

CHINA'S ENERGY NEEDS AND STRATEGIES

HEARING BEFORE THE U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

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OCTOBER 30, 2003

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The Commission's full charter is available via the World Wide Web: <http://www.uscc.gov>.

The Commission's Statutory Mandate begins on page 127.

U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

DECEMBER 17, 2003

The Honorable TED STEVENS,
President Pro Tempore of the U.S. Senate, Washington, D.C. 20510
The Honorable J. DENNIS HASTERT,
Speaker of the House, Washington, D.C. 20515

DEAR SENATOR STEVENS AND SPEAKER HASTERT:

On behalf of the U.S.-China Economic and Security Review Commission, we are pleased to transmit a record of our hearing of October 30, 2003, on China's energy needs and strategies and the implications for global energy markets and China's geopolitical relations.

The Commission's statutory mandate (P.L. 108-7, Division P) calls on us to assess, among other issues, "how China's large and growing economy will impact upon world energy supplies and the role the United States can play, including joint R&D efforts and technological assistance, in influencing China's energy policy." The Commission's mandate further directs it to examine China's economic and strategic relations with its regional neighbors and other countries, of which China's energy policies are an important component.

During our hearing we heard testimony from nine distinguished experts on the economic and security dimensions of China's energy strategies, including Guy Caruso, Administrator of the Department of Energy's Energy Information Administration, and former Director of Central Intelligence R. James Woolsey. The Commission also conducted a luncheon discussion on the geoeconomic and geopolitical aspects of China's energy strategies with former Secretary of Defense and Energy James R. Schlesinger.

The key issue raised in the hearing is whether China will continue to pursue new energy supplies in the Middle East and elsewhere in competition with, or cooperation with, the U.S. and other consuming nations. The continuation of China's unilateral approach could provide additional price leverage for OPEC member countries. It may also encourage China to offer incentives to energy supplier nations, as it has in the past, including missile and WMD components and technologies, for secure long-term access to energy supplies. This practice substantially undermines U.S. global nonproliferation policies. On the other hand, China could pursue its urgent quest for new energy on a more multilateral basis, working with the U.S. and other nations to manage access to supplies, and put into place, for example, the coordinated release of oil stocks to counter future price spikes. Such cooperation would preferably involve the kind of arrangements already in force within the framework of the International Energy Agency (IEA), benefiting both U.S. energy security and nonproliferation goals. China's extraordinary rate of economic growth has made it a rapidly growing consumer of energy. Currently China stands as the world's second largest consumer of energy (behind the United States) and its third largest consumer of oil (behind the United States and Japan). With this increasing demand has come an increasing reliance on imported energy. China became a net oil importer in 1993 and now imports nearly 2 million barrels per day, projected to increase to more than 6 million barrels per day by 2020, making it a major factor in world energy markets.

China has a comprehensive energy security strategy, consisting of demand reduction, diversification, leveraging bilateral relationships with key Middle East suppliers, building stronger ties with Russia, and establishing a market position in Central Asia. Currently, coal dominates China's energy consumption (65 percent). This poses a tremendous environmental challenge to both China and the world as much of this consumption involves unwashed coal and has led to a surge in air pollution and emissions of greenhouse gases. In this area, China is proceeding with improving its energy efficiency, and its use of clean coal technology, coal liquefaction and gasification and coal-bed methane development, exploration, and production.

Oil is the second largest source of energy for China, accounting for 25 percent of its energy consumption, and China will soon be the world's second largest oil importer after the U.S. The world's major oil importing nations belong to the multilateral framework of the IEA. China is the largest oil-consuming nation that does not participate in the IEA system, including the IEA's coordination of joint releases from strategic reserves to counter politically motivated supply reductions by oil producers. China has opted to pursue bilateral arrangements and investment in energy

production and a possible small strategic oil reserve to address its energy security concerns.

To achieve its goal of diversifying oil import sources, and to enhance its energy security, China has entered into energy deals with a number of countries, including some—Iran and Sudan—that are on the State Department's list of terrorist-sponsoring states. These arrangements are troubling, especially to the extent they might involve political accommodations and sales or other transfers of weapons and military technologies to these nations.

In sum, China's growing energy demands, particularly its increasing reliance on oil imports, pose economic, environmental, and geostrategic challenges to the United States. The Commission will continue its thorough examination of China's energy needs and strategies and advise the Congress as appropriate with regard to developing appropriate U.S. policies to influence China's energy policies in a manner consistent with U.S. interests.

Yours truly,



Roger W. Robinson, Jr.
Chairman



C. Richard D'Amato
Vice Chairman

CONTENTS

	Page
THURSDAY, OCTOBER 30, 2003	
CHINA'S ENERGY NEEDS AND STRATEGIES	
Opening remarks of Chairman Roger W. Robinson, Jr.	1
Prepared statement	2
Opening remarks of Vice Chairman C. Richard D'Amato	2
Opening remarks of Commissioner Michael R. Wessel, Hearing Co-Chair	3
Prepared statement	4
Opening remarks of Commissioner Michael Ledeen, Hearing Co-Chair	5
Prepared statement	6
PANEL I: CHINA'S ENERGY OUTLOOK: RECENT TRENDS AND FUTURE FORECASTS	
Statement of Guy Caruso, Administrator, Energy Information Administration	6
Prepared statement	10
Discussion, Questions and Answers	19
PANEL II: ENERGY MARKET AND SUPPLY IMPLICATIONS OF CHINA'S ECONOMIC GROWTH	
Statement of Amy Myers Jaffe, Wallace Wilson Fellow for Energy Studies, James A. Baker III Institute for Public Policy, Rice University	27
Prepared statement	30
Statement of Kang Wu, Ph.D., Fellow and Head of China Energy Project, East-West Center	36
Prepared statement	39
Statement of Dean P. Girdis, Director, PFC Energy	43
Prepared statement	46
Discussion, Questions and Answers	58
LUNCHEON SESSION	
Statement of James R. Schlesinger, Chairman, Board of Trustees, The Mitre Corporation	66
PANEL III: CHINA'S ENERGY DIPLOMACY AND ITS GEOPOLITICAL IMPLICATIONS I	
Statement of R. James Woolsey, Vice President, Booz Allen & Hamilton	72
Discussion, Questions and Answers	73
PANEL IV: CHINA'S ENERGY DIPLOMACY AND ITS GEOPOLITICAL IMPLICATIONS II	
Statement of Robert E. Ebel, Chairman, Energy Program, Center for Strategic and International Studies	83
Prepared statement	86
Statement of Edward L. Morse, Executive Advisor, Hess Energy Trading Company	88
Statement of Kent E. Calder, Director, Reischauer Center for East Asian Studies, Nitze School for Advanced International Studies, Johns Hopkins University	91
Prepared statement	93
Statement of Constantine C. Menges, Ph.D., Senior Fellow, Hudson Institute ..	98
Prepared statement	101
Discussion, Questions and Answers	117

CHINA'S ENERGY NEEDS AND STRATEGIES

THURSDAY, OCTOBER 30, 2003

U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION,
Washington, D.C.

The Commission met in Room 124, Dirksen Senate Office Building, Washington, D.C. at 10:05 a.m., Commissioners Michael R. Wessel and Michael Ledeen (Hearing Co-Chairs), presiding.

OPENING REMARKS OF CHAIRMAN ROGER W. ROBINSON, JR.

Chairman ROBINSON. Thank you. We'd like to begin our scheduled hearing for today. First, we would like to welcome all of you to the U.S.-China Economic and Security Review Commission's fourth hearing during the 108th Congress. Today, the Commission will be examining China's energy requirements and strategies and addressing the potential impact of those requirements on global energy markets and China's geopolitical relations. These are very significant questions for both U.S. economic and national security interests and ones that have not been given significant attention to date.

Today's discussion is a timely one. Energy concerns in the U.S. have come to the forefront. There is an energy bill currently pending before Congress, and the country is examining its antiquated electrical grid in the wake of last summer's widespread blackout. Perhaps not since the 1970s are Americans as focused on our increased dependence on oil imports and their vulnerability to political events overseas.

China's energy picture poses a unique set of challenges for the United States. With a rapidly expanding economy and improved standard of living, it should come as no surprise that China is now the world's second largest energy consumer after the United States and its third-largest consumer of oil. In the early 1990s, China became a net importer of oil and now imports nearly 2 million barrels a day. At the same time, China remains both the largest producer and consumer of coal in the world.

Given these dynamics, it is clear that how China chooses to meet its future energy demands will have profound implications for global energy markets, the environment and its relationships in Asia, the Middle East, Central Asia and beyond. This last point provides a clear indication of the intersection between economic and security concerns. In its 2002 report to Congress, the Commission expressed concern that China's energy needs may be a driver in its relations with certain oil-producing state sponsors of terrorism, particularly Iran and Sudan, and that arms sales and components for weapons

of mass destruction and missile programs may be part of China's efforts to secure oil and gas contracts and concessions.

This potential nexus deserves more attention by the U.S. Government, and the Commission will continue to follow these developments closely, particularly with respect to Chinese energy relations with Iran, Libya, Sudan and Syria. I look forward to today's testimony from a distinguished group of panelists and will now turn it over to our Vice Chairman, Richard D'Amato and today's hearing Co-Chairs, Commissioners Michael Wessel and Michael Ledeen.

[The statement follows:]

Prepared Statement of Chairman Roger W. Robinson, Jr.

Welcome to the U.S.-China Economic and Security Review Commission's fourth hearing during the 108th Congress. Today the Commission will be examining China's energy requirements and strategies and addressing the potential impact of those requirements on global energy markets and China's geopolitical relations. These are very significant questions for both U.S. economic and national security interests, and ones that have not been given significant attention to date.

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I look forward to today's testimony from a distinguished group of panelists and will now turn it over to our Vice Chairman Richard D'Amato and today's hearing Co-Chairs, Commissioners Michael Wessel and Michael Ledeen.

OPENING REMARKS OF VICE CHAIRMAN C. RICHARD D'AMATO

Vice Chairman D'AMATO. Thank you, Mr. Chairman. I would just like to make one point to reiterate the Chairman's remarks. The Congress has asked this Commission, by statute, to examine the potential impacts of China's growing and voracious appetite for energy, on U.S. global national security interests.

China is traveling down the road the United States has been on and is increasing its imports of oil, natural gas and coal into the foreseeable future. Those requirements are going to be escalating rapidly until China will, like the U.S., be dependent on half or more of its oil needs from imports. Where and how the Chinese go to satisfy that appetite is going to say a lot about whether or not the Chinese are prepared to act cooperatively or competitively with the West and the United States in managing that share of world supply. The jury is, in some ways, out, but there are some danger

signs on the horizon, which is the reason for today's hearing, and we will be interested to hear our witnesses' testimony on it.

And with that, I want to turn it over to our hearing Co-Chairman, Commissioner Wessel, who has invested considerable time and thought in putting today's session together.

**OPENING REMARKS OF COMMISSIONER MICHAEL R. WESSEL
HEARING CO-CHAIR**

Co-Chairman WESSEL. Thank you. I appreciate it, and thank you, Mr. Caruso, for being here.

Today, the Commission will be examining the increasingly important issue of China's growing energy needs; its strategies for meeting those demands and the implications for the U.S. economy and our national security. This is an important component of our legislative mandate from Congress and one that China analysts both inside and outside the government likely will be devoting increasing attention to over the next decade.

The Commission will address several issues today. We will first examine China's current trajectory of energy consumption and production. China's stated energy policy goals are to reduce reliance on imports by further diversifying the types of energy used, diversifying the countries of origin of its energy imports and raising the level of technological sophistication in its energy production.

We will explore whether China is pursuing these stated goals in practice. We also will examine the impact of China's energy demand on world supply and pricing. China currently pursues a far more bilateral approach toward its oil imports than does the larger oil-consuming nation community. We will investigate whether this impacts the supply availability and pricing situation for the U.S. and its allies. We will also discuss the impact of fluctuating energy prices on China's GDP and export output.

We will further examine the effectiveness of current Sino-U.S. bilateral energy cooperation programs; whether such programs are furthering U.S. interests and what other ways the U.S. can act to favorably affect China's energy policy. Beyond the energy market and economic issues, we will explore the geopolitical dynamics at work. How does China's growing energy needs drive its diplomacy in Asia and beyond? Where is China investing money in resources to secure energy supplies? And how do these relationships enhance or diminish the prospects for conflict?

Of particular concern is whether China engages with any terrorist-sponsoring and other rogue nations in pursuit of energy supplies and whether non-monetary considerations, including arms sales, as has been noted earlier, are part of such arrangements.

I will chair the morning session of the hearing, and my hearing Co-Chair, Michael Ledeen, will chair the afternoon session. We will begin by hearing from Guy Caruso, Administrator of the Energy Information Administration, who will provide the Commission with an overview of China's current energy situation and the forecasted trends over the next two decades. Administrator Caruso will also discuss the U.S. Government's bilateral energy programs with China.

The normal approach of the Commission is to ask each of our panelists to present their views in approximately 10 minutes or

less so that there is enough time for Commissioners to ask questions. Any prepared comments and/or written materials of the panelists will be made part of the record at their request. Commissioners will be limited to seven minutes of questions. That includes both the questions and the answers. We want to have time for everyone to participate in today's hearing.

Mr. Caruso, we understand that you have a PowerPoint presentation, and we will be liberal with our time demands or time limitations so that we can have the opportunity to hear all of that, and Mr. Ledeen, did you wish to make comments at this time or later this afternoon?

[The statement follows:]

**Prepared Statement of Commissioner Michael R. Wessel
Hearing Co-Chair**

Today the Commission will be examining the increasingly important issue of China's growing energy needs, its strategies for meeting those demands, and the implications for the U.S. economy and our national security. This is an important component of our legislative mandate from Congress and one that China analysts, both inside and outside the government, likely will be devoting increasing attention to over the next decade.

The world's developed and developing economies increasingly rely on oil imports for their economic growth. Global energy demand is rapidly increasing due to the growing numbers of countries, including China and India, which have joined the ranks of oil dependent economies. China became a net oil importer in 1993 and currently imports nearly two million barrels per day, with that level projected to increase greatly in the next twenty years.

Our mandate from Congress directs the Commission to "evaluate and assess how China's large and growing economy will impact upon world energy supplies and the role the United States can play, including joint R&D efforts and technological assistance, in influencing China's energy policy." The Commission's mandate further directs it to examine China's economic and strategic relations with its regional neighbors and other countries, of which China's energy policies are an important component. How China addresses its escalating energy needs over the next decade likely will have significant implications for both U.S. economic and security interests as well as on the world's environment.

The Commission will address several issues today. We will first examine China's current trajectory of energy consumption and production. China's stated energy policy goals are to reduce reliance on imports by further diversifying the types of energy used, diversifying the countries of origin of its energy imports, and raising the level of technological sophistication in its energy production. We will explore whether China is pursuing these stated goals in practice. We also will examine the impact of China's energy demand on world supply and pricing. China currently pursues a far more bilateral approach towards its oil imports than does the larger oil-consuming nation community. We will investigate whether this impacts the supply availability and pricing situation for the U.S. and its allies. We will also discuss the impact of fluctuating energy prices on China's GDP and export output. We will further examine the effectiveness of current Sino-U.S. bilateral energy cooperation programs—whether such programs are furthering U.S. interests—and what other ways the U.S. can act to favorably affect China's energy policy.

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The next panel will focus on the economic and energy market implications of China's current and future energy demands. We will hear from Amy Myers Jaffe, Dr. Kang Wu, and Dean Girdis. Ms. Jaffe is the Wallace Wilson Fellow for Energy Studies at the James A. Baker Institute for Public Policy and Associate Director of the Rice University Energy Program. She is the principal author and research director for eight energy studies published by the Baker Institute, which include topics such as Chinese Energy Policy and Global Oil Geopolitics. Dr. Wu comes to us from the East-West Center in Hawaii where he is head of the China Energy Project. His work includes energy modeling and Asia-Pacific energy demand forecasting. Dean Girdis, Director of the Gas and Power Group of PFC Energy has had extensive experience consulting on energy development and reform and energy security in China.

During the afternoon session we will turn our attention to the geopolitical dimensions of China's energy strategies. We will hear first from the Hon. R. James Woolsey, former Director of the Central Intelligence Agency, followed by Robert Ebel, Project Director for the Center for Strategic and International Studies' Strategic Energy Initiative, Constantine Menges of the Hudson Institute, and Professor Kent Calder of the Johns Hopkins School for Advanced International Studies. My Co-Chair Michael Ledeen will expand further on this panel after lunch.

The Commission welcomes these distinguished panelists and we look forward to dialoguing with them on the important issues before us.

The normal approach of the Commission is to ask each of our panelists to present their views in approximately 10 minutes or less so that there is enough time for the Commissioners to ask questions. Any prepared comments and/or written materials of the panelists will be made part of the record, at their request.

Commissioners will be limited to 5 minutes of questions—that includes both the questions and the answers. We want to have time for everyone to participate in today's hearing.

With that, we will begin with Mr. Caruso.

**OPENING REMARKS OF COMMISSIONER MICHAEL LEDEEN
HEARING CO-CHAIR**

Co-Chairman LEDEEN. In the interests of saving time, I thought I would just read my statement.

We here at the Commission have been trying to figure out what China means for our future and what we might choose to do about it. To that end, we have looked at various aspects of Chinese activity as well as the mirror image, Chinese efforts to figure out what we mean for their future and what they might choose to do about it.

This session deals with the growing Chinese appetite for energy to drive what they hope will be their constant, rapid economic growth. Many energy experts believe that China's huge appetite will drive up prices for everyone, including the United States. Others are more optimistic about supply and resist this conclusion. In either case, it is likely there will be some strains in the U.S.-China relationship revolving around competition for energy sources, and there may well be internal American problems as well.

Finally, a considerable amount of the world's energy supply is in the hands of rogue nations like Iran and Libya and also in countries with increasingly ambiguous and worrisome relations with international terrorists such as Saudi Arabia and Venezuela. Basic geopolitical prudence requires that we carefully watch China's choice of suppliers and attempt to analyze this in terms of our broader concerns.

As we reported a year ago, Chinese military doctrine foresees conflict with the United States, and China's choice of suppliers undoubtedly figures in their planning for such contingencies. We're very happy to have you with us today, Mr. Caruso. Thanks for coming. Please proceed.

[The statement follows:]

**Prepared Statement of Commissioner Michael Ledeen
Hearing Co-Chair**

We here at the Commission have been trying to figure out what China means for our future, and what we might choose to do about it. To that end, we have looked at various aspects of Chinese activity as well as at the mirror image; Chinese efforts to figure out what we mean for their future, and what they might do about it.

Today's session deals with the growing Chinese appetite for energy, to drive what they hope will be their constant, rapid economic growth. Many energy experts believe that China's huge appetite will drive up prices for everyone, including the United States. Others are more optimistic about supply, and resist this conclusion. In either case, it is likely there will be some strains in the U.S.-China relationship revolving around competition for energy sources, and there may well be internal American problems as well.

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**PANEL I: CHINA'S ENERGY OUTLOOK: RECENT TRENDS AND
FUTURE FORECASTS**

**STATEMENT OF GUY CARUSO
ADMINISTRATOR, ENERGY INFORMATION ADMINISTRATION**

Mr. CARUSO. Thank you, Mr. Chairman, Members of the Commission, today's Co-Chairs. I appreciate the opportunity to be here today and speak about this very important country that is critically important to energy markets, even more so as we look out a decade or two.

China and energy are inextricably linked. If one thinks of the last half-century of energy markets and asks what was the prize that energy companies, energy-dominated government organizations were after, it was really focused on supply and the Middle East, and we have all seen what has happened to that picture as the second half of the last century evolved.

When one looks over the next couple decades, the prize is where can the oil and gas reserves that have been discovered in that search since World War II be marketed? And inevitably, whether one is at an international conference or industry meeting, all are looking toward China, particularly in oil, as a key market for their oil, whether it is a government company or a major oil company.

So China represents the demand prize of the next couple decades, as our numbers will show. And the implications, of course, are important not only for global energy markets but, as the Chairman mentioned in his opening remarks, the geopolitical scene, energy security, and where is the oil going to come from and what kind of relationships does that mean?

And probably equally important to energy security is the environmental implications of the China picture that you have been studying and that I will present over the coming minutes. China is the second-largest energy consumer in the world already and growing faster than anyone else. It continues to rely on coal as its dominant fuel, and this will not change, and this has important implications for the global environment. Its oil consumption and imports will grow faster than any other country, and our projection

is that 15 percent of incremental growth in oil demand in the world over the next 20 years will go to China.

They are trying to do what they can to improve the energy and environment mix in their country by shifting away from coal to natural gas and, to a lesser extent, to the building of nuclear power plants to alleviate coal's dominant share in the electricity sector.

So China will continue to be the fastest growing world energy consumer and will account for 13 percent of world energy use and 9 percent of world oil consumption by 2020 in our latest forecast. And even with this desire to move away from coal, nearly two-thirds of incremental coal demand in the world over the next 20 years will be consumed in China.

China's oil consumption is presently at 40 quads; the U.S. is close to 100 quads. But they are growing fast, and we expect China's growth over the next 20 years to average about 3.5 or 3.6 percent, compared with our average growth of less than half of that. And it will be an increasingly important player on the world market.

China's energy intensity is improving. Their ability to use energy more efficiently is actually being reduced in our Outlook, but still, even with that improved energy efficiency and structural change, they will grow more rapidly than any other country, any other large economy, mainly because of the GDP growth that we expect. And they have improved that ability to produce gross domestic product per unit of energy.

They are moving, like we are, to a more service-oriented economy. They are improving the efficiency of their state-owned enterprises and the way they use energy, and they are moving toward more efficient uses in capital stock, both in electric power and other industrial and residential consumption of energy. All are moving toward a more efficient way. But nevertheless, they will continue to be growing much faster than we will.

The next slide shows the GDP growth that I mentioned. We think GDP growth will be averaging about 6.4 percent over the next two decades in China, the highest of any major country. Ours is about 3 percent; the EU, about 2.3; and Japan, 1.8. Other developing countries we don't see growing much more, on average, than about 4 percent. So clearly, this is the driver behind their demand growth in energy. This is the driver of that world energy demand outlook that I mentioned in the opening remarks.

And, of course, that GDP number has been the subject of some concern about its estimation, given the artificially low exchange rates and other measurement issues, but, nevertheless, the trend is still, whether it's 6.4 or plus or minus a half percent, by far the driving force behind these energy demand numbers that we speak of.

Coal dominates China's energy now. It has for decades, and even with policies that they have in place to reduce coal use in electric power and other sectors, it still will dominate for the next two decades. It's 70 or so percent of their total energy now, and, even with improvements, it's still going to be over 60 percent in 2020. Seventy percent of their electricity is generated by coal. It's both the largest producer and consumer of coal in the world and will continue to maintain that role.

We anticipate that China's demand for coal will grow to more than 2,500 million short tons by 2020. That's an 80 percent increase over their consumption this year. They've got abundant coal reserves, some of which are lower quality, but nevertheless, by far, the largest coal reserves in the world.

So we expect that they may even become major exporters. They may move in that direction as they try to develop this surplus coal. And coal's share in the overall mix, as I mentioned, although it will decline a bit, will still be more than two-thirds of total energy.

Oil is most rapidly growing share of China's energy mix. Just a short 10 years ago, China was a net exporter of oil. They became a net importer last decade, and their imports are growing rapidly from virtually nothing in 1993 to one-third of their total oil consumption this year. They've got about 5 million barrels a day oil consumption; about 1.7 of that was imported last year, and this, we expect, will grow dramatically over the next 20 years to the point where perhaps three-quarters of their demand by 2020 will have to be imported. Consumption we forecast to be more than 9 million barrels a day in 2020, up from 5 million barrels a day today, and their domestic production is flat-to-declining over this period.

We anticipate that perhaps this year or next, China will surpass Japan in terms of oil consumption, and even though their rate of growth in demand for oil will trail behind their GDP outlook rate of growth, it will still grow rapidly.

Now, the key issue that was mentioned in both the Chairman and the Co-Chairman's remarks is where will that oil come from? Up to now, about one-half has been coming from the Middle East; and the major countries supplying China thus far have been Iran, Saudi Arabia and Oman. The Omani situation is such that the higher quality Omani crude is needed for the Japanese requirements of their refineries, which are unable to handle some of the heavier, higher-sulphur crudes, and Omani crude happens to be relatively of good quality to meet China's needs for their refineries.

Co-Chairman LEDEEN. I thought you said Japan, Japan's needs, and then, you reverted to China. You meant China all along?

Mr. CARUSO. Yes, sorry.

Co-Chairman LEDEEN. Thank you.

Mr. CARUSO. China will surpass Japan as number two in the world.

China embarked on some equity investments a number of years ago through China National Petroleum Company. They have made investments in Sudan, Kazakhstan, even in Venezuela, and certainly are looking in other places. These investments have been relatively small, certainly on a global scale, and they have led to some success with respect to acquiring equity oil. But it still represents a very small part of even their current imports. As I mentioned, they imported about 1.7 million barrels a day last year. Of that, only a bit more than 100,000 barrels a day was acquired through these equity investments in places like Sudan and elsewhere.

We don't anticipate that situation to change that much based on what we've seen in the pace of these types of investments, so that most of the oil being acquired, as best we can tell, is through commercial transactions between the Chinese refining companies or the Chinese national companies and their suppliers. They're also

getting oil from Indonesia and Vietnam, but we would expect that, as one looks out over the next 20 years, the growing share would come from the Middle East.

Another possibility to supply some of that growth is Russia. They have been talking with the Russian companies about the possibility of an export pipeline from eastern Siberia in the oil fields of Angarsk to the Daqing area of China, and that pipeline still is in the discussion stages. It is uncertain among the Russians as to whether to build the line from Angarsk into eastern China or whether to continue that line to Nakhodka. That decision has yet to be made and continues to be discussed, but the scale of that pipeline will be about 500,000 barrels a day from Russia to China. Currently, there's only a small amount of Russian oil coming into China. There's also a possibility of a natural gas pipeline from Russia.

China is concerned about its environmental situation. This situation is dwarfed by domestic concerns over air quality as opposed to global emissions of CO₂, although that is certainly an issue as well. China can be expected to move, as fast as possible, substituting natural gas for coal, in particular, in the electric power sector, but also in the residential sector where much coal is burned for both cooking and heating.

So we expect that natural gas will grow rapidly in China's mix but from a very small base. Something like 3 percent of China's energy is now provided by natural gas. In our long-term Outlook to 2020 that number is only about 7, which, of course, is quite an impressive growth but still not making a dent in this environmental problem. Part of the issue is all of China's gas right now is domestically produced, and they now are anticipating an improvement in that by the building of a west-east pipeline from the Tarin Basin in the west of China to the Shanghai area. That should be completed in the 2005 time frame.

There are no international pipelines coming into China, but there is discussion of one from Russia and the possibility that LNG imports will begin as early as 2005. Some of these projects have now been delayed to 2007. But LNG will increase, and the potential sources of natural gas are Russia, Australia, Indonesia and perhaps Qatari gas from the Persian Gulf.

Co-Chairman WESSEL. Mr. Caruso, we want to make sure that there is enough time for questions. If you could finish up in a minute or so.

Mr. CARUSO. Yes.

Co-Chairman WESSEL. So that we can move on to questions, we would appreciate it.

Mr. CARUSO. Thank you, Mr. Co-Chairman.

The implications of this for the environment are shown by this next slide, which shows carbon emissions growing dramatically over the next couple of decades, something like 832 million metric tons of CO₂ in 2001 to almost 1,600, nearly doubling in the next 20 years, which is clearly a concern in global climate change.

The next slide shows how China fits into the overall picture, and you can see it is small but growing—13 percent of total energy and 9 percent of oil.

Finally, the key conclusions are that China is a growing player in world energy markets and will grow even more dramatically over the next 20 years. Coal dominates. Oil's import share will grow and become an important energy security issue. Even with this policy to rapidly expand its use of natural gas that will not change.

Mr. Chairman, I would be pleased to answer any questions that the Commission may have, and I may also make another comment about the bilateral U.S.-China bilateral energy agreements. As you know, Undersecretary Card and Assistant Secretary Bailey are in China, as we speak, and one of them certainly would have been here to discuss these in more detail, but the staff of Undersecretary Card has informed me that they will be putting together a list of these bilateral agreements and will be delivering them to the Commission perhaps this afternoon but certainly as soon thereafter as possible.

Co-Chairman WESSEL. We appreciate it, and we look forward to receiving it.

[The statement follows:]

**Prepared Statement of Guy Caruso
Administrator, Energy Information Administration**

SUMMARY

The People's Republic of China (China) is the world's most populous country and the second largest energy consumer (after the United States). Production and consumption of coal, its dominant fuel, is the highest in the world. Rising oil demand and imports have made China a significant factor in world oil markets. China is expected to surpass Japan as the world's second-largest petroleum consumer for 2003, and its petroleum demand is forecast to continue to increase at a rapid pace over the next two decades. Much of this imported oil will come from the Middle East. China also is set to become an importer of Liquefied Natural Gas (LNG) by 2005.

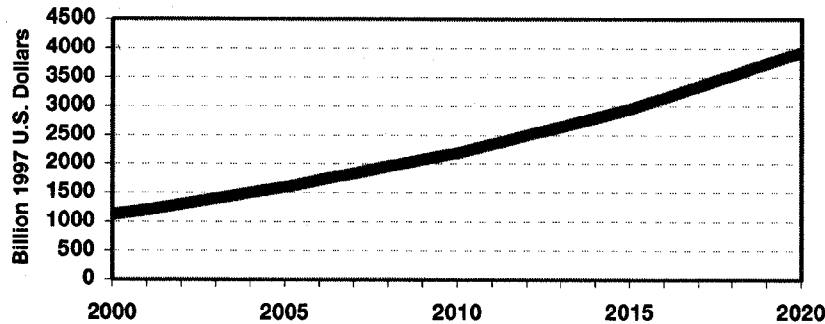
GENERAL BACKGROUND

China is the world's most populous country, with a rapidly growing economy. Economic development has proceeded unevenly, with urban coastal areas, particularly in the Southeast, experiencing more rapid economic development than other areas of the country. China has a mixed economy, with a combination of state-owned and private firms. A number of state-owned firms have undergone partial or full privatization in recent years. The Chinese government has encouraged foreign investment—in some sectors of the economy and subject to constraints—since the 1980s, offering several “special economic zones” in which foreign investors receive preferable tax, tariff, and investment treatment.

With China's entry into the World Trade Organization (WTO) in November 2001, the Chinese government made a number of specific commitments to trade and investment liberalization which, if fully implemented, will partially open the Chinese economy to foreign firms. In the energy sector, this will mean the lifting or sharp reduction of tariffs associated with imports of some classes of capital goods, and the eventual opening to foreign competition of some areas such as retail sales of petroleum products.

China's real GDP grew by 8.0% in 2001, according to official Chinese figures, though some outside analysts have questioned the reliability of China's official economic data. Real GDP growth for 2003 is forecast at 7.5%. The Chinese government's current Five Year Plan (2001–2005) sets a target of 7.0% real annual GDP growth.

**China's Gross Domestic Product (GDP),
2000-2020**



source: EIA

Inflows of Foreign Direct Investment (FDI) into China in 2002 totalled \$52.7 billion, a new record, and data from the first four months of 2003 shows continuing strength. Japan, Taiwan, and the United States are China's most important sources of FDI.

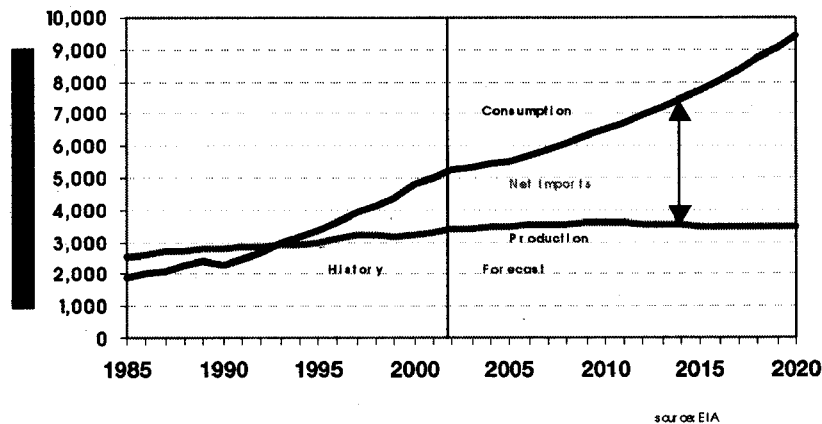
After three years of decline from 1999 to 2001, China's trade surplus has rebounded. The 2002 trade surplus was \$50.0 billion, up from \$30.3 billion in 2001. Imports have been increasing, largely capital goods being acquired to refurbish outdated industrial facilities, but it was offset by a strong 19.6% surge in merchandise exports in 2002.

OIL

China was the world's third largest consumer of petroleum products in 2002, following the United States and Japan, with total demand of 5.26 million barrels per day (bbl/d). Since Japan's demand is stagnant and China's is still growing rapidly, 2003 will likely be the year that China surpasses Japan in petroleum consumption. China's oil demand is projected by EIA to reach 9.4 million bbl/d by 2020, with net imports of 5.9 million bbl/d, making it a major factor in the world oil market.

China's petroleum industry has undergone major changes in recent years. In 1998, the Chinese government reorganized most state owned oil and gas assets into two vertically integrated firms—the China National Petroleum Corporation (CNPC) and the China Petrochemical Corporation (Sinopec). Before the restructuring, CNPC had been engaged mainly in oil and gas exploration and production, while Sinopec had been engaged in refining and distribution. This reorganization created two regionally-focused firms, CNPC in the north and west, and Sinopec in the south, though CNPC is still tilted toward crude oil production and Sinopec toward refining. Other major state sector firms in China include the China National Offshore Oil Corporation (CNOOC), which handles offshore exploration and production and accounts for more than 10% of China's domestic crude production, and China National Star Petroleum, a new company which was created in 1997. Regulatory oversight of the industry now is the responsibility of the State Energy Administration (SEA) which was created in early 2003.

China's Oil Production and Consumption,
1985-2020



The intention of the restructuring was to make these state firms more like similar vertically integrated corporate entities elsewhere. In connection with this process, the firms have been spinning off or eliminating many unprofitable ancillary activities such as running housing units, hospitals, and other services near company facilities. Massive layoffs also have been undertaken, as like many other Chinese SOEs, they were severely overstaffed.

The three largest Chinese oil and gas firms—Sinopec, CNPC, and CNOOC—all have successfully carried out initial public offerings (IPOs) of stock between 2000 and 2002, bringing in billions of dollars in foreign capital. CNPC separated out most of its high quality assets into a subsidiary called PetroChina in early 2000, and carried out its IPO of a minority interest on both the Hong Kong and New York stock exchanges in April 2000. The IPO raised over \$3 billion, with BP the largest purchaser at 20% of the shares offered. Sinopec carried out its IPO in New York and Hong Kong in October 2000, raising about \$3.5 billion. Like the PetroChina IPO, only a minority stake of 15% was offered. About \$2 billion of this amount was purchased by the three global supermajors—ExxonMobil, BP, and Shell. CNOOC held its IPO of a 27.5% stake in February 2001, after an earlier attempt in September 1999 was canceled. Shell bought a large block of shares valued at around \$200 million. In 2002, Chinese oil companies began to look at separating out some of their business units into subsidiaries. CNPC has set up subsidiaries for drilling services and geological survey work, and plans to eventually spin them off through international IPOs. CNOOC also has created an oilfield services unit—China Oilfield Service, Ltd. (COSL)—which was listed on the Hong Kong stock exchange in November 2002.

Several aspects of these stock offerings were very atypical. First, they all involved only minority stakes. Second, they have not given the foreign investors a major voice in corporate governance. The Chinese government still holds majority stakes in all three firms, and the foreign investors have not received seats on their boards of directors. Analysts have generally seen these investments as attempts by the supermajors to gain a foothold in China, which will necessarily involve partnerships with the Chinese majors. Even with the opening to foreign investment envisioned in China's commitments for membership in the WTO, it is still likely that almost all major oil and gas projects in China will involve one of the Chinese majors. The Chinese government stipulated in July 2001 that only CNPC and Sinopec will be allowed to open new retail filling stations prior to fulfillment of China's market-opening commitment in 2004. This is seen as an attempt to strengthen their control of retail sales of petroleum products and ensure that foreign firms will have to partner with one or the other of the Chinese majors to enter the retail market, even after 2004. All three of the global supermajors, BP, ExxonMobil, and Shell, are planning to enter the Chinese retail market in partnership with CNPC, Sinopec, or both.

As a net oil importer since 1993, China's petroleum industry is focused on meeting domestic demand, but it does still export a modest amount of crude oil. The largest

export customer by far is Japan, which imports Daqing crude oil to burn directly in electric power plants. As of early 2003, China's exports of Daqing crude oil to Japan were around 65,000 bbl/d, down substantially from export levels during the 1990s, but up from the previous year due to problems with Japan's nuclear power sector.

Most Chinese oil production capacity, close to 90%, is located onshore. One field alone, Daqing in northeastern China, accounts for about 1.0 million bbl/d of China's production, out of a total crude oil production of around 3.3 million bbl/d. Daqing is a mature field, however, having begun production in 1963, and production fell by nearly 3% in 2002. At China's second-largest producing field, Liaohe in northeastern China, CNPC has solicited proposals from potential foreign partners to help it enhance recovery rates and extend production, though no contracts have yet been signed. In December 2000, regulatory changes were announced which will remove some of the barriers to foreign firms forming partnerships with Chinese oil majors. Government priorities focus on stabilizing production in the eastern regions of the country at current levels, increasing production in new fields in the West, and developing the infrastructure required to deliver western oil and gas to consumers in the East. Offshore development also is a high priority. Chinese officials have said that they expect production in Xinjiang to reach 1 million bbl/d by 2008, but that seems ambitious, given that transportation of that oil to consumers in the East remains a major obstacle.

Recent offshore oil exploration interest has centered on the Bohai Sea area, east of Tianjin, believed to hold more than 1.5 billion barrels in reserves, and the Pearl River Mouth area. Phillips Petroleum announced in March 2000 that it had completed its appraisal drilling of the Peng Lai find in Block 11/05, and would proceed with development. Commercial production began in December 2002, and the field is expected to reach its full output of 100,000 bbl/d in 2004. Shell and CNOOC currently are negotiating over a possible production sharing agreement for the Bonan project in the Bohai Sea, after a successful exploration effort which began in 2001. CNOOC also signed a production sharing contract with Canadian independent Husky Oil in July 2001 for Block 39-05 in the Pearl River Mouth, near the Wenchang 13-1/13-2 blocks, where Husky Oil and CNOOC currently are producing about 50,000 bbl/d. Another major offshore oilfield has been developed in the Pearl River Mouth area by a consortium including ChevronTexaco, ENI, and CNOOC. The field began production in February 1999. ChevronTexaco also concluded an agreement with CNOOC in October 2002 for the development of the Bozhong field in the Bohai Sea, which has reserves estimated at 1.3 billion barrels. Meanwhile, improvement in Sino-Vietnamese relations has opened the way for oil and gas exploration in the Beibu Gulf (known in Vietnam as the Gulf of Tonkin). China and Vietnam signed an agreement in December 2000 which settled their outstanding disputes over sovereignty and economic rights in offshore areas near their border.

With China's expectation of growing future dependence on oil imports, China has been acquiring interests in exploration and production abroad. CNPC has acquired oil concessions in Kazakhstan, Venezuela, Sudan, Iraq, Iran, and Peru, and Azerbaijan. Sinopec also has begun seeking to purchase overseas upstream assets. The most significant deal thus far is CNPC's acquisition of a 60% stake in the Kazakh oil firm Aktobemunaigaz, which came with a pledge to invest significantly in the company's future development over the next twenty years. While there had been some discussion of a possible oil pipeline from Kazakhstan to China, CNPC has said that it would only be considered if reserves were sufficient and it was economical, which looks doubtful. CNPC's position in Kazakhstan also suffered a major blow in May 2003, when the consortium partners in the Kashagan oilfield in the Caspian exercised their rights to block the sale of a 16.7% interest in the project from BG to CNPC. The Greater Nile Petroleum Operating Company (GNPOC), the Sudanese oil project in which CNPC owns a stake, began exports in August 1999. CNOOC also has purchased an upstream equity stake in the small Malacca Strait oilfield in Indonesia.

Russia's Far East is seen as a potential source of Chinese crude oil imports. The Russian and Chinese governments have been holding regular discussions on the feasibility of pipelines to make such exports possible. One proposed plan is a pipeline which would carry 600,000 bbl/d of crude oil from Anagarsk in Russia to join the existing Chinese pipeline network at Daqing. Yukos Oil of Russia and CNPC signed a memorandum of understanding in June 2003 for sales of oil via the pipeline, contingent on the pipeline being built. An alternative plan, proposed by Russian pipeline operator Transneft, would take Russian crude from both West Siberia and East Siberia via a 1 million bbl/d pipeline to an export terminal at the Pacific coast port of Nakhodka. China presumably would be one of the major consumers of oil from such a project, but it would also give Russia increased access to the Japanese, South

Korean, and other East Asian markets. Both options, or possibly both eventually if oil reserves are sufficient, are still officially under consideration, according to recent Russian government statements. Japan has been actively promoting the Nakhodka option, offering to assist with financing, but the line to Daqing appears to be more likely to be built in the near future.

Downstream infrastructure development in China centers primarily on upgrading existing refineries rather than building new ones, due to overcapacity. In the late 1990s, the Chinese government shut down 110 small refineries, which generally made inferior quality petroleum products. Dozens of other small refineries owned by provincial and local governments have been merged into CNPC and Sinopec. Another major issue in the Chinese downstream sector is the lack of adequate refining capacity suitable for heavier Middle Eastern crude oil, which will become a necessity as Chinese import demand rises in the mid-term future. Several existing refineries are being upgraded to handle heavier and more sour grades of crude oil.

Chinese officials have spoken of their intention to build a national strategic petroleum reserve, and Chinese officials announced a policy decision in February 2003 to support the creation of a strategic petroleum reserve, and have reportedly been studying several options for the development of storage capacity. In the meantime, anecdotal evidence has suggested that China may have built up its petroleum stocks earlier this year in anticipation of possible war in Iraq.

NATURAL GAS

Historically, natural gas has not been a major fuel in China, but given China's domestic reserves of natural gas, which stood at 53.3 trillion cubic feet (Tcf) at the beginning of 2003, and the environmental benefits of using natural gas, China has embarked on a major expansion of its gas infrastructure. Until the 1990s, natural gas was used largely as a feedstock for fertilizer plants, with little use for electricity generation. Natural gas currently accounts for only around 3% of total energy consumption in China, but consumption is expected to more than double by 2010. This will involve increases in domestic production, and imports, by pipeline and in the form of liquefied natural gas (LNG).

The country's largest reserves of natural gas are located in western and north-central China, necessitating a significant further investment in pipeline infrastructure to carry it to eastern cities. China has a pipeline under construction, the "West-to-East Pipeline," from natural gas deposits in the western Xinjiang province to Shanghai, picking up additional gas in the Ordos Basin along the way. Shell was chosen in February 2002 as the lead firm for the project, and Gazprom and ExxonMobil hold significant stakes. Sinopec also has been added as an equity partner. Construction began in July 2002, and a section of the pipeline east of the Ordos Basin is scheduled to begin operation in early 2004. The segment connecting to Xinjiang will be completed by early 2005. While it is unlikely to happen in the near future, the West-to-East Pipeline eventually could serve as a trunkline which could be extended to receive natural gas from Central Asia.

China announced the discovery of a major gas field at Sulige in the Ordos Basin in the Inner Mongolia Autonomous Region, adjacent to the Changqing oilfield, in 2001. While the field is still under evaluation, unofficial reserve estimates cited in the trade press put reserves in the range of 16–21 Tcf, substantially more than was assumed when the discovery was first announced. Some natural gas from the Ordos Basin is likely to be put into the West-to-East Pipeline, which was to run through the area in any case, to help make it economically viable. A pipeline was completed in 1997 between the Ordos Basin and Beijing, and a second pipeline may become necessary, as demand for natural gas in Beijing, Tianjin, and nearby Hebei province already is outstripping the capacity of the original pipeline.

Another proposed pipeline project would link the Russian natural gas grid in Siberia to China and possibly South Korea via a pipeline from the Kovykta gas fields near Irkutsk, which hold reserves of more than 50 Tcf. The cost of the project has been estimated at \$12 billion, and a feasibility study is underway, due to be completed at the end of July 2003. The pipeline would have a planned capacity of 2.9 billion cubic feet per day (Bcf/d), of which China would likely consume about 1.9 Bcf/d and South Korea 1 Bcf/d. The main South Korea gas company, Kogas, formally joined the feasibility study in November 2000. The main foreign backer of the project is BP, which owns a 30% stake in Rusia Petroleum, the license holder for the Kovykta gas field. Due to tensions on the Korean peninsula, the route currently under consideration for the section of the pipeline to South Korea would bypass North Korea by running undersea from the city of Dalian in China to the South Korean coast near Seoul. The new route also would bypass Mongolia.

Aside from these huge projects, other pipelines are being developed to link smaller natural gas deposits to other consumers. A pipeline was completed in early 2002

linking the Sebei natural gas field in the Qaidam Basin with consumers in the city of Lanzhou. Another planned project would link gas deposits in Sichuan province in the southwest to consumers in Hubei and Hunan provinces in central China at an estimated cost of \$600 million.

One major hurdle for natural gas projects in China is the lack of a unified regulatory system. Currently, natural gas prices are governed by a patchwork of local regulations. The Chinese government is in the process of drafting a new legal framework for the natural gas sector, but the process has been slow, and there are still considerable uncertainties regarding price regulation and taxation issues dealing with natural gas sales.

Offshore gas projects also are becoming a significant part of China's gas supply. The Yacheng 13-1 field, developed in the mid-1990s, has been producing gas for Hong Kong and Hainan Island since 1996. The Chunxiao gas field in the East China Sea, being developed by China National Star Petroleum, is also expected to become a significant producer within the next decade. The company puts the field's reserves at more than 1.6 Tcf. Another area where exploratory drilling is planned is the Xihu Trough, in the East China Sea about 250 miles east of Shanghai. Shell reportedly has been in negotiations with Sinopec and CNOOC for the development of natural gas reserves in the area, but no agreement has been concluded.

Imported liquefied natural gas (LNG) will be used primarily in China's southeastern coastal region. Guangdong province already has launched a project to build six, 320-megawatt (MW) gas-fired power plants, and to convert existing oil fired plants with a capacity of 1.8 gigawatts (GW) to LNG. In March 2001, it was announced that BP had been selected to build China's first LNG import terminal, to be located near the city of Guangdong. BP will take a 30% equity stake in the project, with CNOOC holding 31% and the rest held by local firms from Guangdong and Hong Kong. A supply contract has been signed for LNG from Australia's North West Shelf LNG terminal. The project has been delayed somewhat, due to slow progress in concluding sales agreements with end-users of the natural gas. It is likely that the commercial operation of the project will be delayed until early 2007. A second LNG terminal is planned for Zhangzhou, in Fujian province farther up the coast. A supply agreement has been concluded with BP for LNG from its Tangguh project in Indonesia. A third LNG import project is under consideration for a startup date around 2010, but it is in the preliminary stages and has not secured government approval. If built, it would likely be located somewhere near the Yangtze River Delta.

COAL

Coal makes up the bulk, 64%, of China's primary energy consumption, and China is both the largest consumer and producer of coal in the world. China's coal consumption in 2001 was 1.38 billion short tons, or over 26% of the world total. The Chinese government has made major upward revisions to coal production and consumption figures covering the last several years. The new figures show coal consumption rising sharply in 2001, reversing the decline seen from 1997 to 2000. The decline during that period also is much less than the previously reported data.

China's coal industry has had a serious oversupply problem in recent years, particularly in the late 1990s, and the government has begun implementing major reforms aimed at reducing the oversupply, returning large state-owned mines to profitability as a prelude to possible future privatization, and reducing mine accidents. Large state-owned coal mines had experienced buildups of unused inventories in the mid-to-late 1990s, and many were operating at a financial loss. A large number of small, unlicensed mines also have added to the oversupply. In 1998, the government launched a large-scale effort to close down the small mines. Many small coal mines were ordered closed. It has become clear, however, through much anecdotal evidence, that not all of the "closed" mines have actually ceased operation, and the upward revisions to the Chinese State Statistical Bureau's production and consumption figures appears to reflect this. China also is increasingly seeking export markets for its coal as a way of dealing with its surplus production, and as of 2002 it was the world's second-largest coal exporter. Japan and South Korea are the primary markets, and China is beginning to emerge as a serious competitor to Australia for Japanese coal imports. India also has been importing modest quantities of Chinese coal.

Over the longer term, China's coal demand is projected to rise significantly. While coal's share of overall Chinese energy consumption is projected to fall, coal consumption will still be increasing in absolute terms. Several projects exist for the development of coal-fired power plants co-located with large mines, so called "coal by wire" projects. Other technological improvements also are being undertaken, including the first small-scale projects for coal gasification, and a coal slurry pipeline to transport

coal to the port of Qingdao. Coalbed methane production also is being developed, with recent American investors in this effort including BP, Texaco, and Virgin Oil, which was awarded a concession for exploration in Ningxia province in January 2001. ChevronTexaco is the largest foreign investor in coalbed methane, with activities in several provinces.

In contrast to the past, China is becoming more open to foreign investment in the coal sector, particularly in modernization of existing large-scale mines and the development of new ones. The China National Coal Import and Export Corporation is the primary Chinese partner for foreign investors in the coal sector. Areas of interest in foreign investment concentrate on new technologies only recently introduced in China or with environmental benefit, including coal liquefaction, coal bed methane production, and slurry pipeline transportation projects. Over the longer term, China plans to aggregate the large state coal mines into seven corporations by the end of 2005, in a process similar to the creation of CNPC and Sinopec out of state assets. Such firms might then seek to pursue foreign capital through international stock offerings.

China has expressed a strong interest in coal liquefaction technology, and would like to see liquid fuels based on coal substitute for some of its petroleum demand for transportation. A coal liquefaction facility is under construction by the Shenhua Group in Inner Mongolia, with a projected startup date of 2005.

ELECTRICITY

As with coal, China's electric power industry experienced a serious oversupply problem in the late 1990s, due largely to demand reductions from closures of inefficient state-owned industrial units, which were major consumers of electricity. The Chinese government responded to the short-term oversupply in part by implementing a drive to close down small thermal power plants and by imposing a moratorium (with a few exceptions) on approval of new power plant construction, which ran through January 1, 2002. Until recently, the backlog of projects approved in the mid-1990s had kept pace with demand increases. In the first half of 2003, however, the Chinese government has approved 30 major new electric power projects, with a total of around 22 gigawatts (GW) of capacity. Construction has begun on 17 of these projects. A total of 18.5 GW of new capacity is scheduled to be completed this year.

The largest project under construction, by far, is the Three Gorges Dam, which, when fully completed in 2009, will include 26 separate 700-MW generators, for a total of 18.2 GW. Plans were announced in March 2002 to reorganize the Three Gorges project into the China Yangtze Three Gorges Electric Power Corporation. The corporation is expected to seek capital through an equity offering open to foreign and domestic investors, similar to those already carried out by the major Chinese oil companies. The IPO has been scheduled for September 2003. The reservoir created by the dam began to fill in June 2003, and the first test runs of the initial group of electric turbines is set for August 2003.

Another large hydropower project involves a series of dams on the upper portion of the Yellow River. Shaanxi, Qinghai, and Gansu provinces have joined to create the Yellow River Hydroelectric Development Corporation, with plans for the eventual construction of 25 generating stations with a combined installed capacity of 15.8 GW.

Many of the major developments taking place in the Chinese electricity sector recently involve nuclear power. China's total installed capacity for nuclear power generation increased from 2.1 GW at the beginning of 2002 to 5.4 GW at the beginning of 2003. The first generation unit of the Lingao nuclear power plant in Guangdong province began commercial operation in May 2002, with a capacity of 1 GW. The second 1-GW generating unit began operating in January 2003. An additional 600-MW generating unit at the Qinshan nuclear power plant in Zhejiang province began operation in February 2002, and another 600-MW unit at the same site came online in December 2002.

A major issue for China's electric power industry is the distribution of generation among power plants. China's stated intention eventually is to create a unified national power grid, and to have a modern power market in which plants sell power to the grid at market-determined rates. In the short term, though, traditional arrangements still hold sway, and state-owned power plants which have government connections tend to have a higher priority than independent private plants. Additionally, some private plants with "take-or-pay" contracts, which provide for guaranteed minimum sales amounts, have had trouble getting the provincial authorities running the local grids to honor those terms.

Growth in Chinese electricity consumption is projected at an average of 4.3% per year through 2025. The largest gainer in terms of fuel share in the future is ex-

pected to be natural gas, due largely to environmental concerns in China's rapidly industrializing coastal provinces, though the largest increase in absolute terms is likely to be coal. If a truly competitive market for electric power develops as planned, the Chinese market may once again become attractive to foreign investment. At present, foreign direct investment is allowed only in power generation, but loan financing has been obtained for some power transmission projects.

The Chinese government is in the early stages of formulating a fundamental long-term restructuring of their electric power sector, embodied in the National Power Industry Framework Reform Plan promulgated by the State Council in April 2002. As with many other countries reform programs, generating assets are being largely separated from transmission and distribution. The State Power Corporation (SPC) divested most of its generating assets and was split into 11 regional transmission and distribution companies in December 2002. Electricity prices will still be regulated, but there are likely to be major changes in tariffs and the overall regulatory structure for electricity pricing. The process is at an early stage, and many of the details remain to be worked out. A new electricity law, superseding the one established in 1995, is expected to be promulgated within the next year.

ENVIRONMENT

China suffers from major energy-related environmental problems. According to a report by the World Health Organization (WHO), seven of the world's ten most polluted cities are in China. The country's heavy use of unwashed coal leads to large emissions of sulfur dioxide and particulate matter. China also is important to any effort to curb emissions of greenhouse gases, as it is projected to experience the largest absolute growth in carbon dioxide emissions between now and the year 2020.

China is a non-Annex I country under the United Nations Framework Convention on Climate Change, meaning that it has not agreed to binding targets for reduction of carbon dioxide emissions under the Kyoto Protocol. While the Chinese government is concerned with its environmental problems, it tends to be more concerned with local problems, such as particulate matter and sulfur dioxide emissions. Thus, it is undertaking efforts to lessen emissions of pollutants such as sulfur dioxide and nitrogen oxide, through improved pollution controls on power plants as well as policies designed to increase the share of natural gas in the country's fuel mix, particularly around major metropolitan areas.

China's Energy Trends

	1985	1990	1995	2001	2005	2010	2015	2020	Average Annual Percent Change 1985–2020
Energy Consumption (Quadrillion Btu)									
Oil	4.0	4.9	7.0	10.2	11.3	13.4	15.8	19.2	4.6
Natural Gas	0.5	0.6	0.7	1.1	1.6	2.5	4.2	5.0	6.6
Coal	16.7	20.3	25.5	25.4	26.5	33.3	38.9	46.2	3.0
Nuclear	10.0	0.0	0.1	0.2	0.6	0.7	1.3	1.3	N/A
Renewables	1.0	1.3	1.9	2.8	3.2	4.6	5.2	5.9	5.3
Total	22.2	27.0	35.2	39.7	43.2	54.4	65.5	77.6	3.6
Oil (mmbd)	1.9	2.3	3.4	5.0	5.5	6.5	7.7	9.4	4.7
Natural Gas (tcf)	0.5	0.5	0.6	1.0	1.4	2.3	3.8	4.5	6.8
Coal (mst)	921	1,124	1,498	1,383	1,442	1,811	2,115	2,511	2.9
Nuclear (bkwh)	0	0	12	17	57	66	129	131	N/A
Renewables (quads)	1.0	1.3	1.9	2.8	3.2	4.6	5.2	5.9	5.3
Net Electricity Consumption (bkwh)									
	364	551	883	1,312	1,545	1,966	2,428	2,986	6.2
Energy Use for Electricity Generation (Quadrillion Btu)									
Oil	0.8	0.7	0.6	0.7	0.8	0.9	1.1	1.3	1.5
Natural Gas	0.0	0.0	0.0	0.1	0.3	0.7	1.0	1.0	13.0
Coal	3.4	5.4	8.4	13.7	14.5	19.3	23.9	28.7	6.3
Nuclear	0.0	0.0	0.1	0.2	0.6	0.7	1.3	1.3	N/A
Renewables	1.0	1.3	1.9	2.8	3.2	4.6	5.2	5.9	5.3
Total	5.1	7.4	11.1	17.4	19.4	26.2	32.5	38.3	5.9
Carbon Dioxide Emissions (Million Metric Tons Carbon Equivalent)									
Oil	76	94	132	175	194	229	271	330	4.3
Natural Gas	8	8	10	18	26	40	68	81	7.0
Coal	424	514	645	639	668	840	980	1,164	2.9
Total	508	617	788	832	888	1,109	1,319	1,574	3.3
Energy Production									
Oil (mmbd)	2.5	2.8	3.0	3.2	3.5	3.6	3.5	3.5	1.0
Natural Gas (tcf)	0.5	0.5	0.6	1.1	N/A	N/A	N/A	N/A	—
Coal (mst)	962	1,190	1,537	1,459	N/A	N/A	N/A	N/A	—

Note: EIA currently only projects oil supply.

China Energy Comparisons

	1985	1990	1995	2001	2005	2010	2015	2020	Average Annual Percent Change 1985–2020
Energy Consumption (Quadrillion Btu)									
China	22.2	27.0	35.3	39.6	43.2	54.4	65.5	77.6	3.6
United States	76.7	84.6	91.5	97.0	103.2	113.3	121.9	130.1	1.5
World	311.1	348.4	368.7	404.1	433.3	480.6	531.7	583.0	1.8
Oil Consumption (Million Barrels per Day)									
China	1.9	2.3	3.4	5.0	5.5	6.5	7.7	9.4	4.7
United States	15.7	17.0	17.7	19.6	20.5	23.0	25.2	27.1	1.6
World	60.1	66.1	70.0	77.1	81.1	89.7	98.8	108.2	1.7
Energy Consumption per Capita (Million Btu per Person)									
China	20.7	23.4	28.9	30.8	32.7	39.8	46.4	53.7	2.8
United States	316.4	331.9	340.5	348.9	358.1	377.2	389.9	400.0	0.7
World	64.5	66.3	65.1	66.0	67.4	70.5	73.9	77.0	0.5
Energy Intensity (Thousand Btu per 1997 U.S. Dollar of GDP)									
China	75.9	63.2	46.9	33.0	27.0	24.8	22.2	19.7	-3.8
United States	13.2	12.4	11.9	10.3	9.8	9.1	8.4	7.8	-1.5
World	15.1	14.3	13.7	12.5	11.9	11.2	10.6	10.0	-1.2
Carbon Intensity (Metric Tons Carbon Equivalent per 1997 U.S. Dollar of GDP)									
China	1,736	1,445	1,047	693	555	506	447	400	-4.1
United States	213	198	185	166	154	144	134	124	-1.5
World	258	241	223	202	191	180	170	161	-1.3

Discussion, Questions and Answers

Chairman ROBINSON. First, Mr. Caruso, thank you again for a very insightful and expert set of views. I was struck by the statistic on the level of oil derived for China via equity arrangements. As you pointed out, of the 1.7 million barrels per day that is involved now, only a little more than 100,000 barrels per day stem from equity arrangements and isn't likely to increase markedly, at least, in the period ahead.

It is true, isn't it, that China likes to put, in effect, a flag in the ground in terms of securing energy supplies. It's not big on the spot market or very trusting of it, it seems, and that I was of the belief that they would be more inclined to accelerate their equity positions and try to lock in supplies through a host of means in terms of their relationships with these governments.

Is that understanding correct, that they're far more inclined to get into this physical supply-securing business than most of the industrialized democracies like ourselves? And the second question has to do with the competition, as I read it, between the Japanese and the Chinese on the large oil pipeline that is being contemplated presently. Of course, Japan would like the longer, more expensive line for their own energy needs, and China is pressing for the Russia-China pipeline that you discussed.

It seems to be a pretty animated competition that could even create tensions between China and Japan, because this is not a trivial matter. So I was wondering what observations you have as to how serious this competition is, whether there could actually be tensions involved, and whether the China-Russia arms trade, as robust as it is, and other arrangements might come into play in influencing Putin to go in the direction of China versus the Japanese request.

Thank you.

Mr. CARUSO. On the issue of equity investments, we saw pretty robust growth in that about 7 to 10 years ago, and it has not really expanded a great deal. And I think there are two reasons. One is the reorganization that China went through within its own domestic energy industry, particularly oil, by splitting the Chinese oil industry into the three companies: CNPC, SINOPEC and China National Offshore Oil Company.

I think that has reduced the amount of cash flow available to those three companies to make these kind of international equity investments, so we've seen the flow reduced, even though I would agree with your statement that, all other things being equal, the Chinese would prefer to secure, let's say, equity oil.

Japan did the same with the Japan National Oil Company after the Arab oil embargo and made a lot of upstream investments, most of which were not that fruitful. They abandoned that approach and basically have relied on commercial arrangements since then.

I think there's the combination of those two things: less cash flow available and the discovery that successful investments are not easy to come by. So they have tended to look for targets of opportunity like Sudan where most Western companies felt the political risk was too great and that's where most of their equity oil is now coming from.

Kazakhstan, a very difficult environment to operate in, has no real transit capabilities.

So I think that's our thinking with regard to the longer-term. Competition over the Russian, eastern Siberian pipeline, whether it goes to China or Japan certainly has created some tension. My understanding is that the main decision there is, of course, with the private companies who are developing the Angarsk field in eastern Siberia, so that up to now, at least, it hasn't reached the level of political tension either bilaterally or trilaterally when you bring in the Japanese.

It certainly could reach that level, but as of now, we don't really see that, and I know most of Russian oil and gas development now is in the hands of the private sector, but we've seen, just from this week's activities with Khodorkovsky that there are also limits in that country.

Mr. Chairman.

Chairman ROBINSON. Thank you.

Co-Chairman WESSEL. Commissioner Dreyer.

Commissioner DREYER. In a way, Commissioner Robinson's question anticipated what I was going to say, but I'd like to carry it a little further. Do you actually think in this bidding for the Angarsk to Daqing versus the Angarsk to Nakhodka that this really is in the hands of Transneft and Yukos? Because it seems to me that there are terribly important geopolitical considerations here. If Japan has offered to put up the extra money, which I know it has, and Russia then has the option of being able to sell oil not just to China but to Japan and South Korea and beyond—because after all—it will be on tankers after it leaves Nakhodka—don't you think that given the Russian apprehension about selling the Chinese the rope that they eventually hang the Russians with, that they might be more inclined to favor Japan?

I was puzzled by your statement that you think that the Russians will opt for the Angarsk to Daqing pipeline. Can you expand on that?

Mr. CARUSO. I was trying to be neutral about that. I'm not sure I would lean to either one.

Commissioner DREYER. But [reading Mr. Caruso's written statement] you said it would be more likely, in your opinion, that it would be the Daqing one that got built.

Mr. CARUSO. Yes; I think China, of course, represents a growing market, it's more flexible if you have a Pacific coast Nakhodka terminal. If they built that line, it will have a 1 million barrel a day capacity compared with the 500,000 barrel a day to Daqing. It will be more costly. It wouldn't necessarily be tied to the Japanese market; in fact, certainly, some of it would go to South Korea.

Commissioner DREYER. Okay.

Mr. CARUSO. I'd be neutral on the commercial aspect. And, indeed, it may turn on the geopolitical, the pressures that would be brought to bear on this. Right now, as you and the Chairman have mentioned, the Japanese have put a lot of pressure on this and even have raised it at the Koizumi-Putin level.

Commissioner DREYER. And second, I wonder how confident you are in your growth projections, and I say this as someone who in the 1980s used to watch Japanese economic growth projected into the 21st century. Extrapolating like that, Japan would soon own everything, but those growth rates stopped in 1990 and have still not resumed.

And I see a lot of constraining factors in Chinese growth. The more energy they consume, for example, the more pollution they create, and the PRC is already high up there on the pollution index. There is also a great deal of social unrest-ethnic minorities, farmers, laborers, and so on. It's possible that Daqing oil workers will rebel. As you mention in your testimony, there is a certain amount of apprehension about the future.

Where do these pipelines go? They go through Xinjiang. Xinjiang has, at least according to the Chinese government, a number of Uygur terrorists trained by Osama bin Laden that they haven't caught yet, and so you're your projections for future growth are tremendously optimistic, and I wonder if you have, somehow, in the back of your mind any apprehensions about those.

Mr. CARUSO. China, by far, outweighs any other country in terms of the global outlook. How China goes, in many ways, will determine how world global energy markets develop over the next 20 years.

I guess the main concern, in addition to the accurate points you made is the GDP growth, the ability of China to keep this economic momentum going at the same time knowing that the political system remains centrally-planned, and can this balancing act, if one calls it that—

Commissioner DREYER. It is.

Mr. CARUSO. —continue to be maintained and, indeed, strengthened. And I think there is a real question mark there.

Commissioner DREYER. Yes.

Mr. CARUSO. So we are being optimistic in the sense that the economic numbers are fairly clear. The transportation sector, which

has a very small share of China's oil demand sector. Whereas, if you take the U.S., two-thirds of our oil demands is for transportation; China, it's less than 10 percent; 13 cars per 1,000 Chinese population; U.S. almost 800.

Commissioner DREYER. There is a huge demand in China for more cars.

Mr. CARUSO. So even moving that to the level of a Malaysia gives you an enormous growth in demand. So I think the potential growth, both for broader macro measures like GDP and translating to specific sectoral and fuel-specific demands, and the numbers, of course, can be mind-boggling if you actually multiply any per capita analogy, for even a developing country in Asia, to China. You get numbers that make our major oil companies salivate.

Commissioner DREYER. Finally, what is a quad?

Mr. CARUSO. Quadrillion BTUs.

Commissioner DREYER. Oh, thank you.

Mr. CARUSO. Translated into oil, 2 quadrillion BTUs equals 1 million barrels a day of oil-equivalent.

Commissioner DREYER. Two—I'm sorry; what did you say?

Mr. CARUSO. Two quadrillion BTUs equals 1 million barrels a day of oil-equivalent.

Commissioner DREYER. Thank you.

Co-Chairman WESSEL. Commissioner Becker.

Commissioner BECKER. Yes, I suppose if you're far enough down this chain, you're going to be answering everything that would at least give rise, in my mind. I appreciated your projections on this. They're rather startling, and to carry those numbers out, it seems that in addition to just vying for oil by the different countries, it's going to have a tremendous economic impact. It's almost inevitable that it will.

And I was wondering if you would hazard any guesses or projections as to what effect this is going to have, say by 2020? If you carry this out, what effect is this going to have on the global economic impact?

Mr. CARUSO. There is a certain range of uncertainty. Growth is highly dependent on the global economy.

I was at a meeting just yesterday in which it was said that a large share of the Chinese projected growth is dependent on the U.S. and other recipients of Chinese export-led growth growing as well, so the engine of growth in a global energy market can be said to be China over the next 10 to 20 years. And that is highly dependent on the kind of GDP outlook that we've mentioned today, and that is highly dependent on countries like the United States and other importers of Chinese goods.

So it's clearly the interdependency, starting with macroeconomics and international trade and China's ability to meet its WTO requirements; all are linked into the Outlook that was presented today. And to the extent that that kind of growth is not fulfilled, it's a very different picture.

The most important variable that could change the picture that I talked about today is the global economy, which we are assuming grows at 3 percent per year. That's led by the \$10 trillion economy here in the U.S. If, for some reason, even 1 percent lower than that can make 10 to 15 million barrels of oil a day of less demand in

the year 2020. So I would say this picture is very much dependent on a lot of other things going right, including, as I mentioned, the expansion of international trade and the implications that has for global economic growth.

Co-Chairman WESSEL. One of the questions that I have, looking at your discussion and that of some of the later participants today is seeming tension between the self-sufficiency goals that China has had in many areas versus what appears to be, from your testimony, market forces driving the investments in their energy situation.

I guess there are many who believe that, and some of the data supports, a strong bilateral relationship that China has had with certain countries in its quest for self-sufficiency, but at the same time, we see with the pipelines, with investments in Kazakhstan and transportation goals, et cetera, that it appears that the price of oil may have come to a point where they have decided that the return on their investment may not be great enough.

Can you comment on what kinds of investments China is making; where it is going to go long-term; is it still, in fact, proceeding on a self-sufficiency goal? And what would they need to try and make that happen?

Mr. CARUSO. I think self-sufficiency for China will probably be limited to coal. As I said, that will still be quite important. Two-thirds of their energy will be coal even 20 years from now unless there are some unusual movements. China will become, conservatively, at least two-thirds dependent on imported oil by 2025.

I think they have made the decision that they can't reach self-sufficiency in oil, and about two years ago, they came out with a long-term strategy on all energy but, in particular, on oil security. And part of that strategy was to develop a strategic petroleum reserve, much like we have in this country. And the other part was to become more involved in international multinational cooperation during oil emergencies.

And in my previous job at the International Energy Agency, we also talked with China in terms of informal cooperation between China and the International Energy Agency during times of emergency, recognizing that they could never join, because the first requirement is becoming a member of OECD. But nevertheless, it reflected China's recognition that the investments that would be needed to meet the kind of growth we are talking about here, going from 1.7 million barrels a day in imports this year to perhaps as high as 7 million barrels a day 20 years from now, just were not in the cards both from the point of view of the amount of money that would be needed and the management that just didn't exist.

I think they took a more pragmatic approach, to be prepared—more or less moving toward a Japanese-style of dealing with dependency. “Yes, we are becoming more dependent, but we should at least try to reduce our vulnerability.” I think that is where China is at this point.

Co-Chairman WESSEL. Is there a price point for oil that would skew the balance in any way as far as you know? Has EIA looked at that, in terms of at what point will they, in terms of their economic growth projections, be concerned enough that they may make more investments than they have?

Mr. CARUSO. We haven't looked at that specifically, but I think when they made these kinds of deliberations, looking at this issue, they published a huge energy strategy document in Chinese, and the IEA had that translated, and it was pretty impressive. And I think their recognition was that at today's world oil pricing, \$25 to \$30 range, they had this movement towards high-level dependency, and how to live with that kind of insecurity would have to be dealt with in ways other than to try to invest outside of their own country.

Co-Chairman WESSEL. Thank you.

Commissioner D'Amato.

Vice Chairman D'AMATO. Thank you very much, Mr. Chairman.

Thank you for your testimony, Mr. Caruso. I have a question on the matter of cooperation with the IEA. You say that China cannot join because it's not a member of OECD. What was and is the level of informal cooperation between the Chinese government and IEA? Do they have a liaison function? Is it robust cooperation? And is there any particular reason why the OECD can't waive its requirement for membership, given the importance of China and the need to share energy resources in emergencies in the future?

Mr. CARUSO. Yes. The cooperation between the IEA and China has been a struggle.

Vice Chairman D'AMATO. Checkered?

Mr. CARUSO. My job at IEA was to develop that cooperation. And they were very skeptical initially, which was started, in my case, about 1994.

Vice Chairman D'AMATO. The Chinese were skeptical of you?

Mr. CARUSO. Of the IEA and in dealing with energy security. The initial reaction was to circle the wagons and plant the Chinese flag as opposed to international cooperation.

I think reality has set in over a period of the five years I was involved, and it moved from more of a tense relationship to one more collegial, where they actually came and presented their outlook to our committees. The IEA did a review of Chinese energy policy and published an energy policy recommendations document about a year ago. So it's still quite informal. I wouldn't want to overstate it, but it's now more collegial. There is no specific liaison. They come to IEA meetings when invited, and IEA, about once a year, presents a workshop within China. They get invited to producer-consumer dialogues on an annual basis.

The big hurdle for OECD membership is that countries should be of likeminded political systems.

Starting with democracy.

Vice Chairman D'AMATO. There's a problem!

Mr. CARUSO. That's a big hurdle.

Vice Chairman D'AMATO. Well, I would follow up by asking you this: has there been any effort, and do you think there should be an effort, for the IEA to do a more structured proposal for sharing arrangements in the event of emergencies with the Chinese? And what would be the problem with attempting to do something like that?

Mr. CARUSO. My recommendation while I was a director of the IEA was that that should happen. It should be more structured.

Chairman ROBINSON. And in that regard, I think we're in sync on this. The joint release of stocks.

Mr. CARUSO. That would definitely be the most important agreement that could be reached, if you actually got to the physical issue of the releasing of stocks, but even just sharing information and working in a way that was more in sync than in opposition during an emergency would be a huge difference. And I should say there is a formal mechanism under which this is happening, again, not sharing of stocks but cooperation through APEC, of which both the United States and China are members, and they meet regularly in the Energy Working Group, of which Assistant Secretary Bailey, in DOE's case, is a member.

Vice Chairman D'AMATO. That would be sharing within the APEC area, though, correct?

Mr. CARUSO. Yes, they haven't gotten as far as to any type of actual sharing agreement, but they are talking about the possibility of that down the road. APEC is a very young organization with still a long way to go, but that certainly is a goal that we have had in the U.S.

Our view is that the more of the major consumers that are involved in either informal or formal agreements to cooperate during emergencies, the better off we will all be in the event of any disruptions of oil supplies.

Co-Chairman WESSEL. Thank you.

Other questions?

Commissioner Reinsch.

Commissioner REINSCH. Can you contrast the policies that China is pursuing now with what Japan has been doing for some time? Are they pursuing similar policies? Different? If so, in what way?

Mr. CARUSO. Yes; I think Japan, having been 99 percent dependent on imports for their oil supply, has had to pursue this policy of dealing with dependency, but trying to reduce vulnerability, and they, early on, of course, having been OECD members and IEA members from the beginning, have relied on this emergency stockpile.

It has taken China a long time to even get to the point where they even considered that, so that is a major difference. And Japan, being a far more robust economy, in response to the 1973 Arab oil embargo tried to buy its way out of the embargo by going out and trying to get as much oil in competition. And that, indeed, is what led to the formation of the IEA.

So China, economically, isn't in a position to do that, so they did look at the possibility of making these equity investments, as I mentioned, but I'm virtually certain that they decided that this was not a way that would ever get them to where they wanted to be in terms of self-sufficiency.

Commissioner REINSCH. When you say "they," are you referring to Japan or China?

Mr. CARUSO. China.

Commissioner REINSCH. Oh, okay.

Mr. CARUSO. Both countries are headed in the same direction with respect to energy security, but of course, in very different political and stage of development.

Commissioner REINSCH. Right; I was looking at it more historically. But, okay, thank you very much. That's all.

Co-Chairman WESSEL. Commissioner Ledeen.

Co-Chairman LEDEEN. I have a request, and then, there's a question from Larry Wortzel that I want to pass.

My request is could you please provide us with the assumptions on which your various projections were made? Because if I heard you right, it seemed like the projections on the growth of Chinese demand for energy and so forth are actually driven by the performance of the industrialized economic world. And if that is true, then, it is quite different from a lot of the things that we're being told, and it puts it in an entirely different context, which I think is useful.

So could we have that?

Mr. CARUSO. Certainly.

Co-Chairman LEDEEN. Could we see that? And if you've done the kinds of parameters, the kinds of variables that you mention, if Western economic growth drops by X, what happens to China and so forth, all of that stuff would be enormously useful.

And then, Commissioner Wortzel, who is incapacitated, alas, for the moment, asked that we ask you the following: China is highly dependent on Middle Eastern oil at present, 70 percent roughly. Japan and South Korea also are highly dependent on oil from the same region at about the same percentage of their total needs.

Do you think this creates potential tensions among these three countries for resources? How would it affect Japan-China relations, in particular, if there were a shortage of oil available from the Middle East?

Mr. CARUSO. I think the potential is there for creating those tensions. Right now, as I mentioned, it's mainly being handled by commercial transactions, but discussing issues like this in multilateral fora like APEC and in a more informal way within the IEA is a way of perhaps defusing some tension. That's my personal view.

Co-Chairman WESSEL. Thank you for appearing this morning. We appreciate your time, and we will get ready for the next panel and look forward to talking to you in the future.

Co-Chairman WESSEL. Certainly, thank you very much.

[Recess from 11:05 a.m. until 11:20 a.m.]

PANEL II: ENERGY MARKET AND SUPPLY IMPLICATIONS OF CHINA'S ECONOMIC GROWTH

Co-Chairman WESSEL. The next panel will focus on the economic and energy market implications of China's current and future energy demands. We will hear from Amy Myers Jaffe, Dr. Kang Wu, and Dean Girdis.

Ms. Jaffe is the Wallace Wilson Fellow for Energy Studies at the James A. Baker Institute for Public Policy and Associate Director of the Rice University Energy Program. She is the principal author and research director for eight energy studies published by the Baker Institute, which include topics such as Chinese energy policy and global oil geopolitical.

Dr. Wu comes to us from the East-West Center in Hawaii, where he is the head of the China Energy Project. His work includes en-

ergy modeling and Asia-Pacific energy demand forecasting, and we appreciate your traveling to be with us today.

Dean Girdis, Director of the Gas and Power Group of PFC Energy, has had extensive experience consulting on energy development and reform and energy security in China. And if we could start from my left to right with each of the witnesses taking approximately 10 minutes so that we have time for questions.

Go ahead.

**STATEMENT OF AMY MYERS JAFFE
WALLACE WILSON FELLOW FOR ENERGY STUDIES
JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY
RICE UNIVERSITY**

Ms. JAFFE. Thank you very much. It's really an honor and a pleasure to be here. The Baker Institute has done extensive work on China. We do have a major study that's on our Website that has 12 papers, and some of my remarks or pretty much all of my remarks reflect this program.

We did our own models on China's energy use by sector, so I'm not going to go over some of those statistics, because I think Dr. Caruso gave us a very good overview of the statistics, but some of our statistics vary somewhat or slightly, and depending on the area, from EIA's own projections, so I welcome the Commission to go into the Baker Institute Website and see some of the work that's done by sector and our views of the transportation sector, which we think is very important.

I'm going to pick a few highlights, especially now having the benefit of the opening presentation to emphasize some points. According to the Baker Institute modeling, we believe that the transportation sector use of oil could triple by 2015 and that the growth in that sector in China will be 50 percent faster or, you know, as a sector than the other sectors in China like industrial, residential, so forth.

Our projection for 2010 is for oil demand to reach 7 million barrels a day. Actually, it has grown so exponentially fast between the mid-nineties and currently that I'm not sure that we're going to find that the projections are too pessimistic, or we're not going to find that they're too optimistic. We think we're probably going to find that there are a lot of people in China who are watching television.

Just to tell you an incredible statistic, 70 percent of people in rural areas in China have a television. Ninety-nine percent of people in urban areas in China have a television. The average Chinese four-year-old watches seven hours of television a day. And I tell that statistic because there is a tendency in the United States; even people who have barely any other electrical appliances have satellite television. And all of this television is punctuated with advertising. I don't know what it is today, but when we had our seminar on this subject, it was a couple of years ago, say, two or three years ago, the favorite show in China was Baywatch.

And I joked at the seminar that what do you see in Baywatch? You see people in Jeeps blow-drying their hair and, you know, using other electrical appliances. So there is sort of a growth of a consumerist society, especially in certain parts of China like southern China, and I think we have to keep that in mind when we

think about energy use, though it is true that there is a clear relationship between how much GDP growth we have in China in the future and what's going to happen with their energy demand, and depending on people's views of whether growth will be at 5 percent, which is what they've done over the past decade, or whether that will slow down considerably will really influence whether these forecasts for things like 7 or 8 million barrels a day of oil demand are correct.

Let me just make a statement just to take a minute to help the committee understand how these issues are viewed in China. The growth in U.S. net imports of oil, which mainly went to feed our automobile private use, the United States represented 30 percent of the increase in oil traded in the world between 1991 and 2000. So that's oil traded in the world; that means oil that went from one country to another.

The United States' rise in imports represented 60 percent of the increase OPEC was able to make over that period. So if you were a hearing of people like yourself in China, you would be having hearings to talk about the fact that the United States doesn't have an effective transportation sector policy and the impact that that has on increased demand for oil for OPEC, and the incredible impact that that has had on OPEC's ability to charge and pick a price in the market is completely and directly related to this 60 percent increase in sales they were able to do because of U.S. imports, and that is a much bigger factor, at least in the last 10 years, than anything that has happened in China.

So I just feel the need, since you also serve on committees related to energy policy, to point out that part of what we can do to help make China's new growing economy not bring pressure on the international market is to get a grip on our own energy policy.

Again, just to give you some perspectives beyond the transportation sector, according to the Baker Institute model, Chinese industrial sector use, which is running about 2 million barrels a day, we project that to rise to 4.9 million barrels a day by 2015. In 1992, China was emitting 55 percent of the American or U.S. level of CO₂ emissions. We see the rise based on our own projection for use by sector that the per capita emissions in China could rise from 2.44 metric tons to about 3.77.

If you do a survey of the kinds of literature that you, the committee, have read to become prepared from these hearings, and let me say I am very impressed with the range of knowledge of all of the Commissioners, Chinese analysts write about concerns that the U.S. will block China's oil supply, and they have—the literature centers on two key factors. One is the United States will blockade, perhaps militarily or perhaps through diplomacy, China's access to oil if there was a war over Taiwan. And then, the second emphasis in the Chinese literature is concerns that the United States will have strong relationships with key oil producers, and during some kind of a conflict period with China, the United States will ask those producers to reduce availability of oil to China.

And those, I think, are primarily the two driving perceptions or paranoia, depending on your position that drives Chinese policy. And therefore, as Members of the Committee have already alluded to, and it is an important problem, China has actually purposefully

sought out countries that it feels the United States has a poor relationship with or possibly even has sanctioned to develop an oil relationship with. So we all know about the Chinese production in Sudan, which the Chinese got access to because Western and Canadian investors felt compelled by U.S. sanctions to pull out of that domain.

We have similar overtures to Iran, and in the last few years, there was even word on the street that Chinese oil companies were visiting in Libya, talking about if sanctions were not lifted by the United States and American oil company properties could not be effectively developed by the companies that own them that the Libyans would take those fields away from the American companies, which are now frozen, and give them to someone like CNPC.

You I think correctly mentioned the dangers of having China pursue a bilateral oil policy where they are dependent on certain countries, and those countries can make demands on them, or military or political strings come attached. We see with our own foreign policy, our high dependence on oil from the Middle East and other key regions does constrain our abilities to try to press certain allied countries to make concessions in the war on terror. There are certain things we can't say to, say, a Russia or a Saudi Arabia or other countries, because we need their support in one area, and so, therefore, we cannot press them on other national security areas as hard as we might otherwise do.

Let me elaborate just quickly: I absolutely agree with Administrator Caruso that strengthening the bond between the IEA emergency stockpiling system and China and other important oil users like India and Brazil is a major thing that U.S. diplomacy should seek to do. I think that—I agree with Administrator Caruso that the Chinese have been studying and studying this problem, and they are starting to understand that planting their flag in faraway countries is not helpful; that having a pipeline from Kazakhstan is maybe not as helpful as they had originally imagined; and that they are more open to thinking about multinational organizations than they were initially. So there is more opportunity today.

But the most important thing to understand in terms of the global system in times of emergency is that if we make a 1 million barrel a day stock release from our SPR or the IEA system, right, and China were to become panicky at that same time, and they were to go out and buy up, in the panic, a million barrels a day of oil, which could happen easily, that they have nullified the entire exercise of our releasing stocks, right? And that is why it is most important that if we are going to have some kind of military campaign in the Middle East; if there is some kind of major accident for a major oil producer that the United States have a clear and structured institutional way to have a cooperative arrangement with China in how we are going to deal with emergencies.

Co-Chairman WESSEL. If you could sum up.

Ms. JAFFE. So, in summary, the United States should be engaged in the China energy area, both viewing China as a good market for energy-efficient technologies; that is both in the transportation sector and elsewhere; to help them develop markets for natural gas and as a partner in R&D for scientific R&D; in areas of emerging energy technologies and nanoscience, solar, electricity transmission.

And I do want to say for the record that the Baker Institute considers this a very important issue. We took a group of Japanese energy policy officials with us to Beijing to hold a special session on emergency stockpiles and other energy policy cooperation policies. We just had a seminar on Russian energy and broached this competing subject of the pipeline route, again, with Chinese and Japanese participants and Russian participants. We had a seminar in Moscow with the same groups.

So we consider this a very important issue. We congratulate the Commission on focusing on these important issues.

[The statement follows:]

**Prepared Statement of Amy Myers Jaffe¹
Wallace Wilson Fellow for Energy Studies
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China and Long-Range Energy Security

China has achieved remarkable economic progress over the past ten years, leading to speculation that it may rival the U.S. as a superpower in the 21st century. Discussion of this rivalry has led to speculation that China may compete with the United States for important global resources.

China's energy sector is one of the key areas where dramatic change can be expected in the coming years. Cheap, readily available energy sources will be critical to China's economic expansion, just as such resources played a major role in the industrial revolution and rapid economic development in the West.

Already, China's economic expansion is being accompanied by a strong increase in demand for energy. China's total energy use has risen steadily from 313.3 million tons of oil equivalent in 1975 to 910.80 million tons of oil equivalent (mtoe) in 2001, according to official government statistics. Coal use has dropped from 76% of the country's energy mix in 1990 to 67% currently, replaced mainly by higher oil consumption and hydroelectric power. While the bulk of total Chinese energy demand will continue to come from industrial activities for the foreseeable future, the transportation sector is beginning to represent an increasing share of total energy use. In fact, at a per capita GDP growth rate of 5%, the Baker Institute projects that energy demand in the transportation sector could triple by 2015, fueling a sharp increase in oil and petroleum product use. This means that transportation energy demand can be expected to grow 50% faster than demand for energy in the remaining sectors of the Chinese economy.

Chinese oil demand has risen from 2.1 million barrels a day (b/d) in 1990 to over 5 million b/d currently. The Baker Institute projects Chinese oil use will grow to around 7 million b/d by 2010. China's domestic oil output is averaging around 3.4 million barrels a day in 2003 and is likely to remain flat to slightly lower in the coming years. Therefore, China's oil imports can be expected to grow significantly in the coming decade after nearly decades of complete self-sufficiency. This change has important implications for Asian energy security and oil geopolitics.

There has been speculation that China's rising oil use would be a major factor driving international oil prices to new higher levels in the coming decade and that China will become a key competitor to the United States for vital oil supplies from the Middle East and elsewhere. However, this view presupposes that a shortage of oil and natural gas will emerge, and experts generally do not support this premise.

Short to Medium Term Oil Market Expectations: Supplies May Go Up, Prices Down

Analysis of scenarios for international oil market supply and demand for 2010 and beyond do not bear out the thesis that China's rising demand will necessarily force oil prices to new, significantly higher levels or leave the world depleted of this important fuel. Many respected analysts are forecasting that oil market conditions may become oversupplied in the coming years if demand growth is held in check over the remainder of the decade. This will require concrete policies in oil consuming countries to discourage sharp rises in oil consumption, but implementation of such policies in many countries is under implementation or debate.

¹Dr. Steven W. Lewis, Senior Researcher in Asian Politics and Economics, contributed to this written presentation.

Under scenarios which posit a continuation of slow world economic growth, analysts suggest that oil demand may grow by no more than 4 b/d between 2002 and 2005, or roughly 1.3 million b/d a year, with about 60% of that growth coming from China and elsewhere in Asia. Non-OPEC supply, including production rises from Russia and the Caspian Basin, is expected to total 3 million b/d over the same period. This development, should it occur, would only leave the Organization of Petroleum Exporting Countries (OPEC) with one million barrels a day in market share growth over the period to 2005. Since Iraq alone could take up to that volume, or even expected increases from Algeria and Nigeria, OPEC could have increased difficulty sustaining its current \$25 oil price targets without shutting in substantial existing productive capacity.

Some analysts believe that OPEC will want Saudi Arabia to cut its production to make room for increases by other OPEC members, but it remains to be seen how much the kingdom will be willing to sacrifice of market share to defend oil prices. Saudi Arabia has also made public statements that it will not look on passively if Russia continues to grab market share away from OPEC, and any Russian government will have to move cautiously to avoid stimulating a price war among major oil producers. This pressure will be increased by 2007 and beyond, if Iraq is able to make significant headway in achieving some large-scale expansion of its production capacity.

Long Term Oil Resources: Are We Running Out of Oil?

There has been considerable debate in recent years about the determinants of future world oil supply. Some experts point to the declining average size of modern oil discoveries and the rate of depletion in conventional oil fields and conclude that steady growth in oil use could overtake available conventional resources in the coming years. Current high oil prices and the precariously low level of spare oil-production capacity worldwide have intensified these concerns. Others have highlighted advances in oil exploration and drilling technology that are expanding potential frontier resources and greatly reducing the costs of exploiting them. This technology can be used in areas that are newly reopened to the international industry, such as the former Soviet Union, China, and the Persian Gulf, to provide potentially higher supplies from those regions. The current environment of rising oil prices and worries about near-term supply conditions has made the issue of resources even more timely, although there is a need to distinguish between immediate oil availability, which is determined mainly by past efforts and current resources, and longer-term supply, where future efforts and the potential resource base are the key determinants.

Warnings that the world will soon exhaust the known base of hydrocarbon resources are not new. As far back as 1914, the U.S. Bureau of Mines forecast only a 10-year supply of oil left for the United States. In the aftermath of the 1970s oil crises, the Club of Rome concluded that the world would shortly run dry of oil. This extreme view, and others like it, failed to allow for the technological advances that have slashed the costs of finding and developing previously hard-to-tap reserves in deep ocean waters and improved the chances of new discoveries, especially in important terrain in Iraq, Libya and the former Soviet Union which were held back from benefiting from emerging technologies by politics. It also failed to recognize the falling commercial costs of exploiting unconventional resources such as oil shale, tar sands oil, oil sands-based synthetic crudes, and perhaps in the future, gas to liquids and methane hydrates. Similarly, technological advances, conservation policies, and consumer reactions to earlier price shocks have all contributed to shifting paces of demand growth, reducing the rate of depletion of the world's resources.

The World Petroleum Assessment released by the U.S. Geological Survey in 2000 estimates that in areas exclusive of the U.S., a mean value of 649 billion barrels of oil could be added to reserves through new discoveries in the coming 30 years (1995–2025). This estimate is 20 percent higher than the estimate in their last assessment published in 1994. These findings represent a continuation of the long-term upward trend in ultimate reserve estimates, which may prove too pessimistic as new drilling in Russia proves up more resources than previously expected. The ratio of world-proven reserves to production currently stands at 42 years, substantially higher than it was in 1972.

Total estimates for the world oil reserves outside the U.S. of 2.66 trillion barrels represent a 5 percent increase over previously assessed totals. The assessment also estimates that as of the end of 1995, the world had used 539 billion barrels, or 20 percent, of its currently estimated total oil endowment. Of the remaining estimated oil endowment of about 2.1 trillion barrels, about 75 percent, which includes potential additions from reserve growth, has been found, and 25 percent remains undiscovered. But the report noted that 75 percent of undiscovered oil resources outside

OPEC would be found offshore, lending credence to contentions that much of the “easy” oil has already been found. The International Energy Agency (IEA) assessment published in 1998 had similar assessments, arguing that there are 2.3 trillion barrels in ultimate recoverable reserves (that is, available at current prices with current technology) and well over 4 trillion barrels if unconventional tar sands and oil shale are included into the tally.

In summary, resource depletion is unlikely to be a factor in the future U.S.-China relationship.

The United States and China and the Geopolitics of Oil

However, the question is not just whether there will be enough oil under the ground but whether the political, social, and economic environment in oil-producing regions will facilitate or hinder the development of future oil production capacity. In studying both the short-term, strained condition of the oil market and the prospects for the future, it is clear that political issues will loom large, possibly playing a more important role than even geological factors in determining the pace of resource development for at least the next 10 years.

One key political factor influencing the pace of resource development in the developing world is nationalistic or protectionist sentiment, which, in many countries, has created a political climate that promotes blocked access to oil resources by foreign investors. In recent years, political factors have far outweighed geological ones in limiting available supply to world oil markets. It is in managing these political factors that the United States and China have common interests that needs to be carefully nurtured through sound diplomacy and public policy.

As China’s oil imports rise to levels above 3 million b/d, it will be increasingly difficult for China to meet its crude oil import requirements without concluding large, long-term contracts for the supply of oil. Over the past few years, China has demonstrated a willingness to deepen its oil trading relationships with Iran, Sudan, and Libya, taking advantage of U.S. sanctions policy and leading to fears that Beijing will form oil-for-arms, military-client relationships with nations under boycott by the United States.

As China pursues bilateral oil diplomacy, political pressures will build for Beijing to back positions popular with particular oil producers in forums such as the United Nations. This could pose new challenges for the West on a variety of issues, in much the way that Russian and French political opposition to military strikes against Iraq hurt U.S. efforts to create U.N. support for a coalition of the willing.

China has yet to consider seriously activities involving multilateral alliances on oil issues with other important oil consuming countries. The West is partially responsible for not making a sufficiently convincing case for an alliance. The U.S. has failed to push for a way for China to join the international emergency stockpiling system and is only now beginning to make significant efforts to transfer new, cleaner energy technologies to Chinese industry and to involve China in multinational energy research initiatives. For the U.S., energy cooperation could be key in building a cooperative relationship with China. Such cooperation could smooth the way for better coordination on weapons nonproliferation and environmental protection.

In the almost three decades since the 1973 Arab oil embargo, countries such as the U.S., France and the U.K. have realized the limitations to bilateral supply arrangements, even in light of the cases where such bilateral relations extended to extensive arms shipments and other forms of military cooperation. The impact, by contrast, of the International Energy Agency emergency stocks program has been quite successful, not only in calming markets such as seen in the early days of the U.S. military campaign to remove Iraq from Kuwait in 1991, but also in serving as a deterrent to oil producer groups to exercise monopoly power in times of market crises or to impose politically-driven oil supply restrictions. The lesson of the IEA is that its members have been able to minimize the impact of supply disruptions from the Middle East by sharing resources in a coordinated fashion rather than by acting alone. The IEA serves other important critical functions as well, including promoting alternative fuels and developing market mechanisms to boost energy efficiency.

The continued effectiveness of the IEA system, however, will depend on oil market developments, including Chinese and Asian demand trends. The member countries of the IEA now represent a smaller portion of the oil market than they did at the time of the IEA’s formation in 1977. As oil demand growth in Asia expands in the coming decade, new strains could come to the international system if new policies are not put in place. The omission of key consumer countries like China from the global emergency stockpiling system will increasingly put pressure on the effectiveness of limited, existing stocks in the Organization for Economic Cooperation and Development (OECD) countries. Moreover, tensions created by Asian “free-riding” or

possible “hoarding” actions during a crisis could hinder the IEA’s ability to stabilize international oil markets in the future.

The OECD countries comprising the IEA represented 42.3 million barrels a day (b/d) out of a total world oil use of 60.6 million b/d in 1977, or around 70% of world oil demand. The U.S. alone consumed 30% of the world’s oil used in 1977. Asia Pacific at that time was a less critical component to the world oil use situation at 10.1 million b/d or roughly 16% of world oil demand.

By 2001, the OECD share of world oil use had declined to 62% of total world demand while Asia Pacific use had grown to 28%, overtaking the U.S. share of 25%. Asian economic powers Japan, South Korea, Australia and New Zealand are OECD members and, as such, are part of the IEA system now. But other key Asian oil consumers such as China, India, Taiwan, Thailand, Philippines, Pakistan and others are not. As their share of world oil demand grows, this disconnect between Asia’s size and importance as a consumer region and its lack of energy policy coordination with other large oil consuming countries will create new problems and challenges for international oil markets and the international economic system.

As oil import levels for key Asian countries rise over the next two decades, the behavior of oil players from these countries during times of market crisis will increasingly matter. If a significant percentage of countries continue to hold little or no strategic oil stocks despite their rising oil import levels, then any rush to markets with panic buying by these countries at the first signs of crisis will thwart the joint, coordinated and constructive policies of the industrial countries to the detriment of all concerned. In addition, even without panic buying, industrialized countries are likely to resent “free-riding” by other large consumer countries over time since the level of stocks needed to stabilize markets will expand as world demand rises. The best possible win-win scenario would be for new links between the IEA and other large consumer countries like China.

Analysts of Asian energy security should make no mistake that China has concrete strategic interests in Asia’s sea-lanes linked to energy concerns among other issues, as well as a major commitment to its own military strength. But in light of the limitations on China’s own force projection capabilities, these interests are best served, at least for many years to come, through cooperation and strategic partnership. It is precisely the U.S. guarantee of equal access for all of Asia’s sea-lanes that allows China to fulfill its strategic energy requirements through free riding rather than military adventurism. A U.S. military asset drawdown in the Pacific, which might open space for security competition—for example, between China and Japan—to fill the vacuum—would be far more dangerous to Asian stability than the potential for a Chinese challenge to the status quo.

Environmental Issues

It is unlikely that China will be able to cope with rising dependence on oil resources in the short to medium term by leapfrogging to alternative technologies for the transportation sector. Environmental policies that forced industry to create cleaner engine systems for use the transportation industry in the U.S., Europe or Japan could eventually lead to commercial breakthroughs that could be applied to reduce pollution in developing countries such as China and India. Still even if a technological breakthrough or government policies could stimulate strong consumer demand, it would take many years before electric, fuel cell or hybrid vehicles would have significant impact on energy markets. Some pilot programs are being conducted to develop non-hydrocarbon-based energy technologies in certain industries including transportation sectors in China, and several cities in China have promoted natural gas vehicles as an alternative to gasoline fuel. Still, these programs are in their infancy and are unlikely to counterbalance the rise in gasoline-fueled vehicles in the short to medium term.

While growth in Chinese energy use in the transportation sector will likely be highest, demand for energy in both the residential and commercial sectors, as well as the industrial sector, may nearly double by 2015. Rationalization of energy use and increased energy efficiency may come with market reforms, denting growth rates as related to GDP gains but the expansion in the Chinese economy is still likely to bring major increases. Energy use in the industrial and other sector could expand from 545 mtoe in 1995 to 1291 mtoe by 2015. Residential and commercial energy consumption could see increases to 282 mtoe, up from 137 mtoe. In terms of oil, residential and commercial oil use could climb from 128,000 b/d to 270,000 b/d by 2015. Oil use in the industrial sector could rise from just over two million b/d to between 3.4 million b/d to 4.9 million b/d, depending on economic growth rates.

To the extent that the industrial, residential and commercial sectors are coal intensive, this will have considerable ramifications for the environment (coal emits 34% more carbon per British Thermal Unit (BTU) than oil and 81% more carbon

than natural gas). For example, by 1992, China was already emitting 55% of the U.S. level of carbon emissions from industrial processes. China's per capita CO₂ emissions could rise from 2.44 metric tons to 3.77 metric tons by 2010. Forecasts for the increase in per capita emissions in China, India, Indonesia and Brazil imply that these four countries could produce as much as 2.0 billion tons of carbon annually in 2010, according to the Baker Institute.

Current international agreements on global warming will be substantially flawed unless they include major developing economies such as China, India, Indonesia and Brazil. Controls on the developed nations alone may be ineffective in reducing the accumulation of carbon dioxide in the atmosphere. The growing emissions from developing countries could dwarf proposed reductions for the industrialized world.

The costs of Beijing trying to limit this rise in emissions in line with the Kyoto agreements are prohibitive. In the year 2020, Chinese attempts to limit emissions in line with available production technology would result in GDP levels 27 percent lower than if emissions are not constrained. The cumulative loss of GDP for the period 1999 to 2020 by evaluating carbon dioxide emission would be about 24 trillion. This is more than twice China's expected GDP level in 2020.

Given the other pressing social, economic and health challenges facing China, its leaders are unlikely to make control of greenhouse gases a major priority. In order for the developing countries like China to take effective action on global warming, they will have to be compensated until the net cost is acceptable. Given the relative unimportance of global greenhouse gas emissions when compared to China's other more urgent pollution problems, as well as health, education and economic challenges, an acceptable cost to Beijing to participate in global warming accords is likely to be close to zero. Thus, the cost of any sacrifice that is demanded of developing countries is likely to fall on taxpayers of those countries whose politicians view the problem as a high priority. Since massive transfers in the billions or trillions of dollars would be required, this is not a practical solution to pursue.

Emerging technologies in the field of transportation and power generation could play a positive role in reducing emissions in emerging economies where major infrastructure investments remain to be made. Cleaner, more efficient emerging technologies in the automotive and power sectors could eventually help fill the gap that the Kyoto agreement leaves in reducing emissions from key developing nations. At the margin, China may try to lessen environmental consequences of rising coal use by switching to other resources where possible. While progress has been made in recent years in the development of alternatives to fossil fuels for power generation, these alternatives are unlikely to have significant impact on energy markets until after 2020.

China's Natural Gas Sector

Natural gas remains another viable alternative to expanding coal and oil use in China. Natural gas could rise from 2 percent of China's current energy consumption to 8 percent by 2010 and 10 percent by the year 2020 if the Chinese government quickly gives priority to the natural gas sector.

China has significant potential resources of natural gas. There are 54 large and medium gas fields found over the past few years mainly in the Ordos, Sichuan, the Tarim, the Juggar, the Qaidam areas as well as in the western South China Sea. Exploration and production (E&P) activities from 1991 through 1998 resulted in newly added proven reserves totaling 853 billion cubic meters (bcm).

Natural gas demand in China has been restricted in the past. While liquefied petroleum gas (LPG) has been widely used in 600 cities, natural gas use has lagged other major economies. Major Chinese natural gas markets still remain most prominent around the Sichuan gas fields. Considering China's current environmental situation and future economic goals, China's natural gas use should be enhanced. High economic growth forecasted above will translate into at least 100 bcm of additional natural gas demand in 2010 and 150 bcm in 2020. But this level of natural gas use faces several obstacles including a possible internal supply deficit, massive infrastructure requirements and lack of expertise and institutional frameworks for commercialization of domestic natural gas markets.

In addition, a nonconventional source, Coal-bed Methane (CBM) resource is estimated 25 trillion cubic meters. There are several pilot CBM areas with 300 bcm reserves and 50–100 bcm production. Further development can be expected in the next decade.

The gap between demand and indigenous supply is projected to grow from 21–24 bcm in the year 2000 to 46–73 bcm in 2010 and to 60–111 bcm by 2020. The potential gaps between Chinese natural gas supplies and its demand by the year 2010 is roughly equal to the size of all annual liquefied natural gas (LNG) exports (23 bcm) from Australia, UAE, Qatar, and Libya in 1997 or 20 percent exports by pipe-

line from the Russian Federation. The level is also close to combined LNG imports of Belgium, France, Italy, Spain and Turkey and larger than LNG imports of both South Korea and Taiwan. China's potential gas import requirements by 2010 could reach or even surpass current LNG imports of Japan. China's southern provinces alone are expected to see demand for gas-generated power reach 11–18 bcm by 2005 and 20 to 35 bcm by 2010, according to a Baker Institute study.

About 50-bcm of natural gas imports have been planned to 2010 from neighboring countries such as Russia, both by pipelines and LNG tankers.

A prioritization of China's natural gas segment could help enhance China's energy security by diversifying available supplies to meet China rising energy requirements. It will also improve the living standard and air quality in most major cities. Reasonably, gas policy should be viewed as an imperative to securing Chinese sustainable development.

China sees itself as both an emerging market and as a land bridge for regional gas shipments and it views its gas import strategy as a means to secure and maximize various regional linkages. China has been vying with Japan over competing gas pipeline routes from East Siberia, with China favoring a route from Angarsk to Daqing, connecting to the Chinese port of Dalian and Japan pushing for a more expensive route that would bypass Chinese territory and remain instead inside Russia, exiting at the Pacific port of Nakhodka.

The Geopolitical Consequences of China's Rising Energy Needs

Over the past few decades, China has had the luxury of choosing a neutral role towards events in oil geopolitics. Oil prices inside China were fixed by the state central planners and had no relation to world price levels. Internal supplies fairly evenly matched domestic requirements. Its economy was sheltered from the volatile international oil scene and therefore its leaders could be indifferent to conflicts in the Middle East or elsewhere. Oil disruptions neither hurt nor helped China substantially.

By contrast, the U.S. economy, as a major consumer and importer of oil, was vulnerable to sudden swings in international oil prices, dictating foreign policies that would promote stability in international oil markets. The U.S. navy defended Persian Gulf supplies while U.S. policymakers worked to remove political and economic barriers to oil development outside the volatile region. The Soviet Union was a major oil exporter and its economy benefited directly from rising oil prices. Its interests in oil markets were diametrically opposed to those of the U.S. Soviet oil interests so diverged from America's that policy theorists in the 1980s suggested the U.S. would benefit from events that could drive oil prices lower to hurt the Soviet treasury.

The implications of China's shift to a world energy importer are significant. Over the next ten to twenty years, China will have to participate in international energy trade on a substantial and sustained basis, to form alliances for energy supply and transportation, and to make security and environmental choices about fulfilling its future burgeoning energy needs. These alliances, trade and policy options will be constrained by the unwieldy organization of China's oil and gas industry and the aged and inefficient infrastructure that exists in China today.

China's rising oil import requirements and the physical constraints of its refining sector may mean China will become increasingly dependent on the same energy sources as the U.S., Japan, and other industrialized economies. This could tie its strategic interests more closely with Western interests in the Middle East. A rising reliance on Persian Gulf oil and gas imports imply that China will suffer the same negative consequences as the U.S., Japan and Europe if military equipment it or others pass to regimes such as those in Iraq or Iran is used to interdict the free flow of oil from the Middle East or elsewhere. Continued political instability in Afghanistan or Central Asia will have similarly dire consequences for China's chances of tapping Caspian energy supplies.

However, it remains to be seen if China's energy interests will be enough to alter China's military's perceptions of its own more general strategic interests, particularly on the issue of weapons nonproliferation. China may continue to perceive a benefit in diverting U.S. strategic engagement away from Asia. China's leaders may view larger strategic interests in Asia—beyond the energy sector—as better served by diverting U.S. diplomatic attention and military assets away from the Asian theatre to places like the Middle East. This latter interpretation of Chinese interests will depend greatly on Beijing's perceptions of U.S. intentions—both in the short and long term—and their potential risk to China.

To some extent, China's economy could be shielded from the negative consequences of a temporary cut-off in oil supplies as a result of a major disruption

by its heavy use of coal in vital industries. But it would still have to implement uncomfortable—and potentially destabilizing—major consumer sacrifices.

The Chinese leadership's freedom of movement on asking for major consumer sacrifices is likely to diminish over time as China's middle classes gain a rising role in the economy. As media outlets expand inside China, awareness is growing regarding disparities within Chinese society and between PRC citizens and people living in Hong Kong, Taiwan, the United States, and other rich societies. The proliferation of television and other media forms is already ushering in vast social change and rapidly rising expectations of a more consumerist society.

Nearly 100% of homes in urban China and two-thirds of homes in the countryside own television sets. Advertising is targeted at middle class Chinese who might desire lavish vacations, air-conditioned homes, and private cars—all of which drive up the demand for energy almost exponentially.

The Chinese central government has fought back against this bombardment of foreign images by delivering competing messages of socialist values, but ultimately, Beijing faces a near impossible challenge to monitor and control the symbols being circulated at the local level throughout China. The net result could easily be a society increasingly unwilling to forego consumer goods and unlikely to conserve energy. This fact will make the imposition of curbs on energy use more costly politically and give the Chinese leadership pause to take adventurous military actions that could result in a cut-off in energy imports.

China does not yet have the military muscle to challenge successfully the U.S. and its regional allies in the Asian seas. China lacks the military capability and the basing facilities to close Asian sea-lanes for any extended period of time—should the U.S. Navy intervene to reopen them. Given its limited military budgets and current capabilities, China's military is 40 to 50 years away from the type of comprehensive, across-the-board technological modernization of its naval and air forces that could challenge American power in the sea lanes.

The U.S. presently has a window of opportunity to pursue cooperative energy policies that help China feel more secure about its energy security, thereby reducing the stimulus to conflict. Initiatives that assist China in developing cleaner energy sources can also enhance Western environmental goals.

Co-Chairman WESSEL. Thank you.
Dr. Wu.

**STATEMENT OF KANG WU, Ph.D.
FELLOW AND HEAD OF CHINA ENERGY PROJECT, EAST-WEST CENTER**

Dr. WU. Mr. Chairman, Co-Chairs of the hearing, Members of the Commission, I am very pleased to be invited and have the opportunity to testify on this very important topic on China's energy needs and strategies.

I have a written statement, which provides some of the details about our views about China's long-term energy and economic developments. I am going to organize my presentation today around some of the important issues, which are related, but also go beyond my written statement.

The first important issue is China's current energy consumption and the structure of the consumption and how it changed in the past 10 to 20 years. China is currently the second-largest primary energy commercial consumer in the world, but on a per capita basis, China's per capita primary energy consumption is far below the U.S., and also, China is a distant second-largest primary energy commercial consumer, far behind the United States.

Coal dominates China's energy consumption, and the second-largest source is oil, which is very important to China. China's growing dependence on imported oil has become a big concern to the Chinese government and also a topic of this hearing.

Currently, natural gas has a very minor share in energy consumption, but it will be growing very fast, and nuclear power is pretty much a late starter in China's energy consumption. It is also

expanding relatively fast. And China has a traditional emphasis on hydroelectricity, and this will continue to be emphasized in the future.

Comparing China's structure of primary energy consumption today with 20 years ago, for the 20 years of time, the share of coal declined, and the share of natural gas is unchanged, and the share of oil, hydroelectricity and nuclear power increased. By 2020, our forecasts show that with the growing overall primary energy consumption, the share of coal will continue to decline, and the share of oil is very much stable, or slightly higher, but the share of natural gas will drastically increase, and the share of hydroelectricity and nuclear power will also increase.

So the growth of China's primary energy consumption and structure changed in the past 20 years, pretty much driven by several factors. Number one is economic growth. Number two is the demand for high-quality energy products in the residential sector. And the third factor is the rapid transportation and petrochemical sector developments. And the fourth factor is the strong demand for electric power. And finally, I need to mention that it was also the need to conserve energy, because the use of energy was so inefficient at the beginning.

Many of the same factors, plus new ones, will continue to drive the future change of China's primary energy consumption and structural change. By new factors, I mean the need for more market-based efficient use of energy and the energy security issue, which is new, and then, how to balance between China's economic and energy developments with the ecological and environmental developments. Those are the new factors affecting the future energy consumption in China.

The second important issue is how China will meet its future energy demand. I will mention just a few, and then, we can discuss more. China's primary approach is still to primarily rely on domestic energy, domestic supply, to meet the basic needs of the future energy consumption. China also wants to emphasize the importance of energy conservation and energy efficiency improvement, because those are the only ways, only effective ways, by which China can be able to maintain the high economic growth with a reasonable amount of additional energy use rather than one-by-one growth.

China also wants to address the issue of energy security and particularly oil security. So these approaches—there are many other approaches I can mention later. These approaches and goals are sometimes conflicting. However, that's the reality it is in China, and the government is trying to strike a balance among these conflicting approaches.

For individual fuels which you heard from this morning, China will perhaps be able to manage not to be a net importer of coal for many years to come, not, perhaps, by 2020, so coal will be pretty much in good shape in terms of purely energy demand and supply balance. As for oil, imported oil, is likely to account for—I'll just give you a ball park figure as one of our views—roughly about 60 percent of China's oil consumption by 2020, oil consumption.

And China's emphasis on natural gas is first as a way to diversify away from coal and perhaps away from oil, but the emphasis

itself also creates a huge demand and also the need to import. So it is also an added element of energy security. Our view is that by 2020, China is perhaps more or less dependent on imported gas for about 40 percent of the gas consumption.

The third important issue is China's impact on the world and on the U.S. and on U.S.-China relations. I'll just make a very simple observation here. China's likely impact on the world is primarily in the field of oil. By 2020, China's oil imports may reach 5 or 6 million barrels a day or higher. It depends on the different forecasts. China will become the world's second-largest oil importer after the United States. The U.S. and China may compete for the same source of oil supply. And, as mentioned again by Amy, the way China addresses its energy security, including the energy diplomacy and overseas investment in Africa and the Middle East may run counter to the U.S. foreign policies.

In the Asia-Pacific region, one will see that a bunch of giant oil importers will emerge: China, India, Japan, Korea, plus others. After saying all of this, I have to emphasize that China's impact on the world by 2020 in the area of oil, is still manageable, not otherwise. After all, China's projected imports will still be far behind the U.S. imports. The oil market has long been globalized, so China's projected imports are still small compared to the projected total volume of trade by 2020.

In the gas field, China's ambition to import more LNG or perhaps pipeline gas coincides with the rapid rise of natural gas demand in the U.S. So the two countries may compete for the same source of LNG supply in the Asia-Pacific region and in the Middle East. However, one has to realize that today's market, the LNG market, is a buyer's market. There are plenty of projects and potential projects there. There are plenty of gas supplies. And after all, importing LNG is not very cheap.

The fourth issue that I want to touch upon is the impact of energy price volatility on China's own economic growth. Overall, the impact of energy prices on China's economy will be growing, but again, in our view, it is manageable. The reason we say that is the share of oil, in our view, will be going up slightly only, so they are quite stable at the 25 to 27 percent. In comparison, other major Asian economies, usually have 40 to 50 percent dependence on oil. So China's dependence is lower than many Asian countries.

The coal price is relatively stable, either domestically or internationally. Coal still supplies two-thirds of China's energy consumption, so that provides a base for the stable energy price. And China's increased use of natural gas will introduce a new element to price volatility, because price is based partially on oil, although China has managed, in the past year, to reduce their price linkage with oil in the LNG deals with Indonesia and Australia.

And in the electricity market, as China reforms its electricity sector, the electricity price is likely to go up, too, in the country.

So on an overall basis, energy will become more costly for China's manufacturing sector. However, the abundance of China's relatively cheap labor will perhaps keep China's relative competitiveness of the manufacturing sector for many years to come.

The last issue I am going to go over is how the U.S. may influence China's policy, maybe in a more favorable way, over, you know, all of the possible areas of competition.

The U.S. Government can influence China's energy policy in several ways. First, the U.S. can encourage China to move toward more environmentally-friendly energy consumption, including helping the Beijing municipal government to promote a green Olympic Games, which is what the U.S. Government is doing. First and foremost, the U.S. can provide assistance to help China to implement clean coal technologies. An effective clean coal technology program implemented in China will have tremendous impact on China's overall quality of energy use, as you can imagine, with the high share of coal use.

Secondly, The U.S. can participate in China's coal-bed methane development exploration and production. China has vast resources of coal-bed methane, and the U.S. has enormous experience in developing coal-bed methane. Thirdly, the U.S. can participate and encourage China's natural gas development. Fourthly, the U.S. also should thoroughly review its nuclear power cooperative policy with China and assess if it is in the best interests of the U.S. to help China to expand the peaceful use of nuclear power, which is being emphasized to address the energy security in China today. In that area, there are tremendous commercial opportunities.

Finally, the issue of energy security: the U.S. needs to study the issue in a more comprehensive and perhaps more positive way. A minimum security for China with open transparent policies means China can focus more on other areas, like cleaning up the environment and continuing their structural change toward a more environmentally-friendly energy mix. A high sense of insecurity in China will likely drive the country to adopt more conservative, closed-door energy policies which could mean more coal use as a way to address their energy security away from oil and gas. Those are the areas that I think that should be reviewed.

Mr. Chairman and Members of the Commission, that is the end of my presentation, and thank you again for giving me the opportunity to speak here.

[The statement follows:]

**Prepared Statement of Kang Wu, Ph.D.
Fellow and Head of China Energy Project, East-West Center**

Outlook for Energy and Economic Developments in China

1. Introduction

China has a huge energy sector and a large energy market. The world's most populous country ranks second in total primary commercial energy consumption after the U.S. and third in primary commercial energy production after the U.S. and Russia.

The Chinese economy has expanded substantially since the late 1970s. While the economy is facing many problems, it is expected to continue to grow strongly. The relatively rapid economic growth in China generates the need for massive amounts of additional energy in the coming decades, creating challenges—among them, security challenges—for both China and the rest of the world.

The main objective of this statement is to briefly discuss China's energy situation in the context of long-term energy and economic developments in the country. Topics covered include discussions of the changing structure of primary commercial energy consumption in China in the past two decades, the future energy economic developments, China's rising energy import dependence at present and in the future, and an examination of China's quest for energy security.

2. Changing Structure of China's Primary Commercial Energy Consumption

In 2002, China's primary commercial energy consumption reached 18.8 million barrels of oil equivalent per day (boe/d), while the consumption was 45.9 million boe/d for the U.S., 12.8 million boe/d for Russia, and 10.2 million boe/d for Japan. On a per-capita basis, however, China's primary commercial energy consumption is about half of the world average. In 2002, China's per capita primary commercial energy consumption was only 9% of that of the U.S. Even if China's vast non-commercial primary energy is added, the per capita energy consumption in the country is still a little over one tenth of the U.S.'s per capita energy use.

China's primary commercial energy consumption increased at an average annual rate of 4.0% during the 1980–2002 period, which was far below the official GDP growth of 9.5% per annum during the same period, leading to a hot debate whether or not the low GDP elasticity of China's energy consumption during the past two decades was justifiable. Improvement of energy efficiency (from a state of very inefficient use of energy at the beginning), introduction of energy conservation measures, structural changes of the economy, and increase of total productivity of the country are all valid explanations of the relatively low growth of energy consumption in China. However, others suggest that it is quite possible that the official real GDP growth during the underlined period was overrated. We also question the validity of the super high GDP growth during the past decades but have approached the issue largely from the point where the measurement of conventional GDP itself has many flaws, particularly for a large developing country like China, as well as India.

Coal dominates China's primary commercial energy consumption. Oil is the second-largest source and it is very important to the economy. China's growing dependence on imported oil since the early 1990s has increasingly been a concern to the Chinese government. Natural gas currently has a minor share in total primary commercial energy consumption in China, but its importance is growing. Nuclear power was a late starter in China's energy development, but its expansion has been rapid since the 1990s. Hydropower has traditionally been given a priority status, and thus construction of hydropower plants has proceeded in a relatively rapid fashion over the past decades.

In 2002, coal accounted for 68.4% of China's total primary commercial energy consumption, down from 75.1% in 1980 and 79.3% in 1990. The coal consumption in 2002 is estimated at 1.31 billion metric tons (tonnes), up from 610 million tonnes in 1980 and 1.1 billion tonnes in 1990, but down from 1.45 billion tonnes in 1996. Back in the 1950s and early 1960s, the share of coal in total primary commercial energy consumption was over 90%.

Oil demand growth has been strong in China since the early 1990s. Total petroleum product consumption amounted to 4.8 million barrels per day (b/d) in 2002, up from 1.6 million b/d in 1980 and 2.2 million b/d in 1990, and accounting for 25.7% of the total primary commercial energy consumption.

In 2002, natural gas accounted for 3.0% of China's total primary commercial energy consumption. This share is still very low compared with the gas share in total primary commercial energy consumption for the rest of the Asia-Pacific region (15%) and in the rest of the world (26%). Despite its minor role in China's overall primary commercial energy consumption, natural gas consumption has been growing fast since the mid 1990s.

China's electric power generating capacity and electric power generation are the second largest in the world after the U.S., although China's per-capita electricity consumption remains low. The country's gross power generation reached 1,602 terawatt hours (TWh) in 2002, up from 301 TWh in 1980 and 621 TWh in 1990. About 84% of China's electricity is generated by fossil energy, mainly coal. Hydropower is the main non-fossil energy power, followed in distance by nuclear power.

By the end of 2002, China had over 80 gigawatts (GW) of installed hydroelectric power generating capacity, accounting for about 24% of the country's total installed power generation capacity. The actual generation of electric power by hydropower plants accounted for around 15% of the national total in 2002.

China started the development of nuclear power in 1982. The country's first nuclear power plant, at Qinshan in Zhejiang Province started commercial production in 1993. Commercial production started for the two nuclear power units at Daya Bay, Guangdong Province, in 1994. In 2002, four more generators began commercial operations. Altogether China has an installed nuclear power capacity of 6.1 GW as of October 2003. Together, hydroelectricity and nuclear power accounted for 3.0% of the total primary commercial energy consumption in China.

Clearly, China's rising primary commercial energy consumption and the structural changes since 1980 have been driven by a number of factors. The first is high economic growth. Despite the doubt about its accuracy, China is still perhaps the

world's fastest growing economy for over two decades since the late 1970s. The second factor is the growing demand for high quality energy products in the residential sector, which has led to the rapid growth of liquefied petroleum gas (LPG) and to a lesser extent natural gas use in China and the decline of coal's share in energy consumption in urban cities. The third factor is the rapid growth of transportation services and petrochemical sector capacities, which has substantially hiked the demand for petroleum products and drastically changed the structure of oil consumption, away from heavy distillates to lighter and cleaner products. Finally, China's demand for electricity has been strong. While China had to continuously rely on coal to satisfy the bulk of its electricity generation needs, the development of hydropower and nuclear power have also been stimulated during the past two decades.

3. Future Economic and Energy Outlook

Many of the same factors that drove China's energy consumption in the past, plus new ones, will continue to shape the future demand for energy, in terms of both total requirements and structural changes. The new factors include calls for more efficient use of energy, the increasing concern of China's energy security, and the balance between China's energy consumption and the environment and ecological systems.

For China's energy as a whole, though economic development is hardly the only determinant for the future, the long-term economic growth does form the basis for the long-term rise of energy consumption in the country. Using the same definition currently employed by the Chinese government, the average annual growth of the real conventional GDP may reach the following by 2020 under the base-case scenario: 7.5% for the 2002–2005 period, 7.0% for the 2005–2010 period, 6.5% for the 2010–2015 period, and 5.9% for the 2015–2020 period. On average, the projected growth rate is 6.6% per annum between 2002 and 2020. China's population will grow steadily during the period, albeit at much lower rates seen in the 1980s and 1990s.

Between 1980 and 2002, coal consumption in China increased at an average annual rate of 3.5% a year. Looking toward the next fifteen years and beyond, coal consumption in China will continue to grow, but its share in total primary commercial energy consumption is expected to decline to 59.2% in 2015 and 57.5% by 2020 under our base-case scenario.

For oil, the total petroleum product consumption is expected to increase to 7.6 million b/d in 2015 and 8.8 million b/d by 2020 under our base-case scenario. As such, the share of oil in China's total primary commercial energy consumption is expected to remain relatively steady at around 25.8% for 2015 and 25.4% for 2020.

Natural gas is expected to lead China's growth in energy consumption in terms of percentage growth. With efforts to develop its own resources and bring in imports in the form of liquefied natural gas (LNG) and by pipeline, China's natural gas consumption growth is expected to accelerate, raising its share in total primary commercial energy consumption from 3.0% in 2002 to 8.5% in 2015 and 10.0% in 2020.

Regarding hydroelectricity, the Chinese government's target is to increase or at least maintain hydropower's share in the country's total installed power generating capacity. Our base-case scenario shows that the share of hydroelectricity in China's total primary commercial energy consumption is expected to increase from 2.3% in 2002 to 3.7% in 2015 and 3.9% by 2020.

For nuclear power, firm plans will bring China's total installed capacity to 8.8 GW by the end of 2005. The government is set to make a new round of plans to build additional nuclear power plants beyond 2005. The current nuclear power generating capacity in China is expected to be tripled by 2015 and quadrupled by 2020. As such, the share of nuclear power in China's primary commercial energy consumption is expected to increase notably, from 0.7% in 2002 to 2.9% in 2015 and 3.2% by 2020.

4. The Rising Energy Import Dependence

China has long been a net coal exporter, but growing amounts of coal are also imported to meet the booming demand in South China. In 2002, China exported 84 million tonnes of raw coal. The country also imported about 11 million tonnes of coal in 2002, up sharply from a little over 2 million tonnes in 2001. Over the next ten to fifteen years, China's coal exports are expected to continue but are likely to decline in volume. By 2020, we expect China to become a net coal importer.

Currently, China is not a natural gas importer; all of the country's natural gas consumption comes from domestic production. However, two LNG projects have been approved, one in Guangdong Province and one in Fujian Province. Completion of the Guangdong LNG project is expected for 2006 and the Fujian LNG is set for a year later. Beyond 2007, more LNG imports are forthcoming, coupled with possible pipeline gas imports from Russia and Central Asia.

The overall projections for China's natural gas imports under our base-case scenario are the following: for 2015, China is expected to import 14 million tonnes per year (t/y) of LNG, which is equivalent to 1.8 billion cubic feet per day (bcf/d) of gas, and 1.9 bcf/d of natural gas by pipeline from Russia. By 2020, it is possible that China will import 22 million t/y of LNG (2.9 bcf/d of gas) and 3.9 bcf/d of natural gas by pipelines from Russia and Central Asia. Altogether, imported natural gas, either LNG or pipelined gas, is expected to account for nearly 30% of China's natural gas consumption in 2015 and close to 40% by 2020.

At present, rising oil imports is the only reason that China is a net energy importer today. In the future, natural gas will add to China's growing energy import dependence while the gap between oil demand and supply widens continuously.

China is still the largest oil producer in the Asia-Pacific region. Its oil production reached 3.4 million b/d in 2002. The majority of China's crude oil is produced onshore, but offshore production has been increasing rapidly. Over the next ten to fifteen years, China's upstream oil industry faces a precarious situation, as production from a number of large onshore oil fields are stagnating or declining or facing slow growth. The hope for incremental production is likely to come from the West, offshore, and other marginal fields in the South. On an overall basis, China's crude production is projected to grow slowly, reaching around 3.8 million b/d by 2020.

China's oil trade patterns have changed dramatically over the past two decades. The country's crude and product exports peaked in the mid 1980s but have since declined. In the meantime, imports of crude and to a lesser extent, products, have increased rapidly. China has become a net overall oil importer since 1993. In 2002, China's gross oil imports exceeded 2 million b/d while the net imports reached nearly 1.7 million b/d.

As domestic production continues to lag behind demand, China's net oil import requirements are expected to surge to 4.1 million b/d in 2015 and 5.3 million b/d by 2020. At 5.3 million b/d, China's projected oil imports by 2020 is roughly about half of U.S.'s net oil imports at present. As a result of these imports, the role of the Middle East, which is already important, will be rising significantly.

5. Elements of China's Energy Security Policy

Because of the continuous rise in oil imports and price volatility in the global oil markets, energy security has become a big issue since the late 1990s. In China's 10th five-year plan, which is currently under execution and covers the 2001–2005 period, energy security is mentioned for the first time and ensuring energy supply security is considered by the government as a precondition for implementing the overall energy strategy. The government continues to make it a priority for relying on domestic energy supply and stresses that coal still be the major fuel for China over the next five years. The government also calls for increasing links with international energy markets, establishing strategic petroleum reserves, diversifying sources of energy imports, developing alternative fuels to oil, and adopting more energy conservation technologies.

On an overall basis, China's energy security policy is still being formed. The main elements of the policy are the following: (1) Diversify the sources of energy imports, increasing the share of oil and gas imports from Russia and Central Asia; (2) Enhance overseas investments by state oil companies; (3) Broaden ways of trade to avoid transactions risk; (4) Increase the investment in oil and gas infrastructure and open more channels to imports; (5) Establish government-controlled strategic petroleum reserves; (6) Adjust energy consumption and production structures and reduce dependence on oil through coal gasification, liquefaction, and development of nuclear power; and (7) Actively participate in the formation of a regional community and establish a regional energy security system.

6. Concluding Remarks

China's primary commercial energy consumption is dominated by coal but the importance for natural gas is rising rapidly while the share of oil is steady. China is currently a net energy importer, and the import dependence, represented by rising oil imports, has been growing.

Over the next fifteen years and beyond, China will continue to rely on coal to support its basic energy needs but coal's share is expected to decline. The rapidly increasing oil and gas demand, coupled with flat domestic oil production growth and limitations on gas production, will lead to rising oil and gas imports and therefore pose serious challenges to China with regard to its energy security. How China copes with the rising energy imports and formulates its energy security policy will have profound impacts on the overall energy and economic developments in the country as well as Asia and the world as a whole.

Author's note: references and sources of information are available upon request.

**Key Social, Economic, and Energy Indicators of China, Selected Years,
1980-2002**

	1980	1990	1995	1998	1999	2000	2001	2002
Yearend Population (bn)	9.87	11.43	12.11	12.48	12.59	12.67	12.76	12.85
Real GDP (constant 2002 US\$ bn)	167	407	716	921	986	1,065	1,145	1,237
Real GDP Growth (%, official)	7.8	3.8	10.5	7.8	7.1	8.0	7.5	8.0
Per Capita GDP (constant 2002 US\$)	169.6	355.8	591.5	737.8	783.3	840.4	897.2	962.8
Inflation Rate (%) ¹	n.a.	3.1	17.1	-0.8	-1.4	0.4	0.7	-0.8
Urban Unemployment Rate (%) ²	4.9	2.5	2.9	3.1	3.1	3.1	3.6	4.0
Foreign Trade Total								
Exports (US\$ bn)	18.1	62.1	148.8	183.8	194.9	249.2	266.2	325.6
Imports (US\$ bn)	20.0	53.4	132.1	140.2	165.8	225.1	243.6	295.2
Total (US\$ bn)	38.1	115.4	280.9	323.9	360.7	474.3	509.8	620.8
Net Exports (US\$ bn)	-1.9	8.7	16.7	43.6	29.1	24.1	22.6	30.4
Direct Foreign Investment								
Contractual (US\$ bn)	n.a.	6.6	91.3	52.1	41.2	62.4	69.2	82.8
Actual Use (US\$ bn)	n.a.	3.5	37.5	45.5	40.4	40.7	46.9	52.7
Foreign Exchange Reserves (US\$ bn, end of the year)	1.3	11.1	73.6	145.0	154.7	165.6	212.2	286.4
Primary Commercial Energy								
Production (mmb/d)	8.56	13.85	17.07	16.31	14.33	14.01	15.24	18.10
Consumption (mmb/d)	7.96	13.05	17.37	17.37	17.42	17.67	18.14	18.76
Coal Share (%)	75.1	79.3	77.7	73.1	71.1	69.1	68.9	68.4
Oil Share (%)	20.3	16.9	18.2	22.3	24.2	25.7	25.6	25.7
Natural Gas Share (%)	3.3	2.2	1.9	2.2	2.3	2.6	2.7	3.0
Hydroelectricity Share (%)	1.3	1.7	1.9	2.0	1.9	2.2	2.3	2.3
Nuclear Power Share (%)	0.0	0.0	0.4	0.4	0.4	0.5	0.5	0.7
Oil								
Crude Production (mmb/d)	2.12	2.77	3.00	3.21	3.21	3.24	3.30	3.41
Crude Oil Imports (mmb/d)	0.01	0.06	0.34	0.54	0.73	1.40	1.21	1.39
Oil Product Consumption (mmb/d)	1.61	2.20	3.16	3.87	4.22	4.54	4.65	4.82
Oil Product Imports (mmb/d)	0.01	0.09	0.36	0.62	0.62	0.52	0.59	0.64
Total Oil Imports (mmb/d)	0.02	0.15	0.71	1.16	1.35	1.92	1.80	2.03

bn = billion. n.a. = not available.

mmb/d = million barrels of oil equivalent per day. mmb/d = million barrels per day.

Notes: 1. Defined as annual percentage change of consumer price index.

2. Officially registered. If job-losing state workers are included, recent actual rates were much larger.

Sources: Compiled by the author based on official Chinese data and author's own analysis.

Co-Chairman WESSEL. Thank you. I look forward to the questions.

Mr. Girdis.

STATEMENT OF DEAN P. GIRDIS, DIRECTOR, PFC ENERGY

Mr. GIRDIS. Good morning. Thank you, Members of the Commission. I work with PFC Energy. We are a global energy strategy firm. We work with governments, international oil companies and national oil companies. Since 1997, I have worked on China, principally with the World Bank. I have worked on hydro, coal, gas and power; and restructuring issues; and most recently, we worked on a paper directly for the National Development Reform Commission of China on energy security, and that was focused on oil and gas.

There are three issues I want to talk to you today about. First are issues related specifically to oil and gas demand; second, the resulting impact on China's energy security; and responses by the government.

I would say that energy and energy security in China, from the Chinese government perspective, is essential from in terms of economic development, employment, and as a result, for social and political stability. Energy security ties back directly for them to political stability.

And this is particularly true for oil and gas. Oil is vital for transport growth and gas to meet growing demand for energy in residential urban areas along the coast and for clean power generation. Specifically, there are three issues in energy security that China is looking to address. One is the increased use of coal, and that's clean coal, coal-bed methane and other technologies; efficiency measures throughout energy forms and sectors; and looking at oil and gas security and what they can do to import both.

There are basically a couple of points I want to emphasize in this regard. The first is the growing gap of supply. In China, we all know that; everyone spoke about that, China is obviously pursuing domestic development, but the combination of unattractive exploration terms, particularly in the west and Tarim Basin and, as well, just bad geology, is forcing China to look overseas. So there is not much they can do domestically for improving access to resources.

Regarding demand growth, I don't think I have to get into that, but we see them importing about 4 million barrels a day by 2010. In terms of where they will be importing it from, this is very important, and obviously, we see that the three focal points will be the Caspian, Russia and the Middle East.

In terms of gas, there are sufficient supplies available in Asia at this time for LNG. You will see large-scale pipelines from Russia coming into northern China as well on the gas side.

In terms of the availability, we see that there are sufficient supplies of both oil and gas available in the world markets in the near term, up to 2020. I think we do not see a lot of impact in terms of prices moving forward or little impact on oil and gas demand on the U.S. situation.

There's an interesting question: you could ask why is there a growing sense of insecurity by the Chinese government in terms of oil and gas? I think there are two principal reasons. One is their increased reliance on Middle East oil. They basically are not comfortable with this situation because it places them within the scope of U.S. influence. They feel that the U.S. could exert pressure on this part of the world and can obviously curtail shipments to China; and also, they see this indirectly as ability for the U.S. to stymie China's economic and political ambitions in the world.

When I ask my Chinese friends what do you want to be? What is your view of China? They say we just want to be like the U.S. We want to be an economic power. We want to be the next U.S. So that is generally the position you see amongst government officials, and it is less to do with ideology; more to do with just being the best.

The second is, obviously, the Middle East is an unstable part of the world, and they worry about that. And as well, other sources such as the Caspian, there are limitations both technologically due to pipelines and politics.

One avenue the government has pursued to improve its security is to use the national oil companies, SinoPEC, CNPC, and CNOOC, to secure access. And you see that they've done that, made investments overseas. The one comment I can make about that is there really has been no strategy on the part of the three companies. There has not been a well-thought-out strategy as to where should we invest, and what should we invest in? In fact, they have overpaid for a lot of the assets they have acquired. They are starting to change, though.

The fourth point is I think you'll see China trying to secure access through bilateral relations to a greater extent. And to do so, they're going to use a couple of leverages. The first, they'll use the political market leverage that China has, its clout politically and the market opportunity presents. You have seen that. It has done that with Australia in terms of getting access to the Northwest Shelf gas and getting upstream access, which is access to the reserves itself via the CNOOC, which is a Chinese state oil and gas company.

The use of the military: China has used their military in disputes with the Spratley Islands, with the Philippines, to secure access and to stake its claim to the oil and gas that's potentially in that part of the world. They have also tied investment to military exports, and in terms of access to oil and gas properties, they have even tried to reduce the import bill by supplying arms, bartering with arms to a number of countries, and these are generally marginal countries; you consider Iraq in the past, Iran, Sudan, and Angola.

And last, you'll see political support for marginalized countries. And an interesting situation happened in 2002. Premier Zhou Jiaming went on a tour of all of these countries. He went to Algeria. He went to Sudan, Libya, and the other countries mentioned. And immediately after that visit, the state energy companies visited all of those countries. So they really tie political and economic development together.

In terms of where they will focus their activities, you'll see three areas: the Middle East, because they have to look at the Middle East; it's the only place where the oil is available, and particularly, they'll look at Iraq, or they would like to look at Iraq. They don't have access now, but are interested in Iran and Saudi Arabia. In terms of Russia, they are trying to get better access to Russia, and Putin favors it. But the situation favors Russia in that they're already exporting arms to China, and they'd like to export energy as well.

Part of the problem is the Russian companies do not want to grant access to Chinese companies, which the Chinese companies want, to upstream positions. And even now, you see there have been problems in terms of securing access to oil and building Daqing pipeline, due to competition with Japan for those resources.

On the gas side, there are likely to be strong agreements there, just because it's logical given the location of gas in the Far East and the demand in China.

In terms of what I think the Chinese government will do to improve energy security, there are a number of issues they will look to. One, they will look at a comprehensive energy security policy,

which is looking at improving access and just formulating a more comprehensive approach. Right now, there is none within the government. They will look to reduce oil demand or manage it better, particularly in the transport sector. There are no well-structured transport policies in the government.

Third, they will look to leverage the bilateral relations, and this has been marginally successful to date. They'll look to identifying key Middle East suppliers. In this regard, what they see is they see post-9/11 and Iraq war, they see that the Middle East is being marginalized by the U.S. This is their position. And you see a lot of the countries that are traditionally exporters to the U.S. are somewhat fearful of their position to sell to the U.S. They'll look into new markets. And China, to them, is an attractive market. It has a high-demand growth. They're willing to pay market prices, and so, as a result, they're focusing on this part of the world in addition to the fact that the most supplies are available there.

They'll try to again build stronger ties with Russia. Right now, they're not that successful at that. And they'll probably continue to work with international organizations in terms of improving reform and restructuring of the industry and then, hopefully introducing transparency.

In conclusion, I would say that China is very focused on securing oil and gas reserves. And they really believe this because it is an essential component to economic development and to employment, and employment is important, particularly with the SOE, the state enterprises having to lay off thousands of people who are unemployed. They see that economic growth is important to put those people in jobs, keep them happy, keep the situation stable socially as well as politically. They want to maintain social order.

I think the U.S. can play a greater role in cooperation with the Chinese, particularly on the technical assistance side. The thing about the Chinese is if you—I'm not suggesting this is U.S. policy, but if you try to strong-arm the Chinese, they are very adversarial in that regard. You have to be more nuanced working with the Chinese, and I think any attempt on the part of anyone to stymie their efforts to provide energy security to the country, which they see essential to economic growth, they will be put in a defensive position, and they will want to defend themselves to ensure that their economy is not at risk.

Well, thank you.

[The statement follows:]

Prepared Statement of Dean P. Girdis, Director, PFC Energy

Energy Market Developments in China and Implications on Energy Security and Policy

Good afternoon. Distinguished Members of this Commission, it is a pleasure to come before you today to address such a timely and critical issue. My name is Dean Girdis and I am a Director with PFC Energy. PFC Energy is a strategic advisory firm in global energy, based in Washington, DC. We work with international and state-owned companies in the global petroleum industry on various aspects of their international oil and gas investments and market strategies.

Energy Market Development in China

The main objectives of this testimony are to:

- Discuss key issues related specifically to the growing oil and gas demand in China,
- Assess the resulting impact on China's energy security and

- Analyze the potential responses by the Chinese government in terms of policy and strategy.

China's energy markets continue to transform through the mechanisms of government sector reform and restructuring, expanding investment by domestic and foreign energy companies, and the resulting transition to competitive markets. The Chinese government continues to push through reform and industry restructuring measures in order to encourage the necessary investment needed to meet energy demand growth. Concurrent with these initiatives is the focus on improving energy security. **Energy, and hence energy security, is seen by the Chinese government as an essential input to the economy and a requirement to sustain economic growth, to generate employment and thus to provide for social and political stability.**

This is particularly true for oil and gas: oil is vital to support the growth of the transportation sector and gas will serve to meet growing residential energy demand and to displace the more polluting coal and oil plants in urban areas in coastal provinces. China recognizes that to improve energy security it: (1) must increase the use of coal, particularly through the application of improved technology, (2) introduce efficiency measures through the country and sectors, and (3) import more oil and gas from a variety of sources to meet demand growth and improve supply diversity. **The focus of this testimony is oil and gas demand growth, as this is the most critical in terms of geopolitical impact of China's energy demand growth and on the U.S.-Sino relations.**

Within this context, there are several issues that are intertwined and dominating China's energy markets and that are in turn impacting government policy including:

- China's growing oil and gas supply import gap,
- Availability of oil and gas supply,
- Geopolitical and economic dimensions of energy security in China, and
- Policy options to manage China's energy insecurity.

Security of Supply—China's Growing Oil and Gas Supply Gap

With China's robust economy forecast to grow 8% per annum to 2010, energy demand will continue to rise, if not increase above forecasts, leading to a growing reliance on imported oil and gas. Even with lower economic growth or increased domestic reserves of oil and gas, domestic production will not be able to meet demand growth. Increased utilization of alternative energy sources, such as China's vast coal reserves or hydropower, will be insufficient to meet energy demand growth. This is due to the structure of energy demand growth—increased demand for transport fuels for automobiles and natural gas for power and heat needs and to improve environmental quality in cities. China's status as a net importer of crude oil and natural gas will only grow.

Reflecting the decline in the ratio of energy to real GDP in China, the elasticity of energy demand in China has consistently been much lower than the energy elasticity in other markets—regardless of stage of development. By way of comparison the usual rule of thumb in forecasting energy demand in emerging markets is about "1" or a bit higher, implying that a 1% increase in real GDP will generate at least a 1% increase in primary energy demand. The energy elasticity of the Republic of Korea and other East and South East Asian emerging markets has consistently been about this level. The rule of thumb for industrial countries is about 0.3 to about 0.5 implying that a 1% increase in real GDP will generate about a third to one half percent increase in energy demand.

The sharp decline in the **ratio of energy to GDP in China and the low elasticity of energy demand are important because if continued they would imply that China's economy can continue to grow quite rapidly while not requiring the same order of magnitude increase in energy** that would be expected were the economy to grow as rapidly in any other country—regardless of the state of economic development. On the other hand if these trends are temporary, the likely increase in China's energy requirements could pose some serious challenges for China and the world.

However, despite a comparatively lower elasticity, China continues to focus on the development of domestic oil and gas resources throughout the country. Increased oil and gas exploration and development activity is moving west and is a primary target of government and foreign operators, including Shell and ExxonMobil, in an effort to fill the major West-East gas pipeline. **However, a combination of unattractive exploration terms and China's thus far unimpressive geology is unlikely to produce substantial additions to oil reserves though additional finds of gas are more likely.** At the same time, currently producing oil fields have been on the decline for over a decade. As a result of these facts the domestic supply of oil and gas will be insufficient to meet demand forecasts.

There will be an increasing reliance on imported oil and gas moving forward. Oil and petroleum product imports first began in the mid-1990s and the supply gap will grow as the demand for transportation fuels grows. According to recent analysis, imports are expected to rise from 1.7 mb/d in 2001 to 4.2 mb/d in 2010 and 9.8 mb/d in 2030.

The country of origin of imported crude is an important consideration. Although China has signed a recent agreement with Russia, and the Caspian has significant supplies, most crude will need to be imported from the Middle East. By increasing its reliance on the Persian Gulf, China will experience a similar dependency that the U.S. and Japan experience. China in part has acknowledged this situation through its pre Gulf War II commitment to invest in Iraq's oil industry once sanctions were lifted and its ongoing diplomatic efforts in Iran for joint exploration and production activities. An important factor impacting the origin of imported crude is the limitation of China's refining industry to process low quality sour crudes from Iran, Iraq, Saudi Arabia, and Kuwait. Some refinery upgrades are now underway.

In terms of gas, a similar picture is emerging. Ongoing production from the Sichuan and Shaanxi Basins will increase to meet growing regional demand in Sichuan and Beijing. New production is likely from Tarim and Ordos's basin. **However, gas demand will outpace domestic supply leading to rising imports of piped gas from Russia and LNG from Asia and possibly the Middle East.**

China will continue to experience a growing reliance on Middle East sources of crude oil, as Japan experienced in the 1970s and 1980s. It may be difficult for China in the near term to break this relationship as most available crude supplies are from the Middle East. Almost concurrently, China has sought to strengthen its ties to the Middle East, through discussions/investments with both Iran and Iraq, and to diversify them, via building relationships in other regions of the world. It is unlikely China will be able to reduce this dependency on foreign oil. **And it is this fact that raises fears in Beijing that China will compete with the U.S. for international energy (oil) supplies—thus, indirectly tying China's economic growth to U.S. geopolitical positioning and the recent pro-active use of the U.S. military.** Regarding gas, China will be less dependent on the Middle East as most supplies will come from Russia and Asia Pacific.

As a result of this growing dependence on imported energy, **the security of oil and gas supplies for China becomes important for several reasons including:**

- Increasing supply deficit of oil and gas has implications on government economic policies, structure of the industrial sector, foreign exchange requirements and overall economic growth;
- Gas is a critical component of the Chinese government's clean energy strategy to improve living standards in Chinese cities through displacement of coal;
- Oil is needed to meet burgeoning transport fuel demand, which is in turn tied to transport policies, higher standards of living, and thus economic growth; and
- Power demand growth forecasts cannot be met without gas for mid and peaking units, particularly in urban areas under environmental stress.

Sufficient Oil and Gas Supplies are Available in World Markets

In terms of oil, the five year supply outlook is reassuring to oil consumers, as it is clear there will be plenty of new production in the market from OPEC and Non-OPEC sources. Russia should be able to continue to raise exports by 300,000 b/d—500,000 b/d each year while deepwater production growth accelerates. Some notable supply areas will enter decline in this period, most notably the North Sea, while numerous mature areas will continue to decline, such as eastern onshore China, the U.S. onshore, and conventional Canadian onshore. In these mature areas, price volatility can have a significant impact on the rate of decline. As prices fall, companies have less money to invest, and scale back first in lower return mature areas. Without continuous drilling, mature areas decline quickly, and while production may stabilize after prices recover, output rarely recovers to previous levels, as seen in the United States in 1998 and 1999. **Despite the expected oil demand growth in China and other parts of the world production will grow sufficiently to meet demand.**

For LNG, global demand has grown significantly in the past two decades. Base load markets in the Asia-Pacific—Japan, Korea and Taiwan—have been the main driver of global LNG demand growth, with Japan leading the way as the largest, and most dependent, LNG buyer. LNG consumption grew from 35 bcmpa to 150 bcmpa in the last 2 decades. Much of this growth was driven by Japan as well as the emergence of Korea as a major LNG consumer provided an important step in

the region's demand for LNG. Going forward, LNG penetration in China and India will be key factors in regional LNG demand growth. However, there would appear to be ample potential gas resources to service LNG demand in the region over the next 10–15 years. **Expansions from existing projects complemented by plans for new Greenfield LNG developments should ensure these markets are well supplied.**

Demand growth for oil and gas in China will not have a major impact on prices as sufficient gas and oil is available in world markets. Saudi Arabia has sufficient spare capacity to meet demand growth and other countries are aggressively developing oil export projects. As noted above sufficient gas is available as well. **The oil and gas demand growth in China will have little impact on the U.S. economy.** Concurrent, the Chinese government has taken a proactive stance at improving the environmental quality through encouraging efficient use of oil and gas resources as well.

Growing Sense of Energy Supply Insecurity by Political Establishment

China's political establishment has a growing sense of supply insecurity driven by the reality of its growing oil imports and need for additional gas resources. Despite some coordinated and impressive efforts to improve infrastructure and to identify new sources of oil and gas, **the Chinese government has not formulated a long-term comprehensive strategy to address energy security.** If China cannot successfully address both the long-term and short-term issues associated with energy security it will be unable to meet the challenge of rising energy demand.

It is becoming increasingly evident worldwide that political relationships with exporting countries are key to securing upstream access to oil and gas reserves and second, for securing oil and gas export projects. This is particularly true within the current environment in Asia Pacific where there is increasing competition amongst Japan, South Korea and China over access to oil and gas reserves both within and outside of the region. Access to the oil and gas reserves of Russia is a key focal point of this competition.

The increased reliance on imported oil is of concern to the Chinese government for two principal reasons. First, given that the Middle East will be the most likely source of crude, this places China within the scope of U.S. influence in the Middle East. China does not feel comfortable with the ability of the USA to exert pressure in this part of the world. This is because China views the USA as a potential barrier to China's goals of achieving greater economic and political power. **Second and more importantly, the Middle East is a relatively unstable region of the world.** Beyond the Middle East sufficient alternative sources of crude are not readily available. And those areas with potential, such as the Caspian, are not an easy solution technically, commercially or politically.

Regarding natural gas, China has some yet undefined potential in Western China. As well, given the lower fungibility of gas, China has better access to both imported piped gas and LNG from within the Asia Pacific region. Russia has extensive gas reserves that are most easily monetized by exporting to China. Chinese officials also appear relatively comfortable working with Russia via bilateral agreements and by accessing LNG sources within the Asia Pacific region.

The impact of rising or high prices for both oil and gas is not a major issue in China as energy is one element of industrial production. This past year has seen high oil prices in world markets and Chinese markets with negligible impact on energy consuming industries in the country. Natural gas currently produced in China is sold at prices comparable to markets in Europe and future gas from the West-East Pipeline and imported LNG will be sold at western prices. **Moreover, in coastal provinces of China, where most export industries are located, current power, gas or oil prices are comparable to those in the U.S. or Europe.**

Role of the Chinese National Oil Companies (NOCs)

Ongoing reform and partial privatization of the state oil companies was a much-needed first step in improving the ability of these companies to operate under commercial principles. A second benefit from improved commercial operations is **that Chinese NOCs will be able, in part, to serve as vehicles to improve China's energy security.** The Chinese government is doing so by supporting and promoting investment in overseas oil and gas assets by the state energy companies—Sinopec, CNPC/PetroChina, and CNOOC. Such support is created through both high-level political delegations to countries with significant energy resources and indirectly through capital infusions.

For some time, **the Chinese NOCs, with government support, have pursued investment overseas in a number of countries.** By examining this mix of pre

and post NOC investment activities it is clear that the government, and by extension, the **Chinese NOCs, did not and have not formulated a clear investment strategy**. However it is important to note that the three Chinese NOCs are increasingly pursuing strictly commercial investment strategies that may not fully take into consideration broader objectives of energy security for China.

China's Leverage of its Bilateral Relations and Geopolitical Dynamics

The Chinese government generally takes a proactive approach to pursuing and building bilateral relations—this applies to the energy sector as well. Consideration of geopolitics and their impact on such activities is often a key consideration. However, in some instances China has failed to fully integrate nuances of geopolitics, particularly in regard to its activities in the Middle East, Russia and the Caspian. There are several issues that the Chinese government have taken into consideration when pursuing bilateral relationships and include:

China's ability to leverage its political and market strength

China has international political clout, given its size and its role as permanent member of the UN Security Council. However, **the greatest leverage China has is tied to the interrelationship of its political clout with its commercially attractive energy market**. Chinese officials are never tired of saying “China is a market with a billion consumers.” Although this may be an overstatement, China has used the argument that it is the most attractive developing country market given its size, growing economy, increasing market transparency, recent membership to WTO, and positive balance of payments to attract foreign investment. In terms of the energy sector, no developing market compares particularly when consideration is given for the **growing energy import gap and the current cost of energy in coastal provinces—equivalent in many instances to that of the markets in Europe and the USA**.

Role and use of Chinese military

China has used its military to address territorial disputes, such as the Spratly Islands dispute in the South China Sea, and as a means of barter for energy imports. China has traditionally limited the use of its military in direct territorial conflicts, though it has flexed its muscle with Taiwan. China has demonstrated however that it will use its military in territorial disputes to protect its rights of access to undeveloped oil and gas acreage. Second, China has pursued a strategy of tying foreign investment to military exports in a number of countries. For example, once it has secured access to foreign oil and gas properties **it has at times used arm sales and cross investment to reduce China's energy import bill with Iraq, Iran, Sudan, Angola, and Nigeria. There is scope to apply such a strategy to the Middle East or possibly Asia as imports rise from these regions**.

Political support for marginalized countries

China pursued support of politically marginalized countries, such as Iran, Iraq, Libya, Sudan and Angola, for economic interests—specifically in these cases for access to their domestic oil and gas resources. Interestingly, a state visit by Premier Zhou Jiaming in 2002 included all the countries noted above. This visit was immediately followed by a visit from several Chinese NOCs. The pursuit of such a strategy is quite logical as the targeted countries welcome access to Chinese capital (via Chinese NOCs) for investment in their respective oil and gas sectors. In particular, China has been strategically building its relationships and involvement with Iran over the past few years. Less directly, it has supported Sudan and Angola during their internal conflicts.

Accessing Global Energy Resources

China is seeking to diversify its oil and gas supply sources as a means of reducing the potential impact of supply disruption. The main concern in this regard is in terms of oil—given most available supply is not within East Asia and China's sphere of influence. In terms of gas, China more readily access reserves located in the Far East including Indonesia, Malaysia and Australia, for example.

Middle East

There is no more important region for accessing oil and gas reserves than the Middle East (defined as those countries in West Asia). The oil resource endowment of this region is unparalleled. The geographical location is ideal, being located between two major oil and gas consuming areas. Moreover, the ability of some of the countries in the region to maintain excess production capacity allows them to play a unique role in balancing global supply with demand. The gas reserves—and the transport competitiveness—of the Middle East are much less pronounced than is the case with oil, the region nonetheless plays an important role as supplier to the industrialized world.

In the long run, China will not be able to avoid increasing its dependence on Middle East oil due to supply availability. As a result the Chinese government and the Chinese NOCs have focused activities in the recent past on Iraq (pre-Gulf War II), Iran and most recently Saudi Arabia. The only means of mitigating this dependence will be by controlling the growth in Chinese oil demand. In terms of gas, China will be able to look to the Middle East as one of a number of diversified sources, and to use competitive pressures in the global gas business, especially in LNG, to drive a hard bargain between Middle Eastern and Asian suppliers. These gas purchases could also be leveraged to gain Middle East access for China's other industries and products.

Russia

The Putin Administration favors closer trade links to China in general, and enhanced energy sales in particular. **The economic basis for this policy is self-evident; the trade overwhelmingly favors Russia, for which China is already an important market for weapons sales.** Oil and gas exports would tilt the balance even more in Russia's favor, while drawing in substantial Chinese investments at the same time.

Strategic and security considerations also count in favor of closer ties, although here the picture is more mixed. **The Russian government certainly shares Beijing's reservations about the extent of American power,** and has sometimes worked with the Chinese government in attempts to restrain the U.S., for example through the UN Security Council. At the same time, however, neither country is willing to antagonize Washington by creating anything like a formal alliance to oppose American interests. This is probably more true of Russia, whose relations with the U.S. are actually quite good. Moreover, the Russian government and Russians in general worry about the 'demographic threat' China represents to its own declining population, particularly in the lightly inhabited Russian far east. This consideration cuts both ways, however, as the development of a vigorous energy trade with China could provide a vital economic boost for east Siberia.

Russian oil firms have vigorously defended their home turf, rebuffing most attempts by Chinese companies to acquire upstream assets. The most striking recent case of this behavior was the privatization of Slavneft in late 2002. Petrochina expressed a strong interest in bidding but was essentially forced to withdraw, with Slavneft eventually going at auction to Sibneft for a price well below the government's target.

Similar complications have dogged China's efforts to reach agreement with Russian partners on pipeline construction and long-term supply contracts. The history of plans for an Angarsk—Daqing pipeline shows the complexity of the bargaining this has involved. Russian President Vladimir Putin appeared to give his government's consent to the deal during an official visit to Beijing in December 2002, but within days the state-owned pipeline monopoly Transneft had announced plans for its own pipeline to the Russian Pacific port of Nakhodka. Even though China substantially secured approval for Daqing most recently Japan has lobbied hard and secured the makings of an agreement that could negate the planned pipeline to Daqing.

Kazakhstan

Kazakhstan offers similar opportunities for China to arrange stable and secure supplies of oil and gas, but the geographic obstacles present a greater challenge than they do with Russia. However most of Kazakhstan's oil and gas reserves are located in the northwest of the country, 6,000 kilometers from the nearest centers of population and industry in China. Yet the completion of the domestic West-East gas pipeline would reduce the distance by half.

If such a line is ever built, it will likely be because China saw a need for it on strategic and security grounds. In the meantime, China is seeking greater participation in Kazakhstan's upstream sector, and would certainly expect this as a *quid pro quo* in any deal for a pipeline and long-term supply contract. China's experience in this regard has been mixed so far. CNPC has recently raised its stake in Aktobemunaygas to 100%, but Sinopec and CNOOC were frustrated in their attempt to buy British Gas's interest in the Kashagan consortium. In the latter case it was reportedly the foreign partners of the consortium who blocked the bid, but the government of Kazakhstan itself is thought to have mixed feelings about a larger Chinese presence in the upstream sector.

Establishing a Strategy to Reduce Energy Insecurity

A comprehensive energy strategy that addresses both demand and supply issues is required to effectively manage the rising energy insecurity in China. In order to accomplish this, clearly defined objectives must be established, implemented and co-

ordinated by the Chinese government. These objectives can only be realized through development of a comprehensive energy security strategy, with accompanying policies.

There are several options and strategies that the Chinese government could pursue:

- Reduce energy demand growth through efficiency and DSM investments
- Increase domestic oil and gas output
- Diversify energy sources, CBM
- Pursue source diversification by investing in other regions of the world
- Reduce impact of supply disruptions and price volatility through creation of strategic petroleum reserve.

Chinese Government Responses to Improving Energy Security

There are a number of options that the Chinese government will likely examine and implement to improve its energy security including:

Establish an Integrated and Comprehensive Government Energy Security Policy

China will need assess and formulate its energy strategy and policy objectives with consideration for both reducing and managing domestic demand for oil and gas while concurrently improving its access to international oil and gas assets. A range of domestic policies will be required to address demand management whereas international relationships and bilateral agreements are required for gaining access.

Reduce oil demand

Design an energy policy that reduces oil dependence in general to a minimum. Structurally, oil usage, especially a transport fuel, will grow. Therefore, China should foster transport technologies, such as the use of hybrids, higher mpg requirements, taxation of particular cars and trucks that meet these requirements among others, and fuel taxes that flatten the crude oil demand curve despite the structure pressures.

Leverage bilateral relationships

China is pursuing this strategy with only a moderate degree of success to date. The most success it has achieved to date is working with the Russian government—however, private energy companies in Russia, particularly oil companies, have resisted China's actions. It is also important to note that the Chinese government may need to change the manner in which it attempts to leverage its position.

Identify key Middle East suppliers

Since the terrorist activities in the USA of 2001, the power brokers of Washington have politically marginalized the Middle East. As a result these countries believe their long-term position of secure energy supplier to the USA may be partially jeopardized—and of greatest concern is the potential loss of political leverage. In response, the USA has pursued a process of building closer ties to Russia and has positioned itself in West Africa in an attempt to reduce crude oil import dependency on the Middle East. The Middle East needs new, or alternative, markets for its energy resources and China presents an attractive export market. There is a high degree of complementary—China needs oil and some countries in the Middle East, more than others, need markets and capital. This argument is particularly true for a country such as Saudi Arabia and Iran.

Build stronger ties with Russia

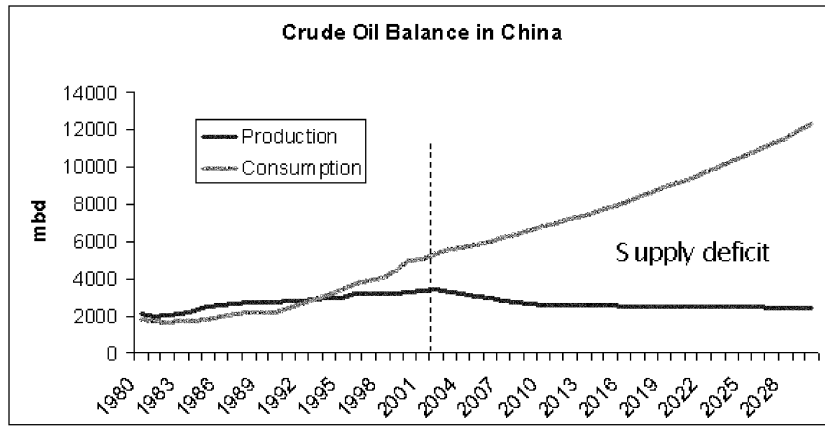
Russia and China complement one another. Managing political and economic linkages are almost impossible to separate from an energy security perspective. This is particularly true for China and Russia where there is a strong case for interdependency between the two countries—Russia needs China's hard currency to meet government budgetary requirements and China needs Russia's oil and gas to meet demand growth. As well, each is seeking stronger ties with each other to counterbalance growing U.S. political and military projection worldwide.

Work with international financial institutions

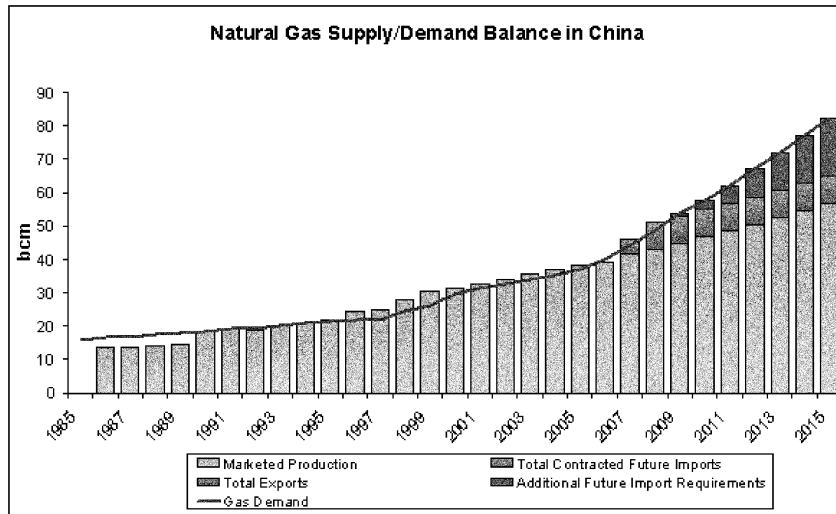
The role of international organizations in improving energy security via reform of energy markets has been important and will continue. The World Bank, in particular, has played a critical role in guiding power sector reform and restructuring and in encouraging transparency in the oil and gas sectors. There has been significant multilateral lending in energy sector though increasingly the level of cooperation is focused on improving sector operations and efficiency and on introducing better energy policies.

Conclusions

China recognizes the growing importance of secure oil and gas supplies for maintaining economic growth, generating employment and securing social and political stability. This position is central to China's actions and policies in terms of its bilateral relationships, geopolitical positioning and in the activities of its NOCs. The U.S. can play a greater role in the Chinese energy sector and possibly by influencing policies through increased cooperation at both the government and commercial level. **However, despite external pressure, the Chinese government will pursue policies and strategies that will meet energy demand growth in China and they will guard against any attempts that are seen as endangering their ability to accomplish this goal.**



Source: China Energy Outlook, IEA/SDPC (2002) and PFC Energy Analysis



Source: PFC Energy Analysis

China's Evolving Energy Markets

Market & Sector Transformation in China

DEAN GIRDIS of PFC Energy's Gas & Power unit assesses the transformations under way in China's energy market and the likely impact on the Asia energy sector.

CHINA'S ENERGY MARKETS continue to transform through the mechanisms of government sector reform and restructuring, expanding investment by domestic and foreign energy companies, and the resulting transition toward competitive markets. The Chinese government continues to push through reform and industry restructuring measures in order to encourage the necessary investment needed to meet energy demand growth. Such measures are seen as critical, by both the government and market players, to achieving a manageable energy balance - one that will be more consistent with China's overall economic objectives - by increasing energy supply, encouraging investment and by improving sector efficiency, increasing transparency, and introducing more competition, and ultimately, to reducing the cost of energy to the consumer.

There are several issues that are intertwined with, and dominant, in China's Energy markets, which are in turn impacting on government policy and market and competitive responses. These include:

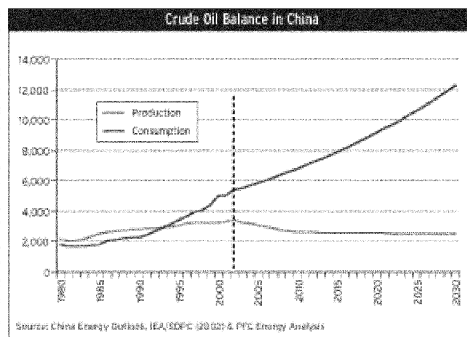
- Security of supply - China's growing oil and gas supply gap.
- Ongoing natural gas sector development.
- Restructuring and privatisation of the state's power assets.
- Government Policy - Ongoing sector reform and transparency

> ... energy security is much more complex than acquiring access to overseas oil & gas reserves <

Collectively, these issues could have a significant impact on Asian energy markets in terms of supply, geopolitics and long-term pricing.

Security of Supply - China's Growing Oil & Gas Supply Gap

China continues to focus on the development of domestic oil and gas resources throughout the country. Increased oil exploration and development activity is moving west and will focus on the Tarim, Junggar, and Tu-Ha Basins. On the gas side, the Tarim basin is the primary target of government and foreign operators, including Shell and ExxonMobil,



to fill the West-East pipeline, in the East China Sea, CNODC (China National Offshore Oil Company) and the Chinese government have high hopes of a major find. However, a combination of unattractive exploration terms and China's (thus far) unimpressive geology is unlikely to produce substantial additions to oil reserves through additional finds of gas are more likely. At the same time, currently producing oil fields have been on the decline for over a decade. As a result domestic supply of oil and gas will be insufficient to meet demand forecasts. As noted in the Chart above, China became a net importer of crude oil in 1996 and imports are expected to rise from 1.7 mbd in 2001 to 4.2 mbd in 2010 and 9.8 mbd in 2030.

Thus, there will be increasing reliance on imported oil and gas moving forward. Oil and petroleum product imports first began in the mid-1990s and the supply gap will grow as the demand for transportation fuels grows. According to the recent joint EIA/Energy Research Institute, State Development and Planning Commission (SDPC) publication on China energy demand, net oil imports by 2010 could reach as much as 4m barrels per day. The picture could be similar for gas given government plans to promote gas for power generation and city distribution. Even if substantial reserves are secured, LNG imports to coastal provinces and piped gas from Russia to northern China will be required.

The Chinese government is well aware of these issues and for some time has promoted investment in overseas oil and gas assets by the state energy companies - Sinopec, CNPC (China National Petroleum Company)/PetroChina, and



CNOOC. Although this response has some logic to it, energy security is much more complex than acquiring access to overseas oil and gas reserves - a myriad of issues are involved including geopolitics, strategic reserves, access to markets and multiply supply options. The reality is that China will have a continuing reliance on foreign sources of oil and gas that has raised government concerns over the country's growing energy insecurity.

As Japan did in the 1970s and 1980s, China is now experiencing a growing reliance on Middle East sources of crude oil. It may be difficult for China in the near term to break this relationship since most available crude supplies are from the Middle East. Almost concurrently, China has sought to strengthen its ties to the Middle East, through discussions/investments with both Iran and Iraq, and to diversify them, via building relationships in other regions of the world. It is unlikely China will be able to reduce this dependency on foreign oil. And it is this fact that raises fears in Beijing that China will compete with the US for international energy (oil) supplies - thus, indirectly tying China's economic growth to US geopolitical positioning and the recent pro-active use of the US military.

Natural Gas Sector Development: A Priority for Investment

Despite the current extended period of relatively moderate economic growth (by China's standards), the gas sector continues to be a focal point of activities by the government and investments by both Chinese and international companies. At present, natural gas plays a very small role in China's energy consuming economy with annual demand of about 30 bcm, equating to 3% of total energy consumption. However, most forecasts indicate that China's total gas demand will grow to over 70 bcm by the end of the decade - a 250% growth in demand.

To achieve this objective, the Chinese government is continuing in its efforts to create a more transparent gas environment to encourage investment via creation of a gas law and appropriate downstream gas regulations. And progress is being made. Concurrent, added incentives have been given to encourage exploration in the Tarim Basin as well as allowing majority foreign shareholdings in gas distribution companies.

China has aggressively pursued the development of the West-to-East pipeline (WEP) - moving ahead faster than many had expected - with construction now underway of the first phase from Jingbian to Shanghai. The WEP will serve as the catalyst for China's push to increase gas consumption though there are a number of obstacles including upstream reserves of only 16 tcf, downstream market development, project economics, gas transmission and end-user prices, and the enforceability of contracts. Demand concerns are

> China's total gas demand will grow to over 70 bcm by the end of the decade - a 250% increase <

warranted when considering the Shaanxi-to-Beijing gas pipeline, which began operating in 1997, and by 2001 had utilised only 63% of its 1.6 bcfpa capacity. Its capacity is now fully utilised and a second line is being considered.

LNG developments in China are moving ahead with the planned LNG re-gasification facilities in Guangdong (2005) and Fujian (2007) and more terminals are likely to be developed in coastal areas up towards Shanghai and even beyond. The critical turning point in the development of each terminal, beyond SDPC approval, was the signing of long-term import contracts with respective offshore liquefaction partners in 2002. And an essential component to these contracts is the inclusion of CNOOC as an equity participant in

the liquefaction terminals and its potential rights to upstream development.

Last, given demand growth projections in China and the supply limitations of WEP, offshore East China Sea and LNG, additional gas supplies will be needed particularly in Northern China. The most likely, if not only, source would be piped gas imports from the Kovytko and Chandravoshye fields in Eastern Siberia though it is possible a pipeline or LNG from Sakhalin could be developed.

Given the scope of activities now underway in China, such as the ongoing regulatory work, pipeline development and LNG investment, gas will play a growing role in several ways. First, it will meet some of China's growing energy demand and in the process help improve air quality in higher income and rapidly growing Eastern provinces through conversion of existing coal fired boilers and displacement of coal power plants. But more importantly, it is helping to shape government policy by moving reform along, as well as by influencing China's geopolitical positioning in Asia.

> The political regime is following through on earlier plans and is in fact accelerating them <

In terms of the gas development, the government (via the old State Council Office for Restructuring Economic System) has continued development of downstream gas regulations and the creation of a gas law. These are seen as critical complements to the existing upstream regulations and as a necessary prerequisite to encourage the planned gas sector development in the country.

Privatisation of the State's Power Assets – and Needed Next Steps

Twenty years of power sector development is coming to an important juncture in the privatisation of state power assets. This is the culmination of economic reform measures that have rapidly developed the power sector. Since 1980, the government has introduced a number of measures to promote investment including the introduction of surcharges on consumption to finance projects, increased access to provincial and local government funds, creation of independent domestic companies and use of foreign partners. Substantial additional investment will be required given power demand growth projections – and much of this growth will be dominated by coal fired power plants, through nuclear and gas power plants will play a larger role.

The ongoing privatisation of the State Power Corporation is aimed at introducing and promoting competitive power markets through the separation of generation from transmission and the introduction of bidding systems whereby generators will compete economically for access to the grid. Five electricity generation companies will be formed each with no more than 20% of the Chinese power market as well as two power grid operators who will purchase power on a competitive basis from the newly established generators.

The Chinese government rightly sees the privatisation as an important step in promoting needed sector investment. Additionally, these changes seek to break monopoly power,

introduce competition, reduce cost, develop more appropriate pricing mechanisms, promote interconnection of the national grid, and ideally, promote the creation of a transparent market system.

Regarding the power sector, the government still needs to pursue needed policy changes and reform generation, transmission and retail power tariff mechanisms to eliminate market distortions – a clear and transparent regulatory framework is a condition of such changes. In a move towards achieving this, the government has created a new power regulatory agency, the State Power Regulatory Commission. The expectations are that this agency will be addressing the issues noted above to ensure that competitive power markets are allowed to develop. The political regime is following through on earlier plans and is in fact accelerating them.

Government Energy Policy - Where is it going?

China has announced the formation of a new Energy Bureau that will be set up under the newly restructured SDPC, now named the State Development and Reform Commission (SDRC). While details are still sketchy, it appears that the new Bureau will consolidate many of the energy policy responsibilities that had previously been divided among parts of three major bureaucracies: the SDPC, which was the predecessor to the current SDRC, and the State Economic and Trade Commission (SETC) and the Ministry of Foreign Trade and Economic Cooperation (MOFTEC), which were merged to form the new Ministry of Commerce, this past March.

China has not had a formal energy ministry since the early 1990s. With all of the changes in energy policy that have been effected under the interim fragmented energy bureaucracy, some will wonder why the government now feels the need to consolidate. The answer is probably that while there have been a lot of changes in energy policy, there is still a lot that needs to be done in terms of planning and coordination, with respect to both primary sources and electricity. The energy industry is reforming, but the introduction of greater synergies amongst the oil/gas, coal, power and hydro sub-sectors will ideally increase efficiency of investment overall – particularly in the context of improving the overall efficiency of the power sector. It is likely that the key issues of the new Energy Bureau will focus on is improving overall security of energy supply, as noted above, and as a means of achieving this, the development of a strategic petroleum reserve.

The implications for international oil and gas companies seeking investment opportunities in China will likely be enhanced by the creation of the Energy Bureau as long as it introduces greater consistency and transparency in decision making. The SDRC and its predecessor organisations have always been involved in major energy investments, and to the extent that the basis for this involvement will not be more concentrated, the process will likely be more coherent and less subject to arbitrary changes and delays.

There are however some risks inherent in the creation of any new government organisation, namely that the new Bureau will make the wrong decisions, or that it will interfere with other key energy institutions, such as the National Oil Companies – or that it will make no decisions at all. Given the issues facing China and the location of the new Bureau with-

in the strategically important SDRC, it is at least possible that these downside risks can be avoided and that China may find itself in a stronger position to address the energy challenges that lie ahead.

Impact on Asian Energy Markets

The evolving, liberalising and growing energy markets of China could potentially have a strong influence on Asian energy markets in two ways. First, by increasing competition amongst consuming countries in the region and second, amongst suppliers competing to supply China - especially as China proceeds toward full implementation of its agreements under the World Trade Organisation.

Examining the first statement, increased competition for access to Asian oil and gas could develop over the next decade with major energy consumers, such as Japan and Korea. Although the level of competition could translate into cooperative agreements and joint investments, China is already beginning to position itself for access to Russia's Far Eastern oil and gas reserves. Yukos and CNPC have just signed an agreement to build Russian oil export pipeline from Angarsk to the Chinese city of Daqing for as much as 200 million barrels annually. This was accomplished despite strong lobbying by Japan for a new pipeline to the Russian port of Nakhodka - ultimately to supply Japan.

Access to and competition to supply oil products in the Asia Pacific region will also see the effects of China's increasing requirements for product imports with Singapore

and Korea being the likely beneficiaries. Key considerations here will include ongoing changes in product specifications.

Regarding gas, Japan and China are beginning to compete for access to Sahaklin gas via either LNG or pipeline routes. China's LNG market will likely stimulate the Asian LNG producers who have an advantage over Middle East sources - e.g., the Tangguh development is now underway after several years of delay. However, competition for LNG is also likely to increase in Northeast Asia. This past winter Japan and Korea competed to secure additional LNG supplies to address nuclear shutdowns and a cold winter. The inclusion of multiple LNG regasification terminals in China - and a corresponding growth in gas demand - could further increase competition for LNG supply, though this will depend on available liquefaction capacity.

Ultimately, the development of transparent and competitive Chinese energy markets should have a positive impact on the region as more investment flows to the area - though geopolitical relationships will increasingly play an important in securing access and supply ■

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Discussion, Questions and Answers

Co-Chairman WESSEL. Thank you. I appreciate it.
Commissioner Robinson.

Chairman ROBINSON. Thank you, Mr. Co-Chairman.

Ms. Jaffe, I was intrigued by something you said with regard to Libya, namely, some seven or eight U.S. companies have concessions on ice in Libya, pending the lifting of sanctions, I had not heard that the Chinese were making, shall we say, a bid for those concessions, but it doesn't at all surprise me.

I'm wondering if you're following that issue with respect to the Administration's potential inclination to lift sanctions on Libya to help remedy that kind of pressure? Regrettably, Libya has ongoing weapon of mass destruction and ballistic missile programs that are of concern.

I mean, I have a personal view as to whether it's appropriate to lift sanctions on Libya, which you can probably ascertain here, but I'm just wondering if you're seeing, in effect, some pressures building concerning the fact that those U.S. concessions could be lost if Qaddafi woke up in a sour mood and that they could actually be moved to China National Petroleum Company or another of the Chinese oil entities?

Ms. JAFFE. Well, I think that those concessions have probably always been at risk, because there are, you know, German and Italian and other European firms that already are active in Libya.

I don't want to speak for the Administration. I'm sure you have many opportunities to have people here in front of the Commission that are with the Administration. I guess my opinion as an analyst is that President Bush had the opportunity with Libya, you know, offering to pay compensation to the families and trying to offer some kind of apology language that maybe could meet a compromise and that the President has been very adamant in his public statement and public posture coming out into the White House lawn with the families of Pan Am 104; showing that they are the priority, and I think the Administration has been very responsive to DOD's concerns over the weapons programs in Libya and trying to get some commitment.

So I think that's the reason we haven't seen the President coming up to the plate to talk about the Libyan sanctions policy. I think the Administration has been very cautious, and I do think, as a person who spends a tremendous amount of my job time dealing with the American media, that too much emphasis has been placed on the Administration's so-called ties to industry in the sense that the Administration has the power to lift sanctions on Libya. Libya did offer tremendous concessions in the area of international terrorism. They did provide cooperation on issues sharing intelligence on Al Qaeda and that the President had an opening to raise the debate in this country about those sanctions, and yet, he didn't take it because these other issues that you mentioned, in my opinion, are more important to the Administration than just these smaller issues of the oil concessions that are at stake.

Chairman ROBINSON. That's positive news, and I agree with you.
Thank you, Mr. Co-Chairman.

Co-Chairman WESSEL. Commissioner D'Amato.

Vice Chairman D'AMATO. Thank you, Mr. Chairman.

I have a question that any one of you or all three of you could address, and that is the extent to which you have done any work in evaluating Chinese programs dedicate resources toward building clean coal technologies, both refining, mining and, in particular, power plants. The reason, of course, is that projections for greenhouse gas emissions are such that if the Chinese are not going to do anything in any substantial way here, I think you can probably pretty much forget about global warming issues.

When the Senate took up the global warming question, one of the things that it used as a condition for U.S. accession to Kyoto was the participation by China as a party to that agreement. I think rightly so, because if you look at their emissions, of course, by 2020, 2025, their emissions are going to exceed the combined emissions of all of the West. So if they're not going to step up to the plate here in the near future on that, at least as far as greenhouse gases are concerned, there is not much hope for an international regime that is going to really get our hands around this.

So for that reason, and given the fact that they have a very, very inefficient coal sector, transmission sector, energy power producing sector, the question is are the Chinese prepared to dedicate the kind of resources, are they doing so, and in cooperation with the United States, is there an opportunity here to do something really meaningful?

Mr. GIRDIS. If I could comment, I worked on a clean coal technology for six months on a paper with the World Bank. We were working on technology assistance. And the commitment is mixed. For example, in Shanghai, it's illegal to build new power plants that are not clean coal technology, which is fluidized gas desulphurization equipment, which is the U.S. standard for new coal plants, or natural gas plants.

So in urban areas that can pay, there is a commitment, and they have restricted new coal plants even with our technology. The problem is in the interior of the country is the ability and willingness to pay for those investments.

Now, they were interested in improving their own technology in this regard. They would favor introducing technology which they could manufacture themselves and not purchase overseas because of the costs associated with it, and that was one of the focal points of interest on the part of the Chinese, it is something which we could adapt new technology which we could then build and install in our plants.

But the main limiting factor in terms of wide scale adoption is the fact that it's very expensive, and there are a lot of coal plants in China, and it's going to be based on the ability and willingness to pay, and that is going to be limited to more of the coastal provinces that have power rates and energy rates which are comparable to the U.S. They pay more in Shanghai for power than we do here. But out in Chongging, they don't.

So there's an issue there, and as well, there are other things that they could do, such as coal washing at the mine mouth, and the large mines can do that. The small mines technically have been closed, but a lot of them are still operating, and it's very dirty coal, and they don't wash that coal. They have taken initiatives. The question is can they financially cover that? And I think there is a

resistance just due to the economic costs, financial costs, for wide-scale adoption.

Dr. WU. Can I add?

Vice Chairman D'AMATO. Yes, please.

Dr. WU. I just want to add quickly that I pretty much agree with those views, and they are very typical of the Chinese economy as a dual economy. You can see that you have very fast growing sectors and a regions in the coastal area versus the vast inland area. Now, so-called clean coal technologies, the definition varies in China. Here, the one we talked about is very advanced and applied perhaps, only to large cities. But in China, washing coal is a big deal. It takes a long way for China to washing all of their coal, which is a very primitive way of being clean, not even called clean technology here.

Shanghai is mentioned by by Dr. Girdis—China is developing the west-east pipeline. The eastern portion of the pipeline has been completed already, and the western portion will be completed by the end of next year to encourage the gas-fired power plants. They are raising the standards for the coal-fired power plants to make the gas-fired plants economical since the government doesn't want to subsidize the whole west-east pipeline forever.

As such, they are taking measures, in that sense, to gradually increase the emission standards in the developed areas, in the coastal region and in south China. And those are the areas that it is highly hopeful that U.S. technologies and clean coal technologies can find opportunities.

But again, I agree that China really wants to adapt the technology so that they can apply it massively rather than simply purchase. So the U.S., other than trying to sell clean coal technology to China, really needs to provide some kind of financial support and other measures to help China build up their own capability. And in other areas of China, the government really should do something. They do have their own step-by-step plan to reduce acid rain and SO₂ emissions, but it does not quite coincide with CO₂ reduction of the global warming.

As Mr. Caruso mentioned, global warming is still secondary. They have more danger of land, air and water pollution that they have to deal with. So those are the longer targets, like CO₂ reduction.

Mr. GIRDIS. If I could add one little point, they are cognizant of the problem. I mean, you talk to my Chinese associates when I visit there, and when I was going to Beijing in 1997, the air pollution was terrible, you couldn't see more than 100 meters. And people I would be working with would be out with respiratory illnesses all the time, and they know that is a problem. They know it is a cost to society, and that has been well documented by even Chinese environmental economists.

The problem is, you know, can we pay for it? And it just depends upon what urban area. Now, in Beijing, they restricted complete use of 40,000 teahouses that used coal a couple of years back and converted them to LPG, in part because the Olympics is coming up. But again, the other areas, it is going to be difficult to pay for.

Co-Chairman WESSEL. Commissioner Dreyer.

Commissioner DREYER. Yes, I was interested in Dr. Wu's statement that even as China is a major coal importer, it is also an important coal exporter and that the reason this has to be done is because of the gaps in the infrastructure which make it so difficult to transport the coal from, say, Shaanxi down to the southeast where it is needed.

Given the inferior nature, in terms of pollution-causing elements, of the PRC's coal, whom is it being sold to, and over what transport link does it go? And then, I have a follow-on question when you are done with that.

Dr. WU. Yes, I think 2002 was the year that China did see the rise, rapid rise in coal imports, but typically, China is not quite classified, you know, a larger importer of coal.

Commissioner DREYER. Exporter. Whom does it export to?

Dr. WU. Okay; the export of coal, the Chinese coal quality really varies, and as usual, it is certainly not up to the standard of Australian coal or Indonesian coal. They do try to sell the best of their coal to the international market, not, you know, that worst quality.

The buyers of Chinese coal certainly is Japan, number one, and Korea, too. Just like Japan, they import everything.

Mr. GIRDIS. Indonesia did as well, yes.

Dr. WU. Yes, Indonesia was exporting, anyway, and India.

Commissioner DREYER. I'm sorry; I thought that Indonesia was exporting coal.

Mr. GIRDIS. I think they also—they took a shipment a couple of years back from China.

Dr. WU. It's possible, but yes, Indonesia typically is exporting, like even to Hawaii, you know. We have a power plant there that is running very high-quality Indonesian coal. And even India is buying a limited amount of coal from China to run their power plants, which is very interesting, too.

So it is all over the place. China exports roughly about 80, 85 million tons, I can verify the number, last year, and they still strive to export a similar amount this year and continue the export for a number of years to come.

Commissioner DREYER. Now, I am interested in the fact that this infrastructure is unable to bring the coal from Shaanxi to, let's say, Guangdong, but somehow, this infrastructure is able to export coal to Japan and South Korea and India and Indonesia. How do we put that together?

Dr. WU. It is a similar infrastructure that, yes, they ship the coal from Shanxi, Inner Mongolia, to the port city in Shandong in Bohai Bay, and there, they either are shipped to Guangdong or are shipped to Japan. So you can see that in relative terms, Japan is even closer to this source of exports.

And again, you know, overall, China has a surplus in coal. They were trying to satisfy both the needs of the south and also export. But also exactly because of infrastructure and geographical issues, the users in south China, like Guangdong, they would rather import from neighboring Indonesia or Australia. It is easier for them to do so, and the quality is much better. That's why you see 11 million tons of imports last year and almost 85 million tons of exports also last year. That's a result of this dislocation and the large geographical area in the country.

Commissioner DREYER. Now, the pollution problem. You have stated what many of us have noticed, and that is that the cities that can pay to clean up are more interested in cleaner environments and are more willing to do something about it. Yet, China does have a central government, and for those of us who are a little bit skeptical of statements like, "Well, the U.S. could help China clean up the environment, and all you need to do is allocate more money," and so on. If you are a skeptic about this, you can say why is it that the Chinese central government says to the United States, "if you want a cleaner environment in China, you've got to pay for it," but then you see them investing money in some very questionable projects like sending people into space and building up their military. And this translates into a certain skepticism in Congress about why is the U.S. expected to pay if the PRC is going to spend money on these questionable projects?

There is also the Three Gorges project, which is also very controversial environmentally. Would any of you care to comment on that? I don't mean to put Dr. Wu on the carpet on this one, because I think you all had something to say about the issue.

Mr. GIRDIS. I could give you a little feedback. We know they have a central government. What I noticed, which is quite interesting, we were meeting with senior government officials at Jiangsu Province, Zhejiang, Shanghai, which are on the coast, and they're autonomous, to a large extent. They will listen to the central government; at times, they will take action on their own part, and they won't listen.

And most recently, you look at Beijing; the Municipal Government has been refusing to develop the gas resources, because they're fighting over the price that the central government says they need to pay, and they say, no, we won't pay it. Then, they say forget it, we won't do it.

So despite the fact that there is a central government, the provincial authorities and the municipalities have a lot of influence and a lot of control, and often, they will try to ignore Beijing. And that is particularly true in the coastal areas, Shanghai and what not. They have always been very autonomous, and you support that. But that is what I have noticed in that regard.

So the control isn't as great as you think. And I think that is what is fearful of the Chinese central government that they don't have as much control as they would like.

Commissioner DREYER. Well, I think I'll tell you what I think, and I think what I think, and I think it very strongly. If the central government really cares enough about an issue, it can make the provinces behave and the cities behave, it will. But so far, it hasn't evinced that will. And that is what concerns me.

Mr. GIRDIS. That could be true, yes.

Ms. JAFFE. Can I make a comment? Being a pragmatist, the United States has taken certain policies in the space area that have meant that if you are a major country, you have to take certain policies in the space area, because it's not a science effort anymore.

And the Chinese have real security interests, right? They have a long border with very unstable regions, and they have to make investments to consider their own national security. And so, maybe

their national security is a higher priority than environmental issues, and maybe here in the United States, too, post-September 11, when we look at budgets, we consider issues of national security more important than environmental issues.

So I would interpret what the Chinese are saying in a slightly different way. What I would interpret them saying is we have to set priorities for our spending, and global warming is not our immediate priority, because we have to concern ourselves with even local pollution, right? They haven't caught up with us in terms of regulation for local pollution in cities and so forth.

So I think what the Chinese government is saying is that when we look at our priorities, we can't have the luxury of the same priorities as the United States. And so, if you would like us to raise our priorities, let's discuss it. And indeed, you asked the question about coal. One of the reasons why there are coal exports to Japan is because Japan provided the financing for the railroads to move that coal to Japan, right? And we do see the Japanese spending a tremendous amount of money going into China and investing in things like clean coal technology and natural gas-powered vehicles.

And Japan has a policy where they have a very proactive government intervention in the car industry to provide scientific research for better technology cars, and I think part of their vision is that they will be exporting those cars to China, and that will actually not only profit Japanese companies in the long-term, but it will also help with the global warming issues. And I think that the United States, by positioning itself in environmental technologies and R&D, in energy and environmental technologies with an eye to exporting those technologies to China can have a win-win.

Mr. GIRDIS. If I could add, I agree with what Amy said. They have to intervene and reduce the pollution associated with coal. But the scale is tremendous. They can't do everything. They just can't finance it. They have to worry about unemployed people from SOEs, and they're accepting that some people are going to get sick, and some are not, and we have to manage the situation.

Commissioner DREYER. Yes, but of course, that is a health care cost as well.

Mr. GIRDIS. It is.

Commissioner DREYER. If people are sick, they are not very productive, and the government incurs certain costs for that.

Mr. GIRDIS. Yes.

Co-Chairman WESSEL. Commissioner Becker.

Commissioner BECKER. Thank you very much.

I have a question in a little bit of a different direction. Ms. Jaffe, I was intrigued by your explanation of the television and the impact that this is having on families and how China is just a burgeoning economic flower, so to speak. And I agree. I've made two trips to China, and they were quite a few years apart. And I was there last year, and it was startling to me to see the differences and the change.

But my question leans more to some of the comments you had in your written presentation about oil supplies. I grew up at a time when a great fear was that we were running out of oil in the world; that it is a finite commodity and that plastics and everything else was going to go down the drain. I am talking about post-World War

II periods. And somewhere along the line, that sort of ended. And I think it sort of ended when, after the Mideast oil crisis, the pricing went up significantly; then, there was more supply.

But I would like to ask you the question: are we running out of oil? And if China continues on the growth pattern that they are on, and if India does, and if the United States doesn't get a grip on things, like you were talking about, when will we run out of oil? When will it cease to be a pricing and availability commodity and become one of more strategic and necessary for survival?

Ms. JAFFE. Well, I am very glad that you asked me that question, because that is really a critical question in considering this issue.

If you take the range of opinion, you know, and running out, I think, is maybe not the right terminology, because we don't ever actually run out of something. We switch to something else.

Commissioner BECKER. We run out of gas. I mean, I've done that. So we don't run out of oil.

Ms. JAFFE. So people talk about the peaking of oil resources somewhere between 2030, if you're a pessimist, and 2050 if you're an optimist. But even those projections misunderstand—they're talking about conventional oil, like what, you know, your friends and my friends from Texas drill and pull out of the actual ground onshore, right?

You have to remember that at a certain number, \$15 a barrel, actually, we can take natural gas and change it into gasoline. We have the technology to do that. And because they had such a terrible bout there in South Africa with their politics, they developed incredible technologies, and I forget the number, but maybe it's \$20 a barrel or the panel could correct me, to move coal into oil, right?

And we now know, as you all know from your work, that we can take coal and convert it now to natural gas and burn it for electricity. So we are really never going to get to a stage where we ran out of fossil fuels, and we couldn't convert them into transportation fuel. I mean, that's not going to happen. So the question is really, you know, are we going to have a transition to something else, whether that would be hydrogen or whether we're going to use—I mean, it's possible today in Canada; every bus in the country is natural gas-powered, right? They have fuel cell buses.

So the question is, really, at what stage will we have a shift, right? And what I try to focus people is not what's under the ground, because the technology for drilling under the ground, going deeper and deeper offshore, you know, we're going to be able to produce oil now, for example, in Greenland in an economical way. Tar sands in Canada; it used to cost \$32 or \$33 a barrel to produce the tar sands of Canada. Shell claims they do it today for \$8 a barrel, right? And there's more tar sands in Canada than there is oil in Saudi Arabia. I think it's three times as much.

So we're really—it's not a resource question. In my opinion, it's a geopolitical question. PFC has this fabulous chart that shows a pie chart of where oil companies can go today to explore for oil. And if you imagine a piece of pie that you and I would want for dessert today at lunch—smaller than that portion of this pie chart is the areas where the international oil industry is allowed free access, you know, to explore and unfettered for oil. So it's a very small portion of what's available.

So really, when you think about U.S. efforts, right, you know, the question is, are we positioning ourselves in science? Are we positioning ourselves in industry to catch the wave when either we have such a political barrier to using oil because of crisis in a place like the Middle East or elsewhere that we need to move to new technologies, and the economic stimulus is going to be there; will we be positioned, or will Japan be positioned better, or will China be positioned better, or will Europe be positioned better, because how many resources are we allocating towards R&D?

Commissioner BECKER. But at some point, it's going to start running out, forcing these changes, or if you don't make the changes, then—

Ms. JAFFE. My opinion is that the global warming issue and environmental issues will force the change way before geology will force that change.

Commissioner BECKER. So what would you estimate the world supply right now? How many years?

Ms. JAFFE. 100 years, 200 years if you add turning coal into oil.

Commissioner BECKER. No, just oil.

Ms. JAFFE. Just oil, conventional oil? Or all oil?

Commissioner BECKER. Oil oil.

Ms. JAFFE. All oil, 50 years.

Commissioner BECKER. Fifty years?

Ms. JAFFE. Yes.

Commissioner BECKER. Would the other two panelists agree with that?

Mr. GIRDIS. I think Amy is right on the mark there. I mean, you know, everyone has been calling the coming end of the oil reserves for years, and if technology develops that allows you to extract more oil from the ground from conventional sources, and the tar sands is a tremendous resource which would be economic. And I think you will see new technologies becoming more to displace traditional fuel sources.

If you look at wind power, for example, the cost curve has come down by a factor of almost 10 in 20 years. It's almost competitive with base law power generation. So you'll see technology advances come along that would meet that—I think will meet that demand in the future.

Commissioner BECKER. Could I ask one more question?

Co-Chairman WESSEL. Quickly, yes.

Commissioner BECKER. Just a very quick question. You had made reference to the fact that China was paying market prices for the oil it is getting.

Mr. GIRDIS. And we did a detailed study, demand study, of power in four provinces equivalent to the UK and France together, and this was in 1998–99. And the power prices, the LPG prices, were equivalent to U.S. base prices and European base prices. You know, and I think the power prices for the consumers were close to what I'm paying now.

Commissioner BECKER. So this effort of, in effect, China owning the barrel is geared—they're not—is geared just for access, then, and there's no problem with them—there doesn't appear to be any problem with them in paying market prices for the oil that they

get? They're not trying to cut some deal, get their hooks into a country like Iran?

Mr. GIRDIS. No, Iran is smart enough not to do that. No one is going to do that, you know. And if you look at even the gas, the domestic gas, the price they set for gas going to power stations from the west-east pipeline is upwards of \$3.80 mmbtu, which is pretty close to—U.S. prices are pretty high right now, but it's higher than European prices.

Commissioner BECKER. Thank you.

Co-Chairman WESSEL. With that, we are going to close this panel. Our transcriber needs to move locations.

We will resume our hearing at 1:30 this afternoon.

[Whereupon, at 12:24 p.m., the hearing recessed for the luncheon speaker.]

LUNCHEON SESSION

Chairman ROBINSON. As you finish your lunch, I'd like to first welcome our very distinguished luncheon speaker who needs no introduction, the Honorable James R. Schlesinger, Chairman, board of Trustees, the Mitre Corporation. And, that said, I'd like to turn over the program here to our Co-Chairman of today's hearing, Michael Ledeen, who will nevertheless refresh some memories concerning his immensely distinguished career.

And with that, Commissioner Ledeen.

Co-Chairman LEDEEN. Thank you. I knew if I lived long enough, I would eventually get to introduce Jim Schlesinger at some event. Jim Schlesinger has been just about everything you can be and has done it all exceedingly well. He's written some of the most important things on the relationship between economics and geopolitics. I think one of his first books when he came out of Harvard was, in fact, on that very subject. And he has been Secretary of Defense, Secretary of Energy, Director of Central Intelligence, advisor to presidents. He's now Chairman of Mitre Corporation, which is a very high-powered organization and still sits, I think, at the place where we met originally, at CSIS, the Center for Strategic and International Studies.

And, Mr. Secretary, we really badly need illumination and enlightenment after a very gray morning, and we're all very much looking forward to your words on how to look at the relationship between China's appetite for energy and what kind of excitement China may cause the rest of the world as a result of that.

STATEMENT OF JAMES R. SCHLESINGER CHAIRMAN, BOARD OF TRUSTEES, THE MITRE CORPORATION

Mr. SCHLESINGER. Thank you, Commissioner Ledeen.

I am not sure how much enlightenment I will provide. I will start with the observation that China is a different country from the China that I visited at Mao's invitation in 1976. Then it was in the midst of the Cultural Revolution. Then you had Red Guards sitting in the classes of physics professors—to see that physics was not taught in contravention of Marxist doctrine.

It is 25 years now since Deng Xiao Peng started his revolution, and China has been transformed. The point that I want to make, though, is that Mao is dead, and Mao's belief was autarky. We see in China today the inverse of autarky, a growing dependency on

foreign markets, on foreign sources of supply and foreign sources of technology and foreign sources of capital as well. China is just about to forge past the United Kingdom in terms of direct foreign investment.

So it is a remarkably changed country, and autarky is no longer the policy of China in regard to energy any more than it is elsewhere.

I mention 1976, that visit that I took at that time, because Marshal Yeh, who, a few months later, incarcerated the Gang of Four and was treated as an icon within China, had been informed or misled into believing that the Soviet Union was dependent upon the Middle East, upon the Arab Middle East for its petroleum and that since the People's Republic relations with the Arab states were splendid that this meant that the Soviet Union could not be very aggressive, despite the array of divisions and tanks along the Chinese border.

I pointed out to him that Russia was not dependent upon the Middle East. Indeed, Russia was a principal exporter of oil, and consternation came through the room, and Marshal Yeh looked around at his subordinates in fury. The point to draw away from that is that in 1976 and today, the leading figures in the People's Republic of China are quite aware of the potential vulnerability associated with energy matters.

Now, I point out that China has been transformed. Change has been dramatic. The evolution is substantial, has been going in the right direction. But change has frequently come to China, and change could occur in a less-benign way, from our standpoint.

You have sent me a list of questions, so I will respond to these questions serially. The first question that you sent to me was what policy objectives shaped China's energy decisions, and what strategies is China likely to use in the future?

First point that I should make is that these issues regarding energy must be viewed in the larger context of Chinese policy; that energy issues are not the paramount issue for China any more than energy issues are the paramount issue for the United States. The paramount issue for the Chinese at this time is substantial economic growth. It is the source of legitimacy for the Communist Party of China at the same time that Marxism or communist ideology has lost any hold that it ever may have had on the Chinese public, so that economic growth is an essential element for the retention of power.

What are the policy objectives with regard to energy? In a sense, they are the same as everybody else's policy objectives that are dependent upon imported oil. The Chinese are interested in an economic supply of oil and the opportunity to play around in areas that we have decided not to operate in, such as Iran. If they can get contracts or positions within Iran, they are going to do so. And that becomes more economic from their standpoint if the United States stays out. Same thing with Libya.

The question that you put to me said, in effect, are they going to go into these places? Do they favor these places? I think the answer to that is no, but they are quite prepared to exploit the opportunities in these places. You raise the question how does this all fit with regard to the U.S. war on terrorism, and the answer is—

it depends on how you define the war on terrorism. The Chinese, quite obviously, regard us as an ally with regard to Al Qaeda. They look upon us hopefully with regard to the Muslim problems that they are having in Xinjiang, but they do not identify with the U.S. war on terrorism to the extent that it might involve Iran or Libya.

These are governments that we don't like, which have harbored or encouraged terrorism in the past. They do not go that far. The Chinese really deal with what they regard as clear and present dangers, to quote Oliver Wendell Holmes, and the clear and present danger for them is Al Qaeda support of what is going on in Xinjiang on the part of the Uygurs.

And it must be remembered that the Chinese—this is in regard to your question Chinese oil diplomacy—that the Chinese are much more interested in their own policy objectives than they are in our policy objectives. That is just the reality of this world. As a consequence, they are not going to forego what they regard as opportunities simply to keep the Americans happy.

The third subject that you put to me is the question of geopolitics, how does China's rapidly-growing needs for energy impact geopolitics with regard to East Asian regional relationships, Sino-Russian cooperation, conflict in the South China Sea, China's role in the United Nations and China's outreach for oil in the Western Hemisphere. Answer once again is we must remember that the Chinese look more favorably on their objectives and their interests than they look on ours. That is one of the realities that we can count on.

They are interested with regard to energy in the same kinds of things that we are interested in. They are interested in limiting their dependence on foreign sources of supply. They are interested in developing domestic sources of energy, including oil and coal, and they have turned to nuclear power to a degree that we might think is unnecessary because it limits the dependency on foreign sources of supply and, incidentally, permits them to burn less coal that they're concerned about.

And finally, on hydropower, despite the continued blandishments of the previous Administration with respect to the development of the Three Gorges hydro project, which will produce 20,000 megawatts of power, they have forged ahead with that. Our Administration or at least the previous Administration may not like that. Environmentalists may dislike it intensely. Economists may regard it as a malinvestment of their resources, but they have forged ahead. One reason is that they want to develop their domestic resources, and hydro is one that is not going to be dependent on imported LNG, so on.

They are interested in their view of the world, their interests, and how does this impact geopolitics? Today, the geopolitics of oil are less connected with the threat of cutoff of supply by the producers than they are with regard to the pipeline distribution. One of the questions that you put to me is how does this affect Sino-Russian cooperation? They are going to inevitably be very close.

That pipeline that the Japanese are hoping will go to the Pacific is likely to go into Daching; and the Russians will be delivering to them, I would guess, in the years ahead, a million barrels of oil a

day, maybe 2 million barrels of oil a day, out of a production that will probably level off at about 9 million barrels a day.

The Chinese look upon Russian oil as a godsend, because it does not have to go through the Straits of Malacca. The Chinese, understandably, will be worried about their lines of communication, their logistics, which go through the Malaccan Straits, and that will be a continuing source of concern to them, and they will seek to limit their dependency on Middle Eastern sources of supply, but it will also mean that they will strive hard to maintain satisfactory relations with the governments in Southeast Asia, most particularly, in this case, Indonesia. They do not have to worry about maintaining good relations with Singapore, at least under the present dispensation.

The interesting thing about Chinese geopolitics is that the tone has changed. It's much more sophisticated than it was. If you look back two and a half years since a Chinese pilot almost knocked that Navy CP-3. I think that the political leadership saw that they had been hornswoggled by the military, and they didn't much like that, and that they have since become much more sophisticated.

As a general proposition, as you look out into the future, I think that the likely influence of the military on geopolitics, on the sophistication of Chinese diplomacy is likely to diminish, partly because of a changing generation; partly because of the continuing emphasis upon economic development, which grows increasingly dependent upon the outside world and globalization, and partly because the events of 9/11 have led to a diminished emphasis in the political establishment on the American threat and, therefore, those who are pointing to the American threat will have less influence than they did in the past.

That was a pretty stupid action on the part of the military 30 months ago. There was no reason for that, and I suspect that they have been—I suspect; I do not know; no one has passed me any information from Beijing on the subject, but I suspect that the military were told that this kind of adventurism just is not very helpful to China.

The Chinese have settled their quarrels with the Vietnamese in such a way that there will be joint development of the Gulf of Tonkin. In the past, one finds it hard to think of prior Chinese governments actually resolving problems, at least in the short run. I think that they recognize that the hostile tone that they had not only toward the United States but towards their neighbors was doing them absolutely no good, and as a consequence, they have changed the tone.

As I indicated earlier, China has changed, but it can change again.

Finally, you raised the question what about their behavior in the United Nations? It's kind of interesting that they have a different tone in the UN as opposed to France, Germany and Russia. They stayed out of the line of fire with regard to the Iraq situation. They very carefully did that. The Russians, I believe, made a strategic blunder not in that they didn't support the United States but that they lined up so openly with the French and the Germans. The Chinese were opposed to our going in, but they were quietly opposed. There was none of the noise that accompanied the Russian decision, let alone the German and French decision.

So I think you're dealing in geopolitics with a much more sophisticated foreign policy on the part of China than has existed in entire period since the Tiananmen Square episode, and most dramatically, moreso than existed during Mao Tse Tung's dominance.

The fourth question you put to me is does China's fuller integration into the world energy market change the dynamics of Sino-U.S. relations? Somewhat. Will the U.S. and China be in competition for sources of energy supplies? You bet. They will be looking for the opportunity to carve out sources for themselves of oil. They are going to be our competitors with regard to the supply of oil, and if you have been reading the newspapers lately, the ups and downs of Chinese imports and import policies affect the oil market and the price of oil.

They have been driving the market, to a large extent. Their imports are now up to something on the order of 2 million barrels a day, and if the projections that were given to you earlier today are correct, they will be importing 6.5 or 7 million barrels a day by 2020, and that makes them a major factor in the oil market, which they were not in the more distant past. In the past, they basically sold a little oil to Japan. It was high-paraffin oil, and there was very little market for it elsewhere other than in Japan. But today, they are a major factor in driving the market. Chinese economic growth has helped sustain the oil market during this period, and we have got to expect that they, no less than the Germans, the French, the Japanese and others, add to the demands in the oil market and are consequently competitors of ours for oil supply.

Finally, your fifth question: what policy options should the United States explore to influence these dynamics and China's energy policy in a manner more favorable to U.S. national security interests? Once again, I go back to what I said in response to the first question, which is these issues must be regarded in a wider context. We have more important fish to fry than Chinese energy policy. To name a most obvious one, cooperation with the Chinese on the question of North Korean nuclear capabilities is, for us, much more important and far more immediate than anything that we are likely to do with regard to the energy markets.

We have more important fish to fry; they know that we have more important fish to fry. There is relatively little we can do with regard to sources of supply other than to outbid them. You will have noticed that when British Gas recently decided to sell its stake in the Kashagan find in the Caspian Sea that China stepped forward to bid on it. That bid was about to be accepted—except for the fact that the other owners of Kashagan had the first right of refusal, and they stepped in and headed off the Chinese from the acquisition in Kashagan, which is the only super-giant that has been discovered in these last 40 years.

And that, of course, is influential. But the way that you influence such things is to outbid China or, in this particular case, have a contract that gives you the right of first refusal. We are not going to significantly affect the oil market in a way that is damaging to China. If we stand aside, if we impose sanctions on countries like Iraq or Libya, that creates an opening for the Chinese to move in. So we have to decide what is the more important thing from our own standpoint, which is whether we want to compete

with them with respect to sources of supply or whether we are prepared, for other reasons, to forego such sources and see them establish a position in the Irans or the Iraqs of this world.

They have been attempting to establish a position in Central Asia. That is not going to be easy. They wanted to build a pipeline, but that is going to be a very costly affair, and so far as I can see, nobody has stepped up with the capital to build that pipeline.

Again, let me close by saying that this is a vastly different country; that it is a country now largely dependent on foreign investment, upon foreign markets, and for the immediate future, it has a partial coincidence of interest with the United States with respect to North Korea, obviously, and with respect to the more ferocious aspect of the terrorism problem. And so long as they feel themselves to be dependent upon those international relations, they will be constrained in the degree to which they are prepared to upset those relationships.

And so, since I assume that for the next 15 or 20 years, their primary interest will be economic growth, I think that we ought to be focused on the interests with the Chinese that we share in common.

I will close by observing that we cannot expect China or even any smaller country to do what we want. We have got to pick out those things that are most important to us and emphasize those things in our diplomatic relations. To the extent that we talk about human rights in Tibet or what is going on with respect to the treatment of dissidents and so forth, we are investing a significant part of our own political capital in dealing with China and that that political capital is not available for those issues on which we are likely to be more effective and which are ultimately more important to us, particularly with respect to the spread of nuclear weapons and the war on terrorism.

I think that we can elicit considerable cooperation from the Chinese if we focus on those things. If we spread ourselves all over the map, we are going to be less influential.

Co-Chairman LEDEEN. Mr. Secretary, thank you very much. The luncheon is now at a close, and this road show will now travel back to room 124, where Mr. Woolsey is waiting for us, and we have to start in about 45 seconds.

[Whereupon, at 1:32 p.m., the luncheon session was concluded.]

AFTERNOON SESSION, 1:35 P.M., THURSDAY, OCTOBER 30, 2003

PANEL III: CHINA'S ENERGY DIPLOMACY AND ITS GEOPOLITICAL IMPLICATIONS I

Co-Chairman LEDEEN. It's a singular personal pleasure as well as an honor for the Commission to welcome Jim Woolsey here today. Jim Woolsey has one of those careers that make us all envious. He has gone from ballroom dancing instructor to Director of Central Intelligence, has been a leading Washington attorney, and more recently a celebrated advisor, author, speaker and so forth, and we're really delighted that you came here today, and we're very much looking forward to your remarks on Chinese energy and geopolitics.

I should tell you that we've just finished a lunch with Secretary Schlesinger. He had a lot of interesting things to say. This morning

we are as full of data on Chinese energy as you can possibly imagine, so please do not drum us with more data but illuminate us with provocative thoughts. Thank you.

**STATEMENT OF R. JAMES WOOLSEY
VICE PRESIDENT, BOOZ ALLEN & HAMILTON**

Mr. WOOLSEY. Thank you, Mr. Chairman. I will do my best on the latter because data is slim for me. Since this is not a subject I study continuously. I've read in it, and anything I really know by way of data would be certainly derivative of the people you've already had speak to you.

In my judgment, China will move toward an increased position of power and influence in Asia pretty much regardless of the energy situation. I think the self-image of the Chinese leaders and their pride in Chinese history and the direction of the country is one which will lead them to build their military forces to exploit technology. They will do this both for national prestige, as in the recent man in space shot—an extraordinary achievement for them, I think—and to build up the military capability to, e.g., keep American aircraft carriers at a distance if there should be a crisis with Taiwan in the future: to be able to exert influence in Asia.

I think that there could be some direct and immediate relationship between aggressiveness in the South China Sea and possible deposits of oil, and there could be some willingness either to cooperate with or to influence the directions of regimes in Central Asia based on the oil from that region.

This will be heavily complicated, of course, by the fact that their own treatment of the Uyghur and the Hui and other citizens of Western Xinjiang, so-called Chinese Turkistan, has been in many cases brutal. But they also do have to some extent a real problem of terrorism there, and therefore, they will find their interests somewhat at odds with some of the governments in authority in Central Asia.

I think the major effect of Chinese energy needs is likely to be simply that of a growing economy. I'm not sure how much one can trust their economic statistics, but today it looks as if the economy is growing well. And if that growth moves into North China and Central China as the large publicly-owned, government-owned facilities there, the economic dinosaurs are disestablished, the economic growth could take off even more. And that means consumption of fuel of all kinds, including particularly what I think should concern us: oil.

Chinese demand added to Indian demand, given the populations of those two countries, could put a substantial upward inclination on the price of oil in the near and mid-term. Yes, there are countervailing possibilities: Iraqi production, increased Russian production, and the possibility that the economic and environmental costs of exploiting the heavy oil of Canada have been already reduced enough that it becomes a realistic alternative. These latter factors could move oil supplies up as well. But the demand that can be created by India and China—as, e.g., the average Chinese moves first from a bicycle to a motorcycle, and then from a motorcycle to one of those Buicks that General Motors is building over there—will potentially move oil demand in the world to very substantial heights.

To me, that is the heart of the matter and that entails substantial risks for us, because the estimates of world oil reserves—you'll excuse me I hope for a little bit of data here—vary generally between a trillion and two trillion barrels, depending on what probabilities you assign and how optimistic or pessimistic you are. That's one to two trillion barrels of conventional oil, not counting the heavy oil in Canada and Venezuela and elsewhere. As those reserves are looked at in light of the geological realities of the oil fields, some things become pretty clear.

King Hubbard, the distinguished geologist of the 1950s, predicted some twenty years in advance within a year, I believe, the date at which the oil fields of the lower 48 States of the United States would peak in their production. That is a very important point for any oil field because under Hubbard's theory, now borne out, production costs tend to begin to escalate rather sharply when the field hits its midpoint. According to the numbers I saw when I last looked into this matter a while back, the fields on the average in the world outside the Persian Gulf either have already peaked or should peak within the next very few years.

The Persian Gulf fields will thereby increasingly be the low cost source of oil. Therefore those who own those fields would have even more capability of raising or lowering the price of oil at their discretion.

Whether the world's oil fields peak, net, sometimes around 2010 or 2020 is largely a matter of whether one believes the one trillion barrel estimate or the two trillion barrel estimate. But in any case we are a relatively few short years from, first, an increased potential dominance of the oil market by the Middle East and, second, an increase overall in the cost of exploiting oil reserves. This may occur simultaneously with a substantial upward movement in oil demand from the increasingly large middle classes of India and China.

The Middle East outside Israel and Turkey consists of governments that are either pathological predators or vulnerable autocracies. This is not a good mix. When Saddam conquered Kuwait in 1990 and stopped at the Saudi border, he was about 100 miles away from controlling over half of the world's known reserves.

So we can't, any of us, predict what's going to happen in any of these countries of the Middle East, whether we're going to have a bin Laden government in Saudi Arabia, or a terrorist attack on the Saudi refineries of the sort that dramatically opens Bob Baer's new book, *Sleeping with the Devil*, or a calm and reasonable evolution of Saudi Arabia in the direction of Bahrain together with friendly relations and increased exploration and pumping of reliable oil reserves. Any of those I suppose is possible.

But the history of the Middle East would suggest that we should be very, very careful to hedge against the dangerous side of any of those scenarios. And with that, Mr. Chairman, I'll cease my opening remarks.

Discussion, Questions and Answers

Co-Chairman LEDEEN. Thank you.

Commissioner ROBINSON.

Chairman ROBINSON. It strikes me that there is general agreement that China is quite keen to go where others dare not go in terms of seeking concessions and contracts, particularly if you look

at the Iran and, increasingly, Libya. It was interesting that we heard from Ms. Jaffe of Rice University this morning that China has taken an interest in the concessions that, as I put it then, are on ice for seven or eight U.S. oil companies in Libya that are pending the lifting of sanctions. Libya may also be looking at the possibility of turning those concessions over to China National Petroleum or one of the other Chinese oil majors.

Do you basically agree with the proposition that China's interested in securing physical supplies? I mean, they're not suspicious of the spot market. They aren't just out there, shopping with brokers but are much more interested in equity investments or offering whatever it takes besides money to get a leg up and secure important positions in Sudan, Libya, or Iran. Given the fact that they are nervous about their energy future, it could be a driver for the proliferation-related challenges that we're already facing.

Does that strike you as a possibility?

Mr. WOOLSEY. Yes, I think definitely so. Certainly the relationship between China and Pakistan, although Pakistan is not a source of oil, is an example of how—although China would be reluctant to develop close relations with any Islamist state, should there be some in the future in Central Asia—it would not have any problem working closely with a Libya or a Sudan or probably an Iran. In a non-oil area it works with Pakistan, to both sell its goods, military and otherwise. In the oil area it works to establish physical or equity control of oil resources.

This is still a communist government, a totalitarian government. It's a complicated one, and it's one that may be going through some types of economic evolution. We don't know yet what the new generation of Hu Jintao and his colleagues holds for us. I don't anyway.

But I think it is still very much a society that likes physical control and is willing to deal with regimes like Iran, Sudan, Libya for a multitude of reasons as long as these aren't regimes that directly and immediately threaten, let's say, aid to the Uyghur and Hui within its own borders.

Co-Chairman LEDEEN. Commissioner D'Amato.

Vice Chairman D'AMATO. Thank you, Mr. Chairman. Greetings, Mr. Woolsey. You know I was looking for some good news in your testimony, and I think I may have missed it, but in the scenario where China's voracious energy appetite impinges on our interests in the Middle East and actually the vulnerability of the Chinese government to blackmail from producing states here, the question is what kind of leverage do we have to move the ball in directions away from trading oil for whatever technologies, weapons, and so on some producing states like Iran, Sudan, and Libya, whatever, want, or a future radical Saudi, a much more difficult proposition? Where is our leverage?

Some people suggest that we hold hostage some things, that we trade apples for oranges, hold hostage access to our equities markets on the part of those Chinese-owned companies that are actually conducting the exploration, the deals and so on in those countries, that we withhold the largess of our equities markets in return for good behavior, so to speak, in this area. Or we withhold some access to other parts of our markets.

You know, in the currency area, there are Members up here who have introduced legislation to withhold access to our consumer markets. They suggest we put tariffs on incoming Chinese goods to induce good behavior currency accounts. One could also link this performance to carrots in the investment area. The question is how do you induce the Chinese in this highly competitive environment to do the right kinds of things?

Mr. WOOLSEY. Well, I do believe there is room for leverage with equity markets for countries that deal with terrorist regimes and terrorist sponsoring regimes. This is a tactical matter that can change with time: for example, with Sudan now there are a number of issues in play. It may be something that it would be wise to do today but not wise to do six months from now. I think it's important to have leverage of that sort that one can turn on and off.

But for the long-term leverage, I may say, Mr. D'Amato, you've given me an opportunity to ride one of my oldest hobbyhorses—an issue that I've been deeply interested in now for nearly a quarter of a century: alternative fuels. A number of things that were, I think, highly questionable and extremely expensive back in the 1970s, such as the Fischer-Tropsch process—the old German process of gasification of coal and putting it through paraffin and turning it into diesel—have been worked on in various countries over the years and there is news, technological news, in several of these areas. Let me just touch on three.

First is Fischer-Tropsch. China, like the United States, is a Saudi Arabia of coal. The South Africans, during the period of their being embargoed for apartheid focused on the fact that they had a lot of coal and no oil, and they continued to work on the old German process. Whereas Fischer-Tropsch probably wouldn't have made much sense in the 1970's unless oil stayed up around 50 or 60 or \$70 a barrel, today at oil prices down into the high 20s and maybe around \$30 a barrel, Fischer-Tropsch begins to make sense. And some companies are beginning to produce diesel this way but not even using coal itself, but rather the slag around strip mines.

The general theme here from my point of view is focusing on technologies that can transform waste into transportation fuel that can be used within the existing infrastructure. Such technologies can also contribute to environmental and global warming gas limitation objectives rather than flying in the face of them. For example, the gasification of coal permits the sequestering of CO₂. It's still expensive, but the technology is reasonably proven.

So one doesn't have to look 20 years into the future, I think, to see a day in which—perhaps cooperatively worked on with American companies—Chinese coal could be gasified and liquefied and could not only help power those Chinese Buicks with diesel fuel, but could also lead us to worry less about global warming emissions from China. For electricity generation, using coal gasification and combined cycle generation, one has a darned good alternative to natural gas at today's natural gas prices. And if you can sequester the carbon, it's as environmentally friendly as renewables, really.

Secondly, you have what my old friend Mike Ledeen was teasing me about a little bit just before the session, what he calls “my bugs.” These are genetically modified biocatalysts engineered to break down cellulose and permit it to be fermented into transpor-

tation fuel as ethanol. Let me say here three times: I'm not talking about corn; I'm not talking about corn; I'm not talking about corn. I'm talking about cellulosic waste, agricultural waste, like rice straw, which Chinese farmers have to pull up out of the fields and burn because it has silicon in it and can't be left there. Burning rice straw smells terrible. It's an awful pollution problem.

So when you have, as I think is essentially technologically available now, a process that Senator Lugar and I wrote an article in *Foreign Affairs* about over four years ago now—genetically modified biocatalysts—that can make it possible to make ethanol out of waste products, then one thereby potentially turns Chinese rice farmers into producers of feedstock for transportation fuel: the rice straw they have to get rid of.

Thirdly, there are new processes that turn waste of all sorts of different kinds—animal wastes as well as agricultural—into fuel gas, diesel, and usable carbon with really essentially no secondary waste streams. I'd call the Commission's attention to an article in the April issue of *Discover* magazine called "Anything into Oil." It deals with a process called thermal de-polymerization that ought to be demonstrated commercially within the next few months in a big ConAgra plant, a turkey processing plant, in Missouri.

These three technologies are not yet fully operational in a commercial sense, but I would say they are well past research and development. They are at the point where they need enough of a market, stimulated by production tax credits or some other incentive, to get them up a step so that they are more affordable. But it is a very different situation than in the 1970s when a lot of people were waving their arms about getting away from oil and using other fuels.

I would think that this would be one friendly thing we could do with China in addition to having the stick. It would be a carrot for the Chinese for us to work with them on commercializing these waste-to-transportation-fuels technologies for fuels that can be used in the existing infrastructure. The reason I keep saying that is I'm not talking about the hydrogen economy, I'm not talking about fuel cells.

I'm not talking about something that's 15 or 20 years out. I'm not talking about completely redoing the infrastructure. I'm talking about fuels, produced from wastes, that can go into existing types of diesel and gasoline engines and are relatively easily shipped, as easily shipped and moved around as fuels that we use currently.

So I would try to use both stick and carrot with the Chinese or at least be prepared to use the stick, but I'd investigate some carrots as well.

Vice Chairman D'AMATO. Thank you.

Co-Chairman LEDEEN. Commissioner Wessel.

Co-Chairman WESSEL. Excuse me. I'd like to get your thoughts on the increasing relations that China is now having in our own hemisphere with Brazil and other nations cooperating on energy and nuclear, et cetera, and whether those relationships, now that they're moving beyond Central Asia and the Mideast, whether those are of cause for concern for us?

Mr. WOOLSEY. It's not a subject I've studied very carefully, Commissioner. I think that as long as it doesn't promote proliferation

of nuclear or any other really dangerous technology, and as long as it doesn't lead to Chinese control of something that is strategically important to the United States, I think we should to some extent welcome Chinese commercial development and involvement with the world overseas.

I think the less insular they are and the more commercial they are, the more likely they are to build up a middle class that could at some point have an impact on the political future of China in a positive direction.

But I think we need to always keep an eye on this. They are potentially a very worthy adversary of the United States and they could conceivably continue to be a dictatorship for a long time. I think one has to keep an eye particularly on any relationships that might produce proliferation or the capacity to deny the United States something that it needs, like say the Panama Canal, which is not as strategic as it once was, but it's still somewhat strategic. I think all of those, anything that gives the Chinese a whip hand over us or promotes proliferation, we ought to keep under a very close watch.

Co-Chairman LEDEEN. Commissioner Mulloy.

Commissioner MULLOY. Mr. Woolsey, my understanding is that the International Energy Agency, a Paris-based international organization that was set up by Secretary Kissinger after the OPEC oil embargo, that that's affiliated with the OECD. So I think that's democratic countries. Do you think that it would be in our interest to try to find some special arrangement where China could participate in the IEA so that in times of oil shortages, it's not out there on its own bidding prices up, where there's some kind of sharing mechanisms and other things in place for the other IEA countries?

Mr. WOOLSEY. You've moved somewhat beyond my area of expertise, Commissioner. On first impression here, and this is not a subject I've even read on, I think if one has an organization of democratic countries and a nation that's still clearly a communist dictatorship, as China is, if it is operating cooperatively, for a time there may be some utility in some sort of adjunct or associate relationship.

I'm Chairman of the Board of Freedom House—and we have been working hard on promoting a Democracy Caucus at the United Nations, for example, so one doesn't get in situations such as we did a short time back with people voting in regional blocs regardless of the nature of government. This resulted in the United States getting kicked off the Human Rights Commission and Qaddafi being made the Chairman of it. These international organizations, when they fold dictatorships in with democracies, even flawed democracies, sometimes produce these sorts of very perverse effects.

So what I'd like to see happen is in any of these international organizations that are already essentially organizations of democracies or new ones like caucuses that might be set up, is the dictatorships kept apart but not necessarily at arm's length. As long as they are willing to play nicely with other children, I think they might be invited into some kind of associate or adjunct relationship, but not full.

But this is with respect particularly to the IAEA; I haven't made any special study of China's relationship.

Commissioner MULLOY. It's the IEA.

Mr. WOOLSEY. The International Energy Agency, IEA.

Commissioner MULLOY. Correct.

Mr. WOOLSEY. IEA, yes. The last thing I looked into with regard to them was a couple of years ago. They were doing, I think, forecasting actually better than our own Energy Department on oil availability, but I haven't looked into anything about them since then.

Commissioner MULLOY. Let me ask you one other thing. I was on the Banking Committee staff when the Iran Sanctions Act went through and then it went to the floor. It was amended to become the Iran-Libya Sanctions Act. Do you think it would be in our interest to take that act off the books or let it expire?

Mr. WOOLSEY. I don't trust the governments of either Libya or Iran any further than I can throw them. I think that it is useful to maintain sanction-like weapons available, and I always like for those to be flexibly available in the hands of a president. I've served as many of you have here as staff on the Hill. I was General Counsel to Senate Armed Services Committee, and I've seen this both from the executive and legislative side. I know there's always kind of an instinct up here to have things either be on or off and in the control of the Congress, but I generally prefer that a president have flexibility on such matters. So I would not altogether get rid of the capacity to sanction either of those countries, but I think executive branch flexibility is a good idea.

Commissioner MULLOY. Thank you.

Co-Chairman LEDEEN. Commissioner Bartholomew.

Commissioner BARTHOLOMEW. Thank you very much, Mr. Chairman. Thank you, Mr. Woolsey, for appearing before us and thank you also for the service that you've provided to our nation over the years. It's a good model. We've heard from a number of people today leaving, I think, in some sense the implication that part of China's proliferation activities to some of these rogue states is—well, it's not an implication; it's actually been said that it is in exchange or return for favorable pricing or access to energy supplies. I guess the implication is that somehow China is doing the proliferation only because of this access to energy supplies. It would seem to me that there are a number of other reasons why they might want to proliferate to some of these countries, if only to provide a counterbalance to the United States. I was just wondering if you could just give us your thoughts on how much is energy supplies related to China's proliferation activities?

Mr. WOOLSEY. This is not an area which I have specialized knowledge, but I have a rather deep conviction that both the energy and the arms trade industries of both China and Russia are highly corrupt. I also think that, since industry in both places is no longer quite so centrally directed as was once the case, there is a strong possibility in some cases that so-called "princelings" or other influential individuals are making substantial amounts of money by agreeing to have some PLA entity export such-and-such to a country in the Middle East. Such exports may meet with favor because it is also a country the Chinese are trying to get close to for energy purposes. But I think this is a really tangled web in China. China is at a point where it does have substantial economic

growth and modernization of portions of its economy, but it won't really be able to get rid of corruption until it takes many more substantial steps toward the rule of law and toward some type of democratic structure. What we have now is a system that is sufficiently corrupt that it is very difficult to tell in a number of circumstances where a decision by a firm to export something is a step that's really sanctioned up the line by Hu Jintao or those directly responsible to him or to Jiang Zemin, or whether it is something that somebody's son-in-law is making a lot of money on and just decided to do it.

Commissioner BARTHOLOMEW. Thank you.

Co-Chairman LEDEEN. Commissioner Reinsch.

Commissioner REINSCH. Thank you, Mr. Chairman. That was a very useful question, and I want to follow it up in a slightly different way. My sense of what some of the previous panelists said was that we may be caught in kind of a chicken and egg situation. You may disagree, and I'd like your first comment to be whether or not you agree.

But the suggestion seemed to be that the, on the one hand, the Chinese are concerned about being subject to U.S. leverage by being dependent on sources of supply that we can influence or have control over, and that in turn drives them to go to places like Libya and Iran and countries with whom we're at odds in order to avoid that problem.

We, in turn, seeing that action are suspicious of their motivations and are suspicious of the deals that they're cutting which may or may not involve proliferation in arms, et cetera, and that in turn makes the situation worse than it already was.

I guess my questions are is that, sort of a loop that you agree with, and if we're caught in that loop, how do we get out of it?

Mr. WOOLSEY. I think probably that loop does exist, but my judgment would be that the Chinese are concerned about our leverage mainly because they're a dictatorship, and that what we really need to do is to use what leverage we have economically with them to try to help move them in a direction of democracy and the rule of law. This will be a huge undertaking. It will take a long time. But my view is that it's really only with other governments that have those features that we can more or less, long-term, have a reasonable relationship.

After all, the world has gone from in 1945 from 20 democracies to 121 today, 89 of them electoral democracies with the rule of law, another 32 electoral like Russia and Indonesia, but having serious problems with the rule of law. That's an amazing increase, up to 62 percent of the world's governments. This is not hopeless. There are a number of countries which have gone this way, Mongolia, Mali, others, that a lot of people would have said, hey, this is crazy, these are not societies that had the Renaissance and the Reformation and the Enlightenment, how can they be democracies? But democracy is a huge movement in the world now and has been for some years.

I think that we will not legitimately be able to trust China until we see this evolution, probably over decades, take a definitely positive direction. Therefore they may well be concerned at our leverage over them and be turning to Iran and Libya, but the reason

we will have to continue to exercise that leverage, I think, is because of the dictatorial nature of the Chinese state.

If it begins to change, we might begin to change with respect to the degree to which we use leverage.

Commissioner REINSCH. Well, this wanders a bit afield, but let me pursue that for a minute, if I may. It seems to me that the United States, at least in the post-war era, has had quite often constructive relationships with dictatorships, as long as they were our dictators.

Mr. WOOLSEY. Oh, yes.

Commissioner REINSCH. Is the problem here the form of government, Mr. Woolsey, or is the problem that they're not one of our dictators?

Mr. WOOLSEY. Well, the most outstanding example of that was that for three years and eight months, from late 1941 to mid-1945, we were allied with, at that point, history's greatest murderer, Joseph Stalin, because we had a more immediate problem.

And Franklin Roosevelt said of at least one Latin American dictator, he's an SOB, but he's our SOB. We had our SOBs during the Cold War. We made common cause with Chiang Kai-shek and various South Korean dictatorships and with Salazar and Franco and Pinochet, but if you look at those countries today, South Korea, Taiwan, Spain, Portugal, Chile, they're all functioning democracies. And that's not accidental.

We and our friends and allies didn't forget about them just because we needed to work with them during the Cold War in order to cause maximum difficulty for the Soviets. It's just statecraft. I think countries have done that for a long time, but it doesn't mean that when you have an opportunity to help move them toward democracy and the rule of law, you back off of it.

It's not a satisfactory situation to have China be a dictatorship today. We worked with the Chinese closely on intelligence matters. I did it myself even in the post-Cold War period because we had some things we needed to cooperate on vis-a-vis Russia. When it was the Soviet Union, we had even more reason to work with the Chinese.

So we've done this over the years, but I don't think that undercuts the basic long-term strategic direction of what I think has been our policy and that of most of our allies, to try to move these governments in a positive direction. You know, when you sup with the devil, you use a long spoon, and I would use at least a fairly long spoon with the Chinese today.

Co-Chairman LEDEEN. All right. Just for the record, Franco, we were prepared to remove Franco at the end of the Second World War. He was saved by a British Labor government, if you look at the documents. So sometimes it gets more complicated.

Mr. WOOLSEY. Yes, indeed.

Co-Chairman LEDEEN. We have a few more questions if you can give us another five or ten minutes. Commissioner Dreyer.

Commissioner DREYER. Yes, I was just curious as to your statement that the U.S. had economic leverage. What in particular did you have in mind, because so often people say we don't have any leverage, so it's useful to try to chide China on this, that, or the

other thing? Are you thinking of perhaps Wal-Mart, K-Mart or something more officially governmental, or what?

Mr. WOOLSEY. Well, with our consumer society and general commitment to free trade, we, of course, have a lot less than we might. I do think that over the long run, free trade is sufficiently important that it's one of the reasons why I've rather been attracted to this notion of focusing on specific foreign institutions and their access to capital markets.

I know Mr. Robinson has been involved in that issue for a long time. Restricting some of those firms' access to capital markets seems to me to potentially be using rifles rather than shotguns, and indeed rifles that don't kick all that much. The problem with firing the shotgun of interfering with free trade as a sanction is that it also hurts your own consumers, but if we use sanctions on individual Chinese entities for dealing with rogue regimes and so forth, it seems to me denying them the use of our capital markets is a reasonable tactic to seriously consider.

Commissioner DREYER. The problem, of course, and then I'll let the next questioner begin, with sanctioning individual entities, is that the personnel and the names of these institutions tend to be kind of slippery. You may sanction a person or entity and then find they are continuing to work under other names.

Mr. WOOLSEY. Yes, indeed. Oh, I know. I understand that. It's at best "a long, hard slog," I guess, as the Secretary of Defense would say.

Commissioner DREYER. Thank you.

Co-Chairman LEDEEN. Commissioner D'Amato, you had one more?

Vice Chairman D'AMATO. Yes. Mr. Woolsey, it struck me that we're talking a lot about the oil market as the area of competition and where we have to make some accommodations and perhaps expect leverage. But there is, also, the question of pipelines, pipelines for gas and oil out of Southwest Asia into China. Is it your feeling that this pipeline alternative or these pipelines are not really a very viable alternative in that (a) they are expensive; (b) through vulnerable areas; and (c) coming from areas that there might be competition as well?

Some people think that that may relieve the pressure on the situation. What's your general feeling?

Mr. WOOLSEY. It's not a subject I've studied. The world of pipelines is an extraordinarily intricate one geopolitically, and I've not gotten into this issue in any substance. I would just state the general principle that I don't think we have any particular interest in trying to limit China's access to oil. It will just produce friction.

It would be best to woo them away from it with things like working on alternative fuels, and if individual companies or the Chinese government are willing to risk putting pipelines through Chinese Turkistan and along the Silk Road, with the chaos and the fighting and the ethnic rivalries and all the rest that are present in that part of the world, I would think that investors would demand rather large risk premium for such investments. But it doesn't seem to me that it's necessarily our business to get into trying to deny it or stop it in any way.

Vice Chairman D'AMATO. My question was whether you thought it was a viable alternative? My impression is it's at the high-risk level.

Mr. WOOLSEY. I would think very definitely the high risk level. In late 1993, I was in Kashi, Kashgar, walking around the souk with my own security, and with Chinese security. The Uyghurs were watching us and I've never seen such intense looks of hatred from such a large number of people, so I contrived to get the Chinese who were present and some of my own people talking, and slipped away and walked around by myself for half an hour or so. As I walked alone among the Uyghurs, there were all sorts of smiles, and people coming up, wanting to practice their English. The Han are not loved in Xinjiang, western Xinjiang, and I would think it would be a very risk-loving Chinese government that would want to put a lot of its reliance on getting oil through pipelines in that region.

Vice Chairman D'AMATO. Thank you.

Co-Chairman LEDEEN. Can I just say how welcome are your remarks about democratization, the linkage, the important linkage between political systems and geopolitical conflict, and just to point out, because I know you agree with it, that there are two different ways to do it. One is to work to democratize China, and the other is to work to democratize the countries with which it is having some of these disturbing relationships.

And probably it would turn out to be comparatively easier to work on democratization of countries like Iran and Libya than it is to try to budge China, which is a much bigger mouthful and a much tougher nut to crack.

Mr. WOOLSEY. It is going to be a matter of working angles on all of these. I essentially agree. I think in Iran, for example, if a lightning strike would take the dozen leading mullahs who control the government, the rule of the clerics, I think the Iranian people would be ready to change a lot about their government rather quickly.

I don't think that's the case yet in China, and let me just add one point to that, Mr. Chairman. Amartya Sen, the Master of Trinity College, Cambridge and Nobel Prize winning economist, who I think normally is at Harvard and is about to go back there, has written a superb book and had a superb essay in the *New Republic* magazine on October 6 about democratization. His point in both is that democracy is not just balloting. It requires the exercise of the "exercise of public reason," a phrase he borrows from the philosopher, John Rawls. Sen says that the reason that the Asian Tigers—South Korea, Taiwan, et cetera—became successful and prosperous was not because they were dictatorships, but rather because they had ameliorating cultural propensities: various ways of making decisions by public debate and compromise. He stresses that it is societies that have exhibited that exercise of reason in many different ways around the world that have also come to adopt democracy in the sense of balloting.

I think that the thrust of all this is that sometimes economic reform goes first, as it did with the Asian Tigers, but it needs a kind of fertile ground to be in. Sometimes balloting will go first. Sometimes the rule of law will go first. These three aspects of freedom are related to one another, but not in any lock-step way.

If you look at those 121 democracies I described earlier, most of them have free economies to one degree or another and most, a substantial majority, have the rule of law, but not everyone has all three, and it's not any one of those steps that always goes first.

We work on different things at different paces, and it is, I think, plausible that in a country like China, economics may go first. In some of these other countries of, for example, Iran, historic respect for the rule of law may precede either economic development in a modern sense or balloting.

We need to stay flexible about the way these things occur, but that there is a link, a long-term link, between the three and having countries move in those directions is, to me, really the heart of what we ought to be about in our foreign policy and international economic policy.

Co-Chairman LEDEEN. Thank you. We'll close this session. It's been great.

Mr. WOOLSEY. Thank you.

Co-Chairman LEDEEN. It's been great to have you. Thanks for coming.

[Recess from 2:25 p.m. to 2:35 p.m.]

PANEL IV: CHINA'S ENERGY DIPLOMACY AND ITS GEOPOLITICAL IMPLICATIONS II

Co-Chairman LEDEEN. Okay, gentlemen, thank you for joining us. This is our final session for today, so we don't have particularly a deadline to reach so that we can take time for all questions. I'm most grateful for your appearance here, Messrs. Calder, Morse and Ebel.

My instinct is to retrace my own life and constantly move from left to right. So with your permission, I will start with Mr. Ebel, move to Mr. Morse and conclude with Dr. Calder if that's all right. And if Constantine appears, we'll add him in. Okay. Mr. Ebel, please.

STATEMENT OF ROBERT E. EBEL, CHAIRMAN, ENERGY PROGRAM CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES

Mr. EBEL. Thank you, Mr. Chairman, and I'm pleased to be able to contribute to your hearings on China's energy needs and strategies. In today's context, national security and energy security are so closely intertwined that it is inconceivable to consider them as separate issues.

First, what do we mean by national security? I would suggest that the best answer, at least in my judgment, was provided a number of years ago by the eminent American diplomat, George Kennan, who offered perhaps the least complicated definition: "National security means the continued ability of this country to pursue its internal life without serious interference."

But what is meant by energy security? For the American consumer, the answer is simple. He has only two concerns: price and availability. Little else matters, and I would suggest that these concerns hold for most consumers everywhere, including China.

Importing governments, however, have a different view and seek energy security or security of supply through diversity of supply and as well diversity among the kinds of fuels that they consume.

China's current and future energy needs have already been defined by preceding speakers. To meet these needs, China must compete in a world market where supplies are not always available in the amounts desired, nor at prices acceptable to the consuming population.

At present, all the oil imported by China arrives by tanker. There are no pipeline deliveries. That adds to China's vulnerability, in that pipelines, although themselves are subject to sabotage and thievery, are comparatively easier to protect than sea lanes.

Vulnerability is not limited to volumes imported. Rather, true vulnerability may be found in the prices paid for imported oil and moreover in the volatility of these prices. Will the Chinese economy be strong enough to absorb the impact of such volatility?

When the United States looks north, we see Canada, our leading source of imported oil, and also the supplier of one-sixth of all the natural gas we consume. When China looks north, it sees Russia, rich in oil and natural gas, but found in fields far distant, in western Siberia and in the Arctic.

Eastern Siberia is far more attractive as a source of oil and gas for China in that it is much closer to the points of consumption in that country. That region has a recognized natural resource potential, but this potential hasn't been realized in the absence of both a domestic and an export market.

Now, the prospect of development based on exports to China and elsewhere has emerged. Exporting nations seek security for their oil sales through market diversity. That is the driver behind a proposal by Yukos, Russia's largest oil company, to export oil to China via pipeline originating at Angarsk, in eastern Siberia.

But diversity of markets is not the only driver nor is it the most important driver. Rather, Yukos and the Russian oil sector as a whole need new export markets if production and oil-derived income are to expand. China, the Far East and Southeast Asia are the growth oil markets for the future.

Thus, the justification for new pipelines to move Russian oil eastward. At present, all Russian oil and gas exports move westward.

Without these new export markets and absent the justification to develop new production bases in eastern Siberia, the prospect for growth in Russian oil production is taken away. Thus, Russia has just as much at stake in its negotiations with China and with Japan, with its future oil growth very much dependent on the outcome of these negotiations.

Having said that, a political and economic conflict has arisen for Russia: a pipeline to China or a pipeline to Nakhodka? A pipeline to Nakhodka is viewed by Russian officials as providing the base for economic development of eastern Siberia and the Russia Far East.

However, the oil reserve base in eastern Siberia is far too small at present to justify construction to Nakhodka, whereas Yukos has given assurances that it can provide 600,000 barrels per day by pipeline to China without any constraints.

Both China and Japan are pressing Russia for a decision to the question: which pipeline is going to be built first? How can Russia play both of these proposals seeking the maximum political and

economic gain but without alienating either the Chinese or the Japanese?

Now, of course, the issue is further complicated by the arrest of Yukos President Mikhail Khodorkovsky. There is a larger question in all of this: that is, would pipelines linking Russia with China serve our national interests?

At first glance, the answer would appear to be yes, it would. Reducing Chinese dependence on Persian Gulf oil, today the largest source of its oil imports, has to be seen in our national interests and in the interests of the world oil market as a whole.

But, of course, there's a tradeoff, as tradeoffs accompany any and all decisions we make, whether as an individual or as a nation, and these tradeoffs carry their own risks and costs. These pipelines when built will bring about a closer political and economic integration of Russia and China. Moreover, pipelines carrying natural gas from Russian East Siberia might not only supply just the Chinese market but possibly could be extended beyond China to both Koreas, providing reliable fuel supplies that would support development and ease strains on their respective economies.

Yet, this prospective economic integration could eventually evolve into a regional political bloc, excluding the United States, and would in part solidify Russia's future place in the region. Once again, would this tradeoff meet our national interests or it would complicate them?

The International Energy Agency has forecast world oil demand approaching 119 million barrels per day by the year 2020. Can we, should we safely assume that oil supply will match demand or that competition for available supplies might heighten? Under these conditions, how might China fare?

Having been an oil importer now for a number of years and sensitive to the workings of the marketplace, would China conduct itself responsibly or would it employ political leverage to secure needed supplies?

If China is not particularly successful in reducing its dependence on the Persian Gulf through investments in other oil exporting countries—and that seems to be its current program—or through pipeline linkages to Russia, and should Persian Gulf supply be interrupted for whatever the reason, could we expect China to react in concert with other importers or might it seek separate arrangements to cover their losses?

Mr. Chairman, I realize I've raised far more questions than I have answers for, but that reflects the difficulty of meaningful assessments of China's future conduct in the world of oil. These questions are easy to come by because we can draw upon past experiences in dealing with the world oil market and interruptions in supply. We know where the pitfalls are—sometimes having learned the hard way—but China is a relatively new boy on the block and has yet to face the realities of protecting an economy that is steadily increasing its dependence on an adequate, timely and secure supply of oil.

Yet China today is a major participant in the global trading system, and there is reason to believe that it will take a more active, more responsible role in keeping with its energy vulnerability.

Thank you, Mr. Chairman. I'll look forward to any questions you might have.

[The statement follows:]

**Prepared Statement of Robert E. Ebel, Chairman, Energy Program
Center for Strategic and International Studies**

Mr. Chairman, I am Robert Ebel and I chair the Energy Program at the Center for Strategic and International Studies. I am pleased to be able to contribute to this hearing on China's energy needs and strategies.

In today's context, national security and energy security are so closely intertwined that it is inconceivable to consider them as separate issues. First, what do we mean by national security? I would suggest that the best answer, at least in my judgment, was provided a number of years ago by the eminent American diplomat, George Kennan, who offered perhaps the least complicated definition: "(national security means) the continued ability of this country to pursue its internal life without serious interference."

What is meant by energy security? For the American consumer, the answer is simple. He has only two concerns: price and availability. Little else matters, and I would suggest that these concerns hold for most consumers everywhere.

Importing governments have a different view and seek energy security or security of supply through diversity of supply and as well diversity among the kinds of fuels we consume.

China's current and future energy needs have already been defined by the preceding speakers. Clearly, China must have access to adequate and timely supplies of crude oil and natural gas if it is to successfully sustain economic growth. To do so, it must compete in a world market where supplies are not always available in the amounts desired nor at prices acceptable to the consuming population.

China, like all importing nations, seeks diversity among suppliers and diversity amongst fuels consumed, with emphasis today on oil and natural gas, although domestically produced coal is still by far the dominant fuel.

At present all the oil imported by China arrives by tanker, there are no pipeline deliveries. That adds to China's vulnerability, in that pipelines, although themselves are subject to sabotage and thievery, are comparatively easier to protect than sea lanes.

Vulnerability is not limited to volumes imported. Rather, true vulnerability may be found in the prices paid for imported oil and moreover in the volatility of these prices. Will the Chinese economy be strong enough to absorb the impact of such volatility?

When the United States looks north, we see Canada, our leading source of imported oil and also the supplier of one-sixth of all the natural gas we consume. When China looks north, it sees Russia, rich in oil and natural gas but found in fields far distant, in western Siberia and the Arctic.

Eastern Siberia is far more attractive as a source of oil and gas for China, in that it is much closer to points of consumption in China. This region has a recognized natural resource potential but this potential has not been realized in the absence of both a domestic and an export market. Now, the prospect of development, based on exports to China and elsewhere, has emerged.

Just as importing nations seek security of supply through diversity of supply, exporting nations seek security for their oil sales through market diversity. That is a driver behind a proposal by Yukos, Russia's largest oil company, to export oil to China via a pipeline originating at Angarsk, in eastern Siberia.

But diversity of markets is not the only driver, nor is it the most important one. Rather, Yukos and the Russian oil sector as a whole need new export markets if production and oil-derived income are to expand. China, the Far East and Southeast Asia are the growth oil markets of the future. Thus the justification for new pipelines to move Russian oil eastward. At present, all Russian oil—and gas—exports move westward.

Moreover, without these new export markets and absent the justification to develop new oil production bases in eastern Siberia, the prospect for growth in Russian oil production is taken away.

An internal study undertaken by the Russian oil company Yukos foresaw Russian oil production peaking by the year 2010, holding at some 10 million barrels per day out to the year 2015, and then slowly declining. However, because the leading oil producing regions of the country were expected to peak as well in 2010, then begin to decline, where would the growth needed to offset this decline come from?

The growth needed to offset production declines is projected to be provided by the Russian shelf, largely Sakhalin Island, and by eastern Siberia. Absent new supplies from these two regions, especially from eastern Siberia, Russian oil production by the year 2020 was projected to be about 1.5 million barrels per day less than what it is today.

Thus, Russia has much at stake in its negotiations with China and with Japan, with future oil sector growth very much dependent on the outcome of these negotiations.

Having said that, a political and economic conflict has arisen for Russia. Russia is also considering construction of an oil export pipeline to the Pacific Ocean port of Nakhodka, to serve the needs of Japan, with a branch line to China. Importantly, a pipeline to Nakhodka is viewed by Russian officials as providing the base for economic development of eastern Siberia and the Russian Far East. However, the oil reserve base in eastern Siberia is far too small at present to justify construction to Nakhodka, whereas Yukos has given assurances that it can provide 600,000 barrels per day by pipeline to China without any constraints.

Both China and Japan are pressing Russia for a decision to the question: which pipeline is going to be built first? How can Russia play both of these proposals, seeking the maximum political and economic gain, without alienating either the Chinese or the Japanese? Now, the issue is further clouded by the arrest of Yukos President Khodorkovsky.

There is a larger question in all this. That is, would pipelines linking Russia with China serve our national interests? At first glance, the answer would appear to be yes, it would. Reducing Chinese dependence on Persian Gulf oil, today the largest source of its oil imports, has to be seen as in our national interests, and in the interests of the world oil market as a whole.

But of course there is a tradeoff, as tradeoffs accompany any and all energy-related decisions we make as a nation, and these tradeoffs carry their own risks and costs.

These pipelines, when built, will bring about a closer political and economic integration of Russia and China. Moreover, pipelines carrying natural gas from Russian east Siberia might not only supply the Chinese market, but possibly would be extended beyond China to both Koreas, providing reliable fuel supplies that would support development and ease strains on their respective economies.

Yet, this prospective economic integration could eventually evolve into a regional political bloc, excluding the United States, and would in part solidify Russia's future place in the region. Once again, however, would this tradeoff meet our national interests, or would it complicate them?

China today is viewed as one of the most promising consumer markets available, particularly by Russia, where the domestic market lags, particularly outside the major cities of the country. At the same time, might Russia fear that it would come to be regarded as little more than a source of oil and gas, to be used by China as a means of developing its own manufacturing potential, a potential that could challenge Russian and other manufacturers?

Like any seller of goods, it is in Russia's interests to encourage competition among the prospective buyers of the energy it has to sell. At the same time, that competition, say, between China and Japan, must not be allowed to deteriorate into a rivalry. Japan is almost wholly dependent on imported oil while China, now second only to the United States in terms of oil consumption, is moving gradually to an oil import dependency that in the years ahead may well match the current level of relative U.S. dependency.

With demand for energy in the developing countries of the world very likely exceeding energy use in the industrialized world by the year 2020 if not sooner, the future does not appear comfortable nor secure. Current world oil demand is on the order of 77 million barrels per day. The International Energy Agency has forecast world oil demand approaching 119 million barrels per day by 2020. Can we, should we safely assume that oil supply will match demand, or that competition for available supplies will heighten? Under these conditions, how might China fare?

Having been an oil importer now for a number of years, and sensitive to the workings of the marketplace, would China conduct itself responsibly, or would it employ political leverage to secure needed supplies? Whatever its response would very much matter to the United States and to other importers.

Current Chinese dependence on Persian Gulf oil comes to mind. If China is not especially successful in reducing its dependence on that region, through investments in other oil exporting countries, as seems to be its current program, or through pipeline linkages to Russia, and should Persian Gulf supply be interrupted for political reasons, could we expect China to react in concert with other importers, or might it seek separate arrangements to cover their losses?

Mr. Chairman, I realize that I have raised far more questions than I have answers for. But that reflects the difficulty of meaningful assessments of China's future conduct in the world of oil. The questions are easy to come by, because we can draw upon past experiences in dealing with the world oil market and interruptions in supply. We know where the pitfalls are, sometimes having learned the hard way. But, China is a relatively new boy on the block and has yet to face the realities of protecting an economy that is steadily increasing its dependency on an adequate, timely, and secure supply of oil.

Yet the country is a major participant in the global trading system, and there is reason to believe that it will take a more active, a more responsible role in keeping with its energy vulnerability.

Thank you, Mr. Chairman, and I look forward to any questions you may have.

Co-Chairman LEDEEN. Thank you, Mr. Ebel.

Mr. Morse, please.

**STATEMENT OF EDWARD L. MORSE
EXECUTIVE ADVISOR, HESS ENERGY TRADING COMPANY**

Mr. MORSE. Thanks, Mr. Ledeen. I am pleased to have been invited to share some observations with the Commission this afternoon, although I was somewhat perplexed as to what I might say because I had been the author, along with Mrs. Jaffe, of a study on this subject, and I knew that whatever I might have prepared, she was also going to say.

So I thought that it would be useful to share with you some reflections of a general nature that have to do with China's entry on to the scene as a major actor in the international petroleum sector. And I want to begin these general observations with a notion that comes from the past because the energy sector of today stands apart from the other significant sectors of the international economy.

Like some other sectors of the trade and investment arena, oil and gas have seen some significant globalization and the retreat of government intervention or market liberalization over the last two decades. These have, of course, been accelerated by the collapse of the Soviet Union with the withdrawal of the Russian state from even more direct involvement in the energy sector than it has today.

But unlike other sectors of the global economy, in the petroleum arena and to some extent in the natural gas arena, government intervention still looms large, and in some significant countries, governments monopolize the sector including in Saudi Arabia where they dominate it as they do in China.

In terms of the market, the rules of the game remain as result topsy turvy where we have not a commodity tending toward the lowest price, of the lowest cost to produce it, but rather we have the lowest cost producers in OPEC and in some key non-OPEC countries including Norway and Mexico regulating production to put a floor under prices that's most of the time considerably higher than where they otherwise might be.

In short, we have in the petroleum sector, unlike most other sectors of the international economy, this confrontation between the forces of the market and of globalization, against political forces and anti-competitive forces that look to political objectives rather than to market objectives, and when we find the major participants in the market, especially but not only Saudi Arabia and other

members of OPEC, who believe that market forces are their enemy, their enemy which needs to be confronted.

Now, why do I bring this up? I bring it up because for the past 25 years, there's been a sort of silent conspiracy between the United States and Saudi Arabia as the two largest participants in the international oil marketplace, and that conspiracy is to leave things alone and to wink from an American perspective at the anti-competitive forces and to allow themselves to play out, and that wink began, of course, during the era of the Cold War when it was in our interest nationally not simply to support a domestic industry but in our interest to support strong governments that were oil producers and to fend off any interest in those areas by the Soviet Union.

Well, times are changing and they're changing in significant ways, and they're changing fairly rapidly. They're changing in part because the Cold War is over, but as this Commission has listened over the past few hours, changing because of the change in the number of key players and the nature of those key players. It's not any longer just Saudi Arabia and the United States, and to a slightly lesser extent the European Union that are the key makers of the rules of the international petroleum sector, but emerging are Russia and China as equally important players, players that are being given the rules of the game, and the rules of the game, as they understand them, may not be from their perspective in their own interests.

We have Russia, as Bob Ebel has just indicated, that's moving from being a large regional supplier of oil and gas to being an exceptionally large global supplier of oil and gas, and as it moves from being a large regional supplier to an exceptionally large global supplier, it is no longer content at the government level or the company level of being a price taker or rule taker, but its interest is keener on what kind of system it wants, what kind of rules it wants to enhance its own interests, and those rules are not going to be the rules of the United States or the rules of the marketplace nor will they be the rules necessarily of Saudi Arabia. They'll be Russian rules.

And the fourth major player now is becoming China as well for the reasons that you understand, from the sheer dramatic increase in the economy of China, the energy sector of China and the oil consumption levels of China. So it's incumbent upon us I think to think through what the wants are, the objectives are, both of China and Russia, as well as what our wants and desires might be in a sector where the rules of the game are almost certainly going to change, and where we have for the first time perhaps in 25 years an opportunity to make sure that the rules of the marketplace become more predominant and where the principal actors working against the rules of the marketplace prevailing, not simply OPEC but China in particular and to considerable extent Russia.

I want to come back to that in my final comments, but I want to just look at three areas where I think this is important, and those three areas are areas that I'm sure others have commented on this morning or just a few minutes ago, but where I hope to offer a slightly different perspective.

The first, of course, has to do with vulnerability and insecurity, an area that I know was commented upon this morning and that we just heard from Jim Woolsey with respect to some Qs and As on the IEA. But the fact is that the IEA framework is the global framework to deal on an international level with the insecurity coming from fear of supply disruption and fear or the use of oil instruments by oil supplier countries and as a self-policing mechanism to prevent other consuming countries from competing with one another unduly for access to supplies.

And as we know, the IEA was founded in the aftermath of the Arab oil embargo of some 30 years and one week ago, and was set up at a time when the members of the OECD, the founding members of the IEA, comprised 80 percent of the oil importers of the world, 80 percent of the oil consumption of the world, and where they were the only ones that counted.

But now and increasingly over time as Japan and Europe, unlike the countries of North America in the OECD, have managed not only to damp oil demand but to reverse oil demand. The new sources of demand on the market are the countries of North America and the emerging markets, principally of Asia, and they need to be looped into this energy security network in a very direct manner, because unless they are, they will find a way to deal with their energy security that is not in our interest and is almost certainly going to be against our interest.

They will do so either by starting as the Chinese have as free riders on an energy security system and strategic stockpiles in the IEA that were extremely expensive to build, but not only are they free riders but they act in anticompetitive ways, and in ways that are adverse to the interests of others in the marketplace.

Last year, in the run-up to and fear of the consequences of a U.S. attack on Baghdad, what did the Chinese and what did the Indians do? They spoke about the need for strategic stocks, but they actually started hoarding oil, and they started hoarding oil in August of last year and they kept building up and building up supplies at an incremental level that put pressure on the world market at the time when the world market was undergoing that insecurity plus the insecurities associated with the disruption from Venezuela and later the disruption from Nigeria.

Nobody has good numbers on what that number was of how much hoarding took place, but my own conversations with the Chinese companies would indicate that hoarding in China alone was equal to some 30 million barrels. If you add to that what is known in the marketplace on extra purchases being made by other countries in Asia, the Asian hoarding by non-IEA members probably amounted to 80 or 90 million barrels.

To put that in context, that's more than four full days of additional supply for the Asian region, non OECD Asia as a whole, and in terms of the Chinese, it's an extra fortnight of supplies, hoarding that would not have taken place had they been part of a system of a security net like the OECD provides.

So I think we need to find a way to provide that, and if we don't find a way to provide that, the likelihood is that others will provide it in a way that is not necessarily in our interests, and I think pushing forward on the remarks that Bob Ebel made, I think there

is a very good chance that unless China is brought into a global safety net, global cushion, against disruption, it will form part of a regional arrangement, a regional arrangement that involves Russia as a supplier and involves major OECD countries, Japan and Korea probably, as financiers of that arrangement, and we can talk about that if you want later.

Co-Chairman LEDEEN. Would you take a breath, please?

Mr. MORSE. Yes.

Co-Chairman LEDEEN. We're out of time. Dr. Calder has to leave at about half past three, so with your permission, we'll get back to this all stuff. I'm most grateful. It's new, it's provocative, it's terribly helpful, and it's great that you came. And sometimes it's great to break up partnerships even temporarily. All right. You see. Dr. Calder, please.

**STATEMENT OF KENT E. CALDER
DIRECTOR, REISCHAUER CENTER FOR EAST ASIAN STUDIES
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JOHNS HOPKINS UNIVERSITY**

Dr. CALDER. Thank you very much. I was glad that Dr. Morse raised this question of the broader regional dynamics because actually that was where I was thinking of starting off. My comparative advantage perhaps is the broader regional context of Chinese energy policy that I've been working on now for close to a decade.

And it seems to me that it has elements that as a point of departure for thinking about China, of course, we have to look first and foremost at this important shift, historic shift really, beginning in 1993 as China became an energy, a net energy importer, and that way that that trend, of course, has steadily deepened beyond—fueled by very rapid Chinese growth, of course—to levels beyond many of the predictions that we were seeing in the mid to the late 1990s as I wrote my Pacific Defense book.

This last year, as you know, China imported something like 1.4 million barrels a day net, and the prospects, of course, are for substantial increase in coming years. Of course, Dr. Morse and others are the real specialists in this. My guess would be that we would see China perhaps inside of a decade importing at least 30 percent of its oil, and that it will rival—at this point, still, of course, Japan is a much larger importer—but within a decade certainly China will be at Japanese levels or beyond.

And in terms of thinking about the regional dynamic, it seems to me very important to remember the very heavy vulnerabilities—I'm sure those have been stressed throughout your hearings today—not only of China but also of the other nations that import oil, LNG, and so on across many of the same pipelines or rather sea lanes from the Middle East particularly into northeast Asia.

Japan is 99 percent dependent on imported oil. Korea is roughly the same, no major domestic sources of oil at all. Taiwan, also. Not only very heavily dependent on imports, these key nations or these key economic areas, but also heavily dependent on imports from the Middle East. Japan now about 90 percent dependent on the Middle East for its oil imports. Korea, about 75. China, relatively low, still at 56. And one of the points that I will stress is that China has been trying to diversify.

Clearly, it sees itself as becoming increasingly vulnerable with these rapidly rising imports and has been trying to diversify and to some extent it has diversified, it is diversifying and is somewhat less dependent on the Middle East than the other major northeast Asian nations.

But still a broad pattern for all of them of heavy vulnerability due to heavy reliance on imports and then heavy reliance on imports particularly from the Middle East across many of the same sea lanes. So, and then also as Dr. Morse was suggesting, safety nets which are not nearly so well developed, particularly in the case of China, as they are in many other nations. Japan has roughly a 100 day stockpile. Our stockpile, while it's not that large, of course, is also very, very substantial.

The Chinese stockpile on the order of perhaps seven to ten days, something much, much smaller, and not as well developed technically. Japan has been quite concerned about this lack of a Chinese stockpile and the possibility that in a crisis situation that there would be competition, and as Dr. Morse suggested hoarding and so on, a perverse dynamic.

We saw this sort of thing, of course, after the Iranian revolution. The Japanese got, as many of you know, quite aggressively into the markets then and there were, of course, competition with U.S. consumer interests and so on.

The China stockpile system is not well developed, and that it seems to me is a concern, and I certainly applaud the suggestion that Dr. Morse was making, that we should be thinking much more about a global safety net. Perhaps just to draw the analogy, of course, to finance, which is the other major area where East Asia, as you know, has a rather unique position in the world system. We now have over 50 percent of global foreign exchange reserves in the hands of East Asian nations, partly as the result of very heavy trade imbalances.

On the financial side, one of the issues that's emerging is the degree of independence, degree of autonomy that the region would have from the global system, again by analogy to what Dr. Morse was saying.

So I think that there is a whole series of important issues relating to stockpiling and so on flowing from the vulnerability that not only China but the other nations in the region have. We only need to look to history, for example, to the late 1930s and the early 1940s, leading up ultimately to Pearl Harbor and for oil vulnerabilities, energy vulnerabilities and some of the consequences.

Of course, there were many, many reasons, but the consequences to which vulnerabilities of these kinds ultimately can lead. Our subject here, of course, is certainly China, and I want to focus just very briefly on a few points of my testimony to you.

Regarding China, as I say, one major theme I think that's important is vulnerability. Vulnerability similar in some ways and different other ways to those of the other major nations in the East Asian region. The historical record suggests that China fears energy dependence on the broader world, partly because of its own historical experience, the early experience with the Soviet Union in the 1950s where Soviet advisors played a major role in the oil in-

dustry, and then their departure following the Sino-Soviet split precipitated rather severe shortages for China.

They've also seen the ways that the Russians, the Soviet Union and then the Russians thereafter, have used energy as a lever in its relationships with Ukraine, for example, and then in the internal dialogue within China, of course, the issue of energy security and the perverse potential consequences of rapidly deepening interdependence as an important theme.

China has, I would say, to characterize overall, China's energy diplomacy, it would seem to me that the major theme, the most important theme is diversification, geographical diversification, diversifying its reliance on oil toward nuclear, hydro, and natural gas which are less susceptible to sea lane interdiction since, of course, the long sea lanes from China to the Middle East are dominated by the U.S. Navy, which assures freedom of navigation, of course, but to the extent that there are delicate relations between China and the United States, that, of course, makes that a concern for China.

Now, in its diversification efforts, certainly China has important relations with Iran. It's one of its major suppliers, and number two supplier this last year, as you know, and that has the attraction of being a nation where it has relative autonomy from outside pressures.

China has diversified to a much larger degree than most nations toward Africa interestingly. The Japanese haven't paid much attention there. China gets something like 23 percent of its oil imports from Africa and both Sudan, of course, with which we've had security problems, and then also particularly Angola have become two of China's five largest suppliers.

Russia and Kazakhstan, as Dr. Ebel also was mentioning, have been important recently, particularly because again they have the attraction of not exposing China to the vulnerability of sea lane-based imports from the Middle East.

Co-Chairman LEDEEN. Dr. Calder.

Dr. CALDER. Yes.

Co-Chairman LEDEEN. In your own interests, because I know you have to leave shortly, could we hold it there?

Dr. CALDER. Surely.

Co-Chairman LEDEEN. And then we can get at the rest in question period if that's okay.

Dr. CALDER. Yes, certainly.

[The statement follows:]

**Prepared Statement of Kent E. Calder
Director, Reischauer Center for East Asian Studies
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China's Energy Diplomacy and its Geopolitical Implications

The critical point of departure in thinking about China's future energy diplomacy must be that nation's substantial and rapidly increasing dependence on energy imports, fueled by its extraordinary economic growth. As late as 1990 China had a net oil-trade surplus of over \$1 billion/year with Japan alone. Until the fall of 1993 China was a net oil exporting nation. Yet last year it imported over 1.4 million barrels per day from the broader world.

And the prospects are strong for substantial future increases in China's international energy dependency. Economic growth shows strong promise of being both rapid and sustained, due to high rates of capital formation and large prospective fu-

ture increases in factor productivity. China's economy shows prospect of growing more, rather than less, energy intensive, particularly in the consumer sphere, as automobile ownership and usage of energy-intensive appliances like air conditioners steadily broadens. Nations at China's intermediate stage of development typically experience large increases in energy usage, with industrial consumption in such sectors as construction and petrochemicals augmenting increasingly buoyant consumer demand.

China certainly enjoys a wealth of natural energy resources, including coal reserves that rival those of the United States as the largest on earth. Yet environmental and infrastructural problems, compounded by a reluctance to offer foreign investors the incentives necessary to access state-of-the-art drilling technology, prevent China from realizing its domestic energy production potential. The major reserves, of oil in particular, are located in the North and the West, while energy demand is surging most rapidly in the South and the East. And the railways and pipelines needed to transport oil, coal, and natural gas from one part of the country to another remain underdeveloped, and in a woeful state of disrepair.

The historical record suggests that China fears energy dependence on the broader world, and that it has some reason to do so. Soviet advisors in the 1950s played a major role in the Chinese oil industry, and their departure following the Sino-Soviet split of 1960 precipitated severe energy shortages in China. It also left China more than 50 percent dependent on the Soviet Union, a new adversary, for over 50 percent of its refined oil product consumption. China has also seen the post-Soviet use of both oil and natural gas as a geopolitical lever in Russia's dealings with neighbors such as the Ukraine over the past decade.

Chinese analysts also appear to see the United States as a prospective threat to China's energy security. There is no nation powerful enough to balance the U.S., and the U.S. Navy dominates the 7,000-mile sea lanes from Shanghai to the Straits of Hormuz through which well over half of China's oil supplies must pass. Economic sanctions have become an important tool of American policy in the post-Cold War world, and China's vulnerability to U.S. economic pressure, and relative lack of allies, could encourage the consideration of oil sanctions as a prospective option, in the view of some Chinese observers.

In 1999, after the Kosovo conflict, and again during the recent U.S. military intervention in Afghanistan and Iraq, the potential effect that the vulnerability of strategic shipping lanes could have on China's energy supplies was repeatedly the subject of security policy debates in China. However strong American capabilities at sea may consistently have been, until "9/11," the United States had a relatively limited military presence in nations bordering directly on China's energy sea lanes. Today, in the context of the war on terrorism, that is no longer the case.

Reducing Energy Vulnerability: A Key Imperative

China has at least five strategic options that it can pursue to reduce its vulnerability to prospective international pressure in the energy area: (1) Geographical diversification of its energy supplies; (2) Increasing energy efficiency; (3) Diversifying its reliance on oil toward nuclear power, hydro-electric power, and natural gas, the supply of which is less susceptible to sea-lane interdiction; (4) Reducing reliance on international majors, conversely increasing the share of energy imports flowing through Chinese owned or controlled intermediaries; and (5) Developing the military capabilities to independently protect Chinese energy supplies. The evidence is that China is simultaneously pursuing all of these strategies simultaneously, with the strongest emphasis on the first four. In their aggregate, these strategies represent, in their international dimensions, the face of Chinese energy diplomacy.

Economic pressures in China currently gravitate, as they do in virtually all nations, in favor of increasing reliance on the Middle East, at least with respect to oil and liquefied natural gas (LNG) supplies. The well-head production cost in the Middle East is simply so low that its logic cannot be ignored, unless collusive behavior by the OPEC production cartel forces prices high enough to make other sources of supply competitive. For most of the past two decades that has simply not been the case.

Within the Middle East, China has placed substantial priority on developing energy ties with nations where American geopolitical influence is relatively limited: Iran and, until the recent war, Saddam's Iraq in particular. Iran was China's second largest source of imported oil worldwide in 2002, eclipsed only by global low-cost producer Saudi Arabia. China took nearly 11 million tons of Iranian crude oil imports. China was also consistently Iraq's third or fourth best export customer in the years immediately prior to the Iraq War, importing 500,000 tons of Iraqi crude in 2002. This represented less than one percent of China's total oil imports, however, suggesting that Iraq was more dependent on China than vice versa.

Prior to the Iraqi War Chinese firms laid fiberoptic cables enhancing the efficiency of Iraqi air defense systems and reducing their vulnerability to air attack. Chinese firms also were reportedly modernizing the overall communications network of that country, in return for Iraqi oil. By the spring of 2001 at least the Chinese government was telling the U.S. Government that it was pressuring these firms to cease and desist, but how serious or effective this pressure was is unclear.

Iran appears to be a continuing economic and strategic partner for China, although increasing Chinese sensitivity to how this Iranian relationship will play in Washington is clearly evident. During the mid-1990s China reportedly sold Iran C-801 and C-802 anti-ship cruise missiles, posing a threat to oil tanker traffic and U.S. naval vessels in the Persian Gulf.

In 1996 China reportedly began assisting Iran in developing indigenous anti-ship cruise missiles, based on Chinese designs. In August 1996 the two countries also reportedly signed a \$3 billion deal that included the sale of Chinese ballistic missiles, missile guidance technology (including sensitive gyroscopes), and missile production equipment. The Chinese government denied these reports, and U.S. State Department officials indicated that they believed Beijing was generally operating within the nonproliferation assurances that it had given Washington. Yet gaps between commitments and implementation were a recurring theme, in the view of many observers.

During 1997–1998 the Chinese government committed to stopping these provocative arms exports. Yet Iran still owes Chinese arms producers substantial debts dating from the Iran-Iraq War of the 1980s. These provide at least one incentive apart from oil for continuing Sino-Iranian arms transactions, as does continuing Chinese irritation at American arms sales to Taiwan.

While Sino-Iranian interaction is a continuing reality, the more striking development is China's rapid diversification of its energy supplies, which is helping it to limit dependence on the Middle East as a whole. In 2001 China was only dependent on the Middle East for 56 percent of its crude oil imports, compared to 90 percent for Japan and around 75 percent for South Korea. This relatively low proportional figure for Chinese Middle East oil dependence was virtually unchanged from a decade earlier, despite the near ten-fold expansion of overall Chinese oil imports during that period.

Regionally speaking, Africa provides nearly 23 percent of China's oil imports—a remarkably substantial share, considering that continent's distance from China. Indeed, the Sudan and Angola—both nations where American geopolitical influence is limited—were two of China's five largest suppliers of crude oil in 2002. And their contribution is rising. Chinese oil imports from Angola, for example, nearly tripled, to over six million tons annually, between mid-2002 and mid-2003.

Energy efficiency has traditionally been extremely low in China. In 1980, for example, China's energy usage per unit of GDP was roughly three times the global average, and more than four times that in Japan. By 2000 it had risen substantially, to around 90 percent of the global average, but remained only around two-thirds of that in Japan, according to World Bank statistics.

Raising China's energy efficiency still further is very much in the world's interest, given both the rapid, sustained character of Chinese growth, which is sharply deepening China's energy dependence on other nations, and the manifest instabilities that could arise from a troubled Chinese energy relationship with the broader world. This is an area where multilateral cooperation is very much in both America's and China's national security interest. Japan, in particular, has been very successful at energy conservation, especially in the industrial sphere, and including it in broader efforts to encourage Chinese energy conservation through its extensive development assistance programs in China is very much in the U.S. national interest.

Diversification away from oil, toward nuclear power and lately toward natural gas, have also been important themes in Chinese energy diplomacy. Nuclear power, of course, has the attraction of requiring only extremely limited raw material imports. Yet the storage and safety problems that have arrested formerly extensive Japanese and Korean nuclear programs are also beginning to concern Chinese authorities. China has built three nuclear power stations so far, all located along the eastern coast, and will have installed nuclear capacity by 2005 of around 8.7 million kilowatts, or about three percent of total national power output.

Yet Beijing has so far been quiet about its plans for nuclear generation beyond 2005, in stark contrast to the Chinese government's explicit call for increases in natural gas and hydro-electric power production capacity. One source of disquiet is the high cost and low level of local technology input associated with most plant-construction proposals. Yet China will likely boost nuclear power capacity in the long-term to supplement thermal and hydro-generation, given the huge prospective growth in overall national power demand.

Natural gas does not suffer from the central drawbacks of nuclear power. It is a safe, efficient, environmentally attractive fuel. And it has the substantial geopolitical advantage of being accessible overland—immune from prospective interdiction by a U.S. Navy unassailably dominant, in the short-term, along China's natural energy sea lanes.

Coal, of course, has been the classical form of energy consumption in China. To this day China relies on coal for well over 60 percent of its energy supply. Given that China has the largest proven coal reserves on earth, it is also likely that China will continue to rely heavily on coal in the future.

Coal causes, however, major environmental damage—not only to China's own natural environment, but also to that of the broader Northeast Asian region. The acid rain that China's massive use of coal induces decimates forests in both Korea and Japan. The rapid dissemination of clean-coal technology thus becomes an important precondition to continued use of coal across China, which is clearly advantageous on national economic security grounds.

China clearly suffers from major energy-related environmental problems, mainly centering on its extensive use of coal. According to a recent report by the World Health Organization (WHO), seven of the world's ten most polluted cities are in China. And China is projected to experience the largest absolute growth in carbon dioxide emissions between now and the year 2020. There are thus compelling environmental as well as geopolitical reasons for diversifying away from the current heavy dependence on imported oil in China's overall energy supply.

Central Asia and Russia have considerable precedence in China's energy diplomacy—both because they are substantial prospective sources of natural gas, the most environmentally attractive and energy-efficient fuel, and because that gas is accessible overland. Russia alone has nearly 31 percent of the proven natural gas reserves on earth, and they appear to be concentrated heavily in eastern Siberia, in manageable proximity to China and Korea. Asia is one of the world's major regions without a land-based natural gas grid, and creating one seems increasingly likely to become an object of Chinese energy diplomacy, as China's explosive economic growth continues. In this endeavor China will have natural allies in the Korean and Japanese banks, steel producers, and trading companies, as they begin to recover from the lingering effects of the financial crises of the 1990s.

China has placed particular priority on deepening energy relations with Kazakhstan—its oil and gas-rich neighbor to the west. Yet results of this commitment have been mixed. CNPC, the large Chinese oil exploration firm, has purchased a 60 percent stake in the Kazakh oil firm Aktobemunaigaz, promising to invest substantially in the company's future development over the coming twenty years. Yet it was unable to secure entry into the major Kashagan oil field in the Caspian when consortium partners in that project exercised their rights to block the sale of a 16.7 percent interest in the project to CNOOC. In the late 1990s China and Kazakhstan also talked of a possible oil pipeline between them, but construction has not begun.

Some deepening of China's energy ties with Kazakhstan may be impending. The Kazakh state oil firm announced early in October 2003 that its Chinese counterpart had agreed to finance a \$800 million oil pipeline from western Kazakhstan to northwestern China, with construction to start in mid-2004. Using the existing pipeline network Kazakhstan could then practice oil swaps with its northern neighbor Russia to ensure stable oil supplies to the China-bound route.

A deepening energy relationship between the giants of Eurasia, China and Russia, is both natural and virtually inevitable, barring severe geopolitical conflict. This prevailed in the 1960s, 1970s, and 1980s, of course, but the likelihood of an acrimonious Sino-Soviet split is much less likely in the future, due in no small measure to energy-sector complementarities. China's growth is driving it to energy dependence on the world, and nearby Russia is a low-cost supplier, once infrastructural costs have been amortized, with at least a third of global gas reserves.

A Sino-Russian gas grid, starting perhaps with the Irkutsk-Baikal project, would have a long-term economic logic that could cement a deepening political-economic relationship between these giants. It would also insulate China much more from American naval leverage along its sea lanes, and from American political-military preeminence in the Middle East, than is currently the case. If anything, the recent war in Iraq has deepened the geopolitical logic of an Asian gas grid for China.

A fourth strategic option for China's energy diplomacy is increasing the share of Chinese energy imports flowing through Chinese owned or controlled corporate intermediaries. The three largest Chinese oil and gas firms—Sinopec, CNPC, and CNOOC, have all strengthened their financial capacity to expand in international markets by carrying out successful initial public offerings (IPOs) of stock between 2000 and 2002. They have expanded into a diverse range of international ventures, ranging from the Northeast shelf of Queensland in Australia, to the Sudan and

Kazakhstan. China has also selectively encouraged energy producers from the developing world, including Middle East oil producers, to become active downstream in China.

China has generally been wary of the international oil majors, but has occasionally teamed up even with them, in keeping with its overall strategy of diversification. Shell, for example, is the lead firm in China's current "West-to-East Pipeline," currently under construction, which will convey natural gas from Xinjiang to Shanghai. Gazprom and ExxonMobil have additional stakes. Construction began in July 2002, with a section of the pipeline scheduled to begin operation in early 2003. This could be the trunkline for a future natural gas pipeline between China and Central Asia.

China's final strategic option for assuring its energy supplies, of course, is military. China has, as noted earlier, cooperated in military construction and arms transfers with pariah nations in the Middle East such as Iran and Iraq, as noted earlier. Yet it appears so far not to have taken determined steps to expand and modernize the long-range naval and air force capabilities needed to protect its expanding imported energy supplies, contrary to earlier expectations. There is clearly a long-term logic to a Chinese blue-water navy with the capacity to assure smooth energy imports into China, but that navy has not yet clearly begun to materialize.

China's current sea power remains more potential than actual, contrary to expectations a decade ago, as China's energy imports began to spiral. The PRC retains major shortcomings in the areas of anti-submarine warfare, anti-air warfare, and electronic warfare. Correcting these shortcomings will require major capital investments that China is only gradually gaining the economic capacity to make. Meanwhile, China's naval strength lies mainly in its numerical advantage in relation to other regional actors. The PLAN (People's Liberation Army Navy) currently has over 50 destroyers and frigates, about 60 diesel and 6 Han and Xia-class submarines, and nearly 50 landing ships. But the PLAN lags beyond other regional navies, including that of Taiwan, in most technological areas, especially air defense and surveillance.

The Importance of American Policies

In the final analysis, the course of Chinese energy diplomacy remains to a fateful degree indeterminate. Within a decade China will almost inevitably be one of the largest energy importers in the world, rivaling the United States and Japan. Over 30 percent of China's energy consumption will in all likelihood be imported. Yet how Beijing will assure the security of the massive imports that it will require, and how it will procure them from the broader world, is still unclear.

Particularly important, yet nontransparent, is the political-military dimension. It is not clear what China will do in terms of blue-water naval development. In the context of the war on terrorism, Japan has been expanding its capabilities in the Indian Ocean and the Arabian Sea. China may well do so as well. Carefully monitoring China's political-military response to its rising energy dependency on the broader world is a clear imperative for the future.

Historical precedents suggest that it is when the energy security of nations is most precarious and vulnerable that they are most dangerous. Clearly that was true of expansionist Imperial Japan in the days leading up to Pearl Harbor. Japan's lack of stable energy supplies was a major factor in its decision to strike on December 7, 1941.

Obviously historical parallels are never exact. Yet Japan's belligerence when it was vulnerable suggests that taking positive steps to support China's energy security can be in America's national interest, as long as China is dealing in constructive ways with mature members of the international community. This could mean, for example, rendering technical assistance to expansion of the Chinese oil stockpile, which currently provides only a seven day supply, compared to 60 days in the United States, and 100 days in Japan. In this context, China might be encouraged to re-deploy some of its massive foreign-exchange reserves, currently totaling upwards of \$400 billion, into the energy area in constructive ways.

Much in China's future course will depend on the receptivity of the United States and the broader international community to China's deepening integration with the world. Clearly, the world must insist on a more open China in the calculus of economic affairs, and progress in reducing the massive trans-Pacific trade and financial imbalances that have emerged in recent years. Yet if the U.S. continues to support and ensure unbiased freedom of navigation in the global sea lanes, as has been this country's longstanding tradition, to that degree China will have reduced incentives to develop an autonomous blue-water naval capability of its own. Conversely, to the extent that China feels vulnerable regarding its energy sea-lane access, it may be encouraged to accelerate its buildup. The changing Chinese energy calculus is gener-

ating major new political-economic equations that the world must watch with great care in coming years.

Co-Chairman LEDEEN. But thank you very much indeed.
Dr. Menges, good to see you.

**STATEMENT OF CONSTANTINE C. MENGES, Ph.D.
SENIOR FELLOW, HUDSON INSTITUTE**

Dr. MENGES. Good to see you, Mr. Chairman. I'm delighted to be here. I'm going to try to stay within the ten minutes that you had indicated we should, and I am so pleased that the U.S.-China Commission is willing to hear a broad range of views on the very important, all the aspects of our relationships with the People's Republic of China.

Co-Chairman LEDEEN. Otherwise we would die of boredom.

Dr. MENGES. I'm going to begin with a brief perspective on my view. My title is "China: Its Geostrategy and Energy Needs." I'm going to offer a brief perspective on what I view as China's geostrategic purposes in the world today, and then move on to a discussion of six parts of the world and how China's geopolitical and energy interests are operative, and conclude with five policy suggestions since you asked for policy suggestions, and I shall allocate about two minutes to each of these topics, so we'll go quickly.

My own view is that the People's Republic of China is a country that is determined to move toward dominance, dominance in Asia, dominance in Eurasia, and dominance in the world. I have recently completed a book entitled 2008, The Preventable War: The Strategic Challenge of China and Russia.

I've spent several years on this and my focus has been an overview of China's actions in the world. So my focus today is on geopolitics and geostrategy.

I believe that we recall that in the 1950s China spoke about the five principles of peaceful coexistence, which it continues to speak about, but unfortunately undertook a number of aggressive actions including sending nearly a million men in to support the North Korean aggression and supporting armed subversion and invading India in 1962.

Fortunately, in the post-Mao years, China's foreign policy has moved away from a number of those very direct aggressive actions, but I believe after some years in which the Chinese regime during the 1980s was open to a possibility of moving toward more political pluralism as its economic pluralism increased, that a decision was made around the time of the decision on Tiananmen Square that the Communist Party of China would not in any way surrender political power, and while there could be movement toward economic pluralism and happily a great degree of improvement in lifestyle pluralism in China, all of which is to the good, the decision was firmly made that the Communist Party of China would remain in power, would not go the way of Eastern European countries or as it then saw the dissolution of the Soviet Union in 1991, and it's at that time that the Communist Chinese Party again defined, again defined the United States as its main enemy instead of the Soviet Union, which had been its main enemy from 1960 to 1985 when normalization began with Gorbachev.

Part of the actions of China, which I'll summarize, which I'll summarize briefly, suggesting these purposes included aggressiveness in a number of territorial disputes—it has territorial disputes with 25 neighboring countries including 11 contiguous countries; its transfer of weapons of mass destruction technology to a number of state sponsors of terrorism including Iran; its extensive espionage and covert action activities against the United States, which have been well documented by the congressional commissions, the Cox Committee, and its continuing espionage; its military build-up which has been extensive, and, as you know, there's the Asian proverb that a rich country has a strong army.

And China has been showing that. As its wealth has increased, it has invested evermore in its military build up, and I believe its fundamental method of action is what I call one of stealth movement toward stealth hegemony. That is trying to seek dominance, seeking dominance in the world, without open war if at all possible, through a combination of political, economic, covert, paramilitary, and at times coercive actions. So a whole series of actions, and that there is a set of things being done together in a coherent, systematic and managed way.

So the reasons for China's pursuit of dominance in my view are three. First, to preserve the power of the Communist Party of China, not to risk that China would move toward a situation of political democracy or a transition to democracy, where the party might be unseated.

Secondly, to counter the military power of the United States and its allies which China sees as the brake on its ambitions for dominance.

And thirdly, to ensure access to economic resources including energy and especially energy. And here I would say that in my discussion, China's quest for energy supplies, energy security, is a very important part of its strategy, but it's a subsidiary part to the overall geopolitical purposes that I've indicated: maintenance of the parties in power; countering the military power of the United States and its allies; and thirdly, seeking access to economic resources.

You've had a lot of discussion here I know about China's increasing demand for energy, and I have a nice table in my prepared presentation. Here we see China's production remains under four million barrels a day. It will need more than ten million barrels a day by 2025 with a rapidly rising curve, so China needs energy, access to energy resources in the world.

I cite Manning's work, which I thought was very well done, in pulling all this together. With that in mind, I'm going to turn to six regions of the world and discuss them briefly.

First, the South China Sea first island chain of defense region, namely, the whole offshore region from China. Here we know that China for decades has contended that it has sovereignty over the entire South China Sea, which is an international waterway of 450,000 square miles to which more than 50 percent of world's shipping passes including the 99 percent of the oil that Dr. Calder mentioned going to Japan and South Korea and so forth.

China says it has sovereignty over the entire South China Sea, and it has acted during the 1990s in a coercive way in a number

of situations to take territory by force, to expand its presence militarily in the South China Sea, and I believe the fundamental purpose in doing so has been geopolitical. That is an exercise in its expression of dominance in Asia, dominance over Japan and South Korea and Indonesia and regional powers. But also it has an energy—there's an energy component to that.

We know that from recent estimates that even looking at the energy in the exclusion zone and the economic zone allocated properly to China, in its current proper borders, not its claimed borders but its proper borders, that there's roughly 29 billion barrels of oil in the South China Sea, the East China Sea, the Bohai Sea and the Yellow Sea.

And my contention is that China's view is that by being aggressive and coercive in the South China Sea, it seeks to intimidate other claimants to energy resources, which will go far beyond the 29 billion barrels in other parts of the exclusion zone such as Japan, Indonesia and other countries. And that that's part of a tactic and approach that China is using in that arena.

Turning to Central Asia, with the unraveling of the Soviet Union in 1991, there were 15 new post-Soviet republics. China began a very careful and cautious and prudent process of getting to establish relationships with the Central Asian countries on its border, not wanting to offend the Soviet Union.

China gradually moved that relationship into a regularized process of meeting, convened in Shanghai in 1995, which essentially became in a formal treaty agreement in June 2001, the Shanghai Cooperation Organization, which consists of China, Russia and the Central Asian countries of Tajikistan, Kyrgyzstan, Uzbekistan, and Kazakhstan. Actually, together this alliance is about 1.5 billion people, and about 3.6 million in its armed forces, though it's not an alliance building toward a military effort. It is an alliance with a political purpose and implication.

China wisely included Russia in order to allay any Russian concerns about China's relationship with the Central Asian countries, and of course has an important geopolitical reason, namely to have a secure area on its border, on the one hand, but to normalize the border and normalize the border discussions, continuing the discussions begun with the Soviet Union in 1985, but also the energy aspect is important.

It has now an agreement with Kazakhstan for the importation to begin next year of roughly 600,000 barrels a day in a pipeline from Kazakhstan directly into China, and the new Iran pipeline that is planned will transport many hundreds of thousand barrels a day transiting these Shanghai Cooperation Organization countries into China. I have in my testimony a very nice map that Mr. Christopher Brown, who is working with me and is skilled at research, found that illustrates this.

The third domain is the relationship with Russia, and here I think it's very important to understand that the fundamental aspect of the new China-Russia relationship is geopolitical, and my book is perhaps the only book that actually discusses the China-Russia relationship.

The relationship with Russia went from deep hostility from 1960 to 1985 to normalization talks, and then with Yeltsin coming to

power, Yeltsin held China at a distance, but continued normalization talks, but then gradually at China's behest, Yeltsin moved toward in 1996 a strategic partnership, annual summits, ever closer geopolitical agreement with China on a number of issues, and then into a formal alliance signed in July 2001 which, as you all know, may have escaped most of the media's attention and most of the official Washington's attention and the major democracies, but there is a new China-Russia alliance.

I believe China and Russia are pursuing with the United States a two-level strategy. One is to maintain normal relations in order to have civil relations and to maintain the flow of economic benefits, on the one hand, and the other is to work discretely and carefully against the United States and its allies in a coherent way. I think it's worth noting that China—

Co-Chairman LEDEEN. Dr. Menges, I'm afraid we're going to have to stop with that.

Dr. MENGES. All right. And so the balance of this analysis and the other three domains we'll have to get to later on.

[The statement follows:]

**Prepared Statement of Constantine C. Menges, Ph.D.
Senior Fellow, Hudson Institute**

*China: Its Geostrategy and Energy Needs**

Introduction—Perspectives on China's Geostrategy

Beginning in 1950, the communist government of China said that its goal in international politics is to promote peaceful relations with other states. Therefore, its international conduct would always be governed by the "five principles of peaceful coexistence" which China defined to include: mutual nonaggression and mutual non-interference.¹

Yet, during the 1950s China committed many acts of aggression including: sending nearly a million troops to battle the United Nations forces in support of North Korea; threatening invasion and attacking island territories controlled by Taiwan; and, supporting armed communist insurgent movements seeking to overthrow regional governments. Nevertheless, as the historian Hsu put it, "Peking succeeded to a large extent in preventing [most Asian] states from aligning with the West,"² even India despite China's surprise attack in 1962 and continuing occupation of part of its territory.

In the post-Mao years, with China's economic opening to the industrial democracies and other countries, there have been major changes in the methods of Chinese action in the world. While China continues to say that it seeks to promote peace and the principles of peaceful coexistence, it has now added the major purpose of promoting its own economic development. Also during the 1990s China increasingly repeated, as officially stated in its October 2000 *Report on National Defense*, that it seeks "a new international political, economic, and security order, responsive to the needs of our times."³

While the content and structure of this "new international order" has not been made clear, obstacles to its realization that China often mentions are the alleged intention of the United States to dominate the world by what China calls "unipolarism" or "hegemonism." Also, impeding the Chinese "new world order" are the alliances maintained by the United States in Asia, Europe and the world, all of which China condemns as contrary to peace and relics of "the cold war mentality." China also opposes the plans of the United States for national missile de-

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¹Immanuel C.Y. Hsu, *The Rise of Modern China*, New York and Oxford: Oxford University Press, 1995, Page. 662.

²Ibid.

³People's Republic of China, State Council, *Report on National Defense*, October 2000, 2 [www.chinaguide.org/e-white/2000/20].

fense and for Asian missile defense involving Japan, South Korea, and potentially other countries.

Since 1990: Increased Aggressiveness Despite Export-led Economic Growth

Since 1980, China has had open access for its exports to the U.S. and other major democracies (while keeping restrictions on access to its market). Economic benefits for China from 1990 to 2002 have included a cumulative trade surplus with the U.S., Japan, and the EU greater than \$1.1 trillion (of which \$612 billion is with the U.S.), foreign direct investment exceeding \$320 billion, and western economic assistance of more than \$60 billion, all contributing to significant economic growth. These Chinese trade surpluses have led to its accumulation of more than \$330 billion in hard currency reserves.⁴

Instead of these benefits from the democracies leading to a more peaceful and less politically repressive China, the opposite has occurred. During the 1990s there was a deepening of political and religious repression within China and an acceleration of military modernization in nuclear weapons, missiles, and other advanced weapons.⁵

China has spoken about building peaceful relations but in fact has often been coercive since 1990. It has territorial disputes with eleven of twenty-five bordering and neighboring states;⁶ continues to transfer technology for weapons of mass destruction to potentially aggressive dictatorships which are also state sponsors of terrorism; has conducted large scale military espionage and covert influence operations against the United States and other countries; and, has failed to keep many of the arms limitation agreements it has signed. It is the pattern of actions by communist China and China's own official pronouncements that indicate its purpose is to seek dominance, first in Asia and then more widely in the world.

Reasons for China's Pursuit of Dominance in Asia and the World

The history of the twentieth century demonstrates that it is the inclination of political democracies to seek international security through conflict resolution, conflict prevention, and defensive alliances. In contrast, ideological or expansionist dictatorships such as the regime in China seek international security through the domination and the neutralization of potentially threatening governments. As the 21st century began, the government of China defined the world situation as follows:

... in today's world, factors that may cause instability and uncertainty have markedly increased. The world is far from peaceful. There is a serious disequilibrium in the relative strength of certain countries. No fundamental change has been made in the old, familiar and irrational international political and economic order. Hegemonism and power politics [the actions of the United States] still exist and are pursuing and developing further in the international political, economic, and security spheres. Certain big powers [the United States] are pursuing neointerventionism, neogunboat policy, and neo-economic colonialism, which are seriously damaging the sovereignty, independence, and developmental interests of many countries and threatening world peace and security.⁷

This negative assessment echoed accusations also made publicly by the then-President Jiang Zemin of China. These are the public declarations of the private conclusions reached by the Chinese communist rulers in 1990, following their repression in Tiananmen Square. To protect itself from the actions of the United States defined as hostile "neointerventionism," "neogunboat diplomacy" and "neo-economic colonialism," China seeks to become dominant for a number of reasons.

1. Preserve the Power of the Chinese Communist Party

The first reason China seeks international dominance is to preserve the power of the communist party and its unquestioned rule. The Party leadership has been concerned since the 1950s about what it perceives to be an American plot of promoting "peaceful evolution" from communist dictatorship to democracy. It believes that the United States and the democracies caused the end of communist rule in Eastern Europe and the unraveling of the Soviet Union. Speaking publicly in June 2000, President Jiang Zemin reflected these concerns when he said: "Our struggle to fight against western hostile forces infiltrating and seeking to overthrow [the Party] is

⁴These facts are sourced in my completed book, *2008: The Preventable War—The Strategic Challenge of China and Russia* (forthcoming).

⁵Ibid.

⁶This includes disputes with 3 of 14 bordering states, and 8 of 11 neighboring states.

⁷People's Republic of China, State Council, *The National Defense Report*, October 2000 op cit.

a long and a complicated struggle that at times will be very intense.”⁸ A few months later, the Chinese leadership witnessed the people of Serbia removing the long established communist dictatorship of that country (1945–2000) through an essentially peaceful popular uprising that some believed was secretly encouraged and aided by the United States and other democracies.

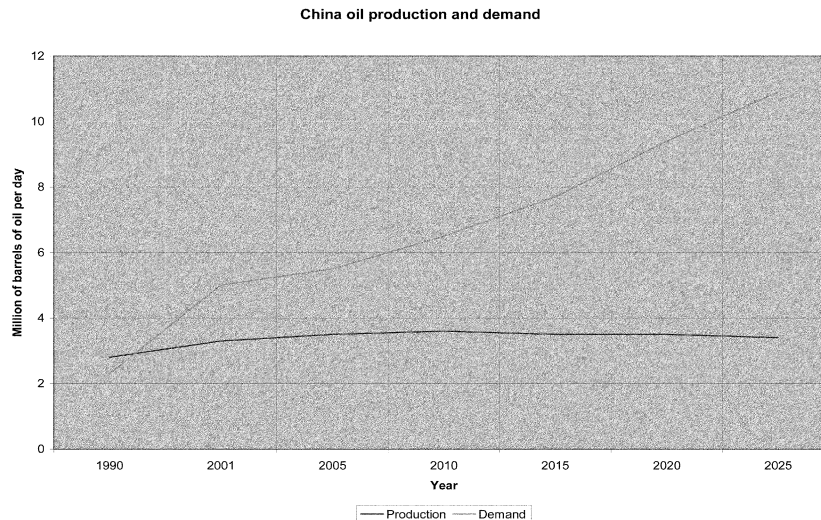
2. Counter the Military Power of the United States and its Allies

China’s second concern is the military power of the United States which is perceived as limiting its ability to take control of Taiwan and attain its other territorial aims in Asia. It is this military power which permits the U.S. virtually alone in the world to announce the sale of a large number of defensive weapons to Taiwan on April 23, 2001, followed the next day by the statement of President George W. Bush that if China attacked Taiwan, the U.S. would do “whatever it took to help Taiwan defend itself.”⁹ This military power was demonstrated in the 1991 Gulf War, in the 2001 removal of the Taliban and in the 2003 removal of the Saddam Hussein regime in Iraq. It is inherent in the U.S. arsenal of 6,000 strategic nuclear weapons, and in its system of alliances.

3. Ensure Access to Economic Resources

A third reason for China to seek dominance is to ensure its continued economic modernization and growth. Chinese strategists have defined “comprehensive national power” to include the political will and leadership of a country, its economic, scientific, and technological resources and development as well as its military capabilities.¹⁰ China’s involvement with the world economy since 1978, its rapid economic growth and enormous success in developing contemporary and advanced civilian and military technology all have made clear to the communist leadership that access to the economic, technological, energy and mineral resources of the world are essential to its future success.

Table 1: China: Oil Production Versus Demand¹¹



Oil imports are an example of China’s inevitably growing dependence on resources from abroad. In the year 2000, China used about 4 million barrels of oil a day and produced about 3 million barrels a day.¹² A comprehensive analysis by Robert A. Manning concluded that China’s energy production may increase slightly in the next

⁸ Agence France Press, 18 July 2000.

⁹ David Sanger, “U.S. Would Defend Taiwan, Bush says,” *New York Times*, April 26, 2001, A1.

¹⁰ Pillsbury, 2000, op. cit. ch. 5, Geopolitical power calculations.

¹¹ Graph based on information contained in Appendix A at the end of this testimony *Oil Production and Demand History and Projections*.

¹² Robert A. Manning, *The Asian Energy Factor*, New York, Polygrave, 2000, 104.

years but that its oil and other energy import requirements will rise steadily as China's economy continues to expand and becomes more developed and as more motor vehicles are used. The economy of China has been growing by more than 7% annually for many years. Assuming that in the next years China's economy grew at a rate of about 5.5%, China is estimated to need to import about 4 million barrels of oil a day by 2010 and 6 million barrels of oil a day by 2020.¹³

Despite the leveling off in domestic Chinese oil production and its growing economy requiring more oil, the U.S. Department of Energy estimates that the total global demand for oil will increase to approximately 119 million barrels per day by 2025.¹⁴ However, global production for that same year is expected to be at 124 million barrels per day which is double the number of barrels in the current reserve capacity.¹⁵ China therefore has no objective need to be concerned about access to available oil resources through the international oil market. However, it is also very possible that in spite of the market realities that China's leadership is likely to continue seeking guaranteed access and exclusive control over foreign oil resources.

China has witnessed economic sanctions imposed under U.S. leadership on Serbia, Iraq, Iran, North Korea, and Cuba. China also experienced the negative effects of the temporary reduction in economic assistance and benefits imposed by the United States, Japan, and other countries after the Tiananmen massacre. For the Chinese regime, the best way to avoid the potential of future economic denial may be an extensive program combining geopolitical influence building and geoeconomic positioning. It has been seeking positions of dominance and political influence such that no major power would consider denying China the resources that it considers vital for the functioning of its economy and society. Examples of this include China's systematic efforts to have positions of potential control on a number of key international shipping routes such as its South China Sea claims, its naval bases in Myanmar/Burma, its control of ports at both ends of the Panama Canal, and its control of major port facilities in the Bahamas, Rotterdam and the Suez Canal. (See map 1 following.)

With these perspectives in mind, we now turn to a discussion of China's geostrategy and energy needs in five regions of the world.

I. South China Sea/"First Island Chain of Defense"

Since 1992, China has again explicitly declared the South China Sea to be its sovereign territory, although these are international waters with vital sea-lanes. To enforce its offshore territorial claims, China has occupied disputed islands by force which has involved threats against the Philippines, Japan, Vietnam, and Indonesia.

There are two main island groups in the South China Sea: the Paracel Islands are in the northern part, about 200 miles from the coast of Vietnam and they are claimed by Vietnam as well as by China. The Spratly islands are spread through the southern part of the South China Sea and include about 100 small islets, sand bars, reefs, and rocks, comprising a total area of no more than 1.8 square miles in a vast ocean.¹⁶ While China claims all the Spratly islands, they are also claimed by Vietnam, which currently occupies 27 of the 100; the Philippines, which occupies 8, Malaysia which occupies 3; Taiwan which occupies 1, while China currently occupies 7.¹⁷ To date, there has been no definitive international arbitration of these competing claims.

In February 1995, the Philippines revealed that one of the Spratly Islands, named Mischief Reef, which was 150 miles from its island of Pelawan, and nearly 1,000 miles from mainland of China, had been occupied by China. In May 1995 the Clinton Administration privately told the Philippines not to invoke the mutual defense treaty. Instead the U.S. urged diplomacy and officially stated that it has:

¹³ Ibid.

¹⁴ World Oil Consumption by Region, Reference Case, 1990–2025 From International Energy Outlook 2003 by the Energy Information Administration Department of Energy http://www.eia.doe.gov/oiaf/ieo/tbl_a4.html. (All figures are represented in Million of Barrels per Day.)

¹⁵ World Oil Production Capacity by Region and Country, Reference Case, 1990–2025 from International Energy Outlook 2003 Energy Information Agency Department of Energy http://www.eia.doe.gov/oiaf/ieo/tbl_d1.html. (All figures are represented in Million of Barrels per Day.)

¹⁶ David G. Winneck, *The South China Sea Dispute: Background Briefing*, February 11, 1999, Manuscript, 2. Other useful sources on this issue include: John H. Nore with David Gregory, *Chokepoints: Maritime Economic Concerns in Southeast Asia*, Washington, DC, National Defense University Press, 1996; and Scott Snyder, *The South China Sea Dispute: Prospects for Preventive Diplomacy*, U.S. Institute of Peace, Washington, DC, August 1996; and the article by Rublee cited earlier.

¹⁷ Winneck, op cit., 4.

... an abiding interest in the maintenance of peace and stability in the South China Sea. The United States calls upon claimants to intensify efforts to address issues related to competing claims, taking into account the interest of all parties and which contribute to peace and prosperity in the region. The United States is willing to assist in any way the claimants deem helpful. The United States reaffirms its welcome of the 1992 ASEAN declaration on the South China Sea.”¹⁸

That formal pronouncement by the Department of State was ignored by China. In turn, the United States mostly ignored China’s further aggressive actions.

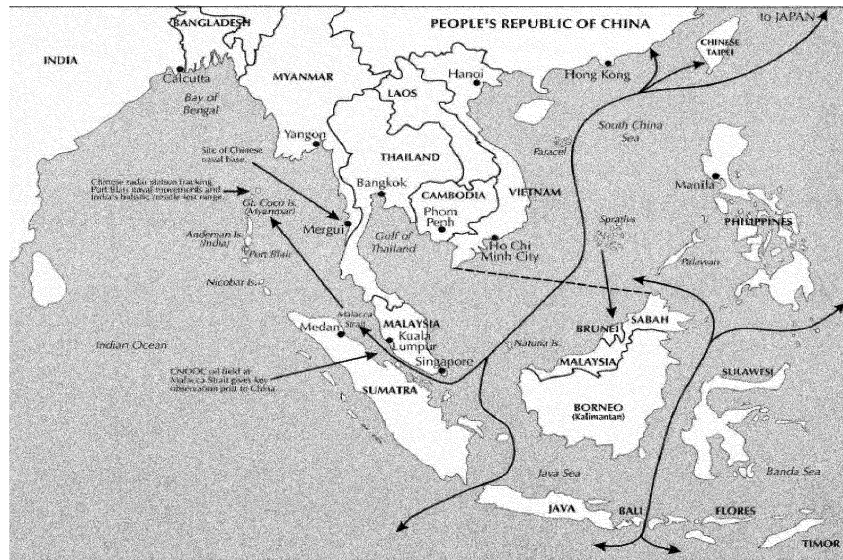
Yet, the May 1995 U.S. statement provides a preview of possible conflict with China in addition to that which might occur about Taiwan. The United States totally rejected the Chinese claim of sovereignty over the South China Sea and said further:

Maintaining freedom of navigation is a fundamental interest of the United States. Unhindered navigation by all ships and aircraft in the South China Sea is essential for the peace and prosperity of the entire Asia-Pacific region, including the United States. ... The United States would ... view with serious concern any maritime claim or restriction on activity in the South China Sea that was not consistent with international law. ...¹⁹

Testifying to the U.S. Congress in March 2000, the then Commander in Chief of U.S. Forces in the Pacific, Admiral Dennis C. Blair, said that in addition to their Taiwan claims, “Chinese authorities have also claimed sovereignty over the South China Sea. The resulting uncertainty over Chinese intentions in using force to resolve territorial claims creates concerns throughout the Asia Pacific region.”²⁰

The effect of continuing acquiescence in these Chinese claims and actions could be to cede China de facto control over the islands in the South China Sea. China could then use the sovereign rights under international law over waters extending to twelve miles from land boundaries and the economic exclusion zone of 200 miles from the land border recognized under the 1982 United Nations Law of the Sea in order to essentially establish large domains of sovereign control from the many Spratly islands and Paracel islands that might in effect give it operational or economic control over much of the South China Sea.

Map 1: Vital Sea Lanes²¹



¹⁸ Department of State, “United States policy on the South China Sea,” May 1995.

¹⁹ Ibid.

²⁰ Admiral Dennis C. Blair, “U.S. Security Concerns in Asia,” Testimony Before the House International Relations Committee, Subcommittee on Asia and the Pacific, March 8, 2000, 19–20.

China has acted and spoken in a tone of belligerent entitlement in pressing its claims in the South China Sea and to the Paracel and Spratly islands. China has used force and has made clear that it is willing to use more force in the future if the other claimant countries fail to acquiesce in China's purposes. Control of the South China Sea would facilitate China's dominance of Asia, since U.S. ships and aircraft as well as those of Japan, South Korea and other countries would have to have Chinese permission to transit the South China Sea, a major supply and transit route. It is estimated that 50% of world commerce and more than 41,000 ships annually transit the South China Sea (in comparison with about 4,000 ships transiting through the Panama Canal each year).²² If China controlled the South China Sea it could decide which country's ships could transit and which could not, and thereby it would have a means to exert political pressure on Japan, South Korea, and other countries in the region that depend on supplies moving through the South China Sea for their energy and commercial deliveries. Energy and other supplies could be transported around the South China Sea but this would increase costs.²³

Such a coercive use of control over the South China Sea would be consistent with the new Chinese geopolitical doctrine of the "first island chain of defense." This was advanced as a strategic concept in the 1990's by General Liu Huaqing, a close associate of Deng Xiaoping, Vice Chairman of the Central Military Commission and member of the Politburo elite until his retirement in 1997. The first island chain of defense doctrine holds that to be secure China needs to control the entire region off its shores in a line from Japan to Taiwan and the Philippines.²⁴

In addition to this geopolitical purpose, dominance over the South China Sea and other adjacent waters could help China meet its future energy needs. Current estimates are that there could be 8 billion barrels of oil beneath the waters of the South China Sea within the internationally recognized exclusive economic zone of China. This could mean large additional energy resources in the entire South China Sea. The following table summarizes the estimated 29 billion barrels of oil within the recognized Chinese Economic Exclusion Zones within the four adjacent seas. In all these situations it is probable that large additional reserves also exist under waters claimed by Japan and other regional states within their economic exclusion zones.

Table 2: China Offshore Oil Resources²⁵

Domestic Holding	Proven/Reported Reserves
South China Sea (including the Taiwan Strait)	8 Billion Barrels
Yellow Sea	4.5 Billion Barrels
Bohai Gulf	4.5 Billion Barrels
East China Sea	12 Billion Barrels

II. Central Asia

The unraveling of the Soviet Union in 1991 opened new opportunities for China to establish relations with the newly independent-post Soviet States of Central Asia. Year by year, but gradually and carefully, China expanded its political economic relations with the Central Asian states directly on its border and continued the talks it had been conducting with the USSR on the demarcation of those borders. By 1995 China had begun a regular series of summit meetings with the leaders of Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, and Tajikistan.

In 1996, Russia was invited to join in these gatherings usually held in Shanghai and then in June 2001, the Presidents of China, Russia and four Central Asian states established a political-security alliance which they named the Shanghai Cooperation Organization and which President Jiang Zemin called the "Shanghai Pact." This alliance treaty includes: political, economic, and security aspects.

China's purposes in establishing this alliance included:

²¹ "China's Worldwide Quest for Energy Security," *International Energy Agency*, 2000.

²² Testimony of Admiral Prueher, CINCPAC as cited in *Washington Times*.

²³ As discussed in, C. Menges "The China Puzzle," *The Washington Post*, March 5, 2000.

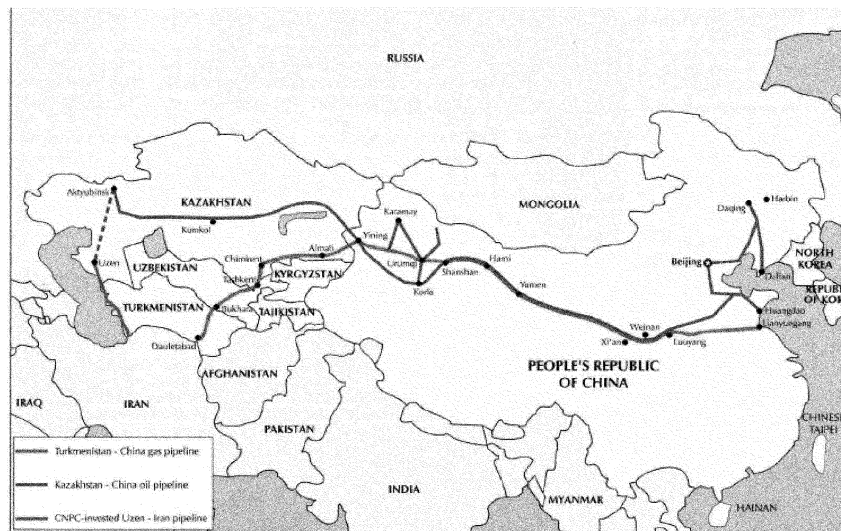
²⁴ John Lewis and Xue Litai, *China's Strategic Seapower*, Palo Alto, CA Stanford University Press, 1994, 226-230.

²⁵ Erica Strecker Downs, "China's Quest for Energy Security," Santa Monica, California: *Rand Corporation*, 2000.

1. an effort to assure normal and friendly relations with states on its borders for security reasons;
2. using these relations to bring Russia closer to its geopolitical purposes while also reassuring Russia; and
3. increasing access to and the security of its energy supplies from Central Asia as well as from the Middle East.

The proposed energy pipeline from Kazakhstan will transit directly into China. In addition, the proposed overland pipeline from Iran to China would first traverse Central Asia. (See the following map.)

Map 2: Proposed Central Asian Pipelines²⁶



III. The China Russia Alliance

The relationship between Russia and China went from alliance in the 1950s to deep hostility from 1960 to 1985 followed by gradual normalization during the Gorbachev years. After 1991, Yeltsin continued talks on defining the 2,000-mile border but kept a political distance because China remained communist, had publicly endorsed the 1991 coup attempt by Soviet communist hardliners and also opposed Yeltsin's democratic aspirations.

However, in April 1996, Yeltsin changed this policy and at China's urging agreed to a "strategic partnership" with China. This meant foreign policy cooperation and increased Russian weapons sales. Through a series of regular summit meetings, China moved the "partnership" with Russia toward strategic alignment marked by an ever larger component of shared anti-U.S. political objectives (e.g., support for dictatorships in Serbia, Iraq, Iran, and opposition to U.S. missile defenses) along with increased Russian military sales and military cooperation.

In July 2001, Presidents Putin and Jiang signed a treaty of alliance, which formalizes and expands Chinese-Russian strategic coordination. While the treaty states that it "is not aimed at any third country," it explicitly seeks to promote a "new international order." This is the phrase China and now Russia use to describe international politics when the United States no longer has or seeks what they have jointly called "unilateral military and security advantages."

China-Russia: Their Two-level Strategy Toward the U.S.

After the terrorist attack on the U.S. of September 11, 2001, Russia provided extensive and welcome cooperation as the U.S. moved in Afghanistan against international terrorists who were also arming groups attacking Russia and to a lesser

²⁶"China's Worldwide Quest for Energy Security," *International Energy Agency*, 2000.

extent China. China also provided some modest cooperation, though it was and remains extremely concerned about U.S. force deployments in Central Asia.

Nevertheless, China and Russia have continued to pursue a two-level strategy toward the United States. First, the two countries maintain a sense of normal relations with the United States and other democracies so that they will continue providing China and Russia with vitally needed economic benefits. For example, since 1992 Russia has received more than \$150 billion in U.S., western and international economic aid; from 1990 to 2002 China obtained more than \$1.4 trillion in economic benefits from the U.S., EU, and Japan.

At the second level, Russia and China are using mostly political and covert means to oppose the United States selectively on security issues including by providing support and weapons of mass destruction/ballistic missiles components and expertise to hostile regimes which the U.S. judges to be state sponsors of terrorism such as Iran, Libya, and North Korea.²⁷

Other negative aspects include: Russia's continued sales of advanced weapons to China, which aims these at U.S. forces in the Pacific—since 1998 about \$18 billion have already been sold with an estimated \$20 billion more scheduled through 2004. And the political and military-to-military relationship with communist China is strengthening authoritarian trends within Russia.

China has pursued the new relationship with Russia in an effort to bring Moscow to its side on as many issues as possible while moving Russia away from the United States. It has also seen the new alliance with Russia as a means to have access to Central Asian and Russian energy supplies. For example in July 2001 President Putin and Jiang signed an agreement on the establishment of a 600,000 barrels a day oil pipeline between Russia and China (which has yet been realized).²⁸ Russia with 49 billion barrels in oil reserves (2002) could be an important energy supplier for China.

Beginning in October 2002, Japan began buying Russian oil for the first time since 1978, and offered to finance the building of a pipeline to the Russian port of Nakhodka for exports of Russian oil and gas to Japan. Discussions continued in 2003, concerning a Russian pipeline for energy exports to both Japan and China. Then, on June 20 2003, Russian President Vladimir Putin said he "would prefer Russia built an oil pipeline to the Pacific coast near Japan over a proposed link to China. . . . [Putin] added he considered the project more flexible than a pipeline ending in Daqing, China."²⁹

Liu Hongbin, a director general of the Chinese company's publicly traded unit, PetroChina, said "The Daqing route has definitely been delayed. Now, we have to see how Russia wants to proceed with this project."³⁰ This after a July 2003 visit by Japan's Agency of Natural Resources and Energy with promises of not only financing a potential pipeline but also assisting in the development of Siberian oil fields.³¹

On September 24th 2003, the Russian Prime Minister announced that Russia will "honor the agreement on establishing a pipeline to Daqing for China."³² This announcement came on the eve of the China-Russia bilateral summit followed by the meeting of the Shanghai Cooperation Organization. Nevertheless, at the October 2003 APEC summit meeting Japan "offered a financial package worth US\$7 billion in assistance for Russia in return for the oil pipeline being used to provide oil for Japan."³³ This competition between China and Japan for access to Russian energy supplies has not yet been resolved and undoubtedly increases China's interest in securing guaranteed access to oil in other regions.

IV. The Middle East

In 1998, China imported 61% of its oil, from the Middle East, a proportion that is expected to rise to as high as 80% by 2010.³⁴ The following table indicates the amounts supplied to China by various Middle Eastern countries in 2002.

²⁷C. Menges, "Russia, China and What's Really on the Table," *The Washington Post*, July 29, 2001.

²⁸Michael Lelyveld, "Russia: Moscow Sees No Profit In Japan Oil Line," *Radio Free Europe Radio Liberty*, 04/15/2003.

²⁹"Putin prefers oil pipeline to Japan, not China," *Associated Press*, 06/20/03.

³⁰Le-Min Lim and Eduard Gismatullin, "Russia rethinks China pipeline venture," *Bloomberg News*, 09/18/2003.

³¹Ibid.

³²"Russia delays China pipeline deal," *BBC*, 09/24/2003.

³³Sergei Blagov, "Putin pushes his case at APEC," *Asia Times*, 10/18/2003.

³⁴Erica Strecker Downs, Op. Cit.

Table 3: Chinese: Oil Sources in the Middle East³⁵

Countries	Volumes 1,000 b/per day	Reserves in Billions of Barrels
Saudi Arabia	245	261.7
Kuwait	23	96.5
Iran	229	89.7
Oman	173	—
Iraq	12	112.5
Qatar	10	—
Yemen	49	—
Total:	741	560.4

Clearly China has the economic means to purchase oil from responsible Middle Eastern countries. However, for geostrategic reasons as well as to have preferential access to energy supplies China has established very close relations with terrorist sponsoring countries such as Iran, Libya, and formerly, Saddam's Iraq.

Iran and Saddam's Iraq

China's current imports from Iran are about 229,000 barrels per day but it intends to increase this significantly once the over land pipeline through Central Asia has been completed. After opposing Iran's development of nuclear weapons, Japan lost the exclusive right to develop the new Azadegan field in Iran which is now being opened up to European and Asian firms including Chinese firms.³⁶

In 1980, Iraq invaded Iran and began an eight year long conflict which caused two million dead and wounded on both sides. In that war, both sides attacked with short-range ballistic missiles and sought to develop nuclear, chemical, and biological weapons for use against the other.

China sold weapons to both Iran and Iraq during and after the war. These military sales by China provided hard currency earnings for the Chinese military industrial complex and a means of developing close relations with two oil-rich dictatorships, which could help to meet China's oil needs, in the present and future. Both Iran and Iraq wanted to develop increasingly destructive weapons for mutual deterrence or battlefield use if another war should occur. They were also both hostile to the United States and its allies in the region.

In 1990 Iraq invaded Kuwait. The United States led a broad coalition in 1990–91 to enforce UN Security Council resolutions requiring Iraq to withdraw from Kuwait. This meant that the United States and several of its NATO allies had to face the possibility of dealing with an opponent that might use chemical, or biological weapons as well as ballistic missiles.

In 1997 the Office of Naval Intelligence stated: "discoveries after the Gulf War clearly indicate that Iraq maintained an aggressive WMD [weapons of mass destruction] procurement program. A similar program exists today in Iran, with a steady flow of materials and technologies from China to Iran. This exchange is one of the most active WMD programs in the third world. . . ."³⁷ In succeeding years, the public congressional testimony of the Director of Central Intelligence, and the Director of the Defense Intelligence Agency indicated that China and Russia continued the active proliferation of weapons of mass destruction technology, expertise and components to a number of hostile and potentially dangerous countries including Iran, Iraq, and North Korea.³⁸

Although the Saddam Hussein regime in Iraq did fire a number of ballistic missiles in 1991, it was deterred by threats of massive retaliation from using chemical

³⁵ "Global Reliance on Mideast Gulf Oil," Energy Intelligence, 2003.

³⁶ Le-Min Lim and Eduard Gismatullin, "Russia rethinks China pipeline venture," *Bloomberg News*, 09/18/2003.

³⁷ Statement distributed by the Office of Congresswoman Nancy Pelosi, June 1998.

³⁸ Statement of Director of Central Intelligence George J. Tenet before the Senate Select Committee on Intelligence on the "Worldwide Threat 2001: National Security in Changing World," February 7, 2001, and Statement of the Director of the Defense Intelligence Agency Vice Admiral Thomas R. Wilson, "Global Threats and Challenges Through 2015," February 7, 2001.

or biological warheads. But the fact that 400,000 U.S. and allied troops had faced this threat for many months added impetus to the expressed policy of the first Bush Administration that preventing the spread of these weapons of mass destruction and the means to deliver them was one of the highest priority concerns of U.S. foreign policy.

As China shifted in 1990 to the view that the United States was its “main enemy,” it viewed the sale of components for weapons of mass destruction and the sale of technical assistance in building these to Iran, Iraq, North Korea, Syria, Libya and other states hostile to the United States, as not only financially profitable but also a way to strengthen the enemies of its “main enemy.” During the 1990s a great deal of government information became public in the United States about first Chinese and then later Chinese and Russian activities in transferring weapons of mass destruction to the main state sponsors of terrorism.³⁹

During the 1990s and since, China has provided Iran with ballistic missile components as well as air, land and ship-based cruise missiles. By 2001, the Director of DIA, testified that “these along with Iran’s submarines, mines, and missile patrol boats can attack ships including U.S. Naval forces in the Middle East and stem the flow of oil from the [Persian Gulf] for brief periods.”⁴⁰ China also sent Iran key ingredients for the development of nuclear weapons, poison gas production ingredients, rocket propellants, and a “research” nuclear reactor. The CIA noted that in 1999 Iran “continued to seek production technology, training, expertise, and chemicals that could be used as precursor agents in its chemical warfare program from entities in Russia and China.”⁴¹

In 2001, the newly inaugurated Bush Administration publicly accused Chinese organizations of breaking UN Security Council prohibitions by providing advanced fiber optics support for the military command and control systems of Iraq.⁴² During the 1990s, China reportedly provided ingredients that Iraq used for nerve gases, missiles and nuclear weapons, and China also sold Iraq chemicals that are used to produce missile fuel.⁴³ There had been no United Nations inspection of Iraq since the autumn of 1998 when Saddam Hussein refused to cooperate any longer with the inspection system that had been set up under the terms of the UN Security Council Resolutions. As permanent members of the Security Council, China and Russia colluded to undo the inspection regime and to delay its resumption until November 2002.

The U.S. lead liberation of Iraq in 2003 ended most risks posed by that regime. However, Iran continues as the leading state sponsor of terrorism and is moving rapidly toward acquiring nuclear weapons. China continues to provide political and military support to that clerical dictatorship for both strategic and energy related reasons.

V. Latin America

There is an emerging pro-Castro axis in Latin America which has largely escaped public and official notice. China is not the cause of this trend, but it is a close political and military ally of the Castro regime in Cuba which is working with its allies in the region to bring this about. The following chart summarizes my perspective that the pro-Castro axis now includes four countries with a combined population of 223 million which also produce 5 million barrels of oil daily and have an estimated 84 billion (2000) barrels in reserve. The table also shows other countries risk.

Table 4: South America: The New Pro-Castro Axis and Countries at Risk

Country	Population, millions (2001) ^a	GDP, \$ billions (2001) ^a	Per Capita GDP ^a	Oil Production (Millions of barrels a day) (2000) ^b	Est. Oil Reserves (Billions of barrels) (2000) ^b
Cuba *	11	26	2,300		
Venezuela *	24	146	6,100	3.3	73

³⁹Due in significant part to the reports of Bill Gertz in *The Washington Times* and Jeff Gerth in *The New York Times*, and the public reports mandated by the U.S. Congress as discussed earlier.

⁴⁰Testimony of Thomas R. Wilson, February 7, 2001, 14, op cit.

⁴¹CIA, op cit. August 9, 2000.

⁴²Bill Gertz, *Washington Times*, February 2001.

⁴³Wisconsin Project on Nuclear Arms Control, *U.S. Exports to China, 1988-98: Fueling Proliferation*, Washington, DC, April 1999, Chart: China’s Dangerous Exports.

Table 4: South America: The New Pro-Castro Axis and Countries at Risk—Continued

Country	Population, millions (2001) ^a	GDP, \$ billions (2001) ^a	Per Capita GDP ^a	Oil Production (Millions of barrels a day) (2000) ^b	Est. Oil Reserves (Billions of barrels) (2000) ^b
Brazil*	175	1,130	7,400	1.4	8.1
Ecuador*	13	37	3,000	0.4	3
Subtotal*	223	1,339		5.1	84.1
Argentina	37	453	12,000	0.8	3.1
Bolivia	8	20	2,500	[negligible]	[negligible]
Paraguay	6	26	4,600	[negligible]	[negligible]
Peru	27	123	4,500	0.1	0.3
Colombia	40	250	6,250	0.8	2.3
Total	341	2,211		6	90.1

*Indicates regimes in the pro-Castro Axis.

^aCIA World Factbook, 2002.

^b"World Production of Crude Oil," Department of Energy, 2001.

During the 1990's, China established ever closer political and military relations with the Cuban regime including a military accord in 1999 and obtained facilities for espionage against the United States and other targets on Cuban territory. For China the primary benefit of this emerging pro-Castro axis is to weaken and distract the United States as it faces partially hostile governments on its southern border. In addition however, as regimes friendly to Cuba and China take control of countries with significant energy resources—such as the Chavez regime in Venezuela—China can expect to have preferential or guaranteed access to those energy resources.

A New Castro Strategy

Since 1959, the Castro regime in Cuba has been using political means as well as covert action, terrorism and insurgency to bring anti-U.S., radical regimes to power in the Western Hemisphere and other regions.

In 2002, a high level defector from Cuban intelligence wrote, "Cuba's espionage apparatus (the DGI), one of the largest and most efficient on the planet, with more than 10,000 spies, has been active on a global scale. The DGI rapidly [learned] . . . undercover operations, . . . cryptography, falsification of documents, training of operatives, theft of secret information, [establishing] illegal centers, the penetration of governments and armed forces, disinformation, assassination of political figures. . . ." ⁴⁴

Furthermore, Cuba trained more than 30,000 terrorists from various continents of which 10,000 were from Latin America, with the rest being operatives from the Middle East and Europe.⁴⁵ Castro's terrorist/insurgent methods mostly failed in Latin America, except in Colombia where the threat from the communist insurgency continues and has increased. However, the 10,000 DGI personnel and many of the 30,000 Cuban-trained terrorists provide the cadre for Castro's new strategy.

Castro's intentions have not changed since 1959, or since the end of the Cold War. In 2001, during a visit to Iran, Castro said "The people and the governments of Cuba and Iran can bring the United States to its knees."⁴⁶ In 1990, Castro initiated the Forum of Sao Paulo with Lula da Silva as its Chairman. This organization is a successor to Castro's Tricontinental Congress which, beginning in 1966, increased collusion among terrorist organizations from Latin America, the Middle East and Europe. The Forum of Sao Paulo also convenes all the communist parties and terrorist organizations of Latin America, along with terrorist organizations from the

⁴⁴ Juan Benemeles, *Cuba: Assessing the Threat to U.S. National Security*, Cuban American National Foundation, Washington, DC, 2002.

⁴⁵ *Ibid.*

⁴⁶ "Iran and Cuba bolster ties, strengthen anti-U.S. solidarity," *Agence France Presse*, May 10, 2001, available online at <http://www.canf.org/News/archived/010917news.htm>.

Middle East and Europe, as well as representatives from Iraq, Libya, North Korea, China, Laos, and Vietnam. (See list at Appendix B.)

The main theme of the First (1990) and Fourth (1993) annual meetings of the Forum of Sao Paulo was that **“our losses in Eastern Europe will be offset by our victories in Latin America.”**⁴⁷ This was an explicit indication of its solidarity with communist regimes and of Castro’s future intentions, which in fact are being realized.

Participants at the 2001 Forum meeting in Cuba and the December 2002 meeting in Guatemala included communist and radical parties from nearly every state in Latin America—including the Worker’s Party of Brazil and Chavez’s MVR of Venezuela; Latin American terrorist groups like the FARC, ELN, MIR, M19, Tupac Amaru and global terrorist groups like the IRA, ETA, and Popular Front for the Liberation of Palestine-General Command. In December 2002, as in most past years, there were representatives from supportive regimes such as Saddam Hussein’s Iraq, Libya (both of which have had connections to Cuba and its allies during and after the Cold War) and the communist regimes of North Korea, Laos, Vietnam, and China.⁴⁸

During the 1990s, Castro decided on a new strategy: helping radical political leaders friendly to him take control of their countries by winning national elections in which they present themselves as “populists,” opposed to corruption, while concealing their ultimate purposes. This new Castro method has four components:

1. Providing propaganda and political support openly and covertly to radical, pro-Castro leaders, not officially members of any communist party, who would run for the Presidency of their countries. They would avoid Marxist-Leninist rhetoric and instead favor “populism” and oppose “neoliberalism,” expressing the Castro ideological agenda in more neutral terms.
2. These pro-Castro, democratically elected Presidents would then use the Chinese communist approach of pursuing a *two-level international strategy*. One level would involve normal relations with all countries and with foreign and especially U.S. economic interests. They would favor international trade and business relations and encourage foreign investment, all of which would both provide useful income for the regime and assure a friendly voice about it from the foreign business and international financial community.
3. At the second level, while professing to seek “good relations with all countries,” these radical pro-Castro Presidents would seek to help other pro-Castro groups take power by working with radical or communist political and armed groups in Latin America such as the FARC, ELN, and others in the Forum of Sao Paulo; with state sponsors of terror such as Cuba and Iran as well as with communist regimes like China and North Korea.
4. Step by step, these pro-Castro Presidents would use pseudo-constitutional means to consolidate their rule internally and make it irreversible.

Chinese Activity in Latin America

Communist China and Cuba formalized their growing relationship with a military agreement in 1999. In the same year, Lula da Silva’s Brazilian Worker’s Party formalized party-to-party relations with the Communist Party of China.

In Late 2000, China and Venezuela established a close military relationship that has expanded since. In the last two years, reports of Chinese military personnel in Venezuela have become more frequent.

Soon after Lula da Silva took office in July 2003 as President of Brazil, the Chinese-Brazilian strategic and military relationship grew, with a permanent Chinese military staff arriving in Brazil shortly after inauguration.

Other forms of cooperation have increased simultaneously. Lula declared a “strategic partnership” with China in May 2003. Since then, Brazil has undertaken to forge relations with China through Mercosur, the G–22 and in partnerships involving satellites and aerospace technology transfers to China.

The President of Ecuador, Col. Lucio Gutierrez, is a part of the Pro Castro Axis and made a state visit to China in September 2003. Ecuador and Venezuela have completed oil deals with Chinese Oil Company SINOPEC and the Chinese government.

⁴⁷ Adolpho João de Paulo Couto, *A Face Oculta da Estrela: Retrocesso, Falsidade e Ilusões*, Gente do Livro, Porto Alegre, Brazil, 2001, 57. This book is a history of the Brazilian Worker’s Party, referring to the white star on its red flag.

⁴⁸ Magali Rey Rosa and Martin Rodriguez, “La Izquierda se Reune en Antigua: El XI Foro de Sao Paulo Convoca a Diversos Personajes de Izquierda de Los Cinco Continentes,” *Prensa Libre*, December 1, 2002, available online at <http://www.prensalibre.com/>; “Leftists Open Havana Meeting,” *The Orlando Sentinel*, December 5, 2001.

VI. Policy Suggestions—Realistic Engagement

For nearly a quarter century U.S. policy towards China has been one that can be termed “unconditional engagement.” The hope, repeated by Presidents of both major political parties was that free trade would bring political freedom to China and lead to its becoming evermore cooperative internationally.

This has not occurred and since 1990 China has both again defined the U.S. as its “Main Enemy” and has used the increased wealth from its one-sided unfair trade with the U.S. and other democracies to support an ever expanding military and a strategy which can be called one of domination through stealth.

This requires realism and prudence on the part of the U.S. The U.S. should pursue a strategy of “realistic engagement” with China which would include the following:

1. strengthening defensive alliance relationships with friendly countries in Asia;
2. deploying Asian regional missile defenses and a U.S. national missile defense;
3. opposing the use of force and coercion by China in all of its territorial disputes including that with Taiwan;
4. a policy of strict reciprocity in trade, which permits China, with its restricted market access, to sell only as much in the U.S. market as the U.S. may sell in China *unless* China ceases its strategic nuclear buildup, its proliferation of weapons of mass destruction, and implements the human rights commitments to which it has obligated itself;
5. the U.S. should consider multilateral agreements which would provide China reassurance for its future access to energy supplies under normal market conditions provided that the conditions stated in item 4 are met.

It should be understood and communicated to China that there are enough energy supplies for all countries and that reasonable projections to 2025 indicate total world energy capacity of 125 mbpd and total world wide demand of 119 even without considering the 280 billion barrels of sand-based oil which will become available in Canada as a result of new extraction technologies. A peaceful and cooperative China would be assured of adequate energy resources for the future.

Appendix A: Oil Production and Demand History and Projections**Oil Production Capacity⁴⁹**

Region/Country	History (Estimates)		Projections				
	1990	2001	2005	2010	2015	2020	2025
<i>Total Persian Gulf</i>	18.7	22.4	24.5	28.7	33.0	38.9	45.2
<i>Total OPEC</i>	27.2	32.6	35.1	40.7	46.3	53.9	61.8
<i>Total Non-OPEC</i>	42.2	46.6	49.1	53.2	57.0	59.6	62.7
China	2.8	3.3	3.5	3.6	3.5	3.5	3.4
Total World	69.4	79.2	84.2	93.9	103.3	113.5	124.5

Oil Demand⁵⁰

Region/Country	History			Projections				
	1990	2000	2001	2005	2010	2015	2020	2025
United States	17.0	19.7	19.6	20.5	23.0	25.2	27.1	29.2
Western Europe	12.5	13.8	14.0	14.1	14.4	14.6	14.8	15.3
Japan	5.1	5.5	5.4	5.5	5.8	6.1	6.3	6.5
<i>Total Developed Nations</i>	38.8	44.1	43.9	45.6	49.3	52.9	55.8	59.3
<i>Eastern Europe Former Soviet Union</i>	10.0	5.2	5.3	6.1	6.8	7.2	7.9	8.8
China	2.3	4.8	5.0	5.5	6.5	7.7	9.4	10.9
India	1.2	2.1	2.1	2.3	2.8	3.5	4.5	5.5
<i>Total Developing Nations</i>	17.3	27.6	27.9	29.4	33.5	38.7	44.5	50.7
Total World	66.1	76.9	77.1	81.1	89.7	98.8	108.2	118.8

⁴⁹ World Oil Production Capacity by Region and Country, Reference Case, 1990–2025 from International Energy Outlook 2003, Energy Information Agency, Department of Energy, http://www.eia.doe.gov/oiaf/ieo/tbl_d1.html (All figures are represented in Million of Barrels per Day.)

⁵⁰ World Oil Consumption by Region, Reference Case, 1990–2025 from International Energy Outlook 2003 by the Energy Information Administration, Department of Energy, http://www.eia.doe.gov/oiaf/ieo/tbl_a4.html (All figures are represented in Million of Barrels per Day.)

Appendix B: Members of the Forum of São Paulo

Nation	Party
Argentina	Frente Democracia Avanzada
Argentina	Partido Comunista Argentino
Argentina	Partido Intransigente
Brasil	Partido dos Trabalhadores
Brasil	Partido Socialista Brasileiro
Brasil	Partido Comunista do Brasil
Brasil	Movimento Revolucionário 8 de Outubro
Brasil	Partido Popular Socialista
Colômbia	Alianza Democrática M19
Colômbia	ELN
Colômbia	FARC-EP
Colômbia	Partido Comunista Colombiano
Colômbia	Presentes por el Socialismo
Cuba	Partido Comunista
Chile	MIR
Chile	Partido Comunista de Chile
Equador	Movimiento Popular Democrático
Equador	Partido Socialista—Frente Amplio
El Salvador	FMLN
Guatemala	URNG
México	Partido de la Revolución Democrática
México	Partido del Trabajo
Nicarágua	FSLN
Porto Rico	Partido Independentista Puertorriqueño
Porto Rico	Nuevo Movimiento Independentista Puertorriqueño
Porto Rico	Frente Socialista
Panamá	Partido Revolucionário Democrático
Peru	Movimiento Revolucionario Tupac Amaru
Peru	Partido Comunista Peruano
República Dominicana	Alianza por la Democracia
República Dominicana	Fuerza de la Revolución
República Dominicana	Movimiento Izquierda Unida
República Dominicana	Partido de los Trabajadores Dominicanos
Uruguai	Frente Amplio
Uruguai	Partido Comunista
Uruguai	Partido Socialista de Uruguay
Uruguai	Movimiento de Participación Popular
Uruguai	Partido Obrero Revolucionario Trotskista-Posadista
Venezuela	Partido Comunista de Venezuela

[From Forum of São Paulo Website, Jan. 2003, Bold are armed terrorist groups.]

Members not listed on Website	
Venezuela	MVR Fifth Republic Movement; joined in 1995
Bolivia	MAS (Movement to Socialism of coca grower Evo Morales)
Ecuador	Movements associated with Lucio Gutierrez
Observer Delegations	
China	Chinese Communist Party ⁵¹
North Korea	Korean Worker's Party
Vietnam	Vietnamese Communist Party
Laos	Laoatian Communist Party (Pathet Lao)
Germany	Party of Democratic Socialism [former East German Communists]
Spain	ETA
Ireland	Provisional IRA
Palestine	PFLP-General Command
Palestine	Palestinian Liberation Organization
Libya	Unknown Government/Ruling Party officials
Iran	Unknown Government/Ruling Party officials
Iraq	Baath Party
Soviet Union	[Sent representatives in 1990] ⁵²

[Bold are communist regimes, state sponsors of terrorism or terrorist organizations.]

⁵¹ "La Izquierda Se Reuníe a Antigua: El XI Foro de Sao Paulo Convoca a Diversos Personajes de Izquierda de los Cinco Continentes," *Prensa Libre* (Managua), December 1, 2002; http://www.prensalibre.com/pls/prensa/detnoticia.jsp?p_cnoticia=42357&p_fedicion=01-12-02.

⁵² "Foro de San Pablo," web document at www.asamblea.org.uy/forosp.htm; this website is for an intellectual project associated with leaders of Forum member Frente Amplio of Uruguay.

Discussion, Questions and Answers

Chairman ROBINSON. Thank all of you. This has been a very illuminating session. This is directed toward Dr. Calder and Mr. Morse, and Dr. Ebel. This notion of China accepting increasingly its responsibilities in a multinational context as a big emerging player in the energy markets, and the fact the OECD and IEA have a fairly elaborate mechanism to curtail price spikes of oil that are fueled by speculators in particular—

Dr. CALDER. Uh-huh, yes.

Chairman ROBINSON. —in the case of disruption or crisis of one form or another, and you know the mechanism very well.

It involves the building of stocks in a pre-crisis period. It also means the coordinated release of stocks in a manner that eludes the understanding of speculators if it's done right, so that we don't have another 1973 or 1979 oil price hikes.

China isn't there yet, as I understand it. It hasn't built its stocks. It has a fairly nascent stockpiling policy.

Dr. CALDER. Yes, definitely.

Chairman ROBINSON. There's a risk that China could take advantage of a shock in the oil markets by, in effect, building stocks at the wrong time, a kind of hoarding, and actually negate our release of the SPRO, for example, and comparable stocks of our other allies.

Would a prudent recommendation for this Commission be in the interest of encouraging China to be a more responsible and orderly member of the international energy community, to accelerate its engagement in this kind of IEA mechanism to avoid price spikes and that China might be strongly urged to get on with the building of stocks now?

Dr. CALDER. Yes.

Chairman ROBINSON. And just basically moving everything to fast forward in terms of our working with China to bring them into what is a fairly established and I think effective International Energy Agency mechanism to maintain stability of world oil prices and supply?

Dr. CALDER. Yes, I think that's an excellent recommendation. On the technical details, I'm sure Dr. Morse is more versed. Perhaps what I could add in addition to a very strong support for the suggestion you make also is the notion that Japan's role, I think, can be quite positive.

As I was saying earlier, the competitive elements of the energy situation in the region, particularly in some sort of crisis situation, I think could be potentially strong, and ways of defusing that would be positive. Japan with 100 days has one of the largest and most well developed stockpile programs in the world. Korea also has been quite sophisticated in its management, and I think cooperation of that sort, subject exactly to the caveat that Dr. Morse perhaps was about to suggest, that I don't think we want to see regionalism emerging, which is independent of the global system, but as one element in this, I think some technical assistance from the Japanese—they've already begun some—is probably good as long as it's within a global context.

Chairman ROBINSON. Mr. Morse.

Mr. MORSE. Yes, I very much concur with Dr. Calder's observations and what was implicit in your question. I believe that consistent with the obligations we and others have as members of the IEA and consistent with developments that have occurred in financial instruments over the past quarter of a century. There are, in fact, ways that could be examined that are not farfetched to bring China into the energy security network and the safety net that's already emerged.

And let me make two such suggestions of things that are feasible and not beyond the imagination. One is to have the IEA countries loop in emerging markets that want to be looped into their safety net through the sale, as it were, not of full participation but of options, insurance policy, as it were, so that for a small fee, if an emergency emerges, China or India or Brazil or any other large still importing country that so chooses can, for the price of that option, get access at the market price of the time to the strategic stockpiles of the IEA countries. That's one relatively inexpensive way of bringing them in, and then, of course, China would be part of international discussions in the IEA context associated with coordinated release of stocks.

A second approach that could be taken is an approach in which IEA countries decide to jointly finance and sponsor regional stockpiles, and there are places around the world, Saldanha Bay in South Africa is one—which could serve as an Atlantic basin and South Asian arena.

Our former bases in the Philippines are another. There are areas in Singapore that are yet another where different IEA countries or the IEA countries collectively could bring in a new arrangement, affiliated with the IEA, making available on the same kind of option arrangement or a buy-in arrangement for these emerging markets that are not members of the IEA. And finally one could loop Russia into this as well by purchasing perhaps Russian oil as the base of the stockpiles.

Chairman ROBINSON. Thank you.

Co-Chairman LEDEEN. Why doesn't China just go nuclear and beat this whole game?

Mr. MORSE. It's hard to drive a car with nuclear fuel.

Co-Chairman LEDEEN. Well, okay, but I mean it reduces—I mean the one thing that everybody is agreed is that China is going to be facing increasing need for energy. Some of it is to drive automobiles, but a hell of a lot of it is for other purposes. For other purposes, for sort of normal running factories, running homes, all these things, electricity, and what have you, nuclear power plants beat that whole game; right? Reduces their vulnerability, gives them energy security, proven source of energy, self-renewable, all of that. I mean why not? Why aren't they doing that? And why aren't people proposing that here? Why? Have I missed something?

Mr. EBEL. I think China is very much aware of the problems that nuclear power faces worldwide, one of which is what you do with the spent fuel?

Co-Chairman LEDEEN. Well, they know what to do with spent fuel. They have weapons. They have plenty of things to do with spent fuel.

Mr. EBEL. Yeah. We wouldn't like to see that, I'm sure. To go back to the question posed, regional authorities, getting China involved in regional authority has its pros and cons. Of course, the major con being it's regional, not international. Second, regional stockpiles are an idea who has been around for sometime, but who pays for the oil going into the stockpiles?

Third, it's not as easy to bring about a coordinated draw down of stocks than you would think. There's always the temptation, particularly in this country, to use stockpiles to manipulate prices, and they're not designed for that particular purpose. The plan in the IEA is a coordinated draw down where there is a significant interruption in supply taking seven—let's say trigger at seven percent or so of the market.

Unfortunately, I had the pleasure or what have you of drafting that first plan, and I think we made it so complicated that it's likely never to be used.

Chairman ROBINSON. We used it during the tanker war in '84 to good effect, and the adjustment we made then was potentially to pull the trigger before reaching the seven percent threshold.

Mr. EBEL. Right.

Chairman ROBINSON. Because even that threshold was predictable. We threw it open, but I thought we had a good result in that circumstance.

Mr. EBEL. Yeah.

Chairman ROBINSON. I was part of that NSC effort.

Mr. EBEL. Okay.

Mr. MORSE. And it was actually used in a coordinated basis in January of 1991 when the liberation of Kuwait began and the price of oil collapsed by \$14 a barrel that minute.

Co-Chairman LEDEEN. Right. Commissioner Bartholomew.

Commissioner BARTHOLOMEW. Thank you very much and thank you to our panelists for appearing today. I don't know a whole lot about the IEA so this might turn out to be a very simple question for you to answer, but it seems to me that China seems quite expert at accruing the benefits of multilateral regimes that it joins without quite living up to the responsibilities that membership entails.

And, what I wonder is are there any benefits that would accrue to the Chinese from participating in an IEA-type regime that we're essentially talking about, and also are there any risks to the international system or to the U.S. of bringing the Chinese into this sort of regime?

Mr. MORSE. The only risk in my mind is that the basis of the IEA were members of the OECD, and they were defined as mostly industrialized democracies. There were a few that were on the edge of not being democracies at the time. Turkey was a member for political reasons, but essentially they were the industrialized democracies.

So it would be a stretch to invite the Chinese government as a full member unless the elements, the constitutional roots of the association were changed. And of course, that's feasible in that IEA is the only international body that has a watchdog or regulatory role to play in the interests of the countries who are members of the IEA and the members of the world.

China is, as a non-member of the IEA, China has had some of the advantages of membership in the IEA. The IEA has sent missions to China, environmental missions, oil, energy sector missions. The Chinese economy has undergone the same review, peer group review, within the IEA context that the U.S. energy sector has undergone, that the Canadian and French and other members of the IEA have undergone. So you have the value of experts from within the IEA reviewing what you have and haven't done within the energy sector, and taking advantage of that.

Dr. CALDER. I think that you're certainly right that there's always the problem of free-riding and historically that certainly has been true. The danger it seems to me which we will increasingly find, and it's not only energy, but as I say, finance, we saw the beginnings of this in 1996, the Japanese Asian Monetary Fund proposal. China at the time opposed that, but more recently with the Chiangmai Agreement, some regional arrangements have begun to emerge in finance.

The point I think is the potential competition between global arrangements and regional arrangements, and if we don't let China into or we don't accelerate, as the Chairman was suggesting earlier, the creation of appropriate global arrangements, then what we're going to get, again arrangements that bind China, that are monitored and where it plays its part, but unless we accelerate the global arrangements, then we'll get more regionalism, and I don't think that's in our interest.

Dr. MENGES. If I may, I'd like to comment on that also. I think you're absolutely right that there is a pattern of China gaining benefits and not taking responsibilities. And, I believe in my policy suggestions which will be in the testimony you'll receive, we need to move toward what I call away from the unconditional engagement with China toward a strategy of realistic engagement with China where benefits received in turn result in actions by China toward peace and cooperation.

I also propose a form of multilateral agreement that would reassure China about energy supplies. We should remember that by 2025, it's estimated that there will be 125 million barrels a day available of energy and only about 119 million barrels per day of demand. So that actually there is enough oil for everybody, not to mention the 280 billion barrels in Canada's shale sands that can now be processed.

I do think, though, as a general rule, what you're getting at is absolutely fundamental, that benefits given to China and reassurances given, which I would favor in terms of energy, and I think it's a very interesting idea, need to come with specific undertakings by China.

For example, one thing might be that it stops its coercion in the territorial disputes and submits these to normal negotiations and normal arbitration, that it removes cloud of coercion and intimidation that it has established since the 1990s in the region and around the claimants. And, in fact, I would say that it drops its claim to the entire South China Sea.

That is a preposterous claim, and obviously a claim which will lead to a grave risk of military confrontation with the United States, which will never accede to the South China Sea being the

sovereign territory of any country, and I think if something is given, something needs to be received, and I think that's—we have in the WTO, China has signed on and gets the benefits; it's not carrying out the agreements. And your phrase summarized it exactly—that's the Chinese pattern. That needs to change. We need to move away from unconditional engagement toward what I call realistic engagement.

Co-Chairman LEDEEN. Commissioner Wessel.

Co-Chairman WESSEL. Thank you. I'd like to go back to a question I raised with Mr. Woolsey, but also the broader question that comes up today as well, which is, is there a clear and direct correlation between China's energy supply patterns and some of its activities relating to weapons proliferation? I mean there appears to be with certain cases there is—Iran, Saudi Arabia, Sudan, et cetera. We've now seen with Brazil and Brazil's helping on the nuclear program the potential for entering this hemisphere with certain problems that we may not want to face in our home court.

I would like your views on whether there is a correlation between the two, as well as does the participation in our own hemisphere raise additional concerns?

Dr. MENGES. I'd be pleased to comment on that first. I think, yes, there is a large correlation. It is interesting to note that of the Middle East suppliers, most are moderate countries, most are responsible countries. It's Iran and Saddam Hussein's Iraq and Libya that have been the state sponsors of terror where China has moved very close.

And I believe that what we've seen in especially this large Chinese activity in Iran, which I summarize in my paper from the unclassified intelligence reports that have been done every year, as you know, by the Director of Central Intelligence and for the reports to Congress, that this is an effort to obtain a preferential relationship with these dangerous dictatorships in order both to counter the United States and its allies in the world, the geopolitical purpose, but also to have the preferential access to energy.

And a good example is that, as you know, recently with respect to the Azadegan field in Iran, when Japan joined the world in opposing the nuclear weapon that Iran is developing secretly, they were excluded from bidding and now China is going to do that.

And so I think there is a correlation and there is a lot of that. And with respect to Latin America, where I have a section on Latin America, I think there's a very serious issue, and I believe there's a new pro-Castro axis that's being formed in Latin America that involves Castro and Chavez in Venezuela and Lula da Silva in Brazil, Gutierrez in Ecuador, and soon when the interim president in Bolivia is destabilized again in the spring, that will likely move into the pro-Castro column there, and it's a new process which I lay out briefly. I've followed it, and I've worked on this area for some years.

And I believe it's actually very, very dangerous to the well being of the people of the region and to our interests and involves fundamentally Castro's initiative. He's been at this for 44 years of revolutionary warfare. It's a new method he's using, but the linkage to China is also very important. China and Castro moved closer in the '90s. They have a military relationship since 1999. China has

an espionage base in Cuba. China and Venezuela, Chavez, have a military relationship since 2000. Immediately after the inauguration of Lula da Silva as president of Brazil in January 2003, China established a large military presence in Brazil.

There's been a long and—the Workers' Party in Brazil under Lula da Silva has a party-to-party relationship with the Communist Party of China established in 1999, and Lula da Silva himself has said he wants to move much closer to China. China is not the cause of the pro-Castro axis, but I believe what China is doing is riding on that process in order to, as friendly regimes, friendly to it come to power, in order to have both a means of counterbalancing the United States, hostile governments in the Western Hemisphere, tying the United States down, and also having preferential access to energy as we see in the Chavez-China energy relationships, the new Ecuador-China energy agreements, and I think we'll be seeing some things coming out in other cases.

So China is not the cause, but China is involved, and I should mention to you that—

Co-Chairman LEDEEN. We have to keep these answers shorter.

Dr. MENGES. I'll just conclude. The four countries that I see in the pro-Castro axis comprise 223 million people, five million barrels a day of oil production. I have a table in my testimony. And about 85 billion barrels in reserves. So they're an interesting target for China's having preferential access and special deals. So I think it's a very serious matter geopolitically, and I think it's a very serious matter for our national interests.

Commissioner MULLOY. May we have a copy of your paper?

Dr. MENGES. Yes, I will.

Co-Chairman WESSEL. Dr. Calder.

Dr. CALDER. I think it's worth remembering, of course, there are varied interests in China, and there are certainly some that understand the implications of some of the actions that Dr. Menges was suggesting and understand that those are counterproductive.

I would say, though, it certainly is true that actions like he mentioned with respect to the Azadegan field in Iran do undermine our allies and some of the steps the Japanese, for example, were taking to support us on Iran, to have China then go in and take over those contracts, of course, undermines and makes our own situation more difficult.

Co-Chairman WESSEL. Other comments?

Mr. EBEL. If there is a correlation between military sales and preferential access to oil supplies, it's not been very successful. The Chinese when you look around at the investments that they have made in Kazakhstan or wherever, not enough really to make a real impact on their reliance on imported oil. You know if they're trying to develop larger and larger equity oil, okay, but they have not been very successful.

Co-Chairman WESSEL. Thank you.

Co-Chairman LEDEEN. Commissioner Mulloy.

Commissioner MULLOY. Thank you, Mr. Chairman. This is just to clarify because this may be something the Commission would want to make a recommendation on. We asked Mr. Woolsey about the IEA and whether China should become a member even

though—or whether there should be some kind of relationship built in where China can participate?

As a young lawyer, I was in the Antitrust Division. As you know, the oil companies to participate in the IEA have to have an antitrust defense or else they won't participate. So I used to go to these meetings in Paris. I have some idea how that organization works. Do you think that we should be trying to get China in or should we invite Chinese participation in the IEA? Is that in our interest? And if so, why, and if not, what is the downside for us of having them in there?

Mr. Morse, if you could take the lead on that, I think it would be very helpful.

Mr. MORSE. Yes. Let me make one comment to begin with, and, yes the antitrust exemption offered firms was very important in the 1970s. It is really insignificant today and the reason for that is, in the 1970s, what the companies were asked to do was to deal with an emergency sharing system before strategic stocks existed in any IEA country.

After the 1980s, when strategic stockpiles went from zero to now 1.4 billion barrels, and when companies in the more complicated world we live in no longer could, a few of them, control the network of delivery of petroleum and petroleum products, that sharing system is no longer significant.

So the world has changed enough to set aside that concern. But on the general question that Mr. Wessel asked, we have China pursuing bilateral ties, much as the French did in the 1970s, much as the Japanese did largely in the '70s and the '80s, and the IEA was one mechanism, one, but only one mechanism. The European Union has their own internal mechanisms for making sure that there aren't these tradeoffs of, let's say, arms for oil or U.N. votes for oil, that the Chinese have been pursuing so assiduously.

So, my general view is that the IEA and other international institutions need to be reviewed carefully to find ways to bring in these large emerging markets, China being the largest one. In 2000–2001, I chaired a committee at the Council on Foreign Relations and the Baker Institute. The committee was looking at national energy security policy—had on it a wide array of people including Ken Lay from Enron, Chuck Watson from his former company, but some people elsewhere in the political spectrum.

The report we wrote, which was beady, had not a single dissent and had included in it the urgent need for the Administration to consider ways to bring emerging market countries into the IEA mechanism. So I do think it's an important thing to focus on.

Commissioner MULLOY. Is that a report that you can—

Mr. MORSE. Yes, I'll make it available and it's publicly available.

Commissioner MULLOY. That would be very helpful. Thank you.

Does anyone else have a comment?

Mr. EBEL. I think that's a wise move, but until then, we need to continue to do what we can to encourage China to build up its own stocks.

Co-Chairman LEDEEN. Further questions?

Commissioner Reinsch.

Commissioner REINSCH. Thank you. To the rest of the panel, Dr. Menges has put forward a number of interesting thoughts. I'd like to ask the other three of you if you agree with him?

Mr. MORSE. I don't, and I don't in terms of some of the very specific policy prescriptions. It strikes me that our desire is to create a world in the world of energy that is depoliticized, in which governments do not use energy as instruments of foreign policy, whether we are speaking of oil exporting countries or gas-exporting countries or oil importing countries, and with the caveat that there are national security circumstances in which sanctions are critical.

But with that caveat, it strikes me that dealing with China in the engaged way that Mr. Menges has suggested is a mechanism for politicizing a very area of the international economy that we want to depoliticize and defuse rather than to open it up for further politicization.

Commissioner REINSCH. You should have appeared with Mr. Woolsey when he was here. It would have been an interesting debate. Mr. Ebel?

Mr. EBEL. We have to be careful not to forget that the marketplace is the right place where the decisions are made, and any time, I'm always concerned that when governments get involved in the process, they're trying to be helpful, but usually they take the wrong actions. So governments can debate these issues, but in the mean time my feeling is let the market work, and they'll make the right decisions. It may not be as quickly as you would like, and sometimes it may not be in the direction you would like, but the decisions will be made.

Commissioner REINSCH. Dr. Calder, you want to follow on?

Dr. CALDER. Yes, as a general principle, it seems to me it would be nice if the market, in fact, would work. Unfortunately, if one looks historically at various patterns in East Asia, trans-Pacific relations, I think one finds that frequently the market doesn't work, and in the case of energy, we have an unusual circumstance given the collective vulnerabilities of the nations in question, and to some extent also the rivalries, you know, very heavy importers.

I mean mainly economic rivalries. Of course, it depends on the nature of the market. If we're in tight markets, those things become more pronounced, but just given the nature of the northeast Asian political economies and maybe particularly China, political dimensions, geostrategic dimensions, I think almost inevitably to some extent come in. That isn't to say that it's good, but those things are there to some extent.

And finally, on this relationship with Iran, as I say, clearly in the interaction of China, Japan and Iran and the United States, on those issues China for some reasons that are understandable in terms of their national interest doesn't have these sort of inhibitions that Japan has with respect to dealing with Iran because of the deeper security relationship that we have with Japan.

Commissioner REINSCH. Mr. Morse, would you like to come back?

Mr. MORSE. Yes, I'd like to make another observation. You know, in the world of politics, there is an old saying that where you stand depends on where you sit. And I just want to share with you the world of oil and security from a Chinese perspective. We have talked about the potential growth of Chinese oil demand and the

potential growth of Chinese oil imports. Let's look at the 1990s. In the 1990s, global oil trade increased by just short of ten million barrels a day.

The single-most important component of that was the 3.5 million barrel a day increase in imports into the United States, more than 35 percent of the total increase in global oil trade was our import—incremental imports. And our incremental imports at 3.5 million barrels a day is larger than the total oil consumption of all countries in the world with the exception of two, Japan and China.

If we look at the Department of Energy and its projections for this decade, given the continuing decline in U.S. production and the continuing increase in U.S. consumption, the expectation is that over this decade, U.S. oil imports will grow from ten million to 16.5 million barrels a day.

China is at the six million barrel a day consumption level. So we're going to have projected 6.5 million barrels a day increase in our demands on the oil system. The same DOE forecast has China and India combined having an increase in imports half of the imports of the United States. So from the other party's perspective, their insecurity is because guess who's gobbling up the lion's share of the world's oil supply? Thank you.

Mr. EBEL. I'd like to take it one step further. Let's look out a little bit further to the year 2030 and combining forecasts prepared both by the IEA and the EIA. I always have a little difficulty with these acronyms.

If you combine the two estimates of U.S. import requirements by 2030 and projected Chinese import requirements by 2030, they would exceed—the two countries together—they would exceed current OPEC production capability—current OPEC production capability.

Co-Chairman LEDEEN. Mr. Ebel, can I just say that I mean I've been looking at forecasting for a very long time. The view of this Commission published is that Chinese statistics are fundamentally fanciful, not reliable. And that projections based on fanciful statistics are themselves going to be fanciful. I mean, in the American case, maybe it's a bit more reasonable to do it, but it's just not serious in my opinion to start basing policy on projections 20 years from now and 30 years from now. That's my only objection.

With regard to Mr. Menges' comments about what kind of policy we should have toward China, I listened carefully. I only heard an outline of it, a description of it, but not the specific components of it. So why he should be criticized for specifics that he hasn't yet presented to us is frankly a bit beyond me.

Thirdly, while the call for a de-politicized market for energy or any other thing is admirable and desirable, it's not real. I'm an historian. I always marvel at the fact that Americans are the first people in the history of the world to believe that peace is normal and that the things that go on during peacetime are normal and define life, when the last several thousand years argue the opposite.

And so, in terms of making policy, any country has to prepare for wartime conditions, not peacetime conditions. Peacetime conditions are rare, very rare in the history of the world.

So with that, I must say this has been a terrific panel. I mean wonderfully and gratefully I say to you that when you get the last panel of the day the most lively, the most interesting, the most original and so forth, that's really a great thing.

Thank you all very much. This session is closed.

[Whereupon, at 3:55 p.m., the hearing was adjourned.]

**STATUTORY MANDATE OF THE U.S.-CHINA ECONOMIC AND SECURITY
REVIEW COMMISSION**

Pursuant to Public Law 108-7, Division P, enacted February 20, 2003

RESPONSIBILITIES OF THE COMMISSION.—The United States-China Commission shall focus, in lieu of any other areas of work or study, on the following:

PROLIFERATION PRACTICES.—The Commission shall analyze and assess the Chinese role in the proliferation of weapons of mass destruction and other weapons (including dual use technologies) to terrorist-sponsoring states, and suggest possible steps which the United States might take, including economic sanctions, to encourage the Chinese to stop such practices.

ECONOMIC REFORMS AND UNITED STATES ECONOMIC TRANSFERS.—The Commission shall analyze and assess the qualitative and quantitative nature of the shift of United States production activities to China, including the relocation of high-technology, manufacturing, and R&D facilities; the impact of these transfers on United States national security, including political influence by the Chinese Government over American firms, dependence of the United States national security industrial base on Chinese imports, the adequacy of United States export control laws, and the effect of these transfers on United States economic security, employment, and the standard of living of the American people; analyze China's national budget and assess China's fiscal strength to address internal instability problems and assess the likelihood of externalization of such problems.

ENERGY.—The Commission shall evaluate and assess how China's large and growing economy will impact upon world energy supplies and the role the United States can play, including joint R&D efforts and technological assistance, in influencing China's energy policy.

UNITED STATES CAPITAL MARKETS.—The Commission shall evaluate the extent of Chinese access to, and use of United States capital markets, and whether the existing disclosure and transparency rules are adequate to identify Chinese companies which are active in United States markets and are also engaged in proliferation activities or other activities harmful to United States security interests.

CORPORATE REPORTING.—The Commission shall assess United States trade and investment relationship with China, including the need for corporate reporting on United States investments in China and incentives that China may be offering to United States corporations to relocate production and R&D to China.

REGIONAL ECONOMIC AND SECURITY IMPACTS.—The Commission shall assess the extent of China’s “hollowing-out” of Asian manufacturing economies, and the impact on United States economic and security interests in the region; review the triangular economic and security relationship among the United States, Taipei and Beijing, including Beijing’s military modernization and force deployments aimed at Taipei, and the adequacy of United States executive branch coordination and consultation with Congress on United States arms sales and defense relationship with Taipei.

UNITED STATES-CHINA BILATERAL PROGRAMS.—The Commission shall assess science and technology programs to evaluate if the United States is developing an adequate coordinating mechanism with appropriate review by the intelligence community with Congress; assess the degree of non-compliance by China and [with] United States-China agreements on prison labor imports and intellectual property rights; evaluate United States enforcement policies; and recommend what new measures the United States Government might take to strengthen our laws and enforcement activities and to encourage compliance by the Chinese.

WORLD TRADE ORGANIZATION COMPLIANCE.—The Commission shall review China’s record of compliance to date with its accession agreement to the WTO, and explore what incentives and policy initiatives should be pursued to promote further compliance by China.

MEDIA CONTROL.—The Commission shall evaluate Chinese government efforts to influence and control perceptions of the United States and its policies through the internet, the Chinese print and electronic media, and Chinese internal propaganda.

LIST OF WITNESSES, COMMUNICATIONS, AND PREPARED STATEMENTS

	Page
Calder, Kent E., Director, Reischauer Center for East Asian Studies, Nitze School for Advanced International Studies, Johns Hopkins University	91
Prepared statement	93
Caruso, Guy, Administrator, Energy Information Administration	6
Prepared statement	10
D'Amato, Vice Chairman C. Richard	
Opening remarks of	2
Ebel, Robert E., Chairman, Energy Program, Center for Strategic and International Studies	83
Prepared statement	86
Girdis, Dean P., Director, PFC Energy	43
Prepared statement	46
Jaffe, Amy Myers, Wallace Wilson Fellow for Energy Studies, James A. Baker III Institute for Public Policy, Rice University	27
Prepared statement	30
Ledeon, Michael, Hearing Co-Chair	
Opening remarks of	5
Prepared statement	6
Menges, Constantine C., Ph.D., Senior Fellow, Hudson Institute	98
Prepared statement	101
Morse, Edward L., Executive Advisor, Hess Energy Trading Company	88
Robinson, Chairman Roger W., Jr.	
Opening remarks of	1
Prepared statement	2
Schlesinger, James R., Chairman, Board of Trustees, The Mitre Corporation ..	66
Wessel, Michael R., Hearing Co-Chair	
Opening remarks of	3
Prepared statement	4
Woolsey, R. James, Vice President, Booz Allen & Hamilton	72
Wu, Kang, Ph.D., Fellow and Head of China Energy Project, East-West Center	36
Prepared statement	39