



NATIONAL DEFENSE UNIVERSITY

STRATEGIC FORUM

INSTITUTE FOR NATIONAL STRATEGIC STUDIES

Number 130, October 1997

Energy Security in a Time of Plenty

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Conclusions

- Energy supply trends are good for Western security. Dependence on the volatile Persian Gulf may increase only slightly, as additional supplies come from stable pro-Western areas, such as Norway and Latin America. Also, the cost of producing oil is dropping thanks to the information revolution.
- In spite of East Asia's rapid growth, world oil demand is unlikely to grow each year by more than 1.5-2.0 million barrels per day (mbd). East Asian growth is concentrated in industries that use little energy. Oil demand growth in both China and the former Soviet Union will be modest as they shut or modernize energy-wasting heavy industries.
- Market forces increasingly determine what happens in the energy business, except in the Caspian basin where geopolitical factors will determine whether the region's rich oil and gas resources will be brought to market.
- An energy security issue for the coming decade will be adjusting to the next energy trade pattern, in which East Asia and the Persian Gulf become more tightly tied—each more reliant on the other.
- Ample supplies in the world energy market continue to maintain relatively low prices. Despite an upward blip in 1996, crude oil prices in the mid-1990s have been about the same as in the mid-1980s, while the average price level for other goods rose about 30 percent over that decade.

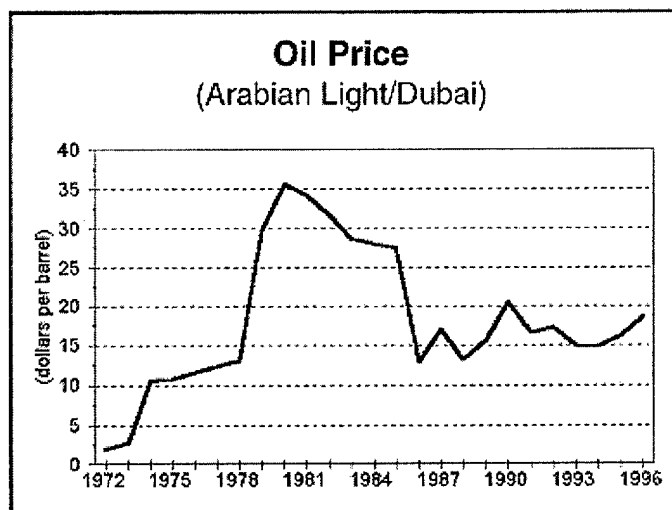
Supply Outlook

From 1986-1996, the world energy supply increased by 2.6 percent per year, excluding the former Soviet Union (FSU) where production fell sharply. Oil's share of the world energy supply held constant at about 40 percent; natural gas' share rose to 23 percent, while coal's fell to 27 percent, with hydro and nuclear power sources making up the remaining 10 percent. Most natural gas and coal supplies are consumed in the country in which they are produced; oil makes up about 90 percent of the energy traded between countries.

The main factor driving the increasing supply of energy between 1986-96 was not price. In fact, prices were not particularly attractive for producers. Instead, two factors came into play:

First, governments adopted more investor-friendly policies. Monopolies were abolished and protectionist restrictions were eased as governments also lightened the burden of regulation and welcomed foreign investment. The effects of these policies continue. For example, thanks to foreign investment, Venezuela is on track to increase its oil output capacity from 3.5 mbd in 1996 to 6 mbd by 2005.

Second, the cost of producing oil has been dropping. The information revolution is reducing the cost of modeling and sensors. With techniques like 3D or 4D seismic and directional drilling, a higher proportion of drilled wells are hitting oil, plus more of the oil reserves in a field can be recovered-40 or 50 percent recovery instead of 30 percent in the past. As costs drop, more output is coming from less attractive oil fields.



These forces have made themselves felt in a wide range of countries, with the exception of Russia, where oil output fell by 3.3 mbd from 1991-96. During that same period, 13 non-OPEC countries each increased production by more than 100,000 barrels per day. Development of deeper offshore fields gave Norway the largest increase at 2.3 mbd, compared to the total increase in world oil output of 4.3 mbd. Latin American countries, excluding Mexico, were able to increase output 1.4 mbd between 1991-96. There is every reason to expect that these trends will continue and that output from outside the Middle East will continue to increase. Indeed, U.S. oil output in August 1997 was higher than in August 1996, reversing a long-term decline. Thanks to increasing Gulf of Mexico production, U.S. oil output is likely to increase from the 1996 level of 8.6 mbd for at least five years.

Because production has become more attractive in areas that were previously marginal, Middle Eastern countries have had less of an advantage in the oil production business. From 1991-96, oil production by Middle East and North African countries rose by 3.0 mbd, but 2.2 mbd of that was recovery from the Iraq-Kuwait war. Outside of those two countries, production rose only modestly from 20.7 mbd in 1991 to 21.5 mbd in 1996. Despite the increase in output due to the recovery in Kuwait, the share of Middle East and North African production in world output rose only 3 percentage points-from 32 percent in 1991 to 35 percent in 1996.

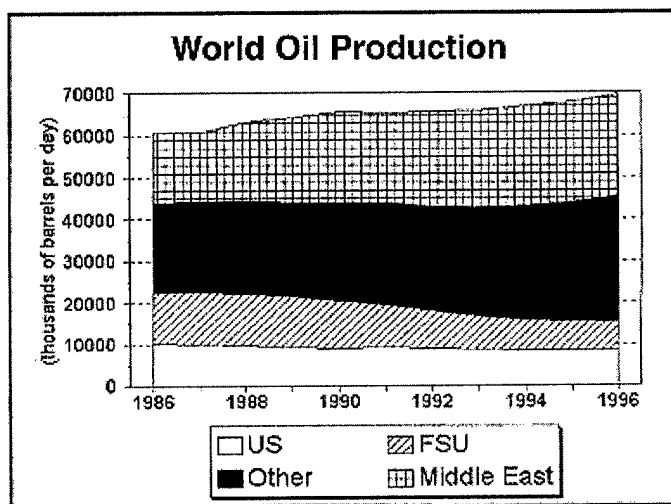
Middle Eastern countries face serious domestic economic problems, including rapid population growth and popular expectations that the government will provide services at levels that can ill be afforded. To fund job creation, balance budgets, and continue social welfare programs, Middle Eastern governments want to raise oil production capacity, which they can readily do given their ample reserves. Although currently producing about 9 mbd, Saudi Arabia has a program underway to raise its capacity from 11 mbd to 14 mbd within the decade. The other Gulf Cooperation Council (GCC) states-Kuwait, Bahrain, Qatar, UAE, and Oman-are increasing their capacity from 7 mbd to at least 9 mbd. And Iraq has tremendous production potential were it to abandon its stubborn opposition to UN resolutions that

prevent its full return to world markets. Already, it could produce 3 mbd, and that could rise to 6 mbd within three to five years after sanctions end. On the other hand, Iran's plans to expand its capacity face serious financial constraints, exacerbated by U.S. laws threatening secondary boycotts against firms investing in Iranian oil and gas.

Prospects for ample supplies for the foreseeable future-given the likely increases in Middle Eastern capacity and the prospective growing output of the rest of the non-FSU world-are good, even if FSU production remains stagnant. In fact, as discussed below, FSU production may well rise, given the investments pouring into the Caspian Basin, even if the unfavorable investment climate keeps Russian output from growing.

Demand Outlook

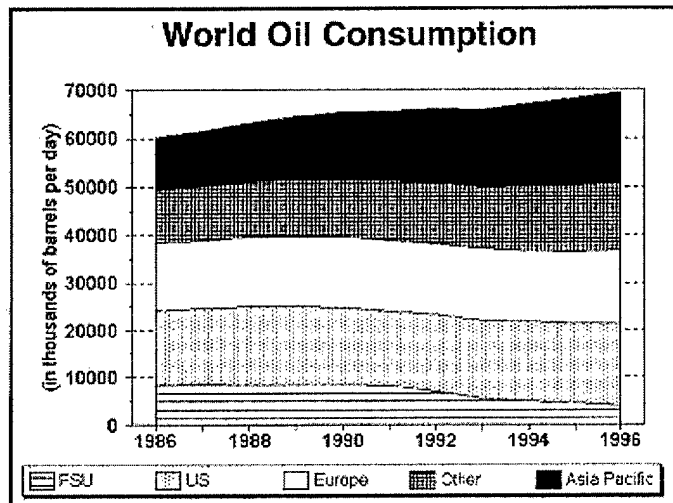
While prospects are good for sustained increases in oil output, the outlook for demand is not as clear. The Energy Information Administration, part of the U.S. Department of Energy, forecasts that oil demand will increase briskly from 1996 to 2015, growing from 72 mbd to 103 mbd. Of that 31 mbd increase, 14 mbd will come from East Asia (a category which excludes Indonesia and India). By contrast, demand in the advanced industrial nations of Europe and North America will grow only 6 mbd, including modest growth for U.S. oil consumption which was 17.4 mbd in 1996. Demand in the rest of the world-East Europe, Latin America, Africa, the Middle East, and South Asia-will increase by 11 mbd.



On the other hand, a host of factors could cause world oil demand to grow less rapidly than this Energy Department forecast. The world economy may not continue the robust growth rates of the mid-1990s. Global warming concerns could result in significant restrictions on fuel consumption. There could be a reduction in the massive subsidies for energy consumption in many OPEC countries. Energy-wasting state-owned industries in the FSU and China could be modernized or closed. Natural gas could be used instead of oil for much of the new generating capacity in Europe and Asia, especially since there is considerable excess gas production capacity in the FSU and several large gas projects elsewhere are in advanced stages of planning.

In any case, East Asia's growing energy demand can be accommodated readily through market mechanisms. Indeed, while East Asia will be an important part of the world oil market, it will hardly be an overwhelming presence. Under the Energy Department forecast, East Asia will consume 27 percent

of the world's oil in 2015, up from 21 percent in 1996. That seems counterintuitive, given that East Asia is growing more rapidly than the rest of the world. The explanation is China-in two ways. First, Chinese energy consumption is 75 percent coal, which comes from China's ample domestic supplies. Coal is used for railroads (the backbone of Chinese transportation), for heating, and for electricity generation. Second, industry in China consumes 60 percent of all energy, and many of the intense energy-consuming industries are inefficient and not growing. China's growth is coming from sectors that use little energy, compared to the industrial behemoths of the Maoist past. Combining these two factors, China's increase in oil consumption until 2015 will be almost entirely for road transport; oil consumption for transportation will probably increase from .8 to 3.5 mbd.



Security Implications

The United States has devoted much effort to preserving the security of the Persian Gulf-motivated mostly by concern about what instability could do to world oil markets and what a rogue could do if he had unfettered access to the entire Gulf's oil. Those will remain serious problems, not only because the Gulf is the world's major oil producing region (29 percent in 1996) but also because it has 65 percent of the world's proven oil reserves. Explaining the policy to the U.S. public has been easy, given the significant U.S. dependence upon the Gulf for oil imports (roughly 20 percent in 1996). It will be interesting to see how U.S. public opinion reacts as the United States uses less Gulf oil. Indeed, the world oil market is splitting into an Atlantic Basin-in which Europe and America import oil from Africa and Latin America-and an Asian market-in which East and South Asia import oil from the Persian Gulf.

In the Asian market, the major security issue is whether China is willing to rely on market forces to supply imports of a vital input like oil. The signs are encouraging. China already relies on imported grain for a significant portion of urban consumption, and China's approach to its metal needs (iron and copper) has been to invest abroad rather than to search for special political relations. Still, Chinese leaders may think that political considerations determine oil supplies. Indeed, the oil industry was dominated by politics, vice markets, for decades until the mid-1980s. And the Chinese may worry about the U.S. propensity for sanctions on energy producers, seen in the cases of Burma and Iran as well as the UN sanctions on Iraq.

There has been much interest in Asia about what increasing oil imports from the Gulf will mean for

protection of the sea lanes of communication (SLOCs) across the Indian Ocean and up the South and East China Seas. It is hard to see how China could in the coming decade or two play a significant role regarding those SLOCs. China and the United States share a common interest in freedom of navigation in those SLOCs, and the United States will protect those SLOCs. Were relations between the United States and China to deteriorate, China could not deny those SLOCs to the United States, while the United States could deny them to China. Energy security may be used as one argument among many by those in Beijing who want a blue sea navy.

Caspian Oil

While the role of market forces in the oil and gas industry is increasing, one area where geopolitics remains primary is the Caspian basin. Rich oil and gas reserves lie under and around the Caspian Sea, mostly oil in Kazakhstan and Azerbaijan and gas in Turkmenistan. The proven reserves are about on the same order of magnitude as around the North Sea: 16 billion barrels of oil and 8.3 billion cubic meters of gas, according to the United States government. The same source estimates that possible reserves are much greater: 163 billion barrels of oil and 17.6 billion cubic meters of gas, which would make them equal to 16 percent of 1996 global proven reserves of oil and 12 percent of gas. U.S. firms are investing billions of dollars, primarily in the Azeri offshore and Kazakh Tenghiz fields.

The problem is how to get the oil and gas to market from the landlocked Caspian countries. Commercial rationale alone would seek outlets to the south, via Iran or Afghanistan. Three oil pipelines are already under construction or renovation: a 1.2 mbd oil pipeline from Kazakhstan via Russia to the Black Sea and two 0.1-0.2 mbd pipelines from Azerbaijan to the Black Sea, one via Russia and one via Georgia. Also under construction are two short gas pipelines to hook up the Iranian gas network with its neighbors: Turkmenistan in the east, and Turkey in the west. While the Kazakh pipeline will carry most of that country's projected oil capacity, additional major pipelines will be needed, especially for Azeri oil and Turkmen gas. Many routes are under discussion, with framework agreements signed for several routes. All of the projected routes have problems, which will make the choices difficult:

- Existing pipelines go through Russia. Adding more capacity to those pipelines raises fears of excessive dependence on Russia. Plus economics dictate that Caspian oil going through Russia would probably go to Black Sea ports, from where it would be carried by ship. That could create problems in the increasingly crowded Bosphorus Straits.
- Transport via Iran faces political problems, i.e., U.S. reluctance-if not opposition-and Azerbaijani suspicions of Iranian irredentism. Plus the Iranians are offering poor terms and have a bad reputation from their price gouging in the 1970s on the gas pipeline to the USSR.
- Turkey is lobbying vigorously for pipelines across its territory to the Mediterranean. But the political geography is complicated: a pipeline to any of the producing countries would have to cross at least one transit country before getting to Turkey, plus the best pipeline routes inside Turkey cross unstable Kurdish areas.
- Other pipeline routes are equally difficult politically (to India via Afghanistan and Pakistan) or challenging economically (to China from Kazakhstan).

Recommendations

- Maintain the U.S. commitment as the ultimate guarantor of security in the Persian Gulf, while beginning a dialogue with Europe about a fairer sharing of security responsibilities.
- Defuse a potentially dangerous rivalry in the Caspian basin by: (1) clarifying that the United States welcomes Russian investment in the region; and (2) laying out a road map for Iran of what *quids* it

must deliver before the United States will offer the *quo* of dropping objections to investment in pipelines via Iran.

- Encourage a dialogue with China about energy security in which the United States can: (1) make clear that it will protect SLOCs for all shipping, and (2) encourage China to concentrate on market mechanisms to guarantee its energy needs.
- Welcome Chinese investments in foreign energy projects, such as announced intentions to invest more than a billion dollars in Kazakhstan. While the Chinese role may reduce opportunities for U.S. firms, that is a price worth paying for avoiding politically motivated Chinese ties with rogue oil producing regimes like those in Iran and Iraq.

Patrick Clawson is the author most recently of U.S. Sanctions on Iran (Emirates Centre for Strategic Studies and Research, 1997). He is indebted to Peter Davies of British Petroleum, whose BP Statistical Review of World Energy 1997 is the source for data cited here, unless otherwise noted. Dr. Clawson can be reached at (202) 685-2217, e-mail clawsonp@ndu.edu, or facsimile (202) 685-3866.

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INTERNET DOCUMENT INFORMATION FORM

A . Report Title: Energy Security in a Time of Plenty

B. DATE Report Downloaded From the Internet: 09/25/01

**C. Report's Point of Contact: (Name, Organization, Address, Office
Symbol, & Ph #): National Defense University Press
Institute for National Strategic Studies
Washington, DC 20001**

D. Currently Applicable Classification Level: Unclassified

E. Distribution Statement A: Approved for Public Release

**F. The foregoing information was compiled and provided by:
DTIC-OCA, Initials: __VM__ Preparation Date 09/25/01**

The foregoing information should exactly correspond to the Title, Report Number, and the Date on the accompanying report document. If there are mismatches, or other questions, contact the above OCA Representative for resolution.