for making these exports that will be even more important to the US and global economy.

- *The ability of our Southern Gulf allies to finance the massive increase needed in Gulf oil production capacity, while simultaneously addressing the growing economic problems they are encountering because of a major increases in population, declines in per capita oil wealth, and the failure to diversify their economies.* The free market may be able to provide the capital that the Southern Gulf needs, but the US may have to take a more proactive role in persuading the Southern Gulf states to make the required investments, allow foreign and private investment, reform and diversify their economies, and consider efforts to limit population growth.

- *The future role of Iran in the world oil market and its role in shaping Caspian energy exports*. The US has failed to persuade any other nation of the merits of the sanctions enforced in the Iran-Libya Sanctions Act, and the Act has had no impact on Iran's military expenditures and efforts to proliferate. The Act has succeeded, however, in making foreign investment in Iran's energy development slow and inefficient, and in blocking US investment and involvement in the development of Iranian oil and gas exports. The end result is a US policy that fails to achieve its military security objectives while limiting US ability to achieve its energy and economic objectives.

- *The future role of an Iraq in which Saddam Hussein or some similar figure may remain in power, and where major modifications may be needed to UN sanctions to allow major outside investment in Iraqi energy development.* This will present major problems for US policy because in may mean accepting the failure of UN efforts to force Iraq to cease proliferating, and finding new approaches to containing Iraq.

Iran and Iraq: The Need to Redefine Dual Containment

The US must change its security policies in the Gulf as well as its energy policies. This means a new approach to Iran and Iraq. "Dual containment" ceased to be an official slogan during the second Clinton Administration, but no clear policy replaced it. The next Administration must treat Iran and Iraq as two very different nations. The US needs to reexamine the political and security trends in each state, and how it should deal with each state in the future.

In the case of Iran, the US has good reasons to question its present sanctions policy, and to consider whether an economic opening to Iran could encourage both Iran's moderates and the development of adequate energy supplies. At the same time, it is far from clear that the US can eliminate the threat posed by Iran's proliferation, hostility to Israel, and support of violent extremist movements. The US will have to find a way to establish correct, if not friendly relations with Iran, but it will have to maintain a high degree of military containment as well.

The US has far fewer incentives to change its policy towards Iraq, but it may well be forced to do so. Economic sanctions have already eroded badly because of the hardships they have imposed on the Iraqi people, and the massive increases in Iraqi oil revenues under the UN oil-for-food program.

However, the present sanctions regime still does not ensure the welfare of Iraq's people, support its economic recovery and development, or ensure the development of its energy resources. Sanctions must be modified to fully relieve the plight of Iraq's people. At the same time, Iraq remains a major conventional military threat. The UN effort to eliminate Iraq's weapons of mass destruction has been effectively paralyzed since the spring of 1998, when UNSCOM was first expelled from the country.

The US has every reason to try to sustain UN efforts to reestablish an inspection regime to try to rid Iraq of its remaining capability to create weapons of mass destruction and long-range missiles, and to enforce sanctions that prevent Iraq from importing weapons and dual-use technology. At the same time such an effort may fail or be limited largely to controls on exports.

This makes it even more important to maintain a combination of US, Gulf, and European forces that can contain Iraq, and secure Kuwait, the Iraqi-Saudi border, and the Kurdish security area. The US also needs to find more effective ways to encourage a change in regime – which a means major changes in the Iraq Liberation Act.

The Need to Restructure US Military Capabilities in the Gulf

The US has already done much to create an effective military partnership with individual Southern Gulf states. It now needs to do everything it can to encourage them to cooperate more closely with each other, and to develop new approaches to coalition warfare that will give the Southern Gulf states the mission-oriented focus, training, sustainment, and interoperability to fight effectively along side with US forces.

More broadly, the US must continue to restructure its forces to minimize the US presence in the Gulf while maintaining and improving its ability to deploy to the region as quickly as possible. It must seek to develop a true coalition approach to conventional warfare, while recognizing the real-world limitations of its Gulf allies. It must adapt to the new risks posed by asymmetric warfare, and particularly to the range of new threats posed by proliferation. These threats extend far beyond the more traditional threats of missiles and nuclear weapons. The US must also be ready to deal with chemical, biological, and radiological attacks and cyberwarfare, and not only to defend its allies but the American homeland.

The Need to Remember the Gulf's Ties to Other Regions

US policy cannot consider the Gulf alone. If the US cannot achieve a full Arab-Israeli peace settlement, it must make every effort to do so and make a convincing case to the Arab world and Iran that it is making every possible effort to ensure a just settlement. This does not mean tilting on the Arab side, however the perception of being as "honest" a broker as a close ally of Israel can be is important. This means a full Presidential commitment to US engagement towards both Israel and the Palestinian Authority.

US policy towards the Gulf must take better account of three allies on the edge of the region. The US strategic relationship with Egypt is critical to the Gulf, as well as to cementing an Arab-Israeli peace. Egypt's prestige within the Arab world, military strength, and power projection capabilities make it a key partner in supporting moderate and friendly Gulf regimes. The next Administration must recognize the need to sustain aid to Egypt, but more than that, to continue to treat Egypt as a strategic partner.

Jordan is caught between Iraq and a hard place. It not only faces continuing problems because of the failure to reach a peace between Israel and the Palestinians, it must live with Iraq and the same time it defends its border against it. As is the case with Egypt., the US must seek to expand its strategic partnership and maintain the necessary flow of aid.

Turkey is a critical strategic partner in many ways. In the case of the Gulf, it serves as a buffer between the Gulf and Russia, and has a common border with Iran and Iraq. It is a secular example in a region where Islamic extremism is a continuing threat, it is a key basing area for US forces, and it has a major strategic interest in the future of the Kurds. US energy policy, and policy towards Iran and Iraq, must be reinvented in ways that take full account of Turkish interests.

In contrast, the US is over-engaged in the Caspian and Central Asia. The Clinton Administration involved the US in a new "Great Game" to obtain access to what were perceived as massive oil reserves, limit Russian influence, and prevent Iran from profiting from Caspian oil. In practice, Caspian and Central Asian energy reserves seem to be the size of a new North Sea at most, and will develop slowly. There is no reason to challenge Russia in its own backyard, particularly since Chechnya has shown Russia that it has little reason to reabsorb Islamic and non-Russian minorities.

"Pipeline politics" seem unlikely to hurt Iran's military efforts in any way, but they already interfere with the operations of US companies in the Caspian and Central Asia, create pointless

political antagonism in Iran and Russia, and attempt to legislate energy development in Turkey. US interests in the Caspian and Central Asia at most require the US to seek a level playing field for US companies in developing the region's energy resources. The best way for the next Administration to win the "new great game" is not to play it.

The US has only residual interests in the Red Sea area. Nevertheless, the Red Sea is a critical route for energy shipments from the Gulf. Saudi Arabia and Yemen are both Red Sea and Arabian states; additionally developments in Djibouti, Eritrea, Ethiopia, Somalia, and the Sudan can affect Gulf and energy security. The US may be best off leaving the area to its allies, and adopting a policy of benign neglect – rather than becoming over-involved in problems it cannot solve. It cannot, however, ignore the region.

India, Pakistan, and the Indian Ocean area are strategically important to the Gulf for three reasons. First, the India-Pakistan nuclear arms race is affecting proliferation in Iran and the Gulf. Second, Pakistan and Afghanistan are emerging as a far more important regional threat in terms of terrorism and Islamic extremism than Iran. Third, India and Pakistan are a major source of foreign labor in the Gulf. In fact there are more Indian and Pakistani workers in Qatar and the UAE than native Arabs. The US must continue to fight proliferation in India and Pakistan and the Pakistani and Afghan role in terrorism and Islamic extremism. At the same time, US naval and power projection forces must be sized so that it is clear that the US can ensure the smooth, secure flow of energy exports to Asia through the Indian Ocean.

II. The Problem of Energy and Energy Security

US strategic interests in the Gulf center on one key issue: The stable flow of energy exports out of the region at prices that sustain the global economy and encourage global economic growth. The US has important friends and allies in the region. They have supported the US in many foreign policy issues, they are important importers of US goods and investors in the US economy, and they have often been supporters in the Arab-Israeli peace process and the fight against terrorism. They share a common interest in fight aggression and preserving international law. The fact remains, however, it is energy which is America's overriding strategic interest.

Much if not most of the time, the US can rely on market forces to ensure the flow of energy at affordable prices. In fact, the US virtually abandoned serious efforts to shape a national energy and trade policy towards the Gulf during much of the 1990s. It focused on the military security of the Gulf, but paid little attention to energy prices and whether the Gulf would provide energy exports at the volume and price needed to meet world demand.

Since late 1997, however, energy prices have gone through a cycle of "bust and boom" that should force the US to reexamine its policy. An "oil crash" that began in late 1997 and which lasted until early 1999, cut prices to near record modern lows. In the process, it threatened to destabilize the economies of our Gulf allies and led to major cuts in investment in new energy facilities. This situation reversed within a few months in early 1999. A combination of underinvestment and understocking of oil made importers vulnerable to new and more effective production cutbacks by OPEC. The recovery of Asia and harsher winters greatly increased demand. Within roughly a year, oil prices rose from below $10 a barrel to well over $30.

The need to find some way to help the market establish more stable prices, however, is only part of the story. There are military and political threats to oil as well as market uncertainties. The first Arab oil embargo was attempted in 1967, and one dramatically succeeded in 1973-1974. The fall of the Shah of Iran and Iraq's invasion of Iran in 1979-1980 led to a new crisis. Oil

supplies and prices remained at risk throughout the eight years of the Iran-Iraq War, and the US was forced to fight a low-level "tanker war" against Iran in 1987-1988 to ensure the security of Kuwaiti and other Gulf oil exports. A new war and price crisis occurred when Iraq invaded Kuwait in 1990. Since that time, the US has twice had to deploy large numbers of troops to the Gulf to deter Iraqi pressure on Kuwait, and it was forced to launch a major air campaign against Iraq called "Desert Fox" in December 1998. To all intensive purposes, the US has been forced to deploy military forces to secure the flow of oil through Gulf for more than two decades.

There is no prospect that this situation will change in the near future. There is a near certainty that the world become steadily more dependent on Gulf oil for at least the next two decades. Important as market forces are, the US needs both an energy and a security policy that takes firm account of this fact.

The Gulf and the Importance of Oil Reserves

The Gulf is has long been an important energy exporter. This fact has shaped US policy since the 1930s, and has been a key factor in US security policy ever since the British withdrawal from the Gulf in the 1960s. The Gulf's role as a global energy importer is becoming far more important than it has been in the past, however, and US policy must react to this fact.

Two factors are driving the Gulf's sharply expanding strategic importance:

- *First, oil will retain its importance as a critical energy supply well beyond the period where energy analysts feel it is possible to make meaningful predictions.* While the Energy Information Agency (EIA) of the DOE projects that natural gas will be the fast growing source of energy during 1998-2020, rising at an annual rate of 3.2%, oil consumption will rise by 1.9% a year during this period. Oil will dominate transportation use of energy and will provide 38% of all energy use in quadrillions of British thermal units (Quads) in 2020. This compares with 39% in 1998. The reason that oil's share remains so high as a percent of total world energy consumption is a lower growth in coal, a decline in nuclear energy, and limited increases in renewables and other new sources of energy.[1]

- *Second, the sheer size of the region's oil reserves, particularly those in the Gulf.* In spite of nearly three decades of intensive exploration outside MENA since the oil embargo of 1974, the region now has a larger share of proven world reserves than it did in 1973. Its share of potential world reserves is even higher.[2] The Middle East and North Africa (MENA) as a whole have roughly 715 billion barrels of proven oil reserves, or a little over 68% of all the world oil reserves.[3].It is the Gulf, however, that

dominates the Middle East's role in world energy exports. It has about 675 billion barrels of oil and two-thirds of the world's proven oil reserves. [4] It is these oil reserves that give MENA the capability to make major increases in its oil production capacity and exports over the coming two decades.

Projected Increases in Gulf Oil Production

The importance of Gulf oil reserves is reflected in virtually every estimate of oil production including those of the U.S. Department of Energy (DOE), Organization of Petroleum Exporting Countries (OPEC), and the International Energy Agency (IEA) which has members from every OPEC country.

According to estimates by the Energy Information Agency (EIA) of the U.S. Department of Energy, the entire MENA region exported an average of 18.5 million barrels of oil a day (MMBD) in 1997. This was 35% of the world total of 53.2 MMBD. The DOE projects that total MENA oil exports will rise sharply to 39.1 MMBD by 2020. This will be 75.85% of the estimated world total of 51.6 MMBD.[5] It will also be an increase of more than 110% over the average current level of exports, and a near doubling of the share of total world exports The reference case estimates of the EIA calls for total MENA oil production capacity to increase from 27.1 MMBD in 1998 to 48.1 MMBD. This is a projected rise from 34% of total world capacity in 1998 to 42% in 2020.[6]

The DOE projects that Gulf portion of these oil exports will reach 36.4 MMBD by 2020. This will be 70.5% of the estimated world total of 51.6 MMBD.[7] It will also be an increase of more than 120%. The key to this rise will be a rise in Gulf production capacity from 18.7 million barrels per day (MMBD) in 1990 and 24.0 MMBD in 1998, to 28.0 MMBD in 2005, 31.4 MMBD in 2010, 36.9 MMBD in 2015, and 44.8 MMBD in 2020. [8]

These same estimates project that Gulf oil production capacity of 87% between 1998 and 2020. They also mean that Gulf oil production capacity would rise from 30% of total world capacity in 1998 to 39% in 2020, and that the Gulf would be virtually the only region in the world which will be able to keep its total oil production capacity substantially above its actual level of

production.[9] In contrast, the shift in production capacity in the other MENA states in the Levant and North Africa will be very different. There is a projected rise from 2.8 million barrels per day (MMBD) in 1990 and 2.9 MMBD in 1998, to 3.6 MMBD in 2005, and 3.9 MMBD in 2010. Production capacity will then drop to 3.7 MMBD in 2015, and 3.5 MMBD in 2020, [10]

As part of this increase, the EIA projects striking increases in the oil production capacity of key Gulf states.

- Saudi Arabia is the lynchpin of world oil production. Its capacity is estimated to increase from 11.4 MMBD in 1998 to 22.1 MMBD in 2020, a 94% increase.
- Kuwait's capacity is estimated to increase from 2.6 MMBD in 1998 to 5.2 MMBD in 2020, a 100% increase.
- The UAE's capacity is estimated to increase from 2.7 MMBD in 1998 to 5.1 MMBD in 2020, an 89% increase.
- Two potentially hostile and sanctioned Gulf states are also projected to make major increases. Iran's capacity is estimated to increase from 3.9 MMBD in 1998 to 5.5 MMBD in 2020, a 40% increase.
- Iraq's capacity is estimated to increase from 2.8 MMBD in 1998 to 6.2 MMBD in 2020, a 120% increase.[11]
- Developments outside the Gulf are far less important. Algeria's capacity is estimated to increase from 1.3 MMBD in 1998 to 2.2 MMBD in 2010, but drop to 2.0 MMBD in 2020. Libya's capacity is estimated to increase from 1.5 MMBD in 1998 to 1.7 MMBD in 2010, but drop back to 1.5 MMBD in 2020.[12]

The Gulf and the Flow of Oil Exports

The projected increases in Gulf oil production capacity are vital to the world economy. They will only rise to meet world demand, however, if there also is a secure and constant flow of exports from the Gulf, and if these exports expand steadily at the rate dictated by world economic growth.

Gulf oil exports are measured in different ways, and estimates differ according to source. According to BP Amoco, they increased from a recent annual average low of 13.4 million barrels a day in 1989 to 18.3 million barrels a day in 1999. These totals included 15.9 million barrels a day worth of crude and 2.4 million barrels worth of product.[13]

Production levels vary over time, however, for a variety of reasons. For example, the EIA estimates that Gulf countries exported 16.3 million barrels per day of oil in 1999. This represented a decrease of about 0.8 million barrels per day from 1998. Production cuts announced by OPEC in March 1999 accounted for much of this decline. Iraqi exports, however, rose substantially, from 1.7 million barrels per day in 1998 to 2.1 million barrels per day in 1999. Iraq's exports under the "oil for food" exemption to United Nations sanctions were not covered by the OPEC cutbacks. The OPEC production cuts were reversed in March 2000, with quotas returned to their previous levels, and raised back to their 1998 levels in September 2000. [14] Gulf countries (Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates) produced over 27 percent of the world's oil in 1999. Persian Gulf net oil exports to OECD countries declined to 9.8 million barrels per day in 1999 from 10.5 million barrels per day in 1998, but rose again in 2000 as the global economy recovered and expanded.[15]

The US demand for Gulf oil also varies over time. The EIA reports that U.S. net oil imports from the Gulf peaked in 1977 at 2.45 million barrels per day. They reached a 25-year low of 0.31 million barrels per day in 1985, and then rose to 1.97 million barrels per day in 1990. They rose from 2.13 million barrels per day in 1998 to 2.42 million barrels per day in 1999. More oil was imported to the United States from the Gulf than in any year since 1977. [16]

The vast majority of these imports came from Saudi Arabia (60 percent), with significant amounts from Iraq (29 percent) and Kuwait (10 percent). Only small amounts came from Qatar and the United Arab Emirates. The increase in exports to the United States was largely due to an sharp increase in exports of Iraqi crude to the United States in 1999, and Saudi efforts to expand market share in the United States in an environment of OPEC production cuts. [17]

Direct US imports from the Gulf are a still relatively limited part of total US imports. They totaled less than 1.1 MMBD of crude and product in 1974, when the oil embargo began. They reached a high of 2.MMBD in 1977, then dropped to an average low of only 311,000 barrels per

day in 1985. Since that time, they have risen from around 1.6 MMBD in 1997 to 2.1 MMBD in 1998, and 2.4 MMBD in 1999.[18] To put these figures in perspective, total US imports were 6.3 MMBD in 1973, 6.9 MMBD in 1980, 8.0 MMBD in 1990, 8.8 MMBD in 1995, and 10.6 MMBD in 1999.

Nevertheless, the Gulf provides roughly one-quarter of the steadily increasing level of US oil imports, which have had a recent annual cost approaching of 700 million dollars.[19] Cuts in US domestic production will also increase US dependence on imports over time. Domestic US crude oil production has recently ranged between 5.8 and 6.2 MMBD, down from averages of well over 9 million barrels in 1973, with an additional 1.6-19 million barrels per day of natural gas plant liquids.[20] The EIA projects that Gulf oil exports to North America as rising from 2.3 MMBD in 1997 to 4.4 MMBD in 2020.

What is more important in strategic terms is that estimates of direct imports scarcely reflect the true strategic importance of Gulf oil to the US. Oil is a globally traded commodity and the U.S. must pay the same globally-determined price as any other nation, and the U.S. has a treaty commitment to share all available imports with other OECD importers in a crisis, under the monitoring of the International Energy Agency. As a result it will be affected by the price rise triggered by any interruption in the supply of Gulf oil and have to share the remaining pool of oil with its allies.

Equally important, the U.S. economy is dependent on the overall health of the global economy and is heavily dependent on energy-intensive imports from Asia and other regions. Western Europe's oil imports from the Gulf increased significantly as a percentage of oil demand had in 1997 and 1998, before falling in 1999, when Europe imported 3.3 million barrels per day. This was a decrease of about 0.7 million barrels per day from 1998. The largest share of Persian Gulf oil exports to Western Europe came from Saudi Arabia (40 percent), with significant amounts also coming from Iran (over 28 percent), Iraq (over 24 percent), and Kuwait (7 percent).[21]

Japan imported nearly 4.1 million barrels per day from the Gulf in 1999. Japan's dependence on the Gulf for its oil supplies increased steadily from 1988 to 1997. In 1988, Persian Gulf oil imports represented only 57 percent of Japanese oil demand. They reached a peak of 75 percent in 1997-1998 and dipped to 73 percent in 1999 figure. In 1999, almost a third of Gulf exports to Japan came from the United Arab Emirates (31 percent), and nearly one-third coming from Saudi Arabia (30 percent).[22]

Gulf exports to Western Europe are projected to rise from 5.4 MMBD to 5.8 MMBD, while exports to Asia are projected to rise from 9.5 MMBD to 19.9 MMBD. MENA oil exports will maintain Europe's trading economy and be the key to Asia growth.[23] In this case, what comes round literally means that oil must go round.

Furthermore, Gulf oil will be of even more importance to the world economy if problems occur in the exports of other troubled regions. The exports of the FSU are projected to rise from 2.8 MMBD in 1997 to 8.3 MMBD in 2020, North Africa is projected to rise from 2.3 MMBD to 2.7 MMBD, and West Africa from 1.8 MMBD to 2.0 MMBD. [24] The risk of some event in one country in these three regions resulting in a significant interruption in oil production is at least as high as the risk in an interruption in exports from the Gulf.

One of the many problems in US energy policy is that the US does not officially recognize the importance of its indirect imports, although it is clear that Gulf oil is already critical to US's main sources of manufactured goods in Europe and Asia and will come steadily more important with time. All US data on energy imports is measured only in terms of direct imports. Such estimates are obsolete and misleading, but no recent Administration has cared enough to correct this critical omission in the basic data it uses for planning.

The Cost of a Major Gulf Interruption in Exports or Oil Embargo

The US does produce estimates of the more limited impact an interruption in the flow of direct imports could have on the US economy. The US is less sensitive to the price impacts of increases in energy prices than it was in the past. Energy accounted for 14% of the US GDP in 1981 and only 7% in the mid-1990's. The share of petroleum fell to only 3%. As a result, even $30 oil adds only about 0.5% in terms of direct increases to the US consumer prince index and lowers GDP growth by around 0.5%.[25]

Put differently, the EIA estimates that oil prices increase by $3-5 per barrel for every disruption of one million barrels per day of oil, and that the growth rate of the U.S. Gross Domestic Product growth rate is reduced by between 0.3-0.5 percentage points by such a disruption. In other words, if U.S. GDP is expected to increase and a 3.0 percent or one million barrel per day oil supply disruption occurred, the U.S. GDP would be expected to grow by only 2.5-2.7 percent (a reduction of 0.3-0.5 percentage points).[26]

These estimates, however, cannot anticipate the political and panic effects of a crisis on oil prices and the global economy, and it is important to note that the historical swings in oil prices have been very, very sharp in response to various crisises. For example, oil prices rose from around $10 a barrel before the 1973-1974 oil embargo to levels of $30-35 a barrel in constant 1998 dollars, and stayed there until 1978. The Iranian revolution and Iran-Iraq War led them up to peaks of $60-65 a barrel in 1980-1981, only to have them skid down to levels averaging $20-24 a barrel from 1986-1997. The sudden economic collapse in East Asia and the resulting "oil crash" led them to levels close to $10, only to rise to over $30 in mid-2000.[27]

Gulf-wide political embargoes do not seem likely today. Iran and the Arab oil-exporting states need to maintain their cash flow, and the Southern Gulf states have shown only limited solidarity with the Palestinians since Arafat supported Iraq in 1990. Even in 1974, the "embargo"

led the world market to rapidly increase production in other areas, and the crisis was caused as much by the world's inability to track the available oil supply in real time as by any actual shortfall in supply. This situation has been largely resolved by improved tracking and reporting after a less intensive crisis following the fall of the Shah of Iran. Neither the "tanker war" between Iran and Britain and the U.S. in 1987-1998, or the Gulf War in 1990-1991, led to critical price rises or hoarding.

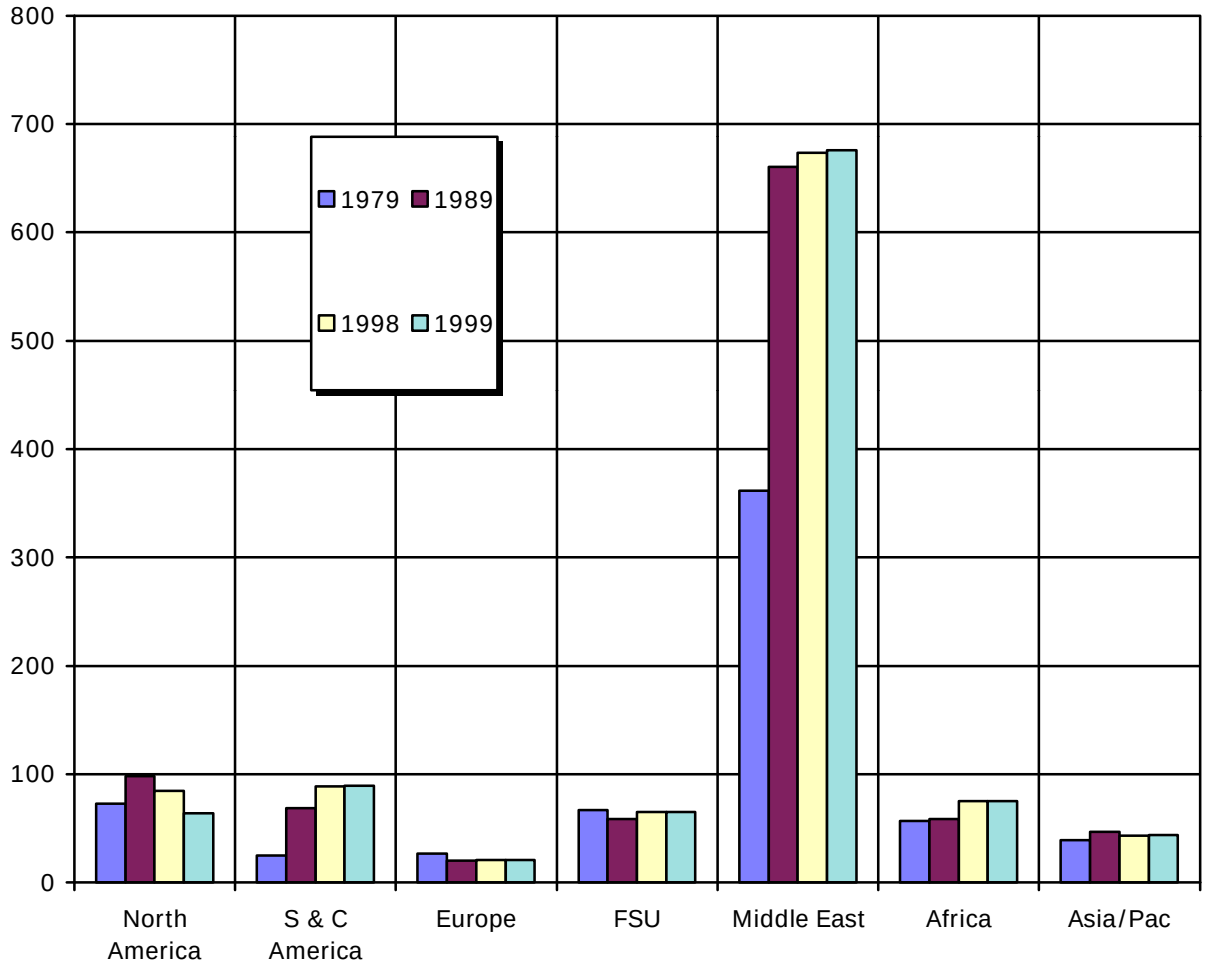
It is important to note, however, that regional conflicts do present a risk of major military disruptions. Iran is focusing its limited defense resources on improving its capability to threaten traffic through the Gulf and develop weapons of mass destruction. Iraq is almost certain to reemerge as a mid- to long-term threat to the moderate Gulf states and the West, equipped with long-range strike systems and weapons of mass destruction.

The mid to long-term impact of any such disruptions in the flow of Gulf oil will also become steadily more important in the future. Current EIA projections indicate that global economic dependence on Gulf oil will more than double during the coming decade, and any major interruption would then probably trigger a global economic crisis. By 2005-2010, the Gulf may also be a region with enough weapons of mass destruction to create interruption scenarios that are far more serious than those Iran or Iraq might create today.

Figure I-1

The Sustained Importance of Gulf Oil Reserves: Shifts in the Regional Balance of Global Oil Reserves

(Billions of Barrels)



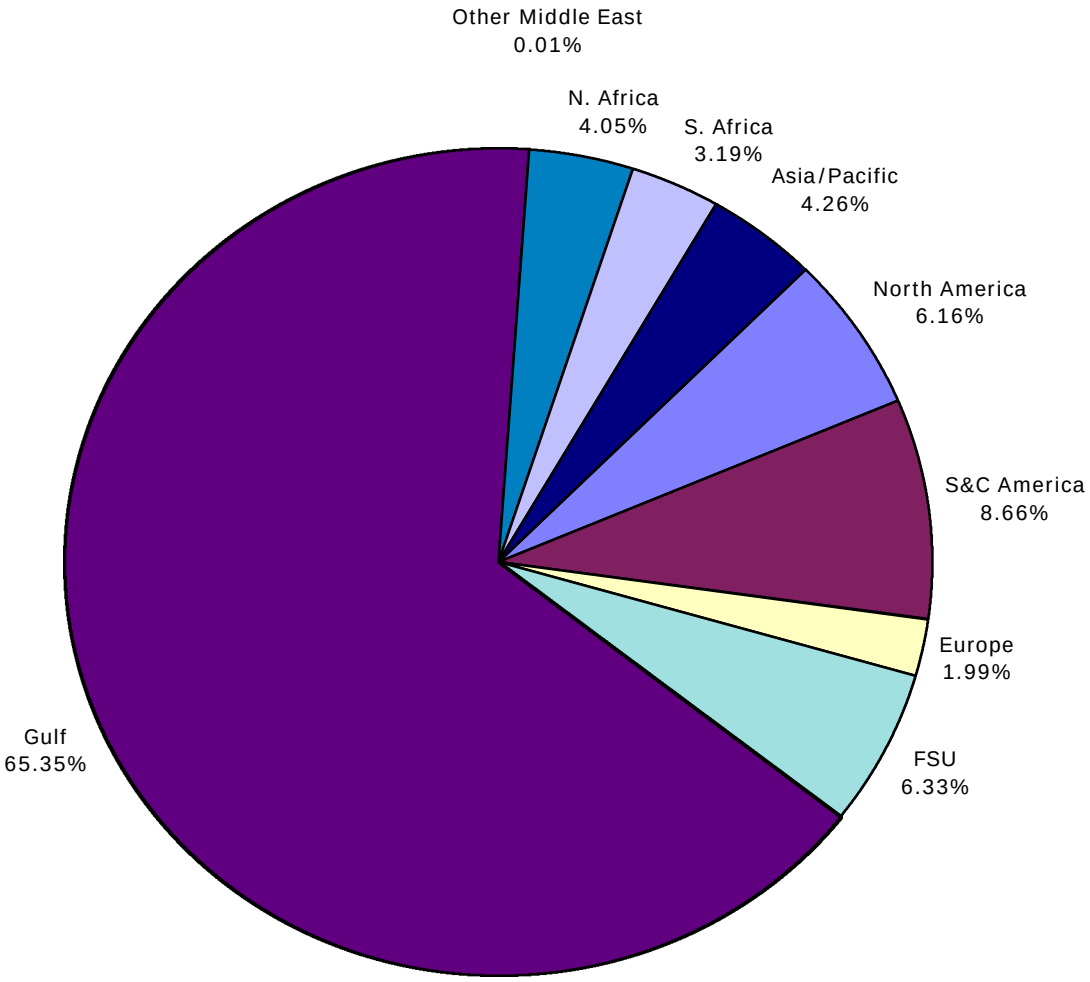
1979	73	25.2	26.6	67	361.8	57.1	39.4
1989	98.4	68.7	20.5	58.4	660.3	58.8	46.6
1998	84.7	89	20.8	65.4	673.6	75.4	43.1
1999	63.7	89.5	20.6	65.4	675.7	74.9	44

Source: Oil and Gas Journal, and BP Statistical Review of World Energy, 2000, p. 4.

Figure I-2

The Gulf Dominates Future Oil Supply: World Oil Reserves by Region as a Percent of World Total

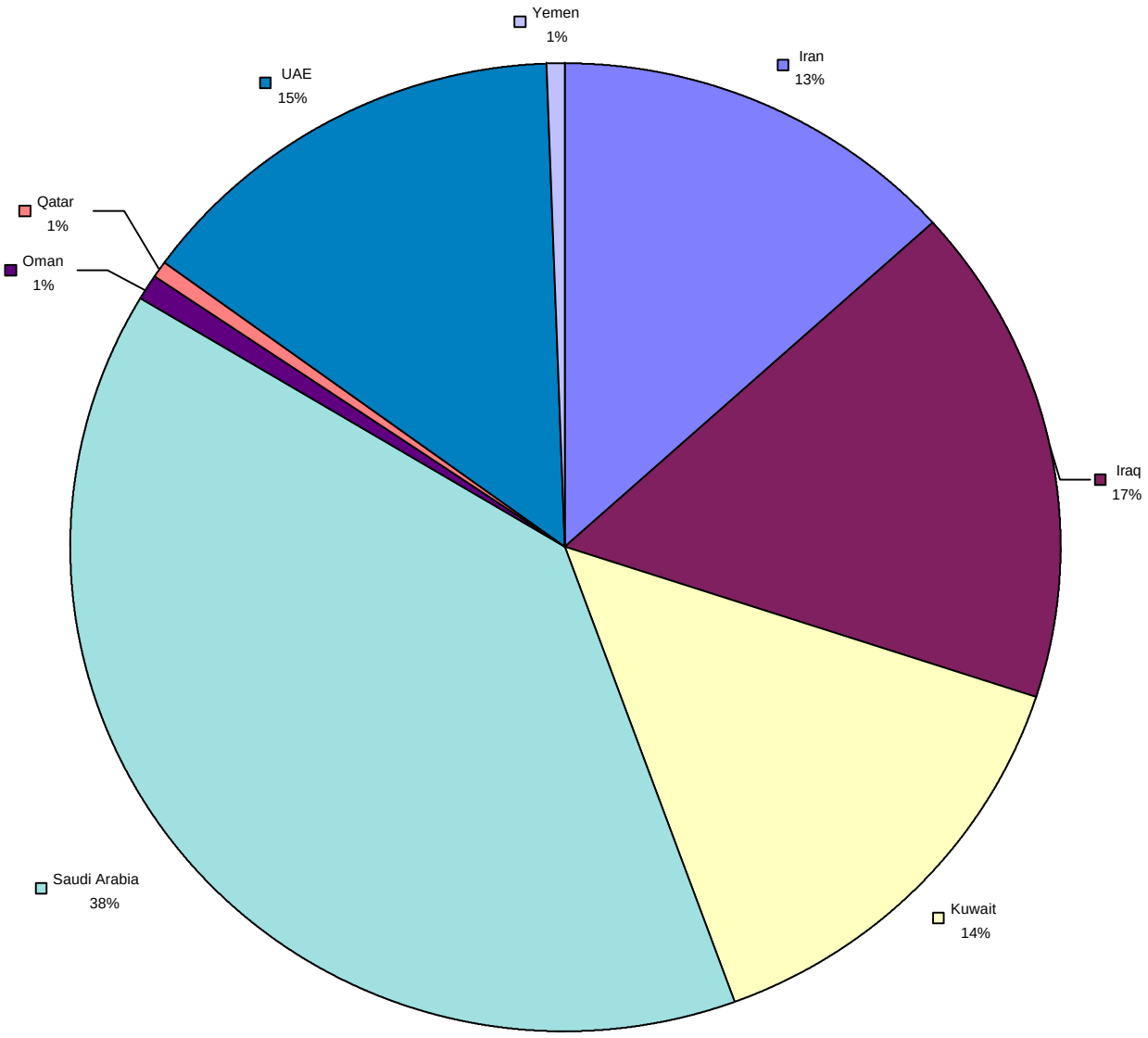
(Based on Oil and Gas Journal Forecast for a World Total of 1,052.9 billion barrels)



Source: Oil and Gas Journal, and BP Statistical Review of World Energy, 2000, p. 4.

Figure I-3

Country Shares of Gulf Oil Reserves
(in Percent of Total)

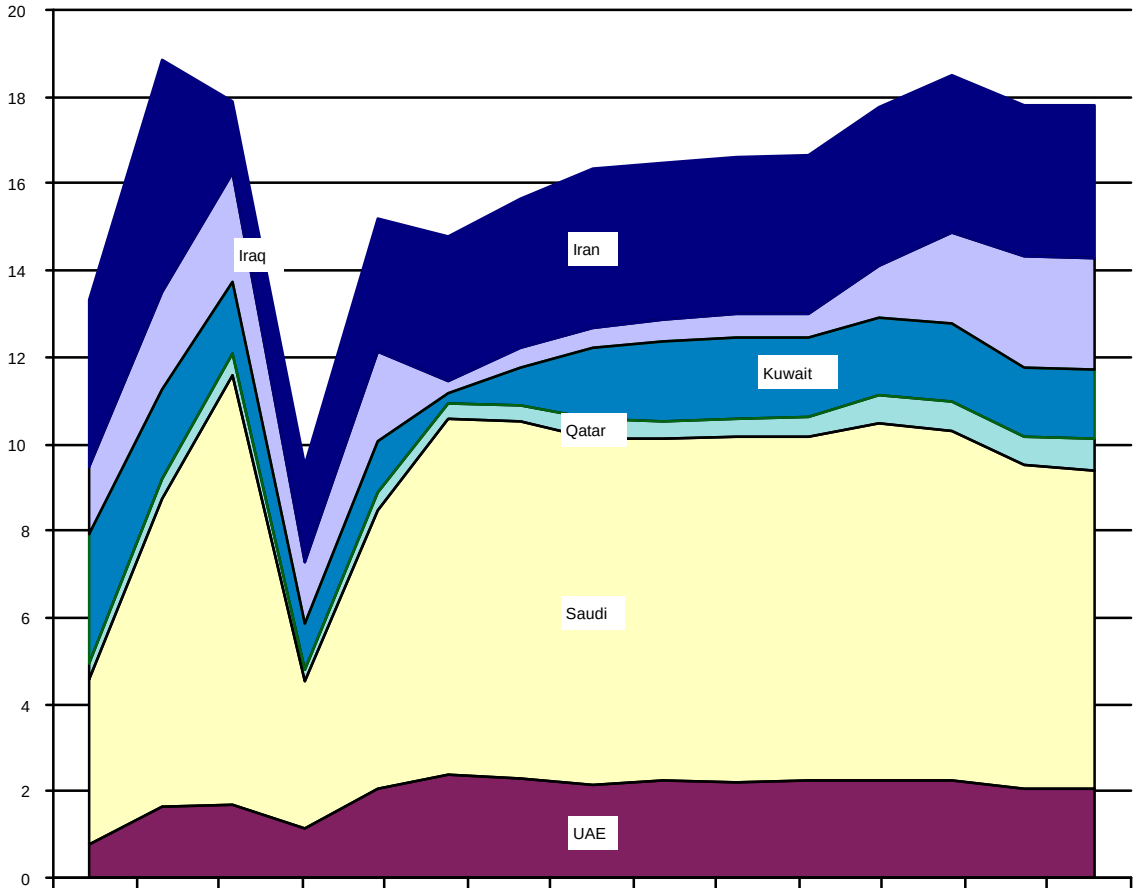


Source: BP Amoco Statistical Review of World Energy, 2000, p.4.

Figure I-4

CEA Estimate of Historical Trends in Gulf Oil Production: 1970-1997

(In Millions of Barrels per Day)



	1970	1975	1980	1985	1991	1992	1993	1994	1995	1996	1998	1999	Jan-
Iran	3.83	5.35	1.66	2.25	3.33	3.43	3.65	3.61	3.65	3.67	3.6	3.48	3.5
Iraq	1.55	2.26	2.51	1.43	0.3	0.43	0.44	0.51	0.55	0.57	2.11	2.55	2.6
Kuwait	2.99	2.08	1.66	1.02	0.19	0.86	1.69	1.83	1.84	1.81	1.8	1.62	1.6
Qatar	0.36	0.44	0.47	0.3	0.39	0.4	0.42	0.4	0.45	0.49	0.66	0.64	0.7
Saudi	3.8	7.08	9.9	3.39	8.18	8.23	7.96	7.9	7.94	7.91	8.07	7.42	7.35
UAE	0.78	1.66	1.7	1.13	2.39	2.28	2.17	2.22	2.2	2.23	2.25	2.08	2.05

Adapted by Anthony H. Cordesman from Cambridge Energy Associates, World Oil Watch, 2000, Cambridge,, Mass., 2000, p. 26.

*Pre-1992 data: CEA, World Oil Trends, 1998, Cambridge, Mass., 1998, pp. 26-27. After 1992: the IEA, Oil Market Report, May 11, 2000. p. 45.

Gas Reserves and Exports

The story concerning the Gulf's role in global gas exports is less dramatic, but still important. Total global consumption of natural gas is projected to rise from 83.9 Quads in 1998 to 173.3 Quads in 2020, an increase of 106%.[28] The Gulf has some 49.5 trillion cubic meters of reserves, or roughly 34% of the world total. If other Middle Eastern states like Egypt, Algeria, and Libya are added to this total, they provide another 241.3 trillion cubic meters of gas, or 4.7% of the world's proven gas reserves, raising the total to 38.7%.[29]

At present, the Gulf and the Middle East are relatively small gas exporters. Oman is the only Gulf nation with significant pipeline and ships only utilizes 1.5 billion cubic meters out of the world's pipeline capacity of 360.51 billion cubic meters. Algeria is a much bigger pipeline shipper, but still ships only uses 33.7 billion cubic meters, about 9% of world supply. [30]

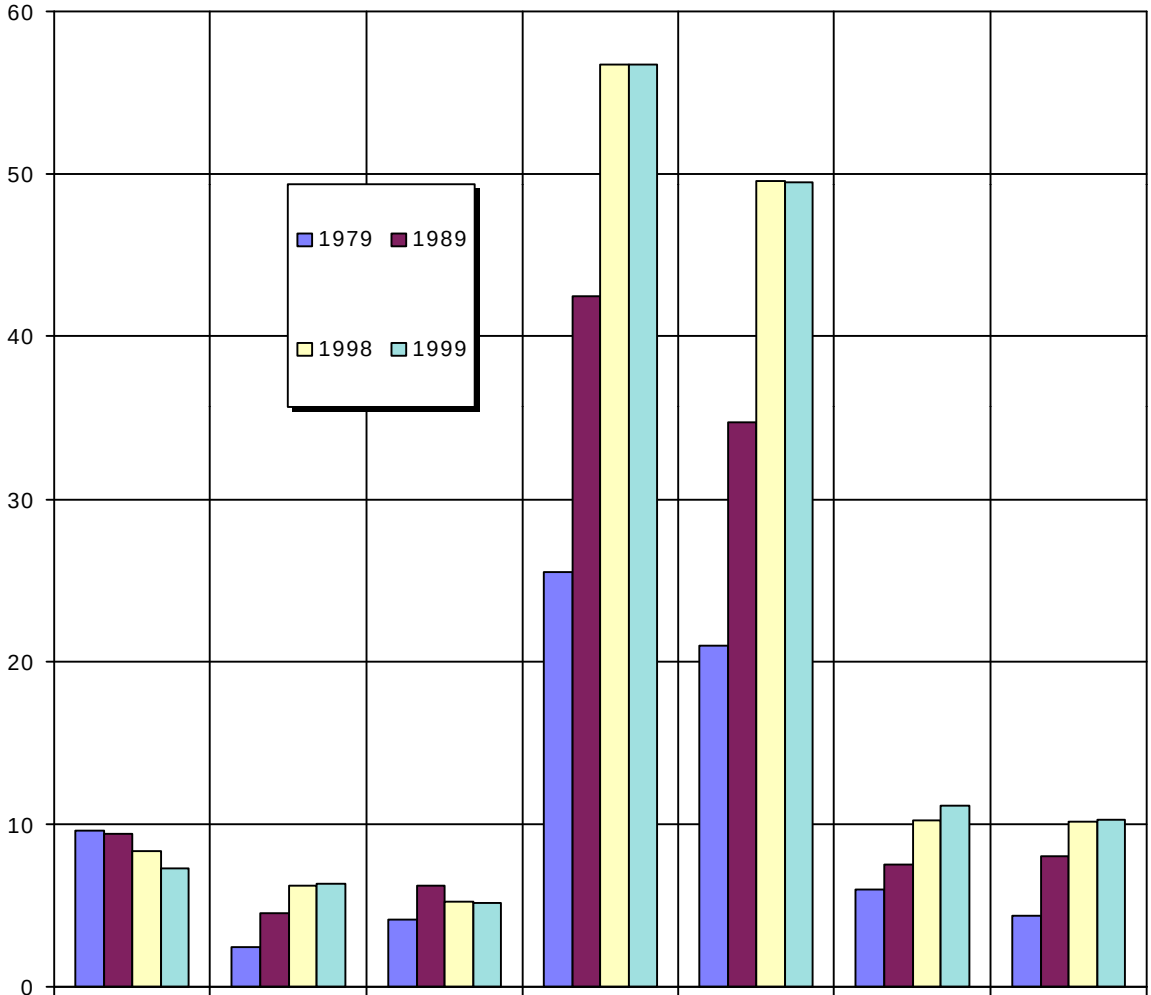
The world LNG trade totals around 124 billion cubic meters. Qatar and the UAE are the only major Gulf shippers. Qatar now ships 8.13 billion cubic meters – roughly 7% of the world total – and the UAE ships 7.1 billion cubic meters – roughly 6% of the world total. Algeria and Libya are more significant. Algeria now ships 25.76 billion cubic meters – roughly 21% of the world total – and the Libya ships 0.96 billion cubic meters – less than 1% of the world total. Taken as a whole, the Gulf accounts for 16.73, or 3.5% of the total world gas exports of 484.71 trillion cubic meters. The Middle East accounts for 76.1 trillion cubic meters or 15.7% of world exports.[31]

The future, however, is likely to be a very different story. Gulf gas reserves are so large that nations like Iran, with the world's second largest reserves of 812.3 TCM, are major potential exporters. Qatar as at least 300 TCM and already plans to be a major exporter. The UAE has 212 TCM and Saudi Arabia has 204.5 TCM and both plan to steadily increase their exports in the form of petrochemicals and feedstocks. Oman plans to expand its exports although it has only

26.4 TCM of proven reserves. Algeria has 159.7 TCM, Egypt has 35.2 TCM, and Libya has 46.4 TCM; all plan to increase their gas exports.[32]

Figure I-5

The Growing Role of the Middle East and Gulf in the Regional Balance of World Gas Reserves: 1979-1999
(Trillions of Cubic Meters)

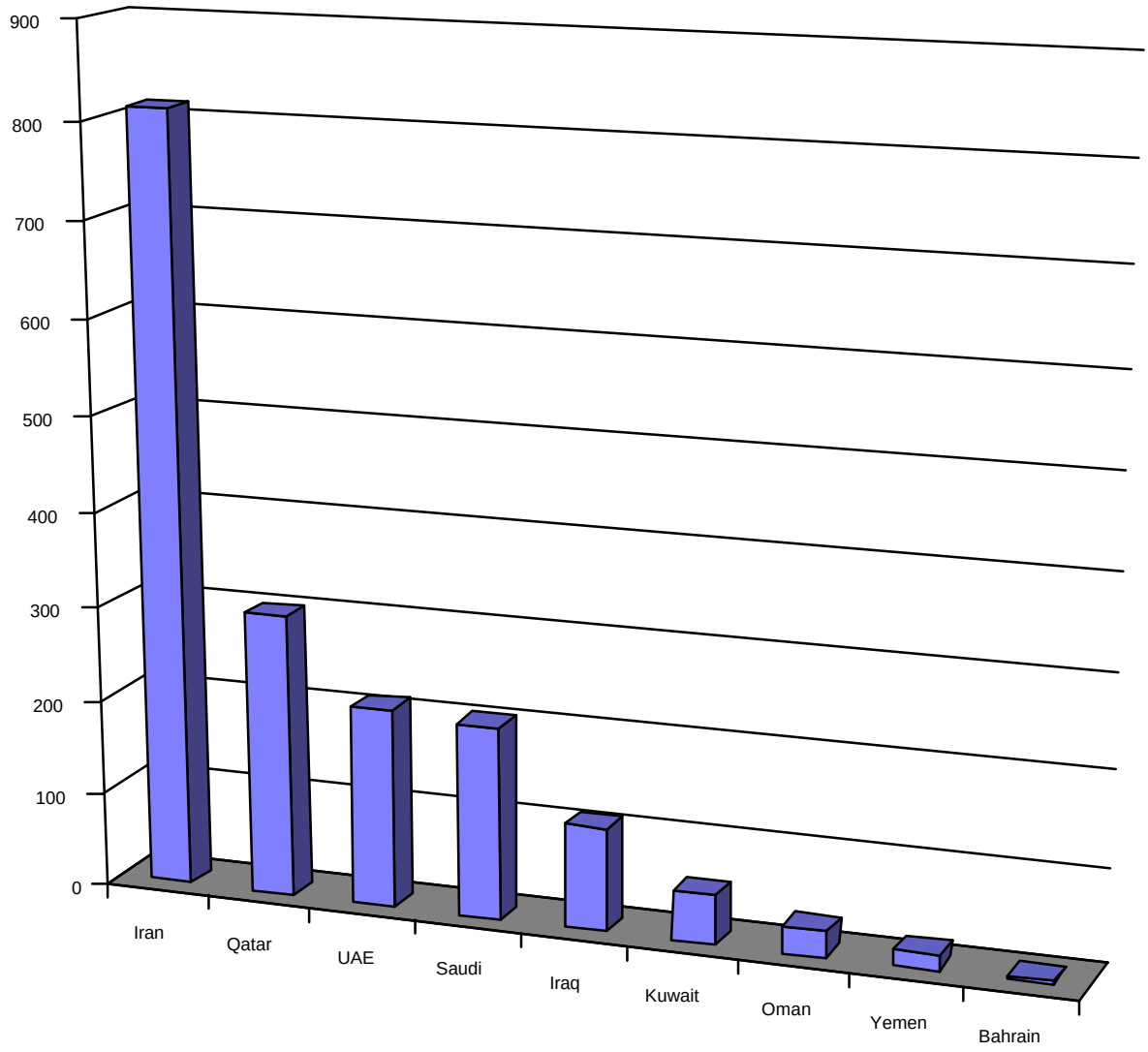


	North America	S & C America	Europe	FSU	Middle East	Africa	Asia/Pac
1979	9.58	2.42	4.13	25.48	20.95	5.96	4.35
1989	9.42	4.54	6.18	42.47	34.72	7.55	8.03
1998	8.35	6.21	5.21	56.7	49.53	10.22	10.17
1999	7.31	6.31	5.15	56.7	49.52	11.16	10.28

Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 2000, p. 20.

Figure I-6

The Importance of Gulf States in Terms of Proven World Gas Reserves by Nation
(Trillions of Cubic Feet in Reserves)

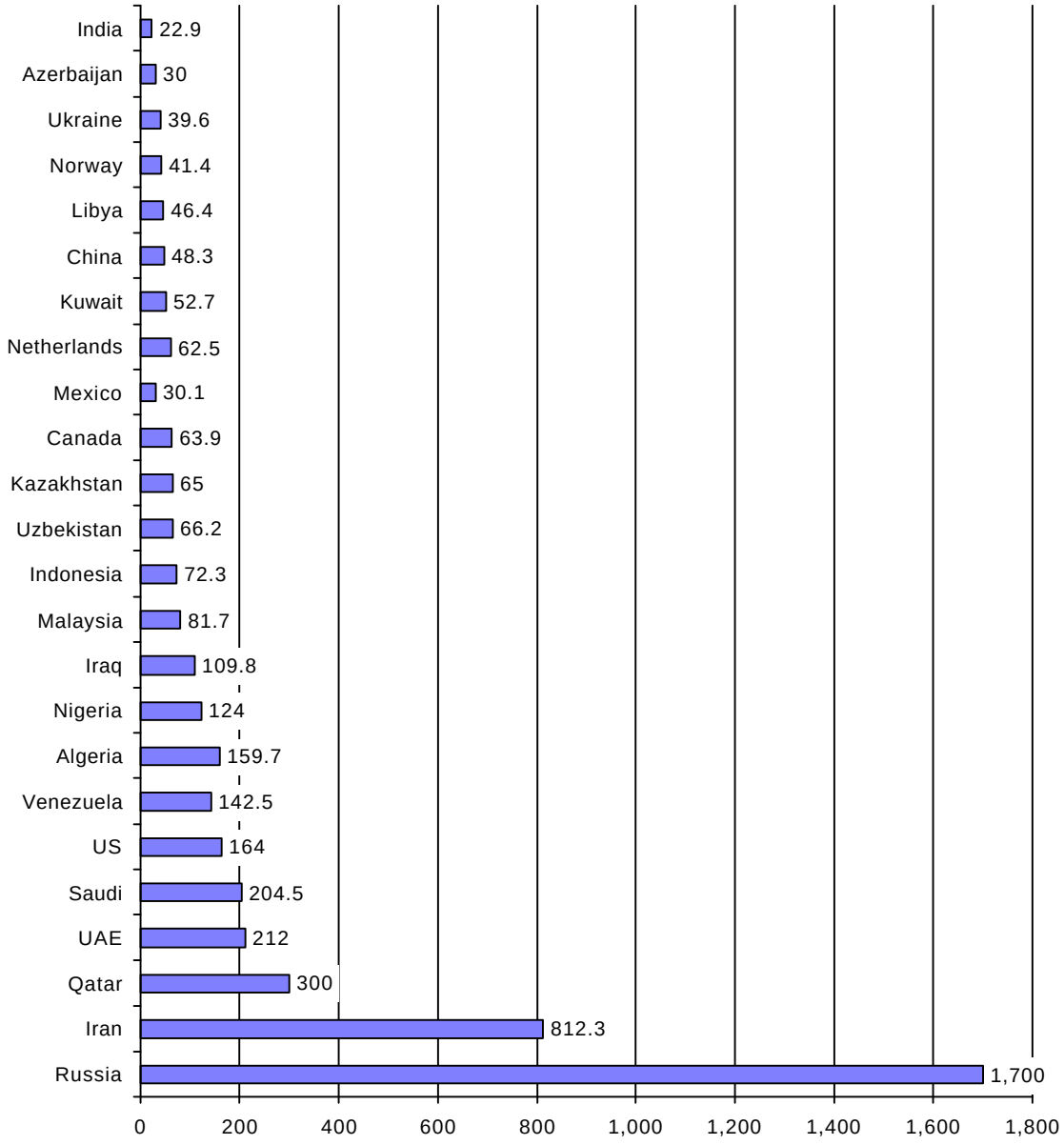


	Iran	Qatar	UAE	Saudi	Iraq	Kuwait	Oman	Yemen	Bahrain
Reserves in TCF	812.3	300	212	204.5	109.8	52.7	28.4	16.9	3.9

Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 2000, p. 20.

Figure I-7

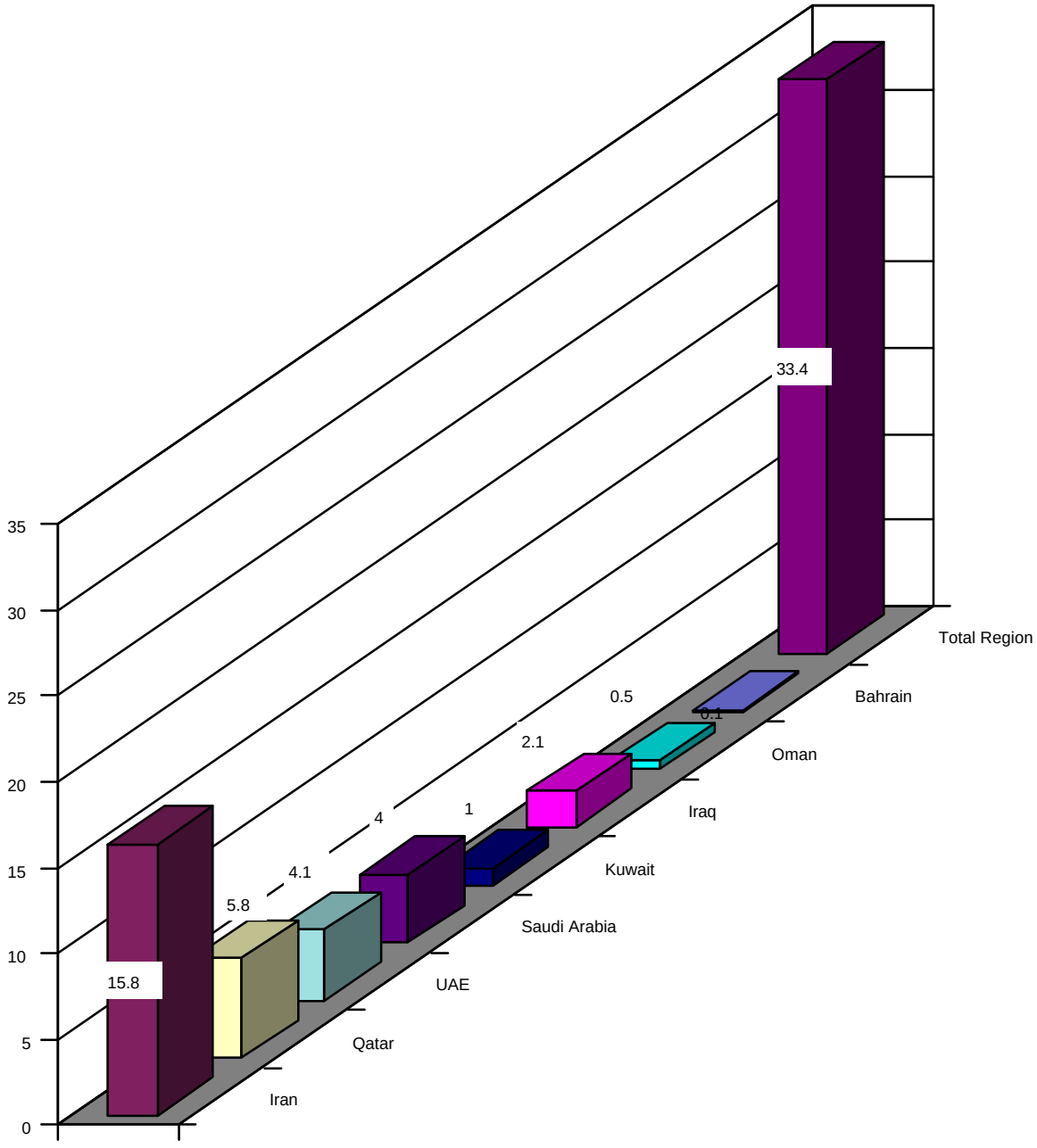
Percent of Total Gulf Reserves in Each Gulf Nation



Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 2000, p. 20.

Figure I-8

Proven Gulf Gas Reserves as Percent of Total Proved World Gas Reserves



Source: Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 2000, March 2000, DOE/EIA-0484(00), Reference Case, p. 46. Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 2000, p. 20.

Energy Exports and Security

The basic forces driving Middle Eastern energy exports will be a combination of the policies of the individual exporting nations and market forces. In most cases, the global economy will shape most of the decision making by exporting states in regard to maintaining and expanding production capacity, the actual volume of exports, and price. It is dangerous, however, to rely on market forces as a substitute for a more comprehensive energy policy:

- There will be a natural division of interest between those nations desperate to maximize their own revenues and those interested in creating a stable, high level of demand for oil. In general, states will invest only to maximize oil revenues, not out of any theoretical considerations about the global need for energy.

- Not every exporting state will be willing to let the market decide. Iraq's invasions of Iran and Kuwait are the most blatant examples of sheer greed transformed into aggression, but states desperate to maximize revenue will also seek political ways to limit the production of other states. The need for outside and regional efforts to protect those moderate states willing to rely on market forces from political pressure and aggression will be just as great in the future as in the past.

- Violent swings in oil prices and revenues of the kind that took place between 1997 and 2000 serve no one's interest. Very low prices mean the region's chronic economic problems encourage instability and prevent adequate investment in meeting future demand. Very high prices encourage importers to turn to other sources of energy and reduce demand, and have a backlash effect in slowing economic and budget reform in the exporting nations. The idea of seeking a stable spread of prices without gross interference in the market benefits producer and consumer alike. It also allows the region to move towards a more stable form of economic development.

- The massive increases in oil and gas production and exports just outlined present another case for economic reform. Subsidized domestic oil and gas prices are a strong incentive for high levels of inefficient demand that reduces the levels available for export.

- These same massive increases will also affect the level of military security required to protect Gulf oil production and exports. Not only does nearly twice the oil and gas have to move with constant on-time predictability, most of the increase will have to move by sea and out of the Persian Gulf towards Asia. Barring the development of massive new oil ports in Iran, on the coast of Oman, or in the Red Sea, the problem of vulnerability and chokepoints will increase radically as a result of globalization.

It is important to note that geography creates several problems for Gulf security that can only be secured by the US power projection capabilities.[33] The Strait of Hormuz lies between Iran and Oman and connects the Persian Gulf with the Gulf of Oman and the Arabian Sea. A recent EIA study of strategic chokepoints notes that over 15 million barrels of oil per day flow through

the Strait to Japan, United States, and Western Europe. The EIA calls it the "world's most important oil chokepoint," and it consists of two mile wide channels for inbound and outbound tanker traffic, as well as a two mile wide buffer zone. Any closure of the Strait of Hormuz would require use of longer alternate routes (if available) at increased transportation costs. Such routes include the five million barrels/day capacity Petroline and the Abqaiq-Yanbu natural gas liquids line across Saudi Arabia to the Red Sea, but there is no alternative route that can move all of the oil that passes through the strait and the amount of oil coming out of the Gulf will increase sharply in the future.

The Bab el-Mandab is another Strait near Djibouti, Eritrea, and Yemen that connects the Red Sea with the Gulf of Aden and the Arabian Sea. Roughly 3.3 million barrels of oil per day flow though the Bab el-Mandab to Europe, the United States, and Asia. Closure of the Bab el-Mandab could keep tankers from the Persian Gulf from reaching the Suez Canal/Sumed Pipeline complex, diverting them around the southern tip of Africa (the Cape of Good Hope). 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 el-Mandab. The EIA estimates that the Bab el-Mandab could be bypassed by utilizing the East-West oil pipeline, which traverses Saudi Arabia and has a capacity of about five million barrels/day. However, southbound oil traffic, which totaled about 1,000,000 barrels/day in 1997, would still be blocked. In addition, closure of the Bab el-Mandab would effectively block non-oil shipping from using the Suez Canal, except for limited trade within the Red Sea region.

The Suez Canal and Sumed Pipeline through Egypt connect the Red Sea and Gulf of Suez with the Mediterranean Sea. About 3.1 million barrels a day flow through this route. The Sumed Pipeline transports 2.4 million barrels/day of crude oil northbound (2.2 million barrels/day from Saudi Arabia and Iran). The Suez Canal transports 0.7 million barrels/day. Like the closure of the Bab el-Mandab, closure of the Suez Canal and/or Sumed Pipeline would also divert tankers

around the southern tip of Africa (the Cape of Good Hope), adding greatly to transit time and effectively tying up tanker capacity.

Implications for US Energy Policy

The US has long recognized that any nation that achieved hegemony over the Gulf, that interfered with the overall flow of Gulf exports, or that produced sustained increases in the price of energy exports threatened its vital strategic interests. It has sought to develop a stable military balance of power in the Gulf ever since Britain announced its withdrawal from the region in the 1960s, and has actively deployed military forces in the region for nearly a quarter of a century.

An effective energy policy, however, requires more than providing military security and relying on market forces:

- *The US needs far more precise estimates of the global demand for Gulf oil exports and of the ability of Gulf nations to meet this demand*. Its current plans are based more on estimates of the demand for oil than the plans of Gulf states to develop the necessary production capacity and export facilities and actually produce and export at the required rates. The US may be able to rely on market forces to accomplish most of the required increase, but it must be certain that the increase will take place and have contingency plans to provide the necessary incentives and diplomatic dialogue with our Gulf allies.

- *The US needs to rethink its approach to evaluating import dependence*. It needs to analyze this dependence in terms of both direct and indirect exports, and the overall health of the global economy upon which it depends. It should shape its strategic calculations and priorities on this basis and not on the basis of direct imports.

- *The US needs to examine its military plans, and efforts to strengthen the capabilities of its allies, to see if they are adequate to defend the flow of far greater volumes of energy exports out of the Gulf region.*

- *The US needs to reexamine the vulnerability of energy production and export facilities in the Gulf in view of both the projected expansion in production and the impact of proliferation in the region.* It may need to encourage the Gulf states to expand pipeline and reserve capacity, find alternatives to reliance on tanker

movements through the Strait of Hormuz, and to disperse oil facilities and make them less vulnerable to attack.

- *The US cannot shape its policy towards Iran and Iraq in terms of energy alone, but it must also face the fact that its sanctions policy cannot ignore the need for Iranian and Iraqi exports and increases in Iranian and Iraqi export capacity.*

- *US and allied strategic reserves and stock level policy were shaped in a different environment that dates back to the Cold War*. Like the sharing agreements under the International Energy Agency they have received little high-level policy attention in recent years. The rises in oil prices in 1999 and 2000 are illustrations of the fact that this whole issue needs zero-based reexamination.

Taking these measures, however, will not enough. The US also needs to examine the broad economic changes taking place in the Gulf region to determine whether market forces can produce the required investment in new oil and gas production and export capacity. It needs to examine what can be done to stabilize oil prices for both exporter and importer, and it needs to shape its energy policy in terms of its relations with individual Gulf states.

III. The Risk that Oil Wealth will Become Oil Instability and the Need to Ensure the Funding of Adequate Production Capacity

Making massive increases in Gulf production capacity requires massive amounts of capital investment at time when Gulf economies and budgets are under severe structural pressure in spite of high oil revenues. Market forces may still be enough to create the necessary new production capacity and flow of oil. However, it is far from clear that the Gulfs' exporting nations can now finance both their energy and other investments over the period between now and 2020 without (a) major efforts to repatriate domestic capital, and (b) massive transfers of foreign capital that are far larger than those that have taken place in the past.

Major structural economic reform is a partial answer, but Gulf governments must consider new measures to encourage domestic private and foreign investment in both oil and gas operations. The US and other major developed energy importing nations must encourage investment and make it clear that they are willing to support regional exporters with the necessary capital to increase their production and export capacity.

Energy Exports and Oil Wealth

Direct and indirect energy exports account for about 40% of the total export earnings of the Middle East, and vast amounts of oil revenues are involved. Even so, oil wealth is as relative as any other form of wealth. In the case of the Middle East, "oil wealth" must be measured in terms of both total national needs and per capita income. In fact, a combination of fluctuation in oil prices, high population growth rates, and a failure to modernize and diversify the overall economy now threatens to turn "oil wealth" into "oil poverty."

Massive swings in oil revenues have helped to shape to the problems the Gulf now faces. In 1972, total OPEC oil revenues were worth around $77 billion in constant 1990 dollars. After

the October War and the 1974 oil embargo, they leapt to levels of around $340 billion and then dropped back to less than $300 billion during 1975-1978. The fall of the Shah of Iran and the start of the Iran-Iraq War drove them to a new peak in 1980, when they were worth $438.8 billion. An oil price collapse began in 1985, and revenues dropped to a low of $83 billion in 1986. They gradually rose back to levels of around $150 billion a year in early 1997, but a new "oil crash" began late that year. Oil revenues dropped back to $80 billion in 1990 dollars in 1998. [34]

Ironically, low prices then turned to high prices with equal alacrity. In March 1999, OPEC's member countries, together with some important outside producers, settled on a program of stringent oil production cuts. Following the implementation of cutbacks, the price of crude oil soared back upward over the course of 1999 and eventually reached levels not seen since the Gulf War. Revenues rose to an estimated $162 billion in 2000 in 1990 constant dollars ($132.8 billion in current dollars in 1999 and $211.5 billion in 2000.)[35] This sharp increase in oil prices was caused by several factors: 1) OPEC's March 1999, 1.7-million bbl/d quota cut agreement, in addition to over 2.5 million bbl/d in two output cutbacks agreed to earlier; 2) high levels of OPEC compliance to its quota agreement; and 3) strong world oil demand, including the rebounding Asian economies and the surging U.S. economy

The resurgence of oil revenues eased the region's short-term economic problems – -at least through 2000 as well as those of its oil dependent state budgets. Total OPEC revenues in 2000 are estimated to be 59% higher in 1999, which was a 34% rise over 1998. They will be the highest levels in real terms since 1984, and in current dollars since 1981. The problem is that such revenues will still be only 37% of their peak in 1980.[36] Moreover, the population of the Gulf has more than doubled since that time, reducing oil wealth per capita to less than one-fifth of their 1980 level.

Oil wealth is relative in other ways. A total of $211.5 billion in oil exports is scarcely small change, but this includes the total oil revenues of all OPEC states. In contrast, total world exports are worth well over $53 trillion dollars, and over $42 trillion come from developed states. East

Asian exports average well over 12 trillion dollars, while total Middle East exports total only $2.1 trillion. Oil wealth simply does not compete with balanced regional economic development by the standards of "globalism."[37]

Oil wealth also differs sharply by Gulf country, and fluctuates with time:. EIA estimates indicate that, [38]

- Saudi Arabia consistently has earned more oil export revenues than any other single member of OPEC, with the Saudi share ranging from below 20% in 1972 to over 40% in the early 1980s, and 28% today. Iran's revenue share fell after the 1978/79 Iranian Revolution (followed soon thereafter by the Iran-Iraq War for much of the 1980s), and has not recovered since.

- Iran currently accounts for about 10% of total OPEC oil export revenues, down from 17%-18% in the 1970s.

- Iraq's oil export revenue share has fluctuated sharply, from a high of around 15% in the late 1980s, to near 0% for several years following its August 1990 invasion of Kuwait (and the subsequent UN oil embargo, which continues to this day). Iraqi oil export revenues have increased over the past three years or so under the UN "oil-for-food" deal, which permits limited Iraqi oil exports to buy food and medicine, for war reparations, and for other U.N.-authorized purposes. Iraq's share of total OPEC oil revenues is now approaching 10%.

- The rest of OPEC has earned between 40% and 50% of total OPEC oil export revenues between 1972 and 1998. Around half of this was earned by "other Persian Gulf" countries, which includes Kuwait, the United Arab Emirates, and Qatar.

The key measure of "oil wealth" for any given nation is not total revenue, but the share of that revenue per person in the total population. Even with today's high oil prices, even the wealthy Southern Gulf states have only about 40% of the real per capita income they had at the peak of the oil boom in the early 1980s, and there is little prospect for anything other than a slow decline in per capita oil wealth even if oil remains at an average annual level of $30 per barrel in constant dollars. There are important exceptions. Kuwait ($22,300), Qatar ($10,300), and the UAE ($17,870) maintain high per capita incomes, but Saudi Arabia's "wealth" ($6,900) is becoming increasingly marginal, Iran has a per capita income of $1,650, Algeria has $1,520 dollars, Libya has $6,700 and Iraq's per capita income is unlikely to be higher.[39]

Many states, including virtually all Southern Gulf states, are also heavily dependent on foreign labor at a time when many of their own younger citizens lack not only jobs but also the training and work ethic to get them. In many cases, these problems are reinforced by poor immigration policies that are routinely violated by the toleration of illegal immigrants, the issue of visas for money, and the existence of laws that require major benefit packages for native labor, thus making it difficult to hire or fire native labor. Some countries are trying to solve the problem with erratic purges of foreign labor, but most still lack consistent policies.

The Limits of Oil Wealth

The upswing in oil prices has not wiped away the economic difficulties facing Gulf oil producers. Average oil export revenues did not climb back to their 1997 levels in constant dollars until mid-2000 because higher oil prices initially had to be achieved at the cost of lower production. Meanwhile, the fundamental dependence of Gulf economies on oil revenues remains unchanged. While the statistics on Gulf GNP's appear to reflect growing diversification, the reality is that much of the apparent diversification consists of service industries dependent on oil revenues and subsidized state industries.

The Gulf is scarcely poor relative to most of the developing world, but Gulf oil revenues have not kept pace with national budgets and population growth. This has had a serious impact on economies that have failed to modernize and diversify. These oil revenue problems have also interacted with the impact of war and revolution, and sanctions on Iran and Iraq. The end result has been tragic for Iran and Iraq, and put growing economic pressure on Bahrain, Saudi Arabia, Oman, and Yemen. This is reflected in growing investment problems, budget deficits, and cuts in entitlements and subsidies. Kuwait, Qatar, and the UAE still have a relatively high degree of oil wealth per native citizen, but Kuwait and Qatar have had to become increasingly cautious spenders.

These pressures have growth steadily for more than two decades. They posed problems for the region's oil exporters long before the "oil crash" of 1997-1998, and they remain in spite of the oil boom of 1999-2000. They are the result of years of over-reliance on oil wealth, economic mismanagement, and the failure of regional governments to realistically plan and budget for the future. Some key Middle Eastern governments have experienced 10 years of budget deficits, and Saudi Arabia and Iraq are key cases in point, although Saudi Arabia will most likely show a surplus this year.

Since the mid-1980's they have slowly created growing budget problems that have already led to under-investment in infrastructure, economic diversification, and state industries including the petroleum sector. Iraq and Iran are improvised by their past standards and the Southern Gulf governments no longer have all the money they need to sustain the current entitlement and welfare system. Most energy exporting economies cannot attract enough outside or internal investment to meet national needs, and their budgets in the Middle Eastern undergo consistent turbulence.

Signs of the seriousness of this issue are the fact that Saudi Arabia still faced a multi-billion dollar deficit in 1999, and Crown Prince Abdullah gave a speech in November 1998, warning that the state would have to cut social services. If low or low-to-moderate oil revenues occur again, the resulting cuts in government revenues could force many Middle Eastern countries to cut their budgets and development plans in ways that result in significant economic, social, and political tradeoffs.

The Gulf is now an economically troubled region with deep structural economic problems and serious demographic pressures. Indeed, the most recent reports and projections from the World Bank describe the entire Middle East and North Africa (MENA) region as a major economic non-competitor. During the last 35 years (1965-1998), the Middle East and North Africa averaged 3.1% annual growth in their total GNP, but per capita income rose by only 0.2%.

This was the lowest figure in the world except for Sub-Saharan Africa, where per capita income dropped by 0.3%. In contrast, Asia's per capita income rose by an average of 5.7%. The next increase in the per capita income of the Middle East was 5.6%. The net increase in the developing nations of East Asia and the Pacific was 159.6%.[40]

The region experienced negative real economic growth during much of the 1980s, and economic growth only averaged about one-third of population growth during the 1990s – before the collapse of oil prices in 1997. The region's average per capita income rose by only 1.6% during the oil crash of 1997-1998. Although it recovered substantially in 1999 and the first half of 2000, it still seems likely that it lagged behind recovery in Asia, and in its rate of increase in real per capita income. [41] As for the north-south aspects of "globalism," the average per capita income of the Middle East is now about $2,030 using the World Bank method, and compares with $22,350 for high-income states.

One key reason for this failure to develop was the some countries failed to plan with any economic realism. An even more important factor, however, was that many did develop the right plans and reform priorities but were unwilling to act decisively to implement the plans they made.

The World Bank also projects only modest near-term improvement. It estimates real GNP growth will be 3.2% in 2001, 3.5% in 2001, and 3.4% in 1999-2008. However, the growth in per capita income will be only 1.1% in 2001, 1.5% in 2001, and 1.4% in 1999-2008.[42] This situation will certainly be better for the oil exporting states in the Gulf – but only as long as the current oil boom produces extremely high prices. The World Bank projects a significantly better mid-term future for the more diversified nations outside the Gulf that do not depend too heavily on oil – with 4.4% estimated GNP growth during 1999-2008. The oil exporting economies are only projected to grow by an average of 2.9% in spite of high oil revenues. The end result will be a net decline in real per capita income. [43] These projections also compare with an average increase in real per capita income of over 5% annually in East Asia.[44]

The Problem of Demographics

Another problem that has limited the Gulf's oil wealth is population growth. This growth has steadily reduced the amount of oil wealth per capita, and now threatens to create major problems in creating jobs and funding infrastructure and entitlements even in periods of peak oil revenues. It is interesting to consider what population growth in the Gulf region really means in terms of absolute increases in population numbers:[45]

- Kuwait grew from 1.0 million in 1980 to 1.8 million in 1998. It is projected to grow to 82.1 million in 2015, and 3 million in 2030. It averaged 2.5% annual population growth during 1980-1998. The end result was that real per capita income decreased by an annual average of 3.0% during 1965-1998.

- Iran grew from 39.1 million in 1980 to 61.9 million in 1998. It is projected to grow to 82.1 million in 2015, and 98 million in 2030. It averaged 2.7% annual population growth during 1980-1998. The end result was that real per capita income decreased by an annual average of 1.2% during 1965-1998. [46]

- Iraq grew from 13 million in 1980 to 22.3 million in 1998. It is projected to grow to 31.3 million in 2015, and 38 million in 2030. It averaged 3.0% annual population growth during 1980-1998.

- Oman grew from around 800,000 in 1980 to 2.4 million in 1998. It is projected to grow to 3.3 million in 2015, and 4.2 million in 2030. It averaged 4.1% annual population growth during 1980-1998. [47]

- Qatar grew from around 200,000 in 1980 to 700,000 in 1998. [48]

- Saudi Arabia grew from 9.4 million in 1980 to 20.7 million in 1998. It is projected to grow to 33.7 million in 2015, and 46 million in 2030. It averaged 4.4% annual population growth during 1980-1998. The end result was that real per capita income increased by an annual average of only 0.5% during 1965-1998.

- The United Arab Emirates grew from 1.0 million in 1980 to 2.7 million in 1998. It is projected to grow to 3.7 million in 2015, and 4.3 million in 2030. It averaged 5.3% annual population growth during 1980-1998. The end result was that real per capita income decreased by an annual average of 3.6% during 1965-1998.

- Yemen grew from 8.5 million in 1980 to 16.6 million in 1998. It is projected to grow to 26.6 million in 2015, and 36 million in 2030. It averaged 3.7% annual population growth during 1980-1998. [49]

The kind of population growth will continue to put severe pressure on the economies of Iran, Iraq, Oman, Saudi Arabia, and Yemen. In the case of Iran and Iraq, these problems have will be greatly exacerbated by a heritage of revolution and war.

Water and Agriculture

Water, infrastructure, and dependence on food imports add to the region's problems. Population growth and the failure of economic reform combine to compound the Gulf's agricultural and water problems. Far too often water is often described as a problem in its own right. Water, however, is the symptom and not the disease. The region's water resources are stretched to the breaking point by several interactive factors.

- First, the failure to modernize the economies of Bahrain, Iran, Iraq, Oman, and Yemen in ways that take a much larger portion of the labor force off of the land.
- Second, Saudi policies that waste fossil water on a vain and costly effort to achieve self-sufficiency in food production.
- Three, the waste of large amounts of water on showpiece parks and urban areas in the UAE.
- Fourth, the failure to price water and many other commodities and services at a market price and force efficiency.
- Fifth, the inevitable problems trying to divide finite amounts of water – some of it fossil and unrenewable – among a population projected to increase by more than three times between 1980 and 2030.

The end result is already alarming. The arable hectares per capita have dropped from 0.29 in 1979-81 to 0.21 in 1995-1997, a drop of nearly 30% in about 15 years. At the same time, water consumption rose as the amount of irrigated land rose from 26% of cropland to 36%. The average annual rate of growth in Middle Eastern and North African agricultural output dropped from 5.5% during 1980-1990 to 2.5% during 1990-1998.[50]

It the case of the Gulf, population problems make the region heavily dependent on food imports and massive expenditures on water where the nations is wealthy enough to make such purchases, and major water shortages where the money is not available to invest in desalination. Agriculture and fishing have become a negligible portion of the Bahraini, Kuwaiti, and Qatari economies, and employ less than 1% of the labor force, and virtually all water must now be desalinized or imported. Oman is seriously straining its aquifers, and its badly outdated

agricultural sector employs 37% of the labor force and consumes large amounts of water to produce only 3% of the GNP.

The two most heavily populated states in the Gulf -- Iran and Iraq are both major food importers -- although agricultural activity accounts for 21% of the Iranian GNP and a large amount of Iraq's impoverished economy. Both nations face major future water problems.

Saudi Arabia relies heavily on desalination, but it still heavily subsidizes water-intensive agriculture. It does so in spite of the fact that agriculture accounts for only 6% of the GNP, the Kingdom remains a massive net food importer, and much of the 6% of the labor force employed in agriculture is now foreign.[51] The UAE still has some agriculture, mostly subsidized or in the poorer eastern emirates, but now uses more water on parks than crops. No reliable statistics exist on Yemen, but its agricultural sector is now largely drug-driven and its water problems are a result of urban demand.

"Regional Youthening" versus "Global Aging"

The combination of economic problems and population growth threatens the Gulf in other ways. One is that rapid population growth has produced a regional "youth explosion" at a time when developed nations like the US, the EU states, and Japan are worrying about "global aging." Roughly 40% of the Gulf's population is now under 14 years of age. The figures are 43% in the case of Iran, 44% in the case of Iraq, 41% in Oman, 43% in Saudi Arabia, and 48% in Yemen, even if one allows for large amounts of foreign labor in several of these countries.[52] The region's educational system is under extreme stress, and real and disguised unemployment for males between 18 and 25 years probably averages over 25%.[53]

This kind of youth explosion would be a potentially explosive situation at any time, and it is compounded by weaknesses in the education system, and gross over-employment in meaningless or low productivity jobs in the state sector. In most countries it is compounded by a lack of housing, the high cost of marriage, and education which is not focused on producing men

and women trained to be productive enough to be globally competitive. This youth explosion places a major burden on the extended family in the Middle East, and makes youth a natural target for extremism of all kinds.[54]

In most Southern Gulf countries, these problems are made worse by over-reliance on foreign labor. Bahrain is relatively poor, but 37% of its population is still foreign. Over 31% of the population of Kuwait is foreign, 75% in Qatar, 27% in Saudi Arabia, and 76% in the UAE.[55] Almost all of this expatriate labor displaces native labor from the work force and exports large amounts of capital out of each country. In the case of many of the richer oil states, native labor cannot compete with low cost imported labor and has no desire to do so. A heritage of real oil wealth, inflation expectations, inadequate education, and status problems does not create the kind of work ethic that seeks out low paying jobs.

These pressures affect political stability in other ways. They are contributing to the slow breakdown of the region's traditional family, clan, and tribal system, which is based on villages and the extended family, in ways that have nothing to do with the Internet and bad Western television and movies. This is not to say that the extended family is failing, but it is under increasing strain.

Population growth, a lack of agricultural modernization, and a lack of development planning also interact to push people of all ages into cities. The percent of urbanization in the total population of the region rose from 37% in 1970 to 57% in 1996, and will probably rise to well over 70% by 2020.[56] Hyperurbanization in areas with a population of over one million has risen from 17% of the total population in 1980 to 21% in 1998, and is projected to reach 24% in 2015.[57] An average of more than 25% of the population of each Middle Eastern country lives in its single largest city, and this percentage is higher in most key exporting countries in the Southern Gulf.[58] Urbanization have many advantages as a global trend, but in far too many cases in the Middle East, it is occurring without enough development to guarantee urban jobs, and a lack of proper infrastructure and housing intensifies the region's problems.

The Decapitalization of the Gulf

Structural economic problems, war, and massive swing in energy prices and the attractiveness of energy investments have kept the Gulf from being competitive in attracting global capital and in retaining its own domestic savings. It is fine to talk about the new global efficiency of capital flows, but one aspect of this efficiency is that domestic capital goes where it is safe and gets the maximum yield. There is some $500-800 billion in private regional capital holdings outside the region, and many wealthier governments invest in the West. More than half of this capital comes from the West.

This does not mean that some foreign capital has not flowed into the Gulf. The World Bank estimates that net foreign direct investment in the region rose from $300 million in 1970, and $2.5 billion in 1990, to $8.1 billion in 1999. However, this figure covers the entire Middle East and scarcely compares with the outflow of direct investment, however, and the comparative total for net foreign direct investment in Latin America was $89.4 billion in 1999, and $61.5 billion in East Asia and the Pacific.[59]

If one looks at total net resource flows for domestic, foreign private and government capital to the Middle East during 1997 – before the oil crash hit – the total was less than $7 billion because of official outflows like debt payments. In contrast, the total inflow to East Asia was $122 billion. It was $116 billion for Latin America, and $14.6 billion for South Asia.[60]

Declining Global Trade Share

Increases in oil trade do not substitute for economic diversification. The Gulf and the entire Middle East have lagged badly behind the fastest developing regions in terms of relative growth in world trade. Pan-Arabism now has little or no meaning in terms of “regionalism.” Every major Gulf State now trades largely with states outside the region, and has done so for decades. Interregional trade has declined as a share of total trade for nearly a quarter of a century.[61]

Directly comparable statistics are only available on a regional basis, rather than for the Gulf but their implications are clear. If one looks at the most recent year for which directly comparable statistics are available, the entire Middle East and North Africa accounted for only 2.3% of world trade, including all oil and gas revenues. Only 8.6% of this trade was with other Middle Eastern states.[62] Put differently, Middle Eastern exports totaled $205.7 billion in current dollars in 1980, and $192.4 billion in 1999. East Asia exports grew from $252.8 billion in the much shorter period from 1990 to $698.7 billion during 1990 to 1999, or by a factor of 2.8.[63]

The Middle East has lagged badly in terms of export growth during the last decade (1987-1997). Its exports grew at an average annual rate of only 5.3% during 1987-1997. This compared with 13.2% for East Asia, 10% for South Asia, and 6.4% for Latin America.[64] This is scarcely surprising given its agricultural problems and the fact that its growth in manufacturing output and industry was only about one-fifth to one-third that of East Asia.[65]

The Middle East has also lagged badly behind other developing regions in terms of export volume as a percent of total goods and services, and this is unlikely to change in the future. The World Bank projects growth rates of around 4% during 1999-2000, versus 8.0% for East Asia, 6.5% for Latin America, 7.7% for South Asia,[66]

The non-petroleum related exports of the Middle East have steadily shrunk as a percent of total world trade for nearly forty years -- except for brief bursts during periods of very high oil revenues. While some individual Gulf states are doing significantly better than the average for the entire region, only Sub-Saharan Africa has a lower rate of growth in share of world trade. [67]

Ability to Fund Investment to Increase Oil and Gas Production

The uncertainties surrounding future demand and future oil and gas export revenues affect more than internal and regional stability. They may be creating serious long-term problems in forecasting the rate of increase in Middle Eastern oil and gas production capacity. Two critical

factors are involved. One is the impact that reduced revenues and problems like the "oil crash" have had on the budgets and investment capabilities of Middle Eastern oil exporting states. The second is the slowly increasing social and structural problems caused by rising populations, high welfare and entitlement programs, high military and arms expenditures, and low long-term revenues.

Saudi Arabia, for example, experienced a 7% cut in its GDP during 1998. It began to increase prices in key subsidized areas like electricity in November 1998, and future deficits were feared. It was forced to steadily cut the level of investment expenditures in its budget to pay for operating expenditures. The rise in oil revenues cut the deficit in 1999 and should produce a surplus in 2000. This will not solve Saudi Arabia's problems in funding its new five year plan, however, and population growth is outpacing the average growth in oil revenues. Even if oil prices remain high after 2002, Saudi Arabia will face a demographic bulge that will make it very difficult to find all the funds it needs for investment. [68]

Iran has had serious economic problems ever since the end of the Iran-Iraq War. Iran could only solve its funding problems in 1998 because of $3.0 billion in debt refinancing, by accepting a $6.0 billion budget deficit, and by paying for 1998's food imports with part of 1999's oil exports. Qatar, the UAE, and Oman faced major cash flow problems, which forced them into near-term cutbacks in some key energy projects while trying to find long-term solutions through foreign investment. Oman and Qatar's gas-based export programs, however, faced serious financing problems, potential delays, and downsizing. [69]

Most Gulf states have been relatively successful in using state revenues to fund energy investments in the past. It now seems likely, however, that foreign and domestic private investment must assume a much larger share of the burden if the region is to produce anything like the energy output projected in DOE and IEA estimates. Relying on market forces may still lead to enough cost-effective investment, particularly given the oil industries history of investing in reserves, future market share, and development even in periods of low oil income. However,

the era of being able to rely on oil and gas revenues to fund state maintenance and modernization may well be over.

Gulf governments do not need to abandon state industries, state investment, and state control over energy resources, but fundamental reforms are needed to increase the ratio of foreign and domestic private investment. There currently is no Gulf country where market forces are allowed to operate freely without serious state interference although Saudi Arabia and Kuwait are liberalizing and Bahrain, Qatar, Oman and the UAE – are making serious progress. Nearly all oil producing countries in the Gulf are also currently examining ways in which to privatize some aspects of its energy investment and obtain foreign investment.

At this point in time, however there is no meaningful way to establish which energy exporting countries will persist in their reform plans, how successful they will be in developing the investment and economic reform plans they need, and how well their investments will be managed. Gulf regimes tend to back-peddle on reform when oil revenues rise, and many countries face resistance from nationalists, Pan-Arab socialists, state-oriented technocrats, traditionalists, and Islamists. Virtually all energy-exporting states want to maximize revenues, but also have powerful elements that want to conserve resources for the future.

The Gulf Must Cure a Self-Inflicted Wound

Dealing with this complex mix of structural challenges is a difficult problem for policy and there is only so much that the US can do. The Gulf's economic and demographic problems are largely a self-inflicted wound. They are not the product of colonialism or occupation. Nations in other regions -- which faced far more serious burdens and which once had a far less well-developed economic base -- have prospered.

They are not the product of regional tensions and war. Taiwan and South Korea are two examples of nations shaped by war and that developed in spite of having to maintain massive levels of defense spending. They are not the product of a lack of democracy and the failure to

accept Western concepts of law and human rights. Each of Asia's "tigers" achieved high levels of development before any major political liberalization took place. They are not the result of discriminatory policies or conspiracies, regardless of how fashionable they may be in the region.

The Gulf and the Middle East have failed to compete globally as a region almost solely because of the failures of its own governing and intellectual elites. No one inflicted war or economic waste on the Gulf. Where valid economic policies have been pursued, the results have been just as effective as in other parts of the world. Where unworkable concepts of Arab socialism, industrial development, patriarchal welfare have been applied, they have failed – sometimes in spite of massive initial oil wealth. Corruption, nepotism, political squabbles, and civil conflict cannot be blamed on anyone else. Economic aid, and heavy state borrowing have largely been wasted, and often been wasted by the fact that governments have used the money to defer reform and effective action. With the exception of a few nations – including an Islamic Iran – population control has been ignored or dealt with through ineffective lip service.

These are scarcely points that any Gulf leader can claim to be unaware of, or which are raised only from the outside by Western scholars. Crown Prince Abdullah of Saudi Arabia has made them forcefully over the last two years. Iran explicitly recognized most of these problems in is 1999 economic reform plan. The current five-year plans of Bahrain, Oman, Qatar, and Saudi Arabia all touch on many of these issues. The Gulf region has many highly competent technocrats, analysts and economists and some have raised these issues for decades, while others have written one competent economic reform plan after another. It should be clear, however, that there is nothing about "globalism" and market forces per se that will change this situation. The Internet, global financial networks, and multinationals act to reward success, not failure. No one can compel even the region's citizens, much less outsiders, to misinvest their money in spite of the return on investment and the risk.

Implications for US Policy

The most useful single thing that the US government, and American corporations and experts, can do to ensure adequate supplies of energy is analyze these problems in detail and tell the region the truth. It needs to work quietly with each of its Gulf allies to encourage them to actually act on their economic reform plans and efforts to reduce their dependence on foreign labor. It needs to start a careful dialogue to encourage the Gulf states to take a much harder look at their population policies and educational structures – paying close attention as it does so to cultural and religious sensitivities.

There are four additional areas where US policy needs to be improved.

- *Governments cannot dictate the price of a global commodity. They may, however, be able to influence the market by taking cooperative steps to keep prices from cycling from one extreme to another, and within a moderate band of prices that meet the needs of exporter and importer alike.* Violent swings in oil policy do not serve either exporter or consumer interest. Prices that are too high can drive importers to use alternative sources of energy and reduce mid and long-term demand. They discourage economic reform, and can discourage effective investment in new production capacity because it is seen as unnecessary. They create major political tensions between the US and its Southern Gulf allies and undermine support for American power projection. Prices that are too low make it impossible for Gulf states to fund the needed increases in energy export capacity and threaten the internal stability of each Gulf state. They also encourage extremism in Iran and Iraq.

- *An ongoing dialogue over price stability between OPEC and the OECD is one possible approach to the problem*. A close ministerial-level dialogue between the US and key Gulf allies like Saudi Arabia, Kuwait, and the UAE is a virtual necessity. The last four years have shown that simply passively reacting to market forces is not enough.

- *An importer-exporter dialogue is also needed on expanding production capacity in the Gulf and ensuring the necessary flow of investment.* Market forces may be able to ensure the necessary level of investment in increased energy export capacity projected by the EIA, and virtually every other official source of such projections. However, the Gulf now has many barriers to investment. The sheer scale of increase in Gulf exports and production capacity projected by the EIA -- and projected in near identical form by OPEC and the International Energy Agency – raises serious questions about the effectiveness of

market forces to solve these problem without a clear consensus between the exporting and importing nations, and new arrangements to provide the necessary investment. The kind of dialogue that Crown Prince Abdullah started with foreign investors in late 1998 should almost certainly be followed by a major US effort to create a continuing dialogue with its Gulf allies over energy capacity and investment.

- *The US needs to know what it takes to ensure the need expansion of energy exports from the Gulf.* Unfortunately, an examination of current estimates of energy investment costs indicates that there is no clear way of estimating future regional and country-specific investment requirements beyond relatively near term projects. One imperative goal for US policy making is to give this kind of "what if" modeling high priority. It is then to consider just how much investment and reform is needed in each key producer country if it is to sustain and expand its petroleum production capacity to the level the world needs.

- *Dialogue is needed to ensure suitable surplus production capacity is maintained along with increases in production capacity,* Saudi Arabia's current status as a "swing producer" with sufficient surplus capacity to make up for most foreseeable shortfalls is not guaranteed in the future, and requires a level of investment that can only be maintained as an act of deliberate policy. Iraq's current ability to threaten world markets is an example of the risks inherent in any situation where actual production comes too close to total production capacity, and the world cannot afford to be held hostage by a single producer in the future.

- *The US, other major importers, and major exporters need to rethink the issue of oil reserves.* One policy conclusion that emerges from many of the following chapters as well is the need to create significant oil and other energy reserves as a protection against miscalculations over demand and weather, and political and military crises. Market forces may well drive individual firms to be too efficient in reducing stocks and inventory, and make on time delivery into a strategic risk. The creation of large strategic petroleum reserves has faltered over the large decade. Equally important, insufficient regulation exists to ensure that private suppliers have sufficient stocks to buffer them against real world swings in supply and demand.

The 1990s may have been a decade where the world could rely largely on market forces, give or take a major war. Nothing about the future indicates that the US will not need a far more proactive energy policy. The US must work with market forces and largely rely upon them. It cannot, however, rely fully on the market place – particularly where the market has little or no incentive to pay for America's security.

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