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ON

ENERGY SUPPLIES IN EURASIA AND IMPLICATIONS FOR U.S. ENERGY SECURITY

Distinguished Members of the Subcommittee:

Thank you for inviting me to address the question of energy supplies in Eurasia and their implications for U.S. energy security. It is a great honor to appear before this distinguished body. Senator Hagel has performed a valuable national service by focusing attention on the vital issue of energy security, and I hope that my remarks will shed some light on this important topic.

The United States now stands at a critical juncture in the evolution of its energy policy, particularly with respect to petroleum consumption. The demand for energy in this country has been rising steadily over the past years as a result of continued economic growth and the vital role of air, ground, and sea transportation in all aspects of economic activity. According to the U.S. Department of Energy (DoE), total energy use in the United States grew by 16 percent between 1990 and 2002, and is projected to grow by another 35 percent between 2002 and 2025. At the same time, many other countries, both developed and developing, have also experienced an increased need for energy, pushing total world energy use from 348 quadrillion BTUs in 1990 to a projected 645 quadrillion BTUs in 2025, an increase of 85 percent.[1]

The growing worldwide need for primary energy has been translated into increased demand for every conceivable source of energy. This is especially true for petroleum, the world's leading source of primary energy, and for natural gas, the fastest growing source of energy. According to the DoE, global consumption of petroleum is projected to rise by 41 percent

between 2002 and 2025, from 78.2 to 119.2 million barrel per day (mbd), while consumption of natural gas will rise by 69 percent between 2002 and 2025, from 92.2 to 156.2 trillion cubic feet. Petroleum consumption in the United States – the world's leading consumer of oil – is projected to rise by comparable percentages, from 17.0 mbd in 2002 to 27.3 mbd in 2025.[2]

Satisfying these huge increases in demand will place enormous pressure on the global energy industry. Fortunately for all of us, this industry has, until now, succeeded in satisfying the world's ever-increasing thirst for petroleum products. While there have been some notable bumps along the way – most notably in 1973-74, during the Arab oil embargo, and again in 1979-80, following the Islamic Revolution in Iran – global oil production has generally kept pace with rising worldwide demand. This has been made possible by the development of new fields in such areas as the North Slope of Alaska, the North Sea, the coastal waters of Africa, and the former Soviet Union, as well as through the more efficient exploitation of existing fields. But now there is reason to doubt whether this steady growth in petroleum output can be sustained in the decades to come, calling into question many assumptions about national energy policy.

Experts in the field have been aware of this concern for some time, but the devastation wrought by Hurricane Katrina has brought this into the public consciousness. Katrina was significant for two reasons: first, because it demonstrated just how tight world supplies of petroleum have become in recent years and how little room for maneuver we have in times of crisis; and second, because it exposed the vulnerability of drilling operations in the deep

waters of the Gulf of Mexico, the only major oil-producing area of the territorial United States to experience an increase in output over the past few years. While we can expect the full recovery of most onshore energy operations in the affected areas, it is not yet evident that we can expect the full recovery of deep offshore operations, at least not in the immediate future. This could entail a significant reduction in domestic crude production, with an accompanying increase in reliance on imports. Hence the importance and timeliness of this hearing.

As the Members of the Subcommittee are well aware, there has been a steady increase in U.S. dependence on imported petroleum over the past few decades. As recently as 1985, we produced over 70 percent of the oil we consumed. But demand has increased while domestic production has declined, and so the extent of our reliance on imports has steadily grown. We crossed the 50 percent threshold of import dependence in 1998, and, before Hurricane Katrina, were projected to reach 56 percent in 2010 and 66 percent in 2020.[3] How Katrina will affect these projections cannot be determined at this time, but we should expect a more rapid increase in the dependency rate.

Where will this additional petroleum come from? It would be comforting to think that it will all be derived from Canada, Mexico, and other nearby, friendly suppliers, but this is not likely to prove the case. As America's dependence on imports rises, more and more of this foreign oil will have to be obtained from distant producers in the developing world, many of them prey to chronic instability. Exactly which of these countries will prove to be our major suppliers at any given moment in time cannot, of

course, be determined in advance, but the DoE does give us a good idea of what the options will look like: according to its most recent projections, 32 percent of world petroleum output in 2025 will be accounted for by the Persian Gulf producers, another 13 percent by African producers, 14 percent by producers in Latin America, and 14 percent by the nations of the former Soviet Union.[4] Whatever the relative share of U.S. supplies provided by these countries at any given moment, all are likely to figure prominently in U.S. foreign energy policy.

It is the stated goal of the Bush administration to diversify the foreign sources of American petroleum supplies and, to the degree possible, to enhance America's access to all of these potential suppliers. These are among the major objectives of the 'National Energy Policy' (NEP) adopted by the administration in the spring of 2001 and announced by the President on May 17, 2001. I need not summarize these proposals in detail, but suffice to say that the NEP called on senior government officials to do everything in their power to encourage and assist the leaders of the major foreign oil producers both to increase their country's output and to make this added energy available to consumers in the United States. And, to the degree that they have been able to do so, these officials have endeavored to achieve these objectives.

But despite these efforts, and the evident desire of many foreign oil producers to expand their output, numerous obstacles have arisen to frustrate plans their efforts to boost production. These range from internal unrest and ethic violence to endemic corruption and managerial incompetence, political

wrangling among competing power brokers, terrorist strikes, insufficient investment funds, the faster-than-expected depletion of some older fields, and disappointing drilling results in some newly-developed fields.

To lend some specificity to this observation, consider the following. In its 2002 projections of future oil output, the Department of Energy predicted that the combined output of Indonesia, Iraq, Nigeria, Saudi Arabia, and Venezuela would total 24.1 million barrels per day in 2005.[5] However, according to the most recent DoE "country analysis briefs" on these countries, their combined output during the past year or so has averaged only about 18.9 mbd, a shortfall of over 5 mbd. This discrepancy is not due to faulty assumptions on the part of the DoE, but rather to the fact that oil officials in those countries have encountered unexpected impediments to their efforts to boost production. These have included the bitter insurgency in Iraq, political upheaval in Venezuela, ethnic violence in Nigeria, organizational limitations in Indonesia, and what appears to be faster-than-expected depletion of large fields in Saudi Arabia. (I say "appears to be" because Saudi officials have not released field-by-field data on the output of their major reservoirs, frustrating efforts by outside observers such as Matthew Simmons of Simmons & Co. International to gauge the country's long-term production capacity.[6])

It is possible, of course, to attribute these shortfalls to unexpected but temporary impediments that will disappear in the course of time, allowing for greatly increased production rates in the years ahead. But a prudent policymaker would have to conclude that something deeper and more

systemic is at work, precluding large-scale gains in the future. This assessment, I contend, is the only sensible way to proceed.

What, then, is the systemic situation we face? It is too early to answer this question with any degree of certainty, but I think we can attribute these problems to a number of critical factors. I will address two of these in my testimony: first, a gradual slowdown in the growth of worldwide petroleum output as large, easy-to-develop fields in more accessible areas go into decline and a bigger share of global output is derived from smaller, deeper, more scattered fields in less accessible areas; and second, the natural propensity for oil production in developing countries to invite internal conflict over the allocation of petroleum revenues. I will discuss each of these briefly.

First, growing reliance on less productive, less accessible fields. This is the predictable trajectory of any resource-extraction process, in that entrepreneurs will always seek to develop the largest and most accessible sources of supply first and leave the less attractive sources for later. This trajectory is plainly evident in the case of petroleum. For example, in the United States, the first fields to be developed were in readily accessible, onshore areas of Pennsylvania, Texas, and Oklahoma; only later, as these onshore fields in the Lower-48 went into decline, did the oil companies invest in the extraction of oil from more remote, difficult-to-reach fields in Alaska and the deep waters of the Gulf of Mexico. Needless to say, extraction in these remote areas entails far more demanding and costly technologies than extraction from onshore sites; it also exposes drilling and delivery operations

to more extreme challenges of climate and weather – a troubling reality that we now see with greater clarity in the Gulf as a result of Hurricanes Ivan, Katrina, and Rita.

The problems raised by our growing reliance on remote, hard-to-reach reservoirs will persist whether or not we have reached the point of "peak" worldwide petroleum output, as claimed by some. I know that all in this room are familiar with this discussion, and so it need not be elaborated upon here. In any case, there is no way to predict the moment of peak production in advance – we will only know of its occurrence after world output has begun a long-term decline. But while we cannot determine with any certainty that we are at or near the moment of peak production, I do think that we can state with some assurance that the world's remaining oil – however great its extent – exists in fields that lie deeper underground, farther offshore, dispersed in smaller pockets, and located in more extreme climates than many of the major fields now in production. We can still get at this oil and bring it to market, but the costs of doing so will rise and the net output from any given reservoir is likely to be less than that obtained from the large, prolific fields that have satisfied our petroleum needs in the past. Development of these remote fields will also raise significant environmental concerns, particularly when they entail the construction of long pipelines through environmentally-sensitive areas, such as Arctic regions or tropical forests.

The second factor that deserves attention is the propensity for oil production in developing world or transitional societies to invite internal conflict over the allocation of petroleum revenues. This danger arises most

frequently in countries where there are no other significant sources of wealth and where the state (rather than private landowners) owns the rights to underground oil and mineral resources. When these conditions prevail, there is a powerful incentive for avaricious cliques and individuals to gain control of the national government – thereby gaining control over the oil sector and all the revenues this entails – and, once in power, to retain control for as long as possible through any means necessary. The natural result is a persistent tendency toward corruption, cronyism, and authoritarianism in all such "petro-states," as they have been called.[7] Because the potentates who rule these states are generally reluctant to risk their continued tenure by allowing generally fair elections, the sole option for those who seek to remove the prevailing regime or to install themselves in its place is through assassination, coup d'etat, or armed rebellion. It is these sorts of upheavals that periodically result in the disruption of oil deliveries from key producing states, adding to the pressure on global supplies.

THE SITUATION IN EURASIA

Both of these factors – our growing reliance on hard-to-get-to oil and the propensity of petro-states to invite internal political disorder – apply with particular vigor to Eurasia.

Eurasia was, of course, one of the first areas of the world to harbor large-scale petroleum extraction. During the Czarist era, the area around Baku, in what is now Azerbaijan, was one of the world's major centers of

production, supplying much of Europe in the years leading up to the First World War. Later, during the Soviet era, large fields were developed in Western Siberia, between the Ural Mountains and the Central Siberian Plateau, and in western Kazakhstan. In the 1980s, production in these areas made the Soviet Union a major world oil producer, pushing its total output to a record of 12.8 mbd in 1988. All of these onshore fields were connected to an elaborate system of pipelines, permitting the delivery of crude oil to refineries and markets throughout the Soviet space and to friendly clients in Eastern Europe. Soviet energy officials were aware that additional petroleum reserves were located in Eastern Siberia and in offshore areas of the Caspian Sea and Sakhalin Island, but lacked the inclination and know-how to develop these hard-to-reach reserves, and so concentrated on the intensive exploitation of the more accessible, onshore fields.

Today, the onshore fields around Baku are largely depleted and many older fields in Western Siberia are in decline. Any hope of boosting net production in Russia and the newly independent republics of the Caspian Sea basin will, therefore, require the development of Eastern Siberian and offshore fields. This is an inherently demanding endeavor, requiring the utilization of advanced technology and the construction of new drilling rigs, pumping stations, and pipelines. Even with massive involvement and investment by Western firms, the exploitation of these fields will prove costly and arduous.

A similar picture holds for natural gas production in the region. Russia harbors the world's largest reserves of natural gas, and the Central Asian

republics of Turkmenistan and Uzbekistan also possess substantial supplies. But the core of Russian gas production is concentrated in three giant fields in Western Siberia – Urengoy, Yamburg, and Medvezh'ye – and these fields are now in decline and Gazprom, the state gas monopoly, predicts steep declines in natural gas output between 2005 and 2020.[8] Once again, significant supplies are known to lie in offshore fields in the Caspian and off Sakhalin. But obtaining this gas presents similar challenges to the production of offshore oil in these areas.

Given the difficulties involved in tapping into these hard-to-get-at supplies, it should not be surprising that the large consortia established to accomplish this feat have run into substantial difficulties. The estimated cost of the Sakhalin II natural gas project, for example, has doubled over the past few years, from $10 to $20 billion, causing a delay in the initial start-up of export operations.[9] Development of the giant Kashagan oil and gas field in Kazakhstan's sector of the Caspian Sea has also run into difficulty, driving costs up and delaying the start of operations. According to the DoE, "Kashagan contains a high proportion of natural gas under very high pressure, the oil contains large quantities of sulphur, and the offshore platforms require construction that can withstand the extreme weather fluctuations of the northern Caspian Sea area." These difficulties have discouraged some of the project's initial investors, forcing a restructuring of the operating consortium and delaying the field's expected online date beyond 2008.[10] Problems have also emerged in Azerbaijan's sector of the Caspian Sea. Although some offshore projects have proved successful,

notably the Azeri, Chirag, Deepwater Gunashli (ACG) structure, others have proved less so. "Besides the ACG project," the DoE noted recently, "many of Azerbaijan's offshore prospects have been relatively disappointing on contrast to the high expectations for the Caspian Sea region in the 1990s."[11]

I will not use this occasion to discuss the problems arising from the transportation of oil and gas from the landlocked Caspian to markets around the world, as I believe these problems are well understood. Nonetheless, it is important to indicate that the construction of these pipelines – and their protection from terrorist and insurgent attack – remains a significant challenge to the global energy industry and participating nations. Even if new oil and gas projects in the Caspian region come on line, it should not be assumed that the resulting output can be safely and economically delivered to markets around the world.

In addition, many of these remote and offshore projects entail significant environmental dangers. For example, a scientific panel convened by the World Conservation Union concluded that the Sakhalin II project poses a significant risk to the survival of the Western North Pacific Gray Whale, a highly endangered species. "It is particularly unfortunate that the only known foraging grounds for the [surviving Gray Whale population] lie along the northeastern coast of Sakhalin Island, where existing and planned large-scale offshore oil and gas activities pose potentially catastrophic threats to the population."[12] Much concern has also been voiced over the environmental impact of offshore oil and gas production in the Caspian Sea, the habitat of over 400 species unique to the region. Likewise,

environmentalists in Georgia have expressed concern that possible leaks from the Baku-Tbilisi-Ceyhan (BRC) pipeline could endanger the famed mineral waters of the Borjomi Valley.[13]

Turning now to the second factor I discussed earlier – the propensity toward authoritarianism and political disorder in oil-producing states of the developing world – we can also detect signs of this in the former Soviet space. This is not the place for a detailed analysis of political conditions in Russia and the Caspian republics, but I believe that the corrosive effects of petroleum politics have taken root there.

In Russia, the central government, headed by President Vladimir Putin, has moved aggressively to extend state control over the nation's energy industry, using questionable legal tactics in the process. Most notable, of course, is the use of tax laws to assert state control over OAO Yukos, once the nation's top oil producer. These moves have been accompanied by the arrest of CEO Mikhail Khodorkovsky and other top Yukos officers on charges of fraud and tax evasion. Putin has also presided over the merger of state-owned Rosneft and the natural gas giant Gazprom, producing a state-controlled energy behemoth with substantial interests in oil, natural gas, and nuclear power. These moves, while not strictly illegal, have been widely viewed as part of a larger trend toward the concentration of economic and political power in Putin's hands, reversing progress toward democratization in Russia.

Kazakhstan and Azerbaijan have also witnessed the concentration of power in the hands of their presidents, Ilham Aliyev and Nursultan

Nazarbaev, respectively. Though both have staged elections to convey a veil of legitimacy over their continued rule, neither has permitted a free press or the unimpeded existence of opposition parties. The election that brought Ilham Aliyev to power in October 2003 (succeeding his father, Heyday Aliyev) was reportedly tainted by widespread fraud and the use of violence, and the 1999 re-election of Nazarbaev has been stained by similar tactics. As in Azerbaijan, a ruling dynasty of sorts is being established, with Dariga Nazarbaev, the president's daughter, the heir apparent. Human rights observers in both countries have reported repeated jailings and persecution of independent journalists and opposition political figures. Corruption is also said to be widespread, with friends and relatives of the ruling elite being favored with government contracts while much of the population lives in dire poverty.

For the present, the leaders of both Azerbaijan and Kazakhstan appear to be in firm control of their countries. But just because there are no public expressions of dissent – those who attempt to voice public disagreement are likely to be jailed or worse – does not mean that there are no reservoirs of discontent. As recent developments in Kyrgyzstan and Uzbekistan demonstrate, powerful anti-government currents can be found just below the surface of allowable public discourse. What is particularly worrisome about this situation is that many of those who oppose their authoritarian rulers are losing faith in the promise of democracy and are turning to radical Islamic movements for inspiration and leadership. We cannot be sure if this was a factor in the armed insurrection in Andizhan in Uzbekistan on May 12-13,

but there is reason to suspect the growing influence in that country of Hizb-ut Tahrir and other radical fundamentalist organizations.[14]

IMPLICATIONS FOR POLICY

There is much to consider in all of this that bears on U.S. energy security and American foreign policy. I recognize that the actual making of policy is the prerogative of our elected leaders, but I would like to make a few comments for the record.

Just as I see two primary factors that underlie the strained energy situation we now find ourselves in, there are two principal policy-related conclusions I would derive from this analysis:

First, I believe that we have passed the point at which it is possible to assume that, with increased effort and investment, the global energy industry will be able to continue expanding petroleum output in tandem with the ever-growing demand expected from the world's developed and developing countries. Total oil output may continue to rise for some years to come, but it will never fully satisfy the world's thirst for more petroleum. This means, I believe, that energy prices will remain high by historical standards, and may climb higher still. It also means that we will be at constant risk of energy shortages and price spikes from major storms and political upheavals in the oil-producing countries. There is no supply-side solution in sight that can save us from this predicament; only by curbing demand can we ease the pressure on oil supplies. Energy conservation must, therefore, constitute the

principal thrust of any new national energy policy.

Second, I think it would be a terrible mistake for the U.S. government to play an active, conspicuous role in promoting extensive involvement of American firms in the extraction of Eurasia's oil and natural gas. It is one thing for such firms to employ the normal channels of international commerce to gain access to Eurasian supplies, and another thing altogether for the U.S. government to be seen as spearheading such efforts – particularly when this entails the establishment of close ties with the potentates who control many of these countries. Whatever our actual intent, such efforts will be viewed by dissidents as conferring American approval on these regimes, thereby making us targets of the dissidents' wrath. None of these regimes is entirely stable, and when (and if) they are swept away by opposition forces, we do not want to be viewed as their evil twin and so made persona non grata, as occurred in Iran after the overthrow of the Shah in 1980. We can certainly encourage U.S. energy firms to do what they are good at, which is seeking out and producing major sources of energy, but we should do nothing to fan suspicions that they are nothing but tools of the American government.

I hope that you find my observations to be useful. Thank you for allowing me to address this august body.

ENDNOTES:

1. U.S. Department of Energy, Energy Information Administration (DoE/EIA), *International Energy Outlook 2005*, Table A1.

2. Ibid., Table A4.

3. Ibid., Tables A4 and E1.

4. Ibid., Table R1.

5. U.S. Department of Energy, Energy Information Administration (DoE/EIA), *International Energy Outlook 2002*, Table D1.

6. For discussion of this point, see Matthew Simmons, *Twilight in the Desert* (Hoboken: Wiley, 2005).

7. For a thorough analysis of this phenomenon, see Terry Lynn Karl, *The Paradox of Plenty* (Berkeley: University of California Press, 1997).

8. DoE/EIA, "Russia," Country Analysis Brief, February 2005, electronic doc. Accessed at www.eia.doe.gov/emeu/cabs/russia.html.

9. "Sakhalin II Project's Phase 2 Cost Estimate Rising," *Oil and Gas Journal*, July 25, 2005, p. 26.

10. DoE/EIA, "Kazakhstan," Country Analysis Brief, July 2005, electronic doc. Accessed at www.eia.doe.gov/emeu/cabs/kazak.html.

11. DoE/EIA, "Azerbaijan," Country Analysis Brief, June 2005, electronic doc. Accessed at www.eia.doe.gov/emeu/cabs/azerbjan.html

12. World Conserrvation Union, *Impacts of Sakhalin II Phase 2 on Western North Pacific Gray Whales and Related Biodiversity*, Report of the Independent Scientific Panel, n.d.

13. DoE/EIA, "Caspian Sea Region: Environmental Issues," February 2003, electronic doc. Accessed at www.eia.doe.gov/emeu/cabs/caspenv.html.

14. See: Stephen Blank, "U.S. Strategic Dilemmas in Uzbekistan and Turkmenistan," Briefing at the Center for Strategic and International Studies, Washington, D.C., July 27, 2005.