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Economic, Environmental and Security Risks

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[TRANSCRIPT PREPARED FROM AUDIOTAPE RECORDINGS.]

PANEL 2:

ENERGY GEOPOLITICS: WHAT ARE THE SECURITY
AND ECONOMIC RISKS OF EXTERNAL ENERGY DEPENDENCE?

Moderator:

James Steinberg, Vice President, Foreign Policy Studies, Brookings

Panelist 1-Strategic Implications, United States Rising Energy Consumption

R. James Woolsey, National Commission on Energy Policy

Panelist 2: Diversity of Fuel Mix and Diversity of Suppliers

Fiona Hill, Senior Fellow, Brookings

Panelist 3: Heightening U.S. Energy Security

James A. Placke, Senior Associate, Cambridge Energy Research Associates and
Nonresident Senior Fellow, Brookings

THIS IS AN UNCORRECTED TRANSCRIPT.

MR. STEINBERG: Let's get started. The surest way to get people to come in is to actually get the program going. So I will do that.

Welcome to our next panel on global challenges for U.S. energy policy. We have a very distinguished panel which we discovered almost could be subtitled "The Panel of Jim's," but we are going to have to rename Fiona, "Jim Hill."

There are a number of analysts here at Brookings on the foreign policy studies side who have been making the argument over the last several years that we are moving from an age of geopolitics to global politics, in an era where because of the nature of globalization and trans-national threats that geography is becoming less important as a part of national security strategy, and we have to think in new terms.

But there is certainly one area where geography still matters, and that is in the area of energy policy, particularly in the area of fossil fuels. Hard-to-move oil reserves and who sits on top of them still is a very important fact of life. So it is appropriate that we have an opportunity as part of this overall discussion to look at the economic and security dimensions of geography and how the politics of suppliers and producers affect some of the choices in front of us.

This was obviously a very important topic and a very familiar topic in the 1970's. We have a lot of debate about these kinds of issues and the relationship between energy policy and national security policy, but it pretty

much dropped out of the conversation in the '80s and mostly the '90s. Yet, we have seen a dramatic resurgence of the topic for a variety of reasons.

The first, of course--and our panelists will speak to this at length--are the changes in the Middle East and the fact that there is dramatic upheaval going on in the countries that are sitting on some of the largest reserves in the world, obviously dramatic changes in Iraq, but also political forces and potential forces of change throughout the Gulf and the region.

Second, we have had a set of events in Russia which have dramatically changed the energy equation, both in terms of the internal dynamics of Russia, its economic system, its political system evolving over the last decade, and its relationship to the rest of the world changing very dramatically, Russia becoming more integrated politically and economically and, thus, its role as an energy supplier, playing a very different role than when it lived in the insular world of the Soviet Union and the Warsaw Pact.

We have seen China emerge to the world stage not primarily as a producer, but rather as an increasingly important source of demand and its own interests as a consumer of energy as it begins to play its own foreign policy and national security strategy increasingly with an eye to its energy needs.

We have seen the introduction of politics into the equation in Venezuela, even in the last couple of days seen very dramatically the potential of the energy card being played by President Chavez, and even in Africa, we see how politics, once again, affect the energy equation in Angola, Nigeria, and elsewhere.

So we have a very distinguished panel to begin to go into some of the depths of these complex equations, and as I said, only several of them are called "Jim."

We will begin with Jim Woolsey, well known to all of us, a good friend and former colleague, former director of Central Intelligence, served in a variety of capacities and--[audio break].

[Side A of Audiotape 2 of 4 begins.]

MR. STEINBERG: [in progress]-- through the administration on national security policy.

We will then next turn to Fiona Hill, a Senior Fellow here, who has done considerable work, along with Cliff Gotti, on Russia's energy policy in Central Asia.

Finally, a semi-member of Brookings, Jim Placke, a Nonresident Senior Fellow here, who has had a very distinguished career in the Foreign Service. He was a Foreign Service officer for almost 30 years--is that right, Jim?--including Deputy Assistant Secretary of State for Near Eastern Affairs and a true expert on the intersection of energy policy and politics, and Jim is an associate now with CERA and Dan Yergin.

So let's begin with Jim. I have a feeling we are going to have a little bit of energy in life to this discussion as we hear the different perspectives on how national security politics and energy intersect in the 21st century.

MR. WOOLSEY: Thanks, Jim.

I was honored when Jim asked me to be with you all today, but to tell you the truth, until I went straight a couple of years ago and went out to

Booz-Allen, I practiced law as a Washington lawyer for 22 years and I spent some time in the CIA in the Clinton administration. So I am actually pretty well honored to be invited into any polite company for any purposes whatsoever.

[Laughter.]

MR. WOOLSEY: I want to say just a few words about what I think the problem is. I summarized this in a piece called "Destroying the Oil Weapon" in commentary a year ago, last September, but generally speaking, I think there are two aspects to the problem our oil use poses.

One derives from issues that you have talked about, and I won't talk about further this morning, in other contexts having to do with issues related to pollution and global warming. You might call those malignant effects because nobody is planning them. Nobody is planning to sink Bangladesh beneath the waves by driving SUVs, but we may be doing that. Those are problems we need to deal with, and they are, in part, caused by oil use, by fossil fuel use, and they are major issues.

I want to focus on another type of problem, which I would call, rather than malignant, malevolent; that is, the potential use of oil as a weapon to affect our security and our behavior.

This deserves from the fact that the cheapest place in the world to produce oil is the Middle East, and if the constitution or basic document being adopted and signed in Iraq today leads Iraq toward being a government under law and moving toward democracy, then we will have one Arab democracy, but as of today, we have two democracies in the Middle East, Israel and Turkey, and

the other states vary between being pathological predators and vulnerable autocracies.

This is not a good mix. It is particularly not a good mix when such a volatile, in price terms, life blood of modern economy as oil is most cheaply produced there.

Yes, there are other parts of the world where at \$30 a barrel or so, or maybe even \$25, people will be able to make a profit, like Russia, but nonetheless, as India and China come online with their increased demands and growth of a middle class and more vehicles and the like in years to come, even with Iraq coming online, the people whose judgment I most value on these issues I think would suggest that we are likely to see a very substantial increase in demand for oil probably not matched by an increased supply.

Much of the supply will continue to come from parts of the world and from countries such as Saudi Arabia and Iran, at least at present, that are volatile, that are themselves in a region and operating as governments in such a way that terrorist interference, for example, with Saudi production or a coup, all of these things are possible.

We have had three oil spikes since the early '70s, and these can be also done intentionally, either price depressions or spikes, and they can be done at the present writing because of its control of such a substantial share of the world's swing production by decision of the Saudi government itself.

Now, Saudi Arabia is a complex place, and I believe Crown Prince Abdullah, currently managing the affairs of the ailing King Fahd, probably would take the kingdom if he were free to do so in some reformist

directions. I don't want to exaggerate that because I think they would be small and halting. They are small and halting, but that is not the end of the matter.

He is 80 years old. One of his potential, I would say, current rivals and one potential successor for King Fahd would be Prince Nayef of Sudairi, currently the head of the interior ministry, and his view of the world can best be summed up by the fact that his continuing public position is that the Jews did 9/11.

Prince Nayef as an interior minister is a very powerful man, in a position possibly to be a strong contender to be the next King of Saudi Arabia, and on top of that, we have, of course, the possibility of something like the scenario that opens Bob Baer's book, "Sleeping with the Devil," crashing a fully loaded 747 into the sulfur, clearing towers up at the northeastern part of Saudi Arabia, not far from Ra's al Khafji, taking millions of barrels offline of production for many months.

All of the tumult, indeed, and all of the uncertainty of this part of the world sits very heavily on the oil market.

Now, I don't think the problem is resolved by the United States buying less oil from the Middle East and other people buying more oil from the Middle East. That is a particularly stupid solution. The world is one oil market for a first approximation, and I don't really think solutions that point toward changing the pattern of oil consumption in that way deserve the time of day.

I also believe that since the problem is a worldwide economy that is hostage to the possibility of substantial increases or big increases in oil

production, one really has to focus on our overall use and our American leadership in the world technologically in being able to deal with that.

Let me tick off just a few things and then turn it over to the other members of the panel.

I think it is ridiculous to put the emphasis for vehicles that would use substantially less oil on the hydrogen economy and fuel cells. That is an interesting technology. It is worth spending some time and effort on, but if the fuel cells reform on board and you can pump gasoline at the station, they are going to be very large and expensive fuel cells. If they reform at the station, you have a [inaudible] problem, who goes first, the energy companies reconstituting all of the filling stations in the country, so that they can pump hydrogen or the automobile companies producing fuel-cell cars.

Far more sensible is moving to give encouragement for things like hybrid gasoline, electric vehicles, and some alternative fuels that can be used in the existing infrastructure, such as diesel from Fischer-Trope, from coal gassification, such as diesel from processes such as thermal depolymerization that ConAgra is now using in Missouri to process the refuse from a turkey processing plant, turning it into diesel and fuel gas, or biomass--not corn, not corn, not corn--biomass ethanol.

[Laughter.]

MR. WOOLSEY: The reason I say biomass rather than corn is that you use about as much energy to produce grain-based ethanol as you get out of it. It is an interesting and lucrative subsidy for ADM. It doesn't have much to do with moving toward real substitutes in volume for oil use for transportation,

but if one has--and we are right at the edge, I think, of having--genetically modified biocatalysts that can produce ethanol from kudzu, from rice straw, from switch grass, one has something very different.

Some combination of these approaches, again, in the existing infrastructure of fuel economy of the dramatic sorts we are already seeing from hybrid gasoline electrics, of alternative fuels that can be used in the existing infrastructure, together with policies that help, I might say as a final footnote, bring democracy and the rule of law in the Middle East, seem to me to be a mixed strategy that has some promise for us.

[Applause.]

MR. STEINBERG: Jim, before I turn it over to the others, I have just one strong--

MR. WOOLSEY: One convert. One at a time.

[Laughter.]

MR. STEINBERG: Let me just push you a little bit, and understanding that this is obviously a continuum, but we all have been hearing and discussing the question of projecting increases in demand in the future. It is, certainly, unlikely that demand is going to go down in the near future.

MR. STEINBERG: What kind of order of magnitude of change of fossil fuel use do you think would be necessary in order to reduce the kinds of risks and reduce the kind of leverage that you have identified as your sort of area of concern?

MR. WOOLSEY: I would like to see us turn these curves of fuel consumption by moving towards things like hybrids and by use of alternative

fuels sharply in a direction such that, within a decade or two, we could start seeing a decrease in our use to begin to come close to matching what we produce.

I think that asking for all gasoline--I mean, we produce about half our own oil. To ask all gasoline to be replaced by ethanol and then project massive amounts of land that that would require is really kind of a stupid exercise.

I think what you want to do is to try to put together these two, low fuel utilization and alternative fuel tendencies.

Let me just give one illustration. I am on the list for a Prius. My next-door neighbor, Bill Butler, has a fine Prius, 60 miles a gallon in town. If a Prius is also a flexible fuel vehicle--and what that means, since there are several million of them on the road--a lot of Ford Tauruses are FFV. It just means a slightly different kind of plastic in the fuel line and a reprogrammed computer chip. It costs 100 bucks or so a car. Detroit gives it to you free because they get some credit for it.

So, if a Prius is also a flexible fuel vehicle, that means it can use 85-percent ethanol rather than only 10 percent in the cars most of us drive.

If you have a 60-mile-a-gallon Prius using 85 percent of its fuel, biomass-derived ethanol, you have something that is getting in the ball park of 300 miles a gallon of gasoline. That ain't bad. You don't need to wait for the hydrogen revolution and so forth to have dramatic impacts if you put together these alternative fuels and better milage.

I think if you gave tax credits for things like hybrids instead of a declining tax deduction, which is what we have now, if you gave tax credits and deductions for things like hybrids and for some of these types of alternative fuels that can be used in the existing infrastructure, you could start to see 2020, 2025 are headed toward matching our gasoline consumption with our domestic gasoline production and thereby removing from our Saudi friends the ability to be in their plane flying to Crawford and have a female air traffic controller come on and have the Saudi pilot say, "I don't want to talk to a woman, Air Traffic Controller," and have the FAA switch to a male traffic controller. Oil does that.

MR. STEINBERG: Well, you focused on demand-side strategies. Fiona, what is possible on the supply side?

MS. HILL: Well, Jim Woolsey is always surprising in his beginning presentations, and I was actually sitting here, all getting myself ready for yet another discussion of the geographic diversification of supply away from the Persian Gulf. So you have certainly caught me by surprise there, and I am going to rush out and buy my Prius this afternoon.

MR. WOOLSEY: Bravo.

MS. HILL: But actually, I think this is really rather refreshing because, in fact, as I was just saying, most of the discussions that we tend to have on the geopolitics all really do focus on the geographic diversification of supply, and we have too little of the conversations that Jim has just picked up on that we had in the first panel about real supply diversification, talking about renewable energies and new technologies on the U.S. as well as on the global scale. So that was actually very refreshing.

As Jim did start out, oil is usually the focal point for any of the geopolitical discussions of energy precisely because of the dominant influence of the transportation sector as being the main driver for oil demand. As Jim noted and as other panelists in the first session today noted, we have only just hit the tip of the ice berg in personal ecology demand in places like China and India.

If anybody has been to Russia recently over the last 10 years, there is an enormous growth in car demand, and rather disturbing from the climate change point of view, a market in secondary car purchases of some of the old clonky cars that have all gone out of fashion elsewhere in Europe driving around the streets of Moscow.

Obviously, if automobile usage is following current trends, we can probably expect that it might increase to about 56 percent of world oil consumption over the next two decades. So, absent these kinds of changes in new technologies, it is going to be very difficult to book this trend.

As a result of our fixation on oil, we have obviously been searching globally for alternative suppliers, precisely because we have been fixed in this kind of image that Jim has outlined about looking for other supplies as our supplements or alternatives to the Saudis or to the Persian Gulf.

Actually, when you look at the case of the United States, it has to be said--and I think other panelists made this clear earlier today. But there has already been considerable geographic diversification in supply in the United States as well as globally over the last 10 years.

In fact, the Persian Gulf, although it still accounts for a quarter of U.S. crude oil imports, it is considerably less important than it was before. We

have got fully 60 countries now having increased their oil production over the last 10 years and now supplying the United States.

Half of all crude oil imports come from the Americas. Jim Steinberg started off pointing to now the concerns about Venezuela, another of our neighbors in the Americas. Fortunately, Canada seems to be nice and stable, and we are having Vincente Fox visiting the President at his ranch in Texas. I hope that goes well. We don't want any more upsets on the American oil front.

But we also have to think of Africa as a new major supplier, about 15 percent now of U.S. crude oil imports, and Europe still remains a major supplier for the United States at about 7 percent.

Now, as Jim Steinberg mentioned, Russia has become a major focal point for us, and I am going to focus on Russia for a while because that has been the area of work that I have been doing for the last several years here at Brookings.

Over the last 3 years, there has been a great deal of speculation here in the United States that Russia could somehow displace Saudi Arabia as a major supplier. As Jim Woolsey said, there has actually been a rather facile degree of speculation. It is worth dwelling on for a while about why we have been so fixated on Russia.

Well, the first point, of course, is that the Soviet Union, rather than Saudi Arabia, was actually the dominant world oil producer back in the 1970's and 1980's, and it was only with the collapse of the Soviet Union that that oil production went down.

Russia's oil production as the major bulk producer within the Soviet Union really declined rather dramatically in the early 1990's with the collapse of its economy, but it has really bounced back over the last 5 years, especially thanks to the rise in world oil prices after 1999, which helped the Russian companies undergo a major restructuring initiative. They improved the management of the companies and increased sufficiency in a rather dramatic fact, in part also because of the collapse of the Russian ruble in 1998 which lowered the cost of all of the imports into the industry. There has been considerable foreign investment, too, in the Russian Oil sector.

We have had major production increases, now well over 8 million barrels per day of oil production in Russia, which may, in fact, move very close to 9 million barrels per day this year. There is potential still, according to almost all Russian oil analysts, of more increases in oil production in the medium term up to about 11 million barrels per day.

Now, it has been based on these rather dramatic production increases, moving back close to where the Soviet Union was before its collapse, that have led to people looking to Russia as an obvious new source of supply, and indeed, prior to the arrest of Mika Obagashi [?] back in October last year, we had a great deal of discussions with the Russians, a lot of claims from Russian oil companies like UCOS, that in the medium term, Russia might eventually supply as much as 1 million barrels per day of crude oil to the United States, which would be a pretty significant portion of U.S. daily supply, if that was possible.

But as most people who really look seriously at Russia have noted--and I am sure all of the Jims are with me in this--in spite of all of these major improvements, Russia has some big challenges, and most of these come down to infrastructure.

As it stands right now, we actually import very little crude oil from Russia and the other states of the Soviet Union, and this is also including the major oil producers in the Caspian and Azerbaijan and Kazakhstan, which have very substantial oil reserves and are already exporting also with increased capacity.

If you put that altogether, it is actually under 1 percent of our total daily imports because the bulk of Russian crude, because of the pipeline system that was left over from the Soviet Union, actually goes to Europe, well over 80 percent.

That also includes not just the EU countries, but also the Eastern and Central European countries, the former Soviet bloc. So Europe is really the dominant importer of Russian oil.

Russia wants to also increase its oil exports to Europe over the next 5 to 10 years, but actually have to make a major shift in decisions of this point if it were to supply more to the United States, and the problem there is that Russia is already exporting at maximum capacity. Unfortunately, infrastructure has not kept pace with the increases in Russian oil production.

Russia is exporting about 5 million barrels per day, and it could export more because of such a depressed demand internally in Russia for crude

oil because of the economic decline and particularly the decline in heavy industry over the 1990's.

Now, there have been improvements in export pipeline capacity in Russia over the last 5 years, but it is still limited. Many oil exporters are having to resort to rail, to river barge, and other methods, actually, to get the product out to world markets.

We have been in a lot of discussions about new pipelines, for example, from Myrmansk, the pipeline. In 2 more months, there can be port facilities to export to the United States, but these are still in their discussion stage, and they have slowed down considerably since the arrest of Mika Obagashi who was a major motor for the construction of new pipelines.

So, again, we have to bear in mind that this major point, the construction of a new pipeline and new export facilities, has not kept pace with this dramatic increase in Russian oil production. So that is the major problem there.

Also, apart from the United States, China, Japan, and many other Asian countries are also interested in Russian oil, but again, it gets back to the infrastructure problem and also to the part that Russia would have to develop new oil fields in Eastern Siberia to meet that demand.

We have got a big debate right now between China and Japan over who will get a new oil pipeline and access to Russian oil fields, which again has been thrown off by the arrest of Hotokovski who, again, was a major motor of those discussions.

As I mentioned, the development of the oil fields over the longer term is going to be a problem for Russia. Although Russia has increased its production, as I mentioned, by about 2020 it is going to peak and then decline because the current fields in western Siberia are reaching their maturity.

There is a lot more oil out there in Russia, and in fact, there is a great deal of speculation about the extent of Russian possible oil reserves, especially in the Northern Seas area, just within the Arctic Circle, as well as in Sakhalin Island and the northeast Pacific. It looks like there is a lot of oil there, and some new technologies will make most of this exploitable.

But there is also a question about will all of Russian potential reserves be ultimately recoverable after 2020 and then will be in the discussions about infrastructure to bring those to market. So there is still a lot of challenges ahead in thinking about Russia, and we can't just simply factor it in as the great new frontier and the great hope for a replacement of the Middle East over the longer term for the global world supply, not just for the United States.

Getting back to that original point about the speculation of whether Russia could replace Saudi Arabia or the Middle East, in fact, for the U.S. or any other oil-importing country, it clearly, as Jim Woolsey said, is just not possible.

Russia will obviously have some impacts on world markets at the margins, especially with the major exporter increase, but it is not going to ease overall the vulnerability of world oil markets.

We keep talking all the way about oil, and I would actually like to shift to gas because I think when you look at gas and especially rising gas

demands in Asia, which was mentioned in the first panel, this is extremely significant. We must not neglect the rising economies of Asia when we are thinking about global energy supply, and that is China, Japan, Korea, and, of course, India.

Already Asia accounts for about a quarter of world energy consumption. It is like it has moved to about a third in the next couple of decades. China is the second-largest consumer of energy after the United States. India is in sixth place and rising upwardly. Of course, a lot depends on whether it be current economic growth in Asia continues as it is, but I think we can at least expect that there will be a sharp rise in energy demand.

It won't just be in the automobile sector. It will also be in the static power generation sector, and that is where an actual gas demand is being pushed up.

China has also got green to some degree. They are very concerned about the effects of pollution on the major cities, and although China is pretty much self-sufficient in coal, there has been a great deal of concern about the air quality, not just in Beijing, but across all of the industrialized cities of China. There is a great desire now to push into more natural gas use.

The problem for China, of course, is although it is self-sufficient in coal, its natural gas reserves domestically are very small.

China, of course, is sitting right next to Russia. So it seems, again, that this may be a logical source because, when you think about natural gas, Russia is to natural gas as Saudi Arabia is to oil. Russia sits on one-third of the world's natural gas reserves.

Gas has become a global commodity over the last decade. Most of the gas that is consumed on a global scale is now transported across national borders, be that by pipeline or in the form of LNG that was discussed this morning.

Along with China, Japan, South Korea, and many other Asian countries would like to increase their gas consumption to mitigate not only pollution, but also dependency on Middle East oil. They are all in the same position that the United States is in.

In terms of gas reserves beyond Russia, although Russia really outranks all of the other major suppliers, Iran is the next largest holder of natural gas. In fact, between them, Iran and Russia hold half, a full half of the world's gas reserves.

So, two decades from now, we might be having completely different discussions about world energy potential, which we already have Russia full and center, but put Iran even more to the forefront of our discussions. I will be curious to see what Jim Woolsey will have to say about that.

If current trends in gas consumption continue, Russia is going to be the primary supplier in gas certainly for Europe, if not all for energy. It already accounts for about 20 percent of the European gas supply, 70 percent of Turkey. Turkey is pretty much captured by Russian gas at this stage, although Iran is also a factor there.

Russia is poised for expungement into future markets, but with several caveats because, although there is a lot of competition in oil globally in terms of suppliers, there is even more in gas, especially in Asia.

Although, as I said, China and other countries in Asia and East Asia, Japan, and Korea look like they might be captive markets for Russia, given Russia's location and the fact that there are large gas fields in the top and eastern part of Siberia, there are lots of alternatives for Asian countries, Bangladesh, Australia, Malaysia, Iran, Qatar and the Persian Gulf, and especially if you move over to LNG, it makes gas more transportable and Russia no longer looks as if it could be the dominant supplier.

Even consumers like China, which are currently thinking actively about Russian gas, if these discussions and difficulties over signing contracts and building pipelines continue, they may be tempted to turn to other Asian suppliers and Australia and the Middle East in shipping LNG rather than having to rely on Russia over the long term.

So, although Russia's capacity is great, the window of opportunity for Russia to break into new markets may be closing.

Also, there needs to be a great shift over in domestic infrastructure, the same sorts of shifts that we have been talking about in the transportation sector, to increase gas use for household heating and also for power generation in many of the Asian countries.

In the U.S., we haven't really talked about Russia as a factor in gas, even though at some point, we may be seeing our gas import dependency mirroring today's oil import dependency.

I know one of the previous panelists are somewhat optimistic on the prospects of gas supplies from North America, and right now, we have the bulk of our gas imports coming from Canada, but at some point in the next 20 to

30 years, I can imagine we will be in a similar situation talking about growing gas dependency as we are now on oil. So Russia as a future supplier of LNG to the United States may well come into play, but then we will have again to think about Iran, given the size of its supply.

Now, a final point on Russia when we are thinking about geopolitical issues is that for Russia, oil and gas are really big politics. It is not just an economic or a commercial issue, but oil and gas really totally dominated the political scene in Russia today. That is precisely because of the huge size of Russia's natural gas and oil reserves, but also because of the impact on the Russian economy in terms of budget revenues and exports, fully half of Russian export revenues and about a third of the state budget revenues.

So there are multiple and conflicting demands on Russian energy for the internal political situation for fueling Russia's economic development, especially outside the commodity sector, and frankly, also, on a very practical level as we outline, Cliff Gudd [ph] and I, in a new book that we have just written called "The Siberian Curse," which shows that millions of people in Russia today literally could not survive in the harsh climates in which they live in wintertime were it not for this abundance of energy and especially low-cost gas.

This is a major sticking point for Russia in the future. It heavily subsidizes its internal energy prices, well below world prices, and the European have been particularly irritated by this as the main importers of Russian supply and are pushing the Russians to bring their domestic energy prices and world energy prices into line and, in fact, trying to effectively block Russia's entry into

the WTO. So we are going to see energy wars to some degree between Europe and Russia on that very fundamental level because in Russia it is actually a life-or-death issue of basically keeping the lights and the heating on in places like Siberia in the middle of winter by heavily subsidizing energy.

There is another problem for Russia which is that it has also tied its economic growth, not its whole economic development, but the actual growth that we are seeing now in the Russian economy to the world oil prices.

If you look back to 1997 and look at the growth in Russia's economy, there is almost a direct correlation with the increase in world oil prices since that point. Unfortunately, although Russian oil companies are now quite well-restructured to withstand the boom-and-bust cycles in the world energy markets, in fact, they could easily operate and be profitable at prices well under where we are today, perhaps around \$16 per barrel and well below. They have even said that they could perhaps continue that profitability at prices as low as \$10 or even lower. That is not the same for the Russian state. The Russian state has not restructured itself sufficiently to be able to withstand this.

Russia has become addicted to a price regime well over the world median, which is about \$18 when you go back over the last century. So this means that the Russian government is going to be fixated on issues of oil and gas for the foreseeable future, especially if they want to continue the growth in the economy. So any kinds of discussions about the future of Russian energy and Russia as a supplier will have to factor in politics and the desires of President Putin and other Russian leaders in the future to maintain their current levels of growth.

So, for Russia, energy is all about geopolitics, not just about commercial issues.

MR. STEINBERG: Before we turn to our last Jim, let me just push you on that last point.

Jim Woolsey has identified two political risks from dependence on Middle Eastern energy, one, the thread of terrorism and the terrorist disruption of oil supplies from the Gulf, and the second is a political risk that leaderships of states with control over resources would make a decision to try to influence the behavior of others by withholding energy.

My question to you is you have identified one factor that affects the Russian government's decisions about energy policy, which is its interest in maintaining prices which may lead it to participate in cartels and do other kinds of things. What risks are there that Russia will see this as a political card it can play to influence the behavior of others? Say, for example, given European dependence on Russian energy, particularly gas, do the Russians think about this as something where they say if you don't let us into the EU, if you don't get us into the WTO, we will use this as a geopolitical tool?

MS. HILL: I think there is a lot less likelihood that Russia will try that with Europe.

In fact, if you look back to the Soviet period, this was a major concern of analysts here in the United States during the cold war that, in fact, the growing dependency of Europe on Soviet gas would play very badly for the United States and allied interests.

In fact, it turned out to be completely the contrary. The Soviet Union was essentially keeping itself afloat by increasing its gas exports to Europe, and there was no chance that they were going to turn off the spigot because it was the major source of foreign currency, of hard currency.

That, to a large extent, remains the case today for Russia as it wants to expand into European markets even more than it is and to emphasize its dominant position. I don't think that that is a card that it will play, but it will certainly be used as a political factor.

I think the greatest risk is that it will be played in the weakest states around Russia and already is being played. We have seen that in Ukraine, but it is often for different reasons than one might assume. It is not simply for Russia to emphasize its continued influence over economic or political developments in those states, but it is also to persuade them to lower transportation tariffs, for example, or to allow Russia access across their territory for increased exports to the other states, pushing Ukraine, for example, on a new pipeline agreement to facilitate Russian exports to Europe or pushing, for example, which we may see in the future, Georgia or Armenia, for example, for electricity exports or oil and gas exports in the future to Turkey and other potential markets.

It is also has clearly been a factor in Russia playing with its relationships with China and Japan right now, kind of hedging and sort of offering the carrot of oil and gas supplies to whoever will pay the most. In that way, I think the Russians are playing a very clever game and hoping that

perhaps Japan or China will fit the bill for paying for most of the infrastructure that needs to be developed.

In fact, I think Russians are also betting that the United States' disillusionment with Saudi Arabia or fears about the Middle East would, in fact, compel U.S. policy-makers to make strategic decisions, non-market decisions about paying for infrastructure development that would facilitate greater exports to the United States. So it is definitely going to be a tool that Russia would like to use, but not necessarily in the ways that we might have thought of in the past.

MR. STEINBERG: Jim?

MR. PLACKE: Let me move over to the podium because, like some of my predecessors, I have got a PowerPoint presentation here, if somebody will put it up for me.

Good morning, ladies and gentlemen. Let me begin by sharing with you the conclusions that I draw from the presentations of the two preceding speakers.

From Jim Woolsey, we have learned that the United States and, indeed, any right-thinking nation shouldn't import oil from the Middle East and particularly from Saudi Arabia.

[Laughter.]

MR. PLACKE: From Fiona Hill, we have learned that Russia, we should not anticipate being an alternative to Middle East or Saudi oil supplies for a series of structural reasons and to some extent Russian policy reasons that she has already outlined.

Well, the conclusion I come to in light of this is that prudence dictates that we should get ready to turn out the lights. So, in the few remaining minutes that we have under the lights, let me begin with this.

In a way, this really verifies some of the points that Jim Woolsey made earlier. It is really political events over the last 30 years that have primarily dictated dramatic changes in oil prices, and most of those political events have been involving the Middle East, but let me draw out a couple of other inferences.

There were twin oil shocks in the 1970's. The first one was the Arab oil embargo that followed the October war. It hasn't been repeated, however, in this succeeding nearly 30 years, as you may note, and I think there are two reasons for that.

First of all, it didn't work. The purpose was to influence American policy. The United States came to Israel's support vigorously in the context of that war, which was an invasion by Egypt and Syria on a surprise basis, and Israel desperately needed military resupply and the U.S. provided that.

The answer was an embargo aimed at the United States to change that policy. The United States policy certainly has not changed. I think we are all pretty well aware of that, and it hasn't been repeated because it didn't work for the policy reason.

The other reason it hasn't been repeated is at that time, OPEC and for the preceding decade, OPEC rather than Arab/Middle East, although the Arab states account for about two-thirds of OPEC's oil exports, but OPEC lost about half of its market share over the following 10 years.

They had accounted for about two-thirds of total world oil exports. Since that time and up to the present time, it is running around one-third. So there was a very high economic cost to be paid as well.

We come to the second oil shock, which was the years preceding- -about 2 years preceding the overthrow of the Shah of Iran, which occurred in 1979. This total is a quadrupling of oil prices, and I would point out to you where prices were at that time in today's dollars, \$70 a barrel, which is roughly twice what we are today and last year prior to the U.S. military action in Iraq. So, from that perspective, maybe it doesn't look so bad, but the lesson to draw out of this is that prices do matter.

Actually, world oil consumption declined from 1980 through 1987 by about 2.5 million barrels a day. More than half of that was in the United States.

Now, oil prices in that period from 1973 through 1979 quadrupled. That is a tremendous bill to pay, but it did matter. It encouraged conservation. It encouraged greater fuel efficiency, and it drove us to do some things that we since seem to have drifted away from.

Well, the other elements here, we are all familiar with. They are more recent history, except I would like to point out the last one.

I think I am the last surviving American observer of the first OPEC conference in Baghdad in September of 1960 at which OPEC was formed. After observing that meeting, I decided I didn't need to go to another OPEC meeting.

OPEC was set up to do what couldn't be done at the time, and that was to get a much larger share of the revenue for its members. Ultimately, that changed over time. Even though OPEC's share of total oil supply has declined as supply constraints, as others have illustrated this morning, intensified, OPEC matters more now than it did then.

We have this period of OPEC market management that really began with the Asian financial crisis of 1998 and has continued up to the present time.

Can it continue? Can they really defy Economics 101? I have never thought so, but they have done it now for about 5 years, and maybe that is something to take a second look at.

Jim Woolsey did us all a favor this morning by dismissing something that is a shibboleth that I encounter frequently, and that is, well, you know, we will just redirect American oil purchases to somewhere else, not to Saudi Arabia, but to somewhere else.

Well, that has already happened over this period of time from 1995 to 2003, and it happened for a variety of reasons. About the mid '90s, the major oil refiners and distributors in the United States discovered what the Japanese first introduced, and that was just-in-time supply management which meant you can reduce your inventory carrying cost if you don't carry a big inventory. Oil refiners today carry a much smaller inventory in the United States and elsewhere around the world than had been true up to that time.

That meant there was a premium increasingly on oil supplies in the western hemisphere, and I would also point out from West Africa, which is

represented here only by Nigeria, but there is a growing oil province off the western coast of Africa that will become increasingly important.

The anomaly here really is Saudi Arabia, and that is worth taking a moment to consider. Why Saudi Arabia when oil supplies from most of the rest of the Middle East? This is so small as to be highly volatile as it went up 500 percent, but it is only 50,000 barrels a day. So it is not something that one needs to worry about.

Basically, the U.S., when you are talking about Middle East oil supply, it comes mostly from Saudi Arabia. That is not a matter of U.S. policy. That is a matter of Saudi policy. The Saudis consider that to maintain their part of what historically has been referred to as the strategic relationship, oil for security or oil for a security guarantee, which is unwritten I should note, they need to remain the number-one supplier to the United States.

Except for a couple of years in the mid '90s, they have been, and it is very easy to do. Saudi full-cycle oil production costs--that includes exploration and discovery and development--are under \$2 a barrel. The average Saudi return on a barrel of exports--and they have a variety of crudes that come at different prices, but the averages are in the mid twenties. Today, it is somewhere between \$26 and \$28 a barrel. That gives you a pretty big margin to play with.

So it is very simple to be the number-one supplier to the United States. You price your oil accordingly.

Now, Saudi Arabia could get a larger net back if it were exporting more to East Asia, particularly China, consumers. They do export a

lot to China, to Japan, and to Korea, and those exports will grow. That is where most of the Middle East oil now goes.

Their oil continues to come here to that extent because they see a political benefit to it. They may or may not be right about that, but that is their policy. In effect, there is a small subsidy to the American consumer built into Saudi oil exports.

I won't spend a lot of time on this because we have already heard a good bit about it from a variety of speakers.

We presented two alternatives, a high and a low case for 2010 and for 2020 as to what the share of primary energy demand from various energy sources might look like. Well, these are scenarios. They are certainly alternative scenarios.

The one thing I guess I would point to--and this bears on Jim Woolsey's comments--the expectation here, as reflected also in other speakers earlier this morning, is that the renewables, geothermal, wind, and solar, are going to remain relatively constant if nothing else changes. Jim has pointed out some things that could change or that we could make them change, and if that happens, then that would look very different. Left the way they are, there probably isn't going to be a proportionate increase.

Nonetheless, there will be very substantial growth in that sector. There has to be because we are talking about an expansion of demand quite significantly over that period of time.

The other is coal. I think the high scenario here is definitely more realistic because there is, given what has happened to natural gas or what

is about to happen to natural gas, going to be a return to coal, with more modern technology in terms of controlling emissions and so forth.

The one that nobody has talked about and it is for a very good reason, which you probably all chuckle at, is nuclear.

We all know that one of the main problems--well, in addition to licensing and plant siting and all of those contentious political problems, there is the very real problems of disposal of nuclear waste. Maybe with the development of a nuclear disposal facility in Utah, which is now going ahead, that could possibly be less of a constraint than it has been up until now.

Of course, like all other areas, nuclear technology has changed over the years as well. Is that likely to be enough to overcome the in-built political resistance to that? Very doubtful, but it depends on a lot of factors and particularly the prices and consequences of some of the alternatives. Anyway, that is one way to look at the future.

This, we have all seen, too, earlier today in various other formats. This is U.S. consumption versus imports. Consumption goes up, and domestic production is going down. The result is we are becoming increasingly dependent upon external sources of energy.

Right now, it is approaching 60 percent, and there is nothing in the short term that is likely to turn that around.

U.S. oil production actually peaked in 1970 at about 9.5 million barrels a day. Today, it is about one-third less than that.

Finally, the subject of gas, as we have also heard earlier today, gas was the fuel of the future, particularly as applied to electric power

generation. It had environmental advantages, it was plentiful, and it was relatively cheap, but that is "was." That is past tense because that situation began to change fairly dramatically at about the year 2000.

Now, there is some discussion as to has U.S. gas supply hits its peak and stabilized, which is the Cambridge Energy view, or is there still some way to go. If there were some regulatory changes, if there were some prohibitions lifted, there could be more gas produced and found in the United States.

I think eventually, it will be brought down from Alaska. This does not involve the Alaskan Wildlife Refuge. It is just building a pipeline across western Canada to get the gas from where it is in northern Alaska to where it is consumed in the U.S., in the lower 48. That, I think will happen.

So there are some possible variations, but basically, North American, that is, Mexico, the United States, and Canada, gas supply has essentially peaked. Gas demand, of course, is going to continue to go up.

Those powerplants, 200 gigawatts of electric power generation that we have heard about that were built in the 1990's, are going to continue to operate for another 20 years, and they are going to operate on gas. The gas has got to come from somewhere, and increasingly, it looks like it will be the only alternative, liquified natural gas or LNG. This is what we see on that basis for LNG imports into the United States.

As someone else observed already--I think in the course of this morning, we pretty much have observed almost everything that is observable.

[Laughter.]

MR. PLACKE: It is true that when you go through the list of major gas reserve-holders in the world, as Fiona pointed out earlier, Russia is number one by miles and miles. Iran is number two. Qatar, a small Persian Gulf state, is number three. Saudi Arabia is number four. UAE is number five and so on.

Then you do get into Algeria, Nigeria, and so on, other sources of gas. Basically--and this should surprise no one--the cast of potential gas exporters looks very much like the cast of potential oil exporters. So there is not much to be gained in terms of additional energy security by going down that route.

I will go back to close to where Dan Yergin started this morning, and that was his reference to Churchill and Churchill's prescription for energy security. He used the word "variety." I think today, we would call it "diversification."

There really is no better way to go than to diversify supplies and also to diversify sources. This comes back to where Jim Woolsey started.

If we can do the things that he identified--and they have a lot of benefits to them, not just diversification of source, but also environmental and other benefits--that would be part of the answer, definitely. To do that, however, you have to drive a Prius instead of a Lincoln Navigator.

When I come into work in the morning, I see more Navigators than I see Prius. So you can legislate, you can regulate, you can raise prices, you can do some combination of all of these things to bring about a different future.

The future that most of us have talked about this morning--and this is a disease that I think all economists especially suffer from, and that is, we tend to project today often into the indefinite future, and we all know that won't happen. That is the one thing that you can be certain of. That won't happen. It will be different. If we knew what it would be, we wouldn't be here.

So we can make a difference without the future. We can make the world look different, but there is a cost to doing it. My sense of the political mood in the United States is that American consumers like consumer choice, they like relatively low prices, and they don't like their congressional representatives who want to change these things.

This being an election year, I wouldn't anticipate a great deal of change.

Thank you.

[Applause.]

MR. STEINBERG: Thank you, Jim.

Before we turn to the audience, let me ask you one question.

What we have heard from all of you is that as a result of the globalization of energy markets, it is harder and harder for even significant producers to target individual countries with their energy political strategies.

Fiona suggested some, perhaps, small exceptions in the space around Russia, but that for the most part, a country couldn't decide simply to try to cut off the United States, the diversification of supply and such, but that the big factor, therefore, is price, and that the one place where there is a potential

real vulnerability is if a supplier could take off enough supply that there would be a price impact that would be a global price impact.

So my question to you, as you look back on the price shocks of the '70s in particular, what kind of order of magnitude would it take in terms of supply restriction to produce a comparable effect, and how do you think the global economy would respond? What parallels should we draw or lessons should we draw from the medium-term response to those price shocks in terms of what would then happen to both the global economy and consumption patterns?

MR. PLACKE: Let me answer that very good question this way.

At Cambridge Energy, we do a lot with scenarios, and we have addressed various kinds of supply disruption scenarios and what would be the price response, where would the additional supply come from to fill in, and at what cost and so forth.

The one scenario for which there is no solution is to eliminate Saudi Arabia. There is no way out. The world goes into a deep recession and stays there for an extended period.

Given where we are today, if we weren't consuming that much oil, well, yes, it would all be different, not only because Saudi Arabia producing around 8 million barrels a day, second only to Russia, as Fiona correctly pointed out. They are, however, the world's largest exporter, and as Jim Woolsey mentioned, they hold most of the world's spare capacity.

So, if that 747 did crash into the gas-processing plants at Abgake [ph] and so forth and eliminated Saudi Arabia or if there was an Islamic

revolution that put Saudi Arabia on a completely different course, whatever scenario you like, there really isn't a way to deal with that.

When we came out of it, the world would not stop, but we would all have a very bad couple of years. When we came out of it, the world probably would look more like some of what Jim was talking about.

We would certainly have learned some lessons. We would turn to alternatives. This event would have accomplished what we would have failed to do in a regulatory or legislative matter. So price matters.

The price differential that I refer to there between the early 1970's and the peak in 1980 was a quadrupling, so something on that magnitude, and you can write your scenario as to how that might come about.

MR. STEINBERG: I think there is a little kind of perverse conclusion that one could draw from that, that in order to achieve the world that Jim Woolsey wants to see, we need to have an effective terrorist organization that can pull off that kind of a--

[Laughter.]

MR. : We just have to be smart.

MR. STEINBERG: And I am confident that is not what Jim is advocating as the way to get to his world of Priuses.

MR. WOOLSEY: I never watch shock therapy.

MR. STEINBERG: Let's turn to the audience. Those were very good presentations.

I guess we have mics, and it would probably be useful if you would identify yourself before you ask your question.

MR. : Thank you. David Mickel [ph] with the Center for Trans-Atlantic Relations at Johns Hopkins University.

Much of the discussion this morning has focused on the ways in which diversifying the geographic sources of fuel and the different fuel types would increase our energy security, and I would like to turn that question around and ask how those type of policy results would influence the situation of those politically unstable countries in the Middle East whose impacts we are trying to avoid.

The journalist, Thomas Friedman, talks about the problem of the sitting-around guys in Saudi Arabia, economic development in the Middle East, and if we are able to diminish our reliance on energy sources from those countries, are we, in effect, diminishing their revenues and making the economic transition that they will have to make more difficult and perhaps increasing the number of sitting-around guys in Saudi Arabia who could be available to terrorist organizations?

MR. STEINBERG: It looks like a softball for both Woolsey and Hill at a minimum in here.

MR. WOOLSEY: It will make it more difficult for them, and that is all to the good.

What we want is for the Arab world, in particular, to change what it does for a living. The 23 Arab states plus Iran have a population slightly larger than the United States, 300 million or so. Between them, except for oil and gas, they export less than Finland, and Finland is a country of 5 million people.

There are a number of successful countries in the world that operate under democracy and the rule of law. There are 121 democracies these days, by the way, 32 of them, under Freedom House's calculations, partly free, 89 of them, elections plus a rule of law.

My two favorites right now--I am chairman of the board of Freedom House. My two favorites right now are Mongolia and Mali, both of which are perfectly fine functioning democracies that are diversifying their economies. They are starting from a low level, both of them, but people are opening businesses. They are starting to learn to do things for a living that will bring them up out of the situation that they are in now.

Would it be a shock for Saudi Arabia or any other country that relies so heavily on oil for its people to have to go to school and to college and to learn something other than rote learning, to learn how to be engineers and-- [audio break].

[Side B of Audiotape 2 of 4 begins.]

MR. WOOLSEY: [In progress]--scientists and mathematicians and even lawyers? Would it be a shock for them to have to learn to produce--

Even economists.

[Laughter.]

MR. WOOLSEY: --to produce textiles to get into the business of learning how to earn a living in this world? Yes. It would be a shock. It would be a shock, I would dearly love to see them have to go through.

Should we operate this and conduct ourselves in such a way that we try to make it a relatively easy transition for them, that we try to help with

these transitions, so that it doesn't produce more terrorists? Sure. But should we sit here and gorge ourselves on their oil?

By the way, Jim, Lexus is coming out with an SUV in September that gets 37 miles to the gallon in town because it is a hybrid. You can drive big cars if you want to, as long as they get good mileage.

MR. STEINBERG: Fiona?

MS. HILL: I wish it were all so simple. I was sort of sitting, listening to Jim Woolsey, thinking, well, wouldn't it be great if your average Saudi could be a software programmer or something like this. If you look at the case of Russia and all the countries around Russia in the Caspian Basin, Kazakhstan, Azerbaijan, and Turkmenistan--of course, maybe we should leave Turkmenistan to one side. That is a tricky one to talk about. The fact is that their comparative advantage, their competitive advantage in the world is natural resource production.

Even if you think about Russia, which is actually a very much more diversified economy than Saudi Arabia, you have got an awful lot of lawyers sitting around in Russia, many of them quite busy right now with Hotokovski and others in jail running around here.

[Laughter.]

MR. STEINBERG: He needs a lawyer.

MS. HILL: That is right.

You have a lot of software engineers sitting in strange places like Novaseebisk [ph]. Many of them might prefer to be in Miami or San Jose, but they are out there.

Where they are located is a bit of a problem because you can't sit in Novaseebisk and type away on your computer, making up the next software, unless the lights are on and you are sitting in heating because it is an extraordinarily cold place to be at this time of the year.

That requires, again, for the domestic economy of many of these states--Saudi Arabia actually has the opposite advantage of being an extraordinarily hot place. So you need air-conditioning to be able to carry these things out. They need their own sources of energy for the development of their own economies.

For Russia, it actually is one of these Catch-22 situations. If they don't pump out more oil for export, they can't keep everything going inside because of the highly subsidized nature of the fuel prices, which not just keeps sort of [inaudible] industries that ought to be restricted going, but keeps the new technology, the new industries, the new service sector, the new high-tech industries going, too.

There is a big debate in many countries across the world that maybe isn't taking place in Saudi Arabia, but it is taking place in places like Russia and Kazakhstan and Azerbaijan about how do they diversify their economies. Russia would like to be a high-tech producer, but how does Russia then compete with Japan, with Korea, with the United States, for that matter?

So it is not a simple issue to think that you should put your natural resource wealth on one side and shift over to other kinds of industry. The Soviets tried to do that with a massive industrialization campaign, in fact, got themselves even more locked into energy use than they were before. So,

unfortunately, a lot of these restructuring issues, which would be ideal, also raise a whole host of other questions.

Will Saudi Arabia's competitive advantage be in producing lawyers or in producing refrigerators or in producing software packages for Microsoft? I am not entirely convinced that that will be the case if you look at other countries.

MR. STEINBERG: Let me do this because Jim Woolsey has to leave at five to 1:00. Let's take a couple of questions, and then we will give each of the panelists an opportunity to comment on what they think is most relevant. So I will take three or four questions, and then we will go to responses.

Right here.

MR. HERSHEY: I am Bob Hershey. I am a consultant.

How will new technologies play into this? For instance, Jim Woolsey had mentioned getting synthetic diesel from Fischer-Trope process, which will exploit some of the natural gas that is locked in. How will that and some of the other technologies play into this?

MR. WOOLSEY: You can take several.

MR. : Yes, Mr. Woolsey. I was the one that applauded after your presentation. I wouldn't describe it so much as me converting as me applauding what I see as the evolution of your thinking on this over the last couple of years.

[Laughter.]

MR. : In particular, in the past, you have talked about the threat to our security from a combination of Wahabis, Bathists, and Jahidists

[ph], but one thing I haven't heard you talk about is something I call the American Jihadist, and this follows up on the previous question.

There is a group that has grown up who has decided that the right thing for the U.S. is to think of the Saudis and the other Middle Eastern autocracies as our enemies and to antagonize them, and that a goal of U.S. energy policy should be specifically to deprive them of the funds in order to strangle their support for world terrorism, i.e., buying oil that supports Arabs and Arabs are terrorists and that sort of thing.

In fact, Saudi Arabia has been a friend to the United States in a great many ways, not least of which is their commitment to keeping approximately 2 million barrels a day of reserve capacity in order to stabilize the market.

That is what I would like to hear you respond to.

MR. STEINBERG: Let's go over here.

MS. : I would just like to ask the panel what the motivations are behind Saudi Arabia now seeming to want to cease being a price moderator.

Lately, we have seen them push through, them solely pushing through OPEC production cuts when prices are really high. Obviously, revenue maximization is one thing, but do you see any political factors at play?

MR. STEINBERG: Let's take one more.

MR. : Jack Bronze [ph], Nuclear Energy Institute.

You all have commented on how diversity or variety, as Churchill I guess would put it, was very important, but not until Jim Placke came up did anybody really mention the "N" word.

But after he said that, he said, well, there are some significant barriers, licensing and so on. The licensing as far as I know is probably not more difficult than pipelines or refineries, but the same with siting, but more importantly, what got everybody's heads nodding was this waste issue.

I would appreciate it if somebody could explain to me how, since all the nuclear waste is where it was produced and isolated from the environment, that is substantially is worse than the waste from the 90 percent of our sources that has just liberated the atmosphere.

MR. STEINBERG: Let's turn to the panel. I don't know whether we have enough expertise up here to speak to the nuclear waste issue, but I welcome any panelist who wants to go into it.

Why don't you go first and then you can slip out.

MR. WOOLSEY: I am going to apologize for leaving after I make remarks because Chris DeMuth has me up at AEI on another panel at 1:00.

First of all, on the issue of the Saudis being good guys, I think bad guys are potential good guys. We conquered Iraq. They adopted a democratic constitution.

I spent a week there about 2 weeks ago and was out in the Sunni Triangle and Shiite villages with American military commanders, and the Shia keeps saying, "The one thing we don't want you go do is let your military leave." This part of the world is potentially a wonderful, prosperous, democratic place.

It is just going to take us some time and effort for a lot of things to get changed, but there are allies in that part of the world, including in Saudi Arabia who want different types of societies than dictatorships. That seems to me to be part of the answer on the energy side is that the more stable and over the long run, the democratic and more oriented toward the rule of law the Middle East is, the better chance we have of having stable economies that aren't being disrupted by terrorists or by the next Saudi king, being somebody like the current interior minister.

I think a big part of the issue with technology that was raised here--and I must say, this is a question on which I at least have a rather different emphasis than Jim and Fiona--is I think that there are two separate problems.

The lights aren't going to go out, Jim, if we stop importing oil because the lights aren't powered. The electricity isn't produced by oil. We are down to like 2 percent or less producing electricity by oil.

We got two distinct problems here. One is oil dependence and the geopolitics of the Middle East that drives that, and those are the issues I was speaking to initially.

A whole separate issue is how do we produce electricity and what is secure or not secure and where should we go with the electricity grid.

My judgment is the big security problem, the national security problem, the electricity grid. It doesn't have anything to do with the fuel you use. It is a question of the grid's vulnerability, both the SCADA [ph] systems and the transformers and terrorist attack, hacking. It is even vulnerable to branches falling on wires in Ohio, as we found out last August.

If you are talking about producing electricity, I don't think we need to get so worried about LNG imports and natural gas and so on. My answer to Fiona's question is four words: coal gassification-combined cycle.

If you are producing gas-fired electricity now at roughly 6 cents a kilowatt hour because gas has gone up so much in the last few years, you are probably at the ball park of being able to do it for 5 cents a kilowatt hour with coal gassification in combined cycle. Then, you have got a system that permits you to sequester the carbon.

Coal gassification-combined cycle does everything you are going to be able to do positively with respect to most of the renewable, solar, wind, whatever, except that it doesn't sequester the carbon automatically, but it makes it a lot easier. It does raise the cost, and it is something we are looking at in the National Energy Policy Commission.

Two of my fellow commissioners, John Holdren and Phil Sharp, are sitting here on the front second row. They have forgotten much more about this issue of electricity generation than I will ever know. So questions about these issues seems to me on electricity can be useful directed to them, but the point is we don't have an overall energy dependence problem on the outside world.

For some decade or two or three here, we have got a serious problem with the Middle East, and the Middle East produces oil. We need to generate electricity. We got a lot of ways to generate electricity. Some have more strengths than others.

I happen to think coal gassification with combined cycle is the wave of the future, and it is something that ought to get a lot more attention than it has had so far, but the security issue, to my mind, is not importing LNG from Russia or anyplace else. The security issue has to do with the very vulnerable electricity grid we have gotten ourselves into and what we have to do to fix it.

The grid is sort of in the situation that some of my Russian friends used to say their own economy was in the early 1990's if they decided to change from driving on the left-hand side of the road to driving on the right-hand side of the road, but they decided to change the first year with the bicycles, the second year with the motorcycles, the third year with the cars, and the fourth year with the trucks.

[Laughter.]

MR. WOOLSEY: The electricity grid in between, its regulated and deregulated situation is in that kind of a mess right now. To my mind, that is our security problem with respect to electricity.

MR. STEINBERG: Thank you, Jim.

Let me just take the chairman's prerogative to comment on the Saudi issue.

I think the issue with the Saudis is not whether they are good guys or bad guys or whether their interests line up with ours, and I think there are some good guys and there are some bad guys there, but the main problem is that in some respects, our interest had been coincident with the Saudis because they have worried about their security and threats to their energy capabilities,

which we also share an interest in. So they have wanted a security relationship with us, and therefore, they have done some things to support it.

But they also wanted to sustain their regime, and so they have cut some deals with radical forces in their own society, which is not in our interests, the Wahabist leadership in their own society, which is not in our interest. So what we need to do is we need to move it to a situation in which the Saudi interest and ours are more in align because we cannot tolerate a world in which, in their pursuit of their self-interest, they are doing things which are becoming increasingly intolerable in terms of our own.

I think if you look at it that way and you don't try to figure this out in terms of good and evil and nice guy and bad guy, I think it leads more sensibly to sort of think about how we orient our policy.

Fiona?

MS. HILL: I don't really have too much to add to these. I think Jim Placke might be able to comment more on the Saudi motivations about price moderation. I don't know if you can think about the nuclear issue, but I just wanted to echo what you just said there.

I think the problem is in looking not just at the Middle East, but across most of the major countries that are energy suppliers. In fact, it sort of seems to be, with the exception of Norway, Britain, and a few other places, that oil and gas seem to be in some places that have some tricky political development problems.

MR. STEINBERG: Which is cause, and which is effect?

MS. HILL: I think, though, it is not necessarily the cause in many instances.

In fact, we will see this in the future if we look at some of the new states of the former Soviet Union, like Azerbaijan and Kazakhstan. Azerbaijan was, of course, the first major oil producer in the world. It was the boom city of Baku back to the times of Malfred Nobel [ph], but went into abeyance for an awfully long time. They are sort of starting off again.

I think, in a way, Azerbaijan and Kazakhstan have opportunities perhaps to prove whether things are cause in effect, and in actual fact, in looking at states like this, you will see that they are actually trying very hard to think about all of the issues that we are concerned about in terms of diversification in their economies. They are just running up with a problem. They have multiple transitions in moving away from being under the Soviet system.

So I think we have to separate all of these things out. There is a lot of complicated processes going on in many countries, and Saudi Arabia is suffering from many of the problems of decolonialization and the collapses still of the Ottoman Empire going back into a historical perspective.

We tend to see oil as the driving factor for most of the problems, and I think just as Jim Woolsey was trying to separate out the electricity sector, those vulnerabilities, structural vulnerabilities, we have to sort of separate out what is really going on in these countries away from the 800-pound gorilla of oil, which tends to focus our brains often in the wrong directions.

MR. STEINBERG: Jim?

MR. PLACKE: Let me follow up on a couple of things that Jim said. Unfortunately, he has departed.

First of all, the mention of coal gassification in combination with combined cycle technology, that really is a very definite prospect for the future, and that may well be one of our best alternatives. When I referred to increasing use of coal, as others did during this morning, that was really what that was a reference to.

Jim's discussion about the vulnerability of electricity grid, absolutely, nobody could question that, and that has nothing to do with fuels. That is a combination of regulatory and investment problems.

However, the LNG aspect in the short run, we are going to import more LNG, and if the present trends hold, say, through the rest of this decade and on into the next, it will be sufficiently important that it will be another supply security concern, even if we move in the direction of coal gassification technology and other things.

From that, let me take off to the mention of Fischer-Trope. The Fischer-Trope process, which is alive and well and living in South Africa, is one of several approaches to extracting liquids from natural gas and making gas into liquid fuels.

What you get--and for shorthand, it is GTL--it products a very, very pure product. It does not produce a product that you can put into your automobile or into your truck if it uses diesel. It something that can be combined with more conventional fuels that come out of the refining process and will help you meet emission standards and so forth, but by itself, it is not a

fuel. So, to talk about that as if it were a replacement for conventional gasoline or conventional diesel is a technological misunderstanding.

Finally, there are two things. The nuclear, I will take last because I know the last about it. On the question about what might have motivated the Saudis, I don't know that they led the effort, but they certainly were concurrent in it in agreeing that OPEC should reduce their output by another million barrels a day, beginning 1st of April.

Two things. The 1st of April is the beginning of the second quarter of the year. That is the quarter in which petroleum demand cyclically is at its low, and OPEC in its market management mode that I referred to in my remarks is trying now to anticipate, as they would need to, what has to be done to adjust supply to maintain prices in a certain band.

Do they always get it right? No, they almost always get it wrong, as anybody would because the supply system is so big, so complex, the Saudis, the Americans, nobody anticipated or can tell you today where is Venezuela going to go, how much political disruption is there going to be, and what effect will it have on oil supplies.

It has already been referred to this morning that that has had quite an impact on U.S. supply in the last series of political disruption in Venezuela and could well again. So there are always surprises that nobody can anticipate.

I guess my answer in why I don't think it is politically driven, there is an economic rationale to it, although it may not be entirely rational. Look at what OPEC does, not what they say.

The OPEC production almost always exceeds, sometimes by a very substantial margin, the nominal quotas. So they seem to have a price objective in mind. They are trying to manage the market around that objective. It is a very tricky thing to do. I am not sure they can succeed. Generally, they have failed in the past, but they are making the effort again, and as I have said, they have done pretty well with it for the last 4 years. So I think it is economics and not politics in this case.

Finally, on nuclear--and I am in an area here where I really have zero background, but from listening to what others have told me and what little bit of reading I have done over the years, the reason why disposal is such an issue there as compared to anything else that comes out of the broad spectrum of energy sources and particularly hydrocarbons is that the wrong exposure there can kill you fairly quickly.

Whereas, there is an argument to be made that breathing polluted air will have the same effect, but it takes a lot longer. So, therefore, it is just more dramatic, and I think it has a lot more political impact.

Given the history of how the nuclear age dawned with a bright light over Hiroshima, it always carries some additional political freight, and I think people have an allergic reaction to nuclear, especially because I think the public in general, and not unjustifiably, feels that it was misled by the statements of the '40s, '50s, and '60s about nuclear energy being the cleanest possible source being renewable, being low cost, and being all the things that ultimately it proved not to be.

I think it is going to be a hard sell to convince people that something has changed, and I don't know enough to assert to you that it has changed, but I think it is probably worth looking at.

MR. STEINBERG: Let's thank the panelists for a terrific presentation.

[Applause.]