

T E S T I M O N Y O F
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On Global Energy Security Issues

Before the
US Senate Committee on Foreign Relations
Subcommittee on International Economic Policy,
Export and Trade Promotion

APRIL 8, 2003

Good afternoon. Senator Hagel and distinguished members of this Subcommittee, it is a pleasure to come before you today to address such a timely and critical issue. My name is Vahan Zanoayan and I am the President & CEO of PFC Energy. PFC Energy is a strategic advisory firm in global energy, based in Washington, DC. We work with most of the companies in the global petroleum industry on various aspects of their international oil and gas investments and market strategies.

CRUDE OIL AND NATURAL GAS: DIFFERENT SECURITY CHALLENGES

This hearing is about global *energy* security issues, which covers both oil and natural gas. The definitions of supply security of oil and natural gas are the same: sustainable, reliable supplies at reasonable prices. However, **I would like to start by highlighting an important distinction between security of crude oil supplies and security of natural gas supplies, because these two commodities represent entirely different security challenges globally, and particularly for the United States.** Oil is a global commodity. Conditions in crude oil markets in Houston, New York, Singapore and Rotterdam change together and in the same direction. Global oil markets equilibrate. Gas is not yet a global commodity. Vast natural gas resources in various parts of the world remain stranded because natural gas cannot be transported as easily as crude oil. Global gas markets do not always equilibrate – it is possible to have a natural gas supply shortage in North America without causing a disruption in Europe or elsewhere.

I will argue that although security of oil supplies receives most of the attention in policy discussions and debates, oil is not the most pressing energy security problem faced by the United States. On the other hand, natural gas, which rarely gets into the limelight of the energy security discourse, has emerged as a major supply security problem for the United States.

SECURITY OF OIL SUPPLIES

The world has had thirty years to adapt to and prepare for oil supply disruptions. Both consuming nations and producing nations have participated in this process. After the oil shock of 1973, the term “Energy Security” became synonymous with “Oil Security” and was firmly embedded in the mindset of policy-makers in the West. Their response to real and perceived supply threats was massive, coordinated and effective, leading to such results as the building of strategic petroleum reserves, substantial new taxes on oil use, diversification of sources of supply, new efficiencies in both energy use and production, and the establishment of more transparent and efficient markets. The oil industry and producing countries made major contributions to these outcomes by investing substantial sums of money in developing new resources and technologies and in increasing production capacity. Security of oil supplies may still receive lip service now and then, it may even enter into various political agendas, but it is no longer a burning concern, and justifiably so.

The record of global oil markets in dealing with major supply disruptions during the past fifteen years is truly impressive. In 1990, in the immediate aftermath of Iraq’s invasion and occupation of Kuwait, the world lost two important OPEC producers at once. The combined loss of production from these two countries was over 4.5 million b/d. It is not easy to imagine larger and more sudden physical supply disruptions than this. And yet, neither the market impact of this disruption nor its implications for the world economy was that great (although the US economy slid into a short recession). Oil prices rose for a brief period of about two months, and then came tumbling down as soon it was known that additional supply disruptions, this time from Saudi Arabia, were not likely. The lost production was made up elsewhere, mostly by Saudi Arabia, and markets calmed down.

As the world was adjusting to the loss of Iraqi and Kuwaiti production, output from the former Soviet Union was also falling. From 1989 to 1996, crude oil output of the FSU crashed from over 12 million b/d to 6.8 million b/d. And although domestic demand also fell considerably, FSU exports dropped by over 1.5 million b/d during a period of serious setbacks in the Persian Gulf, without causing any shortages or sustained price spikes in the world. Again, other producers were happy to make up for the difference.

Let’s look at a more recent example. The latest weekly statistics from the Department of Energy put US crude oil imports at 10.4 million barrels/day for the week of March 28, 2003, the highest weekly import rate ever. **While our country is at war with a major producer in the Persian Gulf, while Venezuelan production has not yet fully recovered from a devastating collapse in output, and while Nigerian production was down by 750,000 b/d in the past two weeks, the United States managed to record the highest imports of crude oil ever, amid declining prices from their recent highs. If this is not supply security, I don’t know what is.**

Before I go into the reasons for this record of supply security, let me address an important misplaced concern that such statistics often evoke, namely, the concern with “dependence” on foreign oil suppliers. We will always depend on imported oil. Interdependence among nations is not a bad thing. **“Energy independence” for the US is a meaningless concept.** US production of oil is falling due to the maturity of US oil fields. US reliance on imported oil has already surged by 1.2 million barrels per day in the last five years, and is likely to continue to grow in the next ten years, bringing US net imports to 13 million barrels per day, equivalent to the combined 2002 production of the entire North

Sea and Saudi Arabia. Greater energy efficiency can help slow down the increase in imports, but the direction is inevitable in the medium term.

The proper way to frame concerns about “dependence on foreign oil” is to talk about vulnerability to oil supply disruptions, such as the ones described earlier. In this regard, diversity of supply clearly enhances security of supply. The more producing areas there are around the world, the better. International oil companies have actually done a good job in diversifying oil production in a wide range of countries over the past two decades. **But the role of supply diversity in providing security, though very important, can be exaggerated.** Given the highly skewed distribution of oil reserves in various geographic regions, there is a limit to how much diversity can achieve in terms of security of supplies and there is an even more critical limit to the ability of some producers to replace others as strategic suppliers of crude oil (more on this below).

OIL MARKET DYNAMICS

The ability of the global oil sector to deal with such major supply disruptions is not accidental. It derives from a complex set of interactions and developments in and among producing countries, consuming countries, traders, and the industry. Thus, the realities that have reduced the world’s vulnerability to oil supply disruptions have a permanence that will keep them relevant and effective in the foreseeable future.

One of the most basic features of this dynamic is the divergence between the degree of dependence of oil importing and oil exporting countries on oil. In the past thirty years, while the industrialized countries successfully diversified their sources of crude oil imports and greatly reduced their relative dependence on energy, the major oil exporters remained dependent on oil revenues. **Today, oil exporters have much more reason to worry about security of their markets than importers have reason to worry about security of supplies.** This persistent dependence on oil revenues has meant that the major exporters – largely the member countries of OPEC – have had to constantly balance between two conflicting interests and needs: their short-term financial requirements and their long term market share interests. The former calls for *relatively* higher prices, which jeopardize the latter. The latter requires *relatively* low oil prices, which jeopardize the former.

So it is not a coincidence that price moderation and stability have been the key policy objectives of the major exporters for the past quarter of a century. They pursue this objective because it is the only way to optimize the balance between their revenue and market share requirements. When oil prices rise too high, the industry and the world economy strike back through both reduced demand and higher non-OPEC supplies, eroding the producers’ market share and revenue base. When oil prices fall too low, the industry and the world economy respond with higher demand and lower investments in exploration and production, eventually curtailing the rise in non-OPEC output and sometimes even causing a reduction in existing flows. While this helps to eventually turn around the eroding market share of the exporters, it does cause considerable short-term financial pain and economic and budgetary instability in the major producing countries.

This has led to an alignment of interests between major exporters and the US. The US has itself opposed both very low (single digit or low teens in terms of dollars/barrel)

and very high (over thirty dollars per barrel) crude oil prices. Thus, the producers have tried to manage crude oil market supplies, mostly successfully, to achieve a price range centered around \$25/barrel. This price is high enough to continue encouraging substantial investment in the global upstream sector as well as in technology, but not so high as to cause any major economic dislocations in the industrialized economies.

I'd like to stress that I do not advocate complacency regarding security of oil supplies; just a recognition of all that has been already achieved in the past thirty years to reduce the world's vulnerability to supply disruptions. These are real achievements with very solid safety nets such as strategic petroleum reserves, which have not yet been used to their full potential.

DIVERSITY OF SUPPLIES AND THE ROLE OF VARIOUS PRODUCERS

I would like to briefly comment on the oil policies and roles played by selected exporters in the context of market dynamics and oil supply security. As mentioned earlier, diversity of supply enhances security of supply, but it is not sufficient to guarantee security of supply. It is important to distinguish between crude oil suppliers of commercial significance and suppliers of strategic or security significance. Size and growth potential are important and generally sufficient determinants of the former. They are not sufficient determinants of the latter. **In order to qualify as a strategic supplier, a producing country needs to also have the capability to cause large swings in its production at very short notice in order to compensate for a disruption elsewhere in the world.**

Saudi Arabia

Since September 11, there has been growing skepticism towards the kingdom of Saudi Arabia, not only as an ally which does not share our goals and values, but also as a key supplier of crude oil. Although September 11 did not change the below-ground realities of oil reserves, it did change above-ground perceptions enough to challenge Saudi Arabia's continued role as strategic supplier of crude oil. The central concern that has been raised in the US is that if Saudi Arabia is unreliable as an ally in the fight against terrorism, it may also be unreliable as an ally in providing energy security, regardless of the record of the past twenty-five years. To reinforce this position, some critics have maintained that we will soon not need Saudi oil, and that the Kingdom's role of supplier of last resort can be replaced by new energy from the FSU – Russia and the other Caspian states. **This reasoning is flawed and could have catastrophic consequences if turned into the bedrock of a new energy security policy.** We can do a lot more harm than good by trying to "fix" the current well-functioning system, especially through policies that are based on misconceived notions and wrong assumptions.

Two unique features give Saudi Arabia strategic significance as a crude oil supplier (as distinct from purely commercial importance): First, its willingness and ability to maintain substantial excess production capacity; and second, its willingness and ability to swing production to meet changing market conditions. No other country in the world can perform these two roles to the same extent as Saudi Arabia. In the past twelve months, Saudi Arabia increased its crude output from 7.3 million b/d to nearly 9.4 million b/d, an *increase* of nearly 2.1 million b/d. This *increment* is substantially larger than the entire

production of Kazakhstan and Azerbaijan put together, which was close to 1.3 million b/d last month.

The role of a swing producer in stabilizing prices is central to the orderly operation of international crude oil markets. The excess capacity that Saudi Arabia maintains allows world oil markets not to panic at every incident, civil war or revolution. Without it, there would be cyclical booms and busts which would destabilize economies and countries. Saudi Arabia is the supplier of last resort, the central bank of the global oil market that provides liquidity and reassurance in difficult times. Neither the Caspian nor Russia is likely to ever play the role of swing producer, because of the resource gap and structure of ownership of the sector.

Saudi Arabia has been a reliable supplier of oil for over a quarter century. Our policy should not be to reject the Middle East in favor of Russian or Caspian oil. The world will need as much Russian, West African, Caspian, Latin American and European oil as it can get. As argued already, such diversity of supplies enhances security. But it is a simple fact that the Middle East in general, and Saudi Arabia in particular, will continue to be the keystone of the oil markets so long as the industrialized world relies on petroleum. The size of their resource endowment, the commitment of the Saudi government to play this role, the unrelenting dependence of the region's governments on oil revenues and the negative consequences of their own past experience with politically interrupting oil supplies will almost guarantee this.

Iraq

There is no question that Iraq, with its massive proven oil reserves and vast potential, will be a major player in world oil supplies for decades to come. In the near term, the conduct of the war and the extent of field damage will be of concern. Longer term, the post-war oil administration structure will be crucial to setting the foundation for Iraq's future role in global oil markets. **I commend the Administration's calls for Iraq's oil sector to be run for the benefit of the Iraqi people.** But simply replacing President Saddam Hussein with an agreeable general is not going to achieve this objective. **Iraq should retain sovereign ownership of its principal national resource, and it should be credible and competent Iraqi professionals, not foreign nationals, who run Iraq's oil and gas sectors.** Furthermore, the participation of foreign capital and technology in the sector should be ensured through production-sharing agreements under terms designed by the Iraqis – a strategic decision that Iraqi technocrats made as far back ago as 1990, before the first Gulf war. However, **transparency and accountability will be crucial**, not only to ensure that the oil sector is in fact being run for the benefit of the Iraqi people, but also to provide a level playing field for the international oil and gas companies to compete in Iraq and to successfully bring capital and technology to maintain and increase Iraq's production. This can be achieved through scrutinizing the oil revenues, not controlling the physical oil assets or running the sector.

However, even if such a system is put in place and Iraq's oil production capacity increases, Iraq cannot act as a *strategic* alternative to Saudi Arabia. First, the financial pressures that a new government will face over the next decade will be tremendous. Iraq may produce below capacity as part of OPEC policy, particularly in the latter half of this present decade, but it will not be able to afford keeping spare capacity simply to play

the role of swing producer. Moreover, with significant additional production capacity increases being dependent on foreign investment, Iraq would be forced to decide whether idled production capacity should be at the expense of international oil companies operating in the country or the Iraqi people. Neither Iraq's finances nor its reliance on foreign investment bodes well for its emergence as a new swing producer. It is worth recalling here that the excess capacity in Saudi Arabia was developed a long time ago not from the Saudi government budget, but by the former American partner companies of Aramco. Saudi Arabia compensated these companies when it nationalized Aramco through the huge oil surpluses accumulated in the 1970s. **It would be next to impossible for any government today to allocate billions of dollars from its current budget to build substantial production capacity for the intention of keeping it idle.**

Russia

Russia's oil production and exports have grown substantially in the past few years, and this has contributed to diversity of supplies. Russian oil companies have made progress in transforming themselves to have the governance, management skills and capital structure of Western companies, but are still striving for stability, transparency and accountability. The Russian companies are producing low cost oil, which had already been discovered in huge, but aging fields. Although their oil production is increasing, it is largely through enhanced recovery techniques, producing more oil in place, rather than exploration. Oil companies there are not organized or capitalized for ongoing exploration in order to sustain growth.

Currently Russia blocks Western companies from investing in exploration and development. It is difficult for foreign oil companies to operate there. It does not appear that there will be a legal framework for further production-sharing agreements for foreign companies to invest in the upstream oil sector, outside of joint ventures, such as the recent TNK-BP agreement – which is not likely to be repeated easily. There are other hurdles as well, such as inadequate transportation infrastructure, which means that most Russian oil must be sold into Europe. Oil pipelines are still controlled by the state and there are no signs that this will change.

Although Russian production is rising rapidly to be on par with that of Saudi Arabia, there are important differences between the two producers from a supply security viewpoint. Russia cannot replace the Middle East, as some have speculated. Russian production was over seven million barrels per day in 2002 and could rise to nine million barrels per day, or over ten percent of world production, by 2007, with exports of about five million barrels per day, *if all goes well with pipeline and port additions and expansions*. While these are substantial additional volumes for world markets, Russia is not another Middle East – by any relevant measure such as swing production potential and significant excess production capacity. **It would be a mistake to base the energy security of the industrialized world on Russian oil.**

Washington can take constructive steps which could make a difference in solving some of the constraints which limit Russia's future oil growth. Washington should urge the Russian government to open up to foreign investment in exploration and production, with reasonable, stable terms and enforceable laws. Russian oil output would grow and would

reach world markets. America should not worry if the oil actually gets to US shores. It is one global market and the US and its consumers are part of it.

The Caspian Region

The Caspian brings together a complex package of “above ground” and “below ground” risks. The region held great promise for international oil companies because of the expected large scale of opportunities that could be accessed. Since 1993, when the first contract was signed by Chevron in the Tengiz field in Kazakhstan, there have been a few steps forward, but also many disappointments. Government relations are difficult and corruption remains a problem.

The two main producers in the Caspian are Azerbaijan, with current output of approximately 300,000 barrels of oil per day, and Kazakhstan with current production of approximately one million barrels per day. By 2010, these two Caspian producers could have combined production of perhaps three million barrels per day, with exports slightly below this level from all pipelines and other routes. This is the best case scenario. While this is an important contribution to the diversification of world oil supplies, it does not come close to challenging the Middle East. **For the most part, the Caspian is and will remain constrained by uncertain reserves, exploration risk, technical hurdles, commercial risks, political risks and chronic transportation bottlenecks.**

West Africa

Another region where oil supply is surging is West Africa, notably Angola, Equatorial Guinea and Nigeria. The industry's capital and technology is pouring in to explore and produce in the offshore. Production will rise from 3.7 million barrels per day in 2001 to over six million barrels per day by 2007.

West Africa is the mirror opposite of Russia when it comes to oil and gas agreements. Terms and conditions are very competitive, which, combined with its high potential for oil, has attracted massive investment from international oil & gas companies – far more investment than Russia, the Caspian or the Middle East. As a result, production is swelling. Unlike the Caspian or Russia, West African oil can be easily loaded and moved anywhere by ship. However, this increase in production does not change the global supply picture in any significant way: it increases the volume coming from West Africa at the expense of the more mature areas of the Atlantic Basin, namely, the North Sea and North America. This shift of production from politically stable regions to West Africa will increase overall market volatility and will enhance the role of more stable suppliers such as Saudi Arabia and Russia.

Latin America

Despite the success of the deep water in Brazil, the restrictions on foreign investments in Mexico, and the political polarization in Venezuela may delay the realization of the considerable potential in this region. **There is a huge opportunity in Mexico to increase output of oil and gas. But difficult political decisions will have to be made** to either

allow the Mexican national oil company, Pemex, to increase its capital expenditures and take higher exploration risk, or to allow foreign investment in the oil and gas sector – or both. The former is difficult because governments generally do not find it politically acceptable to take large commercial risks. The US government could play a role in helping Mexico help itself by encouraging a policy of allowing foreign capital and technology into the Mexican oil and gas sector. **While the Mexican economy is being transformed into a world class exporter that can be competitive against any country in its class, its energy sector remains constrained by 1970s style resource nationalism.**

In Venezuela, the government has long overcome the hurdle of political resource nationalism, and is anxious to attract foreign investment in the oil and gas sector.

The new Hydrocarbon Law of Venezuela allows for private sector participation of up to 49% in upstream oil and 100% in upstream natural gas developments. Most of the gas development effort in Venezuela, especially in the offshore, is aimed at delivering natural gas to the US market, making it especially relevant for the US energy security concerns. However, the perceived risks by foreign companies of investing in Venezuela are greater than the actual risks. The challenge of the government is therefore to demonstrate to international oil and gas companies that the rewards of investing in Venezuela outweigh the risks, and that Venezuela offers a competitive commercial environment relative to other host countries. Some international oil and gas majors already have come to this realization and are actively pursuing projects in Venezuela, but more needs to be done. Thus, only by removing the real and perceived hurdles to foreign investment in Mexico and Venezuela will there be any significant additions to production capacity from the region during this decade.

SECURITY OF US NATURAL GAS SUPPLIES

The domestic pressure on natural gas supplies and prices poses a greater threat to energy security and to the US economy than the rising cost of crude oil. As discussed earlier, oil is a global commodity; natural gas is not. Because it can be easily moved by tanker and stored, the price of oil is set by an efficient and transparent world market. Natural gas prices are set in regional markets because it is difficult and expensive to ship over long distances.

US demand for natural gas is outstripping supply. For the second time in the last three winters, natural gas prices spiked over \$10/thousand cubic feet and there was genuine concern that there could be spot shortages in some areas. Demand will rise even further when the economy rebounds, aggravating the problem. Warm winters can mask the problem of inadequate growth in supplies by providing temporary relief to markets; but this simply helps prolong our complacency about the adequacy of natural gas supplies and exacerbates the fundamental problem.

The main problem facing the gas industry is the rapidly shrinking supply in the lower 48. **Washington has not been helpful – it has encouraged consumption of natural gas but actively discouraged production** in such gas rich areas as the Mountain west, the Eastern Gulf of Mexico and offshore the Northern East Coast. This has become more of an issue as traditional US gas production areas have passed their peak production and will see declines in the years ahead.

The reasons behind the rapid rise in gas demand are numerous and complex, but could be summed up as follows: a) capital stock put in place during 1990's to take advantage of artificially cheap gas; b) excellent environmental benefits of natural gas; c) high efficiencies - especially in the power sector.

But it is becoming extremely difficult to maintain production, let alone increase output in line with demand, no matter how high the price. A number of factors are at play causing the slow supply response, including the following:

First, basin exhaustion is a fact of life in a mature asset base, and the number of drilling prospects is declining in the traditional areas of production.

Second, accelerating decline rates per well have created the so called treadmill effect: the annual decline rates are around 20%, which means that every year just to keep production flat, a fifth of the production has to be replaced.

Third, regulatory hurdles act as a constraint. Large areas, over hundreds of millions of acres, were excluded from exploration and production. The US is the only producing country in the world where a resource base of such significance will be kept off limits to development.

Fourth, Liquefied Natural Gas (LNG) can provide only modest support in the foreseeable future, because of infrastructure capacity limitations. Presently there are four LNG receiving terminals in the U.S, all located near the consumption centers on the East and Gulf Coasts. All of these facilities are over twenty years old, and more will be needed to import the required volumes of gas. However, **the Federal government is gridlocked over issuing permits for new terminals and for the expansion of existing terminals, with different agencies including the EPA, Commerce, Interior, Homeland Security, and Defense Departments squabbling over muddled and conflicting authority.** The energy industry is eager to build new terminals, but without permits it cannot proceed. Some of the energy industry concerns have been heard. Late in 2002 new rules were implemented to streamline the approvals process for onshore and offshore regasification terminals. This has allowed for at least one new terminal in the Gulf of Mexico to be approved. But much more needs to be done in this area.

Fifth, although there are vast natural gas reserves in both the Canadian and Alaskan Arctic, expensive pipelines are needed to transport the gas to US markets. These pipelines would require over five years for permitting, financing and construction, so they are not a short-term solution. Recent high natural gas prices are likely to reinvigorate development of these long-distance pipelines, just as they did two years ago after the last price spike. To the extent possible, steps should be taken to facilitate development efforts to bring Arctic gas to the lower 48. **The Alaskan and MacKenzie Delta pipelines are the right answers, but not for this decade.**

Complacency about gas supplies rose with the unusually warm winter of 2001-02. This past winter, which was only slightly colder than the norm but still brought spikes in gas prices, should be a wake up call that gas supplies, not oil, are actually a greater threat to the nation's ability to provide reliable supplies to consumers at a reasonable price. Gas stocks are at an all time low, and with production declining by 4% to 5% this year, it is unlikely that adequate storage will be built by the beginning of next winter to meet the high

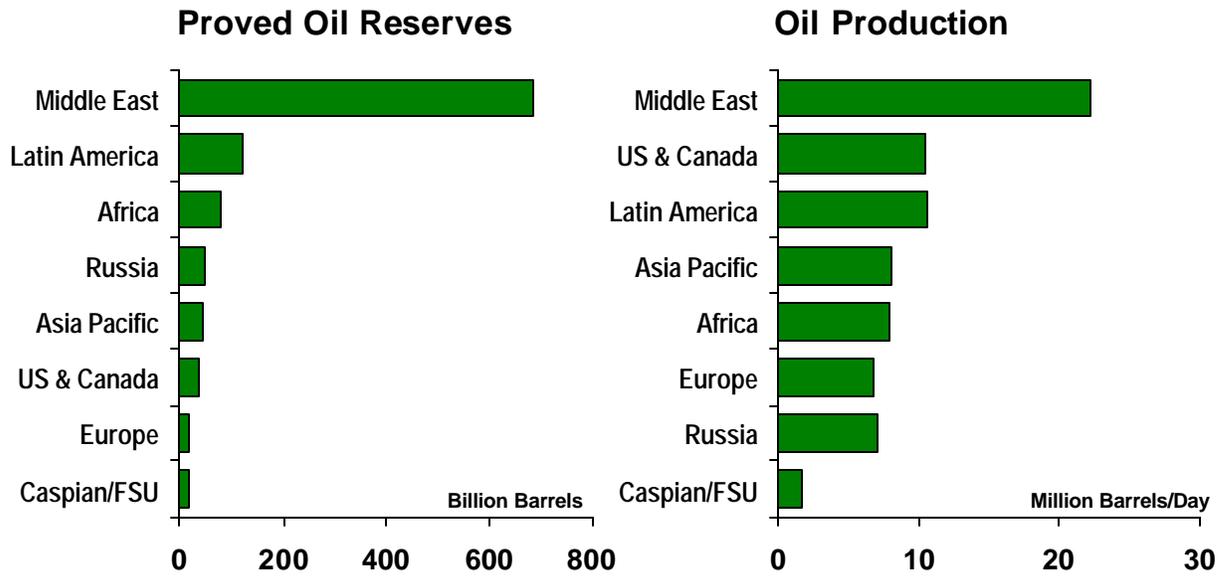
seasonal demand. Industrial demand, which has already fallen, will be suppressed further to make sure that homes, schools and hospitals can keep their lights on. **This suppression of gas supplies for industrial use means something concrete: factories will have to shut down, production will move offshore, and jobs will be lost. This is what is happening right now, and will continue to happen until the supply bottlenecks are cleared.**

CONCLUSIONS

In conclusion, it is important to understand that energy security applies equally to natural gas and crude oil. The global crude oil sector has established an impressive set of structures, procedures and safety nets that reduce the vulnerability of consumers to supply disruptions. Volatility in global crude oil markets is unavoidable, but diversity of supplies can help enhance both security of supplies and stability in markets. It is critical to distinguish between commercial and strategic significance when it comes to key crude oil suppliers. Although Russia is a very significant commercial supplier and Iraq can become one in the medium-term, only Saudi Arabia can play the role of strategic supplier to world oil markets.

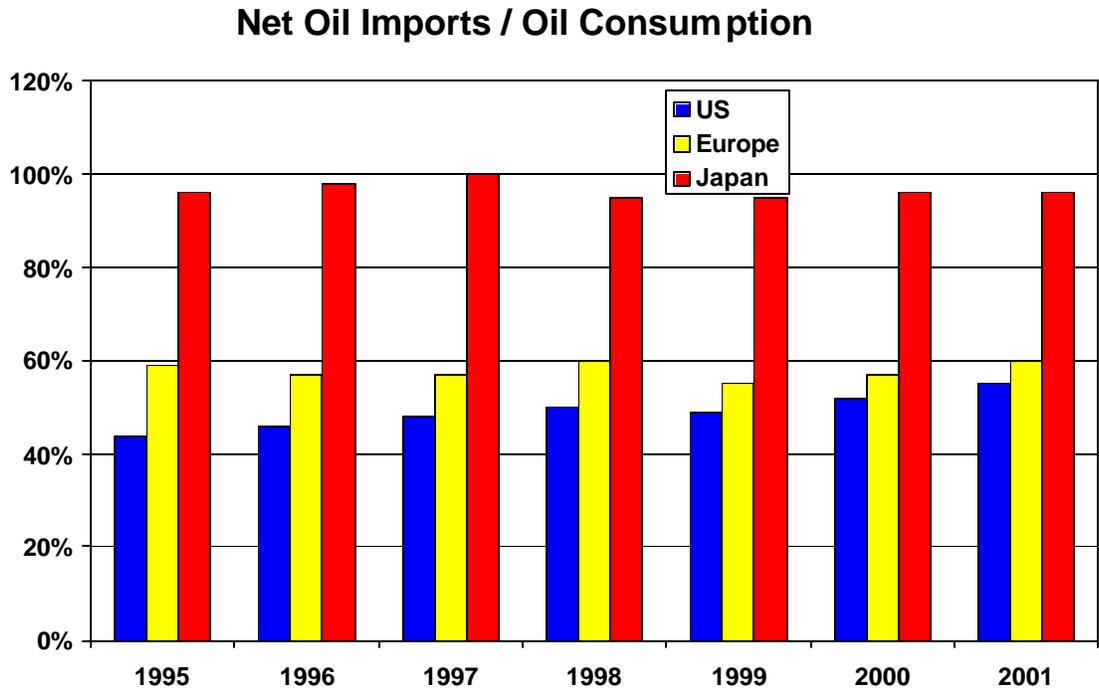
The United States is much more vulnerable to shortages and disruptions in natural gas supplies than to shortages in crude oil. The economic costs of this vulnerability are substantial. The challenge is to increase domestic production and, as importantly, facilitate the transportation of new and more distant supplies of natural gas to the US, because the traditional sources can no longer meet demand. Many of the constraints handicapping progress can be cleared through legislative and regulatory measures, but this requires effective coordination and focus by the government on the gas supply issues.

World Oil Reserves & Production by Region



Source: BP 2002 Statistical Review of World Energy; data for 2001

Oil Imports & Dependency



Source: BP 2002 Statistical Review of World Energy; data for 2001