

Energy in Danger

Iran, Oil, and the West

Simon Henderson



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Front cover: The guided missile cruiser USS *Mobile Bay* patrols the waters surrounding the Basra oil terminal as two Iraqi tug boats guide an oil supertanker into place, October 28, 2004. Copyright U.S. Department of Defense/Petty Officer 1st Class David C. Lloyd, U.S. Navy.

AGENDA: IRAN

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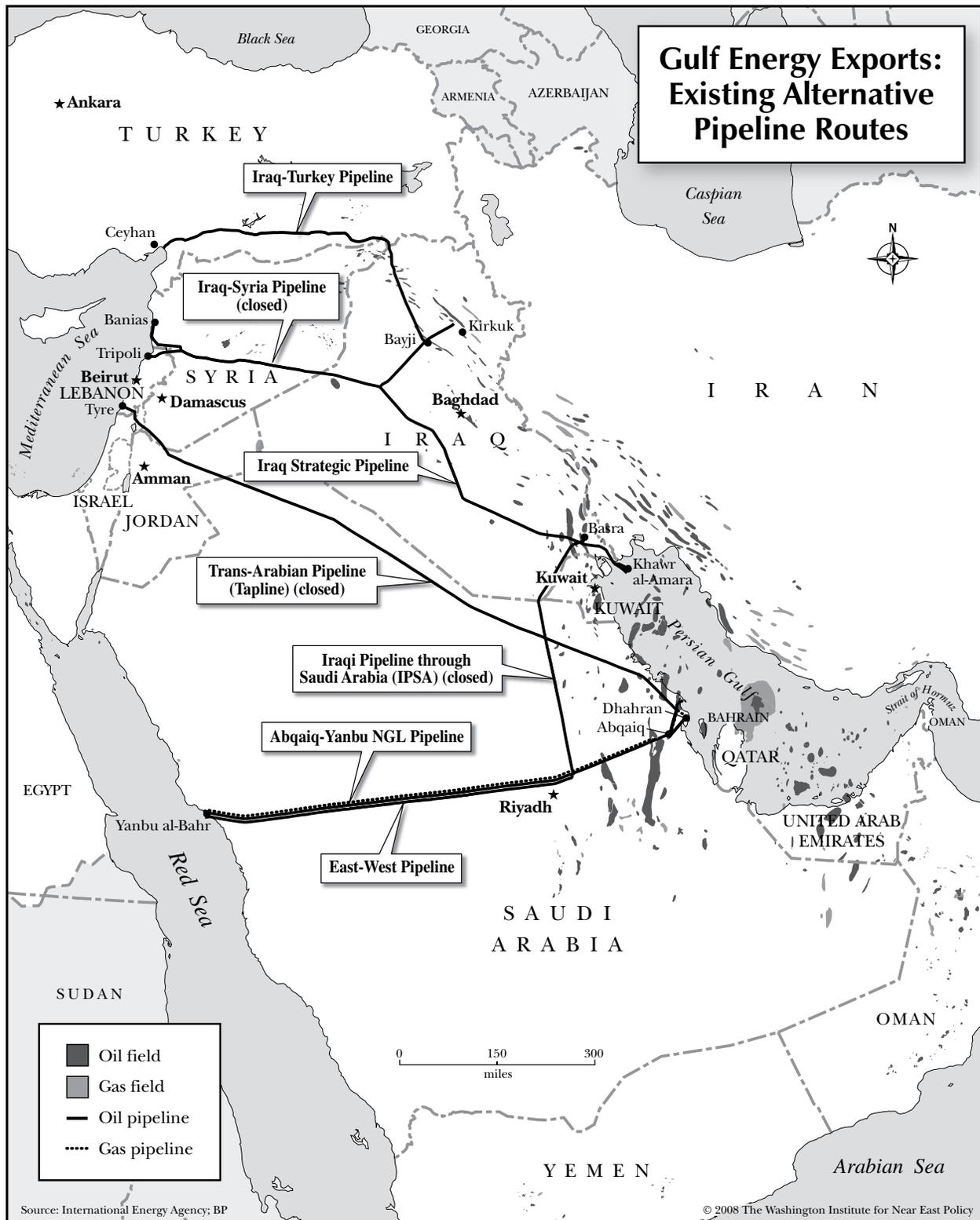
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Executive Summary

“If the Americans make a wrong move toward Iran, the shipment of energy will definitely face danger, and the Americans would not be able to protect energy supply in the region.” —Iranian Supreme Leader Ali Khamenei, June 4, 2006

IRAN SUPPORTS TERRORISM, opposes the Middle East peace process, undermines the U.S. position in Iraq, and seems determined to pursue a nuclear weapons program that will threaten U.S. allies in the region. It possesses the world’s third-largest oil reserves and the world’s second-largest reserves of natural gas. In addition, it is the second-largest exporter in the Organization of the Petroleum Exporting Countries (OPEC) and the fourth-largest exporter of crude oil globally. Geographically—and therefore militarily—Iran dominates the narrow Strait of Hormuz, through which about 40 percent of the world’s internationally traded oil passes daily. Put simply, it is a critical player in the world energy economy. To limit Iranian influence on the energy economy, the international community, led by the United States, should adopt energy policies to diminish Iran’s leverage and exploit its vulnerabilities.

Iran’s Energy Levers

Ultimately, as Ayatollah Ali Khamenei has threatened, Iran could interfere with the free flow of oil from the Persian Gulf. In the most benign form of such interference, Iran could cut off its own oil exports for a period, which could prompt shortages and price spikes because insufficient spare capacity currently exists to make up for a complete stoppage of Iranian exports. Iran could also hinder other countries’ efforts to export oil or interfere with U.S. warships and those of its allies trying to protect such commerce, whether by direct military action at sea or by sabotage on land. Such disruptions would have similar adverse effects on world markets because of the limited capacity of alternative export routes. In those circumstances, the spare capacity of other oil exporters to make up for any shortfalls and routes of export other than the Strait of Hormuz

are vital. Sufficient military force to protect the interests of the world economy is also necessary.

Additionally, Iran has been actively seeking energy cooperation agreements with its oil and gas customers, as well as with neighboring countries. These agreements are designed in part to weaken diplomatic unity in confronting Iran’s behavior, making sanctions less effective and a possible embargo more difficult to impose. Countries trading with Iran, either as purchasers of oil and gas or as suppliers, must be made aware of the implications of their trade and the fact that it will be considered an appropriate area for sanctions or financial pressure.

Within the region, developing spare production capacity and alternative pipeline routes, and increasing the capacities of existing pipelines, should be an urgent policy priority. Although the position of the region’s oil producers in this regard is notably weaker today than it was twenty years ago, options exist in these areas. The region’s ability to match Iranian military force is a continuing concern, especially because of Iran’s apparent preference for asymmetrical warfare—using small boats and the like, which are harder to counter. The presence of U.S. and other allied forces is crucial. On shore, security needs to be developed at countless oil and gas installations, as well as power plants, desalination plants, and military facilities that might be targets. Advances have been made, particularly as a result of threats posed by al-Qaeda, but many of these installations remain vulnerable.

The world community needs to act together to ensure that sufficient stockpiles of oil and refined products are maintained. Although the United States and Europe have a well-developed policy of both official and commercial stockpiles, other countries need to do much more—particularly India and China. The willingness to work in concert to ensure international safe passage needs to be improved. In the past, the readiness to underwrite insurance risk has been an important component of policy; this strategy might need to be applied once again.

Potential for Additional Sanctions

Current international pressure on Iran to change its regional behavior concentrates on economic and financial sanctions, but more could be done. Iran is burdened with a large population and an inefficient economy, which creates vulnerability—especially in the energy sector. At 3.8 million barrels per day (b/d), oil production is less than two-thirds what it was before Iran's 1979 Islamic Revolution, when the population was also less than half the current 66 million. In the meantime, domestic consumption has more than doubled to 1.6 million b/d, mainly because of generous subsidies on a range of goods, including gasoline. Rising consumption and the lack of domestic refining capacity meant that in 2006 the Iranian government, despite its huge national oil wealth, had to impose gasoline rationing. This situation leaves room for additional international sanctions, including bans on foreign investment and the import of gasoline.

Without investment to maintain its oil fields, Iran's own oil minister has said production is being reduced by 500,000 b/d each year. Gas production, instead of being exported, is used mainly for reinjection in oil fields to boost retrieval rates or, at subsidized prices, in domestic households. An antiquated distribution system means that during winter, increased domestic consumption can reduce or stop exports, to the considerable annoyance of foreign customers.

If oil prices had remained in the \$20 to \$40 per barrel range of the first few years of this millennium, Iran's economic position might have forced policy—or even political—changes. The steadily rising price of oil, however, breaking through \$100 per barrel in early 2008, has buttressed Tehran's position. Annual revenues have increased threefold to \$75 billion between 2003 and

2006. The perception of potential future shortages, as well as increased international demand boosted by economic growth in China and India, has kept oil prices high despite economic slowdowns in developed economies, including the United States.

Persian Gulf Oil Likely to Remain Crucial

Policy options such as increasing spare capacity and developing alternative export routes need to be adopted for the long term as well. The International Energy Agency (IEA) predicts that the world is going to become more dependent on Middle East energy supplies. Its *World Energy Outlook 2007* estimated that 16 percent of world oil demand passed through the Strait of Hormuz in 2006. Its scenario for 2030 envisages this proportion nearly doubling to 30.5 percent.

Alternative fuels and other related moves toward greater energy independence for the United States (defined as less reliance on imported oil) will do little to dent this trend over the next few years, unless some unexpected technological breakthrough occurs. (The IEA predicted in 2007 that world production of unconventional fuels, including biofuels, coal-to-liquids, and gas-to-liquids, will account for just 9 percent of the world supply of liquid fuel in 2030.) The vital leadership role played by the United States in maintaining the strength of the international economy will require it to ensure the safe passage of energy supplies from the Persian Gulf for the foreseeable future.

Alternative pipeline routes are an absolute requirement if the Strait of Hormuz chokepoint is not to be a growing concern. The steps taken now will help mitigate a potential future problem, independent of the nature and policies of the Iranian government.

Iran's Direct Threat to Energy Exports

IRAN IS THE HISTORICAL GIANT of the region, but today it competes with Iraq, birthplace of the ancient Mesopotamian civilizations, and Saudi Arabia, home of the Islamic holy places of Mecca and Medina, for regional supremacy.

The Gulf's Role in Energy Supplies

The Persian Gulf¹ region is the single most important source of oil for the world's economy—and has been since 1970, when the region overtook North America in production totals.² In 2006, the countries of the region (Bahrain, Iran, Iraq, Kuwait, Oman,³ Qatar, Saudi Arabia, and the United Arab Emirates [UAE]) produced 28 percent of the world's oil and held 55 percent of the world's crude oil reserves. Current forecasts for energy envisage increased importance of oil from the Persian Gulf, with more than 30 percent of world oil demand passing through the Strait of Hormuz by 2030.⁴

Natural gas is also an increasingly important export from the Gulf. Iran itself has the second-largest reserves in the world (15.5 percent of the global total; Russia has the largest reserves with 26.3 percent of the world total). But Iran's exports are mainly via pipeline northward to Armenia. Newly exploited reserves offshore in the waters of the Persian Gulf are intended for Iranian domestic use and for reinjection into oil fields so that more oil can be extracted and exported. Qatar, Saudi Arabia, and the UAE also have significant reserves of gas (respectively, 14 percent, 3.9 percent, and 3.3 percent of the world total). Moreover, Qatar and the UAE have established substantial infrastructure to make themselves significant exporters of gas in the form of liquefied natural gas (LNG). Over 3.5 billion cubic feet per day of natural gas travels through the Strait

of Hormuz by LNG tankers en route to Asia, Europe, and North America. Just outside the Strait of Hormuz, Oman also has important gas reserves and is a significant exporter of LNG.

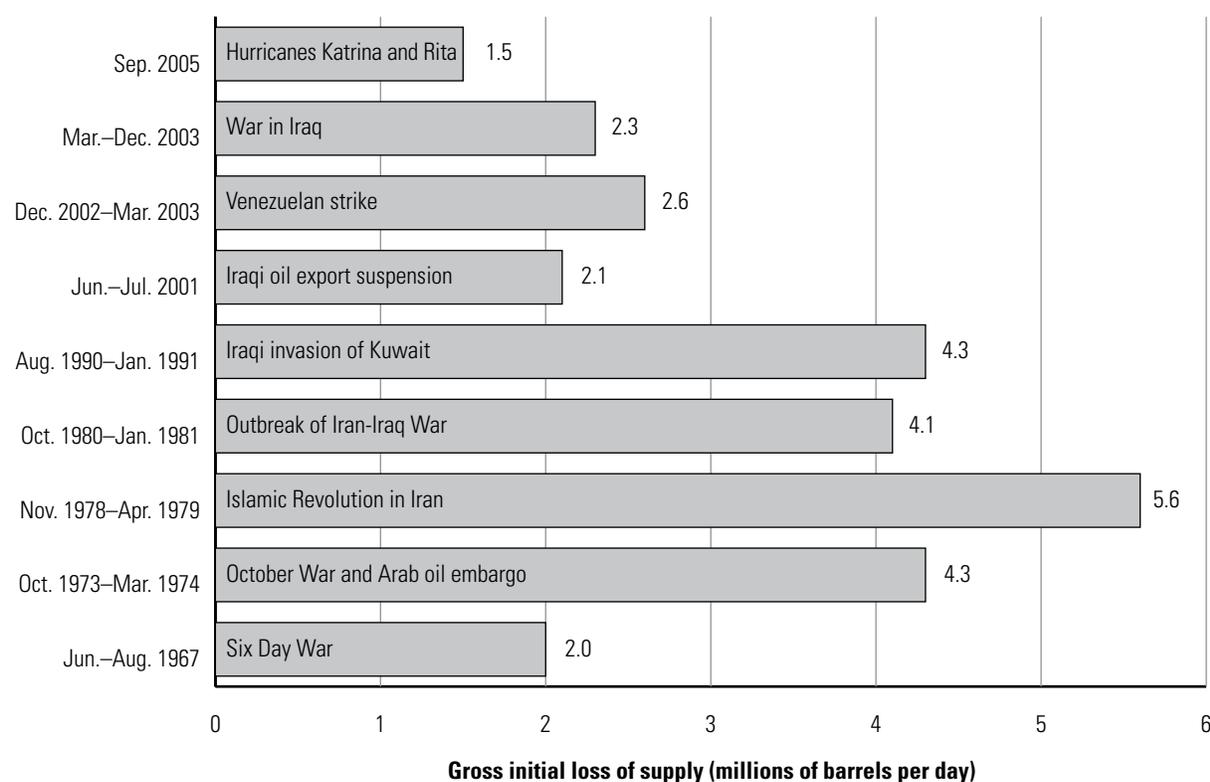
Vulnerability of the Strait of Hormuz

Most of the oil being exported from the countries bordering the Persian Gulf passes through the Iran-dominated Strait of Hormuz, which connects the waterway with the Gulf of Oman and the Arabian Sea. The U.S. Department of Energy estimates the daily flow as between 16.5 million and 17 million barrels per day (b/d), about 20 percent of world oil demand and roughly 40 percent of all seaborne traded oil.⁵ Any disruption of this flow would make previous major world oil supply disruptions pale in comparison (see figure 1, next page).

Oil passing through the strait, 34 miles wide at its narrowest point, is destined principally for Japan and other Asian countries, as well as the United States and Western Europe. Indeed, three-quarters of Japan's imports pass through the strait. Most of the crude oil exports are carried in large tankers, known as very large crude carriers, that can carry over 2 million barrels of oil.

Tanker traffic uses a northern two-mile-wide channel to enter the Persian Gulf, which is separated from a similar two-mile-wide channel farther south by a two-mile-wide buffer zone. At the entrance to the Persian Gulf, both inbound and outbound channels lie in Omani territorial waters. Farther into the Gulf, the tanker lanes run in waters claimed by Iran, north and south of the Greater and Lesser Tunb islands, which have been the subject of a dispute with Ras al-Khaimah, part of the UAE, since Iranian forces seized them in 1971, during the era of the shah.

1. The name "Persian Gulf" is subject to dispute: Iran's Arab neighbors refer to the waterway as the "Arabian Gulf." Iran, as well as the U.S. government, uses the term "Persian Gulf."
2. Historical data are from the BP Statistical Review of World Energy. Available online (www.bp.com).
3. Oman lies mainly outside the Persian Gulf, having only a small coastline directly on the Strait of Hormuz; however, it is a member of the Gulf Cooperation Council, along with Bahrain, Kuwait, Qatar, Saudi Arabia, and the UAE.
4. International Energy Agency, *World Energy Outlook 2007* (Paris: International Energy Agency, 2007).
5. Estimate for 2006 from U.S. Energy Information Administration, Country Analysis Briefs, "World Oil Transit Chokepoints" (January 2008). Available online (www.eia.doe.gov/cabs/World_Oil_Transit_Chokepoints/Background.html).

Figure 1. Major World Oil Supply Disruptions

Source: Adapted from International Energy Agency, *World Energy Outlook 2007: China and India Insights* (Paris: International Energy Agency, 2007), p. 186.

Iran's Military Threat

Iran's leaders have clearly stated the current threat to Gulf shipping. In a speech on August 15, 2007, Commander of the Iranian Islamic Revolutionary Guard Corps (IRGC), General Yahya Ramin Safavi said: "Our surface-to-sea missile systems can now reach the breadth and length of the Persian Gulf and Oman Sea. No boat or vessel can pass in the Persian Gulf without being in range of our surface-to-sea missiles."⁶ More than a year earlier, on June 4, 2006, as U.S. concern about Iran's nuclear program increased, Iranian Supreme Leader Ali Khamenei linked the pressure to an apparent threat to retaliate against energy exports: "If the Americans make a wrong move towards Iran,

the shipment of energy will definitely face danger, and the Americans would not be able to protect energy supply in the region."⁷

During the 1980–1988 Iran-Iraq War, both Iran and Saddam Hussein's Iraq threatened the passage of oil from the Persian Gulf. Iranian forces destroyed Iraq's offshore loading terminals at the head of the Gulf. Iraqi aircraft targeted Iran's main Kharg Island loading facility and tankers loading there. When Iran developed additional facilities farther down the Gulf at the islands of Lavan and Sirri, Iraq attacked them as well.

Other Gulf states and the international community were soon drawn in. In retaliation for the attacks on its facilities, Iran attacked a Kuwaiti tanker near

6. "Iranian Missiles Fully Cover Persian Gulf, Sea of Oman," Fars News Agency, August 17, 2007.

7. "Rice Dismisses Iranian Cleric's Warning on Oil," *New York Times*, June 5, 2006.

Bahrain in May 1984 and, three days later, hit a Saudi tanker sailing in Saudi waters. In November 1986, Kuwait formally petitioned foreign powers to protect its shipping. In March 1987, the United States offered to provide protection for tankers flying the U.S. flag. Under international law, an attack on such ships would be treated as an attack on the United States, allowing U.S. forces to retaliate. In October 1987, the United States attacked Iranian oil platforms after the U.S.-flagged Kuwaiti tanker *Sea Isle City* was attacked. In April 1988, the frigate USS *Samuel B. Roberts* was badly damaged by an Iranian mine. In retaliation, U.S. forces responded with Operation Praying Mantis, the navy's largest engagement of surface warships since World War II. Two Iranian oil platforms being used as military positions were destroyed, along with two Iranian ships and six Iranian gunboats.⁸ (Iraq also contributed to U.S. casualties when an Exocet missile fired from an Iraqi fighter-bomber hit the frigate USS *Stark* in May 1987, killing thirty-seven U.S. personnel and injuring twenty-one.)

Fears of Iranian attacks on shipping were revived in early 2008 when the Pentagon announced that on January 6, five Iranian launches had sped around three U.S. Navy ships for nearly thirty minutes as the latter entered the Gulf. At one point, objects, apparently boxes, had been dropped in the path of one of the American vessels. During the incident, a radio transmission from an unknown source declared a U.S. ship would "explode."

After the January 6 incident, U.S. officials reported earlier incidents. On December 19, 2007, the dock landing ship *Whidbey Island* had fired warning shots after a small Iranian boat rapidly approached it. Three

days later, the frigate USS *Carr* had sounded warning blasts on the ship's whistle to persuade three small Iranian craft, two of which were armed, to turn away.

A further incident occurred on April 10, 2008, when the USS *Typhoon*, a Coast Guard patrol boat, was sailing in the central to northern part of the Gulf. It was approached in darkness by high-speed boats that did not respond to normal bridge-to-bridge radio communication channels. They only stopped when the *Typhoon* activated a flare. Tehran denied any confrontation had occurred.⁹ On April 25, the *Western Venture*, a civilian ship carrying military cargo to U.S. forces in Kuwait, fired warning shots at two small boats that approached it in international waters in the central Gulf.¹⁰

Incidents have also occurred at the head of the Gulf, close to the Shatt al-Arab waterway, the confluence of the Tigris and Euphrates rivers, which forms the border between Iran and Iraq. In a diplomatic embarrassment to London, British naval personnel were seized by Iranian Revolutionary Guards in March 2007. Iran alleged the British boats had strayed into Iranian waters—London later admitted that the waters were at best disputed, the U.S.-led coalition having unilaterally designated a maritime border without informing Tehran.¹¹ The British personnel, marines and sailors, including one woman, were taken to Tehran before being released.¹² On a poorly reported earlier occasion in December 2004, the location of which was not clear, an Australian naval unit avoided being seized in a bad-tempered clash in which violence was only narrowly avoided.¹³ In June 2004, eight British personnel were seized in the Shatt al-Arab by Revolutionary Guards.¹⁴

8. For detailed discussion, see David B. Crist, "Joint Special Operations in Support of Earnest Will," *Joint Force Quarterly*, no. 29 (Autumn/Winter 2001–2002). See also Martin S. Navias and E. R. Hoon, *Tanker Wars: The Assault on Merchant Shipping during the Iran-Iraq Crisis, 1980–1988* (London: Tauris, 1996); Sreedhar and Kapil Kaul, *Tanker War: Aspect of Iran-Iraq War* (New Delhi: ABC Publishing House, 1989); and Anthony H. Cordesman and Abraham R. Wagner, *The Lessons of Modern War, Volume II: The Iran-Iraq War* (Boulder, Colo.: Westview, 1990).

9. "U.S. Navy Turns Away Boats in Gulf, Iran Denies Confrontation," Agence France-Presse, April 16, 2008.

10. "U.S.-Contracted Ship Fires Warning Shots in Gulf," Associated Press, April 25, 2008.

11. "British Sailors Captured by Iran Were in Disputed Waters: Report," Agence France-Presse, April 17, 2008.

12. Simon Henderson, "Gulf Challenge: Iran's Seizure of British Naval Personnel," *PolicyWatch* no. 1214 (Washington Institute for Near East Policy, March 26, 2007). Available online (www.washingtoninstitute.org/templateC05.php?CID=2584).

13. "Australian Navy Repelled Iranian Gunboats in 2004," Reuters, June 22, 2007. Available online (www.alertnet.org/thenews/newsdesk/SYD149272.htm).

14. Simon Henderson, "Incident in the Shatt al-Arab Waterway: Iran's Border Sensitivities," *PolicyWatch* no. 879 (Washington Institute for Near East Policy, June 28, 2004). Available online (www.washingtoninstitute.org/templateC05.php?CID=1757).

Iran's Military Strength

The IRGC's naval forces are estimated to number more than 20,000, including 5,000 marines.¹⁵ Their role is coastal defense. Out of more than fifty patrol craft, ten are of the Chinese Houdong type, which can carry the Chinese-made C-802 Saccade tactical surface-to-surface missile, with a range of seventy-five miles.¹⁶ Another forty are Boghammar fast launches, built in Sweden, that can carry antitank missiles, recoilless rifles, and machine guns. Some are Iranian made, based on a hull from FB Design of Italy, a famous producer of racing boats that sold its patrol boat *Levriero* along with frames and blueprints under a now-revoked government license.¹⁷ Other missiles in the arsenal of the IRGC's naval forces, for operation from shore installations, are the HY-2 Seersucker surface-to-surface type, made by China, with a range of twenty-five miles. Iran fired this type of missile at Kuwaiti territory during the 1980–1988 Iran-Iraq War.

The Iranian navy operates under a separate command structure from the IRGC, although this situation is reportedly changing, with the IRGC becoming more dominant. With 18,000 naval personnel, 2,600 marines, and a naval aviation component of 2,600, the navy is numerically larger than the IRGC's naval forces. It has six submarines, including three capable of operating delivery vehicles for frogmen. It has three frigates, originally British, and two corvettes, originally American. Patrol and coastal combatant craft number 140, including high-speed Chinese catamarans. In Gulf waters, it has four minesweepers and thirteen landing ships, including three with mine-laying capability. The force's naval aviation wing includes three P-3 Orion maritime patrol aircraft, originally supplied by the United States, and three Sea Stallion helicopters, which can be used for mine countermeasures and laying mines.

The Iranian navy has bases in the Persian Gulf at Bandar Abbas, Bushehr, Kharg Island, Bandar Khomeini, Bandar Mahshahr, and—outside the Strait of Hormuz on the Gulf of Oman—at Chah Bahar. The IRGC naval bases are at Bandar Abbas; Khorramshahr; the islands of Larak, Abu Musa, al-Farsiyyah, and Sirri; and the Halul oil platform.

U.S. defense officials believe that Iran could shut the Strait of Hormuz if it wanted to. In February 2005 Senate testimony, Vice Adm. Lowell E. Jacoby of the Defense Intelligence Agency said: “We judge Iran can briefly close the Strait of Hormuz, relying on a layered strategy using predominantly naval, air, and some ground forces. [In 2004] it purchased North Korean torpedo and missile-armed fast attack craft and midget submarines, making marginal improvements to this capacity.”¹⁸ In additional testimony, he said, “Iran's navy... could stem the flow of oil from the Gulf for brief periods by employing a layered force of diesel-powered Kilo submarines, missile patrol boats, naval mines, and sea and shore-based anti-ship cruise missiles.”¹⁹

Iran sees itself as the natural hegemonic power in the Gulf and resents the presence of any non-Gulf military forces. This view explains the harassing, although not the timing, of U.S. navy ships by IRGC launches in late 2007 and early 2008. It is also reflected in the Iranian reaction to the January 2008 announcement that France would be setting up a military base in the UAE. “We are against any kind of increase in the military presence of foreign forces in the region,” Iranian Foreign Ministry spokesman Muhammad Ali Hosseini said. “We do believe that such a presence is not conducive in security and peace in the region... but on the other hand it could be a contributing factor to... any insecurity in the region.”²⁰

15. James Hackett, ed., *The Military Balance 2007* (London: International Institute for Strategic Studies, 2007).

16. Some reports say this type of missile, fired from the Lebanese coast, seriously damaged the Israeli corvette *Hanit*, killing four crew members.

17. Emanuele Ottolenghi, “Iran's Deceptive Commercial Practices,” BESA Perspectives Papers no. 41 (Begin-Sadat Center for Strategic Studies, Bar-Ilan University, Israel, April 15, 2008).

18. Quoted in Simon Henderson, “Facing Iran's Challenge: Safeguarding Oil Exports from the Persian Gulf,” *PolicyWatch* no. 1112 (Washington Institute for Near East Policy, June 7, 2006). Available online (www.thewashingtoninstitute.com/templateC05.php?CID=2477).

19. Lowell E. Jacoby, “Current and Projected National Security Threats to the United States,” Statement for the Record, Senate Select Committee on Intelligence, February 16, 2005, p. 14.

20. “Iran Says French Base in Gulf ‘Not Conducive’ to Peace,” Reuters, February 3, 2008.

Similar remarks were made in 2007 by Hussein Amir Abdollahian, the Iranian ambassador-designate to Bahrain: “The region is currently in a very sensitive and fragile situation due to the massive presence of foreign forces. . . . The arrogant powers intend to gain dominance over the region’s security, energy resources and markets.” He went on: “[Iran] maintains that regional security should be established with the help of all countries in the region.” This formulation excludes extraregional forces. Significantly, Bahrain is the site of the headquarters of the U.S. Fifth Fleet. The Iranian

official called on U.S. and British forces to leave Iraq and the region, arguing that their presence “complicated the situation and caused more insecurity.”²¹

On a visit to Baghdad in March 2008, the first by an Iranian leader since Iran’s 1979 Islamic Revolution, President Mahmoud Ahmadinezhad said the presence of foreign troops in Iraq was “a humiliation and an insult to the region.” He said the major powers should not be interfering in the region’s affairs: “Without the presence of the foreign troops the region will live in peace and brotherhood.”²²

21. “Iranian Envoy Warns against Deployment of Foreign Forces in Region,” Fars News Agency, August 29, 2007.

22. “US Iraq Troops ‘Insult to Region,’” BBC Online, March 3, 2008.

Iran's Other Energy Cards

IN ADDITION TO DIRECT military threats, Iran could take any of the following steps:

- Reduce or stop its own oil exports either as a consequence of military action or as official policy to protest U.S. or wider international action.
- Sponsor sabotage against oil installations in other Gulf producers while denying any responsibility for such action.
- Use its diplomatic or commercial leverage to halt energy flows from neighbors with which it has joint energy ventures.

Cuts in Iran's Own Exports

Iran is a significant oil exporter, but its comparatively weak economy would mean that any self-imposed cut-back or complete cessation of its own exports would risk dangerous economic and domestic political consequences. Iran may hope that halting its own exports—the removal of its 2.5 million b/d contribution to world energy supplies—would prompt an international crisis from which it could gain diplomatically. Others have tried this tactic. When Saddam Hussein was the leader of Iraq, and while United Nations sanctions were in place, he halted oil exports in protest on several occasions, including for thirty days in April 2002 because of Israeli actions against Palestinians. On that occasion, other producers made up for the global supply shortfall with little effect on world prices.¹ The classic example of this tactic was the 1973 decision by Arab OPEC members not to supply oil to the United States to protest Washington's support for Israel in the October 1973 Middle East war. Iran, at the time ruled by the shah, did not participate in this boycott.

In event of disruption, Saudi Arabia's spare capacity could theoretically cover Iran's net exports. The kingdom's underused production capacity helped the world economy cope with the disruptions of the 1979 Islamic Revolution, even though the price of oil soared.

Using such tactics could be devastating for Iran's oil industry, however, which has suffered multiple shocks in the last thirty years. Under the shah, Iranian oil production reached 6 million b/d but fell drastically during the 1979 Islamic Revolution to just over 1 million b/d. It recovered slightly but remained hovering just over 2 million b/d during the 1980–1988 Iran-Iraq War. Since then, production has crept up to just over 4 million b/d, making Iran the second-largest producer in the OPEC cartel. (It is also the second-largest exporter in OPEC, just ahead of the UAE, whose total production is smaller but which also uses much less oil domestically.)

In February 2008, Iran's oil minister, Hossain Nozari, said output had reached 4.184 million b/d, the highest level since the 1979 Islamic Revolution.² Three months earlier, in November 2007, Nozari had said that production could reach 4.5 million b/d within two years, but that would require \$15 billion to develop new projects.³ In June 2007, a National Iranian Oil Company official said its oil fields require at least \$100 billion of investment from international companies over the next decade to raise output by 1 million b/d to 5 million b/d. Planning manager Abdul Muhammad Delparish was quoted by Reuters as saying this was “a conservative estimate,” and internal investment would only provide a quarter of Iran's needs.⁴

An increase in production is not assured, however. Iranian oil fields, like oil fields anywhere, need maintenance and investment to maintain production volumes.

1. “Iraq Suspends Oil Exports but No Allies Join In,” *International Herald Tribune*, April 9, 2002.

2. “Iran Oil Output Record,” *Agence France-Presse*, February 7, 2008.

3. “Oil Minister: Iran Boosted Oil, Gas Production to 4.3m b/d,” *Associated Press*, November 16, 2007.

4. “Iran's Oilfields Need \$100 Billion Investment to Boost Capacity by 1 million b/d, says NIOC,” *Middle East Economic Survey (MEES)*, June 4, 2007.

In 2006, then oil minister Kazem Vaziri-Hamaneh was quoted as saying Iran had a “natural” decline in oil production of 500,000 b/d, caused by depletion of mature fields. As estimated by Iran’s OPEC governor Hossein Kazempour Ardebili, Iranian oil fields needed an annual investment of \$1 billion just to maintain their current level of capacity.⁵ The National Iranian Oil Company is generally considered to have done well in sustaining Iran’s production capability but has had to rely on domestic investment inputs and use less than the most advanced technology available elsewhere in the world.

Any improvement in production will be at least partly offset by a steady increase in domestic consumption, which has more than doubled since the Islamic Revolution, from 600,000 b/d to 1.7 million b/d. Even so, Iran’s refineries cannot produce all the petroleum products the country needs, and gasoline in particular has to be imported. This vulnerability should decline—but will not disappear completely—when the upgrading of Iran’s refineries is complete in 2012.⁶ Gasoline demand is expected to increase because of increased automobile ownership; these cars are mainly produced domestically under license. Demand has decreased somewhat because of the introduction of natural gas-powered buses and trucks.

Iran has huge foreign exchange reserves, estimated at the end of 2007 as \$70 billion, enough to fund imports for nearly eighteen months. According to the Central Bank of Iran, in the fiscal year ending March 20, 2007, total exports amounted to \$75 billion, and imports amounted to just over \$49 billion, a record balance-of-trade surplus. External debt was \$23.5 billion, excluding opened letters of credit not yet consigned, which raised the debt to \$45 billion. Repayment obligations are steepest in 2007–2008, with \$12.4 billion due to

be paid, but then fall to \$2.8 billion in 2008–2009, \$2.1 billion in 2009–2010, \$1.7 billion in 2010–2011, and \$4.5 billion from 2011–2012 onward.⁷ A 2006 U.S. study noted that Iran was suffering from a decline in oil revenues and predicted that, if the trend continued, income could virtually disappear by 2015. The rise in oil prices since then has more than made up for any loss of income in recent years, also providing unexpected additional investment funds for oil field rehabilitation.⁸

Nevertheless, a halt in oil exports would affect the domestic economy severely and likely prompt large-scale resentment against the government in Tehran. After the imposition of gasoline rationing in June 2007, imports of gasoline fell from 200,000 b/d to 90,000 b/d, but incidents of rioting occurred in Tehran and other cities. In early 2008, the Iranian government proposed making official sales of gasoline beyond rationed volumes but at a higher price, hoping to undermine the black market. The planned price for extra volumes was seven times the price of rationed gasoline. In 2006–2007, before rationing was introduced, Iran imported gasoline from many countries, with most (62 percent) coming from the UAE.⁹

The domestic economic impact is one reason many observers say that Iran has no interest in seeing any disruption of energy flows from the Gulf. Indeed, Iran would arguably be affected much more than the intended target of such disruption because Iran’s revenue surpluses, although currently large, are much smaller than those of countries such as Saudi Arabia and the UAE, and Iran’s large, restive population might have an immediate negative political response. At 65 million, Iran’s population is greater than the combined population of all the Gulf Cooperation Council (GCC) member states and Iraq.

5. “Iran Grappling with Internal and International Problems,” *Middle East & Africa Oil and Gas Insight*, November 2006.

6. U.S. Energy Information Administration, “Country Analysis Brief, Iran,” October 2007. Available online (www.eia.doe.gov/cabs/Iran/Oil.html).

7. “Iran Reports Record Balance of Trade Surplus in 2006–7,” *MEEES*, January 28, 2008.

8. “Iran Oil Revenue Quickly Drying Up, Analysis Says,” Associated Press, December 26, 2006. This report is based on Roger Stern, “The Iranian Petroleum Crisis and United States National Security,” *PNAS* 104, no. 1 (January 2, 2007), pp. 377–382.

9. U.S. Energy Information Administration, “Country Analysis Brief, Iran.” According to the brief, Iran imports gasoline from India, Turkmenistan, Azerbaijan, the Netherlands, France, Singapore, and the UAE, as well as from large, multinational wholesalers (BP, Shell, Total, Vitol, LUKoil) and several Chinese firms. In December 2007, the Swiss-based Vitol, the largest wholesale supplier, reportedly decided to end its long-running contract. See “Trader Vitol Ends Gasoline Contract with Iran,” Reuters, December 20, 2007; available online (<http://uk.reuters.com/article/oilRpt/idUKL2027130420071220>).

Iranian-Sponsored, But Deniable, Sabotage

Iran's most likely military response to U.S. military action would be asymmetric retaliation against U.S. oil interests—which include those owned by U.S. allies in the region. Both al-Qaeda and pirates with possible al-Qaeda links have already directly threatened the Gulf area and the sea routes approaching it. The only reported al-Qaeda attack on a tanker was in October 2002 when the French ship *Limburg* was targeted off the coast of Yemen, which is outside the Strait of Hormuz, in the Arabian Sea. A speedboat crammed with explosives was used. A crew member on the *Limburg* died, and 90,000 barrels of oil leaked into the sea. In April 2008, a Japanese tanker en route to the Saudi Red Sea port of Yanbu was slightly damaged by a rocket-propelled grenade fired from one of five unidentified speedboats, which chased it for about an hour, off the Somali coast.¹⁰ Inside the Gulf, in February 2006, al-Qaeda terrorists attacked the Abqaiq processing plant in Saudi Arabia, causing little damage but exposing the possible vulnerabilities of the plant,¹¹ and, in October 2006, there was a reported threat of seaborne attack against Saudi Arabia's principal oil terminal at Ras Tanura.¹²

Following the Abqaiq incident, the Saudi government redoubled efforts to improve the security of its oil installations. Oil company officials noted that the incident had shown the vulnerability of facilities to Iranian-sponsored sabotage as much as al-Qaeda attack. Abqaiq and, indeed, most of the kingdom's oil facilities are located in the Eastern Province of Saudi Arabia, where the kingdom's Shiite minority, coreligionists of Iran, form a local majority. In July 2007, Saudi Arabia announced the formation of a new Facilities Security Force, under the control of the Saudi Interior Minis-

try, whose responsibilities regarding oil facilities seem to replace those previously held by the Saudi National Guard. The Facilities Security Force, which will eventually be 35,000 strong, is being trained by U.S. defense giant Lockheed Martin, under contract to the Sandia National Laboratories, which had previously helped the former states of the Soviet Union secure nuclear arsenals.¹³

Saudi oil facilities, which alone handle 10 percent of the world's daily oil needs, would be a tempting target in Iran's eyes. Although such a scenario seems far-fetched, the vulnerability of the region's oil network is real enough.¹⁴ The newly appointed commander of the IRGC, Muhammad Ali Aziz Jafari, has studied the strengths and weaknesses of the U.S. military campaigns in Afghanistan and Iraq: "Asymmetrical warfare . . . is [our] strategy for dealing with the considerable capabilities of the enemy." He also favors the development of Iran's missile forces: "the IRGC's excellent defensive and ballistic [missile] capabilities [constitute] one of our present advantages, and we aim to attain superiority."¹⁵

The Energy Front Line: Iran's Bilateral Relationships

Iran is trying to develop a series of bilateral relationships with foreign countries and companies that will thwart attempts by the United States and other concerned countries to isolate Iran and pressure it to change its nuclear and other policies. International pressure can be best targeted here and shows clear signs of being effective. For example, in May 2008, European oil and gas companies Shell and Repsol announced that they were not prepared to sign contracts for the exploitation of Iran's giant offshore gas reserves, in part due to U.S. pressure.¹⁶

10. "Pirates Attack Japanese Tanker near Yemen," Agence France-Presse, April 21, 2008.

11. The Abqaiq incident was the first direct attack by al-Qaeda on a Saudi oil installation, although Osama bin Laden, in a December 2004 audio message, had called for attacks against oil, and his deputy, Ayman al-Zawahiri, repeated the call in autumn 2005. In a website message claiming responsibility for the Abqaiq attack, "al-Qaeda in the Arabian Peninsula" said it was part of al-Qaeda's "war against the Christians and Jews to stop their pillage of Muslim riches and part of the campaign to chase them out of the Arabian peninsula."

12. "Saudi Oil Terminal on Alert after Terror Threat," *Times* (London), October 27, 2006.

13. "Saudi Arabia Underlines Commitment to Oil Supply Security with New Protection Force," *MEES*, August 27, 2007.

14. "Persian Gulp," Lex Column, *Financial Times*, October 23, 2007.

15. "New IRGC Commander: Asymmetrical Warfare Is Our Strategy for Dealing with Enemy's Considerable Capabilities; We Aspire to Ballistic Missile Superiority," Middle East Media Research Institute (MEMRI), *Special Dispatch Series* no. 1716, September 19, 2007.

16. Anna Fifield and Javier Blas, "Shell and Repsol Drop Iran Gas Project," *Financial Times*, May 11, 2008.

The most significant of Iran's bilateral energy relationships are related to gas. Iran, with the world's largest reserves of natural gas after the Russian Federation, has been a gas exporter for decades. Even before the 1979 Islamic Revolution, it was exporting gas to the southern Soviet republics of Azerbaijan and Armenia and had elaborate plans for greater exports. Iran is not a reliable supplier, however. In January 2008, in the middle of the coldest local winter in years, Iran cut supplies to Turkey for three weeks because the cold weather increased Iranian domestic demand. Even when Iran resumed exports, the flow was reported to be less than normal—between 1.5 million and 2 million cubic meters per day rather than the usual 29 million cubic meters per day.

These export problems were compounded by a stoppage in supplies to Iran of gas from Turkmenistan for similar reasons of increased demand at home. To meet the crisis, Turkey was forced to stop gas exports to its western neighbor, Greece, and increase its imports from Russia. In January 2007, Iran had similarly stopped gas supplies, but then the stoppage lasted only five days. In the long term, Iran needs to make changes to the current gas pipeline to Turkey or build a second line. The existing line also supplies the Iranian cities on its route.¹⁷

Geographically, Iran is Turkmenistan's closest customer, but Turkmenistan does not think it receives a good price and still wants to exploit export opportunities to the other countries of the former Soviet Union. Iranian media have reported that Turkmenistan wants to double the price of gas it supplies to Iran to \$140 per thousand cubic meters. A Russian company has already agreed to pay \$130 to \$150 per thousand cubic meters for Turkmen gas.¹⁸

Key to Iran's gas ambitions is the giant offshore South Pars gas field in the Persian Gulf, from which Iran would like to supply more than 15 billion cubic meters of gas each year to Europe. In July 2007, Iran

and Turkey signed a deal on energy cooperation and agreed to develop part of this field on a buyback basis. The deal was contingent on the completion of feasibility studies by Turkey. It would be part of a larger agreement that includes the transit of Iranian natural gas to Europe through Turkey, as well as the transit of gas from Turkmenistan to Turkey through Iran. The European part of the project is known as the Nabucco pipeline and involves the Austrian company OMV. The contract, reported to be worth \$32 billion, has come under attack in Austria, where concern about Iran's nuclear program was heightened by the coincidence that 2008 is also being commemorated as the seventieth anniversary of Austria's annexation by Hitler and the subsequent persecution of Austria's Jews. The Austrian government, which owns 31.5 percent of OMV, says it will not intervene because OMV is a private company. OMV distances itself from the issue, saying it "cannot take responsibility for the political situation in [Iran]."¹⁹ In March 2008, Iran and Switzerland signed an agreement for the export of Iranian gas, which would reach Europe by the Nabucco line. The agreement was witnessed in Tehran by Swiss foreign minister Micheline Calmy-Rey, who said the deal was in full compliance with UN Security Council resolutions imposed on Iran.²⁰

Apart from exports to Europe by pipeline, three different projects exist for the export of Iranian LNG from gas produced by the South Pars field. They are being delayed, however, because of the reluctance of oil companies to invest while there are international tensions over Iran's nuclear program. Royal Dutch Shell, Total, and Repsol have interests in the first two projects. In November 2007, Iran claimed that one Chinese and four European companies have been in talks over the third project, known as Iran LNG. The Austrian company OMV signed a preliminary agreement for a stake in Iran LNG, but the deal had not been finalized as of November 2007.²¹ Iranian officials were quoted as

17. "Iran Resumes Gas Supplies to Turkey: Report," Agence France-Presse, January 27, 2008.

18. "Iran Angered by Turkmen Gas Cut, Still Wants Imports," Reuters, February 20, 2008.

19. "Outcry Grows in Austria over Massive Oil Deal with Iran," *Forward* (New York), February 20, 2008.

20. "Iran, Switzerland Sign Gas Export Deal," Agence France-Presse, March 17, 2008.

21. "Europeans Keen to Join Iran on LNG," *Financial Times*, November 16, 2007.

saying that construction of a plant with a capacity of 10 million tons per year would be completed by 2010, although this schedule is considered unrealistic, even if the construction began in 2008.

In April 2008, Iranian oil minister Nozari warned Royal Dutch Shell, Total, and Repsol that a June 2008 deadline to sign natural gas contracts would not be extended. The companies have delayed investments because of soaring costs. The oil minister told reporters at an energy conference in Tehran that the work could be given to local contractors instead, while Deputy Oil Minister Hossein Noghrehkar Shirazi indicated it could be given to Swiss or Austrian companies. The threat of U.S. sanctions has meant that financing costs have grown, although the oil minister said: “Sanctions and threats are old, dull and ineffective instruments for Iran’s oil industry. The slogans of global arrogance have no place in Iran’s oil industry and the oil industry has no worries about meeting its development and management goals.”²²

Non-Western countries appear to have fewer financial or political scruples about dealing with Iran. In February 2008, the Russian energy giant Gazprom agreed to take part in energy projects in Iran, including part of the South Pars field and an unspecified oil field. The same month, the China National Offshore Oil Corporation (CNOOC) indicated it was going ahead with a \$16 billion contract to support the northern Pars gas field. Gas from this field is intended for export as LNG. In December 2007, China’s Sinopec Group signed a deal to develop the onshore Yadavaran oil field. CNOOC has shares listed on the New York Stock Exchange, so the deal will face scrutiny to determine whether it breaches U.S. sanctions law.²³

Tehran is also pursuing gas deals with its Persian Gulf neighbors. A project to export Iranian gas to the UAE, where it is needed to meet rising domestic demand in local industry and power plants, has been

delayed because of arguments over the price of the gas, according to Iran. The gas would come from the offshore Salman field, which is being developed at a cost of \$1 billion. The UAE says Iran has been late in completing the necessary gas export facilities, however. Iranian oil minister Nozari said in April 2008 that Iran was serious in its threat to use the gas domestically if an agreement on price was not reached, but the lack of a pipeline from the field to Iran undercuts that threat.²⁴

Iran has also been discussing supplying gas to Bahrain. Bahraini oil and gas minister Abdul Hussain Mirza said in February 2008 that a joint committee will conclude a deal by the end of the year. A memorandum of understanding for the supply of 1 million cubic feet per day was signed during a visit to the island by President Ahmadinezhad in November 2007. Iran is reported to have earmarked the offshore Farsi gas field as the source for future exports to Bahrain.

Bahrain’s GCC neighbors, Saudi Arabia and Qatar, are more logical suppliers of gas to the island. The former already supplies it with oil. A preliminary deal with Qatar for the supply of 500 million cubic feet per day of gas was reached in 2001 but has never been implemented.²⁵ Kuwait and Oman have also been potentially interested in Iranian gas supplies because rapidly expanding electricity generation has led to local shortages. The Dolphin line—constructed to help Qatar supply gas to Abu Dhabi and Dubai—is the more obvious way of sharing gas among GCC countries.

In April 2008, Iran and Oman signed a deal to jointly develop the Kish gas field in the Gulf, where the Oman Oil Company has proposed investing \$2 billion. The two countries have previously talked about developing the Hengam field, known by Oman as west Bukha, which lies in the Strait of Hormuz. In June 2007, Iran signed a deal to export gas to Oman, which could then be used domestically or reexported by Oman in the form of LNG.²⁶

22. “Tehran Delivers Gas Ultimatum,” *Financial Times*, April 17, 2008; “Iran Says Sanctions Not Deterring Foreign Oil Firms,” Reuters, April 16, 2008.

23. “Iran to Sign Gas Deal with China on Wednesday,” Reuters, February 26, 2008.

24. “Iran Tells UAE Firm: Agree Price or Lose Gas,” Reuters, April 16, 2008.

25. “Gas Supply Talks with Iran to Conclude by End-2008, Says Mirza,” *MEES*, February 18, 2008.

26. “Iran, Oman Sign Deal to Develop Gas Field,” *Kuwait Times*, April 22, 2008; “Oman Becomes First Frontier in Gulf Battle for Difficult Oil and Gas,” *MEES*, April 21, 2008.

A more ambitious project is the Iran-Pakistan-India gas pipeline, valued at \$7.4 billion. In February 2008, however, the Iranian Foreign Ministry announced that negotiations on its construction had been abandoned at the request of all three governments. This action was attributed to serious differences between Islamabad and New Delhi over the project. India had withdrawn from the talks in September 2007 because of a failure to agree with Pakistan on a tariff for the transportation of the gas to its border. The capacity of the planned line was an initial 60 million cubic meters per day. Iran has been suggesting that China could replace India in the project.²⁷ Earlier, reports had indicated that India and Pakistan were upset at an Iranian demand that the gas price formula could be revised every three years, rather than the seven years discussed previously.²⁸ The project appeared to have been boosted again by the visits by President Ahmadinezhad to both Pakistan and India in late April 2008.

Oil. Iran has also been trying to increase its crude oil exports to Asia. Figures in 2007 for exports to China, Japan, and South Korea showed an increase of 25 percent, up to 1.165 million b/d. Although Middle East countries as a group send 64 percent of their oil to Asia and 16 percent to Europe, Iran's figures are 56 percent to Asia and 29 percent to Europe. Iran has carried out

feasibility studies for four joint venture refineries in Asia and another in Syria, with a combined capacity of 1.1 million b/d. The Asian plants would be in China, Indonesia, Malaysia, and Singapore. Iran was proposing to take an equity stake in the projects and also to supply crude oil.²⁹

Iran imports crude oil from Kazakhstan under a swap arrangement whereby the crude serves as feedstock for Iran's northern refineries and a similar quantity of Iranian crude is sold on behalf of Kazakhstan. The Kazakh oil arrives by tanker at the Caspian Sea port of Neka, from where it is piped to the refineries in Tehran and Tabriz. The Iranian oil is exported from Iran's southern oil fields via the Persian Gulf.

Electricity. Iran both exports and imports electric power and is trying to become a regional hub. Existing electric power trade is with Afghanistan, Armenia, Azerbaijan, Turkey, and Turkmenistan. Talks have also been held with Dubai, Oman, and Pakistan. Georgia and Iraq are also possible partners. Of course, the declared role of the controversial Natanz uranium centrifuge enrichment plant is to enable Iran to export uranium fuel for nuclear power stations. It is trying to develop its uranium deposits so that the purity of extracted ore is compatible with use for power generation.

27. "IPI Pipeline Talks Postponed, with Iran Blaming Pakistan-India Differences," *MEES*, February 25, 2008.

28. "Iran Invites Pakistan and India to Sign Pipeline Agreement Despite Outstanding Issues," *MEES*, July 9, 2007.

29. "Vazir-Hamaneh Says Iran Proposing Five Refining JVs with Asia Governments," *MEES*, June 18, 2008.

World Countermeasures to Iranian Threats

IF IRAN WERE TO USE military force or be linked with oil-related sabotage in Gulf states, the United States would likely respond with overwhelming military force. Such Iranian action would prompt wide international concern, probably including condemnation in the United Nations Security Council. The UN could be expected to condemn Iranian action and endorse tough countermeasures. The burden of those reactions would be expected to fall on the United States. The U.S. Navy has long prepared for the mission of keeping the Strait of Hormuz open, recently with the active cooperation of several NATO members and other allies. Iranian military exercises frequently involve scenarios entailing the blockage or closure of the Strait of Hormuz. Military experts estimate clearing and securing the strait for maritime traffic in the wake of an Iranian attempt to disrupt shipping there could take a month or more.¹

In the event of renewed fighting, Iran would probably hope to sink or badly damage a major U.S. warship.² An equal danger is that a U.S.-related installation ashore could become a target. All Gulf states facing Iran have identifiable U.S. military presences, even though the one in Saudi Arabia has been reduced to a military training mission. The island state of Bahrain, where the local Shiites form a majority and the U.S. Navy's Fifth Fleet has its shore headquarters, could be particularly vulnerable. Power plants and a desalination plant could also be targets.

An obvious potential target for U.S. or international forces would be Iran's own oil-exporting capacity, although targeting it might be seen as exacerbating an energy supply crisis that the international community is trying to counter. Kharg Island is Iran's main oil export terminal and, as Iran discovered in the 1980–1988 Iran-Iraq War, very vulnerable to air attack.

Although U.S. and any allied forces would almost certainly score a military victory, the political outcome would be far from certain, as the U.S. experience in Iraq has shown. Also, tactical mistakes by the U.S. military could adversely affect world opinion, as happened in 1988, when the U.S. guided-missile cruiser *Vincennes* mistook an Iranian civilian airliner for an attacking fighter and shot it down, killing 290 people.

A further potential complication could be the issue currently at the center of international concern about Iran: its nuclear activities. With the passage of time, it is likely that nations will become increasingly suspicious that Iran has developed nuclear weapons. Were Iran to achieve that capability, the entire Persian Gulf would effectively become a no-go zone for U.S. aircraft carriers and other large naval ships during times of tension. Such an Iranian capability could also adversely affect the willingness of U.S. Gulf allies—such as Bahrain, Kuwait, Oman, Qatar, and the UAE—to host contingents of U.S. aircraft and other military forces.

Non-U.S. military action, or at least capabilities, remains an important element in the region's ability to maintain energy flows. In November 2007, Saudi vice-minister of defense Prince Abdulrahman bin Abdul Aziz told defense ministers at the Riyadh GCC meeting, "Because of the threats we face, we have to work hard to develop our armed forces to make them capable of providing regional stability and safety for the energy resources."³ Prince Abdulrahman did not name the threats, but he appeared to be hinting at Iran: "This side, which you well know should be looked at within the strategic neighborhood, the change in the origin of threats, the emergence of the terrorism danger and the rise of effective regional powers in the area." Briefing journalists later, he noted, "in the history of Gulf countries, there was no aggression committed by one side

1. Patrick Clawson and Michael Eisenstadt, *The Last Resort: Consequences of Preventive Military Action against Iran* (Washington Institute for Near East Policy, forthcoming).
2. Simon Henderson, "Facing Iran's Challenge: Safeguarding Oil Exports from the Persian Gulf," *PolicyWatch* no. 1112 (Washington Institute for Near East Policy, June 7, 2006).
3. "Saudi Arabia Urges Other Gulf Arab Countries to Develop Armed Forces to Defend Oil Resources," Associated Press, November 7, 2007.

against another, therefore we expect that any other side to act within this context and this same trend.”

These comments by a Saudi prince are an interesting emphasis on the military options, rather than the careful diplomatic position usually repeated by Saudi officials. The \$20 billion arms package promised to Gulf states by Washington in 2007, the bulk of which is for Saudi Arabia, was interpreted as bolstering Gulf Arab defenses and forcing Tehran to recalculate the costs of its options.

The military burden of defending oil export routes could also be shared more broadly than by the GCC member states and the United States. In this regard, the 2008 announcement that France was going to base both an air and naval contingent in the UAE sheikhdom of Abu Dhabi should be seen as a helpful broadening of involvement by allies, even though some commentators viewed the decision as undercutting the U.S.

position in the Gulf. In August 2007, India announced it was revising its defense doctrine and envisioned the extension of the strategic reach of the Indian air force from the Persian Gulf to the Strait of Malacca. The Indian air force would be given the prime role in shaping and customizing the battlefield to enable the army and navy to carry out their tasks, it was reported.⁴

Although sharing the military burden of protecting Gulf shipping routes is important, it also raises the prospect of rivalry, particularly with China, whose recent foreign policy has been to ensure direct access to oil assets. This factor raises questions about the role the rapidly expanding Chinese navy might want to take to safeguard the increasing volume of oil it buys from the Gulf. A Chinese government document laying out defense policy recently stated, “Security issues relating to energy, resources, finance, information and international shipping routes are mounting.”⁵

4. “IAF Draft Defense Doctrine Envisages a Broader Role,” *Jane’s Defence Weekly*, August 22, 2007.

5. Quoted in “As China Grows, So Does Its Long-Neglected Navy,” *Wall Street Journal*, July 17, 2007.

The Need for Alternative Export Routes

ALONG WITH AL-QAEDA terrorism, Iran is the greatest current threat to Persian Gulf energy exports. The Strait of Hormuz is a recognized chokepoint whose importance is predicted to grow. The IEA *World Energy Outlook 2007* noted that 16 percent of world oil demand passed through the Strait of Hormuz in 2006. It predicted that world oil production would rise from 84.6 million b/d in 2006 to 116.3 million b/d in 2030, when the proportion of the world's oil passing through the Strait would be 30.5 percent.¹ The challenge is to devise and implement alternative routes. As Lawrence Eagles, head of oil markets at the IEA, put it: "There is a lot of discussion on these issues, and from an energy-security perspective, it would be very welcome to have an opportunity to bypass the Strait of Hormuz"² (see figure 2).

Some pipelines already exist, and their history provides an example of what can be done in time of conflict. During the 1980–1988 Iran-Iraq War, Iraq, to replace its damaged and exposed offshore loading facilities in the Persian Gulf, built a line capable of carrying 1.65 million b/d across Saudi Arabia to the kingdom's Red Sea coast. A second line from Iraq, northward through Turkey to the Mediterranean, was upgraded and expanded to a capacity of 1.6 million b/d. In addition, a line was built directly westward into Syria, with a potential capacity of 1.4 million b/d. Together, they provided a capacity of 4.3 million b/d, a figure greater than Iraq's historical peak oil production. Tanker trunks driving to Turkey and Jordan provided a further 300,000 b/d of export capacity.

This capacity is currently much reduced for a variety of reasons. The Iraqi Pipeline across Saudi Arabia (IPSA) was closed after the 1990 Iraqi invasion of Kuwait. The kingdom seized ownership of it in June 2001. Although, theoretically, the line could be used

to transport Saudi crude to the Red Sea—it runs parallel to the kingdom's East-West Crude Oil Pipeline (Petroline)—reports say that IPSA has been converted by the Saudis to carry gas as part of the Master Gas System.³ The Iraq-Turkey line remains a major export line but has been subject to frequent attack by insurgents, leading to disrupted use. (A somewhat different route is reportedly being considered.) The line from Iraq to Syria, and then onward to Lebanon, has been closed since the U.S.-led invasion in 2003. Its capacity is variously reported as being 200,000 to 300,000 b/d, although its initial capacity was 700,000 b/d. The proposed expansion to 1.4 million b/d never occurred.

The only addition to export capacity being considered is a 500,000 b/d crude pipeline from Haditha in Iraq to the Jordanian port of Aqaba on the Red Sea; however, this project is only in the early stages of discussion. In 2007, Iraq and Iran had reportedly reached agreement on a 200,000 b/d crude pipeline from Basra to nearby Abadan in return for liquefied gas shipments, but this project should be seen more in terms of Iran's trying to bind its neighbors to energy arrangements rather than of allowing them independence.⁴

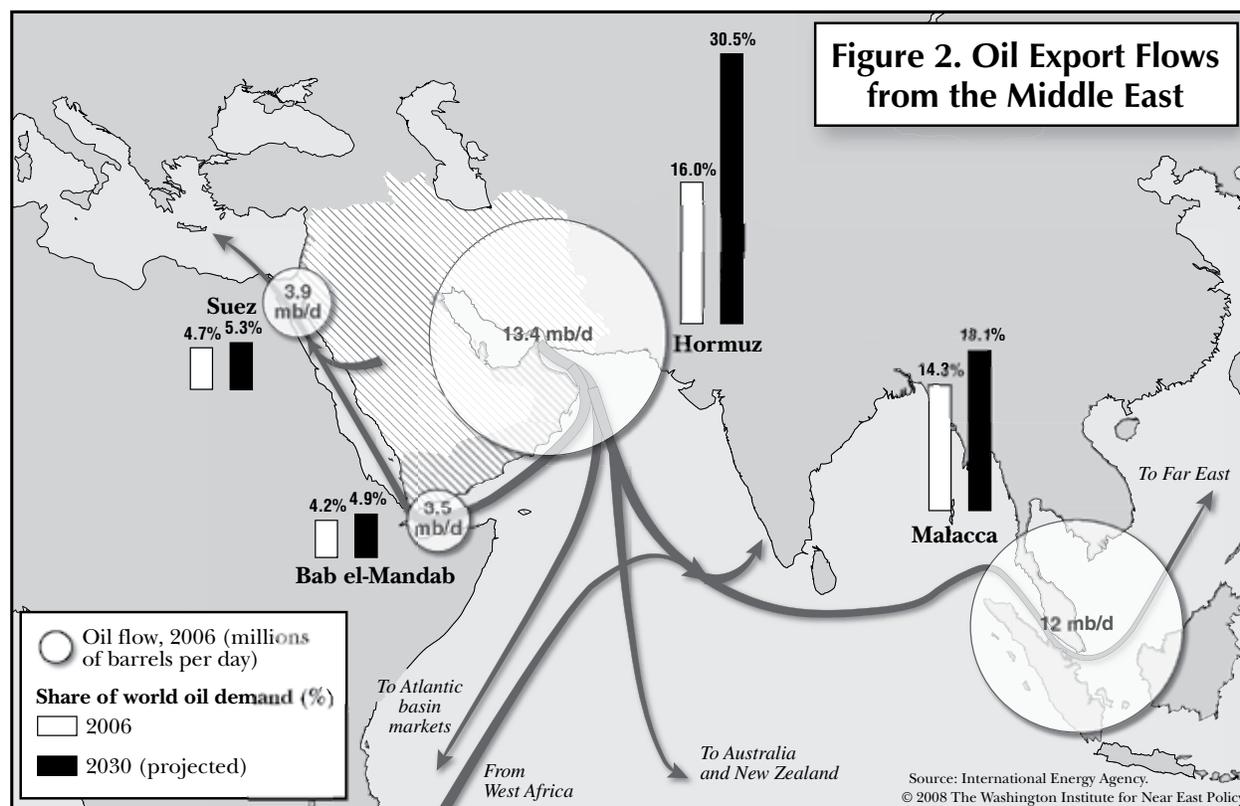
Saudi Arabia does not have any export pipelines across the territory of other countries. Notably, it does not send crude from its newly developed Shaybah field northward across the UAE to the coast, probably because the UAE has a lingering claim to the oil field. The kingdom has two major internal lines that can carry crude from the Persian Gulf coast to that of the Red Sea. The 5 million b/d Petroline is used to transport crude to the terminal at Yanbu for export to European markets. The huge capacity of this line is reported to reflect its role as a strategic option for Saudi Arabia in the event that its exports were blocked from going through the Strait of Hormuz. In fact, the Petroline is used at less than half its

1. International Energy Agency, *World Energy Outlook 2007* (Paris: International Energy Agency, 2007).

2. Matt Chambers, "What if Iran Blocks the Strait of Hormuz?" *Wall Street Journal*, August 27, 2007.

3. U.S. Energy Information Administration, "Country Analysis Briefs, Saudi Arabia," February 2007. Available online (www.eia.doe.gov/cabs/Saudi_Arabia/OilExports.html).

4. U.S. Energy Information Administration, "Country Analysis Briefs, Iraq," August 2007. Available online (www.eia.doe.gov/cabs/Iraq/OilExports.html).



capacity because most of the kingdom's exports are destined for Asia and the location of Yanbu adds up to five days round-trip travel time to the voyage. The second line runs parallel to the Petroline and has a capacity of 290,000 b/d of natural gas liquids. This capacity is being increased to 555,000 b/d in 2008.

One of the first international oil pipelines was the Trans-Arabian Pipeline (Tapline) running from Saudi Arabia, through Jordan and Syria, to Lebanon's Mediterranean coast at the port of Sidon. This line continued in operation after Israel seized the Golan Heights from Syria in 1967. Some of it ceased functioning in 1984, although the portion running to Jordan remained open. The Saudis closed that section in 1990, however, when Riyadh became annoyed by Jordan's support for Saddam Hussein after the Iraqi invasion of Kuwait. The

pipeline's operational capacity is about 50,000 b/d, a fraction of its design capacity of 500,000 b/d.

The UAE, which produces 2.5 million b/d, currently sends all of its exports (2.1 million b/d) through the Strait of Hormuz. Yet, it reportedly has plans to build a 1.5 million b/d pipeline to its Gulf of Oman coast at Fujairah. Project management contracts were awarded in 2007, and a Chinese contractor is most likely to build the line. The reported date for completion is 2009.⁵ The original proposal also involved the construction of a refinery in Fujairah, but this plan was shelved after Conoco pulled out in 2007. Even so, this project would do little to reduce the UAE's overall exposure to the risk of exports being hampered by a crisis in the Strait of Hormuz, given that the country also plans to expand its oil

5. Chambers, "What if Iran Blocks the Strait of Hormuz?" The idea of a transit line is going ahead despite opposition. At a November 2006 meeting in Abu Dhabi, GCC oil ministers in issued a statement saying, "It was agreed to accept the results of a study about the project to build a pipeline to transport Gulf oil in case the Strait of Hormuz is closed, whereby the study recommended that this project is not feasible." "Gulf Oil Producers Drop Hormuz Bypass Pipeline Plan," *Arab News*, November 9, 2006.

production capacity to 5 million b/d by 2014. U.S. experts have in the past suggested that an emergency pipeline could be laid across the peninsula, tracking the road between Ras al-Khaimah in the UAE and the Omani coast. Although attractive, in 2007 such a plan was reportedly being blocked by Oman, which did not want to involve itself in a conflict with Iran. The UAE is also increasing its role as a gas exporter and has plans to pipe gas through to Fujairah, which would then serve as an LNG storage hub, a role originally envisaged for Dubai.

The capacities of pipelines can be radically improved by the use of drag reduction agents (DRAs), chemicals that reduce the turbulent eddies in the oil that lessen the volume of oil that can be transported through a pipeline at any given time. DRAs have been used in the Alaskan pipeline and in the Colombian pipeline system to make up for flows lost during times of operational interruption. Such agents can upgrade capacity by a reported 65 percent; so, for example, the capacity of the Petroline across Saudi Arabia could be boosted from 5 million b/d to 8.25 million b/d. The estimated cost to introduce DRAs to the Petroline is \$600 million, not insignificant but only slightly more than one day's revenues at May 2008 prices of \$120 per barrel. The principal outlay would be the capital expenditure of installing equipment to introduce the DRAs. It would certainly be affordable in a time of crisis.⁶ The enhanced volume, in the absence of other pipeline routes, still falls appreciably short of the oil currently transiting the Strait of Hormuz

Of the other Gulf states, Bahrain, Kuwait, and Qatar have no alternatives to exporting oil in tankers

via the Strait of Hormuz. Bahrain, ironically where oil was first discovered on the southern side of the Gulf, now has minimal reserves and imports oil from Saudi Arabia for refining. Kuwait conceivably could export oil across Saudi Arabia instead of through the Gulf, either connecting to the old IPSA-2 line or building a new line. Qatar, an OPEC member but more a gas exporter than an oil exporter, has a history of poor relations with Saudi Arabia and therefore does not realistically have the same option at this time.

Outside the Gulf, the consequences of an interruption of Persian Gulf energy supplies will be met by the emergency stockpiling system of the IEA, of which the United States is a member. Nevertheless, these stocks can only partially replace supplies because the amount that can be withdrawn each day is limited. The U.S. Strategic Petroleum Reserve contains 700 million barrels of oil, but only 4.4 million barrels can be withdrawn daily. This amount would more than cover U.S. imports from the Persian Gulf of 2.67 million b/d, but stockpiles in other countries are insufficient to replace the estimated total of 16 million b/d passing through the Strait of Hormuz.

In light of these limitations, consumer countries would need to impose emergency conservation measures alongside the release of oil stocks. These options typically include changes in the working day, gasoline rationing, and tax increases.⁷ The IEA has estimated that 2 million b/d—equal to more than 15 percent of U.S. oil imports—could be saved in the United States through a variety of administrative measures, including improved car-pooling, enforcing a 55-mile-per-hour speed limit, encouraging telecommuting, and mandating a four-day work week.⁸

6. Dagobert Brito and Amy Myers Jaffe, "Reducing Vulnerability in the Strait of Hormuz," in *Checking Iran's Nuclear Ambitions*, ed. Patrick Clawson and Henry Sokolski (Carlisle, Penn.: Strategic Studies Institute, 2004), p. 218.

7. Patrick Clawson and Simon Henderson, "Reducing Vulnerability to Middle East Energy Shocks: A Key Element in Strengthening U.S. Energy Security," *Policy Focus* no. 49 (Washington Institute for Near East Policy, November 2005).

8. International Energy Agency, *Saving Oil in a Hurry: Measures for Rapid Demand Restraint in Transport* (Paris: OECD/IEA, 2005).

Policy Recommendations

TAKING THE 2006 THREAT of Supreme Leader Ali Khamenei at face value, continuing the current U.S.-led efforts to change Tehran's behavior runs the risk of spurring Iranian action against energy exports from the Persian Gulf. Dependence on the region's oil and gas represents a strategic vulnerability for the rest of the world. Nevertheless, the key role of energy in Iran's economy makes it a major vulnerability for Tehran as well, and thus a significant pressure point to force changes in policy.

Any sudden crisis would likely prompt a fast-moving series of military clashes, a rapid game of checkers with losses on both sides, disruption of energy flows, and in all likelihood, a chastened though not necessarily defeated Islamic revolutionary regime. U.S. interests would be better served, to continue the metaphor, by a steady but slower game of chess. Iran has significant pieces and a powerful position, but the United States needs to outmaneuver it.

The United States should endeavor to reduce the vulnerability of export routes from the Gulf by working with Gulf countries to develop and expand alternative export routes to the Strait of Hormuz. The most obvious route would be a pipeline across the UAE to the coast of Oman. The construction of a pipeline across Saudi Arabia to the Red Sea coast would also make sense. More ambitious, in terms of the political difficulties involved, would be a pipeline from Saudi Arabia across Oman to the Arabian Sea.

The United States should work to reduce Iran's ability to forge diplomatic and commercial alliances with regard to oil and gas. For most companies and countries, easy access to the U.S. banking system remains a vital component of their overall international operations. Therefore, financial and economic sanctions, or the perception that relations with the U.S. financial system could be impaired, can clearly affect both Teh-

ran and countries or companies doing business with it. These policies need to be enhanced.

Tehran's ability to affect energy flows from the region needs to be limited by better protection of shipping and crucial shore-based infrastructure belonging to U.S. Gulf allies. Daniel Yergin, the chairman of Cambridge Energy Research Associates and Pulitzer Prize-winning author of *The Prize: The Epic Quest for Oil, Money and Power*, the 1992 history of the world's oil industry, has warned the international community "to pay a lot of attention to the security of the physical infrastructure from the wellhead to the consumer, because all of it was built without security in mind."¹

The United States also needs to work with allies in the wider world, not only to increase the pressure on Iran but also to be able to work cooperatively in the event of any supply disruption. The United States already works closely with Europe and Japan through the International Energy Agency. But it needs to encourage other key oil importers, particularly China and India, to hold substantial stocks to help mitigate potential supply disruptions.

Several of these policy objectives, although currently aimed at Iran, have broader and longer-term application. The continuing crisis with Iran represents an opportunity to introduce them and safeguard against future energy supply disruptions in the Persian Gulf. The whole world would benefit. As the IEA *World Energy Outlook 2007* noted, "Supply disruptions drive up prices to all consuming countries, regardless of where they obtain their oil."²

The U.S. role is about leadership more than mere self-interest. The United States is significantly less dependent on foreign energy sources than are other great economies. Imports account for 35 percent of U.S. energy consumption compared with 56 percent

1. Quoted in "Energy Security Worries IEA Chief," *Washington Times*, February 16, 2008.

2. International Energy Agency, *World Energy Outlook 2007: Fact Sheet—Oil* (Paris: International Energy Agency, 2007), p. 2. Available online (www.iea.org/textbase/papers/2007/fs_oil.pdf).

for the European Union and 80 percent for Japan. The Middle East provides only a small portion of U.S. energy supplies. A vital element of the global economic and political system is that the leading global power—the United States—with help from allies and other

parties, maintains the security of world trade over the seas and in the air. For the system to work, the United States must prevent any power from dominating the Persian Gulf while retaining the ability to protect the safe passage of ships.³

3. Walter Russell Mead, "Why We're in the Gulf," *Wall Street Journal*, December 27, 2007.

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