

CHINA'S GLOBAL QUEST FOR RESOURCES AND IMPLICATIONS FOR THE UNITED STATES

HEARING

BEFORE THE

U.S.-CHINA ECONOMIC AND SECURITY

REVIEW COMMISSION

ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

JANUARY 26, 2012

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UNITED STATES-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

WASHINGTON: 2012

U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

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The Commission was created on October 30, 2000 by the Floyd D. Spence National Defense Authorization Act for 2001 § 1238, Public Law No. 106-398, 114 STAT. 1654A-334 (2000) (codified at 22 U.S.C. § 7002 (2001), as amended by the Treasury and General Government Appropriations Act for 2002 § 645 (regarding employment status of staff) & § 648 (regarding changing annual report due date from March to June), Public Law No. 107-67, 115 STAT. 514 (Nov. 12, 2001); as amended by Division P of the “Consolidated Appropriations Resolution, 2003,” Pub L. No. 108-7 (Feb. 20, 2003) (regarding Commission name change, terms of Commissioners, and responsibilities of the Commission); as amended by Public Law No. 109-108 (H.R. 2862) (Nov. 22, 2005) (regarding responsibilities of Commission and applicability of FACA); as amended by Division J of the “Consolidated Appropriations Act, 2008,” Public Law No. 110-161 (December 26, 2007) (regarding responsibilities of the Commission, and changing the Annual Report due date from June to December).

The Commission’s full charter is available at www.uscc.gov.

March 20, 2012

The Honorable Daniel Inouye
President Pro Tempore of the Senate, Washington, D.C. 20510
The Honorable John A. Boehner
Speaker of the House of Representatives, Washington, D.C. 20515

DEAR SENATOR INOUE AND SPEAKER BOEHNER:

We are pleased to transmit the record of our January 26, 2012 public hearing on “China’s Global Quest for Resources and Implications for the United States.” The Floyd D. Spence National Defense Authorization Act (amended by Pub. L. No. 109-108, section 635(a)) provides the basis for this hearing.

At the hearing, the Commissioners heard from the following witnesses: Dr. Patrick Cronin, Dr. Elizabeth Economy, Ms. Sarah Forbes, Dr. Lyle Goldstein, Mr. Jeffery Green, Dr. Mikkal Herberg, Ms. Tabitha Mallory, Ms. Grace Mang, Dr. W. David Menzie, and Dr. Jennifer Turner. The Commission also received written testimony from Dr. Brahma Chellaney and the Environmental and Development Desk of the Central Tibetan Administration. The hearing explored China’s demand for and policies related to natural resources. Topics included China’s domestic and overseas damming activities; China’s energy security; China’s strategic mineral policies; and China’s international marine fishing activities.

We note that the full transcript of the hearing plus the prepared statements and supporting documents submitted by the witnesses will be posted on the Commission’s website at www.uscc.gov, when completed. The prepared statements and supporting documents submitted by the witnesses are posted on the Commission’s website. Commissioners and the staff of the Commission are available to provide more detailed briefings. We hope these materials will be helpful to the Congress as it continues its assessment of the U.S.-China relationship and its impact on U.S. security.

The Commission will examine in greater depth these issues, and the other issues enumerated in its statutory mandate, in its 2012 Annual Report that will be submitted to Congress in November 2012.

Sincerely yours,



Dennis C. Shea
Chairman



William A. Reinsch
Vice Chairman

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CHINA'S GLOBAL QUEST FOR RESOURCES AND IMPLICATIONS FOR THE UNITED STATES

THURSDAY, JANUARY 26, 2012

U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

Washington, D.C.

The Commission met in Room 562 Dirksen Senate Office Building, Washington, D.C. at 9:00 a.m., Chairman Dennis C. Shea, and Commissioners C. Richard D'Amato and Daniel Slane (Hearing Co-Chairs), presiding.

OPENING STATEMENT OF CHAIRMAN DENNIS SHEA

CHAIRMAN SHEA: Good morning, everyone, and welcome to the first hearing of the U.S.-China Economic and Security Review Commission's 2012 Annual Report cycle. As this year's Chairman, I want to thank all of you for joining us today. We appreciate your attendance here and want to make a pitch to encourage you to attend our other public hearings throughout the year.

I also want to acknowledge and welcome a couple of folks who we already know well: Bill Reinsch, who was recently appointed, who is the Vice Chairman of the Commission; and Dan Slane, who is the co-Chair of this hearing. Welcome aboard. And we'd like to also acknowledge our newest member of the Commission, Carte Goodwin, former Senator Carte Goodwin, always a senator, Carte Goodwin from West Virginia. So welcome and thank you for joining us.

Our next hearing is scheduled for February 15th. At this hearing, we will examine China's state-owned and state-controlled enterprises and explore the competitive challenges that they may pose to the United States.

Future hearing topics this year will include EU-China relations, China's civil and military nuclear capabilities, and developments in cyberspace. More information about the Commission, its annual report, and its hearings is available on the Commission's Web site at www.uscc.gov.

With that, I'll turn the hearing over to its co-Chair, Commissioner D'Amato, for his opening statement.

PREPARED STATEMENT OF CHAIRMAN DENNIS SHEA



U.S.-CHINA ECONOMIC AND SECURITY
REVIEW COMMISSION

Hearing on "China's Global Quest for Resources and Implications for the United States"

**Opening Statement of Chairman Dennis Shea
January 26, 2012
Washington, DC**

Good morning, and welcome to the first hearing of the U.S.-China Economic and Security Review Commission's 2012 Annual Report cycle. As this year's Chairman, I want to thank you all for joining us today. We appreciate your attendance and we encourage you to attend our other public hearings throughout the year.

Our next hearing is scheduled for February 15th. At this hearing, we will examine China's state-owned and state-controlled enterprises and explore the competitive challenges they may pose to the United States.

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**OPENING STATEMENT OF COMMISSIONER C. RICHARD D'AMATO
HEARING CO-CHAIR**

HEARING CO-CHAIR D'AMATO: Thank you very much, Mr. Chairman, Chairman Shea.

Today's hearing will examine "China's Global Quest for Resources and Implications for the United States and United States Policy."

In particular, our panel discussions will focus on water, fuel and non-fuel mineral resources, and fisheries. These are the resources upon which the Chinese--quote--"economic miracle"--unquote--depends. Although Mao-era policy emphasized economic energy and political self-reliance, China's endowment of natural resources no longer sustains its massive population and export-driven economy.

China has been a net importer of oil since 1993 and is aggressively seeking mineral resources overseas to supplement its domestic supply. With the exhaustion of traditional Chinese fishing grounds, China's fleets have operated farther and farther afield, in places as far away as Africa and Latin America, and in disputed waters as well. China's consumption of these resources has global implications.

In the case of water, China's management of this domestic resource has significant and potentially devastating impacts on the region. The largest river systems in Asia all originate in the Tibetan Plateau, in China. These rivers are the lifeblood of Asia, sustaining agriculture, commerce, industry and nutrition throughout the region.

China's heavy damming activities and water diversion projects threaten the natural flow of these rivers to downstream states like India, Pakistan and the Mekong River nations. Bangladesh, in particular, is dependent upon rivers originating in China and India for 90 percent of its water.

While the United States and other countries around the world are party to regional or international water-sharing agreements to ensure the equitable distribution of this vital resource, China has not entered into any such agreements with its downstream neighbors.

Some analysts argue that this leaves China in the advantageous upstream position of being able to effectively "turn off the tap" for countries in South and Southeast Asia.

Beijing's management of trans-boundary rivers will be a key indicator of whether China is willing to be a responsible global player.

Today, we will focus on these and other questions. We have asked our witnesses for recommendations for congressional action that can be suggested by the Commission to address the resource management issues raised today, and I am pleased to report to my colleagues that in the testimony that we have received, our witnesses have provided a number of such recommendations for our consideration.

Before I turn to my co-Chair for the hearing, Commissioner Slane, to deliver his remarks, I want to thank Dr. David Menzie, Chief of Minerals Analysis, from the U.S. Geological Survey, for taking time out of his busy schedule to join us here today.

I'd also like to point out that Congressman Mike Coffman from

Colorado will be submitting written testimony to the Commission for this hearing, and his remarks will be posted to the Commission's Web site shortly.

I turn it over to my co-Chair of this hearing, Mr. Dan Slane.

**PREPARED STATEMENT OF COMMISSIONER C. RICHARD D'AMATO
HEARING CO-CHAIR**



U.S.-CHINA ECONOMIC AND SECURITY
REVIEW COMMISSION

Hearing on “China’s Global Quest for Resources and Implications for the United States”

**Opening Statement of Commissioner C. Richard D’Amato
January 26, 2012
Washington, DC**

Thank you, Chairman Shea. Today’s hearing will examine “*China’s Global Quest for Resources and Implications for the United States.*” In particular, our panel discussions will focus on water, fuel and non-fuel mineral resources, and fish.

These are the resources upon which the Chinese “economic miracle” depends. Although Mao-era policy emphasized economic, energy, and political self-reliance, China’s endowment of natural resources no longer sustains its massive population and export-driven economy. China has been a net-importer of oil since 1993, and is aggressively seeking mineral resources overseas to supplement its domestic supply. With the exhaustion of traditional Chinese fishing grounds, China’s fleets have operated further and further afield, in places as far away as Africa and Latin America, and in disputed waters as well. China’s consumption of these resources has global implications.

In the case of water, China’s management of this domestic resource has significant, and potentially devastating, impacts on the region. The largest river systems in Asia all originate on the Tibetan Plateau, in China. These rivers are the lifeblood of Asia, sustaining agriculture, commerce, industry, and nutrition throughout the region. China’s heavy damming activities and water diversion projects threaten the natural flow of these rivers to downstream states like India, Pakistan, and the Mekong River nations. Bangladesh in particular is dependent upon rivers originating in China and India for 90 percent of its water.

While the United States and other countries around the world are party to regional or international water-sharing agreements to ensure the equitable distribution of this vital resource, China has not entered into any such agreements with its downstream neighbors. Some analysts have posited that this leaves China in the advantageous upstream position of being able to effectively “turn off the tap” for countries in South and Southeast Asia. Beijing’s management of transboundary rivers will be a key indicator of whether China is willing to be a responsible global player.

Today, we will focus on these and other questions. We have asked our witnesses for recommendations for Congressional action that can be suggested by the Commission to address the resource management issues raised today, and I am pleased that in the testimony we have received, our witnesses have provided a number of such recommendations for our consideration.

Before I turn to my co-Chair for the hearing, Commissioner Slane, to deliver his remarks, I want to thank Dr. David Menzie, Chief of Minerals Analysis from the U.S. Geological Survey, for taking time out of his busy schedule to join us here today.

I would also like to point out that Congressman Mike Coffman from Colorado will be submitting written testimony to the Commission for this hearing. His remarks will be posted to the Commission's website shortly.

**OPENING STATEMENT OF COMMISSIONER DANIEL SLANE
HEARING CO-CHAIR**

HEARING CO-CHAIR SLANE: Thank you, Commissioner D'Amato, and good morning, everyone.

I'd like to begin by thanking our great staff, especially Caitlin Campbell and Dan Hartnett, for all their hard work, and, of course, I want to thank our witnesses for appearing today.

We look to our expert witnesses to shed light on these topics and provide recommendations for U.S. policies to ensure predictable, equitable and secure management of these resources.

On our first panel this morning, we're going to hear from Dr. David Menzie, Chief of Global Mineral Analysis for the National Minerals Information Center at the U.S. Geological Survey.

Dr. Menzie is responsible for USGS's reporting on mineral production and consumption of more than 180 countries and 50 U.S. states. In addition, Dr. Menzie manages USGS's minerals flow studies.

He is a fellow of the Society of Economic Geologists; a member of the Society for Mining, Metallurgy, and Exploration; the American Statistical Association; and a Sigma Xi. He has received the Department of the Interior's Meritorious Service Award and is a Centennial Fellow of Penn State's College of Earth and Mineral Sciences, and was a Metzger Conway Fellow at Dickinson College.

He holds a B.S. with honors in Geology from Dickinson College, an M.A. in Statistics, and a M.S. and Ph.D. in Geology from the Pennsylvania State University.

Dr. Menzie, we are honored to have you here today and look forward to your testimony.

**PREAPRED STATEMENT OF COMMISSIONER DANIEL SLANE
HEARING CO-CHAIR**



U.S.-CHINA ECONOMIC AND SECURITY
REVIEW COMMISSION

Hearing on “China’s Global Quest for Resources and Implications for the United States”

**Opening Statement of Commissioner Daniel Slane
January 26, 2012
Washington, DC**

Thank you, Commissioner D’Amato, and good morning, everyone. I would like to begin by acknowledging and thanking Senator Ben Nelson and his staff for securing this room for us today.

China’s demand for natural resources highlights the growing interconnectedness of resource security and national security. In recent years, China’s resource policies have had significant security consequences worldwide. The United States recently sanctioned Chinese national oil company Zhuhai Zhenrong for its oil trade with Iran. Chinese mineral investments in African states like Zambia, Zimbabwe, and the Democratic Republic of the Congo have drawn criticism from human rights groups and governments worldwide for their opaque and exploitative nature. And China’s unofficial ban on rare earth exports to Japan in 2010 indicated to the world that China was willing to use critical resources as leverage in its diplomatic relationships.

Nowhere is this relationship between resources and national security more apparent than in the South China Sea. A hub of global commerce and a thoroughfare for 40 percent of the world’s oil, China is dependent on this region for the majority of its energy imports. Moreover, the region has potentially massive untapped oil and gas reserves, prompting Chinese analysts to refer to it as “the second Persian Gulf.” Fish is another valuable and disputed resource in the South China Sea, and fishermen and fishing activities have played an important role in the region’s territorial disputes. The South China Sea constitutes 10 percent of global marine catch, and the region’s fisheries are worth billions of dollars.

China’s naval modernization program is directed in part at ensuring Chinese access to these resources and shipping lanes. Fishermen and fisheries patrols are also significant actors in the disputes. China, in particular, uses the resources of its five maritime security agencies to enforce its claims in disputed waters, by escorting Chinese fishing vessels and enforcing seasonal fishing bans on foreign vessels. These civilian fleets allow Beijing to maintain a maritime presence in disputed waters without having a consistent or overt naval presence.

These policies and activities also affect the United States. As the U.S. implements its foreign policy “pivot” to Asia, the South China Sea is a natural focal point. Secretary of State Hillary Clinton stated in 2010 that freedom of navigation in the South China Sea is a “national interest” for the United States. Ensuring free transit along global sea lanes is vitally important to the United States and the world. Open lines of communication in global commons also enable U.S. military support for our friends and allies around the globe.

We look to our expert witnesses to shed light on these topics and provide recommendations for U.S. policies to ensure predictable, equitable, and secure management of these resources.

Finally, we regret that although the Commission extended invitations to the State Department’s Bureau of Oceans and International Environmental & Scientific Affairs, the State Department’s Bureau of Energy Resources, the Department of Energy’s Office of Policy and International Affairs, the Commerce Department’s National Ocean and Atmospheric Administration, and the Defense Department’s Defense Logistics Agency, all declined to testify.

Panel I – Administration Perspectives

STATEMENT OF DR. W. DAVID MENZIE CHIEF OF GLOBAL MINERALS ANALYSIS NATIONAL MINERALS INFORMATION CENTER U.S. GEOLOGICAL SURVEY

DR. MENZIE: Thank you very much for inviting USGS to speak today about the status and trends of China's production, consumption and stockpiling of minerals.

I am David Menzie. I am the Chief of the Global Minerals Analysis Section at National Minerals Information Center, which is part of USGS. It's the science agency of the Department of the Interior, but unlike BLM or U.S. Forest Service, USGS does not regulate mineral resources. Rather, we provide unbiased, peer-reviewed science and information to the government and to the public.

China is a prodigious producer of raw and processed mineral commodities as shown in Table 1 of my testimony. For many of the more than 80 mineral commodities tracked by USGS, China ranks as the world's leading producer.

In a number of cases, China is not only the leading producer but dominates world production, producing more than 80 percent of such minerals as antimony, magnesium metal, rare earths, and tungsten. In addition, China produces between 50 and 80 percent of 15 additional minerals.

Although China's production of raw minerals is large, its production of processed minerals is even larger. The result is that China must import additional raw minerals to meet its domestic needs. For example, China must import antimony, bauxite and alumina, copper, lead, tungsten and zinc ores and concentrates to meet its production needs for these metals. Perhaps most significantly, China must import nearly one-half of the iron ore that it requires for steel production.

Consumption of many mineral commodities increases as the country's economy develops. Consumption on a per capita basis tends to increase as income per capita increases. Consumption per capita generally plateaus as a country's economy matures.

Table 2 of my testimony presents data on China's consumption of ten mineral commodities. These minerals represent a market basket of construction materials, industrial minerals, and metals. China's consumption of minerals began to increase in the early '90s, and accelerated throughout that decade and into the first half of the next decade.

Since 2005, China's increase in consumption of some of these minerals has slowed. However, consumption of other minerals has continued unabated.

China's mineral policies are based on a white paper issued by the State Council in 2003. The policies were based on the premise that the demand for minerals would continue to increase for the next 20 years. The paper proposed implementation of a sustainable development strategy for balancing exploitation of minerals and environmental protection.

In addition, the government proposed a strategic mineral resource system that would include mineral commodities based on the supply and demand for individual commodities as well as on commodities for which China faced potential shortfalls.

In 2008, China's Ministry of Land and Resources issued guidelines for the development of the country's mineral resources. The Ministry's development plan designated antimony, rare earths, tin, and tungsten as protected mineral commodities. Exploration and production of these minerals was to be strictly controlled.

Currently, China issues production quotas for antimony, fluorspar, molybdenum, rare earths, and tungsten. China maintains exports for these metals and also for indium.

China's mineral policies related to rare earths have been the subject of much debate. About 48 percent of the world's total rare earth resources are located in China. Since the 1990s, China has become the leading rare earth producing country, accounting for more than 90 percent of the world's output.

Before 2000, China's rare earth production exceeded domestic demand, and, at that time, China was a significant exporter of rare earths.

In 2000, China produced about 73,000 metric tons of rare earths and consumed about 19,000 tons. In the last ten years, Chinese demand for rare earths has increased sharply. The country's rare earth production increased to over 120,000 tons. However, domestic consumption increased to 87,000 tons.

At the same time, the Chinese government issued measures calling for restricted production and export of rare earths.

The Mountain Pass Mine in California reopened in late 2011. In addition, construction of the Mount Weld Mine in Australia was completed in 2010. These two mines can supply about 30,000 tons of rare earths during the next couple of years and will reduce demand for Chinese rare earths.

Mountain Pass and Mount Weld, however, contain mainly light rare earths. Many electronic products require heavy rare earths to perform efficiently. Currently, China is the only country that can supply significant amounts of both light and heavy rare earths. So at least for the next several years, China will continue to be the major supplier of heavy rare earths.

In 2007, the Chinese government announced a strategic reserve for cadmium, cobalt, copper, manganese, and petroleum. In 2008, the Ministry of Land and Resources added indium, germanium, rare earths, tin, and tungsten to the country's strategic minerals stockpile, and in 2009, China's State Council ordered the State Reserve Bureau to stockpile aluminum, copper, indium, lead, and zinc.

Beyond these announcements, little is known about the content and operation of China's strategic reserves.

In addition to the national mineral stockpiles, provincial governments have announced their intent to create stockpiles to support metal prices in the domestic market.

China's increased consumption of minerals has been responsible for the majority of the increase in global production and consumption of minerals. This increase has resulted in rising prices for many minerals and increases in exploration for and investment in minerals.

In some cases, Chinese companies have benefitted from Chinese government investments in foreign infrastructure or from loans to foreign governments.

In order to assure supplies of metals, China has invested in mineral projects and has purchased foreign mineral companies. China's investment has been geographically broad, including investments in Africa, Asia, and the Americas.

China has sought investments in copper, iron ore, nickel, rare earths, and zinc projects, and in companies with assets in those commodities.

Initially, Chinese firms sought controlling interests in mineral projects and companies. More recently, some Chinese firms have bought minority shares with agreements for purchase of future production.

For the United States, a particularly worrying trend is the decline in domestic consumption of processed metals. The decline in per capita consumption, which began about 2005, followed decades of stable per capita metal consumption. These declines reflect decreases in U.S. manufacturing of goods that contain these metals.

If one compares China's per capita mineral consumption in 2010 with that of the United States in 2000 before the decline began, one can form some idea of how much China's consumption has increased.

For minerals used in construction, China's 2010 consumption already equals or exceeds that of the United States in 2000. China's 2010 consumption of metals and industrial minerals is slightly less than half of that of the United States in 2000. China's consumption of these minerals is likely to continue to increase for some time.

The resulting production and consumption is likely to support higher prices for these minerals and continued investment in and competition for mineral projects and companies. The increased consumption is likely to be accompanied by increased environmental impacts from mining, processing, and consuming minerals.

To summarize, the Chinese government's policies on production, consumption, and stockpiling of minerals have been driven in part by the country's rapid economic growth. Changes in the mineral economy have and will continue to affect the global economy.

This concludes my testimony, and I'm happy to answer any questions the Commission may have.

**PREPARED STATEMENT OF DR. W. DAVID MENZIE
CHIEF OF GLOBAL MINERALS ANALYSIS
NATIONAL MINERALS INFORMATION CENTER
U.S. GEOLOGICAL SURVEY**

TESTIMONY OF

W. DAVID MENZIE

CHIEF, GLOBAL MINERALS ANALYSIS SECTION, NATIONAL MINERALS INFORMATION CENTER

U.S. GEOLOGICAL SURVEY

U.S. DEPARTMENT OF THE INTERIOR

BEFORE THE

U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

HEARING ON

“CHINA’S GLOBAL QUEST FOR RESOURCES AND IMPLICATIONS FOR THE UNITED STATES”

JANUARY 26, 2012

Commissioners D’Amato and Blumenthal, thank you for inviting the U.S. Geological Survey (USGS) to speak today about the status and trends of China’s production, consumption, and stockpiling of mineral resources. My name is David Menzie, I am the Chief of the Global Minerals Analysis section at the National Minerals Information Center (NMIC). The NMIC is part of the U.S. Geological Survey, the science agency of the Department of the Interior. Unlike the BLM, or the USDA Forest Service, the USGS does not regulate minerals resources in the United States. Rather, we provide unbiased, peer-reviewed science to those bureaus and to the public to inform decision making.

The USGS maintains a long tradition of Federal leadership in minerals information that predates the creation of the bureau in 1879. Congress first authorized the Treasury Department to collect statistical information on gold and silver mines in the Western United States. This responsibility expanded over time to include all types of minerals. The USGS is authorized to gather international minerals information, as well, and does so in collaboration with our various partners across government, academia, and the private sector.

More information on USGS work on minerals resources is available at minerals.usgs.gov.

China’s Mineral Production

China is a prodigious producer of raw and processed mineral commodities as is shown in Table 1 (below). For many of the more than 80 mineral commodities tracked by the USGS, China ranks as the world’s leading producer. In a number of cases, China is not only the leading producer, but dominates world production, producing more than 80 percent of such minerals as antimony, magnesium metal, rare earths, and tungsten. In addition, China produces between 50 percent and

80 percent of bismuth, germanium, indium, pig iron, mercury, silicon, fused alumina, barite, cement, fluorspar, natural graphite, lime, magnesium compounds, wollastonite, and natural zeolites.

Although China's production of raw minerals is large, its production of a number of processed minerals is even larger. The result is that China must import additional raw minerals to meet its domestic needs. For example, China produces significant amounts of bauxite but must import bauxite and alumina to achieve its production of aluminum. Similarly, China must import antimony, copper, lead, tungsten, and zinc ores and concentrates to meet its production needs for those metals. Perhaps most significantly, although China is the leading producer of iron ore, it must import nearly one-half of the iron ore that it requires for steel production.

Finally, China is not a significant producer of a number of minerals including chromium, niobium, platinum-group metals, rhenium, and selenium and, is dependent on imports of these minerals.

China's Mineral Consumption

Consumption of many mineral commodities increase as a country's economy develops. Consumption on a per capita basis tends to increase as income per capita increases. Consumption per capita generally plateaus as a country's economy matures (Menzie et al., 2005; Menzie and Tse, 2006).

Table 2 presents data on China's consumption of 10 mineral commodities including aluminum, cadmium, cement, refined copper, refined lead, salt, soda ash, finished steel products, refined tin, and refined zinc. These minerals represent a market basket of construction materials (cement), industrial minerals (salt and soda ash), and metals (copper, lead, steel, tin, and zinc). China's consumption of minerals began to increase in the early 1990s, and accelerated throughout that decade and the first half of the next decade. Since 2005, China's increase in consumption of some minerals has slowed. However, consumption of other minerals has continued unabated.

China's Mineral Policies

China's mineral policies are based in part on a white paper issued by the State Council in 2003. The policies put forth in the paper are based on the premise that the demand for mineral resources will continue to increase during the following 20 years. The paper suggested that China needs to strengthen its efforts in mineral prospecting, exploitation, and management. The paper also states a concern for protecting mineral resources and the implementation of a sustainable development strategy for protecting the country's mineral resources and balancing the exploitation of mineral resources and environmental protection. The Government would encourage investors to explore for bauxite, chromium, cobalt, copper, gold, nickel, oil and gas, platinum-group metals, and sylvite. In addition, the Government would establish a strategic mineral resources system that would include mineral commodities based upon the supply of and demand for individual commodities as well as for commodities for which China faced possible shortages (State Council, China's Policy on Mineral Resources, white paper, December 2003).

In 2008, China's Ministry of Land and Resources issued guidelines for development of the country's mineral resources for the period 2008 to 2015. The Ministry's development plan designated antimony, rare earths, tin, and tungsten as protected mineral commodities; exploration

for and production of these mineral commodities was to be strictly controlled. The production of bauxite, germanium, indium, molybdenum vanadium, zirconium, and other minor minerals was required to be in compliance with policies set out in the development guidelines [Ministry of Land and Resources, the country's mineral resources development guidelines (2008-2015), December 31, 2008]. Currently, China issues production quotas for antimony, fluorspar, molybdenum, rare earths, and tungsten. China also maintains export quotas for each of these metals as well as indium.

China's mineral policies, especially those related to rare earth minerals, have become the subject of increased debate. China is rich in rare-earth resources, accounting for about 48% of the world's total rare-earth resources (Cordier, 2011). In addition to raw rare-earth minerals, China produces a variety of processed products including rare-earth metals and chemicals. Since the 1990s, China has become the leading rare-earth producing country in the world, accounting for more than 90% of the world's total output. Over the past decade, countries including France, Italy, Japan, and the United States have depended upon rare earths exported from China. Before 2000, China's rare-earth production exceeded domestic demand; at that time suppliers in China exported significant amounts of rare-earth products to overseas markets. In 2000, China produced 73,000 metric tons (t) of mined rare earths (rare-earth oxide equivalent) and consumed about 19,000 t. During this period, China exported unprocessed rare earths.

However, in the last ten years, Chinese domestic demand for rare earths increased sharply. The country's rare-earth production increased to over 120,000 t; however, domestic rare-earth consumption increased to 87,000 t by 2010. At the same time, the Chinese Government issued measures calling for restricted production, and the government further restricted exportation of rare earths. China no longer exports unprocessed rare earths. In addition, the rare-earth export quota decreased to about 30,000 t in 2010 from 47,000 t in 2000. Chinese statistics indicate that the country's rare-earth production has been over 120,000 t during the past several years.

China's restriction of rare-earth exports has significantly affected the downstream sectors of other countries, especially France, Italy, and Japan which do not have rare-earth resources. In the United States, the re-opening of the Mountain Pass Mine in California in late 2011 is expected to reduce U.S. demand for processed rare earths from China in coming years. In addition, Lynas Corp. Ltd. of Australia completed construction of its Mount Weld Mine in Western Australia in 2010. These two mines can supply a total of about 30,000 t of mined rare-earths during the next couple of years and will reduce the demand for Chinese-produced rare earths. Mountain Pass and Mount Weld, however, contain mainly light rare earths (lanthanum, cerium, praseodymium, neodymium, samarium, and europium). Many electronic products require heavy rare earths (gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium) to perform more efficiently. Currently, China is the only country that can supply significant amounts of both light and heavy rare earth products. At least for the next several years, China will continue to be the major supplier of heavy rare earths.

Mineral Stockpiles

In 2006, the Ministry of Land and Resources announced in its five-year plan to build up strategic reserves of minerals over the following 4 years (Aredy, 2006). In 2007, the Chinese Government announced a strategic reserve for five mineral commodities: cadmium, cobalt, copper, manganese, and petroleum. The strategic reserve was to cover 90 to 180 days of net

imports for the country (Tse, 2007). In 2008, the Ministry of Land and Resources added indium, germanium, rare earths, tin, and tungsten to the country's strategic mineral stockpile list [Ministry of Land and Resources, the country's mineral resources development guidelines (2008-2015), December 31, 2008]. In 2009, the Chinese State Council ordered the State Reserve Bureau to stockpile aluminum, copper, indium, lead, and zinc. Beyond these announcements, little is known about the content and operation of China's strategic reserve. In addition to the national mineral stockpiles, the Provincial governments for Jiangxi and Yunnan Provinces have announced their intent to create stockpiles of aluminum, copper, lead, rare earths, tungsten, and zinc in local warehouses to support metal prices in the domestic market (Tse, 2010). In 2010, the government of Nei Mongol (Inner Mongolia) Autonomous Region authorized Baotou Iron and Steel and Rare Earths Corp. to stockpile rare earth concentrates in Baotou (Tse, 2011a).

Competition for Minerals

China's increasing consumption of minerals has been responsible for the majority of the increase in global production and consumption of minerals. This increase has resulted in rising prices of many mineral commodities and an increase in the exploration for and investment in minerals. This has in some cases led to aggressive competitive behavior by companies for mineral projects. In some cases, Chinese companies have benefitted from Chinese Government investments in foreign infrastructure or from loans to foreign governments.

As China's domestic mineral consumption has risen, its large production of many minerals has been increasingly consumed internally and for a number of mineral commodities China has had to depend upon imports of raw minerals, including bauxite, chromium, cobalt, copper, diamond, iron ore, manganese, natural gas, nickel, niobium, oil, platinum-group metals, potash, sulfur, tantalum, and uranium to meet the needs of its domestic processing industries. In recent years, China has also had to import processed minerals such as aluminum, copper, nickel, and zinc.

In order to assure supplies of metals, China has invested significant capital in mineral projects and has purchased or attempted to purchase foreign mineral companies. China's investments have been geographically broad across the globe and have concentrated on fuels and metals. In Africa, China has made significant investments in metals in the Democratic Republic of Congo, South Africa, Zambia, and Zimbabwe. In Asia, China has made significant investments in Afghanistan, Australia, Mongolia, Papua New Guinea, the Philippines, and Vietnam. China has also made significant investments in metals in Canada, Chile, Mexico, and Peru. In terms of mineral commodities, China has sought investments in copper, iron ore, nickel, rare-earth, and zinc projects and in companies with assets in those commodities. Initially, Chinese firms sought to control interests in mineral projects and companies. More recently, Chinese firms have in some cases bought minority shares with agreements to purchase future production.

Implications

If one compares China's per capita mineral consumption in 2010 with that of the United States in 2000, (the last year of domestic consumption data preceding the recent economic downturn) one can form some idea of how far China has increased its consumption. For a few mineral commodities (cement, steel, tin, and zinc), China's 2010 consumption already equals or exceeds that of the United States in 2000. With the exception of tin, these minerals find a significant proportion of their use in the construction sector. For many other commodities (aluminum,

copper, lead, salt, soda ash), China's 2010 consumption is less than half of that of the United States in 2000. It would be reasonable to suggest that China's consumption of these minerals is likely to continue increasing for some time to come. These minerals find their uses in a variety of manufactured products (aluminum, copper, and lead) and in industrial chemicals (salt), and glass manufacture (soda ash). The resulting production and consumption is likely to support continued high prices for many mineral commodities, and continued investment in and competition for mineral projects and companies. The increased mineral consumption is also likely to be accompanied by a significant increase in environmental impacts from mining, processing, and consuming the minerals, particularly in the vicinity of these activities.

For the United States a particularly worrying trend is the declining domestic consumption of a number of processed metals (aluminum, copper, lead, finished steel, tin, and zinc), both in terms of absolute consumption and in terms of per capita consumption. The declines in per capita consumption follow decades in which the per capita consumption of many metals was stable. These declines may reflect a decline in U.S. manufacturing of goods that use these metals.

Conclusion

To summarize, Chinese government policies on the production, consumption, and stockpiling of mineral resources have been driven, in part, by the country's rapid economic growth. The changes in its minerals economy have, in turn, significantly affected the global economy and will continue to do so into the future.

This concludes my testimony. I am happy to answer any questions the Commission may have.

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Table 1. “Comparison of China-World Commodity Production”

Commodity	m/p	Production 2010		Units	China Rank
		China	World		
Bauxite	m	40,000	211,000	thousands of tons	2
Aluminum	p	16,800	41,400	thousands of tons	1
Antimony (Sb content)	m	120	135	thousands of tons	1
Bismuth (Bi content)	m	5.1	7.6	thousands of tons	1
Cadmium	p	5.6	22	thousands of tons	1
Chromium ore (gross weight)	m	200	22,000	thousands of tons	--
Cobalt (Co content)	m	6.2	88	thousands of tons	3
Copper ore (Cu content)	m	1,200	16,000	thousands of tons	3
Copper	p	4,690	19,100	thousands of tons	1
Germanium	p	80	120	thousands of tons	1
Gold	m	345	2,500	thousands of tons	1
Indium	p	300	574	tons	1
Iron Ore (Fe content)	m	332,000	1,290,000	thousands of tons	1
Steel (raw)	p	630,000	1,400,000	thousands of tons	1
Lead ore (Pb content)	m	1,750	4,100	thousands of tons	1
Lead	p	4,200	9,490	thousands of tons	1
Magnesium Metal	p	650	760	thousands of tons	1
Manganese ore (Mn content)	m	2,800	13,000	thousands of tons	1
Molybdenum ore (Mo content)	m	94	234	thousands of tons	1
Nickel (Ni content)	m	77	1,550	thousands of tons	7
Nickel	p	322	1,410	thousands of tons	1
Rare Earth Elements	m	120	130	thousands of tons	1
Silicon	p	4,600	6,900	thousands of tons	1
Silver	m	3	22.2	thousands of tons	3
Tin ore (Sn content)	m	115	261	thousands of tons	1
Tin	p	150	350	thousands of tons	1

Titanium Sponge	m	53	132	thousands of tons	1
Tungsten ore (W content)	m	52	61	thousands of tons	1
Vanadium (V content)	m	23	56	thousands of tons	1
Zinc ore (Zn content)	m	3,500	12,000	thousands of tons	1
Zinc	p	5,160	12,700	thousands of tons	1
Abrasives (mfg)					
Fused Alumina	p	700	1,190	thousands of tons	1
Silica Carbidep	p	455	1010	thousands of tons	1
Barite	m	3,600	6,900	thousands of tons	1
Boron	p	150	3,500	thousands of tons	6
Cement	p	1,800,000	3,300,000	thousands of tons	1
Diatomite	m	450	1,830	thousands of tons	2
Fluorspar	m	3,000	5,400	thousands of tons	1
Garnet	m	470	1,410	thousands of tons	2
Graphite (natural)	m	800	1,100	thousands of tons	1
Gypsum	m	45,000	146,000	thousands of tons	1
Nitrogen	p	42,000	131,000	thousands of tons	1
Phosphate Rock	m	65,000	176,000	thousands of tons	1
Potash	m	3,000	33,000	thousands of tons	4
Salt	p	60,000	270,000	thousands of tons	1
Strontium	m	200	420	thousands of tons	1
Sulfur	p	4,400	68,000	thousands of tons	2
Talc	m	2,300	7,450	thousands of tons	1

Table 2. “Estimated Consumption of Selected Commodities”

Consumption in
thousand metric tons

Consumption per
capita in kilograms
per capita

China	2000		2005		2010	
	Consumption	Per capita	Consumption	Per capita	Consumption	P
Aluminum	3,694.99	2.93	9,058.35	6.97	19,811.00	
Cadmium	5.08	0.00	10.96	0.01	11.67	
Cement	592,371.00	470.14	1,047,856.00	806.04	1,867,622.50	1
Copper	1,941.40	1.54	3,743.20	2.88	7,594.30	
Iron and steel	124,278.00	98.63	347,472.00	267.29	575,984.00	
Lead	648.51	0.51	2,000.61	1.54	4,236.87	
Salt	30,730.66	24.39	50,177.00	38.60	71,712.00	
Soda ash	7,481.00	5.94	12,505.50	9.62	18,770.00	
Tin	39.19	0.03	124.77	0.10	167.83	
Zinc	1,516.64	1.20	3,253.97	2.50	5,595.03	
Population (billion)	1.26		1.30		1.34	

United States	2000		2005		2010	
	Consumption	Per capita	Consumption	Per capita	Consumption	P
Aluminum	9,354.65	33.17	8,822.64	29.81	6,843.53	
Cadmium	2.00	0.01	0.85	0.00	0.47	
Cement	109,527.00	388.39	128,035.00	432.55	69,500.00	
Copper	2,728.57	9.68	2,181.19	7.37	1,730.00	
Iron and steel						

	120,012.00	425.57	110,307.00	372.66	82,000.00
Lead	1,767.70	6.27	1,520.82	5.14	1,500.00
Salt	53,905.91	191.16	56,421.00	190.61	55,305.00
Soda ash	6,430.00	22.80	6,380.00	21.55	5,220.00
Tin	46.11	0.16	51.27	0.17	16.91
Zinc	1,278.00	4.53	1,019.28	3.44	901.00
Population (billion)	0.282		0.296		0.31

Panel I – Questions and Answers

COMMISSIONER WORTZEL: Thank you very much for taking the time to come today.

I have two questions. One is not about minerals so much as politics, and the second one is about resources. I noticed in your testimony you point out that Baotou Steel and Rare Earths in Inner Mongolia is where the Chinese are concentrating their stocks.

DR. MENZIE: That's one of the provincial stocks, yes.

COMMISSIONER WORTZEL: Right. And I understand it's also kind of a national stock from some Japanese trade people. In any case, I'm interested in whether you know if there are political factors that drove those decisions? Is it Party influence or State Council or Politburo influence because Baotou is also one of the largest armor production areas in China? And I wonder if the PLA is involved there?

DR. MENZIE: Mr. Commissioner, we actually don't know very much beyond what I've told you. We tried to meet with staff of the Chinese stockpile in 2010 when we were in Beijing but were, unfortunately, not able to arrange a meeting. So some of the questions that we would have about the operation of the stockpile, we just don't have information on at this point.

COMMISSIONER WORTZEL: Thank you.

My second question. You have got a great chart on the back. I counted--I may be off— about 67 non-fuel mineral metals in your chart. Canada appears 22 times. Mexico appears 13 times. I may be off by one or two. But have we incorporated our need for some of these things into trade agreements with our two closest neighbors?

DR. MENZIE: I'm certainly not an expert on trade policy, but we certainly coordinate with the Canadians on a number of things, and Canadians largely respond the way the U.S. does in terms of the way it markets and looks for minerals.

COMMISSIONER WORTZEL: Thank you.

HEARING CO-CHAIR SLANE: Commissioner D'Amato.

HEARING CO-CHAIR D'AMATO: Thank you, Mr. Chairman.

Thank you very much for your testimony. This is an area of great interest to us, and I think that probably most or all of us don't know as much about it as we'd like to. We have strategic minerals, we have critical minerals, we have rare earths, we have heavy rare earths, and then we have the whole question of the possibility of the Chinese using their export trade in these substances as a political weapon. We've seen that recently with regard to the Japanese fishing incident.

The question I have is whether or not and to what extent our national security at risk as a result of dependency upon China for critical minerals and rare earths? To what extent are we competing with China? To what extent are we vulnerable to the kind of political leverage that the Chinese might use in particular instances because of our dependency on these minerals?

DR. MENZIE: Certainly there's attention to strategic and critical minerals through some committees set up by OSTP. The Defense Department has

made a number of changes in its Critical Minerals Program through the reorganization of the Defense Logistics Agency's response. USGS does provide information to DLA when it's making decisions about stockpiling and minerals needs. But they have undergone a number of changes in the last several years as part of a strategic plan from the House Committee on Military Affairs. So there is broad interest in critical minerals at this point within the government.

HEARING CO-CHAIR D'AMATO: So, would you say that it would be useful to address this question in terms of whether or not we have a satisfactory national policy and whether we ought to have another reassessment of this whole issue to determine what our national policy ought to be?

DR. MENZIE: Well, I think the policies are probably dispersed across a number of different aspects involving State and Defense. So rather than one single policy, I think there are a number of different policies that affect minerals. So they have to be looked at individually but with an overall view in mind.

HEARING CO-CHAIR D'AMATO: Thank you.

HEARING CO-CHAIR SLANE: Chairman Shea.

CHAIRMAN SHEA: Thank you, again, Dr. Menzie, for being here. I agree with Commissioner Wortzel that these tables in the back of your testimony are really, really helpful.

I have two questions. As I understand the debate over the export quotas with respect to rare earths, the Chinese say that we're consolidating the industry within China, and that we need to have these export quotas for environmental protection purposes. Others argue, no, you're trying to incentivize foreign manufacturers to get closer to the Chinese domestic supply of rare earths. So, one, I was wondering whether you have a point of view on that specific argument?

And, secondly, could you just tell us a little bit about the Chinese rare earth manufacturing/processing industry? Are they consolidating? What are the environmental consequences? I mean you list all these raw materials and rare earths that they're leaders in. Is there tremendous environmental degradation resulting from the mining and processing of these materials?

DR. MENZIE: To answer your question, first of all, China, in general, like any country that produces raw minerals, wants to move up the value chain, which means they want to move from producing mined goods to processed goods to manufactured goods. That's not unusual. Most countries that produce minerals and are trying to develop their economies want to do that.

In terms of the rare earths, the industry is consolidating. The Chinese are consolidating it. They have consolidated a number of their mining enterprises throughout the different commodities.

In terms of environmental damage by rare earths, it's important to understand that there are a couple of different kinds of rare earth deposits, and they have a big effect on the environmental implications.

The deposits that are rich in heavy rare earths have mainly been mined in southern China, and they largely consist of mining enriched soils over the tops of certain favorable geologic units.

Mining and processing those soils is very easy to do because they are unconsolidated material. They're basically what we would call a laterite, or a soil. This has led to widespread mining, and the mining is done by-- pouring acid

on the soil. That has led to considerable amount of environmental degradation according to reports coming out of the area.

That is one of the reasons the Chinese use for wanting to consolidate the industry, especially in that area but elsewhere.

CHAIRMAN SHEA: Can I have another question? You say that China has purchased or at least has attempted to purchase foreign mineral companies.

DR. MENZIE: Yes.

CHAIRMAN SHEA: Is there any foreign investment in the Chinese rare earth/raw materials sector?

DR. MENZIE: I don't believe that foreign companies can mine or process. They are involved in the exportation of some rare earths. There are some joint venture companies that do export, and they're part of the export quota system.

CHAIRMAN SHEA: So you're telling me that they're legally prohibited? There's a legal prohibition against foreign investment in the mining of these materials in China?

DR. MENZIE: They cannot mine rare earths and process rare earths. They can —separate processed rare earths.

CHAIRMAN SHEA: So they go out and buy or seek to buy, but they don't allow--

DR. MENZIE: They're not allowed to own the resources.

CHAIRMAN SHEA: Okay. Thank you.

HEARING CO-CHAIR SLANE: Doctor, thank you for taking the time to testify.

What concerns you the most? What keeps you up at night?

DR. MENZIE: I think the point that I highlighted in my testimony about declining U.S. consumption and production of resources. I think that that's an indication. It's at the front end of a supply chain, and the supply chain starts with mining, goes through mineral process, and goes through manufacturing of items, and if you don't, if you need a particular item at the end of a supply chain, and you don't have secure supplies-- and that doesn't mean necessarily U.S. owned--but if you don't have secure supplies, then vulnerabilities may exist.

We don't understand our supply chains for a number of mineral products as well as we should. USGS tracks the initial stages, the production and consumption of minerals through processing, but to get a product to market, you can also run into disruptions at other stages of the supply chain.

An example of that would be in the Japanese earthquake of last spring, there were a number of things affected by the tsunami, one of which was a small titanium plant that was producing paint. There are many, many titanium plants around the world that produce paint, but that plant happened to produce the metallic paint for a number of car manufacturers' black and red paints.

And that was the only plant that supplied those paints to those firms and so for a period of time, those companies couldn't produce black or red-painted cars. Now, that's not particularly important because we don't have to have a black or a red car, but I don't think we understand situations where other kinds of vulnerabilities like that may exist.

HEARING CO-CHAIR SLANE: Our job is to make recommendations to Congress. Is there something that you would think about in terms of helping to

promote or assist these mining companies in these areas or is it a financial issue; is it an environmental issue?

DR. MENZIE: Well, first of all, USGS doesn't recommend policy, and I would have to say that.

HEARING CO-CHAIR SLANE: No, but we do, and that's what we--

DR. MENZIE: Yes, and I understand that.

HEARING CO-CHAIR SLANE: Yes, right.

DR. MENZIE: There are a variety of policies that can be put forth around domestic production of minerals. National Mining Association would be able to give you some idea of what those might be.

In terms of the manufacture and vulnerability, I think Defense is beginning to look at that in depth, in more depth than it has in the past, and I would look for them to provide some of those recommendations to you.

HEARING CO-CHAIR SLANE: Thanks, Doctor.

Vice Chairman Reinsch.

VICE CHAIRMAN REINSCH: Thank you.

Can you say a little bit more, first, about the extent of U.S. resources, existing U.S. resources that you're aware of, of rare earths, and, second, what the obstacles are to their exploitation?

DR. MENZIE: Right now, the only U.S.- producing rare earth deposit is Mountain Pass. It began production back in the 1960s or '70s. It went through a period where there was no production due to both market and environmental issues around the mine. That production, as I said, restarted in 2011, and--

VICE CHAIRMAN REINSCH: Are there other deposits elsewhere?

DR. MENZIE: There are other deposits that are known and being explored, including deposits in Idaho and Alaska, we have a report on those resources that I can have sent to the committee.

VICE CHAIRMAN REINSCH: That would be helpful. And the obstacles to exploiting those resources, generally speaking?

DR. MENZIE: Well, generally speaking, depending on whether the resources are on public land or not, there can be issues related to permitting and whether or not the land is available for mining.

Beyond that, the issues largely will be related to the environmental factors and to obtaining capital. It's expensive to mine and especially to process rare earths. Rare earths are relatively complicated to process, and so having a plant that can process the materials from a particular mine is an important factor.

VICE CHAIRMAN REINSCH: I'm not sure how to phrase this, but can you make any comments about substitutability for some of these things?

DR. MENZIE: There are some parts of the goods that use rare earths that can be substituted with some loss of performance. In particular, you can substitute ferrite magnets for rare earth magnets but at a cost of having a much larger magnet, which means that your cell phone would be a lot bigger and any other component that was using them would be a lot larger.

In terms of recycling and other things, there is research going on to try to recycle rare earths. It's not clear yet how much of that is going to be commercially possible. It's very hard to recycle very small amounts of a material, and we haven't paid as much attention to that in the past as perhaps we should.

VICE CHAIRMAN REINSCH: Yes. I would think that recycling the relatively small amount in one of these things is probably a lot more expensive than obtaining new supplies.

DR. MENZIE: Yes.

VICE CHAIRMAN REINSCH: Thank you.

HEARING CO-CHAIR SLANE: Commissioner Cleveland.

COMMISSIONER CLEVELAND: I join my colleagues, Dr. Menzie, in welcoming you and thanking you for your appearance.

I have some really basic questions. What's the difference between a rare earth and any other mineral? Is it because it's in limited supply? Is it the processing? Can you tell me a little bit about the--

DR. MENZIE: Okay. Rare earths are neither rare nor are they earths.

COMMISSIONER CLEVELAND: Thank you.

DR. MENZIE: That's one of the first--

COMMISSIONER CLEVELAND: That was not in the briefing book.

DR. MENZIE: --one of the first axioms of rare earths. They are unique because of the way the electron shells for those elements are being filled. They're filling an inner electron shell which gives them particular properties. They don't form a lot of common minerals. So they tend not to form individual minerals except in rare cases, and those rare cases are where we're mining rare earths, or in the case of China's laterites where they've been weathered and have collected in clays.

So that's the principal reason, and so there aren't very many places where they actually form individual minerals, which you can then separate and concentrate and process.

COMMISSIONER CLEVELAND: Well, that leads to my next question. Do they clump together? Because I know that when you were talking about the Mountain Pass Mine, do you get--as I look at your list of words that I've never actually seen before in my life--do gadolinium, terbium--do they all tend to concentrate in the same place?

DR. MENZIE: They all form together, but in different proportions. Some deposits have more of one and less of another, and that's why the distinction with light and heavy is important.

COMMISSIONER CLEVELAND: Light and heavy. Okay. So you get concentrations of light and concentrations of heavy?

DR. MENZIE: Yes. And that makes, of course, separation of the individual products difficult, and that's why the processing is difficult. It goes through a large number of solvent extraction sequences.

COMMISSIONER CLEVELAND: And is Mountain Pass heavy or light?

DR. MENZIE: Mountain Pass is predominantly light rare earths. They do have some heavies, and they would be able to produce heavies, and they certainly could process heavies from different deposits. But their ore is predominantly light rare earths.

COMMISSIONER CLEVELAND: And that leads to my last question, which is, is there--I'm not sure quite how to phrase this--but is there a ranking of relative importance based on the challenges of processing or the actual mining process? Is there a ranking of relative importance to the manufacturing base of these rare earths?

DR. MENZIE: It would be very hard to say that one is more important than the other. Because of the wide usage, it would require you to put a value judgment on a number of particular goods. We can get you some information about the uses of individual rare earths or some examples of that.

COMMISSIONER CLEVELAND: I guess what I'm interested in is if this Mountain Pass and the Mount Weld Mine have reopened, is that going to cover the requirement for the foreseeable future given what's mined?

DR. MENZIE: They will certainly help with light rare earths. But the amount of heavy rare earths they're likely to produce will be small so there will still be some problem at least for several years with regard to heavy rare earths.

COMMISSIONER CLEVELAND: So what I'm hearing is that the manufacturing base needs the heavy rare earths more than -or proportionally more than- the light?

DR. MENZIE: No. They need both. I mean if you're cracking petroleum, you need lots of light rare earths and some heavy rare earths. But it's just that particular things--I can give you some examples. For example, terbium is used in recording optical films; dysprosium in hybrid vehicle motors; and thulium in electron beam tubes, medical imagery, visualization and microwave technology. So it just depends.

What it means is you have to look at a particular application and have some detailed knowledge of what rare earth it uses. Those mines will be able to help with production of a large number of things, and to a small extent some of those minerals. But whether or not they'll be able to meet the demand for heavy rare earths is not clear.

COMMISSIONER CLEVELAND: Great. Thank you very much.

HEARING CO-CHAIR SLANE: Commissioner Bartholomew.

COMMISSIONER BARTHOLOMEW: Thanks very much, and Dr. Menzie, I join my colleagues in thanking you for coming here. We learn lots of things. I did not know that we had an Office of Global Minerals Analysis, but I'm pleased to hear that we do.

One of the things that you note in your testimony in your section on competition is that initially Chinese firms sought to control interests in mineral projects and companies, but that more recently they've bought minority shares with agreements to purchase future production.

What do you think is responsible for the shift in practice?

DR. MENZIE: I think that Chinese companies have not operated in an international environment, and so they're learning a lot of things about international business that perhaps they didn't know, and naturally your first reaction to something is to control it. You're much happier to do that.

But other countries that have been seeking resources, for example, the Japanese depend very heavily on imports; they largely do it through partial ownership and then production agreements.

I think for the Chinese firms, their knowledge of international business has changed in a number of areas, and you see that in how they operate in countries. They've had problems with how they've operated in some countries, but that's slowly changing with time and with experience.

COMMISSIONER BARTHOLOMEW: Do you think that some of it might be a desire to avoid CFIUS review of some of the purchases that they might be

making in the United States?

DR. MENZIE: Well, CFIUS review is, of course, an important process although it's very specific, and so sometimes you miss some aspects of proposed foreign investments. For example, the U.S. did do a CFIUS review when China proposed to purchase the Union Oil Company back in about 2004 or '5. At that time, the reason that we did not allow that purchase to go ahead had to do with information about petroleum resources in Southeast Asia.

But, in fact, perhaps the more important thing was the fact that at that time Union Oil owned Molycorp, which was the U.S. rare earth deposit.

So when you look at these things narrowly, you may not--you may be constrained somewhat in terms of the importance of the issue to the overall economy.

COMMISSIONER BARTHOLOMEW: It's always interesting about that Unocal transaction. Within about six weeks on one side or the other of that attempt, the Chinese also were interested in buying Canada's, I think, remaining source of rare earth minerals.

Are you concerned that--one of the things that we've seen over the course of the past year, in particular, is the Chinese government's interest in controlling access to rare earth minerals for a number of reasons. But are you concerned that as they either acquire ownership of other minerals or sort of control over production of them, that they might be trying to control other countries' access to those resources for both--either to play the market or for political reasons?

DR. MENZIE: I would start by saying that in some of the cases that have been in the press; the Chinese stepped in or tried to step in after other countries did not make the investment. This was true of a couple of Australian ventures.

I think there's a lot more sensitivity to those things now. I think that any country that's dependent on raw minerals should be concerned about overconcentration of source of supply of any of a number of minerals because it does allow for manipulation of prices and other things. And this happens--the same can be true of companies, that if one particular company owns too much of a particular mineral or one small group of companies, you can also have problems.

On the receiving end, two companies control much of the iron ore that is exported across oceans, and they've managed to raise prices over the past five years a very large amount on a percentage basis, and that's particularly affected the Chinese because they're having to buy iron ore in that market, and the prices have gone up considerably for them.

COMMISSIONER BARTHOLOMEW: Thank you.

HEARING CO-CHAIR SLANE: Doctor, do you have a formal or informal relationship with your counterpart in China?

DR. MENZIE: We have a Memorandum of Understanding for research and materials flows with the Chinese Nonferrous Metals Association.

HEARING CO-CHAIR SLANE: Commissioner D'Amato.

HEARING CO-CHAIR D'AMATO: Yes, Mr. Chairman.

I just wanted to actually clarify this Mountain Pass issue and the Unocal. The fact is that the ownership of the Mountain Pass Mine by Unocal was

an important factor in congressional opposition to that--

DR. MENZIE: Right.

HEARING CO-CHAIR D'AMATO: --acquisition. And I know that because I participated in an important hearing of the Armed Services Committee in which it was very actively discussed. So I don't know whether it was part of the CFIUS process per se, but it did become--it was raised and it was a factor because it was cited as the only mine of its kind existing in the United States; it was going to go to China in the baggage of the Unocal acquisition.

DR. MENZIE: Thank you.

HEARING CO-CHAIR D'AMATO: Yes.

HEARING CO-CHAIR SLANE: Chairman Shea.

CHAIRMAN SHEA: Yes. Talking about CFIUS and talking about the Unocal proposed transaction, now USGS is part of the Department of Interior; is that correct?

DR. MENZIE: Yes, it is.

CHAIRMAN SHEA: When a foreign entity attempts to make an acquisition of a natural resource in the United States, are you part of the CFIUS review process if that is initiated?

DR. MENZIE: We were for a very brief time part of that process, but to be frank, we didn't have the staff to be able to deal with the volume of material that was coming across our desk at the time. I have 15 country specialists. We have about 120 people in the whole National Minerals Information Center, and that may seem like a lot of people, but when you're producing three volumes of minerals statistics and commentary a year, it's just barely enough to get the job done.

And for us to read and comment on each of the individual cases, which we did look at for about a six-month period, was just beyond our ability. So we rely more on the Defense Department and Commerce to do that, which is appropriate--and Justice--and those are appropriate places I think.

CHAIRMAN SHEA: Okay. Thank you.

COMMISSIONER CLEVELAND: What's the book on your left?

DR. MENZIE: The book on my left is one of our publications. This is the version that was produced in 2011. There is a new version for 2012. We don't have the printed book yet, but it is available on the USGS Web site. It has updated statistics. It's Mineral Commodity Summaries.

And it contains--

COMMISSIONER CLEVELAND: Will you leave that for us?

DR. MENZIE: You may certainly have this volume, but I would refer you to the Web site to get the updated statistics. We produce it annually. It's meant to provide information to Congress and other agencies in short form. It's a two-page summary of 80 commodities.

COMMISSIONER CLEVELAND: Thank you.

HEARING CO-CHAIR SLANE: Anyone else have any further questions?
Okay.

Doctor, thank you so much. Very helpful. We appreciate your testimony, and thank you for coming, sir.

DR. MENZIE: Thank you.

HEARING CO-CHAIR SLANE: We're going to resume at 10:10.

[Whereupon, a short recess was taken.]

Panel II – Water Resources

HEARING CO-CHAIR D'AMATO: The Commission will come to order. The Commission's hearing on "Global Quest for Resources by China and Implications for the United States" will resume, and we have a panel on water resources, primarily freshwater resources now.

In this panel, three leading experts will address China's management of its water resources, including its trans-boundary rivers. We will examine China's domestic and overseas damming activities and discuss how these activities impact downstream states in Asia.

First, we have Dr. Elizabeth Economy, C.V. Starr Senior Fellow and Director for Asia Studies at the Council on Foreign Relations. Welcome, Dr. Economy. Dr. Economy has published widely on both Chinese domestic and foreign policy, and she is currently working on a new book focusing on China's rise and its geopolitical and strategic implications.

She authored the award-winning book *The River Runs Black: The Environmental Challenges to China's Future*.

Second, we have Grace Mang. Ms. Mang is the China Program Director at International Rivers, where she coordinates the organization's efforts to strengthen environmental and social standards of China's overseas dam builders.

Before joining International Rivers in 2010, she worked as an environment and water policy advisor for the Australian Prime Minister and Ms. Mang is a lawyer by training and specializes in environment and water law.

Thirdly, we have Dr. Jennifer Turner, who has testified before the Commission before, as has Dr. Economy, and Dr. Turner is the Director of the China Environment Forum at the Woodrow Wilson Center here in Washington for 12 years.

Her current projects focus on U.S.-China energy and climate cooperation, the impact of energy development on water resources in China, and environmental governance in China.

I'd also like to point out that the Commission has received in reference to this panel two additional written testimonies. One of the contributions is from Dr. Brahma Chellaney, Professor of Strategic Studies at the Centre for Policy Research in New Delhi, India, who is very well-known, and has just published a widely-acclaimed new book called *Water: Asia's New Battleground*.

The other written statement is contributed by the Environmental and Development Desk of the Central Tibetan Administration. Both can be found on the Commission's Web site, and both provide recommendations for the Commission to consider in the way of recommendations for action by the Congress.

So we'd like to start with Dr. Economy and go from there.

**STATEMENT OF DR. ELIZABETH ECONOMY
DIRECTOR OF ASIA STUDIES, COUNCIL ON FOREIGN RELATIONS**

DR. ECONOMY: Thank you very much, Mr. Chairman and members of the Commission, for inviting me here to speak on this important and interesting topic.

As everyone here is aware, China today faces serious pressures related to its water supply. More than 40 mid-to-large size cities, such as Beijing and Tianjin, have been classified as water poor by the World Bank, and roughly 400 cities are relying heavily on underground water resources. According to one report, underground water now supplies 65 percent of household water supplies, 50 percent of industrial water, and 33 percent of agricultural water.

In northern China and parts of southern China, these water-poor regions are drawing down their underground water reserves, leading to subsidence, causing highways to crack, subway stations to collapse and even entire villages to relocate.

Water pollution adds an additional dimension with implications for people's health, industrial productivity, energy availability and agricultural production.

China has in the recent past adopted many measures to try to address their water pollution and shortage problems including a series of planned desalination plants, experiments with water pricing, water conservation, recycling measures and inter-provincial water transfer projects.

These measures, however, have fallen short, and China has sought to export its water challenge through its go-out policy.

The go-out strategy was initially enunciated by Jiang Zemin in the early 1990s, and over the next decade, Beijing developed a well-articulated policy. The leaders identified 50 state-owned enterprises that would be national champions and would lead the charge in four priority areas for Chinese investment abroad: resource acquisition; infrastructure development; research and development; and mergers and acquisitions with foreign companies.

A broad range of policies supports China's go-out strategy, including subsidies, highly concessionary loans, strong Chinese diplomacy, and the export of cheap Chinese labor.

Initially, water and agriculture were not technically incorporated into China's resource acquisition policy, but both have become de facto additions to it over time.

With regard to water, China seeks both to harness water for agriculture, industry and household use, as well as to develop hydropower potential. Several of Asia's longest and most important rivers begin in the Himalayas and Tibetan Plateau, and China has tapped into the resources of several, sometimes at significant environmental and economic cost to downstream players.

In general, China resists consultation over its water use, but under certain conditions, it has been persuaded to provide information about water quality and flows to countries, including the Mekong River Commission countries, Kazakhstan and India.

In each case, it took pressure to get China to the table. According to one report, it was the Lower Mekong Initiative and heightened U.S. attention to the issue that were responsible for China's decision in 2010, for example, to invite Vietnam, Laos, Cambodia and Thailand to Yunnan to look at two of China's dams on the Mekong and to invite the Mekong River Commission officials to visit Beijing to discuss how China could contribute more to the MRC's efforts.

There may even be more potential for the Lower Mekong Initiative countries to work with China given China's new security interests in the Mekong and the advent of the joint patrols among four of the countries.

In the case of Kazakhstan and the Irtysh, over a ten-year period, China has become progressively more willing to share information with Kazakhstan, moving from a joint commission to an agreement on sharing information on water quality to a potential agreement on water allocation. Several factors have probably played a role in this policy evolution.

First, the Kazakh press published a number of unfavorable articles about Chinese exploitation of the Irtysh, and China takes a lot of pains with its image.

Second, Kazakhstan now supplies three percent of China's oil, and this is only expected to increase.

Third, Kazakhstan internationalized the issue by raising it within the context of the broader regional organization, the Shanghai Cooperation Organization, which included other countries, such as Russia, who are also concerned about China's water usage policies.

And, fourth, of course, China is concerned about relations between the Central Asian Republics and the Uighur population.

With regard to India, there seems little tradition of China sharing information about its water usage although I did come across a 2002 memorandum of understanding in which China agreed to share data on water level, discharge and rainfall on the upper reaches of the Brahmaputra from three Chinese sites after a particularly bad flood had devastated part of northern India.

According to this same MOU, China has to inform India of any plan to divert water from the Brahmaputra, but many Indians don't believe that China will honor the agreement, and, in any case, informing doesn't mean discussing or negotiating.

China's lack of water also means that it exports its agricultural demand. China now imports 60 percent of its agricultural needs. More than half of all soybean production in the world now ends up in China. And during 1998 to 2008, imports of some food products, such as rice, jumped 30 percent.

In 2008, there was discussion of formally incorporating agriculture into the go-out strategy. One official said, for example, there should be no problem for a go-out strategy on agriculture to be approved--the problem might come from foreign governments who are unwilling to give up large areas of land.

Others, however, were more sensitive. As one official stated: it is not realistic to grow grains overseas, particularly in Africa or South Africa. There are so many people starving in Africa. Can you ship the grains back to China? The cost will be very high, as well as the risk.

Despite these concerns, China, like a number of other countries, has gone out in search of arable land. There have been protests in places such as the

Philippines and Kazakhstan. Some countries, such as Argentina and Brazil, have passed or are considering laws to limit the amount or even prevent Chinese ownership of their land, and in other regions, such as Africa, the media are filled with stories of Chinese farmers outcompeting local farmers, as well as calls of neocolonialism.

What does all this suggest for the United States? I think a more robust U.S. presence on issues related to China's regional trans-boundary water initiatives fits quite well into the context of President Obama's recent pivot to Asia. The U.S. can take advantage of this stronger economic and security commitment to the region.

When we are considering how best to encourage China to behave responsibly with regard to its go-out strategy on water and agriculture, I think initial evidence suggests that there are a few points of leverage:

One, internationalizing the issue; two, linkage of the water issue to others, such as oil or other commodities; and three, developing domestic capacity both within China and within resource-rich countries.

I offer a couple of suggestions in my written testimony. I'm running close to time so I'll just highlight them. The U.S. could approach India and Bangladesh to establish a Lower Mekong Initiative-like organization offering capacity-building assistance in anticipation of challenges that might arise from China's damming and potential diversion of the Brahmaputra. This could include providing science-based support, data sharing, mapping of geological consequences and more.

The U.S. should also provide support for NGOs here in the United States that are involved in capacity building for indigenous NGOs in China and in resource-rich countries to advocate for a higher level of Chinese government and corporate social responsibility. We have two excellent examples sitting right next to me.

Third, the U.S. could provide information about water issues through an Internet-based campaign. Given the popularity of the Internet in China as a source of information, the U.S. has the opportunity to share its own experiences, as well as those of other countries, to enlighten the Chinese people and potentially bring pressure to bear on the Chinese government.

Look at what the U.S. Embassy did with their tweeting on the air pollution. You can see our potential to use this form of the Internet to change the dynamics is significant.

And finally, the United States needs to think through the rules of the road for Chinese companies as they begin to seek more investment opportunities in the United States. Is it worth exploring, as Brazil has done, the opportunity to match Chinese regulations with those in the United States on an issue such as land ownership?

How to welcome Chinese investment in the U.S. while protecting U.S. interests is an issue that needs our urgent attention.

Thank you very much.

**PREPARED STATEMENT OF DR. ELIZABETH ECONOMY
DIRECTOR OF ASIA STUDIES, COUNCIL ON FOREIGN RELATIONS**

**“China’s Global Quest for Resources and Implications for the United States”
January 26, 2012**

Testimony before the U.S.-China Economic and Security Review Commission

**Elizabeth Economy
C.V. Starr Senior Fellow and Director, Asia Studies
Council on Foreign Relations**

Introduction

China’s quest for resources to fuel its continued rapid economic growth has brought thousands of Chinese enterprises and millions of Chinese workers to every corner of the world. Already China accounts for approximately one-fourth of world demand for zinc, iron and steel, lead, copper, and aluminum. It is also the world’s second largest importer of oil after the United States. And as hundreds of millions of Chinese continue to move from rural to urban areas, the need for energy and other commodities will only continue to increase.

No resource, however, is more essential to continued Chinese economic growth than water. It is critical for meeting basic human needs, as well as demands for food and energy. As China’s leaders survey their water landscape, the view is not reassuring. More than 40 mid to large sized cities in northern China, such as Beijing and Tianjin, boast crisis- level water shortages.¹ As a result, northern and western cities have been drawing down their groundwater reserves and causing subsidence, which now affects a 60 thousand kilometer area of the North China Plain.² According to the director of the Water Research Centre at Peking University Zheng Chunmiao, the water table under the North China Plain is falling at a rate of about a meter per year.³ Meanwhile, industrialization and urbanization have seriously deteriorated the quality of underground water: over 90 percent of groundwater is polluted by urban sewage, refuse, and industrial waste.⁴ Estimates are that 400,000 people are driven from their homes annually as a result of lack of water.⁵ Ten provinces in China—including Jiangsu, Shandong, Hebei, and Henan—now sit below the World Bank’s water poverty level of 1,000 m³ per person per year, and these provinces account for 45 percent of the mainland’s GDP, 40 percent of its agricultural output and more than half of its industrial production. Even traditionally water rich Guangdong is now near the water poverty line.⁶

Beijing recognizes the challenge and is undertaking a wide range of measures to address the emerging crisis, including the planned construction of several large-scale desalination plants along the eastern seaboard, intra-provincial river diversion projects, additional wastewater treatment plants, and increased water efficiency and conservation measures. Experiments with water pricing have also been underway for decades. Yet a number of factors, such as corruption, lack of human and financial resources, and a weak policy environment have often undermined fulfillment of Beijing’s goals. A preference for large projects also hampers effective planning. For several years, for example, Beijing has drained water from neighboring Hebei province, forcing sacrifices on one water-poor area for the sake of another. In the

¹ Lanjun Zhang, “Qingnian Bao (October 25, 2011).

² Lanjun Zhang, “Qingnian Bao (October 25, 2011).

³ Jonathan Watts, “China Told to Reduce Food Production or face ‘dire’ water levels,” *The Guardian*, June 28, 2011).

⁴ Jiangtao Shi, *South China Morning Post* (August 26, 2011).

⁵ Jon Bowermaster, “Made in China: World’s Harshes Water Shortage,” (February 15, 2-011) www.takepart.com/article/2011

⁶ Toh Han Shih, “Business caught in grip of mainland water crisis, *South China Morning Post* (November 14, 2011)

process, farmers in Hebei were forced to switch from rice to corn in order to save water.⁷ Hebei has complained that with merely stronger efficiency and conservation measures, Beijing would be able to manage its own water needs more effectively.

None of these policies—taken alone or collectively—has been sufficient to address the challenge at hand. As a result, China has “gone out” in search of water. While China’s “go out” strategy does not formally embrace water as a strategic resource, China’s search for food and land in Southeast Asia, Latin America, and Africa, as well as its regional hydropower projects and trans-boundary water policies, reflects the country’s pressing scarcity of water. And, as with other aspects of China’s go out strategy, China’s approach has set off some alarm bells in the region, as well as among other resource-rich developing countries.

River Diversions and Dams

Several of Asia’s longest and most important rivers begin in the Himalayas and the Tibetan Plateau, and China is a central player in many of the controversies surrounding shared water resources in Central, South, and Southeast Asia. Several of these conflicts, such as those centered on the water resources of the Mekong, Irtysh, and Brahmaputra Rivers are raising regional tensions as China develops plans for its upstream reserves that will have dramatic impacts on the lower reaches. While there are negotiating mechanisms in place for most of these shared resources, the power dynamic means that satisfactory resolution continues to elude the downstream countries. China is one of only three countries, along with Burundi and Turkey, not to sign onto the 1997 United Nations Convention on the Law of Non-Navigational Uses of International Watercourses. It rejects the idea of national integrity, which asserts that states have the right not to be adversely affected in their development potential by activities of the upstream riparian countries. Instead, Beijing asserts sovereignty: the right to harness the potential of national resources.⁸ As a result, a number of countries that share trans-boundary water resources with China, including India, Vietnam, Cambodia, Laos, Thailand, and Kazakhstan are engaged in ongoing efforts to bring China to the negotiating table over issues such as water flow, water quality, and water allocation.

In his written testimony before this commission, Brahma Chellaney details Beijing’s expansive and ongoing drive to “corner the resources” of the Mekong, Yarlung Tsangpo/Brahmaputra, and Irtysh Rivers through dams and diversions. Chinese activities with regard to each river pose a specific and unique set of political and economic challenges, but all speak to a relative reluctance by China to consider the interests of its downstream neighbors. Dam building for China, moreover, will remain a priority. In 2010, Chinese water expert Zhang Boting stated, “The 12th Five Year Plan calls for greater use of hydroelectric power because for a variety of reasons during the 11th Five Year Plan, China only completed two-thirds of its planned hydroelectric projects.”⁹ In addition, dam building is a big business for Chinese state power companies. According to the International Rivers Network, China has about 300 hydropower projects in 70 countries.¹⁰ Such projects are often part of China’s vast “aid for trade” system, in which China develops large-scale infrastructure in developing countries at low costs and is repaid in natural resources.

Pressure on Beijing to modify its plans and behavior is mounting, however, both within China and from the international community. With regard to the Mekong River, for example, pressure from the Mekong River Commission, as well as negative publicity, led Beijing in 2010 to agree to release more information on inflows and outflows from its cascade of dams on the upper reaches of the river. Pressure from local and international NGOs reportedly also contributed to China’s state owned power company Sino-Hydro

⁷ Nadya Ivanova, “Off the Deep End—Beijing’s Water Demand Outpaces Supply Despite Conservation, Recycling and Imports,” Circle of Blue (2011).

⁸ United Nations Department for Economic and Social Affairs, “International Rivers and Lakes,” Newsletter no. 39, June 2003, 6-7.

⁹ Chinatibetnews.com, “Three Rivers Area: 25 Cascade Hydropower Stations to be Built,” (January 18, 2011) www.tibet3.com/news/content/2011-01/18/content_439558.html

¹⁰ International River Network, “China’s Global Role” <http://www.internationalrivers.org/en/china/chinas-global-role>

developing a more serious approach to environmental impact assessments based on international standards.¹¹

Recent events in Kazakhstan's negotiations with China over the Irtysh River also suggest that external pressure may be effective in certain cases. China began diverting water in the 1990s from the Irtysh—upon which more than one-quarter of Kazakhs depend for their livelihood—to irrigate its agriculture and supply water to the Karamai oil fields. (By 2020, China has plans to double the volume of water diverted to 1 billion m³, and local officials have been pushing forward aggressively to develop water intensive industries such as cotton and petroleum production, as well as increasing agricultural production in wheat. The development of the region corresponds with plans by Beijing to move Han Chinese into Xinjiang.)

In response, Kazakhstan raised concerns about not only a growing shortfall in the river's water resources but also rising pollution. The river carries nitrates, petroleum products, and heavy metals, the concentration of which would increase if flows diminished.¹² After a series of unfavorable articles about China's water usage in the Kazakh press in 1998, China sat down and negotiated a framework agreement that was signed in 2001. The agreement didn't produce a common understanding concerning the utilization of the river's resources, but in 2006, a Sino-Kazakh consultative commission drafted an agreement to share information about water quality.¹³ Moreover, in 2007, Russia and Kazakhstan succeeded in raising water usage and water rights from international rivers as a topic for discussion at the Shanghai Cooperation Organization Forum.¹⁴ Finally in February 2011, China and Kazakhstan signed an Agreement on Water Quality in Transboundary Rivers. Even more critically, perhaps, the two countries have started preparatory work on the technical aspects of water allocation, which is supposed to be completed by 2014.¹⁵

Kazakhstan's apparent relative success in getting China to the negotiating table may result from the country's value to China as a source of copper and in particular oil. China now sources around three percent of its oil from Kazakhstan, and its share is expected to grow over time.¹⁶ (This suggests that other commodity-rich countries such as Vietnam might consider adopting a strategy of linking access to their commodities or energy to Chinese willingness to negotiate water allocation issues.) Raising the water issue within the context of the Shanghai Cooperation Forum may also have helped to bring pressure to bear on China.

The controversy surrounding China's plans to pursue the western route of the South-North Water Diversion Project, which might also include an effort to divert water from the Brahmaputra, is especially heated. There is little tradition of formal Sino-Indian cooperation on trans-boundary water issues, other than a 2002 Memorandum of Understanding to share data on the water level, discharge and rainfall on the upper reaches of the Brahmaputra from three Chinese sites with the Indian Water Ministry. According to this MOU, the Chinese must also notify the Indian Water Ministry in advance of any plan to divert water from the Brahmaputra.¹⁷

¹¹ Peter Boshard, "China's dam builders clean up overseas" *The Asia Times*, May 12, 2010.

¹² Sebastian Peyrouse, "Flowing Downstream: the Sino-Kazakh Water Dispute," Jamestown Foundation China Brief, vol.7, no. 10, May 16, 2007, pp. 7-10.

¹³ Sebastian Peyrouse, "Flowing Downstream: the Sino-Kazakh Water Dispute," Jamestown Foundation China Brief, vol.7, no. 10, May 16, 2007, pp. 7-10.

¹⁴ Bruce Pannier, "Central Asia: SCO Leaders Focus on energy, Security, Cooperation," Radio Free Europe/Radio Liberty, August 16, 2007.

¹⁵ A.K. Kenshimov, "Some issues of cooperation in transboundary river basins with the People's Republic of China," UNDP Office in Astana, Republic of Kazakhstan

¹⁶ Chinaoilweb.com data

¹⁷ Yan Wang, "The River Wild," *NewsChina* (January 2012).

An overall lack of trust and transparency between the two countries, however, means that suspicion of Chinese intentions remains rife within India.¹⁸ Opposition to both the South to North River Diversion project and a potential diversion of water from the Brahmaputra, moreover, is arising not only from India but also from Chinese officials, scientists, and netizens. In early October, 2011, China's Vice Minister of Water Resources Jiao Yong stated that China had no plans to divert the Brahmaputra, citing "technical difficulties, environmental impact, and relations with the neighboring countries."¹⁹ In August 2011, the Chinese NGO Green Earth Volunteers organized a discussion among Chinese scientists on the project. The scientists articulated a number of reasons why the project should be stopped: earthquakes and geological disasters on the Tibetan Plateau; numerous points along the river don't have enough water to be diverted into the Shuotian Canal; the canal would change the entire distribution of water across China, particularly in the South West so that existing dams and power stations would end up lying idle; and the project would exacerbate problems of drought and local climatic changes.²⁰ Moreover, after the Ministry of Water Resources published a series of articles and discussions on the project on their website, Chinese citizens responded with largely negative commentary concerning the likely impact of the project, with some referring to western references such as Jared Diamond and a movie about the U.S. National Parks system.

Still, there is substantial support within China not only for the broader South-North Water Diversion Project but also for the diversion of water from the Brahmaputra. On the nationalistic and popular "Strengthening the Nation" online forum, netizens generally support the project, with some even arguing that cutting off the Yarlung Tsangpo would not only help solve China's water shortage problems but also "force India to compromise over disputed territory by controlling their water flow." Moreover, China has already begun damming the Yarlung Tsangpo, without consultation with India or Bangladesh, leading many analysts to worry that any future moves to divert water would similarly be pursued without discussion.

A few Chinese scholars have begun to recognize the costs of Beijing's single-minded pursuit of economic benefit in its "go out" effort, and its failure to include governance issues as part of its overall strategy. The case of the Myitsone dam in Burma is instructive in this regard. In developing the plan to construct the Myitsone dam in Burma, the Chinese Power Investment Corporation reportedly refused to engage with any concerned parties outside the government, such as the local villagers, community groups, or international NGOs. The company also ignored the independent environmental impact assessment that claimed that there was no need for such a large dam on the Irrawaddy; two smaller dams could be built upstream instead.²¹ While the Chinese argued that the project would bring significant economic benefits to the region, the Burmese were not convinced given that some 90 percent of the electricity would go to China.²²

When Burmese President Thein Sein decided to suspend development of the dam on the grounds that he needed to "listen to the people," Beijing was shocked. Peking University scholar Zhu Feng wrote, "China's neighbors will not be reliably good to Chinese interests unless and until China begins to provide essential public goods—not just commerce but also full-fledged regional governance based on the rule of law, respect for human rights, and regional economic growth."²³ (It is also worth considering that President Sein's decision was part of a broader shift toward political openness and accountability, as well as an opening to the West.)

Agricultural Development

¹⁸ Hari Bansh Jha, "Diversion of the Brahmaputra: Myth or Reality," Institute for Defence Studies and Analyses Comment (August 9, 2011).

¹⁹ Yan Wang, "The River Wild," *NewsChina* (January 2012).

²⁰ Wei Zhou, "Divided waters in China," *Chinadialogue.net* (September 20, 2011).

²¹ Liao Ruo, "Lessons from the Irrawaddy," *chinadialogue.net* (October 10, 2011)

²² *Ibid.*

²³ Zhu Feng, "China's Trouble with the Neighbors" www.project-syndicate.org (October 31, 2011)

Chinese officials often note that they have roughly one-fifth of the world's population but only seven percent of its arable land, prompting an historical concern over food security. Traditionally, China addressed its food security concerns by growing grain domestically, no matter the cost. Today, however, Beijing seeks arable land abroad to secure access to food and avoid over-reliance on the market.

China is not alone, of course, in its pursuit of land abroad. Saudi Arabia, South Korea, and the UAE, among others, have all been trolling the world for fertile land. Yet no other country appears to provoke quite the same concern, perhaps because of the involvement of the Chinese government in this investment abroad and the country's tendency to export its labor. As Tan Xiao writes, "Involvement in overseas contracts enables our country to improve employment and also enhances the exportation of domestic machinery and raw materials. For a long period ahead of us, we will face very serious employment problems. We must not forget the fact that our huge quantity of cheap labor is one of our comparative advantages, which enable us to compete in the international market."²⁴ Or as one Chinese scientist noted in the press, "We have six hundred rivers in China, four hundred of which have been killed by pollution. We will have to send at least 300 million people to Africa before we begin to see the end of our problems."²⁵ And in 2007, the head of the Chinese Export-Import Bank Li Ruogu suggested that Africa has plenty of land, but not a correspondingly significant level of agricultural production. His answer: "There's no harm in allowing [Chinese] farmers to leave the country to become farm owners [in Africa]." Moreover, Li promised that the bank would support this effort through "investment, project development and help with the sale of products."²⁶

As Chinese agricultural concerns have sought to buy land in Africa, Latin America, and Southeast Asia, there has been some resistance. In Kazakhstan, for example, there were protests in 2010 over Chinese plans to lease one million hectares of farmland to grow soya and other crops.²⁷ And a Chinese attempt to lease almost 3 million acres in Philippines failed in the face of substantial opposition.²⁸

Some states are adopting formal measure to prevent a Chinese land grab. In Argentina, for example, Nobel Prize winner Dr. Raul Montenegro has spoken explicitly about the challenge posed by China. In reference to a proposal for the Beidahuang Group to lease and develop 300,000 hectares of farmland in the Patagonian province of Rio Negor, he said, "On a global level, China is the country most affected by the extension, intensity, and economic impact of land degradation. So it is difficult to believe that they won't make the same mistakes with their land in Rio Negro as they have in their own country."²⁹ In December 2011, Argentine President Fernandez won passage of a law that will place a 20 percent cap on the amount of land available to foreign landowners, within which no single nationality can own more than 30 percent. Moreover, per buyer, there will be a 1,000 hectare limit.³⁰

Even more telling, Brazil is considering a measure directed uniquely against China that would ban the Chinese purchase of land in Brazil since China, itself, does not permit private ownership of land. Former Trade Minister and current president of the China-Brazil Business Council also articulates the broader concern over Chinese state investment: "Sometimes you don't know whether the investments are looking for Brazil as a market or whether they correspond to strategic purposes of the Chinese government."³¹ Brazilians are trying to be smart about Chinese investments by ensuring that the Chinese will not only buy soybeans from Brazilian producers but also manufacture soy oil in Brazil rather than in China.

²⁴ Tan Xiao, *Zhongguo zouchuqu de fazhan celue*, (The China Strategy of "Going Global"), China Social Science Press, 2003, p. 542

²⁵ Kevin Bloom, "Why China Needs Africa More," *Daily Maverick* (October 27, 2010).

²⁶ Michael Bristow, "China in Africa: Developing ties," *BBC News* (November 29, 2007).

²⁷ JM Anthorpe, "China's Global Hunt for Food Security," *Vancouver Sun* (February 3, 2010).

²⁸ Carlos H. Conde, "Philippines suspends Chinese-funded projects in wake of scandal" *The New York Times* (September 25, 2007)

²⁹ Mia de Graaf, "Limiting Foreign Land Ownership: A Law in the Making" *The Argentina Independent* (September 28, 2011)

³⁰ *Ibid.*

³¹ Solana Pyne, "China's Brazilian shopping spree" *Global Post* (November 22, 2010)

Recommendations

On a macro-level, water insecurity in Asia raises several challenges for the United States, chief among them the potential for a sustained crisis in the provision of safe water and sanitation to contribute to destabilizing politics within the region. In addition significant water-induced constraints on growth in Asia could affect the U.S. economy by raising the price of many consumer goods and agricultural products.

The United States, therefore, has a direct and significant interest in working actively to help Asia address its water security needs. As a first step, the United States could articulate a vision of water security akin to that put forward in the United Nations Human Development Report: “Water sharing is not a zero sum game. Two overarching challenges define trans-boundary water governance strategies at the start of the twenty-first century. The first is to move beyond inward-looking national strategies and unilateral action to shared strategies for multilateral cooperation...the second is to put human development at the center of trans-boundary cooperation and governance.”³²

Second, at the regional level, the United States should seek opportunities to work with actors committed to a long-term and sustainable water policy that ensures the broadest protection of water security interest and avoids highly asymmetrical outcomes that will significantly advantage one party at the expense of another. The U.S.’s engagement in the Lower Mekong Initiative is one such positive example. The United States could similarly approach India and Bangladesh to offer capacity building assistance in anticipation of challenges arising from China’s damming and potential diversion of the Yarlung Tsangpo/Brahmaputra. The United States can help provide science-based support for data sharing, mapping of geologic consequences, and more.

In addition, sensitivities concerning U.S. government involvement in countries’ internal affairs suggest that direct support for foreign NGOs might be problematic. However, the United States could support U.S. NGOs and other actors that help build capacity for indigenous NGOs—in China and in resource-rich countries—to advocate for a higher level of Chinese government and corporate social responsibility.

Fourth, the United States, particularly the U.S. Embassy in Beijing, could also take the lead in promoting an Internet-based environmental awareness campaign. It could capitalize on the U.S. experience—as well as that of other countries, including China—in managing shared water resources. It could also provide information about what can go right or wrong in constructing dams. For example, the United States could share the experience of the Elwha and Glines Canyon dams that after decades in operation are now being removed.

Last, the United States should start thinking through the rules of the road for Chinese companies as they begin to seek more investment opportunities in the United States. Is it worth exploring, as Brazil has done, the opportunity to match Chinese regulations with those in the United States? For example, China, itself, does not allow private ownership of farmland and has cautioned local governments against granting large-scale or long-term leases. It also bans foreign companies from buying mines and oil fields.³³ How to welcome Chinese investment in the United States while protecting U.S. interests is an issue that urgently needs attention, perhaps in cooperation with other countries.

³² United Nations Development Programme, *Human Development Report 2006* (New York Palgrave Macmillan, 2006), 204.

³³ Alexei Barrionuevo, “China’s Interest in Farmland Makes Brazil Uneasy,” *The New York Times* (May 26, 2011).

HEARING CO-CHAIR D'AMATO: Thank you very much, Dr. Economy.
Ms. Mang.

**STATEMENT OF GRACE MANG
CHINA PROGRAM DIRECTOR, INTERNATIONAL RIVERS**

MS. MANG: I'd like to start by thanking the Commission for giving me the opportunity to testify today.

International Rivers is an international human rights and environmental NGO and has been monitoring China's global role in dam building since 2006. During that time, we have worked to inform Chinese audiences about the impacts of Chinese overseas dams and encouraged Chinese dam builders and financiers to adopt international environmental standards.

I would like to share with you today some of our observations and analysis regarding the environmental and social impacts of China's hydropower industry around the world.

Today, Chinese companies dominate the international hydropower market. Over the past few years, China has successfully exported its large dam-building expertise to the world. International Rivers is currently aware of some 300 dam projects in 66 countries in which Chinese companies and financiers are involved.

More than two-thirds of these dams are large hydropower projects with a generating capacity of over 50 megawatts. Approximately 42 percent of these projects are located in Southeast Asia and 15 percent in Africa.

The geographical spread mimics the regional distribution of Chinese overseas investment.

Behind these numbers are two key actors: China's Export-Import Bank, and now the world's biggest funder of hydropower dams, and the state-owned Sinohydro Corporation, the world's largest dam builder. Sinohydro by its own estimates has a 50 percent share of the global hydropower market.

And by our own records, we are aware of Sinohydro's involvement in no less than 195 dam projects in around 60 countries.

With an ever-increasing global presence, I would like to explain why Chinese dam builders face heightened environmental and social risks when operating overseas.

First, Chinese companies are often operating in countries that have weak environmental protection and social safeguards. For example, in Burma, the government did not require any environmental approvals for the 6,000 megawatt Myitsone Dam. In such cases, Chinese companies cannot rely on local legislation to ensure compliance with international laws and standards.

Second, until very recently, Chinese dam builders have lacked any clear environmental and social policy standards consistent with international best practice for their overseas operations.

Third, many Chinese companies lack experience and are ill-prepared to adequately deal with community grievances in the host countries and the scrutiny of an independent medium.

When confronted with local opposition or negative reporting, Chinese companies have tended to be defensive or dismissing, confirming

perceptions that they operate in a nontransparent manner.

And, finally, in some cases, strengthening bilateral relations between China and the host country has meant that social and environmental considerations of dam projects are an afterthought.

China has not, however, turned out to be the rogue dam builder that many feared it might be. Instead, Chinese dam builders have made it clear that their aim is to be a responsible global actor, and I would like to produce two points in this regard.

First are the efforts made by the largest Chinese dam builder, Sinohydro Corporation, and the second are the policy reforms underway within the Chinese government.

In late 2011, Sinohydro adopted an environmental policy which, if implemented, would put it amongst the leaders of the global hydropower industry. The environmental policy is, in part, a product of an ongoing policy dialogue between Sinohydro and International Rivers.

Sinohydro has adopted all the World Bank safeguard policies, including those relating to indigenous people, resettlement and the environment, as its minimum standard. Sinohydro has identified a number of "no-go" zones for hydropower development, including World Heritage areas and the habitats of internationally-protected species.

Sinohydro has also committed to establishing grievance and complaints mechanisms for its overseas projects. Of course, the challenge for Sinohydro will be in policy implementation which will require a fundamental change in the way it does business.

The Chinese government has also initiated policy reforms, which, if implemented, would see the Chinese government go beyond what any Western country has done to address the social and environmental impacts of its companies operating overseas.

The Ministries of Commerce and Environmental Protection are currently drafting guidelines for the environmental impacts of Chinese companies operating abroad, which will go some way in establishing a minimum standard regardless of how weak host country laws may be.

As part of this process, International Rivers has encouraged the Ministry for Environmental Protection to prepare hydropower standards guidelines based on Sinohydro's policy so that other Chinese companies cannot gain an advantage by disregarding environmental standards.

For the Western dam-building industry and U.S. companies, China's global role in dam building has and will continue to present both opportunity and challenges. We are aware that Chinese companies are interested in partnering with U.S. companies given their global expertise.

For example, Sinohydro has discussed with AES Corporation opportunities to jointly pursue dam projects in Africa by utilizing and benefiting from AES' local office infrastructure in southern Africa. Nonetheless, there will be instances where U.S. companies will be in direct competition with Chinese companies.

To conclude, China, like the U.S., has an interesting global development and environmental protection. Sinohydro's newly adopted environmental policy and the Chinese government's intention to issue

environmental policy guidelines is evidence that China is capable of pushing the global hydropower industry to take on higher environmental and social standards.

Of course, implementation of good intentions will be crucial, but it would be prudent for traditional dam builders and funders to take notice and try to meet China's challenge to do better.

Thank you.

**PREPARED STATEMENT OF GRACE MANG
CHINA PROGRAM DIRECTOR, INTERNATIONAL RIVERS**

Date of hearing: 26 January 2012

**Title of hearing: China's Global Quest for Resources and
Implications for the United States**

Name of panelist: Grace Mang

**Panelist title and organization: China Program Director,
International Rivers**

**Testimony before the U.S. - China Economic and Security Review
Commission**

About International Rivers

International Rivers is an international environmental and human rights NGO with offices in Brazil, India, South Africa, Thailand and the U.S., and has been monitoring the environmental and social impacts of dam projects for the past 25 years. We work to protect rivers and defend the rights of communities that depend on them. As an international NGO, we do not represent any national or commercial interests. We seek to promote water and energy solutions for a just and sustainable world. We are not in principle opposed to dams but will work to stop destructive dam projects such as those impacting millions in the Amazon and Mekong River Basins.

In 2006 International Rivers started monitoring China's global role in dam building. We have conducted dialogues with China Export-Import Bank (EXIM) and since 2009, Sinohydro Corporation, a State-Owned Enterprise (SOE) and the world's largest hydropower company. Through our dialogue with Sinohydro, we made constructive contributions to their environmental policy, verified data and information about Chinese overseas dam projects, and raised concerns from host country NGOs about destructive dam projects in which Sinohydro is involved.

China's Role in Dams Overseas

In recent years, China's hydropower industry has significantly expanded its involvement in overseas markets and now dominates the international hydropower industry. International Rivers is aware of over 300 projects in 66 countries which Chinese companies and financiers are involved in. Types of involvement include dam funding (provided by state and non-state-owned banks, export credit agencies and investment firms), dam

development (companies who take a lead on dam planning and construction and may also invest in the project), and contracting and equipment supply. Chinese companies are predominately building hydropower dams and more than two-thirds of the projects being monitored by International Rivers constitute large hydropower projects (greater than 50 megawatt (MW) generating capacity). However Chinese companies have also been involved in the construction of water supply, flood control and irrigation projects. Chinese dam building activity is concentrated in South-East Asia (127 projects) and Africa (86 projects). The regional concentration in activity is consistent with the overall geographic focus of Chinese overseas investment. 72% of China's foreign direct investment by the end of 2010 (US\$300 billion) was based in Asia. It is also important to note that in the past two years, China has rapidly increased its presence in the Latin American hydropower market and currently has around 22 hydropower projects at the feasibility study or project construction stage.

China EXIM Bank, the official export credit agency of the Chinese government, has provided critical funding for many large hydropower projects and is now the largest funder of hydropower projects in the world. China Development Bank, one of China's policy banks, has also recently emerged as a funder of several large hydropower projects through "resources-for-infrastructure" deals in Ecuador and Kazakhstan. While the level of participation of other state-owned banks in overseas hydropower dams remains limited and piecemeal, the Industrial and Commercial Bank of China (Ethiopia, Sri Lanka), Bank of China (Lao PDR, Ecuador) and Peoples Bank have all supported overseas projects. Chinese dam builders have also been the recipient of dam building contracts from the International Financial Institutions such as World Bank, African Development Bank and Asian Development Bank.

Sinohydro Corporation dominates the international hydropower market and by its own estimates has a market share of around 50%. International Rivers is aware of Sinohydro's involvement in approximately 195 dam projects in 60 countries across Asia, Africa, Europe, the Pacific and Latin America. Other state-owned dam building companies with international portfolios include China Three Gorges Corporation and its subsidiary China International Water and Electric Corporation (Cameroon, Ecuador, Guinea, Lao PDR, Malaysia, Nepal, Pakistan, Sudan, Tunisia), China Gezhouba Group Corporation (Burma, Cambodia, Ecuador, Ethiopia, Iran, Kazakhstan, Nepal, Lao PDR, Nepal), Guodian Corporation (Cambodia, Indonesia), Datang Corporation (Burma),

Huadian Corporation (Cambodia) and China Power Investment Corporation (Burma).

In a growing number of cases, Chinese companies are developing hydropower projects using their own credit lines. Sinohydro has recently used its own credit lines to develop and operate hydropower projects in Cambodia (Kamchay Dam) and Lao PDR (Nam Ngum 5). In Pakistan, China Three Gorges Corporation announced plans in March 2011 to invest up to \$15 billion in wind and hydropower projects, which includes four mega hydropower projects -Bunji (7,100 MW), Kohala (1,100 MW), Bhasha and Karot.

Chinese companies have also expressed their desire to develop multiple projects or dam cascades along undammed rivers. In Lao PDR, Sinohydro surveyed the Nam Ou River, a major tributary of the Mekong River and identified up to eight hydropower projects. Construction of the first dam in this cascade will begin in 2012. In Burma, China Power Investment plans to develop six hydropower dams on the headwaters of the Irrawaddy River in addition to the Myitsone Dam project primarily for power export to China. In Colombia, HydroChina a state-owned engineering firm is surveying the entire Magdalena River for hydropower development potential.

Possible Factors in the Outward Expansion of China's Dam Building Industry

First, unprecedented domestic demand for resources has required the Chinese government to develop a strategy for accessing new resource deposits, which have so far not been exploited because other developers have considered them insignificant in size, geographically remote or politically risky. In many cases, this strategy has also led to Chinese investment in auxiliary infrastructure such as pipelines, roads, railways, power plants and transmission lines. Chinese companies are usually called upon to build this infrastructure, which has tended to be funded by conventional loans secured by resource payments. To illustrate, China has made significant investments in the development of Sudan's oil resources and has a 40% share in Sudanese oil projects. In addition, China has also invested in a pipeline, an oil refinery, a railroad, and several thermal and hydroelectric power plants, including the Merowe Dam, to support

its Sudanese oil extraction activities. China has also offered and/or is implementing similar investment packages in Angola, Congo, Ethiopia, Gabon, Zambia and Ecuador to meet its domestic resource needs.

Second, China's hydropower industry has also been a beneficiary of the Chinese government's "going-out" strategy launched in 2001 and subsequently adopted in the 11th and 12th Five Year Plans. The objectives of the "going out" strategy, according to the UNCTAD are to promote "the international operations of capable Chinese firms with a view to improving resource allocation and enhancing global competitiveness." Government incentives and strengthening bilateral relations has ensured the proliferation of Chinese overseas dams.

Third, fierce competition for hydropower projects and low profit margins for energy producers in China has also driven companies to look overseas for profits. For instance, three different survey and design institutes conducted feasibility studies for the Nu River hydropower cascade even though only one will receive a contract if and when the projects are approved. State-owned power generation companies such as Datang, China Power Investment, Guodian and Huadian have very low profit margins or are making losses due to low power tariffs and the high costs of developing and maintaining energy generation and assets in China. Confirmation of the attractiveness of international projects can be found in the current five and ten year plans of companies like Guodian and Gezhouba, which outline their intention to rapidly develop their international hydropower construction businesses.

Fourth, the competitiveness of the Chinese dam building industry has ensured their global success. More often than not, Chinese companies are able to do the job for much less than their western counterparts and have significant experience from building large dams in China. For example, in the international tender process for the Asian Development Bank funded Nam Leuk hydropower project in Lao PDR (completed in 2000), China International Electric and Water Corporation submitted a bid that was 28% lower than the consultant engineer's estimate and 25% lower than the second-lowest bidder. In such cases, it is very difficult for host country governments to turn down the significant savings that the Chinese companies offer. Chinese companies have also begun to build their reputation as being able to deliver quality and timely projects, however this is still to be definitively proven within the international hydropower industry.

Environmental and Social Standards and Regulations on Dam Building

Overall China's environmental policies, standards and regulations regarding its overseas dam building sector are on an upward trend. Chinese hydropower companies have made clear that they have no desire to be a developer or contractor of "last resort" and have actively sought to build their reputation as international leaders and responsible actors overseas. This section will first outline international dam building standards and second, describe efforts by the Chinese government and by the Chinese hydropower industry to set environmental policies guidelines for overseas investments and in particular, overseas dams.

There are a series of non-voluntary international environmental and social guidelines for dam development. The World Commission on Dams (WCD) established the most comprehensive guidelines for dam building. The WCD's final report describes an innovative framework for planning water and energy projects. The framework is intended to protect dam affected people and the environment, and ensure that the benefits from dams are more equitably distributed. The WCD framework covers key areas for improved planning of dams, including the need to fully assess all available options for meeting water and energy needs; addressing outstanding social issues from existing dams before building new ones; gaining public acceptance for key decisions; and the importance of healthy rivers. China was originally represented on the WCD but its representative withdrew from the panel due to health reasons.

The dam industry body, the International Hydropower Association launched the "Hydropower Sustainability Assessment Protocol (HSAP)" in 2011 which establishes a scoring system to assess the sustainability of hydropower projects. The protocol does not establish any guidelines or standards, but provides a means of evaluation at any stage of the planning and construction. The China Institute for Water Resources and Hydropower Research Institute and China Three Gorges Corporation represented China in the forum that developed HSAP.

The WCD's final report and HSAP reflect attempts to set and measure international best practices in dam building, however the primary sources for environmental and social safeguards still remains the host country and the Chinese government. National environmental planning legislation usually dictates the

standards and regulations governing dam projects but are not reliable sources for ensuring adequate protections for affected communities and the environment. The majority of Chinese hydropower projects are in emerging or developing countries with relatively poor environmental approvals processes and weak or non-existent enforcement capacity. For example, Myitsone Dam in Burma was not subject to any environmental approvals process as there is no such requirement under Burmese law and in the case of Cambodia's Kamchay Dam developed by Sinohydro Corporation, vague environmental impact assessment laws meant that the environmental impact assessment could be conducted and submitted after construction had begun. Weak national protections have prompted a number of Chinese companies to adopt Chinese environmental standards as a minimum when operating overseas.

Within China, there are no laws or regulations as yet that specifically addresses the social and environmental impacts of Chinese overseas dams. However, in response to mounting criticisms of the impacts of Chinese companies working overseas, the State Council in October 2006 issued a set of "Principles Governing the Activities of Foreign Investment Firms." The State-owned Asset Supervision Administration Commission (SASAC), which oversees China's SOEs, has also taken steps to ensure that SOEs set the standard for corporate social responsibility. In January 2008, SASAC issued "Corporate Social Responsibility Guidelines for State-Owned Enterprises," which required SOEs to "set an example of honesty and trustworthiness, resource conservation, environmental protection and people-centeredness."

The strongest indication of an upward trend in addressing the overseas environmental impacts of Chinese companies is the development of draft guidelines by the Ministry of Commerce and Environmental Protection. Such guidelines would oversee the environmental impacts and policies of Chinese companies operating overseas. It is important to appreciate that such a measure to oversee and monitor the overseas activities of Chinese companies goes well beyond efforts of other governments including the U.S., and reflects a strong view within the Chinese government that the overseas operation of Chinese companies, particularly large SOEs, serves as a critical component of China's soft power and public diplomacy.

In addition to broad corporate social responsibility requirements and the development of specific environmental impact guidelines, overseas investments also require general sign off by various Chinese government departments including the State Council, National Development and Reform Commission,

Ministry of Commerce and State Administration for Foreign Exchange. For example, all overseas investments greater than US\$10 million fall under the purview of the Ministry of Commerce, which is required to sign off on the investment. The Ministry of Commerce is the primary government institution that approves, manages and monitors overseas investments initiated by central SOEs, and is required to approve investment projects over \$100 million dollars in countries with high safety risks and countries without a diplomatic relationship with China. Investment projects between \$10-100 million or initiated by local SOEs must be approved by the provincial based departments. As part of the approval process the Ministry of Commerce may seek advice from the host country embassy's economic counselor. It is unclear the extent to which social and environmental risks are considered by the Ministry of Commerce. However after the suspension of Myitsone Dam, the Chinese government has indicated that it will increase its attention to risks and challenges facing Chinese enterprises when approving foreign investments.

China Needs to Address its Overseas Risks

The President of Burma, Thein Sein's decision to suspend the Myitsone Dam in September 2011, came as a surprise and shock to the senior executives of the Chinese dam developer, China Power Investment. Myitsone Dam was China Power Investment's first foray into overseas dam building and was viewed as an important project for the development of its international business. China Power Investment's surprised reaction can be attributed to its failure to address national opposition to the project and its desire to isolate the construction site from Burma - a SASAC report of August 2011 praised China Power Investment's Community Party units for their "closed management" and described the project site as "an isolated island floating above the national soil of Burma."

In his statement to the Parliament of Burma, President Thein Sein said that the government had to act "according to the desire of the people." Burmese civil society groups have long opposed the dam which under the 2006 deal signed between the Chinese government and the Burmese military junta, would have seen 90% of the power generated from Myitsone Dam go to China. The hydropower project was large even compared with dams in China. Myitsone Dam, at 6,000 MW and with a proposed reservoir greater than the size of Singapore (295 square miles), would have forced the relocation of around 12,000 people and impacted around 20,000 people during construction and in operation.

Opposition to the project also grew due to a complete lack of transparency around the environmental and social impacts of the dam. Construction at the dam site began long before any environmental studies had been finalized. While the Chinese developer felt it was good practice to do an Environmental Impact Assessment (EIA), the EIA was not released until public opposition was high and by our own analysis was by no means comprehensive (for example, the EIA failed to investigate any downstream impacts).

China Power Investment's failure to engage with local civil society groups and mounting opposition to Myitsone Dam is not an isolated case. Compared to China, the local communities, environmental organizations, trade unions and media in host countries can be more vocal and independent. To date many Chinese companies have been ill prepared to deal with community concerns and complaints, and unresponsive to requests for engagement and dialogue. In January 2011, Mr Li Fusheng - an Assistant General Manager of China EXIM Bank wrote in the Chinese language newspaper, Huan Qiu (Global Times):

"Unfortunately, most Chinese companies are not good at dealing local communities, non-governmental organizations, and local and foreign media, apart from local governments and partners. Some companies have not made any efforts to communicate with different voices and have even refused to do so" (unofficial translation by International Rivers). Mr Li went on to suggest that a failure of Chinese companies to engage with stakeholders had impacted China's business interests and competitiveness.

The alarm signals sent by the suspension of the Myitsone Dam are not the first to go off on China's global role in dam building and have also not gone entirely ignored.

Sinohydro's Environmental Policy - A First Step in Responding to Overseas Environmental and Social Impacts

Sinohydro has been active in the international hydropower power market since the 1980s. However it was international civil society criticism of Sinohydro's civil works contract in the destructive Merowe Dam project in Sudan, which began a process within the company to address and respond to its overseas environmental and social impacts. In an article published in the journal "Public Diplomacy Quarterly" of Chinese People's Political Consultative Committee, Sinohydro's CEO, Mr Fan Jixiang acknowledged that the criticism of its projects in Africa by International Rivers had "seriously undermined Sinohydro's image." Sinohydro invited International Rivers to a

meeting in 2009 and we have been engaged in a constructive dialogue since then. In March 2010, Sinohydro informed International Rivers that it was preparing an environmental policy and invited our input. In our recommendations we made clear that if Sinohydro wanted to become a world-class brand, then it needed to adopt a world-class environmental policy and meet its international responsibilities, which Sinohydro has since accepted.

In late 2011, Sinohydro Corporation adopted an environmental policy which if implemented would put it amongst the leaders of the global hydropower industry. The environmental policy adopts a number of "no-go" zones for hydropower development including World Heritage Areas, Ramsar listed wetlands and habitats of internationally protected species. Sinohydro has also adopted the World Bank safeguard policies pertaining to indigenous peoples, resettlement and the environment, as its minimum standard. Sinohydro's environmental policy goes in part to meeting the Chinese government's expectations that SOEs should operate responsibly overseas. In his article in Public Diplomacy Quarterly, Mr Fan wrote "[SOEs] are widely expected to fulfill civil obligations in the international community. To this end, enterprises need to pay more attention to social responsibility in international business and take environmental protection and sustainable development into consideration in the company's overall strategic plan."

Sinohydro's environmental policy also comes at a time when there has been unprecedented interest in Chinese overseas investments. In the lead up to Sinohydro's Initial Public Offering on the Shanghai Stock Exchange in September 2011, prospective investors, financial markets analysts and the Chinese state media discussed Sinohydro's draft environmental policy and its adequacy in addressing Sinohydro's overseas risks. Of course the challenge for Sinohydro will be the implementation of the environmental policy, which will require a fundamental change in the way it does business.

Sinohydro is by no means alone in responding to concerns about Chinese overseas dams. In Ethiopia, the media reported that the world's biggest funder of large dams, China EXIM Bank delayed financing for the Chemoga-Yeda Hydropower Project on the Nile River in response to concerns from downstream countries. This delay follows China EXIM's Bank decision to suspend the Belinga dam project in Gabon, after a local NGO's letter informed the Bank that the project violated its own environmental policy. In a separate example of the unwillingness

of Chinese dam builders to build dams overseas at any costs, the China Southern Power Grid Company announced that it had withdrawn from several controversial projects in Cambodia according to the South China Morning Post, because it saw itself as a socially responsible company (September 2011).

Conclusion - View From the West

China has not turned out to be the rouge dam builder we feared it might be, instead Chinese dam builders have made clear that their aim is to be a responsible international actors. Nonetheless, Chinese companies continue to face many challenges when operating overseas as the Chinese government, financiers and companies themselves struggle to get the policy settings and implementation practices right. International Rivers expects there may be other Chinese overseas dams like Myitsone Dam project that will be fiercely opposed by local communities, but that such instances may also spur on policy reform and changes in the way that Chinese companies do business. We also expect that there will be increased scrutiny of Chinese overseas dam building within China. In our experience, Chinese media, NGOs and academics are extremely interested in the challenges and risks facing state-owned companies.

China's global role in dam building has and will continue to present both opportunities and challenges for the western dam building industry, including U.S. companies. Anecdotally, we are aware that Chinese companies are interested in partnering with U.S. companies given their existing global expertise, and international networks and infrastructure in key markets such as Africa and Latin America. Sinohydro for example, has discussed ways of working in partnership with AES Corporation to strengthen its African operations. Nonetheless, there will be instances where U.S. companies will be in direct competition with Chinese companies.

China, like the U.S. has an interest in global development and environmental protection. Two recent developments indicate that China may have some positive and constructive influence on whether and how dam projects are being developed around the world: Sinohydro's environmental policy and the intention of the Chinese government to issue guidelines on the environmental impacts of Chinese enterprises operating overseas, is evidence that China is capable of pushing the global hydropower industry to take on even higher environmental and social standards. Of course, implementation of good intentions will be crucial - but it would be prudent for traditional dam builders and funders to

take notice and try to meet China's challenge to do better.

HEARING CO-CHAIR D'AMATO: Thank you, Ms. Mang.
Dr. Turner.

**STATEMENT OF DR. JENNIFER TURNER
DIRECTOR, CHINA ENVIRONMENT FORUM
WOODROW WILSON INTERNATIONAL CENTER FOR SCHOLARS**

DR. TURNER: Okay. "Xin Nian Kuai Le." Happy New Year. Appropriate for us now, it's the year of the Water Dragon, and we're the water panel, so we're good with this.

All right. You know who I am, that I've been doing a lot on water and energy in China, being a platform for dialogue and exchanges, and I've been doing a lot of work. I dove into the whole water-energy confrontation in China, and as you know, Liz gave a really grim snapshot of the water crisis, but what was striking to me over the years, I haven't really found people looking into what's happening with the water-energy confrontation.

So in our investigation of it, we produced 16 multi-media stories, and in the course of this talked to government, NGO, business, and researchers in ten Chinese provinces, and the reception was really enthusiastic. People were excited asking about water in China because the water issue is their biggest environmental challenge, and I think that this could be a really fruitful area of U.S.-China cooperation, not just government, but also I'm trying to encourage the NGO and research communities to see this as a good opportunity.

In looking, too, in the United States, I mean Congress commissioned Sandia National Lab to look at our own water-energy confrontations, and Congress just asked the National Academy of Sciences to figure out, okay, what are we going to do about our own problem of energy development impacting water. So common challenges on both sides.

"Choke Point China." We found two narratives: good news/bad news. Good news first is that even though China's economy has been going like gangbusters, particularly in the last 15 years we've had a lot of massive growth in energy/urbanization-- water consumption has only grown one percent per year. Some of that is because of conservation, but more of it is because it's just being taken out of agriculture.

Ningxia farmers have had to decrease their water consumption by 30 percent over the past five years, and we know that if you have a coal-fired power plant versus farmers, we know who's going to win. It's the same worldwide.

Another bad news trend that Liz noted, too, is, of course, that the availability is dropping. Climate change, wastage, but also water pollution itself. A lot of water is not accessible. The lady who wrote *The River Runs Black* is at the end of the table. She knows this.

Our "Choke Point: China" research, though, I have something new. We went to water and energy experts in China and put together a number no one had really thought to put together before. We've calculated that 20 percent of China's water is being used to produce coal--right--for the mining, the washing, the ash control, cooling of coal-fired power plants. And a lot of Chinese folks tell me it can't be that number. I'm like okay, but then tell me what the number is. So I'm kind of stimulating people to look into this.

So coal is king, and the king is thirsty; right? And so we know that coal use is projected to still be 70 percent in another ten years, and where are

they going to get that water from? Some of it, again, coming out of agriculture, and as Liz noted, the "going-out" strategy, there's going to be a lot more of it happening because they need the agriculture, and right now there aren't a lot of international NGOs really engaging with China--the banks, the companies--on the ag issue, or even engaging the host countries themselves--the governance issues that you talked about on dams. Same thing in ag.

So there's an opportunity that the U.S. foundations, NGOs, U.S. government, need to look at.

The coal-water-agriculture nexus. It has serious domestic and environmental implications in China, but it also underscores really the importance of what we've been under the Obama administration, the U.S.-China clean energy cooperation, cleaner coal, maybe even shale gas if it's done right the game changer to get you off coal.

Low carbon could mean low water, but I think it's kind of a byproduct of the current clean energy cooperation, both government and nongovernmental, but I think there needs to be a much stronger focus on the water issue, even in the energy technologies. Shale gas to the point China is already fracking in Sichuan Province. U.S. companies and all these other people are getting involved, but there is no regulation yet.

But I think the Chinese probably will move faster on it because they have no wiggle room on water. Now in terms of thinking also about another water-energy-security link, dams, it's pretty obvious. They're building dams because they need energy, but it has a big impact on water.

The water transfer. South-North Water Transfer Project, the world's largest infrastructure project that very few people have heard of. Most of us think that that it was really to just supply the water to cities in the north, but we did an interview of the Chief Engineer of the South-North Water Transfer Project, and the kind of debated Western line is really meant to get water to northwest China, to Xinjiang and Inner Mongolia, to get at the coal. And so really your India-China confrontation over the diversion, it boils down to coal. Okay?

You got to know about coal. There's also the Bohai Water Transfer Project. You guys heard about that one? Yeah. Nuclear power to desalinate and transfer water to get at coal in Inner Mongolia.

So we've got a lot of water-energy choke points--dams, transfer, shale gas. It's going to play out a lot in southwest China, potentially big impacts on the region. Poor policy coordination within China. You know, the infrastructure, it just happens. So there's definitely opportunities to engage.

Like Liz, I agree that there's a big potential for U.S. government foundations to support U.S. NGOs to build the capacity of Chinese NGOs, researchers, and journalists, and those banks. They're the ones if you're thinking of the overseas stuff. But, again, don't overlook the fact of improvements in water efficiency within China could have a lot of benefits overseas as well.

Wow. I can even talk more. This is exciting. On the NGO front, I think that--I've talked about NGOs a lot in front of this Commission. I've been seeing, too, like Liz, there's changes in the capacity. We've been seeing some Chinese NGOs working on greening supply chain, on climate issues. Greenpeace China did a very hard-hitting report on the impact of coal ash--mountains of it--on water and soil, human health issues, and the Premier of China, he saw this

report, and he called Greenpeace in and then turned around and talked to the Ministry of Environmental Protection and said, hey, we need to regulate coal ash more.

So when you think of it, if China really starts incorporating the true cost of coal, the impact on the water and the environment and the people, that will also push for a lot of change. You know, there's a lot of internal reforms that could still happen, a lot of room for us to work with China on controlling the coal.

And I'll just stop there. I can talk to you more later about coal liquefaction trends and positive Chinese government, looking, you know, 12th Five Year Plan, very aggressive on water as well. So I'll stop, and then they can ask us questions.

HEARING CO-CHAIR D'AMATO: Thank you very much, Dr. Turner.
Commissioner Wortzel.

Panel II – Questions and Answers

COMMISSIONER WORTZEL: Thank you all. I appreciate your being here.

I have two questions. I'll just throw them out there and, Liz, one actually comes out of your testimony, but any of you that may want to comment, I'd appreciate it.

We have a paper submitted by Brahma Chellaney of India, and he asserts that the PLA, in particular, is enthusiastic about the water diversion project from the Brahmaputra.

And he cites Zhao Nanqi, who used to be head of the General Logistics Department, and was making some broad statements even after he retired supporting this project. So what's the PLA's interest here? I mean it's out of business. It, at one time, would have owned the construction companies that built the projects, but it supposedly doesn't do that anymore. So that's one question.

And the second is on the--is it Irtysh?

DR. ECONOMY: Irtysh.

COMMISSIONER WORTZEL: Irtysh. It seems to me with China's interests in all those Kazakh energy resources, that's an area where Kazakhstan might actually have a little bit of pressure on how to handle that, and I'd be interested in your thoughts on that.

DR. ECONOMY: Okay. I'll make two points, and then Jennifer and Grace can also chime in.

With regard to the Irtysh, I don't have any hard evidence that that was the driving force behind some of what seemed to be some wins by Kazakhstan in terms of getting China to sit down at the table. But it seems reasonable to me that that combination of bad publicity, putting the issue within the SCO because Russia is also worried about China's water policies, and then China's seeking access to the Kazakh oil from the pipeline, might have given Kazakhstan some leverage to get the water quality agreement signed. It sounds like there is some kind of water allocation discussion going on that might lead to an agreement over the next three years.

I could be wrong, but by piecing it together, it seems that it may be playing a significant role and that Kazakhstan has some leverage that other countries don't necessarily have.

As far as the PLA's interest, it's interesting. I don't know what it is. He's right. There was a point at which 112 retired and senior PLA officials signed on to some statement about controlling the waters of Tibet, river diversion, and the Brahmaputra. It seemed to stem from a strongly nationalistic root within them, a sort of "we need this water, this water is ours, and we don't need to consult with anybody else."

But I don't know whether there's a business connection -- even though they're ostensibly out of all their businesses, they might not be. That would be worth exploring.

COMMISSIONER WORTZEL: It lends itself to economic warfare if you want, but Bangladesh is a big client state.

MS. MANG: I don't have anything to add.

DR. TURNER: No, I don't either.

COMMISSIONER WORTZEL: Thank you.

HEARING CO-CHAIR D'AMATO: I'd like to just follow up.

Commissioner Wortzel mentioned the testimony by Dr. Chellaney, and we've had a discussion about this. I want to explore the conventional wisdom, as he articulates it, and see what room there is for American policy to move the ball in this area beyond where it is.

Chellaney says this in his testimony: that China rejects the very notion of water-sharing arrangements or treaties with any riparian neighbor. Getting China to accept water-sharing arrangements or other cooperative institutional mechanisms has proven unsuccessful so far, he says, in any basin.

Instead, its construction of upstream dams on several major international rivers, including the Mekong, Salween, Brahmaputra and others, shows that China is increasingly headed in the opposite direction toward unilateralist actions impervious to the concerns of downstream nations.

Having said that, then, several of our witnesses here, and in testimony that we've received, have recommended the United States engage in renewed efforts to engage the Chinese in, quote, "partnerships" in specific regions such as in the Mekong River area, where we have participated, but the Chinese have been reluctant, but where we have been involved, that the United States should engage in partnerships.

And the question I have is, is this a foundation for a renewed American policy to bring the Chinese to a more reasonable approach to its neighbors in terms of river diversion and dam construction?

What I'm getting from, I think, from you is that if there's leverage of other kinds, it's useful, that if you bring leverage to the table, there's room for some kind of movement forward in this area. Is that clear?

DR. ECONOMY: Yes, I think both pressure and also inducement in capacity building are important. One of the things I found interesting when I was preparing my written testimony was the extent to which people comment on the Ministry of Water Resources Web site, just general public. Some of the commentary dealt with things like, "I just watched this movie about the U.S. National Park Service; we shouldn't be doing what we're planning to do in the Nu Jiang, we don't want to be damming this. We need to preserve what is special about China."

Or they'd read about Jared Diamond's ideas about what causes a society to collapse, and they saw all the different parts of it relating to China.

So I think that there's an element where information coming to the Chinese people -- the kind of work that both Grace and Jennifer do in terms of capacity building both with NGOs and the Chinese government are both important but the truth is that in order to move the Chinese government, to get them to turn, there has to be some degree of pressure and leverage. The evidence bears out that on a number of occasions, even the smallest amount of movement, such as getting them to agree to share information on river flows and water quality, comes about because of pressure.

MS. MANG: I think there's two ways to look at China's involvement on trans-boundary rivers, and the first is Chinese dam building upstream on the Nu Jiang or the Lancang River, and to that I want to point out that, by and large, international water law, which hasn't developed very much because there isn't

any treaty signed by a large number of nations to recognize the general principles, but if there were, and there is some argument that reasonable and equitable utilization is the governing principle, and looking at China's actions, it's not diverting water at this stage, and to some extent it could be argued that its practices, its current practices are consistent with this concept of reasonable and equitable utilization.

The second point is that a lot of the pressure that's been building up, particularly around the Mekong drought around 2009, has translated into some policy change in China. Late last year, the Ministry for Environmental Protection (MEP) released further guidelines on Environmental Impact Assessments around hydropower planning in China.

The 12th Five Year Plan entails a huge hydropower dam-building spree, if you would. About 85 gigawatts are planned over five years, which is equivalent to one Three Gorges for the next five years. Some of that will impact the trans-boundary rivers, but in those guidelines that were issued, the MEP isolated trans-boundary environmental impacts as one area that deserves significant investigation, and so I think we're starting to see some of that pressure translate into actual practice change in China.

Of course, implementation - we'll see how this goes.

And the third point that I wanted to make about Chinese dam building on trans-boundary rivers pertains to China's role in building dams farther downstream. Besides the Xayaburi Dam on the Lower Mekong river, China is behind five proposals to build significantly large mainstream Mekong dams, and so while its practices may not be limiting flow upstream or withholding flow, its practices downstream will be holding back flow and impacting the food security of the countries of the Lower Mekong region.

DR. TURNER: Just real quick, I think just in talking about the droughts, I mean even though there are two different trends--they're still saying they're going to build dams like gangbusters, but the droughts, a lot of dams in southern, southwest China were 30 to 50 percent down. A lot of brownouts in Guangdong from the hydro plant that couldn't get to it.

I think that in China there's going to be more openness for them, realizing that they need to cope with climate change, the adaptation issue, and I know that USAID and other organizations, these climate change centers of excellence, trying to pull the Chinese in more with the thought of adaptation and I think it's a different angle to get at the same issue, that if China is going to be coping with problems of lack of water in their dam-building, it kind of goes to show that they might think of it more for their own investments further downstream.

HEARING CO-CHAIR D'AMATO: Thank you.

Just one quick last comment is that the Burmese canceled a big Chinese dam project in Burma. That was a surprise to the Chinese, as I understand it, a pretty bad surprise. Do you think that has had any impact on Chinese thinking as to cooperation with the downstream countries, and that this kind of thing might happen over and over again unless they change somewhat their approach?

MS. MANG: I can start by answering that. Your question pertains to the Myitsone Dam which was on the confluence or planned to be on the

confluence of the Irrawaddy River. That dam would have been massive by any stretch of the imagination and would have created a reservoir the size of Singapore.

The history behind that dam, there has been significant opposition to that dam since it was first proposed in 2006. The Chinese were definitely surprised. I think one of the reasons why they were surprised was that the original agreement signed between the military junta and China Power Investment, which is a state-owned company, they thought would hold, and they didn't realize that the change in government, and with somewhat parliamentary elections occurring, that there was political change in Burma.

The other reason is that they didn't pick up on the changing, significant opposition. This became a national movement in Burma. Not only NGOs were involved, but artists, politicians, the president's office was behind looking at the evidence for why this dam shouldn't go ahead, and the Chinese executives said that they were genuinely surprised.

Part of that relates to the violence around the dam site. A year before the President of Burma's decision to suspend the dam there had been bomb attacks, probably by some Kachin rebels or at least the opposition, which made the company close down the dam site. In my testimony, I refer to China Power Investment being applauded by the fact that they created an "island of China floating above Burma" as the dam site, and so they cut themselves off, failed to engage with opposition, and those were some of the reasons why they were so surprised because they did not see it coming.

DR. TURNER: Oil and water. An example, also, in terms of like oil investments, World Resources Institute, they have a project where they've actually gotten Chinese oil company to talk with them about they want to do oil investments in Uganda, and--I think it's CNOOC--they don't want to make the mistakes that have happened in other countries, and they actually want WRI. They have been participating in dialogues with Ugandan NGOs and wanting to learn how not to make the mistakes. My jaw kind of dropped when I heard this anecdote.

But this is really interesting to me that a number of international NGOs in my network are starting to get more access with Chinese government and researchers, and Chinese NGOs and researchers are starting to come to me and saying like, hey, you know, this Chinese overseas investment thing, you know, how can we, you know, we need to learn. You know, we want your China Environmental Forums over here. I'm like, okay, we'll work on it, but, you know.

But not just me, but just getting this kind of information, there is kind of a hunger for it so I think that's also an interesting sign.

HEARING CO-CHAIR D'AMATO: Thank you.

Chairman Shea.

CHAIRMAN SHEA: Thank you all for being here.

Ms. Mang, is it fair to say--I see that you're a graduate of the University of Sydney. Is it fair to say that you are a native of Australia?

MS. MANG: Yes, I am.

CHAIRMAN SHEA: And would it be appropriate for me to say "Happy Australia Day"?

MS. MANG: It would be.

CHAIRMAN SHEA: Happy Australia Day, which is today.

I'm glad, Dr. Turner, that you mentioned the South-North Water Diversion Project and the western leg, and I would appreciate if all of you could contribute to our knowledge about this. As I understand, what you're saying, Dr. Turner, it's not about--this whole project is not really about bringing water to the northeast, but more about bringing water to the northwest to feed the coal industry.

Now, I don't know if the other, Dr. Economy or Ms. Mang, you agree with that assessment. But if you could just give us a primer on this project, and what specifically, what rivers that have downstream, that flow downstream to countries like India and Bangladesh, what rivers are affected and what countries are affected as a result of this, or potentially affected as a result of the project?

DR. TURNER: I'll start, and Liz will help me where I have information gaps. I mean the Western Canal, I mean there's planning going on. I don't know if there's really been an Environmental Impact Assessment. Maybe pro forma. Because they did one for the Central Canal after it was almost completed. . So there's no real Environmental Impact Assessment for these canals.

It's 20 years off. It's going to take a long time to build this, but I think what fascinates me about it is just that it's the audacity to say that we're going to build this huge canal to move this water north. But they're anticipating their energy needs. They have coal; they're looking at energy security.

They started doing coal liquefaction, but they stopped that realizing that, whoa, it's using a lot of water. As luscious as it is for having energy security, they can't do that.

So moving water north, again, the canals, the Eastern and the Central Canals, will be doing much more to serve the cities.

CHAIRMAN SHEA: But some work has been done on those.

DR. TURNER: The Eastern Canal is more or less done. It has been built on the old Grand Canal. I can send you a research brief on this.

CHAIRMAN SHEA: Okay.

DR. TURNER: And then the Central Canal is also going to be going to cities. But Beijing has--even this isn't enough, though, because in the Eastern Canal, they've had to install 400 wastewater treatment plants to clean the water before they can use it. Let's even flip the water energy around and think about what is the energy footprint of the South-North Water Transfer Project. I keep trying to get people to find this out.

But Beijing has said that the water from South-North is too expensive. We're actually going to shift more to desalinate water for the city, and wow, desalination is cheaper than actually the South-North water. Again, it's massive infrastructure. It has a movement of its own.

But I think that there are a lot of debates, and Liz mentioned them, that even like Sichuan Province, a lot of concern from researchers, the NGO, and even government, that we're having droughts down here. We have earthquakes. We're building lots of dams, and you're wanting to transfer water out. So in some ways the Western Canal-- I go back and forth. I got the engineer saying it's going to happen, but it's not a done deal. A lot of things can happen in that time.

Liz.

DR. ECONOMY: It's come back to life actually. A few years ago it

looked like it wasn't going to happen. In fact, the Ministry of Water Resources was saying it's technically just too difficult, and we're not going to pursue it, and then all of a sudden, just in the past year or so, there's been this resurgence of discussion.

It has a couple of different elements to it. It will take water from the Salween, the Brahmaputra, and the Mekong, and feed it into the Yellow River. I think what Mr. Chellaney says about the diversion of the Brahmaputra is quite concerning.

There's another Indian scientist. He said, given how technically difficult it really is, that China would be using all the energy it could produce from the water just to move it.

Jennifer is right. There has been enormous amount of debate and discussion. People have trekked along the rivers and found that at various points, for example, on the Yangtze, it runs dry. They don't even have the water that they say they have to transfer north. But it seems to be quite an uphill battle for the scientists at this particular point in time.

I can't quite figure out what's going on in the Chinese government, in that there seems to be so much scientific opposition to the project, and yet it seems to have a life of its own at this point.

Will it take 20 years? I don't know. The Chinese are constantly surprising us; once they put their minds to something, they can actually quickly get underway and move forward. And so they've given assurances to the Indians that they are not going to divert the Brahmaputra. They've said this.

I wasn't quite sure in Mr. Chellaney's testimony. He said diversification versus diversion. I didn't find that distinction in anything I read. It's important. We should probably check that out further. The Chinese have said they're not going to do that but the Indians have remote sensing. They'll be able to tell. That's where I see it right now, but it is an enormous project. It does seem to be back to being a focus point for the Chinese government right now though.

CHAIRMAN SHEA: Thank you.

HEARING CO-CHAIR D'AMATO: Commissioner Bartholomew.

COMMISSIONER BARTHOLOMEW: Yes, thanks, and as always, it's wonderful to have Dr. Economy and Dr. Turner here, and welcome, Ms. Mang. It's great to have you here also.

I was really struck, Ms. Mang, as you were talking about the development of standards', environmental standards', impact on people for Sinohydro working overseas. I couldn't help but think about the Three Gorges Dam, and how it would probably have violated every single one of these standards that you're talking about.

Are you seeing any evidence that--first, of course, implementation is key, and we know that that's a huge issue on all sorts of things with China--but any evidence or possibility that some of these standards that they might be talking about doing overseas will actually play back into what the Chinese people can expect from their own government?

MS. MANG: I mean it's a bit of a question of if, and you would assume that there would be some kind of cross-semination going on. Sinohydro is also a massive dam builder in China and is behind some of their dams on the

Brahmaputra, for example.

I would hope that with further strengthening of their ability to implement the environmental policy that leads to some in-house capacity to develop more sophisticated Environmental Impact Assessments. For example, they currently rely on outside consultants to do this work, and it's not built into their organization, and as of last year, they didn't have very many environmental scientists on board as part of their oversight from their International Department looking at these issues.

With that said, we would hope to see cumulative impacts better looked at. A lot of the projects that Sinohydro is starting to be involved with overseas is the whole of river basin projects where they're asked by the government what is the hydropower potential of this river, and can you bring along funding to develop it? In Lao, that has happened, and on the Patuca River, that's happened in Latin America, and you would think that they start to build the ability to better plan these projects and work out which are the most destructive projects and which ones shouldn't be built. So we think that there will be better environmental and social capacities built into these big state-owned corporations because they've traditionally relied on government institutes or the government to do resettlement, and they haven't had to do this overseas, and that's been part of their problem when they've come up against social opposition.

They've never had to deal with those issues before, let alone African groups opposing their projects or resettlement issues with African villages and what not in Sudan where they've been ill prepared, and so on--

COMMISSIONER BARTHOLOMEW: Can I follow up because, Dr. Economy, you've talked about capacity building, both U.S. NGOs--to help capacity building--with NGOs in China? Do people inside China have access to information about what Sinohydro is doing in other countries? I mean is there a nascent NGO community that's interested in the conditions in which Chinese companies or Chinese state-owned companies are investing overseas?

DR. ECONOMY: You work with the Global Environmental Institute; right?

MS. MANG: Yes.

DR. ECONOMY: That is one that works directly on this issue of dam building. The issue of dams has, for close to ten years, been significant in China. They've had anti-dam campaigns within China and it was one of the big growth movements within the environmental movement itself. There is a lot of interest on that topic.

In general, NGOs have not focused as much on Chinese companies' activities overseas. In fact, a number of Chinese NGOs focus on multinational companies' activities within China even more than they do Chinese companies within China. But, as Jennifer suggested, maybe that's beginning to change.

MS. MANG: I just wanted to add that over the past year we've had significant interest from Chinese journalists, even state media, covering the issue of Chinese overseas investment. Sinohydro recently went public on the Shanghai Stock Exchange with 30 percent of its shares. And throughout that process, we had significant interest from journalists looking at the overseas risks facing Sinohydro, particularly not only environmental reasons, but they lost a number of projects in Libya when there was significant unrest there, for example.

DR. TURNER: Yes. I have been asked. I'm a matchmaker in my job, you know, bringing NGOs and government and research people together, and I've, as I said earlier, I'm getting more Chinese NGOs coming to me and asking about, you know, well, what can be done; how can we build a platform? Because there are some folks, like former Greenpeace folks, they go out and form their own NGOs. Yeah. A little bit of fire there.

And so I think that--but fire, but also an understanding of how far to push, and I think, so there is really a big need, and what I've been struck with, like even in the BINGOs the Big International NGOs working in China, that they focus a lot more of their efforts engaging the government and the businesses and what's happening outside, and my thought is can you guys look at the Chinese NGOs because that's not really happening yet, but I think that it will.

And so, again, as my matchmaking and information clearinghouse stuff, just trying to get that, and also not everyone knows what everyone else is doing. I mean there is some more funding from the foundation world to work on this topic, China's overseas investment issues. So it could come.

COMMISSIONER BARTHOLOMEW: One would certainly hope that if China is going to be setting the standard for environmental protections as it's doing dam building and big water projects overseas that it somehow adopts those standards and protections inside China.

DR. ECONOMY: Can I just say I think we're a little ways off from that?

[Laughter.]

COMMISSIONER BARTHOLOMEW: It's aspirational.

HEARING CO-CHAIR D'AMATO: Commissioner Blumenthal.

COMMISSIONER BLUMENTHAL: Thank you all very much for coming here and testifying. All great testimony.

I had two questions, I guess primarily for--on the first one for Dr. Economy, but I'd like everyone else to take a stab as well. So the first question has to do with the relationship between unrest and protest in China and water pollution, water shortages, and so on. I don't know if there's any way to correlate the two.

Obviously, we know that land grabs are one of the biggest reasons that people are protesting now, but how much discontent would you attribute to some of the problems you raised in your testimony with just the quality of water pollution, and so on and so forth?

The second question is you know we're broke, not just the Commission and not just the Blumenthal family--

[Laughter.]

COMMISSIONER BLUMENTHAL: --but the U.S. government. And so what I'm really looking for here is the really hardheaded prioritization and national interest in some of the policy initiatives that some of you recommend.

If you had the President or Secretary of State's ear, where would you put the resources and why? And what would you say are less, lesser priorities?

DR. ECONOMY: Okay. I'll start. Thank you.

With regard to the relationship between social unrest and water pollution or water scarcity, if you look back even to 1994 or so, the environment has always been one of the four largest sources of social unrest in the country.

It's always been a dominant factor.

In 2006, the then Environmental Protection head said there had been 50,000 environmental protests of one form or another in 2005. That's the only number I've ever seen that sort of laid out just how significant the environment is as a source of challenges to stability in the country.

I don't know how that breaks down in terms of water versus noise versus air, but I would think water would be a pretty significant source and probably the most significant when it would come to violence-inducing social unrest. If you look at the cases where there have been the largest demonstrations -- 30,000 people storming 12 chemical plants, for example -- it's because the water was polluting their land, their fish are dying, these kinds of things. They feel they're getting sick.

The relationship between public health and water has become a very significant one in China and they're starting to do a lot more in terms of epidemiological studies to try to track it. There was all the hype about the cancer villages along China's rivers. It got a lot of attention here and also in China but in terms of doing serious studies, it's only been really within the past several years that they've started to try to understand that relationship. There has been some specious work linking things, but I think they're really trying to get at this. It's quite significant. Social unrest and water are tied together.

In terms of sort of how I would set out priorities, obviously priorities that require less money are good in this environment, as you suggest, although I still think that supporting NGOs is really important.

But I'm also a big fan of approaching the Indians and talking to India and Bangladesh and seeing whether there's interest in having the United States work with them. There may not be, but that's one thing to do and it doesn't cost a lot of money.

The other thing is the Internet, and I really am quite a firm believer in this because, again, if you look at the Embassy and the tweeting of the air pollution statistics, you can see the Internet as a virtual political system for China. We look at it as a source of transparency, the rule of law and official accountability. It plays all those roles in a way that the official system does not. How the United States can play into that system through education and through pressure building is a very cheap way to get some added transformational push within the system.

COMMISSIONER BLUMENTHAL: And where would you say this absolutely needs to get done? What would the "this" be? Would it be--from a U.S. national interest perspective, would it be this problem of potential rise in commodity price? What is the bottom line?

DR. ECONOMY: Out of the whole scheme of things?

COMMISSIONER BLUMENTHAL: Yes.

DR. ECONOMY: Let me think about it and get back to you.

COMMISSIONER BLUMENTHAL: Okay.

DR. ECONOMY: That's an important question.

COMMISSIONER BLUMENTHAL: Thanks.

DR. TURNER: She did all the fun numbers, but there's, you guys, how about a movie? You guys ever watch "The Warriors of Qiugang"? I'm screening it in March, but you could go rent it. It was nominated for an Academy Award. It

was about a village in Anhui Province that was--they were literally sick from the chemical pollution from a chemical park in their area. I think it was only one plant. I don't know.

And so, and with the help of a Chinese NGO, Green Anhui, which for many years has received capacity-building support from Pacific Environment. You know they're not getting tons of money, and I'm not saying that you do this. But just to give you an example of how a community was empowered. It was very sensitive, but at the same time the community did fight back.

Yeah, just kind of a little anecdote, but I think that it's--where to go--also, CLAPV, the Center for Legal Assistance for Pollution Victims, they do have some numbers. In their class action cases, some of the largest and most successful ones were around water pollution issues. So I think water really is a big driver of protests and moving people.

There's also been some, like I said, openness to letting sometimes international and Chinese NGOs just do investigations of water pollution issues that show that there's recognition that there is a big problem.

Yeah. Where to put your resources? That's always a tough one. I guess obviously I'm, you're thinking I'm here on a water panel, and I keep talking about coal, but in some ways as an internal driver of--and it's going to be a bigger driver of water degradation and water use in China. Kind of the work that already the U.S. Department of Energy and other agencies are doing on cleaner coal issues, it could really have--and if more water was incorporated with that.

There are potentially business opportunities, the energy sector becoming more water efficient, and also governance issues of coal permitting, of pricing. There's a lot of work that still could be done and potentially having some good impact back in the United States, a lot of good experiences, potential technologies.

MS. MANG: I've got just two things to add. On the first question, I think, on protests, you can't ignore Weibo, which is Chinese Twitter, and we've been engaged. International Rivers recently got its Weibo account, and you would not believe the amount of protesting going on on Weibo or the amount of dissemination of information of pollution issues and organizing that goes on, and that's one way of monitoring the correlation between various outrage between active netizens in China and environmental issues.

The second issue is that I just want to reflect on some of the tactics of Chinese NGOs to try and raise compliance with environmental laws in China pertaining to water pollution, and that is they have actively picked on multinational corporations or U.S. companies, such as Apple, to try to lift their standards on their supply chain and not pollute the environment as a means of demonstrating to Chinese companies we're not picking on you, but you really need to do better, and so perhaps a non-expensive option might be that U.S. companies comply with Chinese laws when operating in China as a means for Chinese companies doing better.

And I say that because Chinese NGOs had significant difficulty engaging Apple, monumental challenges in even getting them to recognize there was an issue, but that has since changed, and Apple has really come to the table to dialogue with these NGOs.

DR. TURNER: If I can just add that USAID, some of the work that

they've supported in China, that there has been some capacity building for like businesses in Guangdong and Jiangsu on greening supply chain issues. Other international NGOs are also working on greening supply chain issues, and, again, they're not just doing it just with the international but with the Chinese companies, and there seems to be a receptiveness because the whole push for low carbon cities, low carbon industries, meeting energy intensity, and then increasingly water quality issues. So that's another area, again, not as sensitive, but greener business.

HEARING CO-CHAIR D'AMATO: Thank you.

Commissioner Slane.

HEARING CO-CHAIR SLANE: Thank you all for coming and testifying.

When I read your testimony and when I listen to you, it all sounds very grim and getting worse. My question is will technology/can technology solve the problem? And let me give you an example. In the United States, we hit enormous amounts of natural gas in the Marcellus shale. Two-and-a-half years ago, gas was at \$14 an MCF. Today it's at \$2.50. All of our, many of our power plants are converting over to natural gas.

Last month, CNOOC hit their first large gas well in China, and the Marcellus shale formation in China is projected to be three times the size of the U.S., and for the first time, they were able to use hydraulic fracturing to get this enormous amount of gas.

If I look into the future, and if they start to really blow that out and start connecting their coal-powered plants with natural gas--I mean what's taking so much of their water is energy and trying to, not only using it for their coal, but also trying to generate energy from their dams--I mean do you see technology solving this problem?

DR. TURNER: We did a research brief called "Shale We Dance?" about a year ago thinking about this issue, too, and it's a great question. Is shale gas the game changer? I was just in China in December, and I asked everybody I met, even strangers on the streets, well, no, actually not, but really government, business, NGO folks, and some of the Chinese didn't even know what it was. I had to educate them on what shale gas was, but some people who are in the know, like Energy Foundation and other energy researchers in China, they do see it as a game changer.

But, again, as in China, technology will not solve everything. Again, look at our stories today about the clash of infrastructure. You have water transfers going like crazy. You know, again, it's the governance issues with it. I mean shale gas is only going to work if it's really well regulated.

U.S. Clean Air Task Force just brought over a group of Chinese business and government folks to look at some of the mistakes that we've made in this country in shale gas, and I think the Chinese, they probably take it to heart that they're not going to mess up--hopefully. Because then it's not a game changer if they mess it up with water.

But at the same time, shale gas and damming and water transfers, that little nexus there in Sichuan. So something is going to give at some point if it's not done well, but definitely, I mean the governance issues, and even the water quality issue, you know, working--they've done a lot on energy intensity and energy efficiency, but trying to deal with their water challenges, I mean the

water availability, it's huge, and it's messy. That's the problem, too.

DR. ECONOMY: I'm not going to contradict you because you ended on the right note, which is to say that technology will only get you part way there. What it boils down to time and time again in China, however, is the policy environment -- do you have appropriate pricing in place? If you talk to people in Hebei, for example, they say that if Beijing would just price its water appropriately and undertake more water conservation initiatives, they wouldn't be transferring all the water out of Hebei to Beijing.

The technology exists. Chinese have access to all sorts of technologies. In many respects, it's not a failure of technology at this point when it comes to the water issue. It's a failure of policy environment -- the implementation of the appropriate incentives, disincentives, penalties, and enforcement that make it worth the while of business and local governments and households to do the right thing. That still happens only very rarely in the country. So technology is a big plus, but they need the policy environment.

DR. TURNER: Can I add one more? I got to say coal one more time. Wastewater treatment plants in China--they have increased the rates. It evidently went up to like 75 percent, but there are still plenty of stories where local governments given the choice between running their factories and running the wastewater treatment plant, which wins; right?

And so they're turning off wastewater treatment plants still, and in my mind, just think like Denver has got a really big solar wastewater treatment plant. Why don't they use solar waste? You know what I mean? That somehow--and that comes down to a governance issue as well. It's not technology. I mean you've had the World Bank, the Japanese, and I don't know who else building their wastewater treatment plants for years. They have the technology, but if you're not going to flick the switch.

HEARING CO-CHAIR D'AMATO: Thank you very much.

Commissioner Cleveland.

COMMISSIONER CLEVELAND: Can I just follow up on that sort of area of issues? It's true, we are broke, but they are not. And so--and Dr. Economy, you said they never cease to amaze us in terms of time tables--if they were to commit to an agenda of improved water quality, first of all, where would that decision be made? I mean who's in charge of this whole issue internally? And what could they do to reduce the heavy metal pollution from industry into the water supply?

Dr. Turner, this thing that you gave me just before we started, you talk about decreasing the number of coal enterprises in the 12th Five Year Plan and reducing sulfur dioxide and investing in environmental protection.

Can you sort of flesh out what the details of those pollution control efforts might be, and as I said, what would it look like if you're the new premier and who would you task with this, and what would you tell them to do? Because I think there is a tipping point in terms of public interest that Dan talked about on this issue, and it does present huge social instability risks. So what would you do to get ahead of the curve?

DR. TURNER: In some ways I kind of, I'm going to solve the water problem, and I have three minutes here. Okay. Well, let's talk just about water quality. In the 12th Five Year Plan, I was really excited. I get excited about

weird things, but the fact that the 12th Five Year Plan started talking about water in a better way. Instead of just saying three rivers, three lakes will be cleaned, you know, like, yeah, right. I mean there are no targets. Lake Tai is still turning green with toxic algae after I don't know how much money. Not just the Chinese. I mean the Chinese are investing like crazy in Lake Tai. It's still green with toxic algae.

Because they invested in technology, , that they flush it out with Yangtze River water that probably has as much nitrogen, if not more. There's a lot of money in there. And then the World Bank and AusAID go in for dredging and what not. A lot of it does come back to governance issues.

Where to go? Where to go? There's so many issues. What do you think, Liz? Where should I take--I mean the Ministry of Environmental Protection. Ministry of Environmental Protection still doesn't have as much power as it really should have. I mean particularly at the local level.

I mean environmental protection bureaus, like I said, you have environmental protection bureaus, and you still have local governments turning off their wastewater treatment plants.

But, again, there are more protests. On Greenpeace--we're evoking their name so many times today--but they've done a lot of investigation and exposes on toxic, in the Pearl River Basin on toxic releases from industry, but then they actually, before they released it publicly, they went to the industries themselves, Chinese industries, and they were like "whoa, whoa." And so that's encouraging too. I mean a lot has to be done, but really it boils down to a lot of governance issues.

DR. ECONOMY: I would say that the problem starts at the top because so many different bureaucracies are involved. It's not just the Ministry of Environmental Protection. It might be, for example, the Ministry of Agriculture dealing with pesticides, fertilizer, runoff and so forth that will cause them to be involved. And the Ministry of Water Resources. Local governments are the critical actor in all of this.

There are so many different bureaucracies. You have to go through the Ministry of Finance if you're going to set fees. For water pricing, however, a lot of it is localized. There even was a case, in which a local People's Congress in Foshan in southern China vetoed something that the mayor wanted to do in terms of raising the price of water. So, you know, good for democracy. Not really.

One of the mistakes that Beijing made was several years back when they dismantled the State Environmental Protection Commission, which stood above all these ministries and ostensibly had the power to bring them together to coordinate policy. There isn't really a very good coordinating function, frankly speaking.

You also have a lot of industries, some of which have ministerial status, which just run amok. Bringing it all together is going to be very difficult. I'm not as optimistic as Jennifer about the 12th Five Year Plan because time and time again, you see the levels of investment are supposed to be "x," such as one-and-a-half percent of GDP devoted to environmental protection. It doesn't even reach that, and in any case, half of it goes siphoned away to corruption.

We're talking about governance. In many ways we're talking about these competing interests and bureaucratic interests, but we are also talking

about the transparency that's necessary, the official accountability and the rule of law, and as far as I'm concerned, until China gets those things working, they're not going to have effective environmental protection.

COMMISSIONER CLEVELAND: Are there NGOs or local organizations that are promoting water quality standards or active on this issue?

MS. MANG: Chinese NGOs recently formed a river watch network, which is primarily all garnered together by water pollution issues and water quality issues. They do things such as do citizen testing and tweet that or "Weibo" it, and to try and hold their local environmental protection offices to accountable for that and confront them with this. So I think NGOs play that function of an additional watchdog.

I just wanted to reflect on something from my Australian government days, and when we held--what are they called--a commission between or a show-and-tell essentially between the Australian government on water policy and the Chinese on water policy. They were very interested and have made significant inroads on trading of pollution permits in terms of water pollution, I think on the Yangtze Delta, on important pollutants in that river.

But the thing is that governance is the most important, and I think there's a will within the agencies and genuine enthusiasm to adopt the best policy tools to do the job, but when it comes to implementation and enforcement, that hasn't come through, and that's one role that NGOs are playing, but there is not enough of them doing that work, and it's sensitive.

If they anger a local official or a local enterprise, they get additional checks of their books, and then they're, you know, put off by confronting their local environmental protection office, and so it's a difficult line there for NGOs to play.

COMMISSIONER CLEVELAND: Thank you.

DR. TURNER: We should give a wave to the Institute for Public and Environmental Affairs. I think you guys have heard about Ma Jun before, that I mean a number of years ago created an online water pollution database, which doesn't sound very exciting here in the states, but it was revolutionary in China. Now, he's gone on and done a clean air, I mean air pollution database and just published a blueprint for clean air in China as well.

But besides having this information online where people can click and see--and it's all government data which they got--international companies go to it as well to look at their suppliers. But Ma Jun also created this Green Alliance, Green Choice Alliance, which is a network of about 30 Chinese NGOs around the country that are there to help him.

When companies, Chinese companies, will often come to him and say, hey, we've cleaned up; we no longer should be on here as being bad. And he says, okay, we will have you audited. And so they have this network of auditors, but the auditors accompanying them are either community members or other Chinese NGOs, and this network of 30 Chinese NGOs reviews the audit and then will decide whether or not, okay, we can clear them off on the Web site.

And the fact that, you know, I mean it's not a huge NGO by any shape or form now in China, but the fact that, you know, he's starting to wield some real power. But the problem is it's just one NGO. We need one in every province doing that kind of work.

COMMISSIONER CLEVELAND: Interesting. Thank you.

HEARING CO-CHAIR D'AMATO: Thank you.

Commissioner Shea.

CHAIRMAN SHEA: I just have a quick, couple of quick factual questions for Dr. Turner and maybe a question for Dr. Economy.

The quick factual questions. I think, Dr. Turner, you said that 20 percent of China's water is diverted to coal, is used for coal. Could you give us a comparative assessment? What's the percentage in the United States? Or just give us a little bit of context to that figure.

And with respect to natural gas, I mean after all, it's called hydraulic fracturing; isn't the removal of the shale gas through hydraulic fracturing also a very water-intensive activity? I don't know. I'm just asking the question.

And, then, Dr. Economy, as you know, we've received testimony from Dr. Chellaney, who is based in India. He's written a book called Water: Asia's New Battleground. It's quite chilling. And he concludes that unless China and its neighbors establish some sort of multilateral mechanism to resolve these water disputes, he says "peace would be the casualty in Asia, and water would become a treacherous new battleground." And I'm wondering if you agree with that? Is that a bit of an overstatement?

And in connection with that, you know the Chinese and India have a dispute over Arunachal Pradesh, and I understand it's a very water-rich region of India. Does that play into the mix?

Thank you.

DR. TURNER: Okay. Yeah. Go online and look at our reports, too. The 20 percent number, which is, again, some of the Chinese, they disputed it, and I said, okay, well, find me better numbers. But I mean the estimate is that along the whole supply chain--there's actually a guy at Tsinghua University, that very soon, he actually did a report for the BP Energy Center--I want to see it--trying to gather data better than we could because, again, you know, what am I? I'm in D.C., and I send some NGO folks there for a few weeks to look at the data.

But along the whole supply chain they use an awful lot. Even though they only clean about half their coal, only wash about half their coal, it still uses quite a bit of water when they can use it, and controlling these huge, you know, the water that goes into the ash piles. So maybe it isn't the perfect data.

The numbers, I'm not as fluent in the U.S. side. I'm getting there, but I think I've heard numbers like in the U.S., like 42 percent of the water is used for coal and nuclear plants for cooling. Not all of that is consumptive. But in certain parts of the country, like down in Florida, Georgia, and those areas, it can be like 75 percent of the water has to be used for the cooling. Again, it goes back into the water, but that's why when we had that drought, I think it was 2007, 2008, down there, that quite a number of nuclear power plants were under threat of having to be shut down.

So, again, look at the Sandia report on where we stand. We have a lot of really big problems, and a lot of our coal-fired power plants are going to be retired--nuclear power plants are going to have to be retired by 2050, and so in this country, we seem to be shifting more towards the shale, highly water intensive, and if you don't recycle, and it's not always required to be recycled in certain states. Also a huge impact, the tar sand soil, the biofuels, you know, so

we're moving down a high carbon and also high intense water path in our energy development.

In China, it's still, again, it goes back to coal. I mean coal, if they can address the coal issue, I mean use less coal, the benefit for the water sector is going to be amazing.

CHAIRMAN SHEA: Thank you.

DR. ECONOMY: I would say battleground probably should be taken as a political battleground more than an actual site of conflict and war -- although I think Mr. Chellaney probably meant it in the latter context. I tend to have more faith that the Chinese government and the Indian government have enough common interest in stability that they wouldn't let it deteriorate to that point.

In terms of the contested area and water rich, I have some recollection of India getting the Asian Development Bank to in essence give it a substantial sum of money for watershed development there (Arunachal Pradesh), and the Chinese opposed it.

CHAIRMAN SHEA: Right.

DR. ECONOMY: You already know this so you probably could tell me.

CHAIRMAN SHEA: No.

DR. ECONOMY: I thought it was a very strategic move on the part of the Indians because it, in essence, got the ADB to say that this was Indian land. But that's the extent of what I know. The Chinese didn't like it, and the Indians won.

CHAIRMAN SHEA: Thank you.

HEARING CO-CHAIR D'AMATO: Let me just follow up with a question for all three of you, and that is we're concerned about what areas of initiative we can suggest for American policy to move the ball forward in two areas:

One, the suggestion has been made that we ought to attempt to build a partnership with China and some joint study of the Tibetan Plateau in terms of its ecological dynamics right now because there's fast-moving change with regard to the recession of those glaciers, and this is going to affect the volume of water that goes into those rivers. So that will have a long-term effect and maybe a medium-term effect.

The question is whether or not the Chinese would be receptive to an initiative to do something in partnership with them in terms of studying the dynamics of the Tibetan Plateau? That is the first one.

The second one would be what would be the overall reaction by the Chinese of an American initiative to work more in a multilateral framework with both Mekong River countries and with India and Bangladesh in terms of all of those regions as to building some kind of new, multilateral dynamic for water sharing? Dr. Chellaney says we have to go for it.

You all can think about this and get back to us on this because that's a really important question—is how should America approach the new leadership coming to China?. Should we take advantage of the new leadership to try and pose a new dynamic or a new kind of mechanism to approach water management in the whole region? If anybody has any ideas? What do you think the Chinese reaction would be to these kind of proposals without additional leverage being exerted?

DR. ECONOMY: I'll say on the second point, I think their reaction will

be reasonably similar to their general reaction to the U.S. reengagement in the region, which is not so happy. I don't see them welcoming a U.S. multilateral initiative that would encompass not just the Lower Mekong Initiative, which we already have going, but something with Bangladesh and India and anything that would further insert the United States into an issue and in a region in which China basically feels we shouldn't be playing at all in any case. So I think they would not be terribly welcoming.

MS. MANG: On the first proposal of, I guess, looking at the Tibetan Plateau, I think if the U.S. approached this by not looking at the area in isolation, so maybe doing three areas of significance and putting it in a global context, then China would be less kind of concerned about it and see it as part of a global study. And that information and those concerns are warranted for several watersheds around the world where that is the case, that melting glaciers is increasing river flow.

On the multilateral basin issue, one way that we've looked at it internally at International Rivers because we are concerned about the impacts on the Lower Mekong and for downstream countries, is to look at and help China explore situations where it is the downstream country, and it faces the same issues that Bangladesh or India may be thinking about, or the lower Mekong countries, and where China is in the same position that these countries find themselves.

And in those situations, we're finding that China has a different modus operandi or different way of approaching that issue, and so we're focusing on that rather than isolating as controlling of all water and, therefore, it needs to play ball with these countries.

DR. TURNER: They covered pretty much what I wanted to say, but to go back, the issue, you know, the Chinese are becoming very concerned about climate adaptation, and, again, putting it as like similar to, you're saying a broader initiative in the region, that helping them see how do we adapt, you know, because I mean I think I've heard people talking about that, you know, if there is in the Tibetan water tower a huge crisis, who's going to be involved to help in adaptation? It's going to be the militaries that help the people and what not.

So I think that the Chinese, they could be more open to that kind of angle, but it may be, you know, maybe not the way that, like a multilateral thing, U.S.-led. Maybe more starting research phase.

HEARING CO-CHAIR D'AMATO: Well, we have kind of a model with the Mekong River Basin. Perhaps at the moment we should confine our activities to there and see how far we can move that more.

But in terms of the Plateau, there's lots of international interest in what's going on with those glaciers because that's the major source of water for the world outside the Poles, and, obviously, what's happening there is fairly dynamic at the moment and not completely understood.

I want to thank the panel for a lively and I would say exciting, discussion this morning, and thank you very much.

This concludes the water panel, and we'll resume at 11--let's see. Lunch is 11:30 to 12:15, and we're back here at 12:15 for the Panel III on Oil, Gas and Minerals.

Thank you very much.
[Whereupon, at 11:35 a.m., the hearing recessed, to reconvene at
12:20 p.m., this same day.]

Panel III – Oil, Gas, and Minerals

HEARING CO-CHAIR SLANE: Welcome back. In the next panel, our witnesses will share their expertise on China's resource security by examining China's energy imports, its domestic shale gas industry, and its efforts to acquire and manage critical mineral resources.

Our first witness is Dr. Mikkal Herberg, who is the Research Director for the Energy Security Program at the National Bureau of Asian Research. He is also a senior lecturer at the University of California, San Diego, and a Senior Research Fellow at the Pacific Council on International Policy.

Dr. Herberg has spent 20 years in the oil industry, providing worldwide energy, economic and political analysis.

Following Dr. Herberg is Ms. Sarah Forbes. Ms. Forbes is a Senior Associate and Manager of the Shale Gas Initiative at the World Resources Institute. At WRI, she has worked on a number of U.S.-China issues, including a partnership with Tsinghua University on clean coal.

Prior to joining WRI, Ms. Forbes worked at the National Energy Technology Laboratory.

Last on the panel will be Mr. Jeffrey A. Green, President and Founder of J.A. Green & Company. Mr. Green is an expert on strategic minerals and defense-industry supply chain security. He has particular expertise in rare earth elements.

Mr. Green has served in both the legislative branch and the Pentagon, as well as in the Air Force as a missile combat crew commander. He continues to serve as a Lieutenant Colonel in the United States Air Force Reserve.

Again, thank you all for being here. Each witness will have seven minutes to present their testimony. Dr. Herberg, we'll start with you.

**STATEMENT OF DR. MIKKAL HERBERG
RESEARCH DIRECTOR, ENERGY SECURITY PROGRAM
NATIONAL BUREAU OF ASIAN RESEARCH**

DR. HERBERG: Let me thank the members of the Commission for inviting me here to speak today. It's a great opportunity and a great honor and a privilege to be here.

I've been asked to speak about China's approach to securing its energy supplies, its impact on the United States, the oil markets, energy markets, territorial disputes, American companies. It's a wide range of issues. I'll make some wide assertions briefly, and then we can follow up in the Q&A.

Energy security is a visceral concern for the leadership in China. They believe it's an Achilles' heel that potentially could undermine economic growth, job creation, social stability; hence, political stability. So this is a deeply important strategic issue for the leadership.

They import 50 percent of their oil plus today. They're headed for 75 percent import dependence probably very soon. All of that has got to come from all those awful places that we all know so well. A quarter of their oil today comes from the Persian Gulf, and that's going to rise, and those all have to transit sea lanes controlled by the U.S. Navy and other regional navies. This is deeply unsettling for the leadership in Beijing.

And this is what drives the impulse for this "go-out" strategy to go out and secure resources. It's symptomatic, I think, of the politicization of energy and oil across the region. You see it, Japan, Korea, India, elsewhere, as well. But on the big scale in China.

I won't go into a lot of detail. I think the four components are: the acquisition of equity oil supplies by the national oil companies supported by state diplomacy; pipelines from Central Asia and elsewhere in the region for overland supplies sponsored by the government; big oil-backed loans from the government, from the China Development Bank, to secure long-term supplies; and a healthy dose of state diplomacy that wraps around all these efforts.

I think it's important to understand that in the beginning this was shaped by Beijing back late '90s, early 2000, but increasingly it's the NOCs that lead this process--the national oil companies. They are more powerful, more capable, more competitive, and often it's the government and the state banks in tow as the national oil companies really set the pace and the agenda.

I think it's become more industrial policy, more a policy of supporting and developing national champions in the energy sector, globally competitive companies. And we see this in many areas of Chinese policy, industrial policy, today. So it's not unlike that.

In my view, it's not locking up supplies. It's not affecting availability of crude. It's not undermining our energy security. Their acquisitions of oil supplies and gas supplies are simply not enough to make much difference in a 90-million-barrel-a-day global oil market, and I would be happy to elaborate.

Ultimately, they, like we, are dependent on the stability of that global oil market, that big 90-million-barrel-a-day pool. It's not about securing your own proprietary supplies and turning Sudan into your own filling station.

This doesn't work. It's not adequate to their needs.

But it is, I think, affecting at the margin the competitiveness of U.S. American-based oil companies and other international oil companies. As these companies become more competitive, as their deals are wrapped in state diplomacy support, loans, other kinds of things that make these big political deals, mean national oil companies in China get deals that they wouldn't have gotten before, and I think they're going after better assets. They're getting more skillful, and so at the margin this is aggravating some of the competitive opportunity problems, a shrinking opportunity set for the U.S.-based oil companies, and I could elaborate on that.

Energy is not a root cause for the maritime issues in the region, and China's approach to territorial issues or sea lanes issues, but it's certainly a multiplier effect. It's certainly a factor that is very high on the agenda that motivates some of their assertiveness vis-a-vis territorial issues in the South China Sea, and, in particular, the sea lanes, control of the sea lanes, the SLOCs through the South China Sea, the Malacca Straits, the Indian Ocean.

Energy and the sense that they can have some control over those energy sea lanes is an important piece, what drives them on their maritime strategy, but I think those issues would be as difficult as they are even if energy wasn't part of the puzzle, but I think it adds to the sensitivity.

What should the U.S.--how should we respond to China's efforts? As I said, this does not undermine our energy security as far as I can see, and I think rhetoric to that effect from our side simply feeds those and reinforces those in Beijing who believe we want to use energy to constrain Chinese economic growth and to contain China. Many of the leadership believe that we want to use energy to contain China, weaken them.

So I think rhetoric, we have to be very careful because it's not affecting the market. Certainly their demand affects prices because it's very large, but where they access the oil and how they do it does not.

But it is a competitive issue, and so I think it's important that we begin to push China to pull back from this kind of state support for their support for their companies in the energy sector. It's not needed. These companies are competitive today. They're moving up the curve in terms of skill, and it's just basically crude mercantilism industrial policy from my point of view.

Another thing I think we should be doing is putting together a forum for regional energy security discussions. We started one in 2006 or '7. It died of inattention two years later, but China, Japan, Korea, India, and the U.S., we have a common energy security problem of an unstable, unresponsive, dangerous global oil market characterized by very pathological suppliers and unstable regions.

That's a common problem we have, and we should be working together on that rather than competing, the sense that we're competing for supplies.

Finally, China will be a key player in every key energy exporting region of the world over the next ten, 15 years. It's inevitable. They will be dragged into it by these enormous interests and investments and contracts and expats and people in these places. So we better get ready for having China as an important player in all these places where the U.S. is used to being the dominant

player.

The Persian Gulf is number one in my book, but you put Central Asia, Africa, Latin America and Southeast Asia, as well. China is going to be a player in the key exporting regions, and we need to be talking with them or working with them to try to find some common ground. Places like Iran, South China Sea and elsewhere.

So with that, I'll finish. Thank you for your attention.

**PREPARED STATEMENT OF DR. MIKKAL HERBERG
RESEARCH DIRECTOR, ENERGY SECURITY PROGRAM
NATIONAL BUREAU OF ASIAN RESEARCH**

January 26, 2012

Hearing on “China’s Global Quest for Resources and Implications for the United States”

Statement of Mikkal E. Herberg

Research Director, Asian Energy Security Program

The National Bureau of Asian Research

Testimony before the U.S.-China Economic and Security Review Commission

I first would like to thank the members of the Commission for the opportunity to testify to this important group. It is an honor and a privilege.

I have been asked to speak about China’s approach to securing its energy supplies and implications for the United States. I will discuss China’s approach, whether it is impacting global energy markets and the competitive prospects of American energy companies, how Beijing’s energy security drive is influencing maritime territorial and sea lane disputes in the seas around Asia, and some suggestions on U.S. policy towards the developments.

The global energy market impact of China reflects the enormous scale of its rising oil demand and Beijing’s increasingly active strategic diplomacy designed to secure future energy supplies. Energy security has become a critical political and economic concern for Beijing’s leadership. First, at a visceral level, China’s leaders fear that energy shortages and rising energy costs could undermine the country’s economic growth and thus seriously jeopardize job creation which could potentially lead to serious social instability. For a regime that increasingly stakes its political right to rule on economic performance and rising living standards, the threat of economic stagnation could threaten the continued political monopoly of the Chinese Communist Party (CCP). Hence, energy security is a strategic domestic political concern for the leadership. Beijing also has been alarmed by the huge rise in global energy prices over the past decade and the increasing risk of long-term global oil “scarcity.”

The enormous rise in oil demand in China which has roughly doubled in each of the past two decades has meant that China increasingly must rely on imported oil to meet the majority of its needs. China now imports over 50% of its total oil consumption of nearly 10 million barrels per day and consensus forecasts suggest this dependence will rise to 75-80% over the next two decades. Those oil imports will inevitably have to come largely from the Persian Gulf but also from Africa, Russia and Central Asia, and even Latin America. China will also become increasingly dependent on imported natural gas from many of these same regions. This is a leadership for whom self-sufficiency and national control of resources and energy remain important ideological underpinnings. The specter of heavy and growing dependence on imported oil and gas resources from a wide range of unstable regions of the world transported through lengthy sea lanes controlled by the U.S. Navy and other regional powers is deeply unsettling to the leadership in Beijing.

Beijing’s instinctive impulse for national control over key resources and energy in the face of chronically growing dependence on imported oil is what has driven its push for control over overseas oil and natural gas resources embodied in its “Go Out” strategy adopted after 2000. The go out strategy reflects the

growing politicization of energy security in China but is symptomatic of the reaction to growing energy security anxieties across the region in Asia among the big oil importers. My own term for this is “energy nationalism” which can be thought of as an energy version of economic nationalism and mercantilism prevalent in Asia. This is different than what is commonly termed “resource nationalism” which generally refers to host governments of large oil and gas reserve and producing countries maintaining tight political control over access to their resources by international oil companies (IOCs). The energy nationalism of China and Asia is a reflection of the angst of big importers over access to future oil and gas supplies and the increasingly national competitive character and energy rivalries of Asia’s scramble for control over and access to oil and gas resources abroad.

China’s energy drive abroad has been manifested in a number of ways that have been well-documented. First, Beijing has sponsored and supported the overseas acquisition of oil and gas resources by China’s three main national oil companies (NOC) with state bank funding, loans, and expanding state diplomacy in the key oil and gas exporting regions. The NOCs often pay significant premiums to other market bidders to acquire these assets. Second, Beijing has sponsored a range of long-distance overland pipeline projects through its major NOC CNPC to bring oil and gas from Central Asia, Far Eastern Russia, and more recently Myanmar to diversify its oil and gas import slate and limit to the extent possible its dependence on seaborne oil and gas supplies. More recently as the energy security strategy has evolved, Beijing has mobilized its large financial reserves through its state banks, most importantly, the China Development Bank (CDB), to make large, long-term loans to key energy exporting countries to be repaid by a guaranteed, secure stream of future oil exports. Large loans have been extended to Russia, Kazakhstan, Brazil, Venezuela, Ecuador, Angola, and several other countries. These are effectively long-term forward purchases of oil that are locked-in more directly than term contract oil supplies. All these measures have been accompanied by active Beijing energy diplomacy to strengthen diplomatic and economic ties with key producers to improve the competitive position of its NOCs and seek to strengthen access to long-term contract supplies. For example, Wen Jiabao made a major trip just a few weeks ago to visit Saudi Arabia, UAE, and Oman to seek to ensure access to crude supplies in case of an Iran disruption.

For insight into the implications of China’s energy security strategy, it is important to note that while this broad energy security drive was originally shaped by Beijing’s leadership, over time as China’s NOCs have become more capable internationally they have become powerful proponents of this collaborative approach. Often it is now the NOCs who shape and lead their overseas expansion with Beijing and the state banks following along in support. Today it is best seen as a convergence of interests between Beijing’s perceptions that China’s energy security is served by the global acquisition of oil and gas resources by its NOCs combined with the increasingly sophisticated commercial and competitive drive of the three NOCs and their promotion of this notion. In this sense the energy security strategy is evolving toward “industrial policy” aimed at strengthening the domestic and global competitiveness of China’s NOCs into “national champions”, not unlike Beijing’s efforts in many key industrial and technology sectors. The interests of China’s state banks also converge insofar as large oil-backed loans are an excellent investment in an environment where they are short of credit-worthy investments for such a large horde of capital. Other interests also now increasingly reinforce this “China Energy Inc.” template. China’s shipbuilders seek state support by arguing that China’s oil and gas imports will be more secure if transported on Chinese-built and owned tankers. Even the PLA Navy reinforces this template as it increasingly defines one of its key future missions to be guarding the security of China’s energy sea lanes in the South China Sea and Indian Ocean.

Despite the concerns of many that China is “locking up” oil supplies for the future that won’t be

available to others and, therefore, distorting oil markets and undermining the energy security of other countries, China's NOCs and Beijing's support for acquiring overseas "equity barrels" controlled by national companies are very unlikely to have a significant impact on the availability of oil in global oil markets. China's three major NOCs currently produce an estimated 1.5 million equity barrels of oil per day (MMBD) abroad. However, this represents less than one-third of China's daily oil imports. Moreover, China's oil import demand is growing at an average of nearly one-half million barrels per day each year so the reality is that China's oil import needs are rapidly outrunning their NOCs' ability to accumulate investments in equity production abroad. China will increasingly be deeply dependent on the stability of the global oil market; the equity oil strategy is hopelessly inadequate as an energy security strategy. Many analysts in China understand this already. In any event, most oil produced by China's NOCs abroad is not sent back to China but, instead is sold into regional markets at the best netback value just as other IOCs do. And the global market of internationally traded oil is over 50 MMBD which dwarfs China's equity barrels. And to the extent China sources its crude imports from one set of countries, it leaves other barrels from other countries available to other buyers. The more Persian Gulf crude it imports, the less West African crude it imports. The global oil market is quite fungible, transparent, and flexible. Certainly China's large and rapidly growing oil demand does impact global prices since China is the largest single source of world oil demand growth. But the choice of countries from which it imports does not directly impact prices.

However, the growing competitive strength of China's NOCs and continuing state support for their expansion has begun to impact the competitive landscape of the international oil industry. In just the past 2 years China's NOCs accounted for nearly one third of global oil and gas mergers and acquisition activity (M&A) making a number of large acquisitions of significant, high quality fields and projects. China's NOCs are more often bidding against the large international oil companies (IOCs) for high quality assets in West Africa, Latin America, Central and Southeast Asia. The NOCs are moving up the technology and project management learning curve that the IOCs have dominated in the past with growing investments in heavy oil development, large liquefied natural gas (LNG) projects, and shale gas projects in the U.S. At the margin, this is adding to some of the major competitive challenges facing the American oil companies. U.S.-based IOCs like ExxonMobil, Chevron, and ConocoPhillips (and other IOCs from Europe and elsewhere) face a competitive squeeze from two sides. On the one side from growing international competition for opportunities from NOCs from the big producing countries like Russia, Brazil, and Malaysia which is now being reinforced by new competition for investment opportunities from the big importing countries NOCs from Asia such as China, India, Japan, and South Korea. China's NOCs are by far the most active and capable of this new group. On the other side, U.S.-based IOCs face new incursions into their traditional opportunities from the large oil service companies, such as Schlumberger, who increasingly are working directly with the NOCs of producer countries to partner with them to develop their resources without the need for the IOCs. So the Chinese NOCs are adding to an already challenging competitive environment for U.S.-based IOCs facing a very limited global opportunity set.

China's energy security drive and anxieties are not the root cause but contribute significantly to growing tensions over maritime territorial disputes in the South and East China Seas and also to tensions over control of the major sea lines of communications (SLOCs) through Southeast Asia and the Indian Ocean. As regional anxieties over future oil and energy supplies grow, the potential for large resources in and around the South China Sea has a "multiplier" effect by raising the already high stakes in sorting out extremely sensitive maritime sovereignty issues. China's recent more assertive posture on sovereignty disputes towards Vietnam and the Philippines and its bellicose pronouncements about the South China Sea being a "core interest" vis-à-vis U.S. involvement in the region, in part, have roots in China's view

that the potential oil and gas resources in the region would be extremely valuable as nearby and, therefore, extremely secure sources of energy. China's growing dependence on oil and LNG flowing through the Indian Ocean, Malacca Straits, and South China Sea is also a key driver of its naval modernization and move towards "Blue Water" power projection capabilities by the PLA Navy, which, in turn is setting off alarm bells across the region and contributing to a regional naval arms race. For China, the security of energy flows is not the fundamental driver of their effort to extend their naval and strategic power in the region but has become an increasingly important factor among others driving these developments.

U.S. Implications and Policies

U.S. policy on China's energy security drive to acquire overseas oil supplies needs to separate fact from fiction.

First, as suggested earlier, China's efforts to secure overseas oil and gas supplies does not fundamentally threaten U.S. or western energy security. U.S. rhetoric to this effect simply needlessly feeds the fears of those in Beijing who believe the U.S. seeks to deny China access to the oil it needs to build its economy and develop peacefully. Beijing's belief that acquiring overseas barrels will strengthen national control over its energy is an illusion built on mistrust of global oil markets and an antiquated, politicized view of how these markets work. China's energy security, like that of the U.S., Europe, Japan and other large oil importers, is destined to depend on promoting stability in global markets, reliable and growing supplies flowing from the key producers and producing regions to the market, increasing investment in new global supplies to meet gradually rising global oil demand, and policies to slow oil demand growth and take pressure off a chronically constrained global oil supply picture. China and the U.S. have profound common interests in working together to strengthen the stability of global oil markets and reduce the chances for damaging oil price shocks which undermine both our and world economic growth. The U.S. and China crafted pious words to this effect during the most recent SAED talks but little has been done to implement any of this.

The Congress should push the administration to work with China and the other major Asian oil importers to create a regional oil forum or working group to find common ground on ways to enhance stability in global oil flows and prices. China convened such a group including the U.S., Japan, South Korea, and India in 2007 but the initiative died from inattention after 2009. It should be revived. It should be aimed at confidence-building and developing a dialogue to begin to de-politicize energy security tensions in the region. It could complement the work of the International Energy Agency since China and India are not members of the IEA. It should be built on the premise of our obvious common interests in stable and effective global oil supplies and prices.

Second, investment by China's NOCs in the U.S. and North American energy development should be encouraged, not discouraged. China's new investments in U.S. shale gas and oil development are positive signs. Investment in the U.S. will impose greater transparency on their operations, expose them to world-class safety, environmental, and human resource practices, and reduce their need to focus on investment in countries where we have major political differences, such as Iran. Rhetoric from Congress is often unhelpful and feeds negative perceptions in Beijing.

Third, as part of our dialogue we should explicitly identify Beijing's support for its NOCs overseas as crude mercantilist industrial policy and press for Beijing to free its NOCs to compete as other oil companies do. The NOCs no longer need the state support; they are increasingly highly competitive on

straightforward energy industry terms.

Fourth, while our energy security interests are highly convergent, there are a number of foreign and strategic policy cases where energy investment and supply security feed other bilateral tensions. These need to be managed carefully. One example is Iran where China's continued energy involvement with the regime has weakened U.S. and western efforts to isolate Tehran over its nuclear program. Beijing's approach to Iran is driven by many factors, of which energy is only one. These other interests are likely to continue to make Beijing reticent to sign onto more than the minimum sanctions that can pass UN Security Council agreement. Another area where energy plays a "multiplier" role is in maritime disputes in Southeast Asia. Energy clearly is a strong interest in Beijing's South China Sea and SLOC policies but, in my view, not the fundamental determinant of Beijing's approach to the region. It is much more about sovereignty and managing long-term adjustments to U.S.—China naval power and interests in the region. As such, strategic shifts in the maritime balance will determine when and if the region can come to terms with rising Chinese power and influence. Energy will remain in a secondary role rather than driving Beijing's view on sovereignty in the region. But tensions over energy's role will need to be managed carefully.

**STATEMENT OF SARAH FORBES
SENIOR ASSOCIATE, WORLD RESOURCES INSTITUTE**

MS. FORBES: Good afternoon, and thank you for the opportunity to contribute to the deliberations of this Commission.

My name is Sarah Forbes, and I'm a Senior Associate for the Climate and Energy Program at the World Resources Institute. The World Resources Institute is a non-profit, non-partisan environmental think tank that works on the world's most urgent environmental development challenges.

I'm delighted to speak with you today about China's prospects for shale gas and the implications for the United States. Considering the speed with which shale gas has shifted the U.S. energy outlook, this is an important moment to consider the implications of the development of China's shale gas resources. I would like to emphasize four key points which are described in more detail in my written testimony.

First, the shale gas industry in China is in early development. The Chinese government is implementing new policies in the 12th Five Year Plan that support the future development of China's gas industry broadly, as well as supporting shale gas research. State-owned and provincial-owned enterprises are conducting exploration and pilot demonstrations on shale gas in China. Through its state-owned enterprises, China is also investing in shale gas development in the United States.

Between 2008 and early 2012, these investments accounted for eight percent of all foreign investment in U.S. shale gas basins.

Second, U.S.-China cooperation on shale gas creates benefits for U.S. companies in the near and long term. The global oil and gas industry operates joint ventures to sustain growth and defuse financial risks.

The emerging international shale gas industry will rely on the same tactics. In recent years, major investments or partnerships between U.S. and Chinese companies in the shale gas sector have been used to the near-term economic benefit of both countries and provide the potential for U.S. companies to benefit domestically and abroad.

Oil and gas companies work together on projects all over the world, owning shares in projects and hiring service providers as required for operations. Because of the variation in geology, most of what is needed to develop any oil or gas play is local know-how, not technology that is subject to patents. These unique features of the globalized industry result in less dependency on intellectual property production and the risks of sharing technologies abroad as compared with other industries.

Third, China's total natural gas demand will continue to far outstrip all domestic production for the foreseeable future. Any natural gas from shale in China is expected to be consumed domestically. China's domestic use of its own natural gas resources would be unlikely to have an effect on net U.S. energy imports, as the U.S. is projected to domestically produce sufficient quantities of natural gas to meet its own demand for at least the next 25 years.

In fact, according to the early release of the 2012 Annual Energy Outlook, the U.S. will become a net exporter of natural gas in 2012.

Fourth, ensuring responsible operations in China provides market

opportunities for U.S. companies. Shale gas development should proceed in China or in any country with environmentally and socially responsible operations, which are, first, enforced by appropriate laws, regulations and standards; second, realized through implementation of international best practices; and third, based on an understanding of the real risks and benefits of responsible deployment both to industry and the public. Such approaches drive demand for U.S. products and services.

In conclusion, I'd like to offer four recommendations. First, to avoid environmental risks associated with shale gas development, it will be critical for public and private sector stakeholders in China to receive technical guidance from qualified experts. If Congress considers future programs and government-to-government collaboration, it should support programs that include information sharing on regulatory capacity as well as operational best practices.

Second, the social, environmental and market implications of shale gas in China remain largely unknown due to the nascent status of China's shale gas industry. In particular, uncertainties remain regarding the estimates of its technical recoverable reserves and the pending implementation of new policies and targets as outlined in the 12th Five Year Plan.

Congress should support ongoing analysis by government and independent researchers, and in the near term Congress could request a report that explores these issues.

Third, Congress should help maximize the opportunities a potential shale gas market in China provides for U.S. companies. Specifically, the State Department-led U.S.-China Shale Gas Resource Initiative should work with other U.S. government agencies, U.S. companies, and civil society to transfer knowledge on best practices and regulations to China.

Finally, here in the United States, Congress must work toward reaching bipartisan agreement on national energy policies that encourage more efficient energy consumption, that increase the diversity of domestic energy production, that maximize the deployment of low carbon energy technologies, and that minimize the environmental impacts throughout our energy system.

Thank you, and I look forward to your questions.

**PREPARED STATEMENT OF SARAH FORBES
SENIOR ASSOCIATE, WORLD RESOURCES INSTITUTE**

TESTIMONY OF SARAH M. FORBES

SENIOR ASSOCIATE, CLIMATE AND ENERGY PROGRAM

WORLD RESOURCES INSTITUTE

**HEARING BEFORE THE U.S.-CHINA ECONOMIC AND SECURITY REVIEW
COMMISSION: "CHINA'S GLOBAL QUEST FOR RESOURCES AND
IMPLICATIONS FOR THE UNITED STATES; CHINA'S PROSPECTS FOR SHALE
GAS AND IMPLICATIONS FOR THE U.S."**

January 26, 2012

Good morning and thank you for the opportunity to contribute to the deliberations of this Commission. My name is Sarah Forbes, and I am a Senior Associate for the Climate and Energy Program at the World Resources Institute. I am also manager of the World Resources Institute's Shale Gas Initiative. The World Resources Institute is a non-profit, non-partisan environmental think tank that goes beyond research to provide practical solutions to the world's most urgent environmental and development challenges. We work in partnership with scientists, businesses, governments, and non-governmental organizations in more than seventy countries to provide information, tools, and analysis to provide for human well-being.

I am delighted to speak with you today about China's prospects for shale gas and the implications for the United States. The United States and China share an interest in the domestic and international development of shale gas resources. In this testimony I will describe the state of China's shale gas industry as well as the governmental policies that will drive its future development in China. I will discuss the implications of U.S.-China business-to-business partnerships as well as government-to-government cooperation--including the risks and opportunities such cooperation could yield. I will also describe how shale gas development in China and the United States changes the global dynamics of energy security. In conclusion, I will provide recommendations for future actions Congress and this Commission can take. In the interest of time, I have limited the scope of my testimony to a discussion of the implications of shale gas development in China on the U.S. and China.

Considering the speed with which shale gas has shifted the U.S. energy outlook¹, this is an important moment to consider the implications of the development of China's shale gas

¹ For example, see natural gas production as described in Annual Energy Outlook 2009 compared with Annual Energy Outlook 2011. [http://www.eia.gov/oiaf/aeo/pdf/0383\(2009\).pdf](http://www.eia.gov/oiaf/aeo/pdf/0383(2009).pdf);
[http://www.eia.gov/forecasts/aeo/pdf/0383\(2011\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2011).pdf)

resources. Development of shale gas in China will shift future global energy dynamics. How it is done will affect the environment and global climate picture. As I describe in this testimony, shale gas can help improve international energy security by providing an abundant domestic energy resource and reducing the need for natural gas imports. What role it plays in addressing climate change will depend in large part on the degree to which shale gas displaces inefficient coal plants and supplements continued improvements in energy efficiency and renewable energy.

As I start, I would like to emphasize the following key points, which I will describe in detail in the sections that follow.

1. Current state and future direction of China's shale gas industry: The shale gas industry in China is in early development, but the topic has already garnered significant interest from the national government. The Chinese government is implementing new policies that support the future development of China's gas industry broadly, as well as supporting shale gas research. State-owned and provincial-owned enterprises are conducting exploration and pilot demonstrations on shale gas in China. Through its state-owned enterprises, China² is also investing in shale gas development in the United States.

2. U.S.-China cooperation on shale gas: The global oil and gas industry operates joint ventures (JVs) to sustain growth and defuse financial risk. The emerging international shale gas industry will rely on the same tactics, particularly given the current state of the global economy. In recent years, major investments or partnerships between U.S. and Chinese companies in the shale gas sector have been used to the near-term economic benefit of both countries and provide potential for U.S. companies to benefit domestically and abroad.

3. Impacts on the energy situation in China: Shale gas development in China will reduce natural gas imports, thus improving China's energy security. Because total natural gas demand will continue to far outstrip all domestic production for the foreseeable future, any natural gas from shale in China is expected to be consumed domestically. From an environmental perspective, the more China can develop energy alternatives to imported oil and domestic coal, the less pressure it exerts on global energy markets and the global environment. China's domestic use of its own natural gas resources would be unlikely to have an effect on net U.S. energy imports, as the U.S. is projected to domestically produce sufficient quantities of natural gas to meet its own demand for at least the next 25 years^{3,4}.

Throughout my testimony, I will also emphasize a fourth point that cross-cuts these three

² Large investments made by the enterprises are overseen by the State-owned Assets Supervision and Administration Commission of the State Council (SASAC)
<http://www.sasac.gov.cn/n2963340/n2963393/2965120.html>

³ According to the U.S. EIA Annual Energy Outlook 2011, from 2012 to 2035 net imports of liquefied natural gas are projected to never exceed 2% of total supply: http://www.eia.gov/forecasts/aeo/source_natural_gas.cfm

⁴ Andrei Korzhubaev and Alexander Khurshudov, *Shale Gas: Great Expectations, Modest Plans*, Oil & Gas Eurasia, 2011; Olivia Chung, *China Joins Shale Gas Hunt*, Asia Times, 2011

themes.

4. Ensuring responsible operations and creating a “level playing field”: Shale gas development should proceed in China (or any country) with environmentally and socially responsible operations which are (1) enforced by appropriate laws, regulations, and standards, (2) realized through implementation of international best practices, and (3) based on an understanding of the real risks and benefits of responsible deployment (both to industry and the public). Such approaches drive demand for U.S. products and ensure a “level playing field” between companies operating in the United States and those in China. More importantly, they help ensure that any negative environmental impacts associated with shale gas development in the United States are not repeated elsewhere.

1. Current state and future direction of China’s shale gas industry

Estimated reserves

Although there are a wide range of forecasts, China appears to have significant reserves of natural gas trapped in shale. According to a 2011 EIA study, China overlays eight basins containing 1,275 trillion cubic feet (Tcf) of technically recoverable resources (See Figure 1), which is larger than the study’s estimate for the U.S. (862 Tcf)⁵. However, Chinese oil experts point out that these estimates are not based on any studies of what the recovery rate would be for China’s shale gas and recognize an urgent need to evaluate the extent and scale of the resource. Even if the estimates are overstated, shale gas could be a game changer in China’s energy future in the same way that it changed the future energy context here in the United States.

Policies drive future supply and demand

The potential of China’s shale gas reserves is of great interest to the Chinese government for both energy security and environmental reasons. While China has made real advancements in renewable energy and energy efficiency, it still depends on fossil fuels such as coal to sustain its current pace of development. For example, in 2008 coal accounted for 66% of China’s primary energy consumption⁶.

The growing energy demand places stress on China’s energy security – as prices from chief import partners, such as Russia, continue to fluctuate. In the context of emissions goals for traditional air pollutants and greenhouse gases, natural gas is generally more favorable compared with more carbon-intensive fuels like coal or oil. Increasing the share of natural gas in the energy mix both improves energy security and helps in meeting climate goals, and China has been expanding its production and use of natural gas. Natural gas production has been growing at an annual rate of 15-20% for more than a decade and the 12th Five Year Plan set a target for natural gas to become 8.3% of total primary energy in 2015 (compared to 3.8% in

⁵ World Shale Gas Resources: An Initial Assessment of 14 Regions Outside the United States

⁶ IEA. 2011. World Energy Outlook Special report: *The Golden Age of Gas*.

National Energy Technology Laboratory (NETL), *Life Cycle Greenhouse Gas Inventory of Natural Gas Extraction, Delivery and Electricity Production*, NETL, 2011. <http://www.netl.doe.gov/energy-analyses/pubs/NG-GHG-LCI.pdf>

2008 and a goal in the 11th Five Year Plan of 5.3%)⁷.

China's current domestic supply of conventional natural gas cannot keep pace with the projected increases in demand, without turning to imported liquefied natural gas (LNG). The promise of greater energy security and the need to meet environmental goals have sparked a strong interest in domestic unconventional gas development in China⁸. The 12th Five Year Plan targets the production of 6.5 billion cubic meters (0.23 Tcf) of shale-sourced gas per year by 2015 and 80 billion cubic meters (2.8 Tcf) by 2020^{9,10}. Comparatively, U.S. projections are 7.20 Tcf, and 8.21 Tcf for the same years^{11,12}. According to Chinese energy experts, China's plans include an effort to drill 990 shale gas horizontal wells by 2015¹³. The Ministry of Land and Resources also recently approved shale gas as an independent mining resource, which is a legal status that may allow firms other than State-owned enterprises to begin developing the unconventional sources¹⁴. The announcement of the new approved status came shortly after a government decision to free well-head prices for unconventional gas, including shale and coal bed methane. The press release is linked to the launch of pilot reforms on natural gas pricing in Guangdong Province and Guangxi Zhuang autonomous region, an effort to steer toward a market-guided pricing mechanism that includes costs associated with transportation and consumer demand, as well as production costs¹⁵.

Shale gas activities

Currently, China is assessing and exploring potential shale gas resources through geologic basin evaluations conducted by State-Owned and Province-Owned Enterprises. PetroChina has successfully drilled several pilot shale wells in the Sichuan Basin and plans to produce 1.5 billion cubic meters (0.53 Tcf) of gas from shale in 2015, 1 billion cubic meters from Sichuan alone¹⁶. PetroChina's activities include two vertical wells, operated as part of a JV with Shell¹⁷. Results from these wells presented in December 2011, show that the primary production has been "very good"¹⁸. PetroChina has also successfully drilled two horizontal shale gas wells in the Weiyuan gas field in the Sichuan basin. As of December 2011, this well had produced over 2

⁷ IEA. 2011. World Energy Outlook Special report: *The Golden Age of Gas*

⁸ Philip Andrews-Speed and Roland Damnreuther, *China, Oil and Global Politics*, Routledge 2011, p. 24.

⁹ Reuters, *China sets ambitious shale gas output targets-paper*, Reuters, 2011.

<http://af.reuters.com/article/energyOilNews/idAFL3E7LCODM20111012>

¹⁰ Bloomberg, *China to Set Shale-Gas Output Targets, Securities Journal Says*, 2011.

<http://www.bloomberg.com/news/2011-10-11/china-set-to-shale-gas-output-targets-securities-journal-says.html>

¹¹ USEIA, Annual Energy Outlook 2011.

¹² SinoCast, *China Shale Gas Planning Coming Soon*, MENAFN News, 2011; Energy Information Administration (EIA), *Annual Energy Outlook: 2011*, EIA, 2011; Conversion rate: 1 Bcm = 0.03531Tcf.

¹³ Interfax China. *China's first horizontal shale well outputs 2 MMcm to date*. December 7, 2011.

¹⁴ Reuters, *China Approves Shale Gas as an Independent Resource*, Reuters, 2011

¹⁵ Reuters, *Government to liberate wellhead prices*, Global Times, 2011

¹⁶ Chen Aizhu and Coco Li, *China: PetroChina aims to produce 1 bcm of shale gas in Sichuan in 2015*, Reuters, 2011.

<http://www.reuters.com/article/2011/09/25/petrochina-shale-output-idUSL5E7KP0VX20110925>

¹⁷ Shell, *Our business in China*, Shell, 2012.

¹⁸ Tom Bergin, *Exclusive: Shell strikes shale gas in China*, Reuters, 2011.

million cubic meters (70.6 million cubic feet) of shale gas¹⁹. China Petroleum and Chemical Corporation (also known as Sinopec Corporation) has partnered with BP on shale gas exploration and deployment in Guizhou and Jiangsu, and has also drilled a horizontal well in Hubei province^{20,21}. In January 2012 Sinopec announced that it is drilling its first shale gas well in Anhui province²². The provincial oil and gas companies are also actively developing shale gas in areas like Hunan and there is government-supported research underway in government and research institutions and by provincial governments and enterprises²³.

2. United States and China cooperation on shale gas

Government-to-Government

The United States and China are working together in both a governmental and private sector capacity. In 2009, Presidents Barack Obama and Hu Jintao announced the launch of the U.S. – China Shale Gas Resource Initiative, with the goal of sharing information about shale gas exploration and technology to reduce greenhouse gas emissions, promote energy security, and create commercial opportunities²⁴. Activities conducted under the initiative include forums, workshops, and a Chinese delegation’s visit to a U.S. shale gas development operation.

Business-to-Business

Over the past two years, two of China’s State-Owned Enterprises (Sinopec Corporation, and China National Offshore Oil Cooperation, or CNOOC) have formed JVs with U.S. shale gas operators. These JVs are not investments in the companies themselves but financial stakes in portions of the company’s assets. The global oil and gas industry operates JVs to sustain growth and defuse financial risk, and these deals are evidence that the shale gas industry is following that same model. Figure 2 describes the geographic distribution of foreign company investment in the U.S. shale gas industry. Key investments are also described below.

November 2010: CNOOC paid \$1B for a 33% stake of Chesapeake Energy’s 600,000 acre oil and gas leasehold in Texas (Eagle Ford). CNOOC paid \$1.08 billion in cash, plus an additional \$40 million at closing. CNOOC will also fund 75% of Chesapeake’s share of the drilling and completion costs up to \$1.08 billion, which Chesapeake expects to occur by year-end 2012²⁵.

January 2011: CNOOC and Chesapeake came to agreement on a \$1.3B deal for 2011-2014 which gives CNOOC a 33.3% stake in Chesapeake’s 800,000 acre holdings in the Denver-Jules and Powder River Basins. The deal included CNOOC funding 66.7% of Chesapeake’s share of

¹⁹ Interfax China. *China’s first horizontal shale well outputs 2 MMcm to date*. December 7, 2011.

²⁰ Interfax China. *China’s first horizontal shale well outputs 2 MMcm to date*. December 7, 2011.

²¹ Olivia Chung. *China Joins Shale Gas Hunt*, Asia Times, 2011.

²² Interfax China. *CNPC takes the lead in shale gas production*. January 19, 2012.

²³ Peng Suping, China University of Mining and Technology, January 2012.

²⁴ Office of the Press Secretary, *Fact Sheet: U.S.-China Shale Gas Resource Initiative*, White House Press Release. 2009.

²⁵ Oil & Gas Financial Journal, *CNOOC, Chesapeake close Eagle Ford shale deal*, Oil & Gas Financial Journal. 2010.

drilling and completion costs until an additional \$697M is paid²⁶.

December 2011: CNOOC and Sinopec Corporation are jointly competing to buy a 30% stake in FTS International, an oil-field services company specializing in hydraulic fracturing, or fracing. Saudi Arabian Oil Company, known as Saudi Aramco, is also bidding²⁷.

January 2012: Sinopec Corporation and Devon Energy signed a multibillion-dollar deal which gives Sinopec Corporation a one-third stake in five U.S. shale oil and gas fields. The stake includes 1.2 million acres in Devon's lease holding in the Tuscaloosa Marine Shale in Alabama and Mississippi, the Niobrara in Colorado, the Mississippian, the Utica Shale in Ohio, and the Michigan Basin. The deal included a \$900 million payment at closing, \$300 million of which went toward reimbursements for acreage and drilling acquisitions. In addition, by the end of 2014 Sinopec will pay \$1.6 billion to Devon to cover the costs of drilling²⁸.

Opportunities in the U.S. market

It is worth noting that although these investments total more than \$5B, they represent only about five percent of overall Chinese investment in foreign energy between 2010 and 2012²⁹. In the United States, Chinese financial interests between 2008 and early 2012 accounted for eight percent of all foreign investment in shale gas basins. Other major foreign investment came from Norway's Statoil, France's Total, BHP Billiton, and international majors like Shell and BP³⁰.

From a short-term economic standpoint, JVs are advantageous to both parties. In the case of the United States and China, both countries stand to benefit from additional business-to-business deals. Shale gas extraction is costly and requires significant up-front capital investment by well operators with a lag in returned profits. The high capital costs coupled with the low price of natural gas in the United States, currently around an average of \$4.00 with recent prices below \$3.00³¹, creates a strong need for investment that offsets the capital requirements and reduces financial risk for U.S. companies³². Chinese investment is driven both by the opportunity of participating in what can be a lucrative U.S. market opportunity, as well as the potential to learn more about the operational aspects of shale gas development along a fully integrated supply chain and apply those lessons to its own shale gas resources³³. The result is

²⁶ Reuters, *UPDATE 2 – Chesapeake, CNOOC strike second shale deal for \$1.3 bln*, Reuters, 2011.

²⁷ <https://secure.marketwatch.com/story/devon-reaches-shael-deal-with-sinopec-2012-01-03>²⁸ Ryan Dezember, *Devon reaches shale deal with Sinopec*, Market Watch, 2012.

²⁸ Angel Gonzalez and Ryan Dezember, *Sinopec Enters U.S. Shale*, Wall Street Journal, 2012.

²⁹ The Heritage Foundation, *Chinese Outward Investment data*, The Heritage Foundation, 2011.

³⁰ Angel Gonzalez and Ryan Dezember, *Sinopec Enters U.S. Shale*, Wall Street Journal, 2012; Joanne Liou, *PwC: International investment in US shale plays surge, drive M&A activity*, Drilling Contractor Magazine, 2011.; James Regan and Caroline Jacobs, *France's Total in \$2.3 billion U.S. shale gas deal*, Reuters, 2012. Final figure for international shale gas investment in U.S. shale was derived by using PwC's calculation of \$60B in shale gas deals from 2008 – 2011 and adding the two deals finalized in 2012, with Total and Sinopec.

³¹ U.S. Energy Information Administration (EIA), *Natural Gas Data*, EIA, 2011.

³² *UPDATE 2 – Chesapeake, CNOOC strike second shale deal for \$1.3bln*, Reuters, 2011.

³³ Julie Jiang and Jonathan Sinton, *Overseas Investments by Chinese National Oil Companies: Assessing the drivers and impacts*, International Energy Agency (IEA), 2011.

that the U.S. shale gas industry benefits by receiving the capital it needs to continue operating and the Chinese companies profit in dollars and in knowledge on shale gas technology and operational management of shale gas. Such knowledge transfer could increase the speed and efficiency of China's shale gas resource development.

Opportunities in China's shale gas market

Domestic Chinese shale gas production could open new markets for U.S. companies producing goods and services to support activities throughout the shale gas supply chain. For example, Halliburton and Baker Hughes are international leaders in oilfield services, including fracing fluid production and well-completion management³⁴. Even if only China's state and provincial enterprises gain access to the country's shale gas reserves, they will likely require goods and services from the sector's top-performing companies, most of which are based in the United States.

Water treatment technology could especially be in demand. Each well drilled and fractured in the Marcellus shale of the northeast United States requires 2.4 to 7.8 million gallons of water³⁵. Twenty to 80 percent of injected water returns to the surface, which leads to a net loss of water and generates wastewater at each drilled well. In the relatively water abundant northeast United States, water demands from fracing are small compared to uses such as municipal water supply and power generation³⁶. In China, however, any additional water demands for fracing pose significant challenges because most major shale plays underlie water-scarce regions (Figure 3). Further straining demand on water resources, residents in 400 of 657 major Chinese cities rely on groundwater³⁷. For these reasons, Chinese shale gas operations should reuse reclaimed water, treat wastewater before discharging it to receiving surface waters, and prevent the intrusion of wastewater from well casings into groundwater. U.S. companies are at the forefront of water treatment technologies for all three purposes because of experience complying with the Clean Water Act and other environmental laws as well as adoption of voluntary industry best-practices.

Are there risks as well as opportunities for U.S. companies?

From a global perspective, the oil and gas industry is integrated; companies work together on projects all over the world, owning shares in projects and hiring service providers as required for operations. Because of the variation in geology, most of what is needed to develop any oil or gas play is local "know-how," not technology that is subject to patents. These unique features of the globalized industry result in less dependency on intellectual property protection and the risks of sharing technologies abroad as compared with other industries. For example,

³⁴ Trefis Team, *Frackign Good New from China for Halliburton, Schlumberger and Baker Hughes*, Forbes, 2011.

³⁵ New York Department of Environmental Conservation. 2009. *Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas, and Solution Mining Regulatory Program: Well Permit Issuance for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and other Low-Permeability Gas Reservoirs*.

³⁶ Susquehanna River Basin Commission as reported in Penn State Cooperative Extension. 2009. "Marcellus Education Fact Sheet: Water Withdrawals for Development of Marcellus Shale Gas in Pennsylvania."

³⁷ Statistic cited in the National Groundwater Pollution Prevention Plan, signed by the State Council in August 2012 http://www.gov.cn/ldhd/2011-08/24/content_1932021.htm

while the basic drilling and fracturing technologies needed for shale gas development are relatively uniform, the extraction methodologies depend most heavily on the site-specific geological features of the shale play being developed. Horizontal drilling first occurred in the United States in 1929 and fracing has been performed since 1949³⁸. Geological factors that are unique to each well site (e.g., natural gas content, natural fractures of the rock, fracturing ability of the source rock) impact the staging of the fractures, the pressure of the hydraulic fracturing, and the fracturing fluid mixture. It is the experience gained from working many drill sites, in different basins and plays, which is the driving force behind U.S. shale gas development.

Chinese companies currently possess the ability to drill wells horizontally and have some experience with fracing³⁹, but operators and service providers in the United States currently have a clear global advantage based on the substantial experience with drilling and fracing shales to produce gas and the know-how to use these techniques effectively to maximize output⁴⁰. This being said, the oil industry in China is a very domestic business (especially onshore) and has historically provided international companies with very limited access to onshore resources. Any international involvement typically comes from the creation of partnerships between Chinese companies and foreign companies, which is already happening with shale plays in China, as demonstrated by the PetroChina-Shell and CNOOC-BP JVs. A key question is whether the future shale gas industry in China will be modeled after the offshore oil industry (which includes more JVs) or the onshore oil and gas industry.

Future cooperation between governments and businesses should not be limited to financial investments or knowledge sharing on operational practices. Although the United States currently stands as the only country with domestic experience in large-scale shale gas development, the experiences have not been all positive. U.S. regulatory structures, information flow, and enforcement capacities have generally not kept pace with the speed of development in shale formations. Stakeholders affected by U.S. shale gas development have not reached agreement on the risks associated with fracing, although experts agree that practices and regulations should be improved in order for the United States to develop its shale gas resources in an environmentally and socially responsible manner⁴¹. The growing understanding within state governments of both the level of environmental risks and how to manage them are valuable experiences for Chinese regulators and industrial entities to be aware of and take into account while pursuing and designing Chinese domestic development.

³⁸ <http://www.kgs.ku.edu/Class2/horz05092001a/index.htm>;

<http://www.spe.org/jpt/print/archives/2010/12/10Hydraulic.pdf>

³⁹ Oilfield Technology. *Revolution of Evolution?* March 2011. http://www.deloitte.com/assets/Dcom-unitedstates/local%20Assets/Documents/us_consulting_RevolutionorEvolution_Oilfield_Technology052511.pdf

⁴⁰ Tim Carr, January 6, 2012

⁴¹ U.S. DOE. Secretary of Energy Advisory Board (SEAB) Natural Gas Subcommittee. *Improving the Safety & Environmental Performance of Hydraulic Fracturing*, Final Report. November 2011. <http://www.shalegas.energy.gov/>

3. How will the growth of the shale gas industry in China impact the energy situation in China and the U.S.?

China's current domestic supply of conventional natural gas cannot keep pace with the projected increases in demand⁴². Shale gas development in China is expected to reach considerable production levels between 2015 and 2020⁴³, and this additional gas could both increase China's energy security and also impact the global market by reducing the need for imports from Russia as well the Middle East. Some imports of natural gas are projected for China, even if significant shale gas is produced⁴⁴. These imports include gas from the Myanmar and Kazakhstan pipelines as well as LNG imports (140 bcf in 2009), among other sources⁴⁵. The timing and scale of the development of China's shale gas industry should be viewed as uncertain, however, as there are a number of challenges to China's development of a fully integrated shale gas industry (pipeline infrastructure and access, drilling rig availability, regulations, market disincentives, existing contracts, etc.).

China's shale gas resources are located in areas that are "energy short" (Hunan, Hubei, Sichuan, and Chongqing), and it is likely that shale gas produced in China would be needed and used locally rather than exported, even to other areas within China. There is, therefore, very little risk of exported Chinese gas competing with U.S. suppliers within the United States.

The implications of shale gas in China and the United States extend beyond the gas market alone. Shale gas has the potential to remake the world energy picture – potentially undercutting markets for existing and new coal-fired power generation in the near-term and clean zero-emission technologies for the foreseeable future. It is essential that as Congress considers new energy policies, priority is given to provisions that help ensure that the environmental impacts of shale gas are managed and that it contributes to, rather than detracts from, a sustainable, low-carbon energy future. The rapid pace at which shale resources are being tapped means that time is short to ensure responsible development that avoids negative consequences for people, ecosystems, and the global climate.

Concluding recommendations:

1. To avoid environmental risks associated with shale gas development it will be critical for public and private sector stakeholders in China to receive technical guidance from qualified experts. As Congress considers future programs and government-to-government collaboration, it should support programs – including government-to-government collaboration – that include information sharing on regulatory capacity as well as operational best practices. Specifically, the U.S. could assist China in developing environmental regulations for shale gas and in establishing and implementing best practices and international standards for shale gas development. The U.S.-China Shale Gas Resource Initiative, led by the State Department, could provide a platform

⁴² Philip Andrews-Speed and Roland Dannreuther, *China, Oil and Global Politics*, Routledge 2011, p. 24.

⁴³ Gavin Thompson and Wood Mackenzie, *Challenges Hamper China's Near-Term Unconventional Development*, Hart Energy, 2011.

⁴⁴ Kenneth Medlock et al., *Shale Gas and U.S. National Security*, James A. Baker III Institute for Public Policy, 2011.

⁴⁵ EIA, 2012 China Energy Data, Statistics and Analysis – Oil, Gas, Electricity, Coal, Country Analysis Briefs.

for such exchanges.

2. The social, environmental, and market implications of shale gas in China remain largely unknown due to the nascent status of China's shale gas industry. In particular, uncertainties remain regarding estimates of its technically recoverable reserves and the pending implementation of new policies and targets outlined in the 12th Five Year Plan. Congress should support ongoing analysis by government and independent researchers who are tracking the global economic and environmental impacts of emerging global shale gas developments. In the near term, Congress could request a report that explores these issues, delivered to Congress by the Department of Energy's Advisory Board Subcommittee on Shale Gas Production with input from the DOE National labs as well as U.S. Departments of State and Commerce, Environmental Protection Agency, Geologic Survey, Trade and Development Association, and other relevant agencies.

3. Congress should help maximize the opportunities a potential Chinese shale gas market provides for U.S. companies. Specifically, with Congressional support, the U.S.-China Shale Gas Resource Initiative should be charged to work with other U.S. Government agencies, the private sector, and civil society to transfer knowledge on well completion including drilling and fracing, best practices for mitigating environmental and social impacts, and necessary regulations to China. Such efforts should stimulate demand for U.S. products and services, maximize production at Chinese wells, and realize benefits of natural gas production for Chinese citizens (i.e., develop jobs, generate tax revenue, raise standard of living).

4. Here in the United States, Congress must work toward reaching bipartisan agreement on national energy policies that encourage more efficient energy consumption, increase the diversity of domestic energy production, maximize deployment of low-carbon energy technologies, and minimize environmental impacts throughout our energy systems. In this context, measures will be needed to ensure that natural gas complements rather than competes with energy efficiency and the development of renewable energy sources in the U.S. market. In the near-term, it is critical for Congress to provide funding and incentives for low-carbon and clean energy technology. Congress should also move forward on comprehensive energy and climate legislation - but that is a topic for another day.

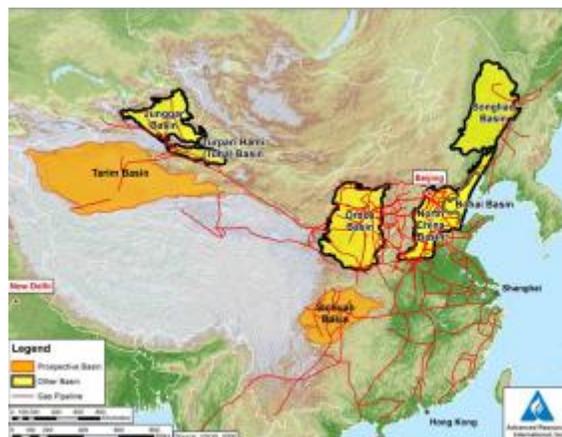


Figure 1. Major Shale Gas Basins in China (Figure Courtesy of Advanced Resources International)

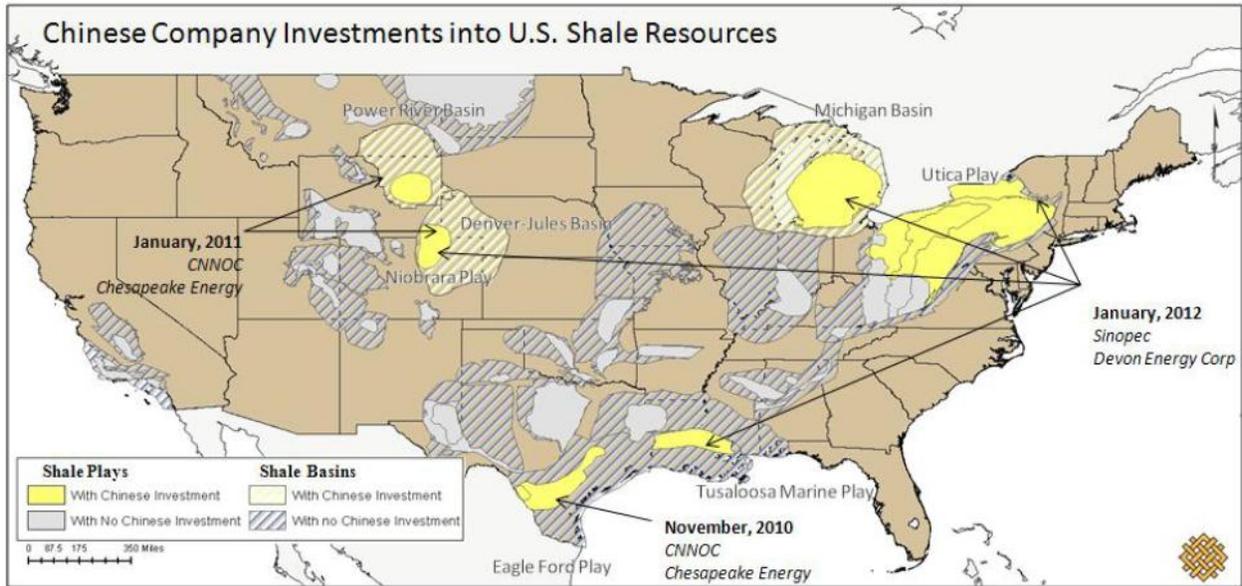


Figure 2. China’s shale gas investments in U.S. Shale Gas Resources (Source: WRI analysis)

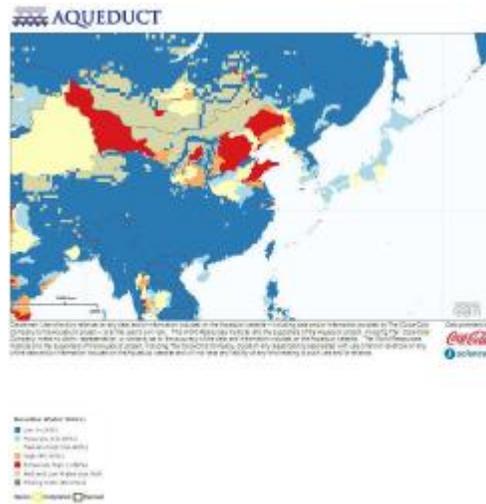


Figure 3. Shale gas production could occur in arid regions⁴⁶ of China (Source WRI Aqueduct tool⁴⁶)

⁴⁶ <http://insights.wri.org/aqueduct/welcome>

HEARING CO-CHAIR SLANE: Mr. Green.

**STATEMENT OF JEFFERY GREEN, ESQ.
PRESIDENT AND FOUNDER, J.A. GREEN & COMPANY**

MR. GREEN: Commissioner D'Amato, Commissioner Slane, and distinguished Commissioners, thank you for the opportunity to testify today.

Over the past decade, explosive economic growth in the People's Republic of China has received significant attention from industry, academics, policymakers, media and others.

Direct consequences of this growth have been marked escalations in Chinese raw material demand and development of proactive Chinese policies, such as tighter export restrictions and acquisition efforts around the globe to support increased Chinese industrial activity.

One subset of raw materials, known as "strategic and critical," are remarkable for their limited availability, geographic concentration, lack of alternatives, and unique value to green energy, high technology, and military applications.

Despite the "strategic and critical" nature of these materials, U.S. policymakers often overlook their technological, political and economic importance. This inattention can create serious risks for the U.S. economy and national security.

Today, I will use rare earth elements as an example of "strategic and critical" materials and provide recommendations that can reduce or eliminate U.S. and allied vulnerabilities.

For more than 20 years, the People's Republic of China has exercised near total dominance of global rare earth supplies. This dominance is a direct result of the vastly different approaches by China and the U.S. to secure resources in the global market.

While the U.S. has embraced the invisible hand and promoted free trade, China executed deliberate, government-orchestrated policy that creates significant barriers to entry for new foreign competitors and squeezes existing foreign competitors from the market. China has established a dominant role for their companies at all stages of the supply chain. This policy assumes that the supply of strategic and critical materials is a fundamental driver and multiplier of their economic growth.

Consider China's latest Five Year Plan for National Economic and Social Development. This plan provides a forward-looking industrial blueprint for economic growth and explicitly addresses access to and use of raw materials.

As the Commission has learned over the past several years, China dominates the entire rare earth supply chain, producing roughly 94 percent of rare earth oxides and nearly 100 percent of commercial rare earth metal. This dominance has grown over the past decades as the Chinese leveraged their rare earth resources, ramped up production, and supplied the global market with relatively cheap raw materials.

From the 1970s to the '90s, China went from producing one-third of the world's rare earths to producing nearly all of it. The United States became import-dependent, and U.S.-based rare earth mining and manufacturing

companies moved overseas or simply closed.

Deliberate industrial policies and a rapidly growing economy have allowed China to maintain market dominance to this day. These policies include reduced export quotas, industry consolidation, creation of a national stockpile, embargoes, new licensing requirements, two-tier pricing, and expansion of the existing export quotas.

This pattern of market intervention has led to significant price volatility and created tremendous uncertainty for both producers and consumers.

Meanwhile, Chinese state-owned enterprises have acquired or taken equity stakes in companies outside of China at various supply chain stages. In the past ten years, the Chinese attempted to take control of two of the largest rare earth deposits outside of China: the Mount Weld site in Australia and the Mountain Pass California mine. Both deals failed due to political opposition.

Chinese firms are also entering into joint venture agreements with state-backed loans to fund broader strategic materials projects in developing countries, attempting to secure supplies of more strategic resources.

Despite having considerable rare earth deposits, the U.S. has become reliant on China for nearly all rare earth imports. As the largest single supplier, China has enormous leverage over companies looking to obtain materials. This upstream supply chain dependence means U.S. and allied nation companies must often relocate to China to ensure access to raw materials, and inherent in these moves is the risk of unintended technology transfer.

Moreover, China has proven willing to use its material advantage to assert regional territorial claims. In September 2010, China cut off all rare earth shipments to Japan over a diplomatic dispute. This action made it clear to the U.S. and our allies that this situation can pose real economic and national security risks.

Now, however gloomy this may sound, there are a number of U.S. government agencies that realize the importance of strategic and critical materials policy. That said, there is no deliberate U.S. government plan. We have, in essence, defaulted, and inactivity has become our plan.

Domestic industries and the ability to manage our supply chain are fading. With the disappearance of virtually the entire U.S. rare earth supply chain, the United States has only become further dependent.

These events represent a disturbing trend. Between 1992 and 2006, the U.S. expanded its total dependence on foreign supplies of strategic materials from eight to 17. Of these, China dominates production of rare earths, fluorspar, graphite, antimony, and others. While no meaningful steps have been taken to reverse this trend, the U.S. can and must take steps to counter Chinese resource dominance.

First, the U.S. must adopt a government-wide definition of "strategic and critical" materials.

Second, in 2007, the Congress established the Department of Defense Strategic Materials Protection Board to issue recommendations on materials-related issues. In 2008, the Board identified only one "critical" material and failed to identify rare earths at all. The Board did not meet in 2010, failing to comply with their statutory obligations. This is unacceptable.

Third, the U.S. government must acknowledge that efforts to reduce,

reuse, recycle and substitute represent only one small part of the solution. This popular policy relies heavily on expensive research and development projects that are high risk, high reward, and often require decades to provide commercially viable solutions. We must address short-term elements of the overall solution.

Fourth, the U.S. and its allies must demand China comply with its international trade obligations. We have already pursued WTO action with the European Union, Japan and others, and this should be continued. In the President's State of the Union address, he announced the creation of a trade enforcement unit to investigate unfair trade practices. This is a positive and welcome step.

Fifth, the Department of Defense has tools to incentivize strategic and critical materials extraction and manufacturing to support the defense-industrial base. One method involves stockpile arrangements. Other tools include the Defense Production Act, research grants, tax credits and streamlined permitting processes.

As a final thought, the "rare earth story" is not an isolated example, and the U.S. can learn much from this issue set. Therefore, I urge you recognize similar characteristics in other markets, such as fluorspar, graphite, vanadium, and antimony. These cases might soon parallel our current rare earth situation.

For too long, the U.S. government has employed an ad hoc approach to addressing our strategic and critical materials policy. Many in the U.S. government point to free market developments as evidence that no crisis exists. However, the market, subject to manipulation and therefore not truly free, has overwhelmingly chosen China as its supplier of choice.

I sincerely hope you and the Congress will consider these recommendations for future legislation. Natural resources clearly play a key role in the national security and economic future of this country. Chinese policymakers have already recognized this nexus. We, in the United States, now face a choice. We can continue to ignore this to our detriment or we can lay the foundation for American success in the 21st century.

Thank you. I look forward to your questions.

HEARING CO-CHAIR SLANE: Thank you very much.
Commissioner Blumenthal.

**PREPARED STATEMENT OF JEFFERY GREEN, ESQ.
PRESIDENT AND FOUNDER, J.A. GREEN & COMPANY**

Testimony before the U.S.-China Economic and Security Review Commission

Hearing on “China’s Global Quest for Resources and Implications for the United States”

by

Jeffery A. Green, Esq.
President and Founder
J.A. Green & Company
January 26, 2012

Introduction & Executive Summary

Chairman D’Amato, Chairman Blumenthal and distinguished Commissioners, I want to thank you for the opportunity to testify before the Commission on Chinese policy towards strategic and critical materials and the repercussions of this policy on the United States.

Significant public attention on the People’s Republic of China (“China”) has focused on big-ticket, high-visibility items, such as the apparently sudden manifestation of more superhighways, high-speed trains, and—of course—new military equipment. To support this impressive growth, China has exhibited a seemingly insatiable demand for raw materials: base metals, fossil fuels, rare earth elements (REE), and others. Many of these materials are of sufficiently high material intensity, geographic concentration, and unique applicability to warrant being labeled “strategic and critical” materials.

The Chinese government has demonstrated a forward-looking strategic and critical materials policy that considers the supply of said materials to Chinese industry a fundamental driver and multiplier of economic growth. This policy is notable for both its foresight and ancillary benefits, such as deeply integrated state-to-state relationships with key nations that can provide for Chinese demand. However, the execution of this policy poses serious security and industrial concerns for the economy and national defense of the United States and our allies.

The Logic of Strategic & Critical Materials

To lay the necessary groundwork for discussion of “strategic and critical materials”, we must have a clear definition of that term. Unfortunately, current usage is inconsistent and confusing, despite attempts by the U.S. Government to establish a common framework. For example:

The term “materials” means substances, including minerals, of current or potential use that will be needed to supply the industrial, military, and essential

civilian needs of the United States in the production of goods or services, including those which are primarily imported or for which there is a prospect of shortages or uncertain supply, or which present opportunities in terms of new physical properties, use, recycling, disposal or substitution, with the exclusion of food and of energy fuels used as such. (30 U.S.C. § 1601(b) “Materials & Minerals Policy, Research, and Development”)

Strategic & critical materials: materials that would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency, and are not found or produced in the United States in sufficient quantities to meet such need. (50 U.S.C. § 98h–3(1) “Acquisition and Development of Strategic Raw Materials”)

The term “materials critical to national security” means materials— upon which the production or sustainment of military equipment is dependent; and the supply of which could be restricted by actions or events outside the control of the Government of the United States.(10 U.S.C. § 187(e)(1) “Strategic Materials Protection Board”)

In short, materials that may be characterized as strategic and critical by one part of the U.S. Government do not necessarily earn the same consideration by other U.S. Government agencies, leading at times to a myopic “there’s no problem in my program” attitude within Executive Branch agencies. In my testimony, I choose to use the definition in Title 50, United States Code, because, in my view, it best captures a “whole supply chain” industry approach along with security and civilian demand.

With this definition in mind, we can answer what strategic and critical materials are. Now we should turn to “why are strategic and critical materials important, and how should we think about them?”

I would offer this set of guiding principles: strategic and critical materials are, first, a function of the economic policy of the state, wherein these items provide the necessary raw materials to support high value-added manufacturing and research and development (R&D). More generally, they increase revenues, job creation, and economic growth. However, per the definition in Title 50, this is not the end of the story; economic growth and high per-capita gross domestic product (GDP), which is concomitant with high value-added manufacturing and R&D, enable the equipping, training, mobilizing, and sustaining of modern military forces with increased capabilities. Therefore, strategic and critical materials, in addition to their supporting role within economic policy, fuel the defense industry and enable military modernization.

While all highly-developed economies consume strategic and critical materials, each country

differs in local availability and efficiency for using strategic and critical materials. This is the basic understanding of comparative advantage and the benefits from international trade. Unfortunately, the risk to all participants increases when one country introduces market distortions to exploit this co-dependency among nations and gain a temporary absolute advantage to enable quasi-monopolistic price discrimination and security advantage.

The following case study of rare earth elements and other mineral activities outside mainland China demonstrates the implications of a lack of strategic materials policy by one country and a comprehensive policy by another.

Chinese Resource Policy for Materials within Mainland China: Rare Earth Case Study

History of the Rare Earth Industry

The rare earth issue presents perhaps the clearest example of the impact that Chinese resource policy has had in shaping political and economic realities in the United States and the rest of the world.

Today, China dominates all aspects of the rare earth supply chain. They produce roughly 94% of all rare earth oxides consumed world-wide, nearly 100% of commercial rare earth metal, and the vast majority of rare earth alloy and magnets. China has embargoed neighboring countries (e.g., Japan) over diplomatic disputes, frequently revises its export policies, implements strict controls on the industry nationwide, and increasingly controls export quotas for materials. These policies have resulted in a growing supply-chain dominance that has often led to relocation of industrial players to China as they seek to secure rare earth supplies. Such relocation has led to growing concern over technology transfers and intellectual property. While the global market has responded by attempting to bring new sources of supply online, to date we have seen no new production in the rare earth oxide market, and our dependence on Chinese sources has grown.

This was not always the case. Starting in the 1940s and for nearly forty years thereafter, the United States was the overwhelming leader of the rare earth industry with the Mountain Pass mine in California single-handedly providing the vast majority of rare earth materials to the rest of the world.

“There is Oil in the Middle East and there are Rare Earths in China” – Deng Xiaoping, 1992

How did this role-reversal occur? China realized the value of their abundant rare-earth reserves in the late 1970s and began taking measures to increase rare earth production steadily throughout the 1980s. Then, during the 1990s, China flooded the market by more than tripling the previous world supply of the materials.

During this time, Chinese rare earth-producing firms were largely unprofitable but were allowed to survive through direct and indirect support by the Chinese government. This backing

enabled China's rare earth industry to continue to mine and export these materials at prices far below the actual costs of production.

With the additional industrial advantages of a low labor cost, questionable environmental standards, and export taxes, the impact of these efforts were swift and dramatic: within 20 years China went from producing roughly one-third to nearly all of the world's supply of rare earths. Mines in the United States and elsewhere, unable to remain profitable against cheap Chinese exports, went out of business. The United States was completely dependent on imports. With the mines shuttered, companies in the United States that refined the rare earth metals and alloys and manufactured rare earth magnets moved overseas or simply closed.

With the disappearance of the entire U.S. rare earth supply chain, the United States became further dependent on foreign suppliers for all rare earth materials, from oxides, metals, and alloy to permanent magnets and finished products. According to Government Accountability Office estimates, rebuilding this supply chain could take as long as 15 years, and some technical expertise may be permanently lost.

Export Quotas and Consolidation

As China solidified control of most aspects of the rare earth supply chain, it began to take additional anti-competitive actions to capitalize on its domination of the industry.

Despite skyrocketing demand for the materials due in part to their critical roles in high- and green technology applications — ranging from iPhones and hybrid vehicles to satellites — China began decreasing exports in 2006; officials have cited internal demand and environmental concerns as their rationale. These export constraints created supply uncertainties among key industries, fueling dramatic price increases throughout 2010-11. As a result, industries have been forced to raise prices to compensate for these uncertainties and / or relocate to China to secure a more reliable, lower-cost supply of rare earth materials.

With rare earth prices reaching unprecedented highs in June 2011, China took action to seek a stabilization of prices at higher levels and also, perhaps counterintuitively, support establishment of non-Chinese sources of supply. As demand sagged in light of difficult economic times globally and as global prices fluctuated, Baotou Steel announced that it would buy back rare earth oxides at above-market prices to support price levels. Meanwhile, the high price of rare earth materials led to an increase in smuggling and illegal mining operations across China. In response, Chinese authorities took a hard line against smugglers and cracked down on the industry as a whole. The government has also spent the last several years consolidating the industry, announcing in 2009 that it would push to reduce permitted rare earth mines from 123 to less than 10, and reduce processing firms from 73 to 20 by 2015.

China has further worked to establish tighter control over its rare earth industry through new

licensing rules and environmental regulations; failure to meet these requirements would result in loss of license or facility closure. A major theme of China's official explanation for the current crackdown on rare earth producers is the negative impact the mining operations have had on the environment, which coincides with one of the two exceptions to World Trade Organization (WTO) rules governing constraints on exports or production.

Such policies seemingly ensure historically higher rare earth pricing in the long term, while also enabling future producers to capitalize on the improved economics provided by the new pricing regime. Numerous industry analysts project that between 2014 and 2016, China will become a net importer of rare earths.

While this will provide much needed relief in the market, it should be approached with caution. It is critical to consider the eventual markets for new sources of supply. As previously noted, much of the world's current rare earth metal, alloy and magnet production takes place in China, with the vast majority of production occurring in Asia.

Securing Global REE Resources

While it has consolidated its rare earth industry at home, China has also been working to secure additional resources abroad. On numerous occasions during the 2000s, Chinese firms have sought to take an equity stake in, or outright acquire, rare earth mines and mining companies across the globe. Two key examples of this are the bids that Chinese firms have previously made on the two companies now positioned to provide the first sources of rare earth supply outside China: Molycorp and Lynas.

Chinese state-owned enterprises (SOEs) attempted to buy the Mountain Pass rare earth mine as part of a 2005 China National Offshore Oil Company (CNOOC) bid to acquire Unocal Corporation for \$18.5 billion. CNOOC eventually gave up on the deal in the face of stiff opposition from U.S. political leaders who raised strong concerns over transfer of oil reserves; however, little attention was paid on Capitol Hill or within the Executive Branch to the inclusion or implications of the sale of the rare earth resource.

Four years later, another Chinese SOE, the China Non-Ferrous Metal Mining Company (CNFMM), attempted to acquire a 52% stake in Lynas. In return the Chinese firm would secure funding for development of Lynas' Mt. Weld mine, the largest single deposit of rare earths in the world. However, after an extended review by the Australian government's Foreign Investment Review Board, CNFMM rescinded its offer when the government requested a number of changes to the deal before it would be allowed to go through — in particular that the proposed percentage ownership to be held by CNFMM be less than 50%.

These are just two examples of Chinese attempts to develop and secure rare earth supplies; similar cases have occurred in Brazil, Malawi, the Philippines, South Africa and elsewhere around the world.

In addition to mining operations, Chinese firms have also sought out and acquired the downstream, value-added manufacturing firms elsewhere in the supply chain. In 1985, General Motors founded Magnequench to fabricate neodymium iron-boron magnets and other components for munitions and military equipment. This company developed the methods to mass produce rare earth permanent magnets for the primary applications we use today: miniaturized motors, generators, audio speakers, and sensors.

This company was sold in 1996 to the Sextant Group, which was owned by two Chinese SOEs: San Huan New Material and the China National Non-Ferrous Metals Import and Export Corporation. Though the head of Sextant had promised to keep Magnequench open in the United States, the company was shuttered in 2004, and all of the company's machine tools, computers, and other equipment were sent to China, leaving hundreds of U.S. workers jobless. The loss of the intellectual property developed and utilized by Magnequench essentially terminated the lead held by the United States in the rare earth permanent magnet industry.

More broadly, China's rare earth oxide production dominance has resulted in the dismantling of the United States' rare earth supply chain in two ways. First, by establishing export restrictions on rare earths, China can effectively set two prices: one for rare earth buyers inside China and another for buyers outside China. As export restrictions continue to tighten and encompass a growing range of products, there is an added implicit threat: not only is it cheaper for companies in China to buy rare earths, companies outside China may not have access to them at all. Second, simply by being the largest single marketplace in the world, China has enormous leverage over companies looking to sell their products. Often the most effective means of selling cars or televisions in China is partnering with a domestic Chinese firm and accepting the associated risk of unintended technology transfer.

The pattern has been too consistent to ignore. In the last year, both Nissan and Toyota have indicated they will move some electric motor and battery manufacturing to China. Honda has said it plans to move electric motor manufacturing plants to the China for the first time. Showa Denko, one of the world's leading rare earth alloy manufacturers, is establishing production in China and leading neodymium iron boron magnet manufacturer, Hitachi Metals, is reportedly considering establishing Chinese production. Even General Motors is only allowed into China's market on the condition that it establish a venture with China's largest automaker to jointly develop an electric vehicle for sale in China.

Raw Materials and Politics by Other Means

Many of these market perturbations may have gone largely unnoticed if not for an international incident that occurred off the coast of the Senkaku Islands in September of 2010. Two Japanese Coast Guard vessels attempted to stop and inspect a Chinese fishing trawler in disputed waters. The Chinese captain refused and attempted to flee, colliding with both Japanese ships in the process. The trawler was eventually stopped, and the captain and crew were detained.

In response, the Chinese first demanded the release and return of the trawler's crew. When the request was denied, China broke off all high-level diplomatic communications with Japan and cut off shipments of rare earths to Japan. While the "embargo" was officially denied by the Chinese government, the impact was immediate: suddenly an obscure set of elements were headline news and maintaining a reliable supply was a national security necessity. Furthermore, this action highlighted a critical supply chain vulnerability, making abundantly clear that Chinese dominance in rare earths poses an economic and national security concern for U.S. allies — and the United States itself.

General Characteristics of the REE Market

Overall, the REE market contains high barriers to entry, lacks transparency, astronomically high start-up costs, and reflects relatively small demand when compared to commodities such as copper. The Department of Energy's 2011 Critical Materials Strategy addresses the lack of transparency in the REE market, citing internal industry characteristics as the root cause. Rare earth oxides (REOs) are not traded on major exchanges, so transactions tend to occur between independent parties and are therefore not formally recorded. The characteristic opacity of the market creates price volatility, which has been cited as more concerning to investors than higher prices. Adding to market uncertainty is the inability to predict Chinese political moves that affect REO supply and, in turn, price. This, of course, was the case when the Chinese announced a 40% decrease in REO export quotas, causing REO prices to skyrocket. China's future REO supply is also unclear due to a lack of information on reserves, future consumption, and production capability.

The 2011 Critical Materials Strategy also addresses the capital required to break into the REE market. At a rate of nearly \$50 million for just the exploratory stage, market entry is extremely challenging. In such a small market, worth only about \$3 billion in sales for 2010, prospective suppliers are particularly challenged by market uncertainty.

The U.S. REE market in particular faces supply chain uncertainty that, with new domestic production, could result in strengthening Chinese industry. Even with new domestic production of rare earths and processing to rare earth oxide, limited capability exists to process such oxides to alloy, metal, and magnets. Without such capability and with uncertain commercial demand for value-added rare earth products in the United States, it is possible that much of the new domestic production could be destined for export to China and Japan. As the U.S. rare earth supply chain has atrophied, much of the production of rare earth containing products has already migrated to Asia, ultimately limiting the users of rare earth products by U.S. manufacturers, who instead tend to import rare earth products.

In examining this global issue, it is important to address the actions U.S. allies have taken to address the REE market and dominant Chinese control. The WTO and the European Union (EU) have been particularly active in supporting U.S. rare earth interests and have repeatedly

pressured China to lift its export restrictions and comply with international trade obligations. In July 2011, the WTO, with support from the United States, the EU, and Mexico, issued a ruling affirming that China violated global trade laws when it restricted export of a variety of non-rare earth materials. The EU's European Commission issued a raw materials strategy of its own in an effort to sustain a global supply of these materials for the future.

It should also be noted that a WTO case for rare earths and other materials is not a panacea. While an expectation certainly exists for countries to comply with their WTO obligations, a successful trade case does not necessarily benefit all parties equally. For example, a WTO case requiring removal of export quotas on rare earths might drive down global prices, which would benefit consumers of rare earths. However, this downward price adjustment might dissuade non-Chinese companies from entering the market, preventing further diversification of sources of REE supply.

Other Strategic & Critical Materials with Similar Trends

Within mainland China, there are a host of other materials which have tended to follow this trend of increasing export quotas and even WTO action. One such material, which was formerly mined in the United States, is fluorspar.

Fluorspar comes in two grades based on the concentration of calcium fluoride (above or below 97%), with China accounting for approximately 50% of world production. The highest grade, acid-grade, "is the primary feedstock for the manufacture of virtually all fluorine-bearing chemicals and is also a key ingredient in the processing of aluminum." (U.S. Geological Survey) This material has previously been the subject of study by several Department of Defense (DOD) reports regarding material shortfalls during peacetime supply disruptions, and DOD recently identified it as a Top 10 material shortfall based on planning assumptions. (*Strategic and Critical Materials 2011 Report on Stockpile Requirements*)

Responsibility for fluorspar is also under the same Chinese agency as rare earths, the Ministry of Industry and Information Technology (MIIT). In a September 2011 article in the Shanghai Securities News, MIIT released an interim planning document labeling fluorite (the mineral form of fluorspar) a "non-renewable precious resource" and implemented controls to deliberately decrease production, year over year, "for the protection of resources [and the] environment."

While government agencies highlighted the criticality of fluorspar, major foreign end-users, like Solvay S.A. (Belgium) and Arkema, have begun negotiating exclusive off-take agreements or outright purchasing mines to guarantee supply. U.S. companies have been slow to move on this issue. Such is the vertical integration of most of the industry that perhaps only 700,000 to 800,000 metric tons of fluorspar was freely traded in 2010.

Although more commonly affiliated with pencils, graphite is another material with exciting new potential applications for both the consumer electronics and clean energy fields. Presently, the

main U.S. applications involve the steel industry, but lithium-ion batteries in hybrid and electric vehicles promise to be a major driver of future graphite demand. For defense purposes, graphite is also an ablative material for missiles and bombs, is a lubricant for small arms ammunition, and is used to produce ceramic armor tiles. Nuclear reactors also use high grades of graphite, and this use is the subject of increasingly intense development in China as the country attempts to diversify its energy portfolio.

The most exciting new, potential use of graphite is based on a form of it called graphene, a single layer of hexagonal rings of carbon. Discovered in 2004, graphene is the thinnest material ever developed, is 200 times stronger than steel, and conducts electricity and heat better than copper. Some have touted this as the material that may replace silicon-based electronics, enabling advanced products like a high-definition television as thin as paper or a full-size digital newspaper that could be folded to fit in your pocket.

Approximately 73% of global production originates in China and about 77.5% of global reserves of graphite are located in China (U.S. Geological Survey).

Another element, vanadium, has seen a dramatic spike in world-wide demand owing to a relatively minor change in China's building codes. In 2005, China began requiring new buildings to use certain types of steel rebar that contained vanadium, which increases steel's strength. This one change created a 40% increase in world-wide vanadium demand practically overnight and is yet another material of increasing importance to development of the Chinese economy.

In addition to these actions in the rare earth market, China identified five strategic materials as reserve priorities for the country. As reported by the China Economic News, these materials included cadmium, cobalt, copper, manganese, and petroleum. The combined cost of this Chinese stockpile is approximately \$2.7 billion and most notably includes both fuel and non-fuel resources — like combining the Strategic Petroleum Reserve and the National Defense Stockpile. What makes these commodities unique is that none of them appear in great quantities in mainland China.

Chinese Resource Policy for Materials outside Mainland China: Future Action?

Where the trends in the rare earth market have been described as manipulative or predatory, a better description is, perhaps, a "China first" policy, namely, protecting Chinese-based miners and manufacturers at the expense of global competition to retain overwhelming market share. This motif, if not necessarily the method, is repeated for several other commodities not predominantly found in China.

This is not to necessarily say that the acquisition of these materials overseas is part of deliberately executed strategy orchestrated by the Chinese government —though one could be forgiven for thinking so considering China's "Going Out" Strategy (1999). However, the cumulative result of the profit motives for Chinese SOEs and the supply chain worries of the Chinese government is, in effect, a de facto effort to gain exclusive access to strategic and

critical materials necessary to fuel Chinese economic growth.

This strategy also may not necessary be as overt as was evidenced by Magnequench and other activities. Considering that Chinese GDP growth had consistently remained in the double digits for several years with the financial crisis being a significant outlier, the shift in mid-2010 to consistent single-digit growth as part of a state policy to limit asset price increases and constrain inflation will necessarily affect commodity prices. Short-term speculation about Chinese monetary policy aside, elevated interest rates and other limitations on construction will place structural obstacles to the consumption of strategic and critical materials in China. Though this might be interpreted as a welcome reprieve, more likely it will return to the quiet acquisition policy mirrored in the pre-Senkaku period of the rare earth industry.

One of the areas already addressed by this Commission is Chinese investment in the energy sectors of South America, Africa, and elsewhere. This has played an important role in U.S. foreign policy and United Nations action addressing the humanitarian crisis in Darfur and other areas. Again, the mixture of profit motives by Chinese SOEs and strategic and critical resource risk plays an important role, in addition to a larger trend of attempting to separate business from local politics.

On the other hand, metals have not received nearly as high a public profile, despite increasingly similar trends. Among these commodities, cobalt is among the more noteworthy strategic and critical materials. Typical applications for cobalt and its alloys are the turbine blades for jet aircraft, orthopedic implants, and prosthetic limbs, among others. Approximately 46% of global reserves are located in the Democratic Republic of Congo (DRC) (U.S. Geological Survey), and many companies are reluctant to invest due to ongoing instability in the country. The Dodd-Frank Financial Reform legislation also has an additional reporting requirement for only U.S.-listed companies to certify that their products are “conflict free”, specifically with regard to the DRC.

However, approximately 90% of China’s imported cobalt originates in the DRC and neighboring Zambia, with the flagship agreement between China and the DRC known as Sicominex — Sino-Conglais des Mines. This joint venture between three Chinese SOEs (68% share) and the DRC state mining company (32% share) was funded by loans from the Chinese Export-Import Bank, separate SOE. Six of the nine billion dollars for this deal was allocated for infrastructure improvements with the other three used to upgrade the mining facilities. This agreement would allow for the extraction and shipment of 10.6 million tons of copper and 626,629 tons of cobalt to China, and in the event that profits from the mining operations were insufficient, China has demanded guaranteed repayment of its infrastructure investments. Among the concerns raised by advocacy groups and others include environmental compliance and transparency, especially in light of government corruption and a poor security environment.

This combination of joint ventures and state-backed loans is just one of the main methods used by Chinese firms in the bid and proposal process to developing countries when negotiating mining agreements. However, another tool often used by Chinese firms with more established

foreign firms, many of which badly needed capital through the 2008-09 financial crisis, is to take an equity stake in the company.

South Africa produces almost 40% of global chromium ore, and chromium has no substitutes in the use of super alloys, stainless steel, and other defense products to increase metal hardness and corrosion resistance (U.S. Geological Survey). Since 2005, multiple Chinese companies have taken an equity position in or formed joint ventures with South African chromium miners and ferrochrome processors, including Sinosteel (50% of a joint venture with Samancor; 60% holding in Asa Metals) and Jiuquan Iron & Steel (also known as “Jisco”; 26.1% holding in International Ferro Metals [IFM], with off-take of 50% of ferrochrome production). When asked about some of these activities on the part of Chinese mining companies, a senior economist with the South African Department of Mineral Resources insisted that South Africa is a free market, but the United States should “be more aggressive like the Chinese.”

Unfortunately, this pattern is slowly repeating itself for a number of metals across the African continent, some of which simply do not occur in economically viable deposits elsewhere in the world: platinum group metals, manganese, tantalum, tungsten, vanadium, titanium sands, and others.

With this being said, there is significant backlash to the increasing Chinese presence in Africa. The primary grievances can be categorized as follows: (1) Chinese companies importing labor instead of hiring host nation personnel; (2) quality control, sustainment, and environmental compliance on infrastructure projects; (3) Chinese laborers tending to remain in country after completion of the project; and (4) labor-management conflict.

Concluding Observations & Geostrategic Consequences:

Recalling the Logic of Strategic & Critical Materials of this testimony, the case study of rare earths has shown an increasing tendency by the Chinese government to control production and exports to first gain a dominant position and then, once achieved, extract rents from the United States and the rest of the global market. Similarly, when considering those strategic and critical materials not predominantly concentrated in China, Chinese SOEs, sometimes with financial guarantees from the Chinese state, are working towards gaining a similar foothold in a variety of niche commodities.

The question remains, then, “How does this actually shape the geostrategic reality the United States and our allies are likely to face in the coming decades?”

The first and most obvious area where this will have an impact for the United States is the purely “economic” field. The basic availability for certain strategic and critical materials will be significantly reduced in the near future if current trends continue; this is the view of most experts in the rare earths field, increasingly in the metals arena, and even within parts of the U.S. Government (see the Department of Energy’s 2011 Critical Materials Strategy). This does not necessarily mean that these strategic and critical materials will be completely unobtainable,

but U.S. companies would be fiercely competing against the rest of the world's manufacturers for raw materials at artificially high prices. Those countries with direct, cheaper access would necessarily have a competitive advantage that does not bode well for U.S. companies.

The current status of the green technology market shows some of these trends, as major applications like wind turbines and hybrid cars rely on rare earth materials and specialty metals. Increasing raw material costs have encouraged many companies to shift their manufacturing bases from their home countries, including the United States, to China. In so doing, they no longer incur the extra costs associated with shipping materials to the manufacturing facility and other export duties and value-added taxes. However, as a part of this transition, China has required the foreign firms to form a joint venture with a local Chinese company and transfer some of their proprietary technology.

There is a close link between these economic consequences driven by strategic and critical materials and the defense market. One very real recent example bridging these two distinct realms is receiving increased collective attention from Congress and the Administration: the General Electric-Aviation Industry Corp. (AVIC) joint venture. This joint venture would supply avionics for China's planned commercial airliner to challenge the Boeing 737 and Airbus A320 families, but AVIC is also a SOE that produces fighters, bombers, and 90% of the aviation weapon systems used by the Chinese military. Other items that bridge the civilian and defense sectors include the most recent National Defense Authorization Act, which required an analysis of and mitigation steps for counterfeit electronic parts in the defense supply chain.

However, the question to which I believe the Commission would like at least a partial response addresses how strategic and critical materials policy might affect the security of the United States and our allies. China truly shocked the world with its aggressive behavior over the Senkaku Islands incident with Japan. In short, the economic leverage derived from strategic and critical materials policy, which is at best an anticompetitive nuisance, has the demonstrated potential to be translated into diplomatic leverage to build the case for the territorial gain — or ultimately present less powerful neighboring states with a fait accompli without alternative.

Similar such events are, unfortunately, increasingly likely with multiple regional claimants, but so long as careful steps are taken to avoid unnecessary confrontation and especially escalation, this should be a manageable risk. This is one of the many reasons why the President's strategic focus on East Asia — as outlined in the DOD's new Defense Strategic Guidance — is most welcome.

Under a truly worst-case, lowest-probability scenario which would mirror U.S. policy prior to our entry into World War II and longstanding Japanese export policy, China could perhaps threaten to prohibit or actually prohibit the export of raw materials or other finished products which it deemed included in "offensive weaponry" or in support of "offensive military action" around the world. Considering the early reports from the counterfeit parts legislation, the prevalence of raw earth materials in U.S. weapon systems and platforms, and other investments by SOEs in strategic and critical materials around the globe, such a scenario would

present extreme supply challenges to the United States and our allies.

However gloomy this may sound, there are a number of U.S. Government agencies slowly realizing the importance of strategic and critical materials policy in economic and national security terms. That said, in the absence of a deliberately thought-out plan, inactivity has become our plan, and domestic industries and the ability to manage our supply chain are fading.

In closing, I wish to offer several policy-based recommendations that may begin to better formulate a national strategic and critical materials policy. These recommendations should be immediately considered by committees of jurisdiction within Congress for potential inclusion in future legislation, and I believe they will bring us one step closer to the realization that Chinese policymakers have already internalized: the intersection of national security, economics, and resource policy.

Recommendations:

1. Require a U.S. government-wide definition of “strategic and critical” materials, and encourage a common definition with key allies.
2. Require Federal agencies to use existing tools to incentivize strategic and critical materials extraction and manufacture in the United States, including but not limited to the following: stockpile arrangements (traditional, off-take, vendor-managed inventories, buffer stocks); Defense Production Act (Title III) use; grants, tax credits or other incentives; and streamlined permitting between the states and Federal government and among Federal agencies.
3. After failing to meet in 2010 and thus failing to comply with 10 U.S.C. §187(b) and 10 U.S.C. §187(c), require the Department of Defense’s Strategic Materials Protection Board to issue recommendations.
 - a. This statutory model should be copied across the Executive Branch to generate information required to feed an interagency working group.
4. Acknowledge that Reduce, Reuse, Recycle, and Substitute alone, however politically palatable, is a woefully inadequate policy to address strategic and critical materials policy because it tacitly embraces current market conditions, thereby encouraging states to follow what have been described as predatory practices in the rare earth market.
5. Create a strategic and critical materials development fund to foster the development and manufacture of United States and allied nation-based strategic materials for the U.S. defense market to offset high barriers to entry, long-lead times, and foreign predatory practices.
6. Pursue World Trade Organization (WTO) action with the European Union, Japan, and others to bring about successful Chinese compliance in line with our common WTO obligations.
 - a. Require the U.S. Trade Representative to issue a report on China’s compliance

with WTO obligations specifically related to strategic and critical materials.

Thank you for this opportunity to speak, and I look forward to your questions.

Panel III – Questions and Answers

COMMISSIONER BLUMENTHAL: Thank you very much for coming here and also offering some very useful and fascinating testimony.

I suppose this is a question for Ms. Forbes and Mr. Herberg, in particular, but it's striking that some of the numbers on U.S. production and now export of oil and gas, I guess, is a development that all of you saw, but to the layman, you know, it's pretty striking and pretty incredible.

I'm wondering what could be done or is being done to make this really beneficial for U.S. business and U.S. workers, particularly with regard to China? You mentioned a little bit about business opportunities for increasing technological know-how, but I guess a two-sided question.

One is, Mr. Herberg, you mentioned the fact that we may be in a competition in the Persian Gulf, but how could this over time, if the U.S. is actually exporting a lot of its oil and gas itself, how does this affect the Persian Gulf and the U.S.-China competition in the Persian Gulf?

And the second question is do you see possibilities for large-scale exports of U.S. natural resources to China? As I say, the question is for both of you.

DR. HERBERG: Well, I think the U.S. export of energy issues is a little complex. We have become a net exporter of oil products--gasoline, diesel fuel, other--partly because demand has slowed down so much in the U.S. from the slowdown. But on a net basis, we're still importing half, roughly half, our oil supplies. What that means is that we're importing nine million barrels a day of crude. We're producing somewhere around ten. When it all gets processed and refined, some of that goes abroad because we don't need quite that much.

So technically we're a net exporter of products, but we're still, on an overall basis, an enormous importer of oil.

The competition in the Gulf that I'm thinking of is--frankly, we get very little of our oil from the Persian Gulf. I mean China gets a much larger percentage. I think the competition is for influence, diplomacy and that kind of thing in the Gulf. The obvious case is Iran where they're involved deeply for their reasons. We have obviously huge stakes. We disagree about how to handle the Iranian problem and therefore we're at odds on that.

COMMISSIONER BLUMENTHAL: I guess my question is given the energy outlook and given natural resource outlook here in the United States, and projections that that might grow, and I don't know if you agree or disagree with those projections, does the Gulf become as important to us, and particularly, I guess I took your comment beforehand as U.S. companies are going to be competing with Chinese companies for--I understand the diplomatic piece of it and so forth--but for oil and gas deals. But how intense is that going to be over the next five, six, seven, eight years if we really develop natural resources here?

DR. HERBERG: Yeah. I think you have to separate the competitive side of it from the market. I think our companies do face a lot more competition, and they're getting competition from producer country national oil companies, consumer countries like China, from service companies working directly with the producer countries, so the IOCs just basically get cut out.

I think the companies face a lot of competition. What all this means

for the marketplace, U.S. probably will become a large exporter of natural gas LNG because assuming the shale resources are what we think they are, and regulatory issues get sorted out, safety and other things.

It looks like our oil production will be rising for the foreseeable future with this domestic fracking of tight oil supplies, the Bakkan and those areas.

But I think in the overall marketplace, we're still going to be importing. You know, if it's 40 percent or 50 percent, does that matter really in our dilemma? And in the Gulf, what that means is it's vitally important to us what happens in the Gulf even if we import zero barrels from the Gulf because it's the global market. Cutoff of any supplies from the Gulf are so significant that prices respond.

You don't get disruptions that make you not have barrels. It goes up in price. That's the phenomenon. So even if we import no barrels from the Gulf, that's still a vital strategic national interest to us, what happens in the Gulf, and the same for China, and this is where we have common interests that are profound, and the difficulty is getting over the level of distrust we have to see those common interests.

I don't know if I've answered your question very well.

COMMISSIONER BLUMENTHAL: Yeah. Would you let Ms. Forbes answer, Chairman?

HEARING CO-CHAIR SLANE: Yes, please.

COMMISSIONER BLUMENTHAL: Okay. Maybe you have some comments as well.

MS. FORBES: Sure. I'll take your second question first, and that was is there a possibility for large-scale exports of U.S. natural gas to China?

COMMISSIONER BLUMENTHAL: Or oil and gas.

MS. FORBES: Oil and gas. So I've looked specifically at shale gas, and it's really too soon to tell I think. Right now, China is getting LNG from a number of sources. I understand the cheapest to be from Australia. Will U.S. gas, shale gas converted to LNG and exported through our terminals, be competitive with Australian LNG? Could be. And I think it's an interesting dynamic to watch, and it will, of course, interplay in terms of with what happens to China's shale gas market and the timing with which that develops, which is, of course, uncertain.

COMMISSIONER BLUMENTHAL: Quickly. So China's investment in some of the stakes in Chesapeake and Devon is, I mean presumably, commercially, at least, we have, or economically, we have some interest in that because it could expand, well, not only investment here, but expand the worldwide production of oil and gas; right? I mean is my logic--am I following the logic here or?

MS. FORBES: Yeah. So, China's investment in the U.S. companies, I'd like to make one important point. It's not company ownership. It's investment in specific plays and specific projects, and that's been really important in the United States because you have companies that are short on capital. They don't have the funds needed to drill the wells and do the operations. The leases are expiring, and so that capital coming in from China, from the U.S. perspective, from the companies themselves, has helped them continue the operations.

COMMISSIONER BLUMENTHAL: And the China interest in that is?

MS. FORBES: The China interest in that is both participating in what can be a lucrative market, but also in gaining some experience and understanding in how to operate a shale gas site. So I understand that there have been some cases where they've been invited to be on site and see how these projects are managed from the management perspective.

COMMISSIONER BLUMENTHAL: Thank you.

HEARING CO-CHAIR SLANE: Commissioner Reinsch.

VICE CHAIRMAN REINSCH: Thank you.

Dr. Herberg, I want to pursue for a minute one of the comments you made about Chinese policy of acquiring resources as opposed to barrels, if you will, on the open market, and the implications for the market.

I think your testimony more or less takes the prevailing view that that's not likely to have a big impact for the reasons that you state.

It seems to me that's an analysis that's correct for a market where demand and supply are roughly in equilibrium or where supply is increasing rapidly enough to accommodate increasing demand.

What about a different scenario? What about a scenario where demand is accelerating rapidly post crisis, particularly in China and India, and supply is relatively flat? I'm talking primarily here about oil and not gas. Supply is relatively flat. I guess two questions. One, is that a completely farfetched scenario, in which case maybe we shouldn't bother talking about it? But if not, does your analysis still hold in that set of circumstances?

DR. HERBERG: I think that's a plausible case. It's certainly a plausible case, and if you look at the IEA, latest IEA forecast, they're really worried whether the investment is going to be made in the key producing cases fast enough to meet rising Asian demand. Asia accounts for 70 percent of the demand growth today in the oil market, most of that China.

So if you get into a very tight market, prices rise. From the perspective of China and its equity stakes and its ownership of oil around the world, take the numbers. They import five million barrels of oil a day now out of the ten that they consume. They have equity production of about one-and-a-half million barrels a day, which has taken them a decade to accumulate.

Import demand is rising at 400,000 barrels or 500,000 barrels a day per year. The math doesn't work out. They're going to depend on contract barrels that come from Saudi Arabia and elsewhere just like everybody else, and so they are going to depend on the stability of that market. They'll pay the high prices that we all pay because the market is really out of balance.

Owning those equity barrels doesn't solve their problem. And it's not enough; those are not enough barrels, one-and-a-half million. 50 plus million barrels a day cross borders everyday in international oil trade. So it's just a very small portion, most of which doesn't go back to China today anyway.

VICE CHAIRMAN REINSCH: Well, not now. I guess the question is in this scenario they might.

DR. HERBERG: In the scenario, they could mandate that to come back to China. It wouldn't fit very well in their refineries in most cases, but I can't see that in a market that big, that liquid, that dynamic, that transparent, that those barrels can help them. It's the market, you know. It's that shortage.

It's the supply-demand problem that is really--

VICE CHAIRMAN REINSCH: Right.

DR. HERBERG: You know, whether they have those barrels or not, they're going to pay \$200 a barrel or whatever the market is whether they have those barrels or not.

VICE CHAIRMAN REINSCH: Okay. Thank you.

Mr. Green, in the remaining time, I just have a quick question for you, and maybe we'll have another round later on. You referred to, in rare earths, in particular, the administration's proposal for more trade enforcement against a variety of things that the Chinese and presumably others are doing although we're primarily interested in the Chinese.

As I recall, the administration has already brought a rare earths case against the Chinese in the WTO, which has been moving along. I think we won actually at the initial stage.

CHAIRMAN SHEA: Raw materials.

VICE CHAIRMAN REINSCH: I think rare earths were included; weren't they?

MR. GREEN: No, Commissioner. Rare earths are being investigated now.

VICE CHAIRMAN REINSCH: Okay. It's underway now.

MR. GREEN: Yes.

VICE CHAIRMAN REINSCH: Okay. So that one is ongoing. We'll see how it turns out. What else should the United States be doing in the trade enforcement area in this sector?

MR. GREEN: Thank you for the question, Commissioner.

I think the WTO action is likely the primary avenue. One thing that we need to recognize going into this is that the Chinese will have two strong arguments against the trade case: the preservation of scarce natural resources, as well as their reliance on this for their own industries and their military technologies.

It's very unclear to me whether this trade case will parallel the first case. It's a very difficult situation for consumers and companies who have business interests in China to step up and provide the government with detailed information about the very opaque rare earth market.

With the commingling of business interests between U.S. and Chinese suppliers in this particular market where many of these businesses are reliant on the Chinese to access the raw materials to continue production, there's a disincentive in the market to come forward on these trade issues. It's made it very difficult to gather information.

VICE CHAIRMAN REINSCH: So, right, we've had other hearings about this, but very quickly, let's posit for a moment that we lose. Then what do we do?

MR. GREEN: Well, this goes to my primary focus, which is creation of industry, creation of capability, at a minimum to support our national security.

VICE CHAIRMAN REINSCH: So the remedies are domestic policy, not trade policy, at that point?

MR. GREEN: It would be ideal to solve the trade policy issues. I'm not sure that that's going to happen.

VICE CHAIRMAN REINSCH: Got it. Thank you.

HEARING CO-CHAIR SLANE: Commissioner Wortzel.

COMMISSIONER WORTZEL: Thank you all for being here. I'm going to follow a little of Commissioner Blumenthal's line of thinking because in your testimony, Dr. Herberg, you talk about the desirability of Chinese investment in shale plays and basins here, and Ms. Forbes, you also seem to think that that's a good idea.

I guess I'm skeptical so I'd ask you, in your judgment, is this investment activity on the part of the Chinese to hope in the future for assured exports or is it to learn techniques and, essentially, as they have done in some other areas, steal intellectual capital by observing, or is it just for profit?

And then, second, Dr. Herberg, you point out that the national oil companies in China are really state instruments, and you want them to free up, be freed up in the marketplace, but if they are state instruments, why do we want them to be in projects in U.S. shale plays and basins if they're not competitive companies?

DR. HERBERG: That's a fair question. My view is that we need these companies to be in transparent markets where they have to operate like other international companies, where they're forced to divulge, their operation be transparent, and to me, one of the worst things that happened was the CNOOC-Unocal episode which sent the message to Beijing that we don't want their investment, that they should, you know, and they said fine, we'll go to Iran, we'll go other places.

So I think what we want to do is say our market is open as long as you're competing on a level playing field. They don't need state support to invest here. That's not part of the package here. So I think it's an important part of making these companies more international responsible companies.

The export issue, I think they just--the shale issue, they want to learn the technology. They want to learn heavy oil technology. They want to learn LNG. They want to move up that technology curve for their own development.

MS. FORBES: One of the things that I'd like to emphasize is the basic drilling and fracturing technologies are really quite uniform. Companies all over the world use the same technologies. The U.S. companies, particularly the service providers in the shale gas industry, have a very specific, unique advantage because of the experience in drilling and producing shale gas from a variety of basins here in the United States.

There's a lot of know-how that goes into really doing, how do you do the hydraulic fracturing to maximize the flow, to make the production work in that particular basin and play.

The situation and the geology in China is not going to be exactly the same as the geology in the United States. One key question is, is the shale gas industry in China going to develop in the same way that the offshore industry in China did where joint ventures are very common, and they often bring in foreign service providers to do the services, or will it be more similar to the onshore oil industry, which has relatively fewer joint ventures?

The opportunities for U.S. companies are also not limited to oil field service providers. If you think about the previous panel on water, the U.S. has

really pioneered water treatment technologies in really solving some of the problems with the wastewater streams that are created, and there are opportunities for those companies as well.

As far as really getting to the bottom of how U.S. companies are viewing the investment of the Chinese companies, I do encourage the Commission to talk to the U.S. companies. I've read some of the statements that these U.S. companies have made, and it seems to me--and I've talked to a number of professors at different universities who have worked on this issue--and my understanding is that it really is a matter of capital, and that the capital from China is helping the production proceed in what's a really constrained environment right now in the U.S. with the low natural gas price.

COMMISSIONER WORTZEL: Thank you.

HEARING CO-CHAIR SLANE: Chairman Shea.

CHAIRMAN SHEA: Thank you.

Mr. Green, just to clarify, the U.S. won a WTO case with respect to Chinese export quotas on raw materials, and the question is whether such an approach could be successful and replicated with respect to export quotas on rare earths; is that correct?

MR. GREEN: That's correct.

CHAIRMAN SHEA: Okay. Now, Ms. Forbes, this is following up on Commissioner Wortzel's question and, I think, Commissioner Blumenthal's question. You have--on page five of your testimony, you have a very helpful list of all the recent Chinese investments in U.S. oil and gas lease holds and in projects here in the United States.

Now, then, on the next page, you talk about opportunities in China's shale gas market. You basically just talk about U.S. companies providing like servicing, entering into servicing contracts. Can U.S. companies invest in China just as the way these Chinese companies are investing in the United States?

MS. FORBES: So, first of all, I'd like to clarify that list is specific to shale gas.

CHAIRMAN SHEA: Right.

MS. FORBES: Not oil and gas broadly.

CHAIRMAN SHEA: Right.

MS. FORBES: There are joint--Shell and BP have formed joint ventures for shale gas in China with PetroChina and Sinopec respectively. Right now we have not seen U.S. companies entering joint ventures specific to shale gas. Possible, but it hasn't happened.

CHAIRMAN SHEA: We heard testimony this morning that U.S. companies can't invest in the rare earth mining and processing market in China. It's sort of off limits to non-Chinese companies. Are you suggesting that this is a potential opportunity for U.S. companies in the shale gas sector in China?

MS. FORBES: I believe so. I can do more analysis and get back to you, but my understanding is that these majors, these international majors, are forming joint ventures. I don't see why a U.S. major or a U.S. company could not form a similar joint venture and operate as a joint venture with a Chinese national oil company.

CHAIRMAN SHEA: Okay.

DR. HERBERG: You have to joint venture. I think you can't do it

independently, but you do have to joint venture, but I think the opportunity is there.

CHAIRMAN SHEA: Okay. Well, Dr. Herberg, you mentioned two things: Iran and I think the Malacca issue. Let's do the Malacca issue. Do you think there's any opportunity for the Chinese to solve the Malacca dilemma or is that just something they're going to have to deal with in perpetuity?

DR. HERBERG: I think so. What they call the "Malacca dilemma" is really a code word for U.S. control of the sea lanes and the need--

CHAIRMAN SHEA: Right.

DR. HERBERG: --for Chinese oil and gas to go through those straits.

CHAIRMAN SHEA: Right.

DR. HERBERG: You can go Sunda, Lombok. There's a whole bunch of them, but they're all basically controlled by the U.S. Navy, the Indonesian, Indian, whatever, and they can't solve that because all of their incremental oil imports are going to have to come basically from Africa, the Middle East. They'll get some from Central Asia and some from Russia.

CHAIRMAN SHEA: But it won't compensate for what they need.

DR. HERBERG: But it won't. The bulk of it will still have to come by sea, sea lanes from Africa, mainly Persian Gulf, because demand is just growing too fast, and production is basically flat. So every two years, they add a million barrels a day to their import load, and there's only a few places to go for that scale of contract barrels--Persian Gulf, Africa, other places.

CHAIRMAN SHEA: Now, Iran. I guess I have one more minute left. We heard testimony last year that the U.S.--from Dr. John Garber, Georgia Tech--

DR. HERBERG: Yes.

CHAIRMAN SHEA: --who said that the U.S. government is very shy about sanctioning under the various sanctions regimes the large Chinese oil majors with respect to their business activities with Iran, that that would be politically very difficult to do.

So I'm reading, as you mentioned, Ms. Forbes, Sinopec investing in five gas, oil and gas projects in the United States. They're doing some business with Iran. I mean help me figure this out.

DR. HERBERG: They're buying a significant 500,000 barrels a day of Iranian crude on contract. Two companies have large oil development field projects possible, potential. They have those deals, but they're dragging their feet.

Yadavaran is a large one Sinopec has. CNPC has Azadegan North and South. But they're dragging their feet on this, and the Iranians are now getting frustrated. Why are they dragging their feet? I think they're getting guidance from Beijing that we don't, we've got enough trouble with the U.S., enough issues. We'll continue to buy crude, but let's not push on the investment pedal, which would really be provocative, I think, and make it difficult for the administration not to do something about it.

So I think it's a very delicate thing going on in Beijing trying to measure that. Companies have had the opportunity to go forward with the Iranians, and they're dragging their feet. They're not moving, to Iranian frustration.

It's hard to know exactly what's going on behind the screen though.

CHAIRMAN SHEA: Thank you very much.

HEARING CO-CHAIR SLANE: Commissioner D'Amato.

HEARING CO-CHAIR D'AMATO: Thank you very much, Mr. Chairman.

I've got a couple of questions for Mr. Green and also for Ms. Forbes. Mr. Green, first of all, I want to commend you for your very workmanlike testimony. This is meaty in detail, and it's disturbing. I find it very disturbing testimony.

As I understand it, what you're saying is the U.S. is highly vulnerable to disruption of foreign sources of minerals and rare earths, given, for example, 61 percent of the 18 minerals upon which we are 100 percent import-dependent from China are produced in China. And you've described Chinese purposeful dominance of this field as nearly complete, and that's long-term leverage, which is, I think, very worrisome. There appears to be as well, as a kind of lackadaisical attitude on our part, and the Production Board within DoD didn't even bother to meet on this matter. So the idea that this is a crisis or a looming crisis is certainly not on the agenda.

I'd be very interested in having a list of specific national security problems that could arise as a result of Chinese cutoff of these critical materials and rare earths. If we had such a list of--and I would bet that we could come up with a worrisome list of things that could develop as a result of that.

The second thing, as I understand it, your answer to it is to build our own capability rather than spend all our time running around with WTO cases on the margin, but to build our own capability. And I look at your recommendations, and I see number two and number four both seem to have a lot of meat to them in terms of creation of our own capability.

Do you believe that if we put our mind to it over a period of five to ten years, we could actually overcome this vulnerability and build our own capabilities in these materials and rare earths?

MR. GREEN: Commissioner D'Amato, I think that's a terrific question. I appreciate it.

I'll be happy to provide a more detailed list of problems for the record.

HEARING CO-CHAIR D'AMATO: Yes, please do follow up.

MR. GREEN: But two come to mind. One is the propensity of the U.S. government to say we're going to reduce, reuse, recycle and substitute. That's a good long-term strategy on the margins. What that does is cede the entire lanthanide series of the periodic table to the Chinese. We've essentially taken a tool away from our engineers and our research and development community and said, well, since we don't have this, we're going to let somebody else use it, and we're not going to use the most advanced technologies in the world. We're going to try something else.

We do things like invest in technologies for which we're really leading ourselves into other supply chain problems. For example, the Department of Energy is invested in gallium technology, gallium magnet technology. Great. Promising. It may work, but you're trading a material like neodymium with 60,000 tons a year of production where we have supply problems and trading it for a material like gallium where we have 200 tons a year of production. It doesn't seem like a viable strategy to me.

Another risk, and it's probably a higher risk, of higher consequence, but lower probability, is a supply chain interruption. The Chinese have demonstrated the willingness to use their lock on the market to leverage their commercial and political interests, and that's very disturbing.

Do we have the ability to create our own capability? Absolutely. Do I think we should do it? Not on a commercial scale because I do believe in the free market. What I don't believe in is ceding our national security to foreign suppliers who are willing to use that against us.

So what I think we need to focus on is the creation of a national security strategy that ensures availability of this material. We have spent, by my estimation, roughly \$50, \$60 million in research and development to try to find our way out of this problem, to recycle, to find substitutes.

A fraction of that, in my opinion, could have established a small rare earth supply for the United States to provide a reserve for the Department of Defense, and we have worked very hard trying to get the Department of Defense to recognize this and to use this demand. They're already buying the materials, it seems to me that it just makes sense to use that demand of the Department of Defense to stimulate the development of an industry.

Now will it be competitive on the global market with the Chinese? Hopefully in time. Not up front. But it would be a strategic priority to say this is something we need. This is a risk we're going to eliminate using a large amount of money or a large amount of demand that we're already going to spend for relatively little investment. So I do think it is doable, and I do think the companies exist that can do it in the United States.

HEARING CO-CHAIR D'AMATO: Well, thank you. I think that would reduce Chinese leverage in those particular instances when it would count.

And I would ask Ms. Forbes to respond on the question of shale. Do you have any information or how would you evaluate the development of this newly formed U.S.-China Shale Gas Resource Initiative, which was created in 2009 between the President and Hu Jintao? Is that actually a viable operation? Is something going on there that's of interest or are you familiar with that? That's first.

And then, secondly, in terms of U.S. business going in to develop shale in China, are we going to be faced with the same thing we do across the board? The company goes in there to get access to the Chinese market, has to divest itself of all its technology, new technology, to the Chinese companies, who eventually will take over the operation themselves. What would prevent that kind of scenario from happening in the shale case, do you think?

MS. FORBES: Okay. Thank you.

So, first, with respect to the initiative that was launched in 2009, a limited number of forums, workshops, and a site visit have been conducted as part of that initiative. It is a platform that more could be done with, and that ties into my recommendation. So a limited amount of activity has happened. I would expect that it could be increased.

With respect to your second question, it's an important consideration. Shale gas is still in the global sense a very new thing. The know-how in terms of--most of it is know-how. It's not technology that can be patented.

HEARING CO-CHAIR D'AMATO: Right.

MS. FORBES: But that know-how is something that the oil field service providers have in the United States, and there's going to be some unique challenges as you take that technology to new geologies. So one of the--we have some experience in working with the U.S.-China Clean Energy Research Forum--Research Center, which Jennifer Turner also mentioned.

It might be interesting to think about unconventional gas and whether such a platform for joint research that includes a technology management plan that covers IP and deals with how countries can work together on joint technology might be something to consider in shale gas. It's not something I've considered previously, and I'd like to put some more thought to it. But that type of model is something that it's still early in the CERC, and we only have about a year of experience, but it might be a model that could be applied to other type.

Right now it's being done in vehicles, in energy efficiency, and in advanced coal technologies. It might be interesting to put a little more thought into whether or not that type of a platform could be effective for an oil and gas research program.

HEARING CO-CHAIR D'AMATO: Thank you. I'd be interested in learning more about your thinking on that.

MS. FORBES: Thank you.

HEARING CO-CHAIR D'AMATO: Thank you.

HEARING CO-CHAIR SLANE: Commissioner Bartholomew.

COMMISSIONER BARTHOLOMEW: Thanks very much and thanks to all of our witnesses for very interesting testimony.

One of the things that I think we try to do here is to examine conventional wisdom, which when you take it to its logical conclusion often shifts the balance of power over to China, things like you know we have to be careful what we do with China because if we upset them, they're not going to buy our bonds, those kinds of things.

So, Dr. Herberg, I have been hearing ever since the CNOOC-Unocal issue was resolved in a way that a lot of people didn't like, that it's been sending the message that we don't want Chinese investment here. And I guess I just want to offer up another possible message that it sent instead, but, remember, of course, that the Chinese would have acquired our only remaining rare earth minerals, as Mr. Green said, facility, and also cavitation technology. There were a number of national security reasons why that deal was rejected.

So I guess I'd like you to consider that the message that was sent was not we're not open for your investment because the Chinese are investing here, but that, like the Chinese, we actually do have some lines that for national security purposes that we won't cross, and in reality, our lines are so much fewer than the lines/the sectors of the Chinese economy that they fence off for national security reasons.

So when I hear that argument now, I just think, wait a minute, there's a completely different way to think about it, and I would just ask you to do that.

Mr. Green, I want to go, sort of building off of the rare earth issues, though, can you explain what your first recommendation about requiring a U.S.

government-wide definition of "strategic and critical materials," what would that do, what would that accomplish, and why is it necessary?

MR. GREEN: Well, the U.S. government, in my opinion, has been in a bit of analysis paralysis over the last three years. We have studied the issue from every angle, but we've not come up with a comprehensive set of recommendations. So the recommendation to derive a single definition is really to try to force people in the interagency-- which is a very difficult process--to actually discuss issues to try to come to a common understanding.

For example, if the Department of Energy's definition leads them down a path of substitution and recycling, that's a very different path than, say, perhaps the Department of Defense, who may view this purely as an issue required to support the construction of weapon systems, as opposed to the Department of Agriculture and the Forest Service, who's in charge with permitting on public lands. We need to be on the same sheet of music before we can have a comprehensive policy so it's a first step.

COMMISSIONER BARTHOLOMEW: One of the questions I always have is how does any of this relate to the CFIUS process, if it does? Are any of the issues that you've raised issues that would arise during a CFIUS review, and if not, would creating a government-wide definition of strategic and critical materials help ensure that they are?

MR. GREEN: Well, I do think it would help. I think we need a set of guidelines by which we all kind of are talking about the same thing.

The CFIUS point is very interesting to me. I happened to be in government at the time that the CNOOC-Unocal deal was underway, and I worked on some of the hearings. I wasn't involved in the CFIUS process, but my recollection from 2005, I don't recall one time rare earths being discussed. I've seen them referenced retroactively, and I've seen claims that this was the reason we rejected that deal, but there was a lot of talk about petroleum at the time, and I think one witness in his written testimony briefly referenced the rare earth deposits.

COMMISSIONER BARTHOLOMEW: Yeah. I actually participated in the debate at the Carnegie Endowment on this very issue, and I remember, you mentioned rare earth minerals, and people just were kind of scratching their heads like what are you talking about and where did this issue come from, and you're just crazy. So it's interesting how things come back, and just for my colleagues, I also want to mention and note that George Becker, who was a member of this Commission in the early years, actually identified the issues relating to Magnequench back in the 1990s. So I'm sorry he's not here with us to be able to see that his concerns have come to fruition.

MR. GREEN: And Commissioner, I would point out that when that Magnequench deal went through, Senator Evan Bayh was a very vocal opponent, and he urged the CFIUS process to reject that deal, and that did not happen.

COMMISSIONER BARTHOLOMEW: Thank you.

HEARING CO-CHAIR SLANE: Commissioner Cleveland.

COMMISSIONER CLEVELAND: Well, that's a perfect segue because I wanted to ask about Magnequench, and whether there are lessons to be learned from that process? When Senator Bayh opposed it, I don't recall having been in the White House in 2004, but not 1996, what was the process? Why did the deal

go forward as you describe it in your testimony?

MR. GREEN: Well, I can speak to what happened in the process. Very simply, a Chinese state entity-backed venture capital fund comes in and attempts to buy what some people considered a strategic resource.

I can only speculate on why that went through. As Commissioner Bartholomew mentioned, it wasn't on the radar at that point.

COMMISSIONER CLEVELAND: But was there a request to bring it to CFIUS, and there was no CFIUS process, or did it go through a CFIUS process? That's what--

MR. GREEN: To the best of my recollection, I believe there was a formal request made, but it did not go through the formal process.

COMMISSIONER CLEVELAND: Right.

MR. GREEN: I'll check that and get back to the Commission.

COMMISSIONER CLEVELAND: Which gets to the lessons learned. If, indeed, as you suggest, that having a common definition across agencies as to what a rare earth or a strategic mineral, metal, whatever, is, it may trigger a process more effectively. Agencies use the lack of a common definition to defeat other agencies in bringing these cases forward.

So if you were sitting in the White House back in 1996, what do you think the steps should have been or the procedures that might have raised concern about this transaction sooner? How would you have changed the process to a different outcome?

MR. GREEN: Well, Commissioner, I think the first thing that I would have done is turn to the heads of my agencies at the principal level and say how does this happen? How do you not recognize this? And I think when I was in government, working for the legislative branch, that's one of the things that my boss at the time did--Chairman Duncan Hunter of the HASC. He said how could we not know about this, and that was the genesis of the Strategic Materials Protection Board.

And that Board was chartered with--forgive the reference--the "unknown unknowns," you know, what don't we know about? And that Board was tasked with identifying what are strategic and critical materials where supply may not equal demand? The recommendation they came back with was only one critical material, beryllium, a material where the U.S. government has invested heavily. Rare earth was not referenced.

I would also note that on the rare earth issue, in the FY11 Defense Authorization bill, Congress again went back to the Department of Defense on this issue and said, okay, you've not given us a clear analysis on this. We want you to do a very specific thing: look at the global supply, look at the demand of just the Department of Defense, and identify those, whatever number of 17 materials, where we're going to have a shortfall through 2015.

That report was due in July. It has not been submitted. It was promised at the end of December. It has not been delivered. So there's clearly something going on where there's great difficulty in coming up with these answers.

COMMISSIONER CLEVELAND: Or lack of interest. Never assume great difficulty when lack of interest will--so in the process on the CNOOC, I mean I was surprised, as you draw attention to in your testimony, that Mountain Pass was

probably as much of a target of interest of the Chinese as the Unocal transaction, and all the attention was on Unocal.

How, again, looking just at the rare earth implications, what--let's take Unocal out of the picture--is it possible that that transaction could have gone forward without any kind of objection or any kind of concern because there's no legal, trade, or regulatory structure in place to prevent it?

MR. GREEN: Well, I--

COMMISSIONER CLEVELAND: That was an incoherent question.

Sorry.

MR. GREEN: No, I understand, Commissioner. I think that the process is in place, and that's what CFIUS ideally is supposed to do. The problem is if that organization doesn't have the tools with which to do their analysis, we have problems. And that's why I reference this is not just a rare earth issue; I believe we'll see this again.

When I look at materials like fluorspar and graphite and vanadium, I can predict today that unless something is done to change U.S. government policy, we're going to see these trends continue: decreased Chinese production; increased Chinese demand. If the Chinese attempt--and I think it would be very difficult right now to buy a resource in the U.S.--but if they were able to do that, and they were to buy, say, name the material mine somewhere, and nobody recognized the strategic and critical nature of it, how would the CFIUS process know to stop that?

COMMISSIONER CLEVELAND: I am old enough to remember that a large part of the reason we supported General Savimbi had to do with vanadium and cobalt and our defense industries.

Do you think there's been a decline in interest in these issues? I mean they were front and center in the debate over the Congo years ago.

MR. GREEN: I think the decline from the military side and the defense side has been a real loss of focus, and what I mean by that is the department has very much embraced, and I think in an appropriate way, the need to leverage commercial items, commercial off-the-shelf items, buy material as cheaply as we can to support the warfighter. That's terrific, but that's a top-down approach.

What's lacking in the Department of Defense is a bottom-up approach to say wait a minute, guys, there's an assumption of risk here, and when we budget, part of the budget process is to draw a line and say what is an acceptable level of risk? But if we don't know what's down there at the bottom of the supply chain, we're never going to be able to draw that line accurately.

COMMISSIONER CLEVELAND: Is there any other agency that can promote this agenda other than Defense?

MR. GREEN: I think that the State Department has been somewhat absent in this. I can recall a discussion with State in September 2010 when the response I got--and this is at low levels, mind you, where the State Department's answer was, well, we called the Embassy in Beijing, and there is no embargo. Interesting...

[Laughter.]

MR. GREEN: ...and expected. I think we need to engage at a little bit higher level, and to Secretary Clinton's credit, she has engaged, and she has

spoken on these issues, but I'd like to see the State Department more proactive.

COMMISSIONER CLEVELAND: Thank you.

COMMISSIONER BARTHOLOMEW: Could I just ask a follow-up question there?

HEARING CO-CHAIR SLANE: Yes, sure. Go ahead.

COMMISSIONER BARTHOLOMEW: Mr. Green, do people at DoD or, frankly, anywhere in the government know what materials we need for these things or how dependent we are on these materials?

MR. GREEN: Commissioner, I'd urge the Commission to ask that very question. As someone who goes in from the industry side, the answer is often no, and the answer I get is the department doesn't buy raw materials; we buy weapon systems. The implication in my mind being, you know, I don't really care where those raw materials come from, and I think that's a very dangerous precedent.

COMMISSIONER BARTHOLOMEW: Thank you.

HEARING CO-CHAIR SLANE: Commissioner Blumenthal.

COMMISSIONER BLUMENTHAL: Yes. Let me just editorialize for a second, and then I'll come back.

You know, we discuss defense supply base issues all the time, but I think we all have noticed that the Defense budget has now undergone almost, well, I guess a half-billion dollar, a half-trillion dollars in cuts, and it may go through another trillion dollar in cuts. We're going to lose the defense-industrial base of workers, maybe numbering 100,000, in every part of the defense-industrial base.

I think if I was a service secretary or the Secretary of Defense, I too would say given this environment, what I care about is that those weapon systems be saved, and if we care about other things as a nation, then we're going to fund them properly, and we're going to fund the defense-industrial base that can--because the answer to this I think in the end is, you know, marking it as a defense-industrial problem, and actually investing in ways that the market wouldn't take care for, but that's not the direction we're going, and I just would urge everybody to keep that in mind. We're going the opposite direction.

But, anyway, enough editorializing. Two questions. One is why isn't Mountain Pass and some of these other places, just from a pure market perspective, why haven't they become more developed and greater sources of supply? Everybody is deeply worried about this problem, and, yet, forget government action because we all know what, you know, government action can and can't do. But why isn't there a market response?

The second question is for Ms. Forbes. Given projections on the future of shale gas, and let's say we have policies that promote exploration and development here in the United States, what do you think the capital requirements would be for some of these plays that you've already listed? And if the Chinese didn't provide the capital, who would?

MR. GREEN: Commissioner, I'll address the why isn't there a market response? I think unpredictability in the market, in a relatively small market, has been one of the great challenges. You're talking about a \$3 billion a year global industry with about 200,000 tons roughly of global demand, compared to copper with just millions of tons of demand.

That demand primarily is coming from China with much of that

demand coming from Asia. We have lost the ability technologically to do many of the functions that we need in rare earths and other critical materials so it's very difficult to go out and open a new mine.

You really have two choices: you're going to reinvent the technology yourself or you're going to have to partner with the Chinese to find that capability.

And the last thing, I think that the market dynamics, and much of these are affected by Chinese policy, have created a really instable market for the capital markets to fund these things. If you look at price swings over the last year, we went from historic lows in 2007-2008 to historic highs in the summer of 2011.

And one thing I would point out on the WTO case--two things on the WTO case, to clarify my earlier testimony. There are two exceptions that the Chinese will use at the WTO: one is the preservation of scarce natural resources; the other is environmental protection. I just wanted to clarify that.

If the U.S. is successful creating a trade case and pressing at the WTO, that's a great result for consumers of rare earths. It will drive down the prices. It will have the opposite effect on prospective producers. These are very expensive capital projects, sometimes upwards of 500 million, nearing a billion dollars. If rare earth prices go down, it's really going to drive the number of economic projects out and delay new sources of supply.

MS. FORBES: So with respect to the projections, first of all, any projections of shale gas are uncertain. Those in China are uncertain, and if you follow the 2012 early release of the Annual Energy Outlook, you know, the projections for technical recoverable reserves in the Marcellus shale were decreased significantly. So there's always a great deal of uncertainty.

I don't have the figure in front of me for the cost per well, but one thing I would like to mention is in my testimony I talked about eight percent of the foreign investment coming from China. Well, there's a lot of other foreign investment in shale gas in the United States: coming from Norway, Statoil; from France is Total; from a number of other foreign sources, as well as domestic investors.

If you'd like more detail, I can provide that in follow-up.

COMMISSIONER BLUMENTHAL: That would be great. Thank you.
Thank you both.

HEARING CO-CHAIR SLANE: Go ahead.

COMMISSIONER CLEVELAND: Mr. Green, I shouldn't have preempted you by saying lack of interest versus a real problem. What do you think the problem is as to why they haven't provided the report? The Department of Defense hasn't provided the report?

MR. GREEN: I think the structure, the bureaucratic structure of the Department of Defense, is one of the leading problems. If you look at the structure within--

COMMISSIONER CLEVELAND: In so many ways.

[Laughter.]

MR. GREEN: I'm getting a little bit into the weeds here, but if you look at the Office of Acquisition Technology and Logistics where these issues reside, you have an Office of Manufacturing and Industrial Base who looks top

down. You have a stockpile, the Strategic Materials Stockpile Program, now DLA Strategic Materials, buried within the Defense Logistics Agency, operating really in an unfair fight. You have an SES, Senior Executive Service, member looking top down, and you have the Stockpile people whose job it is to identify materials that are needed to support the industrial base, fighting from a GS-15 level up, and by the way, they have to go through that top down organization to move any policy.

So it's really an unfair fight where you've got two different ways of looking at the world. And the one that looks at the world that says strategic materials are important is going into this with one hand tied behind their back.

COMMISSIONER CLEVELAND: Thank you.

HEARING CO-CHAIR SLANE: Thank you very much. We're past our time.

Larry, okay. Quickly go ahead.

COMMISSIONER WORTZEL: I didn't interject. When you interject, you get recognized.

[Laughter.]

HEARING CO-CHAIR SLANE: We'll give you time.

COMMISSIONER WORTZEL: I wanted to follow up, Dr. Herberg, on one of your responses to Commissioner Shea because if the Chinese reference to the Malacca dilemma is really a shorthand for concerns about U.S. dominance of sea lines of communication, would it be fair to say that the whole concept of AirSea battle as it's evolving only exacerbates their concerns with Australia being able to dominate the Sunda and the Lombok and the U.S. presence in Singapore handling the Malacca?

DR. HERBERG: Yeah. I can't say I know much about AirSea battle strategy. So I would really get in trouble quickly. But--

COMMISSIONER BLUMENTHAL: No one does. It doesn't stop them.

[Laughter.]

COMMISSIONER BLUMENTHAL: So join the conversation.

DR. HERBERG: Okay. It never stopped me before so why would it stop me now?

[Laughter.]

DR. HERBERG: Yes, they are very concerned about those sea lines for not just energy but for trade. I mean there is enormous flow of trade coming through there. They're doing everything they can to find alternative routes from Northeast Asia and Russia and Central Asia. You're kind of pushing on a string there. There will be more supply coming, but when their import demand is growing at the scale it is, the iron law of geology is that's got to come from the Gulf and some from Africa--the bulk of it.

So anything, they really see energy as a national, narrow "our supplies versus this notion that it's about the markets." Stability is really--they want to protect their supplies. That's the mentality, at least. Therefore, part of the big--big part of the drive for blue water naval capability, their extension of naval modernization through their--energy is one of the components of that, and to the extent the U.S. aggravates that sense of insecurity and control, I think that is a real worry for them.

HEARING CO-CHAIR SLANE: Well, I think we needed another couple of hours here, but thank you very, very much. It was terrific, and we appreciate

your time.

We're going to take a ten-minute break.
[Whereupon, a short recess was taken.]

Panel IV: China's International Fishing Activities

HEARING CO-CHAIR D'AMATO: We'll resume our hearing today with a panel dealing with China's international fishing activities, which is, of course, a resource—diminishing and rarer, important. And our final panel today will discuss China's marine fisheries across the globe from West Africa to the South China Sea.

Our panelists will explore the environmental, economic and geopolitical impacts of Chinese fisheries.

Ms. Tabitha Mallory is a Ph.D. candidate at the Johns Hopkins School of Advanced International Studies, where she is currently finishing her studies in International Economics and China Studies.

Previously, Ms. Mallory served as a research associate at the National Bureau of Asian Research. She is a Phi Beta Kappa graduate of the University of Washington in Seattle, and she holds a double B.A. from the Henry M. Jackson School of International Studies.

Dr. Lyle Goldstein is an Associate Professor at the U.S. Naval War College's China Maritime Studies Institute. He was Director of the Institute from 2006 to 2011 and has also worked in the Office of the Secretary of Defense.

Recently, his research focus has been the development of China's Coast Guard and maritime cooperation issues.

Finally, we have Dr. Patrick Cronin, the Senior Advisor and Senior Director of the Asia- Pacific Security Program at the Center for New American Security.

He edited and contributed to a recent CNAS publication on the South China Sea, entitled Cooperation from Strength:--he's got the copy sitting in front of him right there; he edited and contributed to that--The United States, China, and the South China Sea.

Dr. Cronin's career has spanned defense affairs, foreign policy, and development assistance, including posts at the Institute for National Strategic Studies, Center for Strategic and International Studies, and the U.S. Agency for International Development, as well as the U.S. Institute of Peace.

Again, thank all three of you for coming here today. Each witness will have seven minutes roughly to present your testimony, and then we'll have some Q&A. Why don't we go ahead and start off with Ms. Mallory.

Thank you.

**STATEMENT OF TABITHA MALLORY
PHD CANDIDATE, JOHNS HOPKINS SCHOOL OF
ADVANCED INTERNATIONAL STUDIES**

MS. MALLORY: Thank you for the introduction, and I would like to thank the co-Chairs D'Amato and Slane and other distinguished members of the Commission for the opportunity to testify on this topic.

I have submitted a written testimony for the record, and I will now briefly summarize the main points in my paper. An unprecedented 85 percent of global fisheries are fully exploited, overexploited or depleted. Because China is the world's largest producer of marine catch, producing about 16 percent of the world total in 2009, China's behavior in international fisheries has considerable economic, security, environmental and governance implications for the United States.

My testimony addresses China's international fishing operations and China's compliance with international institutions related to fisheries.

This issue has significant implications in the following areas: can the Chinese government control the behavior of its companies and agents in the world system as it globalizes; is China abiding by the agreements it has signed and will China be a responsible actor in the global system; to what degree is competition for ocean resources going to be a source of interstate conflict; and, finally, will sustainable development be a relevant concept to the Chinese system as it develops nationally and internationally?

I argue that while China is, on the whole cooperative, several challenges remain in efforts to work with China to sustainably manage fish stocks. Distant water fishing refers to fishing in the Exclusive Economic Zones of other host countries or on the high seas. Distant water fishing fleets get access to the EEZs of other countries through fisheries access agreements.

Historically, the largest distant water fishing entities are Japan, Spain, South Korea, the former USSR and now Russia; and Taiwan. Chinese law distinguishes between fishing in its near seas, which are the Yellow Sea, East China Sea and South China Sea, and distant waters, which is everything beyond.

The growth of China's distant water fishing industry has been primarily driven by economic concerns. The industry began in the mid-1980s when it became clear that China's own resources were overfished. China faces rising unemployment in its fishing industry, which the government has sought to relieve through development of its aquaculture and distant water fishing industries.

Today, China has the largest distant water fishing fleet in the world, which is active in over 30 countries and in three oceans although their production capacity and industrial scale is much smaller than that of developed countries. The industry has evolved from being entirely state-owned to being 70 percent privately owned. Because of this gradual change in ownership structure, the Chinese government now has less control over the activities of its fishing enterprises.

China plans to expand the industry, update its fleets, and improve the quality of its fishing operations through state subsidies and other support.

China also plans to develop nontraditional fisheries, such as Antarctic krill.

Domestic advocates of expanding the industry see it as a way to guard China's ocean interests and seek international space for development.

China is the world's third-largest subsidizer of its fishing industry. Without such subsidies, it's doubtful that the distant water fishing industry would remain profitable.

Turning to international institutions related to fisheries, China overall has demonstrated a record of cooperation although challenges remain. China implemented the Law of the Sea domestically and signed bilateral fisheries agreements with its neighboring countries, but while China has adjusted its legislation in accordance with the Law of the Sea, enforcement remains a great challenge.

Enforcement problems are often due to a lack of capacity in terms of domestic resources and education, and also reflect tension between the central and local levels of government in China.

The 1995 Code of Conduct for Responsible Fisheries is a non-binding agreement that lays out guidelines for the sustainable use of fisheries. In 2009, a study scored 53 of the top fishing nations according to these guidelines. Overall, China ranked 22 out of 53 countries--number one being the best--with an average score just above failing. But Chinese domestic fishing is better regulated than distant water fishing. China had failing scores on measures of illegal, unreported and unregulated, known as IUU, fishing, and so-called flags of convenience.

Fisheries governance experts argue that fisheries access agreements have led to unsustainable use of fisheries resources and have negatively impacted the development of host countries.

IUU fishing is most prevalent off the coast of West Africa and is a problem to which China contributes. Evidence also indicates that Chinese vessels reflag to flags-of-convenience states, but Chinese vessels seem to do this less frequently than other distant water fishing entities.

There is a strong correlation between IUU fishing and poor governance, with IUU fishing being greater in areas where countries score lower on governance indicators, such as in West Africa.

Addressing IUU fishing is important because of the negative economic, social and environmental impacts that it has. Estimates of global IUU fishing range up to almost 30 percent of global catch, for a total of \$23 billion. Illegal fishing also poses dangers to consumers because fishing vessels often do not comply with hygiene standards.

Based on my analysis, I submit the following policy recommendations: for the United States to ratify the Law of the Sea; to pass Port State Measures legislation; and to create better fish traceability systems; and then also for the United States to support the removal of fisheries subsidies; strengthen fisheries governance in developing countries; continue a policy of engagement with China over fisheries resources; and finally support multilateral fisheries conservation efforts and encourage other countries to fish sustainably as well.

Thank you very much, and I look forward to your questions.

**PREPARED STATEMENT OF TABITHA MALLORY
PHD CANDIDATE, JOHNS HOPKINS SCHOOL OF
ADVANCED INTERNATIONAL STUDIES**

Testimony before the U.S.-China Economic and Security Review Commission

By Tabitha Grace Mallory
Ph.D. Candidate, China Studies
Johns Hopkins School of Advanced International Studies

Hearing: China's Global Quest for Resources and Implications for the United States
Panel V: China's International Fisheries

January 26, 2012, 1:40 – 3:00

Dirksen Senate Office Building, Room 562

China as a Distant Water Fishing Nation

I would like to thank Co-chairs Blumenthal and D'Amato for the honor of inviting me to testify on this topic and I look forward to discussing the matter with you and other distinguished members of the Commission and participants.

We have all heard the 21st century referred to as the “Chinese century.” The Chinese, no doubt, agree. Yet the Chinese are also calling the 21st century the “ocean century.” A strong ocean country, in the mind of one Chinese scholar, has three components: economic, scientific and technological, and military.¹ One issue that lies at the intersection of these three facets is marine fisheries. China is already the world's largest producer of marine catch, producing 12.7 million tons out of an estimated global total of 79.9 million tons in 2009 (which is about 16 percent of the world total).² As such—and furthermore as 85 percent of global fisheries are fully exploited, overexploited or depleted—China's behavior in international fisheries has considerable economic, security, environmental and governance implications for the United States.

My testimony addresses China's international fishing operations, particularly distant water fishing operations, as well as China's compliance with international ocean governance institutions related to fisheries. In one sense China's expanding fisheries activities might seem to be a narrow topic with limited security and global implications. However, beyond its importance

¹ 海洋国策:研究文集 [Essays on Chinese Ocean Policy], 北京 : 海洋出版社, 2007, pg. 3.

² UN Food and Agriculture Organization (FAO), The State of World Fisheries and Aquaculture 2010, 24 February 2011, <http://www.fao.org/docrep/013/i1820e/i1820e00.htm>. Some evidence suggests that China may be inflating its catch numbers. Even so, it is likely to be the world's largest or second largest producer of marine catch (after Peru), and remains the world's largest producer of fish products. Watson, Reg and Pauly, Daniel, “Systematic distortions in world fisheries catch trends,” Nature, Vol. 414, 29 November, 2001, 534-536. For charts on China's catch, please see Appendices I and II.

to the global economy, the findings of this paper have significant implications along the lines of the following issues: 1) Can the Chinese government control the behavior of its companies and agents in the world system as it goes global? 2) Is China abiding by the agreements it has signed and will China be a responsible actor in the global system? 3) To what degree is competition for ocean resources going to be a source of interstate conflict? 4) And finally, will sustainable development be a relevant concept to the Chinese system as it develops nationally and internationally?

I begin with an overview of China's distant water fishing (DWF) industry, examine the country's compliance with international laws and norms that relate to fisheries management, and then discuss the impact that China's DWF activities are having on global fish stocks and other countries. I argue that while China is on the whole cooperative, several challenges remain in efforts to work with China to sustainably manage stocks. I conclude with some policy recommendations on this matter.

Overview of China's Distant Water Fishing Industry

"Distant waters" refer to major fishing areas that are not adjacent to the fishing country, such as in the exclusive economic zone (EEZ) of another host country or on the high seas.³ Article 62 of the UN Convention on the Law of the Sea (UNCLOS) stipulates that when a coastal State does not "have the capacity to harvest the entire allowable catch, it shall, through agreements or other arrangements ... give other States access to the surplus of the allowable catch." This provision has led to the development of fisheries access agreements to allow a state's DWF fleets to fish in the EEZs of other host countries. The largest DWF nations/entities are Japan, Spain, South Korea, the former USSR/Russia, and Taiwan.

China's "Distant Water Fishing Supervisory Provisions," promulgated by the Ministry of Agriculture in 2003, defines distant water fishing as "citizens, legal entities, and other organizations of the People's Republic of China engaging in marine fishing and its processing, supply and product transportation activities on the high seas and in the sea areas under the jurisdiction of other countries, but does not include fishing activities in the Yellow Sea, East China Sea, or South China Sea" and states that "the Ministry of Agriculture is responsible for the planning, organization, and administration of the distant water fishing industry, though the ministry also works with the State Council and other related departments over policy and supervision of the industry."⁴ The Ministry of Agriculture's Bureau of Fisheries has a Distant Water Fishing Subdivision.

The growth of China's DWF industry has been primarily driven by domestic economic concerns. The DWF industry began in 1985, when one of China's state-owned fishing enterprises expanded outward to seek profit in Africa, as China's own resources were overfished.⁵ Since the

³ The exclusive economic zone extends 200 nautical miles from coastal baselines, throughout which a country has sovereign rights over economic resources such as fisheries. The high seas fall under the jurisdiction of no country.

⁴ 农业部 Ministry of Agriculture, "远洋渔业管理规定" ["Distant Water Fishing Supervisory Provisions"], 14 April 2003 (entered into force 1 June 2003), Articles 2 and 3, available at http://www.cndwf.com/news.asp?news_id=19. The Provisions provide a variety of instructions on regulation, licensing, requirements, and supervision.

⁵ Marine pollution is also a major threat to China's fisheries.

late 1980s, the Chinese government has invested in conservation of domestic fisheries resources through seasonal moratoria on fishing, vessel decommissioning, and alternative employment programs. As UNCLOS entered into force globally in the mid-1990s, it put further restrictions on China's domestic fishing industry. China's bilateral fisheries agreements with South Korea, Japan, and Vietnam that came into effect in the early 2000s limited traditional fishing grounds for Chinese fishermen. The combination of domestic resource depletion and China's implementation of UNCLOS has led to unemployment in China's fishing industry, which China has sought to relieve through development of its aquaculture and DWF industries. China maintains that DWF is an important part of its official "going out" (走出去) strategy, which was elaborated in China's 2001–2005 tenth five-year plan and encourages Chinese companies to search for new markets and invest abroad.⁶

Today China has the largest DWF fleet in the world, although China's production capacity and industrial scale is much smaller than that of developed countries.⁷ China has a number of fisheries access agreements in the form of state-to-state bilateral agreements that allow its distant water fleets access to resources in the EEZs of other nations. In 2010, China had 1899 DWF vessels.⁸ Total catch amounted to 1.12 million tons worth RMB 12 billion (about \$1.8 billion).⁹ Of the total catch, 54 percent was transported back to China, and the rest was sold abroad. Tuna and squid accounted for 14.6 percent and 32.9 percent of total catch respectively.¹⁰ Most high-value species are sold abroad.¹¹ In 2009, the industry had 108 DWF enterprises.¹² Operating in 32 countries in three oceans, about 500 of the vessels are squid jiggers, almost 400 were tuna boats, almost 800 were trawling boats, and over 100 were purse-seiners and other fishing vessels.¹³ The DWF industry directly employs about 50,000 people. The DWF industry has evolved from being entirely state-owned to being 70 percent privately owned. A third of the industry is composed of a large Chinese state-owned enterprise, Chinese National Fisheries Corporation (中国水产) and its subsidiaries, which maintained 556 of a total of 1652 boats in the industry in 1999. The rest of the industry is composed of regional middle-sized companies and

⁶ The plan calls for "strengthening China's fisheries resources and ecological protection of fishing areas, and to actively develop aquaculture and distant water fisheries" (加强渔业资源和渔业水域生态保护, 积极发展水产养殖和远洋渔业), Fourth Meeting of the Ninth National People's Congress 第九届全国人民代表大会第四次会议批准国民经济和社会发展第十个五年计划纲要 ["National Economic and Social Development Tenth Five-year Plan"], 15 March 2001, <http://www.people.com.cn/GB/shizheng/16/20010318/419582.html>.

⁷ "扶持和壮大我国远洋渔业研究"课题组 ["Supporting and Strengthening Distant Water Fisheries" Task Force],

"把远洋渔业作为一项战略产业加以扶持" ["Support Distant Water Fisheries as a Strategic Industry,"] September 2010.

⁸ "十一五"期间我国远洋渔业取得长足发展" ["In the eleventh five-year plan, China achieves rapid development of its distant water fisheries"], 25 February 2011, available at 中国水产信息网 <http://www.jinnong.cn/sc/news/2011/2/25/20112251417624259.shtml>. Some discrepancy exists in Chinese sources on size and production of the DWF industry.

⁹ 中国渔业统计年鉴 [2011 China Fishery Statistical Yearbook], 北京: 中国农业出版社, [Beijing: China Agriculture Publishing Company], May 2011, pg. 52.

¹⁰ Ibid.

¹¹ 中国渔业协会远洋渔业分会 [China Fisheries Association Distant Water Fisheries Subsection], 中国远洋渔业行业发展: 前景可行性调研报告 ["Development of China's Distant Water Fishing Industry: Prospect and Feasibility Investigative Report"], 30 January 2008, 44pp.

¹² 农业部渔业局 [Ministry of Agriculture Bureau of Fisheries], 2010 中国渔业年鉴 [2010 China Fisheries Yearbook], 北京: 中国农业出版社 [Beijing: China Agriculture Publishing Company], October 2010, pg. 7.

¹³ China Fisheries Association Distant Water Fisheries Subsection, 2008.

small coastal companies.¹⁴ Because of this gradual change in ownership structure, the Chinese government now has less control over the activities of its fishing enterprises.

China plans to expand its DWF industry and update its fleets through state subsidies. China aims to increase its DWF fleet to 2300 ships by the end of the twelfth five-year plan (in 2015) for an output of 1.7 million tons at an estimated value of RMB 18 billion.¹⁵ One report explains the Ministry of Agriculture's eleventh five-year plan to develop the DWF industry, stating that the Ministry of Agriculture coined the concept of "grabbing the high seas and EEZs with two hands, they form two wheels turning together" (大洋过洋两手抓，两个轮子一起转).¹⁶ The plan also aimed to improve the quality of fishing operations through quality assurance systems, improved processing (such as a mobile processing seabase), and utilization of ports that are farther away to develop new large-scale fishing operations.

In September 2010, a task force composed of twelve people affiliated with the State Council, Chinese DWF companies, industry associations, and universities published a report advocating supporting and strengthening China's DWF industry.¹⁷ In advocating for expansion of distant water fishing for food security reasons, the report argues that "marine biological resources are seen as the largest store of protein, therefore owning and mastering the ocean means owning and mastering the future"

(“海洋生物资源被视为世界最大的天然蛋白库，因此，拥有和掌握海洋就意味着拥有和掌握未来”). The report sees expanding DWF as a way to guard China's ocean interests and seek international space for development because, it says, the more international space China has, the more resources and benefits it can obtain. The report argues that while the ocean ecosystem should be managed under a framework of sustainable development, at the same time those countries that have had a longer history of using the ocean have achieved more say in how ocean resources are distributed and thus receive a larger share of those resources; in other words, the authors say, the international fisheries management system is one of "if you occupy and possess, then you have rights and interests" (“占有即权益”).

China also plans to develop nontraditional fisheries, such as Antarctic krill. In 2010, the Ministry of Agriculture implemented an inaugural exploratory catch of Antarctic krill that resulted in 1846 tons and "laid a solid foundation for the development and utilization of Antarctic resources."¹⁸

To achieve the aforementioned objectives, the State will "provide corporate tax relief; reduce import duties or value added taxes; provide subsidies to renovate boats; reduce taxes on import

¹⁴ 文秋利 Wen Qiuli, "我国远洋渔业企业的竞争力分析" ["Analysis of Competitiveness of Distant-water Fisheries"], 水产科学 [Fisheries Science], Vol. 22, No. 6, November 2003.

¹⁵ "Supporting and Strengthening Distant Water Fisheries" Task Force, 2010.

¹⁶ China Fisheries Association Distant Water Fisheries Subsection, 2008.

¹⁷ "Supporting and Strengthening Distant Water Fisheries" Task Force, 2010.

¹⁸ China also "carried out preliminary research of the fishing area, meteorological conditions, fishing equipment and methods, processing and utilization, as well as the biological traits of antarctic krill," see "In the eleventh five-year plan, China achieves rapid development of its distant water fisheries," 2011. See also: 唐建业, 石桂华 Tang Jianye and Shi Guihua, "南极磷虾渔业管理及其对中国的影响" ["Management of Antarctic Krill and Its Implications for China's Distant Water Fisheries"], 资源科学 [Natural Resources], Vol.32, No. 1, January 2010.

of second hand equipment like ultra-low temperature, trawling, and purse seiner tuna boats; provide subsidies for the development and exploration of new fisheries, and fuel subsidies.”¹⁹ The Chinese state invested over RMB 10 million every year during the tenth five-year plan (2001–2005) to develop fisheries resources (such as tuna and squid) and more efficient fishing technology.²⁰

Without such subsidies, it is doubtful that China’s DWF industry would remain profitable. As three economists showed in their analysis of subsidies from 2003 to 2008 provided to China National Fisheries Corporation, the subsidies necessary for the company to remain profitable rose steeply beginning in 2006, to the point that subsidies were equal to approximately half of the company’s net profit in 2008.²¹ China is the world’s third largest subsidizer of its fishing industry, with harmful, capacity-increasing subsidies equaling 20 percent of the overall value of its catch in 2000.²²

China’s Compliance with International Ocean Governance Institutions

As many scholars have noted, China is an active member in many international organizations and on the whole has demonstrated a record of cooperation through the framework of the international community.²³ The same is largely true of international institutions related to fisheries, although some challenges remain.

China ratified UNCLOS in 1996 and successfully implemented this international treaty in two broad areas concerning fisheries.²⁴ First, China claimed its EEZ and formally adopted an UNCLOS-based management approach to its domestic fisheries resources. Second, China signed bilateral fisheries agreements with neighboring countries.

While China has adjusted its legislation in accordance with UNCLOS, enforcement of these laws and regulations remains a great challenge. Despite pledges to reduce fishing overcapacity, vessel retirement programs have proceeded at a glacial pace. Illegal fishing remains an enormous problem between China and its neighbors, as witnessed in the December 2011 fatal stabbing of a South Korean coast guard official by an illegal Chinese fisherman. In the case of Japan and

¹⁹ China Fisheries Association Distant Water Fisheries Subsection, 2008.

²⁰ Ibid.

²¹ In 2008, the company’s total income was about RMB 202 million, while total costs were about RMB 151, for a net profit of about RMB 51 million. However, that same year, the company was given about RMB 18 million in fuel subsidies and about RMB 7 million in other subsidies for a total of RMB 25 million, or about half of the company’s net profit. 陶玉蕾, 孙琛, 周应祺 Tao Yulei, Sun Chen, Zhou Yingqi, “远洋渔业企业经济效益分析: 以中水集团为例” [“Economic Benefit Analysis for Distant Water Fishing Enterprises: The Case of China National Fishing Corporation”] 山西农业科学 [Journal of Shanxi Agricultural Sciences], 2010, Vol. 38, No. 1, 98-102.

²² Sumaila, U. Rashid et al., “A bottom-up re-estimation of global fisheries subsidies,” *Journal of Bioeconomics*, Vol. 12, 2010, 201–225.

²³ See for example: Economy, Elizabeth and Oksenberg, Michel, *China Joins the World: Progress and Prospects*, Council on Foreign Relations Press, 1998, 372pp; and Alastair Iain Johnston, “Is China a Status Quo Power?” *International Security*, Vol. 27, No. 4, Spring 2003, pp. 5-56; and Kent, Ann, *Beyond Compliance: China, International Organizations, and Global Security*, Stanford, CA: Stanford University Press, 2007.

²⁴ Xue Guifang (Julia), *China and International Fisheries Law and Policy*, Martinus Nijhoff Publishers: Leiden, Boston, 2005; Ferraro, Gianluca, *Domestic Implementation of International Regimes in Developing Countries: The Case of Marine Fisheries in China*, Dissertation for Katholieke Universiteit Leuven, 2010.

Vietnam, maritime disputes further complicate fisheries management. Enforcement problems are often due to a lack of capacity (domestic resources and education), and also reflect tension between the central and local levels of government in China.

It should be noted that China is at odds with UNCLOS over two issues. First, unlike its neighboring countries, China's claim to the South China Sea is not clearly articulated in accordance with the provisions of UNCLOS, and some of the various bases for China's claim are not recognized as legitimate by international law.²⁵ Second, China disagrees with UNCLOS and the United States in arguing that the interpretation of freedom of navigation in EEZs should exclude military surveys, military maneuvers, and military reconnaissance.²⁶

Several subsequent international agreements attend to fisheries issues that UNCLOS left unaddressed. Many of these agreements have important implications for DWF nations. The 1995 "Fish Stocks Agreement" deals with highly migratory and straddling fish stocks.²⁷ China has signed but not ratified this agreement because it disagrees with the understandings of enforcement authorization and use of force during inspections of fishing vessels by authorities other than the flag state.²⁸ However, even though China has not ratified the agreement, according to the agreement's guidelines China is a member of a number of regional fisheries management organizations (RFMOs), including the International Whaling Commission (IWC);²⁹ **the International Commission for the Conservation of Atlantic Tunas (ICCAT);**³⁰ **the Asia-Pacific Fisheries Commission (APFC);**³¹ the Western and Central Pacific Fisheries Commission (WCPFC);³² the Inter-American Tropical Tuna Commission (IATTC);³³ and the Indian Ocean Tuna Commission (IOTC).³⁴

The 1995 "Compliance Agreement" requires flag states to license high seas fishing vessels; monitor vessels fishing on the high seas so that they act in accordance with sustainable fishing practices; not allow authorization of vessels that act in violation of conservation measures; and share relevant vessel information with the FAO.³⁵ China has signed but not ratified this

²⁵ Dutton, Peter, "Three Disputes and Three Objectives: China and the South China Sea," *U.S. Naval War College Review*, Autumn 2011, <http://www.usnwc.edu/getattachment/feb516bf-9d93-4d5c-80dc-d5073ad84d9b/Three-Disputes-and-Three-Objectives--China-and-the>

²⁶ Ren Xiaofeng and Cheng Xizong, "A Chinese Perspective," *Marine Policy*, Vol. 29, 2005, 689-695.

²⁷ United Nations, The Agreement for the Implementation of the Provisions on UNCLOS Relating to the Conservation and Management of Straddling Stocks and Highly Migratory Fish Stocks (UNFSA), signed 1995, entered into force on 11 December 2001, http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm

²⁸ Declaration of China, pursuant to Article 43 of the Fish Stocks Agreement, upon signature on 6 November 1996, http://www.un.org/depts/los/convention_agreements/fish_stocks_agreement_declarations.htm#CHINA. For the text of the declaration, please see Appendix IV.

²⁹ International Whaling Commission, www.iwcoffice.org.

³⁰ **International Commission for the Conservation of Atlantic Tunas**, www.iccat.int/en.

³¹ Asia-Pacific Fisheries Commission, www.apfic.org.

³² Western and Central Pacific Fisheries Commission, www.wcpfc.int.

³³ Inter-American Tropical Tuna Commission, www.iattc.org.

³⁴ Indian Ocean Tuna Commission, www.iotc.org.

³⁵ UN FAO, The Agreement to Promote Compliance with International Conservations and Management Measures by Fishing Vessels on the High Seas, signed 1995, entered into force on 24 April 2003, <http://www.fao.org/docrep/meeting/003/x3130m/X3130E00.HTM>

agreement.

The 1995 “Code of Conduct for Responsible Fisheries” is a non-binding agreement that lays out guidelines for the sustainable and responsible use of fisheries.³⁶ A 2009 study scores 53 of the top fishing countries according to Code of Conduct guidelines across nine indicators in six evaluation fields.³⁷ Overall, China ranked 22 out of 53 countries, with an average score just above failing, ahead of Spain and Russia, but behind the United States, Japan, and South Korea. On an indicator comparing intentions and actions, China scored passing on intentions but failing on actions, indicating the aforementioned enforcement problem. Chinese domestic fishing is better regulated than DWF.³⁸ China scored more poorly on measures of illegal, unreported, and unregulated (IUU) fishing and so-called flags of convenience, when ships are registered in countries other than those where they are owned in order to evade regulation—important indicators for international fishing—than it did on domestic measures. On IUU fishing, China ranked 44 out of 53, with a failing score. On flags of convenience, China ranked 46 out of 53, with a failing score, but higher than the other major DWF nations/entities of Japan, Russia, South Korea, Spain, Taiwan.

The 2001 “Plan of Action on IUU Fishing ” is a non-binding agreement that addresses IUU fishing.³⁹ The Plan was followed in 2009 by a binding “Port State Measures Agreement,” which would require port states to inspect fishing vessels and deny entry to those engaged in IUU fishing.⁴⁰ This agreement has been signed by 23 countries—China has not signed—and will take effect once there are 25 signatories. The United States Congress introduced Port State Measures legislation in December 2011. The significance of IUU fishing is discussed in more detail in the next section.

The Impact of China’s DWF Industry on Global Fisheries

China is already an important presence in West African fisheries, though exact details of China’s distant water fishing industry in Africa are hard to come by due to a lack of publicly available

³⁶ UN FAO, The Code of Conduct for Responsible Fisheries (CCRF), adopted by the FAO on 31 October 1995, <http://www.fao.org/docrep/005/v9878e/v9878e00.HTM>.

³⁷ Pitcher, Tony, et al., “Safe Conduct? Twelve Years Fishing under the UN Code,” December 2008. The first three areas “measure intentions to comply with the code, rating a country’s balance of conservation and economic aims; its stated management targets; and its use of precaution when expanding fisheries and establishing no-take zones. The remaining questions deal with the effectiveness of day-to-day compliance, including the rigorous use of quantitative reference points, minimizing wasteful discard, by-catch and impact on habitats such as coral reefs; socio-economic factors such as maintaining beneficial small-scale fisheries and coastal communities; and the control of illegal fishing and ‘flags of convenience’, when ships are registered in countries other than those where they are owned in order to evade regulation,” Pitcher, Tony et al. “Not Honouring the Code,” *Nature*, Vol. 457, 5 February 2009, pg. 658-59.

³⁸ Cheng Jiahua et al., “An Estimation of Compliance of the Fisheries of China with Article 7 (Fisheries Management) of the UN Code of Conduct for Responsible Fishing,” University of British Columbia Fisheries Centre, 2006.

³⁹ UN FAO, The International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, adopted on 23 June 2001, <http://www.fao.org/docrep/003/y1224e/y1224e00.HTM>. For a definition of IUU fishing, see Appendix III.

⁴⁰ UN FAO, Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, 22 November 2009, <http://www.fao.org/Legal/treaties/037t-e.pdf>

information. China signed bilateral fisheries access agreements with South Africa (1978), Guinea-Bissau (1984), Guinea (1985), Senegal (1985), Sierra Leone (1985), and Mauritania (1991) to allow for Chinese companies to fish in the offshore waters of these countries.⁴¹ In 2009, China's distant water fishing companies had 375 boats in ten West African countries, producing 190,000 tons valued at RMB 1.9 billion.⁴² In Liberian coastal waters, China is the largest foreign fishing country and some argue that Chinese illegal fishing and overfishing are displacing local fisherman.⁴³ In Senegal, ocean products are the largest export good to China (63 percent of Senegalese exports to China in 2005) and the fishing and shipping industries are by far the predominant destinations for Chinese foreign direct investment into the country.⁴⁴ *Senegal Peche*, a subsidiary of the state-owned China National Fisheries Corporation, is the largest commercial fishing company in Senegal, with a fleet of 12 boats.⁴⁵

Fisheries governance experts argue that fisheries access agreements on the whole have led to unsustainable use of fisheries resources and have negatively impacted the socioeconomic development of host countries.⁴⁶ In Africa, DWF has depleted fisheries resources through overfishing, misreported catches and landings, fishing in illegal areas (such as in artisanal zones or in the waters of other countries), transshipped catch at sea, or using inappropriate methods or gear (e.g., trawling or illegal mesh sizes). DWF has led to overcapacity in the fishing industry, and has negatively impacted domestic large- and small-scale (artisanal) fishers by squeezing them out of the industry (due to one or more of the following reasons: fewer fish are available, DWF nations pay higher license fees than locals do, or foreigners destroy the gear of domestic fishermen). DWF has not led to increased employment, economic growth, or food security in host countries. Between 1992 and 1996, employment in the fishing sector in Ghana decreased by 20 percent because of decreased catch per boat.⁴⁷ Fisheries access agreements, especially those signed with Asian countries, lack transparency. These agreements may foster dependency on the fishing nation for income from fishing fees—in Mauritania, fishing fees account for 27 percent of the state budget.⁴⁸ One author views government corruption as a key challenge to sustainable fisheries management in resource-rich African countries, for example officials in some countries

⁴¹ China has similar agreements with Russia (1988) and Australia (1988). There are probably more agreements, but these were the only agreements for which I could find evidence. For a (non-exhaustive) list of countries in which China operates, please see Appendix V.

⁴² Ministry of Agriculture Bureau of Fisheries, *2010 China Fisheries Yearbook* 2010, pg. 7.

⁴³ Wrelton, Steve, "Fishing in Troubled Waters," *Geographical*, June 2009, 38-43.

⁴⁴ Hazard, Eric et al., "The Developmental Impact of Asian Drivers on Senegal," *The World Economy*, 2009, pg. 1568-1570.

⁴⁵ *Ibid.* The authors argue that the Chinese fishing industry in Senegal threatens the fishing sector.

⁴⁶ Several studies have detailed this impact, see for example: Alder and Sumaila, 2004; EJF, "Pirate Fish on your Plate – Tracking illegally-caught fish from West Africa into the European market," Environmental Justice Foundation, London, UK, 2007; EJF, "Dirty Fish—How EU Hygiene Standards Facilitates Illegal Fishing in West Africa," Environmental Justice Foundation, London, UK, 2009; Mwikya, Stephen Mbithi, "Fisheries Access Agreements: Trade and Development Issues," ICTSD Natural Resources, International Trade and Sustainable Development Series Issue Paper No. 2, International Centre for Trade and Sustainable Development, Geneva, Switzerland. April 2006; Standing, André, "Corruption and Industrial Fishing in Africa," Chr. Michelsen Institute U4 Anti-Corruption Resource Centre, U4 ISSUE 2008:7; Walmsley, S.F., Barnes, C.T., Payne, I.A., Howard, C.A., "Comparative Study of the Impact of Fisheries Partnership Agreements—Technical Report," May 2007, MRAG, CRE & NRI. 183 pages.

⁴⁷ Atta-Mills, John, Alder, Jackie and Sumaila, Ussif Rashid, "The decline of a regional fishing nation: The case of Ghana and West Africa," *Natural Resources Forum* 28 (2004) 13–21, pg. 18.

⁴⁸ Alder and Sumaila, 2004.

sell too many fishing licenses in order to collect the fees, fishing nations may intervene diplomatically on behalf of their fleets caught fishing illegally, and inspectors may be bribed to not report fishing violations.⁴⁹ Some host countries may be afraid of cracking down on illegal fishing because it may jeopardize other development aid projects contributed by the fishing nation.⁵⁰

IUU fishing is a problem to which China contributes. Estimates of global IUU fishing range from 14 percent to almost 30 percent of global catch, with an estimated value between \$10 billion and \$23.5 billion annually.⁵¹ IUU fishing is most prevalent in FAO area 34, the Eastern Central Atlantic, which is off the coast of West Africa, with total estimated catches being approximately 40 percent greater than reported catches.⁵² Many DWF fleets fish in this area and contribute to the problem. IUU fishing also increased in the Northwest Pacific, due to primarily to the fishing activities of Chinese and Russian fleets.⁵³

There is a correlation between IUU fishing and poor governance, with IUU fishing being greater in areas where countries score low on governance indicators, such as in West Africa.⁵⁴ Of all possible vulnerability indices in one study, poor governance was the most statistically significant in predicting IUU fishing.⁵⁵

Addressing IUU fishing is important because of the negative economic, social, and environmental impacts it has. IUU fishing poses threats to: sustainable management of fisheries resources (for example by skewing stock assessments); food security; the livelihoods of people dependent on the resource, especially in developing countries; and the broader ecosystem (for example by disregarding regulations on bycatch or gear restrictions). The World Bank estimates that up to half of the animal protein in West African diets comes from fish.⁵⁶ Fishing is an important source of employment for many African countries, for example the fishing sector employs 10 percent of the labor force in Ghana, Sierra Leone, and Cape Verde, and 17 percent in Senegal.⁵⁷ Illegal fishing also poses dangers to consumers because vessels often do not comply with hygiene standards.⁵⁸

⁴⁹ Standing, 2008.

⁵⁰ *Ibid.*, pg. 15. The author says that this has been the case with China—for example in Mozambique commentators believe that illegal Chinese fishers escape punishment because China has become so influential in that country.

⁵¹ Agnew DJ, Pearce J, Pramod G, Peatman T, Watson R, et al. (2009) Estimating the Worldwide Extent of Illegal Fishing. *PLoS ONE* 4(2): e4570. doi:10.1371/journal.pone.0004570. Their analysis excludes discards and unregulated artisanal catch.

⁵² *Ibid.*

⁵³ *Ibid.*

⁵⁴ *Ibid.*

⁵⁵ Marine Resources Assessment Group Ltd (MRAG), “Review of Impacts of Illegal, Unreported and Unregulated Fishing on Developing Countries,” report prepared by MRAG for the UK’s Department for International Development (DFID), with support from the Norwegian Agency for Development Cooperation (NORAD), July 2005.

⁵⁶ World Bank, “Project Appraisal Document for the West African Regional Fisheries Program APL-1,” 2009, pg. 1.

⁵⁷ OECD, “Fisheries for Coherence in West Africa: Policy Coherence in the Fisheries Sector in Seven West African Countries,” 2008, pg. 9.

⁵⁸ EJF, “Dirty Fish—How EU Hygiene Standards Facilitates Illegal Fishing in West Africa,” Environmental Justice Foundation, London, UK, 2009.

Illegal fishing boats of Chinese origin or with Chinese crew have been captured off the coast of African countries. Reports by observers in Guinea and Sierra Leone state that Chinese and South Korean vessels dominate IUU fishing in West Africa.⁵⁹ Of IUU vessels observed fishing illegally in Guinean waters, over half were Chinese, far more than any other country.⁶⁰ Liberia has licensed 17 fishing vessels, but one World Bank fisheries specialist estimated that there were 200 industrial vessels operating in Liberian waters.⁶¹ Many of these vessels are based in Guinea. Industrial vessels frequently violate the moratorium on industrial fishing in the three-nautical-mile artisanal zone.⁶² Evidence indicates that Chinese vessels reflag to flags-of-convenience states, but Chinese vessels seem to do so less frequently than other DWF nations/entities.⁶³

As a member of both the WCPFC and the IATTC, China also fishes in the Pacific for tuna and billfish. While China cooperates with these organizations, China also faces challenges in keeping accurate logbooks and observer data, properly identifying bycatch, properly attributing catch to the correct country of origin, and language ability.⁶⁴

Policy Recommendations

Based on the analysis above, I submit the following policy recommendations:

1) *Ratify UNCLOS*

The United States is one of the few countries in the world that has not ratified UNCLOS. Ratifying UNCLOS not only gives the United States more credibility in dealing with China over ocean-related matters, including fisheries, but it also allows the United States to participate in fora that make important decisions over ocean issues that directly affect U.S. interests, for example the current negotiations on extending exclusive economic zones to continental shelf limits.

2) *Pass Port State Measures Legislation / Pirate Fishing Elimination Act (S. 1980, introduced 12 December 2011)*

Senator Daniel Inouye introduced a bill on 12 December 2011 that would ratify the Port State Measures Agreement prohibiting IUU fishing vessels from landing their catch in U.S. ports. This bill would also make mislabeling or misidentification of fish or fish products illegal. Congress is also encouraged to pass the Commercial Seafood Consumer Protection Act (S. 50, introduced 25 January 2011) and the International Fisheries Stewardship and Enforcement Act (S. 52, introduced 25 January 2011).

3) *Create better traceability systems*

⁵⁹ Ibid.; and EJF, “Pirate Fish on your Plate – Tracking illegally-caught fish from West Africa into the European market,” Environmental Justice Foundation, London, UK, 2007.

⁶⁰ Ibid.

⁶¹ Interview with World Bank fisheries specialist, 26 August 2010, Monrovia.

⁶² While several Liberian Bureau of Fisheries officials reported this, several members of the local expat community in Monrovia also anecdotally reported that they frequently spot industrial fishing vessels right offshore.

⁶³ Gianni, M. and Simpson, W. (2005). *The Changing Nature of High Seas Fishing: how flags of convenience provide cover for illegal, unreported and unregulated fishing*. Australian Department of Agriculture, Fisheries and Forestry, International Transport Workers’ Federation, and WWF International.

⁶⁴ Interviews with NOAA fisheries experts, Honolulu, Hawaii, 21-23 November, 2011.

Almost half of the fish that China catches in its DWF operations is sold abroad, and most of this fish ends up on the markets of developed countries, including the United States. A traceability system would require certificates of origin to provide information on the exact area of catch, vessel identification numbers, and whether the fish are whole or primary-processed.⁶⁵ Traceability systems can also be used to deter IUU fishing.⁶⁶

4) *Encourage the removal of fisheries subsidies*

Capacity-increasing subsidies contribute to overfishing by artificially changing the profit-incentive structure for fishing. In 2000, these harmful subsidies were equivalent to 27 percent of the value of total global catch.⁶⁷ China is the world's third largest subsidizer of its fishing industry.

5) *Strengthen fisheries governance abroad*

The United States should encourage programs that strengthen governance—both with regard to fisheries and in general—in developing countries, such as those in West Africa. Shiprider programs, in which a U.S. Coast Guard jointly patrols an area with forces from a partner state, are encouraged. The United States has a successful shiprider program with China that patrols the North Pacific for illegal fishing, as well as shiprider agreements with eight Pacific Island nations.

6) *Continue a policy of engagement with China over fisheries resources*

Overall, China has demonstrated a record of cooperation with international institutions. The United States should continue to work with China on a multilateral level to manage global fisheries. The United States is also encouraged to cooperate bilaterally with China over this issue. Many of the challenges of China's fishing activities arise from lack of capacity and education in China—bilateral cooperation can impart important knowledge, skills and best practices.

7) *Support multilateral fisheries conservation efforts and encourage other countries to fish sustainably*

Fisheries depletion is a global problem that requires a collective international response. China pays close attention to the fishing activities of other countries and imitates their behavior. The DWF nations/entities of Japan, South Korea, Russia, Taiwan, and Spain, as well as other fishing nations, should also be encouraged to fish sustainably. And while it is beyond the scope of the discussion here, fisheries are also negatively affected by climate change through ocean acidification—the United States is encouraged to be a leader in addressing climate change through international cooperation.

⁶⁵ For more on China's traceability systems, see: Clarke, Shelley, *Understanding China's Fish Trade and Traceability*. TRAFFIC East Asia, 2009.

⁶⁶ Borit, Melania and Olsen, Petter, "Evaluation framework for regulatory requirements related to data recording and traceability designed to prevent illegal, unreported and unregulated fishing," *Marine Policy*, Vol. 36, 2012, pg. 96-102.

⁶⁷ Sumaila, U. Rashid et al., "A bottom-up re-estimation of global fisheries subsidies," *Journal of Bioeconomics*, Vol. 12, 2010, 201–225.

HEARING CO-CHAIR D'AMATO: Thank you very much, Ms. Mallory.
Let's go ahead with Dr. Cronin.

STATEMENT OF DR. PATRICK CRONIN
SENIOR ADVISOR AND SENIOR DIRECTOR OF THE ASIA-PACIFIC SECURITY
PROGRAM, CENTER FOR A NEW AMERICAN SOCIETY

DR. CRONIN: Thank you very much to the co-Chairs and all of the Commissioners. I want to briefly summarize the main points of my testimony that I've submitted for the record. It's based on a new report, *Cooperation from Strength: The United States, China and the South China Sea*, which the Center for a New American Security published in January, as well as a Web Site that we have set up that looks at incidents in the region since 1955.

My first point is simply to note that the number of fishery-related incidents has increased recently. One can look at the Chinese fishermen who stabbed the two Coast Guard officers from South Korea last month; or the poaching of Philippine sea turtles or Japanese coral, also last month, which have been repeated in previous months; or six months ago when we saw Chinese naval personnel accused of beating Vietnamese fishermen.

A second point, though, is to note, as my learned co-author Taylor Fravel has noted in our report, there is no comprehensive reliable data. A lot of it comes from single national sources. So Vietnamese and Chinese media, for instance, are both state-related. The Chinese have not increased or shown an increase in the reporting of fishing incidents unlike, say, the Philippine or Vietnamese press. So we don't have that reliable, comprehensive, authoritative data. Therein probably lies some kind of recommendation in terms of building that repository of objective information.

A third point is that not only has the trend appeared to be increasing, but in all probability, the demand for fish, especially in the South and East China Seas and in the Western Pacific, is going to increase this problem. It's going to grow whether you're thinking about Vietnamese population growing, the prosperity of the Asian economies, including the Chinese economy looking for more fish, the fact that fish is such a high percentage of the Asian diet. All of these point to this as an increasing problem.

A fourth point is to note that fishermen do more than fish. They are instrumental in state policy that they help to show jurisdictional claims. And there is no doubt that there is some collaboration between the state and fishermen. Go back to the data problem. Go back to an interagency problem, which is another point here. The Chinese do not have, just as we do not have, a great cohesive interagency process. They're highly fragmented.

On the one hand, they can take orders and carry them out, especially on high security issues and on dealing with crises. But absent a crisis or an obvious national security issue, they're highly segmented. They've been trying recently to rein in the various civilian and military institutions and the fishermen, but that's a long-standing problem China is going to face.

Another problem is simply that the Chinese are using civilian instruments of their civil law enforcement fleet as a paramilitary institution. So

the Chinese in their last few years of assertiveness in the South and East China Seas, rather than using their warships as they did back in Mischief Reef from the late '80s and early '90s, they've been using, for instance, 200 vessels as part of the China Maritime Safety Administration, which are basically bigger than most of the navies and coast guards of this region. They've been using them as de facto naval platforms, and so it allows the Chinese to be assertive without militarizing the problem per se.

But it's a fine line over what is military and what is not so there is a blurring of the line between the military and the civilian domains.

Another point here is that China's neighbors believe that the Chinese fishing expeditions in disputed waters are the result of conscious policy. So they are maybe both the result of conscious policy and maybe just inadvertent, but the neighbors in the Philippines and Vietnam and elsewhere believe there is no doubt that the Chinese are sending in these fishermen to make sure that there are legal claims and disputes in China's favor.

Now, China has been restrained in some ways, as I pointed out, and this is another point. They have clearly not wanted to seek open conflict. They have not wanted to resolve these disputes through force. There is no doubt that they would prefer obviously to gain influence through economic means, through legal means, through psychological means, and obviously that that's their tactic for trying to deal with this problem, at least in recent years.

Another point here is that the Chinese are not that interested in creating the same kind of rules of the road that the United States is interested in. We keep butting heads with Chinese, whether it's in military-to-military context or just in interstate context. There has only been one great Strategic and Economic Dialogue between China and the United States. A second one has not been scheduled, and I think senior administration officials will readily acknowledge that one good discussion for a few hours on maritime security does not make for real cooperation.

The Chinese don't want to use the existing mechanisms, like the Military Maritime Agreement, and they certainly don't want multilateral agreements. They want bilateral agreements where they can get more leverage out of these deals.

In addition, the institutions in the region of Southeast Asia, in particular, the Association of Southeast Asian Nations (ASEAN), are going to have weaker chairmanship relative to maritime issues over the next few years. Cambodia has made it clear that they don't have an interest in maritime issues, and they're more likely to side with some of China's agenda.

When you get 2013 when Brunei will chair ASEAN, even though it might want to bring up these issues, it does not have as much purchase as some of the larger Southeast Asian nations who have been in the chair, such as Indonesia this last year or even Vietnam back in 2010.

So this sobering assessment points to the probability that these problems are going to grow. Institutions are not really set up to deal with them. United States is going to have to look to build capacity in this region, to maintain a strong naval presence, to make sure that we back it up with a trade and investment engagement of this region, to try to keep this multilateral focus on maritime security, including on fishery issues, an international issue, not just a

bilateral issue, because we all have a stake in the rules of the road and good order at sea.

I'm happy to answer your questions. Thank you very much.

**PREPARED STATEMENT OF DR. PATRICK CRONIN
SENIOR ADVISOR AND SENIOR DIRECTOR OF THE ASIA-PACIFIC SECURITY
PROGRAM, CENTER FOR A NEW AMERICAN SOCIETY**

January 26, 2012

Testimony before the U.S.-China Economic and Security Review Commission

**Prepared Statement of Name
Senior Advisor and Senior Director of the Asia-Pacific Security Program, Center for a New
American Security**

Mr. Chairman and Members of the Commission, it is a pleasure to appear before you today, and I thank you for inviting me to discuss the vital subject of China's approach to managing natural resources. At the Center for a New American Security, where I am senior advisor and senior director of the Asia-Pacific Security Program, we are following both China and natural resource issues. Earlier this month, we released a major report on the South China Sea, where we tried to look at that body of water "in the round," and we have also created an online web hub of information on both the East and South China Seas.¹ I have been asked specific questions about these littoral seas, and drawing on these research activities I will attempt to address them while placing them in strategic context.

Let me begin by relating several recent incidents that are illustrative of broader trends. Then I will provide answers to each of the specific questions asked of me. First, consider the following incidents last year:

- On December 12, the captain of a Chinese fishing vessel stabbed two South Korean coast guard officers who had boarded the vessel for illegally fishing in South Korean waters in the Yellow (West) Sea. One of the South Korean officers died. South Korean Coast Guard commandos have been fining Chinese fishing vessels with increasing regularity, more than 470 times last year, which is at least 100 times more than in 2010.²

¹ Both the report and the Flashpoints web portal are online at www.CNAS.org. The author wishes to thank his CNAS colleague Daniel Katz for his assistance in preparing this testimony. In addition, the Flashpoints web portal would not be possible without the additional help of various colleagues but especially Will Rogers and Zachary Hosford.

² Paula Hancocks, "South Korea: Chinese Fishermen Kill Coast Guard Member," CNN, December 12, 2012, <http://www.cnn.com/2011/12/12/world/asia/south-koreachina-stabbing/index.html>; and "High-Seas Stabbing of Korean Commando Worsens Ties with China," Chinh's News, December 12, 2011, <http://chinhdangvu.blogspot.com/2011/12/high-seas-stabbing-of-korean-commando.html>.

- Also last month, after a 6-hour chase, Japan's coast guard arrested a Chinese fishing captain for trying to collect coral in waters 4 kilometers from Japanese islands near Nagasaki Prefecture.³ Virtually the same thing happened the month before in the same waters. These captains are fined about \$4,000 and released.

- On December 2, the Philippine navy, coast guard and environment department arrested six Chinese fishermen for poaching endangered sea turtles near the Philippine island of Palawan, an activity that has nabbed hundreds of poachers who have been caught over the past decade. Two months earlier, the Philippine navy seized 25 small Chinese fishing boats in the same vicinity.⁴

- On July 5 of last year, armed Chinese naval personnel reportedly beat a Vietnamese fisherman and threatened other crewmembers with their automatic rifles and batons. The incident occurred off the contested Paracel Islands during China's annual mid-May through July fishing ban during spawning season; the ban covers both Chinese waters and waters that Vietnam believes are its own.⁵

1. *Describe China's fishing activities in and around regional seas off its coast (the Yellow Sea, the East China Sea, and the South China Sea). What are the environmental, economic, diplomatic, and security impacts of Chinese fishing in these waters?*

These recent incidents collectively describe a growing trend regarding fishing activities in and around China's eastern seaboard. This is nothing new. As Robert Kaplan and I discussed in our CNAS report on the South China Sea, Chinese fishermen have enjoyed de facto fishing rights in these waters for centuries.⁶ But the problem appears to be getting worse. However, one challenge is the absence of comprehensive and authoritative data. MIT Professor Taylor Fravel elaborates on this problem:

"...reliable information about the competition over maritime rights is hard to find.... Most information comes from media outlets in the various claimant countries. In China and Vietnam, these media outlets have direct or indirect ties to the state.... Although Vietnam and the Philippines appear to have increased their reporting of events in the South China Sea since 2009, China has not. Confrontations involving Chinese ships, especially Chinese fishermen, are almost never reported in the Chinese media, most likely because the government wants to avoid the criticism that it is not doing enough to

³ "Japan Coast Guard Arrests Chinese Fishing Boat Captain," Japan Update, Okinawa, December 23, 2011, <http://www.japanupdate.com/?id=11695>.

⁴ "Six Chinese Arrested for Illegal Fishing," The Manila Times, December 5, 2011, <http://www.manilatimes.net/index.php/news/regions/12587-six-chinese-arrested-forillegal-fishing>.

⁵ "Vietnam: Chinese Soldiers Attack Fishermen," AP News, July 14, 2011, <http://asiancorrespondent.com/60001/vietnamese-chinese-soldiers-attack-fishermen/>. Also see Nguyen Dang Thang, "Fishing for a Grey Zone?," The Diplomat, July 23, 2011, <http://the-diplomat.com/asean-beat/2011/07/23/fishing-for-a-grey-zone/>.

⁶ Patrick M. Cronin and Robert D. Kaplan, "Cooperation from Strength: U.S. Strategy and the South China Sea," in Patrick M. Cronin, editor, *Cooperation from Strength: The United States, China and the South China Sea* (Washington, D.C.: Center for a New American Security, January 2012), 14.

protect its citizens.”⁷

One reason to believe the problem is intensifying, however, has to do with the rising demand and diminishing supply of fishing stocks in these littoral seas, which takes me to the second question.

2. How integral are fish resources to the territorial disputes in the South China Sea or East China Sea? What fishing resources are at stake for China and other countries involved in territorial disputes?

The South China Sea is “one of the most biologically diverse marine areas in the world.”⁸ Fish stocks there are a multi-billion-dollar industry and account for as much as one-tenth of the global catch.⁹ National policies, both subsidies and the enforcement of domestic fishing laws, are creating regional tensions. As my colleague Will Rogers has written, China’s fishing ban during spawning season, while undertaken to protect fish from being overexploited, sets up an annual fight with Vietnamese fishermen.¹⁰

Fish protein is more than 22 percent of the average Asian diet, significantly higher than the global average of 16 percent.¹¹ As Asians become both more prosperous and more numerous, the demand on fish increases. Thus, Asians are consuming more of the world’s fishing stocks, of which roughly one-third is “overexploited, depleted or recovering,” according to the United Nations.¹² The United Nations Food and Agriculture Organization cautions that the production of most fish resources in the western South China Sea have either been depleted or are in decline.¹³ Moreover, as Vietnam’s population increases, perhaps growing 25 percent by 2050, the heightened demand for fish will aggravate existing tensions.¹⁴

A key point is that fishermen do more than fish. They are civilian instruments of power that help stake out legal claims and establish national maritime rights. As Taylor Fravel writes in the CNAS report, “fishermen will often justify operating in disputed waters through their country’s claims to maritime rights. Chinese fishermen operate in the southern portions of the South China Sea near Indonesia and Vietnam, for example, while Vietnamese and Philippine vessels

⁷ M. Taylor Fravel, “Maritime Security in the South China Sea and the Competition over Maritime Rights,” in Patrick M. Cronin, ed., *Cooperation from Strength*, p. 36.

⁸ Will Rogers, “The Role of Natural Resources in the South China Sea,” in Patrick M. Cronin, ed., *Cooperation from Strength*, 89.

⁹ Will Rogers, “The Role of Natural Resources in the South China Sea,” in Patrick M. Cronin, ed., *Cooperation from Strength*, 90; and Ian Storey, “China’s Bilateral and Multilateral Diplomacy in the South China Sea,” in Patrick M. Cronin, ed., *Cooperation from Strength*, 55.

¹⁰ Will Rogers, *Cooperation from Strength*, 89.

¹¹ *Ibid.*, 90.

¹² “Rising Wealth of Asians, Fishing Subsidies Straining World’s Fish Resources, UN Experts Say,” Associated Press, January 24, 2012, <http://www.3news.co.nz/Risingwealth-of-Asians-strains-world-fish-stocks/tabid/1160/articleID/240612/Default.aspx>.

¹³ Will Rogers, “The Role of Natural Resources in the South China Sea,” in Patrick M. Cronin, ed., *Cooperation from Strength*, 90.

¹⁴ *Ibid.*, 93.

operate in the northern portions near the Paracel Islands.”¹⁵ It is also worth noting that as fish migration patterns change, it is entirely possible that areas of maritime contestation will also migrate. For instance, a recent United Nations study observed that cold-water fish species may decline as warm-water species migrate north because of climate changes. Consequently, this is likely to be a catalyst for increased confrontation between China and its neighbors over fishing rights.¹⁶

Of course, fishing resources in the East and South China Seas are by no means the only contested resource. Competition over hydrocarbons (both petroleum and natural gas) and minerals are also part of an increasing bid for both competition and potential joint ventures. While it remains uncertain whether the South China Sea will become a “second Persian Gulf,” as some Chinese appear to believe, the jockeying for claims and the dispatching of various civilian and even military maritime vessels are often driven by resource concerns.

3. To what extent can fishermen of China and other claimant countries be characterized as proxies in these disputes? How does Beijing view the role of Chinese fishermen (or those of other claimant countries) in asserting its territorial claims?

China’s neighbors generally believe fishing expeditions in disputed waters are the result of a conscious national policy emanating from Beijing. However, indications suggest that the Chinese government does not wield effective control of the interagency, and the highly fragmented division of labor across the country leads to action not necessarily intended by political leaders. The absence of a strong interagency process within China – at least in the absence of a crisis that forces whole-of-government cooperation – leaves plenty of ambiguity about how much the Chinese government encourages fishing in troubled waters.

One thing is clear: Chinese officials are deliberately using civilian maritime law-enforcement vessels, rather than the People’s Liberation Army Navy—to enforce China’s maritime rights and fishing laws. Whereas China resorted to using warships over Mischief Reef territorial disputes in the 1990s, the recent assertiveness of China in these waters has been prosecuted largely with civilian instruments of power. According to Taylor Fravel, the Chinese Bureau of Fisheries Administration within the Ministry of Agriculture is responsible for supervising “...fishing in the disputed waters...” and enforcing “...its domestic fishing laws.” The Bureau divides “...patrols and other law enforcement activities...among regional fisheries administrations, including the Yellow Sea and Bohai Gulf Region Fisheries Administration, the East Sea Region Fisheries Administration and the South Sea Region Fisheries Administration.”¹⁷ In the South China Sea, Fravel adds, Bureau “vessels escort Chinese fishing boats when they operate in disputed waters. The escorts provide aid to the fishing boats, but also exercise Chinese jurisdiction over these waters (thus supporting China’s claims to maritime rights) and protect Chinese fishermen when they are challenged by vessels from other states.” The Chinese vessels also aim “...to

¹⁵ Fravel, *Cooperation from Strength*, 37.

¹⁶ Rogers, *Cooperation from Strength*, 91.

¹⁷ *Ibid.*, 37 and Michael Auslin, *Security in the Indo-Pacific Commons: Toward a Regional Strategy* (Washington: American Enterprise Institute, December 2010), 47, <http://www.aei.org/files/2010/12/15/AuslinReportWedDec152010.pdf>.

prevent foreign ships from operating within China's EEZ [Exclusive Economic Zones] by boarding and inspecting these vessels, levying fines and confiscating catches and equipment, as well as by expelling ships from waters claimed by China."¹⁸

Significantly, China is using its civilian law-enforcement fleet as a de facto arm of naval power. China's civilian maritime law enforcement fleet is large and well-equipped, especially relative to neighboring nations. For instance, the 200 or so patrol vessels that comprise the China Maritime Safety Administration (MSA), often are used to confront the naval and coast guard fleets in the East and South China Seas. According to Dr. Michael Auslin of the American Enterprise Institute, "Armed MSA ships regularly accompany private Chinese fishing vessels in East Asian waters and have been involved in numerous confrontations with the naval and coast guard forces of other nations."¹⁹

As Auslin makes clear, the PLA Navy occasionally interferes in support of Chinese fishermen. Recent Chinese maritime assertiveness has included not only interference with U.S. survey ships and warnings to the United States Navy not to conduct exercises within its 200 nautical mile EEZs, but also "confrontations with neighboring naval forces, primarily while intervening on behalf of private Chinese fishing boats caught fishing illegally in foreign territorial waters. These actions are tied to demands for greater regulatory rights over larger maritime tracts and seem to correspond with previously expressed desires to control waters up to the first island chain."²⁰

4. How do Chinese fishing activities impact maritime security and freedom of navigation in the region? Are there any clear implications for U.S. interests?

China has shown a clear level of restraint in its recent assertiveness in the East and South China Seas. Not only has China sought to avoid any serious open conflict, but it has also generally refrained from deploying warships in its confrontations with neighboring states. In contrast to China's willingness to deploy warships to the South China Sea during the 1990s, the recent "competition over maritime rights in the South China has not become militarized.... China is responding with improved civil maritime enforcement capacities," but it is avoiding "more provocative measures, such as using naval forces to enforce its claims."²¹ According to Fravel, "relying on these civilian agencies appears to be a deliberate choice and suggests that China has sought to limit the potential for escalation through how it chooses to assert and enforce its claims to maritime rights."²²

Singapore-based South China Sea expert Ian Storey generally agrees with Fravel on this point in his chapter of the CNAS report. Dr. Storey argues that "China is not likely to try to resolve disputes in the South China Sea through military force, as the costs of doing so would greatly outweigh the benefits." Rather, Chinese officials will be "...emphasizing their commitment to

¹⁸ Ibid.

¹⁹ See Auslin, *Security in the Indo-Pacific Commons: Toward a Regional*, 12.

²⁰ Ibid., 15.

²¹ Fravel, *Cooperation from Strength*, 33.

²² Ibid., 42, 44.

peace, stability and cooperation while simultaneously asserting their jurisdictional claims and expanding China's physical presence in the South China Sea."²³

Fravel suggests that "...the United States must balance efforts to maintain stability in the South China Sea with actions that could inadvertently increase instability, such as becoming more involved in trying to resolve the dispute – an action that many regional states would interpret as a move away from the traditional U.S. policy of neutrality in territorial disputes."²⁴

5. Are there any specific cooperative bilateral or multilateral measures to ensure sustainable and secure fishing practices in contested areas of the East China Sea or South China Sea? How effective are these measures? Do you have any recommendations to this end?

Let me make a couple of generalizations based on my research and my experience. The Chinese are not really interested in creating agreed-upon rules of the road in the South and East China Seas. Rather, they would like to push out others. This is not to say that China is not willing to cooperate, providing that cooperation enhances or certainly does nothing to diminish Chinese influence. And the Chinese generally prefer bilateral mechanisms over multilateral mechanisms in their negotiations on maritime practices in regional seas.

Experts disagree about how much cooperation China might be prepared to undertake. Some China analysts see more hope than analysts who look at these problems from the perspective of China's neighbors. For instance, Dr. Fravel notes that "China has signed fishing agreements with most of its neighbors; some of these agreements create joint fishing zones for fleets from both countries." Peter Dutton of the U.S. Naval War College, for instance, has proposed a "multilateral fishing organization...using the Northwest Atlantic Fisheries Organization as a model," and Fravel thinks this that China could well contemplate such a scheme.²⁵

But Ian Storey, an expert on Southeast Asia, notes that China opposes discussing maritime disputes in multilateral forums, such as the ASEAN Regional Forum and the East Asia Summit. Rather, "Beijing utterly rejects the role of third parties in the dispute, particularly the United States, which it has accused of interference or 'meddling'...the PRC also rejects international legal arbitration, partly because this would involve a multilateral institution but also because China does not have a strong case."²⁶ Storey adds that "...no substantive negotiations between China and any of the Southeast Asian claimants have occurred during the past two decades..." Because of this dismal record, "Southeast Asian claimants do not like China's insistence on a bilateral approach. Because China is the strongest party involved, others fear that it is trying to 'divide and rule' and that China would leverage its power in any bilateral negotiation. Moreover, China only supports bilateral negotiations when it is one of the parties."²⁷

In looking ahead to leadership of the Association of Southeast Asian Nations, there are reasons

²³ Storey, *Cooperation from Strength*, 53.

²⁴ Fravel, *Cooperation from Strength*, 34.

²⁵ *Ibid.*, 46.

²⁶ Storey, *Cooperation from Strength*, 57.

²⁷ *Ibid.*, 59.

to wonder whether ASEAN will continue to be as diligent about maritime issues in the next few years as it has been in the past couple of years. In 2010, Vietnam chaired the process, and last year, Indonesia was in the ASEAN chairmanship role. Both countries have strong track records with respect to maritime issues. This year, however, Cambodia is in the chair, and it has made clear that it does not have a strong stake in maritime disputes or issues. As Dr. Storey notes, “The Hun Sen government has close political and economic links to the PRC and will not want to risk damaging those ties over the Spratlys.... In 2013, Brunei takes over the rotating chairmanship. Although Brunei is a claimant state, it has never taken any major initiatives on the South China Sea, and it lacks the political clout of ASEAN’s larger members. Myanmar and Laos will occupy the chair in 2014 and 2015, respectively. As with Cambodia, both countries are close to China and do not see the South China Sea as a priority.”²⁸

Despite this sobering institutional assessment in Southeast Asia, there are two basic convictions widely shared in the region: almost all countries want to preserve U.S. engagement and presence; and virtually none wishes to jeopardize its economic ties with China. These dual realities will frame the larger strategic context as fishing disputes and other forms of maritime competition continue to rise in the East and South China Seas.

²⁸ Ibid., 64.

HEARING CO-CHAIR D'AMATO: Thank you, Dr. Cronin.
Dr. Goldstein.

**STATEMENT OF DR. LYLE GOLDSTEIN
ASSOCIATE PROFESSOR, CHINA MARITIME STUDIES INSTITUTE
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DR. GOLDSTEIN: Yes, thank you. Thanks to the Commissioners for addressing this very important issue, and before I give my testimony, I would also just submit quickly the caveat that I work at Naval War College, but this is my own opinion and not that of the U.S. Navy.

In almost all the maritime territorial disputes in East Asia, fisheries questions play a significant role. One need only consider that fishing has been at the heart of serious wrangling among East Asian states from the Yellow Sea through the East China Sea down to the South China Sea over the last year, and there have been even fatalities involved.

Chinese fishery policy might, however, be critical to the possibilities for peaceful resolution of many of these maritime territorial disputes in East Asia. Moreover, China's status as the world's largest fishing power also means that Beijing's inclination to accept and practice global fisheries norms could mark a giant step forward for environmental protection of the oceans in the coming century.

Now, I think a little bit of background here is quite important. One thing to note, for example, is that early on, as the Chinese Navy, when it was initially created, that actually protecting the fishing fleet was one of its core missions. Also, when the Fisheries Service was stood up formally in China in the 1970s, this service actually reported directly to both the State Council but also the Central Military Commission, and this is all by way of indicating that fisheries have long been considered really a national security problem for China.

Now, China has, I think, come a long way as far as fisheries enforcement, and some of those restrictions can be traced back all the way to the '50s, but it's also clear that many of the initial positive steps toward conservation were ignored during the head-long rush for economic growth in the 1980s and early 1990s, and Chinese production spiraled accordingly at that time--fisheries production that is.

A major shift, though, occurred in the late 1990s with Beijing adopting a series of important reform measures, including the inauguration of the summer fishing ban in the Yellow and East China Seas in 1995, the adoption of a explicit policy to favor aquaculture while, quote, "stabilizing" the marine fisheries in 1996, as well as new fisheries agreements with Japan in '97, and South Korea in 1998, but probably the most important step in this reform process appears to be the adoption of "zero growth" plan to control fishing capacity in 1999 along with measures to spread the summer fishing ban to both the Bohai and the South China Sea.

There were also at this time efforts to improve enforcement capacity, and then in 2000, China also reached a fisheries agreement with Vietnam, extended some of its fishing bans to the Yangtze River and also

launched an ambitious effort to create marine protected zones.

Now, a lot of this reform effort, behind it was a very deep crisis in Chinese fisheries and one can find many examples, but just to give a couple. It was reported in 1998 that in the South China Sea, the stock density was just 16 percent of what it had been in 1962.

A more recent statistic says that Bohai fisheries production today--that's the Bohai Gulf--is only 20 percent of what it was just in the 1980s. So you can see the level of depletion is very high, and I just was in China in December meeting with fisheries experts, and they continue to be pessimistic--you know, it's a bad situation--and are not necessarily ready to say China has turned a corner.

Now, I give a lot of data in my testimony. I'll let you look through that. I might disagree slightly with my colleague and say that there is a fair amount of transparency here, and these--China Fisheries Yearbook, actually, I think needs to be looked at more carefully by Western scholars. I think it's quite unexploited, although Taylor Fravel has done some good work there, but we need to do a lot more.

Now, looking at the enforcement capabilities, I also give quite a bit of data, and this is an enforcement service that has more than 2,000 vessels. So at some level, there is real capability, but they have a long way to go. They're getting stronger for sure, and I can elaborate on that, and that certainly has some strategic implications, but I would argue it also has some positive environmental results as well.

Now, there are major challenges, as Ms. Mallory has noted, certainly closer to China as well. I might highlight a few of these. For example, the Chinese do not really count their bycatch at all, as near as I can tell. Bycatch is a major problem in marine fisheries. It means the catch that goes overboard because it wasn't what we were fishing for.

So this is a huge cost to the world, to oceans, so this is something very important to follow. Another issue is mariculture, which is aquaculture in the oceans, and from what I understand from my Chinese fisheries expert colleagues that this is a huge problem off China's coast presently causing all kinds of complications. And Ms. Mallory noted the IUU problem. I think the Chinese are recognizing increasingly that that is a very difficult issue.

We'll talk plenty about disputes, but I do want to note here for the record that there has been actually some fisheries cooperation in U.S.-China relations. The U.S. Coast Guard and the China Fisheries Law Enforcement Command have quite an innovative relationship that goes back to the early '90s. That's a success story I think that's worth considering and building upon, and it's something the Chinese actually talk a lot about in their discussions.

Now, I don't have much time left, but some quick answers to the questions that were put to me before. How central are fish resources to territorial disputes? I will say quickly I think it's of intermediate importance. To me, the oil and gas issues are really driving these issues. So fishing is not front and center although it tends to get some headlines because the fishermen are out there, of course.

Are fishermen just proxies for the Chinese government? Though some incidents are clearly orchestrated by Beijing, I think most incidents have

featured Chinese fishermen getting into trouble on their own accord. In fact, there's ample evidence that the Chinese are very concerned about their fishermen making big problems for them in their foreign policy.

Does the fishing issue impact freedom of navigation issues in the region? I think incidents like the Impeccable incident in March 2009, that they endangered the lives of mariners and, therefore, are rightly condemned. However, I think the dangers to the freedom of navigation in the South China Sea that flow from that particular incident I would say have been quite exaggerated. I will be happy to amplify on that.

What about bilateral and multilateral measures? I would just say that we should look carefully at the bilateral measures that are in place. Some of them are quite innovative and there has been quite a decent level of cooperation. For example, Chinese and Vietnamese joint fisheries patrols, that is what we want to see. It hasn't worked perfectly by any stretch, but it's something we ought to look--it doesn't make headlines; right? It doesn't sell like rivalry, but there is some cooperation going on.

We ought to, speaking of multilateral forums, the North Pacific Coast Guard Forum, I think is a very interesting model that we ought to consider how that could be useful in a South China Sea context.

And, finally, as far as recommendations, I certainly support many of Ms. Mallory's practical suggestions. I'll throw in one more, though, which would be that our Coast Guard, I think, has built a very successful set of relationships. These "white hulls," as I call them, are welcomed everywhere. They have built a strategically significant reservoir of trust also with Chinese maritime enforcement authorities, but I think that cooperative relationship, which is very unique--I look at the Navy-to-Navy relationship, and that is very difficult, but this Coast Guard relationship has, I think, made considerable headway, and we ought to consider that it is also in some ways hemmed in by statute, and so I think that is a major concern.

So let me close there. Thank you very much.

HEARING CO-CHAIR D'AMATO: Thank you very much.

Commissioner Wortzel.

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CHINA'S APPROACH TO FISHERIES MANAGEMENT

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Caveat: The views expressed in this testimony are the opinions of the author alone and do not in any way reflect the official assessments of the U.S. Navy or any other agency of the U.S. Government.

1) INTRODUCTION

In almost all of the maritime territorial disputes in East Asia, fisheries questions play a significant role. One need only consider that fishing has been at the heart of serious wrangling among East Asian states from the Yellow Sea, through the East China Sea and down to the South China Sea over this past year. In December 2011, a Chinese fisherman killed a South Korean Coast Guardsman, rocking a relationship that has been deeply troubled since at the spring 2010 sinking of the South Korean frigate *Cheonan*.¹ In September 2010, another fishing incident sparked a dramatic crisis between China and Japan. After the Japan Coast Guard arrested a Chinese fisherman for seemingly reckless navigation practices near the disputed Senkaku/Diaoyu islands, Beijing is alleged to have threatened Tokyo with a cut-off in supplies of critical rare earth minerals – a major shock to the bilateral relationship.² Moreover, in the South China Sea, fisheries has been raised as a key issue dividing the many disputants and also one that has played a role in escalating tensions in that region since at least 2009.³

The above list of troubling episodes strongly suggests that Chinese fisheries policy might be critical to the possibilities for peaceful resolution of the many maritime territorial disputes in East Asia. Moreover, China's status as the world's largest fishing power also means that Beijing's inclination to accept and practice global fisheries norms could mark a giant step forward for environmental protection of the oceans in the coming century. With both strategic

¹ Choe Sang-hun, "Chinese Fisherman Kills South Korean Coast Guardsman," *New York Times*, 12 December 2011, at www.nytimes.com/2011/12/12/world/asia/chinese-fisherman-kills-south-korean-coast-guardsman.html. For a surprisingly candid Chinese perspective, see Cui Jia and Liu Ce, "Fishermen Ride Wave of Discontent," *China Daily*, 13 January 2012, p. 1.

² Keith Bradsher, "Amid Tension, China Blocks Vital Export to Japan," *New York Times*, 22 September 2010, at www.nytimes.com/2010/09/23/business/global/23rare.html.

³ Taylor Fravel, "Maritime Security in the South China Sea and the Competition Over Maritime Rights," in Patrick Cronin (ed.), *Cooperation From Strength: the United States, China and the South China Sea* (Washington DC: Center for New American Security, 2012), pp. 37-38.

and also environmental concerns in mind, therefore, this testimony endeavors to evaluate China's efforts to regulate its marine fisheries, to discuss the future prospects and challenges for this regulation and finally to outline various implications of this effort. Answers to specific questions outlined by the Commission are addressed in Section 5 below.

2) BACKGROUND

Before endeavoring to paint a fuller picture of the present situation in Chinese fisheries, it will be worthwhile to briefly present some background, especially focusing on developments of the last two decades. In addressing the issue of fisheries management, one should note that from the earliest days of the PRC, the escort of China's fishing fleets was viewed as a core mission of the Chinese Navy.⁴ In the aftermath of the devastating Cultural Revolution, the Chinese Navy began to consider more ambitious tasks and state institutions (including the armed forces) were generally reduced in capacity, in part to facilitate the growth of private entities. As originally developed in the 1970s, the fisheries service actually reported directly to both the State Council and also the Central Military Commission, reflecting the long-held belief that marine fisheries issues constitute a national security problem for China.⁵

Regulatory neglect ensued as a strong emphasis was placed on ever-increasing production targets. For Chinese fisheries, this trend led by Deng Xiaoping resulted in a massive expansion in Chinese fishing effort and production. In 1985, China entered the realm of the fishing powers by launching its first fleet of long-distance fishing vessels.⁶ This dramatic growth in effort resulted in an almost fivefold increase in marine fisheries catch by 2000.

While fisheries protection efforts in the PRC go back as far as 1955 when a trawler restricted line was established by the State Council, it is also clear that many of the positive, preliminary steps toward conservation were ignored during the headlong rush for economic growth of the 1980s and early 1990s.⁷ A major shift occurred in the late 1990s with Beijing adopting a series of important reform measures, including the inauguration of the summer fishing ban in the Yellow and East China Seas in 1995, the adoption of an explicit policy to favor aquaculture while "stabilizing" marine fisheries in 1996, as well as new fisheries agreements with Japan in 1997 and South Korea in 1998. The most important step in this reform process, however, appears to be the "zero growth" plan to control fishing capacity adopted in 1999, along with a measure to spread the summer fishing bans to both the Bohai and also the South China Sea (including notably both Hong Kong and Macau). With respect to enforcement capacity, the China Maritime Surveillance (CMS) was created in 1998 with the mission, closely related to fisheries enforcement, of protecting China's extensive Exclusive Economic Zone (EEZ) from various forms of encroachment. In 2000, a Fisheries Law Enforcement Command (FLEC) center was established "in order to bring Chinese fisheries management in line with international standards

⁴ 银河 [Yin He] "中国近海执法力量 [Development of China's Littoral Law Enforcement Force and Its Equipment] 舰载武器 [Shipborne Weapons] (March 2011), p. 16.

⁵ 银河 [Yin He] "中国近海执法力量 [Development of China's Littoral Law Enforcement Force," p. 18.

⁶ 2009中国渔业年鉴 [2009 China Fisheries Yearbook] (Beijing: China Agricultural Press, 2009, p. 2.

⁷ Huiguo Yu and Yunjun Yu, "Fishing Capacity and Management in China: Theoretic and Practical Perspectives," *Marine Policy* 32 (2008), pp. 353, 355.

and to meet domestic needs for the centralization of fisheries management.⁸ Other achievements of this period of intensive reform included: a fisheries agreement with Vietnam, the extension of fishing bans to parts of the Yangtze River, and also an ambitious effort to create marine protected areas.⁹

It is not certain at this point what leaders or bureaucratic constellation enabled the above sweeping reforms, but one may speculate that – as elsewhere in global fisheries – that a deep crisis in the form of depleted stocks have spurred the above actions. The kind of data at the heart of this crisis included the revelation that since the 1960s, fish species in the Beibu Gulf (Gulf of Tonkin) area of the South China Sea had declined from 487 to 238. The same study revealed that stock density had reached its lowest level in 1998 at just 16.7 percent of that in 1962.¹⁰ Suggesting that the crisis would not be easily remedied, Chinese fisheries expert Prof. Mu Yongtong wrote in 2006: “Now, the fact is obvious that the development of our nation’s fishing industry has reached an extremely important juncture. Most – if not all – of the fisheries have been fully exploited, and many are already exhausted.”¹¹

A different perspective on this crisis emerged from a study by faculty of the Maritime Police (China Coast Guard) Academy in Ningbo that was published in 2007 and which received ample attention in diverse parts of the Chinese government. The authors asserted, for example, that Chinese fisheries suffered from significant foreign encroachment, explaining that, for example, fishermen from Malaysia, Vietnam and the Philippines were taking advantage of the summer fishing ban on Chinese fishermen in the South China Sea to take a larger catch for themselves.¹² The authors maintained that part of China’s problem in fisheries enforcement was related to the division of labor in maritime enforcement among “five dragons stirring up the sea,” rather than the centralized enforcement (e.g. coast guard) wielded by states such as Japan or the United States. As an illustration of the problem, the Ningbo Academy faculty suggest the apparently common place problem in Chinese maritime enforcement of “管得着的看不见，看得见的管不了 [Got the jurisdiction, but can see or can see, but lack jurisdiction].¹³ In other words, the balkanized nature of Chinese maritime enforcement into at least five different departments, of which the FLEC of the Agriculture Ministry is just one major entity and not at all the most potent, has seemingly contributed to the present crisis in Chinese fisheries and the weakness of fisheries enforcement.

3) RESULTS

3.1 *Chinese Fisheries Data*

⁸ 银河 [Yin He] “中国近海执法力量 [Development of China's Littoral Law Enforcement Force and Its Equipment], p. 18.

⁹ 2009中国渔业年鉴 [2009 China Fisheries Yearbook], pp. 4-5.

¹⁰ Yunjun Yu and Yongtong Mu, “The New Institutional Arrangement for Fisheries Management in the Beibu Gulf,” *Marine Policy* 30 (2006), p. 251.

¹¹ 慕永通 [Mu Yongtong] 渔业管理：以基于权利的管理为中心 [Fisheries Management: Focusing on a Rights-Based Regime] (Qingdao: China Ocean University Press, 2006), p. 292.

¹² 何忠龙 [He Zhonglong et al], 中国海岸警卫队组成研究 [Research on the Creation of a Chinese Coast Guard] (Beijing: Ocean Press, 2007), p. 54.

¹³ 何忠龙 [He Zhonglong et al], 中国海岸警卫队组成研究 [Research on the Creation of a Chinese Coast Guard], p. 41.

The total marine catch for 2009 was 11,786,109 tons, up 2.5% from 2008. The catch of pelagic fishes for 2009 was reported to be 8,040,286 tons, up 1.8% from 2008. The take of shellfish for 2009 was reported as 2,018,924 tons, up 3.8% from 2008. Among the three basic regions encompassing Chinese fisheries, the East China Sea yielded the largest catch, followed by the Bohai/Yellow sea areas, and with the South China Sea somewhat lower than these other areas. While each of these sea areas registered higher catches, it is interesting to observe that the South China Sea area witnessed the smallest increase of .4 percent.¹⁴

Breaking down further the catch of pelagic fish by Chinese fishermen, the largest catch for 2009 by a significant margin was of hairtail at 1,172, 440 tons, a slight decline from 2008. Blue round carangid, anchovy, spanish mackerel, silver pomfret and small yellow croaker followed in that order, varying between 350,000 and 550,000 tons. However, the largest catch increases did not involve any of those large fisheries. Rather, major catch increases were of mullet, porgy, spotted maigre, black scraper, and sand lance – all of which increased 10-20% in 2009. The largest catch declines for 2009 were of bamboo pod fish, chub mackerel, anchovy, and pacific herring. The decline for anchovy amounted to - 20.8%.¹⁵

With respect to shellfish, the large shrimp catch was up 5.6% in 2009, rising to a total of 1,475,426 tons. The crab catch was down slightly to 543,498 tons. The squid catch increased to 351,778 tons in 2009. Prawns were reported to increase the most (20%), while the take of algae saw the steepest decline in this reported data (-38.75%).¹⁶

China was officially reported to have just over a million fishing boats, of which 672,633 are motorized and 430,835 are involved in marine fisheries, including 1,570 large fishing vessels, 68,538 medium-sized fishing vessels and 360,727 small fishing boats. Despite policy intention to decrease fishing capacity, both numbers of boats and also tonnage are reported to have increased from 2008 to 2009. A few provinces, including Guangxi, Shandong and Guangdong succeeded in reducing fishing tonnage, but others such as Zhejiang and especially Jiangsu saw major increases.¹⁷

4.2 *Chinese Fisheries Law Enforcement Command (FLEC)*

The same annual report that yielded the catch data above suggests that the FLEC had 2,165 enforcement vessels of all sizes in 2009 with a total force equivalent of 55,453 tons. The force was reported to have been reduced by 144 ships (3,358 tons) since 2008. In terms of human capital, the FLEC has 35,093 personnel. Apart from a headquarters unit of 865 persons, they are spread among all of China's provinces.¹⁸

Reflecting an apparent consensus in the Chinese government that includes the influential

¹⁴ The data in this paragraph is drawn from 2010中国渔业年鉴 [2010 China Fisheries Yearbook], (Beijing: China Agricultural Press, 2010), pp. 186, 188, 154, 158.

¹⁵ The data in this paragraph is drawn from 2010 中国渔业年鉴 [2010 China Fisheries Yearbook], p. 187.

¹⁶ The data in this paragraph is drawn from 2010 中国渔业年鉴 [2010 China Fisheries Yearbook], p. 186.

¹⁷ 2010 中国渔业年鉴 [2010 China Fisheries Yearbook], p. 208.

¹⁸ The data in this paragraph is from 2010 中国渔业年鉴 [2010 China Fisheries Yearbook], pp. 207, 221.

military, there is a strong conviction that Chinese maritime enforcement forces are too weak, especially relative to other Pacific maritime powers. The announcement in October 2010 by a senior official that China would endeavor to build 30 maritime enforcement cutters over the next five years was the result of this consensus.¹⁹ Relative to other world coast guards, this rate of production qualifies as a very significant buildup that illustrates both the determination of Beijing to advance in this area, but also the relative backwardness of current forces that have long been neglected. Indeed, it has seemed that over the last decade among the so-called “five dragons” of Chinese maritime enforcement that the FLEC has ranked among the lowest of priorities.

A recent unofficial report suggests that the FLEC has 140 ocean-going cutters with eight vessels exceeding 1,000 tons. This same report observes that 渔政 202 (hereafter YZ 202) was China’s first modern, large enforcement cutter that entered service with the FLEC in 2001. Future operations and capabilities of the FLEC, however, are probably better understood by briefly examining the newest cutter – much heralded in the Chinese press -- designated YZ 310 that entered service in September 2010. Its speed of 22 knots makes it the fastest cutter in service with the FLEC. The cutter is 107m in length and has a crew of 56. At 2,500 tons, it is certainly capable of deep ocean patrols and is said to have a range of 6,000km. Notably, it appears to be the first FLEC ship to be significantly armed, as it is equipped with a pair of 14.5mm rapid fire machine guns mounted on deck, which is suggested to be a response to the increasing threat of piracy. More important still is that it is the first FLEC ship to have a helicopter hangar and launching deck.

As in most endeavors, capital and technology are only one part of the equation and more often than not, human capital more accurately determines true capability. At present, unfortunately, little is known regarding the recruitment, education and training of FLEC personnel. Of the approximate 33,095 employees of the FLEC reported above, it is said that 5,467 serve on board FLEC vessels. The FLEC apparently added 2,000 additional billets over the last year. 67% of FLEC personnel are now college graduates, up 11 percentage points compared to 2005.²⁰

For 2009, the FLEC claims to have performed 4,971 vessel inspections, and also expelled 103 foreign fishing vessels illegally fishing in Chinese waters. Although the FLEC appeared to have moderate patrol activity, including some inspections, in the vicinity of the Paracel Islands in the South China Sea, no vessel inspections were claimed in the sensitive Spratly Islands area.²¹

According to official data, about 300 Chinese fishermen died at sea with the most frequent causes of death being accidents resulting from collisions and also typhoon-related sinkings. The FLEC was reported to be involved in 877 rescue incidents in 2009 in which 4,502 Chinese fishermen were saved. An apparent priority for the FLEC has been to provide Chinese fishermen with advanced communication and navigation equipment to facilitate rescue.²² A report in 2009

¹⁹ "中国计划未来5年内建造30艘海上执法船" [China Plans to Build 30 Maritime Enforcement Cutters Over the Next 5 Years] 中国新闻网 [China News Net] 11 October 2010.

²⁰ 2010 中国渔业年鉴 [2010 China Fisheries Yearbook], p. 26.

²¹ 2010 中国渔业年鉴 [2010 China Fisheries Yearbook], p. 118.

²² 2010 中国渔业年鉴 [2010 China Fisheries Yearbook], p. 18-19.

suggested that the government would provide two-way satellite communications equipment for one million Chinese fishing vessels.²³ The AIS system is widely functional along the Chinese coast. Satellite vessel monitoring systems are apparently in place, as well, to assist with enforcement.²⁴

According to the 2009 China Fisheries Yearbook, the FLEC first undertook to patrol the Spratlys region of the South China Sea in 1994 and was ready at that time to both “eat bitterness ... and to ... struggle ...”²⁵ On the other hand, such long distance patrols appear to be quite rare even up until the present time in light of the major headlines accorded to the deployment of the new YZ 310 to the Spratlys region in late 2010. This vessel’s deployment to that sensitive sea area at that time was apparently intended to both “regularize [and] ... institutionalize” Chinese fisheries patrolling in the Spratly’s area of the southern South China Sea.²⁶ An even more significant clue regarding FLEC patrol patterns in the South China Sea concerns the 12 degree line, cited in at least one Chinese official pamphlet to suggest that the summer fishing ban is enforced north of that line, but not south of it.²⁷ This intriguing enforcement policy will be taken up again for discussion in the section that follows. Relying on Vietnamese data, as well as Chinese figures, Taylor Fravel concludes that there was a disturbing uptick in 2009 of Chinese confiscations of Vietnamese fishing boats in the South China Sea, but these numbers subsequently fell sharply in 2010 – and no cases were reported for 2011.²⁸ In November 2011, it was announced that the medium-sized FLEC cutter YZ 306 would hence forth be based in the Paracel Islands.²⁹ This may serve as yet another indication that the FLEC will play a definite role in China’s evolving strategy for the South China Sea. A clear pattern of increasing FLEC patrols is evident in the South China Sea, a point noted recently by Fravel using similar data.³⁰

Another rather conspicuous and likely politically motivated deployment of FLEC ships occurred immediately after the confrontation with Japan in September 2010 concerning the Japan Coast Guard taking a Chinese trawler crew into custody in the East China Sea. The image of China FLEC cutters standing eye-ball to eye-ball with the Japan Coast Guard cutters in the disputed area produced significant consternation among Chinese observers who noted that their cutters did not compare favorably either in respect to size or capabilities.³¹

4) DISCUSSION

²³ 中国100万渔船将可装备国产卫星双向通信设备 [One Million Chinese Fishermen Will Be Equipped with Two Way Satellite Communications Equipment] 新华网 [Xinhua Net] 22 May 2009.

²⁴ Interviews, Qingdao, December 2011.

²⁵ 2009中国渔业年鉴 [2009 China Fisheries Yearbook], p. 5.

²⁶ 陈韬颖[Chen Taoying] "中国渔政310船" [China Fisheries Enforcement Vessel 310] 舰船知识 [Naval and Merchant Ships] (December 2010), p. 71.

²⁷ 严寅央 [Yan Yinyang, ed.] 海业卫士: 平安选择1997-2007 [Guardian of the Ocean Industry: the Choice for Security] (Hangzhou: Zhejiang Province Fisheries Law Enforcement Command, 2006), p. 23.

²⁸ Fravel, “Maritime Security in the South China Sea,” p. 38.

²⁹ 中国首艘X西沙群岛大型渔政船投入使用 [China Initiated the Basing of the First Large Fisheries Enforcement Cutter in the Paracel Islands] 舰船知识 [Naval and Merchant Ships] (November 2011), p. 13.

³⁰ Fravel, “Maritime Security in the South China Sea,” p. 37.

³¹ 海韬 [Hai Tao] "中国酝酿建'第二海军'执法舰应配火炮" [China Must Affix Cannons As it Builds Its 'Second Navy'] 国际先驱导报 [International Herald Leader] 27 November 2010.

4.1 *Positive Outlook*

Given the trends outlined above, it is important to state that the overall picture is one of steady and even dramatic improvement in China's approach to fisheries management. Various and numerous problems continue to plague this system (and will be analyzed in section 5.2), to be sure, but China is in no sense a "rogue" actor in regional and global fisheries, nor does it seem to be using fisheries issues as lever to coerce its neighbors within a scheme of maritime expansion, as has been alleged.

First and foremost, the Chinese leadership has made a series of important decisions that have set China on the right course. These have included the mid-1990s decision to strongly emphasize aquaculture in order to take production and employment pressure off of marine fisheries. Also important have been the series of fisheries agreements that followed in that period of major reform with key maritime neighbors. Those agreements have resulted in many angry Chinese fishermen³² and they are perhaps by nature imperfect, requiring constant fine-tuning, but they have crucially created a strong institutional framework and enduring precedent for regional cooperation in fisheries management. The "zero growth plan" adopted in 1999 stands as a landmark decision by the Chinese leadership that cut sharply and directly against the country's national ethos of growth.

The implementation gap remains, but this paper suggests that this problem is being addressed. For example, the fact that fishing tonnage in both Shandong and Guangdong provinces (two of the largest marine fishing areas) decreased during 2008-09 appears to reflect major efforts to better regulate Chinese marine fisheries. Likewise, although the Chinese DWF fleet is active now on all the world's oceans, it is noteworthy that it declined in size during 2008-09 (the second year in a row),³³ suggesting again that Beijing is actually not simply out to exploit the world's oceans down to the last fish. An especially critical component of China's apparent commitment to improving its fisheries is its robust development and cultivation of fisheries expertise, which is readily apparent in its many ocean policy and fisheries research journals, as well as in its support of dedicated and robust research efforts embodied in such quality institutions as China Ocean University (Qingdao) or Shanghai Ocean University. Indeed, the technocratic Chinese approach to marine resources management specifically is amply evident in the annual Chinese Fisheries Yearbook – a major source for this testimony. Chinese statistics have been problematic for fisheries science in the past, but the data are now much more credible, reporting as they do both good news and bad. Overall, it should be recognized that the practices of Chinese fishermen have important regional and global environmental consequences and so continued strengthening of the China FLEC is a crucial process not just for Chinese but also for the world.

4.2 *Major challenges*

Despite the generally positive outlook flowing from a series of brave decisions in the 1990s, Chinese marine fisheries cannot yet be described as healthy. A few positive signs have been

³² See, for example, Cui Jia and Liu Ce, "Fishermen Ride Wave of Discontent," *China Daily*, 13 January 2012, p. 1.

³³ 2009 *中国渔业年鉴* [2009 China Fisheries Yearbook], p. 14.

recorded, but overall fish stocks remain dangerously depleted and Chinese fisheries experts remain pessimistic.³⁴ A recent Chinese study found that pollution was a significant reason that Bohai fish production is now just 20% of what it was in the 1980s.³⁵

As discussed previously, a consensus among Chinese maritime analysts holds that China's approach of multiple maritime enforcement agencies without any single "leading dragon" has created a problematic situation of confusion, inefficiency and general weakness. While some significant steps toward realizing integration among the maritime enforcement agencies has been achieved, the outlook is not especially promising in this regard. For example, the phenomena described in section four above of various provinces integrating maritime enforcement while others do not, is broadly suggestive of the pervasive decentralization in Chinese maritime enforcement that inhibits uniform and effective fisheries management. Moreover, despite some improvements in both personnel and capital, it seems that the development of the FLEC is not a very high priority – well behind the vigorous Maritime Safety Administration (MSA), for example.

Despite stricter enforcement measures and a variety of steps discussed above, major problems may continue to exist within the mechanics of Chinese enforcement. Thus, a recent report in the Chinese journal 海洋开发与管理 [Ocean Development and Management] notes that four of five critical fish species stocks off of Guangdong show no improvement under the current regime of regulation.³⁶ The summer fishing ban, perhaps China's most fundamental control on fishing effort, is controversial. One study, for example, claims that the summer ban is more effective than restrictions on mesh size and that significant improvements followed the 2009 decision to extend the ban from 12 weeks to 14.³⁷ Other Chinese specialists, however, argue that the summer ban fuels regional tensions (see section 5.3 below) and needs to be replaced by a more advanced system of tradeable quotas – a practice gaining acceptance among global fisheries experts. Without quotas in place (and related measures), it is reported that China has done little to track bycatch in its fisheries – a veritable gaping hole in its effort to restore ecological balance in its proximate seas. Chinese specialists are, moreover, very concerned about the increasing and somewhat unpredictable impact of mariculture on coastal ecosystems.³⁸ Another concern articulated by Chinese specialists concerns the issue of 三无 [three nils] or illegal, unregulated and unreported (IUU) fishing.³⁹

³⁴ Interviews, Qingdao, December 2011.

³⁵ 张显良 [Zhang Xianliang, editor] 中国现代渔业体系建设关键技术发展战略研究 [Strategic Research on the Key Technologies and Development of China's Contemporary Fishing System] (Beijing: China Ocean Press, 2011), p. 66.

³⁶ 侯秀琼 [Hou Xiuqiong et al], "2007-08年伏季渔深圳市海域鱼类资源调查研究" [Research on the Fisheries Resources of the Shenzhen Sea Area During the Hot Season Moratoriums of 2007-2008] 海洋开发与管理 [Ocean Development and Management] Vol. 21, No. 6, January 2009, p. 111.

³⁷ 严利平 [Yan Liping et al] "东海区拖网新伏季渔渔业生态和资源增殖效果的分析" [Effect of New Summer Close Season of Trawl Fisheries on Fishery Ecology and Resource Enhancement in East China Sea] 海洋渔业 [Marine Fisheries], Vol. 32, No. 2 (May 2010), pp. 185-191.

³⁸ Interviews, Qingdao, December 2011.

³⁹ 许浩 [Xu Hao] "管制IUU捕捞的渔业法对策" [Law and Policy for Controlling IUU Fishing] 海洋开发与管理 [Ocean Development and Management], Vol. 26, No. 8, (August 2009), p. 26.

4.3 Disputes

There is little doubt that recent tensions, mixing with bitter historical memories and jealousies may combine to spawn a dangerous “fishing nationalism,” in the related countries. Certainly, this phenomena is amply evident in Chinese discourse. Thus, a recent Chinese book on “emergency management” of fisheries incidents asserts: “Although our country has signed one after another fishing agreements with neighboring states, the number of fishing industry security incidents involving foreigners has unceasingly increased ... Some countries even send warships to bump and sink our side’s fishing boats...”⁴⁰ Also troubling is the seeming tendency to deploy either fishing boats (maritime militia) and/or FLEC vessels for obviously political purposes that are only peripherally related to fisheries. Related examples including dangerous incidents with U.S. surveillance vessels in March 2009 and also the interaction described in late 2010 with the Japan Coast Guard in disputed areas of the East China Sea.

“武器化” [Weaponization] has been identified as a major trend for the various components of Chinese maritime enforcement including the FLEC.⁴¹ Significant gun armament on the newest FLEC cutter, as described in section four, implies a rather major departure for Chinese fisheries enforcement vessels that have always been unarmed. The same report offers detailed plans regarding how Chinese fisheries cutters might be “re-outfitted” in wartime for various combat missions including anti-submarine warfare. Such a complexion for elements of China’s maritime enforcement capabilities would not be outside the norm for major coast guards, but is still suggestive of worrying trends extant in the region.

Undoubtedly, a more robust FLEC comprising a large fleet of advanced, armed cutters that wield aviation capabilities might be viewed as a looming threat by other regional claimants in the East Asian region. China is hardly disguising its intent to employ these new capabilities for enforcing maritime claims, in addition to improving fisheries management. Still, one hopeful way to approach this development is to consider a much starker alternative. Would it be better if Beijing regularly dispatched naval vessels “grey hulls” equipped with missiles to enforce its claims or perhaps the “white hulls” of the FLEC instead? Chinese maritime strategists, including within the military, seem to understand that employing civil maritime enforcement “white hulls” into volatile situations is less dangerous and escalatory than the deployment of “grey hulls.” Another interesting aspect of Chinese policy concerns the 12 degrees latitude line that the FLEC apparently employs in its enforcement activities in the South China Sea that strongly hints at a less extreme and more compromising approach to claims and resources by Beijing. Indeed, this pragmatic line could point the way toward an equitable division of the sea’s resources on the basis of a negotiated compromise.

4.4 Cooperation

Even as fisheries disputes may form the “leading edge” of intensifying struggles for resources in

⁴⁰ Li Zhujiang (ed.), *The Ocean and the Fishing Industry: Emergency Management* (Beijing: Ocean Press, 2007), p. 299. [in Chinese]

⁴¹ 银河 [Yin He] “中国近海执法力量 [Development of China's Littoral Law Enforcement Force and Its Equipment], p. X.

the Asia-Pacific region, it is alternatively possible to consider how fisheries might simultaneously form one of the most pioneering and innovative aspects of bilateral and multilateral maritime cooperation in this volatile region. It is not widely known that quiet, technocratic cooperation has been on-going in this area between China and various neighbors and other important maritime powers including the U.S. for decades.

A successful record of fisheries cooperation between Washington and Beijing is especially noteworthy given the other tensions that have plagued the broader relationship. In 1993, a memorandum of understanding was reached between the countries to jointly act against driftnet fishing in the North Pacific, a practice prohibited by the United Nations. The memo established the innovative concept of posting a Chinese FLEC ship-rider aboard a USCG cutter in order to give the American ship the necessary jurisdiction to enforce the UN prohibition effectively. At this point, the FLEC has leaned upon the superior capabilities of the USCG in cooperating to serve global environmental imperatives. China FLEC personnel and related specialists have also visited various U.S. fisheries enforcement training centers in Alaska and elsewhere. In the future, however, a more robust FLEC may become a more equal partner in this kind of cooperation, regularly dispatching one or more high endurance cutter to patrol the waters of the North Pacific. No doubt, this original form of cooperation has been supported by the broader cooperative institutional framework of the North Pacific Coast Guard Forum, enabling the USCG and various maritime enforcement agencies including the FLEC to develop essential habits of dialogue and cooperation.

Some may criticize these efforts as more symbolic than substantive, but that is not at all how such efforts are presented in Mandarin-language (i.e. for Chinese audiences) official reports wherein international exchanges and cooperation are actually prioritized, for example in the China Fisheries Yearbook 2010. Thus, the East Sea FLEC department report calls for “active development of China-ROK and China-Japan fisheries cooperation, accelerating bilateral trust ... and enhancing the exchange of information,” among other objectives. It also calls for strict enforcement against violations by Chinese fishermen of the waters of neighboring countries.⁴² This is consistent with provincial level FLEC reports that also highlight the benefits of close international cooperation.⁴³

5) ANSWERS TO SPECIFIC QUERIES

- a. How central are fish resources to territorial disputes in the East China Sea and South China Sea? What fishing resources are at stake? The fishing factor is of intermediate importance in these disputes. On the one hand, depleted stocks and pollution are pushing Chinese fishermen further off shore. Among maritime industries, marine fisheries and aquatic products remains one of the more significant in terms of profits. Also, fishermen are a vocal minority and they do not hesitate to play the nationalism card. On the other hand, Beijing has taken steps (elaborated above) to reign in its own fishermen and its significant overcapacity. China has also engaged in significant cooperation with neighboring in the domain of fisheries – though these cooperative steps are not often covered by journalists. Finally, it is well known that oil and gas exploration issues are the

⁴² 2010 中国渔业年鉴 [2010 China Fisheries Yearbook], pp. 118-122.

⁴³ 忠于法律 执法为民 浙江省查处北太非法流网工作简报 [Faithful to the Law, Enforcement Serves the People : Short Report of Work Concerning the Investigation of Illegal Drift Nets in the North Pacific] (Hangzhou: Zhejiang Province Fisheries Law Enforcement Command, 2009).

primary drivers of each of these disputes. If fully developed, offshore energy development in these regions would likely substantially dwarf fisheries profits.

- b. What Chinese and foreign actors have been involved in fishing-related skirmishes in the disputed waters of East and Southeast Asia? To what extent can Chinese and other fishermen be characterized as proxies? Over the last several years, China has found itself entangled in fishing disputes with most of the region's countries, including especially South Korea, Japan, Philippines, Indonesia, and Vietnam. Occasionally, these incidents have resulted in violence and the loss of life. However, it is also worth noting that international fisheries cooperation has also occasionally resulted in the saving of lives (e.g. Chinese rescue of Vietnamese fishermen) and also the decreasing of tensions, as between China and Taiwan. With respect to various Chinese agency involvement with fisheries, management is mostly handled by the Ministry of Agriculture, but the Public Security Ministry and the State Oceanic Administration each also play important roles. It would not be quite accurate to characterize Chinese fishermen as proxies of the state. As with fishermen everywhere, most Chinese fishermen are inclined to keep their dealing with state institutions to a minimum. However, China does formally organize at least some segments of the fishing fleet as a "maritime militia." Though some incidents seem clearly to be orchestrated by Beijing (e.g. the March 2009 *Impeccable* incident), most incidents have featured Chinese fishermen getting into trouble of their own accord. In fact, there is ample evidence that Beijing wants to reduce and manage such incidents.
- c. How do Chinese fishing activities impact maritime security and freedom of navigation in the region? Are there clear implications for U.S. interests? The question is no doubt prompted by the March 2009 incident in which Chinese fishing boats surrounded and navigated recklessly in dangerous proximity to USNS *Impeccable*. Such incidents endanger the lives of mariners and therefore are rightly condemned. However, the dangers to the freedom of navigation through the South China Sea that flow from this particular incident have been exaggerated. First, there is no discernible pattern of deploying fishing vessels against U.S. surveillance vessels – the incident remains exceptional, as least as far as open source reporting has revealed. Second, the incident does reflect a genuine difference in interpretations of the Law of the Sea, in particular regarding military activities in the EEZ. Third, the incident may be regrettable, but it is worth considering that Beijing has chosen to indicate its displeasure with such surveillance activities by deploying civilian, unarmed vessels for the most part. That clearly suggests that China is not looking to escalate the crisis to a military confrontation. As indicated elsewhere in this paper, "white hulls" or unarmed fishing vessels in these incidents are preferable to grey hulls armed with cannons and missiles. The U.S. cannot and should not retreat from its widely accepted legal position regarding military activities in the EEZ. Nevertheless, Washington would be wise to consider reducing these surveillance missions in China's EEZ in return for increasing Chinese military transparency. Given modern Chinese history with "gunboat diplomacy," such missions conducted at a high rate of frequency are doing more harm than good for international security. The United States should take a more relaxed approach to China regarding freedom of navigation issues. After all, the rising maritime juggernaut that is contemporary China benefits enormously from freedom of navigation, and thus is very unlikely to block other states from doing so, not least because of its own intense vulnerability to blockade.
- d. Are there any specific cooperative bilateral or multilateral measures to ensure sustainable and secure fishing practices in contested areas of the East China Sea or South China Sea? How effective are these measures? With regard to bilateral steps, it is worth emphasizing that bilateral fisheries agreements have been in place since the late 1990s. These agreements, while very far from perfect, have had some noteworthy successes, including for example, joint Vietnamese and Chinese fisheries patrols. In another example, it seems that Chinese maritime enforcement personnel have attended the Japan Coast Guard Academy with some regularity. As related above, it is important to note that Chinese fisheries reports draw attention to the successes of bilateral fisheries agreements – strongly suggesting that Chinese fisheries personnel are keen to

demonstrate to the Beijing national leadership that they are working effectively with international partners. One way to energize these useful connections would be to establish a South Pacific Coast Guard Forum on the model of the North Pacific Coast Guard Forum – an organization that has had some major success in coping with the complex issues of civil maritime enforcement, rescue and management in the volatile region of Northeast Asia.

- e. What are your recommendations for Congressional action regarding these matters? Contrary to conventional wisdom, the U.S. government (including Congress) should actually be less concerned with the disputes in the East China Sea and South China Sea. These disputes do not directly involve U.S. national security interests, and the U.S. should avoid triggering inadvertent escalation of these conflicts by intervening. Indeed, escalation of the South China Sea dispute since 2009 has partly resulted from Washington's more proactive stance, unfortunately. Tensions and anxiety are bound to accompany the rise of China, but resources disputes between neighbors are natural and wholly expected. Some related muscle flexing is also to be expected, but the fact that Beijing has not resorted to the significant use of force in more than three decades should be the basis for significant confidence that major military conflicts will be avoided in both of these cases. As regards effective fisheries management in East Asian waters, it is advisable that the U.S. Coast Guard maintain and even increase its helpful role. The non-threatening "white hulls" of the USCG are welcome everywhere in the region – offering genuine experience in combating the non-traditional security threats, from fish poaching to narco-trafficking -- that are of greatest concern. Indeed, the USCG has built a strategically significant reservoir of trust over time with various Chinese maritime enforcement authorities – though this cooperation is unduly limited, for example with respect to Chinese students at the US Coast Guard Academy, by statute. Congress should act to remove limits on this unique and helpful relationship that supports East Asian maritime security. Moreover, given USCG's very important role in international engagement, USCG needs to be funded at appropriate levels so that day-to-day security and rescue missions (the obvious priority) do not curtail outreach and engagement missions that are of secondary importance, but are still very significant for enhancing national security.

6) CONCLUSION

The conclusion of this preliminary survey of various Chinese-language materials related to fisheries, rarely examined by Western scholars, yields the tentative conclusion that significant, albeit incremental progress is occurring in Chinese practices as demonstrated by major leadership commitment, the impressive related research apparatus, clear efforts to improve the China FLEC in order to close the implementation gap in Chinese fisheries, and an evident Chinese enthusiasm for bilateral and multilateral cooperation.

As enumerated in section four, major flaws are still evident in Chinese fisheries enforcement, such as tabulating and reducing bycatch but the trend is generally positive for the global environment and deserves international support. To be sure, small states in dispute with China over maritime claims will no doubt be anxious regarding a more capable FLEC that will carry the Chinese flag more frequently and on larger vessels into disputed waters. Still, there is little evidence at this point of Beijing recklessly pushing its fishermen and enforcement vessels into disputed zones. Rather, China appears to be generally trying to minimize the deleterious impact of fisheries complications on relations with crucial neighbors.

Contemporary China is always looking for external models to aid in its development process. Thus, it is not surprising to find Chinese specialists puzzling over the lessons of the 18 year

struggle over fisheries between the United Kingdom and Iceland in the so-called “Cod War.”⁴⁴ One may hope that a major lesson of that dispute for China is that the country with the bigger navy does not necessarily prevail in maritime disputes. However, Westerners evaluating Chinese policies in East Asian waters also need to recognize that current evidence suggests that Beijing is, as in many countries, facing a wave of discontent among fishermen, but still making gradual and earnest efforts to comply with emerging international norms regarding maritime governance.⁴⁵

⁴⁴ 蓝云 [Lan Yun, ed.] 鳕鱼战争 [The Cod War] 现代舰船 [Modern Ships] (XX), pp. 28-31.

⁴⁵ Cui Jia and Liu Ce, “Fishermen Ride Wave of Discontent,” China Daily, 13 January 2012, p. 1.

Panel IV: Questions and Answers

COMMISSIONER WORTZEL: Appreciate you all being here, and it's good to see two of you again. Nice to see you.

Ms. Mallory, if the U.S. ratifies the Law of the Sea Treaty, as you suggest, do you have any reservations about turning authority for seabed mining over to some, as yet undefined, United Nations body that could be influenced by countries like North Korea, Cuba, Venezuela and Iran, and how do you see that serving U.S. interests? And then I'll ask another question, and let everybody have a chance to answer.

Dr. Goldstein, in your testimony, you say that the United States government, including Congress, should be less concerned about the disputes in the South and East China Seas.

Now, my contacts, South Korea, Japan, Vietnam, mirror the concerns that Dr. Cronin expressed, that these activities by China are expressly designed to not only create tension but to reinforce territorial claims.

So the question is would a dispute in either of the areas that you told the United States not to worry about, especially if it involved militaries, affect United States interests, and especially if one of those disputes involved an ally, Japan, and South Korea, or a partner by note, the Philippines?

And Dr. Cronin, if you have a position on that, I'd be happy to hear it.

MS. MALLORY: Thank you very much for the question.

Actually, I think that if the U.S. were to sign the U.N. Convention on the Law of the Sea, I think that would really be a show of credibility on the part of the U.S. And just because the U.S. would sign that or ratify the treaty, that doesn't necessarily mean that everything that is in the treaty automatically applies and is law and is going to be implemented.

I actually think--I mean we all know that doesn't really necessarily happen, that an international law--

COMMISSIONER WORTZEL: So we would just opt out of that, the way the Chinese opted out of--

MS. MALLORY: No, no, that's not what I'm saying.

COMMISSIONER WORTZEL: --the Exclusive Economic Zone?

MS. MALLORY: Actually, what I'm saying is that I think it would allow the United States to participate in a forum for discussion over some of these issues, whereas, right now, it's actually excluded from a lot of the discussion, and so just because the Chinese would ratify--Chinese--sorry--just because the United States ratifies the treaty doesn't necessarily mean that it's going to agree to everything, but it allows some conversation about it.

Thanks.

DR. GOLDSTEIN: Yes, thanks for the question, Commissioner Wortzel. I note that this is not the first time that we've sparred on the issue of the East China Sea.

[Laughter.]

COMMISSIONER CLEVELAND: And it won't be the last.

[Laughter.]

DR. GOLDSTEIN: Sorry?

COMMISSIONER CLEVELAND: And I said it won't be the last.

DR. GOLDSTEIN: Very good. I look forward to that dialogue.

I have some deep reservations with the administration's so-called "pivot to Asia." I think we have found ourselves with a much more, quote, "forward" policy than we should have, than our interests merit. This has been-- one way of characterizing this has been that the United States used to have a policy of neutrality. Indeed, when China was actually assertively using force in the South China Sea in 1974 and 1988, the U.S. maintained its policy of neutrality, but maybe our policy of neutrality has become, quote, "active neutrality" or maybe has become, you know, "active concern."

One can speculate on the reasons for this, ranging from, deep economic stresses, that we're just concerned about China, China's economy, China's military capabilities. I think there is some rightful concern there. Or, you know, one can, in the days of constrained military budgets, I think there is a bit of a concern for how do we preserve the military budget. Sad to say, I do think that is extant in a lot of strategic thinking today.

But there are real reasons why this pivot is not helpful. I think that we cannot consider U.S. interests to be the sum of other countries' interests. That is we can't sort of add up the interests of Philippines, Vietnam, Japan, and say that equals U.S. interests. I think that is a very wrongheaded and poor strategic approach.

There is no question in my mind that we need China on various global issues of great importance to the United States. For example, North Korea. For example, Iran. These are questions that do impact very seriously upon U.S. national security. If we are strident with China on the East China Sea and the South China Sea, we should not be surprised if things are not going well in these other difficult areas. I can enumerate many other reasons, but I don't want to take all the time here, but I would welcome the opportunity to elaborate further.

COMMISSIONER WORTZEL: Dr. Cronin, do you want to add anything?

DR. CRONIN: This opens up a lot of questions so let me just make a couple of brief points. One is that the United States does, indeed, have an interest in cooperating with China where we can cooperate, but we're wrong if we assume that we always have the same interests.

Just because we want to cooperate doesn't mean that China wants to reciprocate. They have larger strategic aims here beyond fishing, not just oil, not just the sea lines of communication. It does get very much to the previous discussion on trying to overcome this Malacca dilemma, trying to assert greater control over their near seas, and we would be wrong to deny that they have those strategic interests, and they conflict with some of our presence and some of the institutions and the norms that we've helped to erect over the last more than half century.

I think we have a strong interest in trying to cooperate with China on what those rules of the road will be though, and one reason to work more diligently with Southeast Asia and others in the region is to try to help convince China that they have a common interest, and they should have a common interest in abiding by some of these rules, and if they don't, there's a counterweight ready to take on that problem.

I don't see this as the United States stepping away from its neutrality over sovereignty claims. Far from it. I see this as very much a reaction to growing Chinese assertiveness. If you look at it from the perspective of all of China's neighbors, that's how they see it.

And the United States, when Secretary Clinton famously stepped in the 2010 ASEAN Regional Forum, she essentially drew a line in the sand about, no, the United States really does have an interest in making sure we have peaceful cooperation and multilateral means of overcoming challenges like this in dealing with these problems, not United States has an interest in taking sides, and I think that's a very important distinction, and I support that distinction.

HEARING CO-CHAIR D'AMATO: Yes. Commissioner Blumenthal.

COMMISSIONER BLUMENTHAL: Thank you. Thank all of you for your testimony, and Ms. Mallory, I commend you still being a graduate student and coming out here and putting yourself out and testifying before us. It's great to see. I don't think I could have done that. I still can't really do that.

[Laughter.]

COMMISSIONER BARTHOLOMEW: Yes, you can't.

VICE CHAIRMAN REINSCH: She's a SAIS student. What else did you expect?

COMMISSIONER BLUMENTHAL: Well, so was I.

HEARING CO-CHAIR D'AMATO: Oh, wow.

COMMISSIONER BLUMENTHAL: Anyway, a couple of questions. Well, I guess a comment and then a question or pivot to a question.

[Laughter.]

COMMISSIONER BLUMENTHAL: So, Dr. Goldstein, you've rightly written in the past that freedom of navigation is not really the issue. The issue is that the U.S. conducts a lot of military exercises inside the EEZ of China, which China doesn't like. But it's not freedom of navigation, but, I guess we have a national interest in doing so. I mean we're in a great power competition with China.

So the other sort of comment and question is let's say it is true that--well, it is true that China is violating the UNCLOS by claiming all these features as territory and then claiming those features as EEZ essentially, and the U-shaped line, and so on and so forth. Let's say China is successful in those efforts, which essentially means that the South China Sea becomes--and I'm being speculative here--becomes Chinese sovereign territory. We have a pretty significant national interest if China was able to do that.

And, again, you have to put the pieces together here, but violating the UNCLOS, claiming, as Ms. Mallory and others have said--Peter Dutton, the Naval War College, claiming territory where UNCLOS has no basis for that claim, not in islands but in land features and so forth, and then claiming EEZs around those, one could make a case that China is trying to stake out a big expanse of territory as its own which the U.S. has national interests in.

So, anyway, I'd ask you to respond to that.

Finally, on the UNCLOS itself, I don't think the UNCLOS has anything or is very vague on the issues that really matter to us, and that is our military exercises in the EEZ, and the U.S.-- and Dr. Goldstein pointed out that that's really the issue. And China has been very successful in arguing legally that we

don't have the right to do that under UNCLOS because of the vagueness of it all.

And I just wonder why we would sign a treaty that China is already violating when there are hundreds of years of customary international law and practice behind what we're doing?

And I guess specifically on the question of fisheries, aren't we already abiding ourselves by international law on fisheries? What does UNCLOS do for us there? So I believe that's all. I'm sorry I took a lot of time with the question. If the Chairman would allow them to answer the questions, go over my time, I mean?

HEARING CO-CHAIR D'AMATO: No, you go ahead.

COMMISSIONER BLUMENTHAL: I'm not going to answer my own questions.

HEARING CO-CHAIR D'AMATO: Go ahead and answer the questions.

COMMISSIONER CLEVELAND: You might.

[Laughter.]

DR. GOLDSTEIN: Yes, thanks.

Many people, many of my colleagues at the Naval War College would wholeheartedly agree with your perspective--and you named Peter Dutton-- James Kraska, James Holmes. So when they come down, you can get their perspective.

I also want to say that even over the course of the last couple of months, several Chinese colleagues--that is Chinese strategists-- have said, our own opinion, my own opinion is that this U-shaped line is completely ridiculous and wholly indefensible.

So, in some ways, I think that in China, the issue --among strategists-- is not taken all that seriously. Again, I can elaborate if you wish. But my position, in general, is that the United States position at this point is conflating a number of different issues, as you suggested.

Indeed, they don't even happen in the same area; right. These incidents that have happened, like the Impeccable happened way up in the north part of the South China Sea, whereas some of these fisheries incidents of concern and whatnot, many of them are occurring in the central or the south part of the South China Sea.

I think that reasonable countries disagree about these things. India, I think, India's position on the military activities in the EEZ is not that far from China's position. On freedom of navigation and transit issues, which are, you know, part of this debate, but, again, a kind of separate part, we have issues with Canada; we have issues with Japan. So it's not actually unusual for countries, even friendly countries, to disagree.

What I'm worried about is that we are kind of using this issue as a kind of a battering ram, and, unfortunately, this is having negative strategic effects. I alluded to some earlier, but the level of threat anxiety at this point in China is extremely high, and to a point where I've seen rhetoric that in the 20 years that I've been following this is, you know, I think it's totally unprecedented.

I actually have an article on this where I go through some of the Chinese materials I think that haven't been looked at elsewhere, and it's very troubling. And I see that there's been a very--this turn since the Clinton speech

in Hanoi, you know, incredibly bellicose rhetoric, and I don't think we ought to ignore that.

China is not against freedom of navigation. Wen Jiabao just gave a big speech saying, golly, we got to keep the Strait of Hormuz open. And it's a no-brainer; right? China is a maritime trading juggernaut. China's economy would tank if these--

COMMISSIONER BLUMENTHAL: I didn't say it was. I didn't say it was--

DR. GOLDSTEIN: If you don't mind, let me finish.

COMMISSIONER BLUMENTHAL: Yeah.

DR. GOLDSTEIN: Okay. China also views its own SLOCs as intensely vulnerable; okay. Historically, they have suffered. They have had their SLOCs interfered with seriously. They have actually had their own merchant ships stopped, actually pulled over by the U.S. Navy in the so-called Yinhe incident where we pulled over a merchant ship, inspected the whole thing and found it had nothing. They didn't like that too much.

So, whereas, the opposite has not happened. China has never pulled over a merchant ship and said what the heck is in here? So, you know, I think that we have seriously exaggerated this issue as a point of contention, and we should be thinking about more cooperative approaches to resolving these issues.

Thanks.

HEARING CO-CHAIR D'AMATO: Anyone else have something to add on that?

MS. MALLORY: Yeah, I'd like to add something. Just a few points. Peter Dutton actually wrote a really great article discussing China's claim to the South China Sea, and it's actually a very vague, sometimes not very cohesive, sometimes the arguments that various people in China make are at odds with each other.

And if you contrast what China is claiming to what some of the other countries in Southeast Asia are claiming in the South China Sea, there's a very big contrast. The Chinese are very vague about it, whereas, other countries in Southeast Asia have very clear claims that are based on the U.N. Convention on the Law of the Sea.

So that's the first point. Related to that, I actually think that the United States is actually mostly on the side of the U.N. Convention on the Law of the Sea with this, and so it would actually, I think, be in our favor if we were to ratify it because I think it would just give the U.S. credibility in arguing a lot of the points that are in that Convention.

And then, finally, and this is just a point to consider that I think is important, is would the United States be okay with China doing some of the same activities in our EEZ that we've been doing off the coast of China?

COMMISSIONER BLUMENTHAL: On that note, we are okay with it.

MS. MALLORY: Yeah, I think.

COMMISSIONER BLUMENTHAL: The Soviets do it. The Russians, the Russians.

MS. MALLORY: Exactly.

COMMISSIONER BLUMENTHAL: The Russians do it.

MS. MALLORY: Yeah, exactly.

COMMISSIONER BLUMENTHAL: It's common practice.

MS. MALLORY: Yeah. That was the point I was going to make. And so if that's the case, I mean we're not doing, you know, that's not violating our position on the U.N. Convention on the Law of the Sea, and so I think we should stay firm in that position.

Thank you.

HEARING CO-CHAIR D'AMATO: Dr. Cronin.

DR. CRONIN: Thank you.

First, on the United Nations Convention on the Law of the Sea, two sides of this coin. On the one hand, it would be consistent with trying to build a rules-based system, which we have stood for and do stand for and we're trying to erect.

In particular, this issue of the Exclusive Economic Zone differences, if China were allowed, because they have ratified it, were allowed to rewrite UNCLOS to convince other countries, like India, that the United States Navy, for instance, and other navies should not have right of innocent passage through the 200 nautical mile Exclusive Economic Zone of countries like China, then we would suddenly be butting up against international law. So there's a realpolitik reason even for UNCLOS.

On the other side, it doesn't solve the problems that we have actually, and it could complicate it in ways that there are different members of the U.N. committee. So it's a mixed picture, to be honest.

Now, on the 9-dash line question, there are indeed many views in China on this issue. There is no doubt about that, and some Chinese, yeah, privately will say, well, we don't really believe it, but we had to put something on the table.

But then there are those in the strategic community who also very much think this is China's wedge to ensure that this is a core interest, and that China does get the most leverage in negotiating the future of who controls this near sea.

So whether it's grounded on historical claims, which is not consistent with international law and UNCLOS, or whether it's grounded on the five main land features in the middle, which could be consistent with UNCLOS, the Chinese right now prefer to keep it ambiguous because that's where they gain leverage and advantage, and although they're now pursuing an interagency process to determine should they be less ambiguous, so far they haven't made that determination.

COMMISSIONER BLUMENTHAL: Thank you for your forbearance.

HEARING CO-CHAIR D'AMATO: Thank you.

Let me make, if I may, one comment on that. It seems to me--maybe I'm ignorant in this area--but if we don't have agreement--I'm assuming we're not going to be joining the Law of the Sea any time soon. So if we assume that's off the table, then there are no other regional arrangements, national institutions or mechanisms that are workable in terms of solving disputes in the region, as I understand it. Maybe some of the bilateral agreements are.

So if the Chinese are ambiguous about their, quote, "core national interests," it seems to me the logical result is that the countries that maintain a presence there are the ones that are going to establish the de facto rules of the

road as they exist, and therefore it's in the U.S. interests to be involved with our allies and to be in the region as a presence. Therefore the situation remains ambiguous because the major powers all have an important presence that no one wants to push to any kind of a confrontation.

Does that make any sense to you? We have this kind of sort of a standoff, but without an American presence there, the Chinese would attempt to over time implement core interests or whatever they claim to be core interests. So that what we have there is kind of a Wild West situation, it looks like to me, without any kind of international oversight. And the Law of the Sea doesn't count when we're not in it. So it seems to me--tell me if I'm wrong--that the answer is we have to maintain a substantial presence in the region to ensure that it doesn't move in the wrong direction.

Anybody want to comment on that?

DR. CRONIN: Commissioner D'Amato, I certainly would underscore your sentiment on this issue. I think that's the fundamental truth. Now, I don't stop there. I think we want to try to keep building cooperation.

Indeed, there is a lot of cooperation. Whether it's the Vietnamese and Chinese having the joint patrols-- by the way, Vietnam and China have agreed three times now on a hotline that they haven't actually implemented. So we have to be very skeptical about even the bilateral agreements that China is making with its neighbors.

On the other hand, United States is a great power. We don't want to get dragged into the disputes of a smaller country, which has issues, and China, which we have a common interest on growing our economies, and we don't necessarily dispute that China has some legitimate claims, too. So we have to be careful how we tread on these issues, but certainly whether you use the word "pivot" or "engagement," we need to be very much present and engaged in this region, and I think there are two realities in this region that I point to in my testimony that I've written.

One is that everybody in the region, virtually everyone, every country, wants the United States there. I take this away, for instance, from the last two years. I spent two weeks of the last two years with 30 chiefs of defense in the region, and I can tell you that all 30 of those present wanted us present and accounted for in the region.

At the same time, the second reality is that we all want a better relationship with China so don't step across the line. So let's try to build cooperation with China directly. Let's try to build this multilateral norm as well but recognize that these are not going to be resolved soon.

We're going to have to just manage this, and if we give up and cede our presence, we will lose our ground.

HEARING CO-CHAIR D'AMATO: Commissioner Bartholomew.

COMMISSIONER BARTHOLOMEW: Thank you very much and thank you to all of our witnesses for coming. Some of you have been here before, and we always welcome new faces, new voices. There are so many issues imbedded in this issue: issues of territory, sovereignty, environmental factors, health of the oceans, sustainability, and food security, and we haven't really talked about food security at all.

Do you know what percentage of Chinese, of the catch of Chinese

fishing activities is used for Chinese domestic consumption? Is there any information on that out there?

MS. MALLORY: Yes, I can answer that. So just to make sure I get your question right, the percentage of China's marine catch--

COMMISSIONER BARTHOLOMEW: Yes.

MS. MALLORY: --that is consumed by China?

COMMISSIONER BARTHOLOMEW: Yeah.

MS. MALLORY: A little less than half of it goes back to China for domestic consumption.

COMMISSIONER BARTHOLOMEW: And has that number grown, shrunk; is it changing at all?

MS. MALLORY: Actually there's going to be an increase in demand in China for fish products so I think we can expect that to rise. The Chinese were consuming 33 million tons of seafood products in 2005, and that's estimated to go up probably about another four million tons in the next years.

COMMISSIONER BARTHOLOMEW: Are there concerns with other countries in the region about being able to feed their own populations if their oceans are being fished out?

MS. MALLORY: Yes, definitely. And as Dr. Cronin pointed out, Asia tends to have a very high percentage of its diet coming from fish protein, about 22 percent as opposed to the world average of 16, and as rising incomes in the rest of Asia, as we see that, we're going to see other countries in Asia, too, demanding more fish. And yeah, a lot of those countries are dependent on the South China Sea, other areas in Asia. South China Sea is like the fourth richest fishing area in the world.

So, yeah, I think food security issues are very important.

COMMISSIONER BARTHOLOMEW: And if you're Vietnam and you're sitting there, and you're worried about what's going to happen with your freshwater, the Mekong, and your ability to grow rice to feed people, and then you also see you're losing your fish off of your coast--

MS. MALLORY: Yeah.

COMMISSIONER BARTHOLOMEW: --I can't imagine that people feel very secure about that?

MS. MALLORY: Yeah, yeah, exactly.

COMMISSIONER BARTHOLOMEW: All right. I want to switch gears a little bit. Dr. Cronin, you mentioned that fishermen help to establish jurisdictional claims, and I'm trying to understand--sort of tease that out. In a situation like the Japanese coral or in the Philippines, are these fishermen always fishermen? How does the national interest, the Chinese national interest, in establishing jurisdictional claims in these waters, is it communicated down to the fishermen? Are the fishermen making their own decisions about where they're going to go out? Is it just sort of floating out there in the ether we can try this today and, you know, see how far we get away with it?

DR. CRONIN: Thank you very much, Commissioner.

I think we have to be realistic that no country controls all of its fishing fleets. Fishermen are outdoorsmen; right? So they're not likely to be looking for central guidance in many ways. But if we just take a specific example of the Senkaku Diaoyu Islands, and what I know from inside Japanese government,

which has been considerable access in the recent years, there's no doubt that senior Japanese officials at all levels, right up to the Prime Minister, during the famous incident with the Coast Guard ramming by the Chinese trawler in 2010, that they believed--and they had a lot of evidence--that the Chinese government was encouraging the fishermen to press into the territorial waters of the Senkakus in order to make sure that there was a legal claim for China, that Japan did not own the Diaoyu Senkaku Islands, but they were indeed contested.

Japan claims that they're not contested. They claim that they're--and because the United States treaty with Japan covers territory administered by Japan, and the Senkakus are administered by Japan, it's actually covered by the U.S.-Japan Alliance, which was one of the complications about where is the boundary between the U.S. Alliance and our stated neutrality, in general, over sovereignty issues.

But this was one case where there was a lot of evidence, according to the Japanese officials that I can cite, where the Chinese were encouraging fishermen to go into both the EEZ and the territorial waters of these islands in order to press the fact that China claims this area.

COMMISSIONER BARTHOLOMEW: And how do you think that message gets communicated down? It starts in Beijing? Where does it start and where are the marching orders or--

DR. CRONIN: Let me turn to my colleagues on the table. I know Taylor Fravel and Ian Storey both talk about this a bit in our report. I don't know that I can directly draw a linear line in chain of command, but there are certainly bureaus in charge of the fishing fleet so it could just come from that era.

Please.

DR. GOLDSTEIN: Yeah. I can say very quickly that the--I mean there is something called the Maritime Militia. However, I don't give it terribly much credence--that is the level of exercise and so forth. The fishermen are organized in this kind of way, but I think it's a fairly minor aspect.

Now, what you have, I have actually a report on the different agencies involved. I authored this report called "Five Dragons Stirring Up the Sea." We have it online, but you do have possibly a phenomena of some of the enforcement agencies, you know, the Fisheries Enforcement Agency, kind of wishing to take the lead because it wants to get more access to resources.

However, I think I would disagree with my colleague, Dr. Cronin, and say that the fact that we see these, by the way, unarmed cutters, basically Coast Guard cutters without deck guns, though, the fact that we see those down there, I would argue is kind of a good thing. It shows that China is not desiring to fight. They want to show the flag, sure, but to me, this is a clear sign they're not interested in escalating.

So I think that's very important. And by the way, if I could just answer Commissioner D'Amato's very good point. He said we need to be out there to show, but in my view, I'm not sure that Americans have really thought through the risks on this question.

On the Taiwan question, it was extremely volatile. I think we did debate the various risks and people asked good questions. I don't think that's happened on the South China Sea. I think we need to do that. I see three possibilities of our current policy:

We could be--China could be deterred. Great. China is deterred. That's wonderful. You know that's one possibility.

Another possibility. China strikes out against Vietnam or Philippines or something like that, and we say, oh, not a big deal. In fact, we did that with Georgia; right? A third of the country of Georgia was annexed in 2008, and the United States basically had no cards to play because we talked the talk, but we didn't walk the walk. So that's another possibility.

The third scenario: we go to war with China over the South China Sea. I don't think that's a good option either.

I present to you that we ought to think through these risks really carefully because if you read the kind of rhetoric, and by the way, it's not just the stuff that appears in English occasionally, but what the Chinese are saying to each other, it has reached a very high and troubling level of sort of vitriol. I don't think Americans are quite aware what kind of hornets' nest we are kind of wandering into here.

MS. MALLORY: If I may--

HEARING CO-CHAIR D'AMATO: Let me respond. I don't think Georgia has a historical interest for the United States the way the South China Sea does with our interests with our long-term allies in the South China Sea. I don't see Georgia in the same ballpark at all as South China Sea, not to say we shouldn't have been involved in Georgia, but I don't see the historical antecedent.

But, on the other hand, if you press the argument that we have to be worried because the Chinese are going to become overly aggressive, that to me is no reason not to maintain a presence there, but on the contrary, that to me is a reason to maintain the presence there because otherwise you lose your historical involvement and interest, and if that's their goal, they'll win it, and that could be the end of it.

You know, there aren't a lot of many good choices for us here, but I think a bad choice is to remove ourselves from the region.

COMMISSIONER BARTHOLOMEW: I think Ms. Mallory wanted to address my question.

MS. MALLORY: Yes, I'd like to contribute some information to that. I think it's an important point actually. I think it's really important to distinguish between the levels of government in China, and I think what's happening in a lot of these cases where the fishermen are going into these disputed areas, the central government is, nationally it's saying that these areas belong to China, and so the fishermen who are operating at local levels are hearing that, and I think in many cases, they're just profit driven.

They want to make as much money as possible, catch as many fish as possible, so they're going out farther to fish, and then they're ending up--they're nationalistic, too, sure, you know. They don't want to be stopped; they don't want to be caught. And then they're coming into contact with some of these Coast Guard forces from these other countries.

So I think that's actually reflecting a lot of fragmentation in the government. You had asked about how some of the government is laid out that way. I mean there's a Bureau of Fisheries in the Ministry of Agriculture, and that oversees fisheries, and there are local levels for that, too.

But that would come into conflict with, say, the Ministry of Foreign

Affairs, which doesn't actually want these fisheries issues to be a diplomatic problem. So I actually don't think that there is really, there is not necessarily a lot of coordination between the fishermen themselves and the government.

COMMISSIONER BARTHOLOMEW: But if we take that the fishermen are laying the groundwork of some sort of jurisdictional claim, why do you think that the Ministry of Foreign Affairs wouldn't want them to be doing this?

MS. MALLORY: Well, I actually think the Ministry of Foreign Affairs would not like to see these things turn into diplomatic catastrophes. I also think that there are some differences between the Ministry of Foreign Affairs and the PLA in China so you're going to see some of that tension, too.

And, also, I mean a lot of the enforcement in the South China Sea is, as my colleague said earlier, there's a lot of agencies that are overseeing that. I mean there's the Ministry of Transport has their forces there; the China Marine Surveillance; the Ministry of Public Security; the Fisheries Law Enforcement Command. I don't think that they're actually as coordinated with each other as we might think.

COMMISSIONER BARTHOLOMEW: Thank you.

MS. MALLORY: So, yeah, I don't think so.

HEARING CO-CHAIR D'AMATO: Yes, Commissioner Cleveland.

COMMISSIONER CLEVELAND: I have a couple of questions for you, Ms. Mallory. I--it's like the rare earths issue--I am uncertain about some of the technical details of your testimony. Tell me how IUU fishing is defined, by whom, and when you suggest to us that, in your recommendations, that Senator Inouye's measure on Port State Measures Agreement prohibiting IUU fishing vessels from landing their catch, how would something like that actually be enforced?

And I guess it gets at the traceability question as well. So I'm sort of interested in how you go--if we were to be vigorous in this area, how would we go about identifying IUU fish?

MS. MALLORY: Thank you very much for your question.

I actually included a definition.

COMMISSIONER CLEVELAND: I'm looking at that right now.

MS. MALLORY: Yeah.

COMMISSIONER CLEVELAND: Whose definition is that, and how does it work?

MS. MALLORY: That comes from a non-binding treaty from 2001 on IUU fishing. It's the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported, and Unregulated Fishing. So that's their definition of it.

Because that's non-binding, it doesn't require any countries really to do anything about it, and so it was followed in 2009 by Port State Measures Treaty, and what that would do--so Senator Inouye introduced some legislation for that, and what that would do is prevent vessels that have been fishing illegally from landing that catch in the United States.

COMMISSIONER CLEVELAND: But if it's a non-binding agreement, in the first instance, and I'm not--

MS. MALLORY: Right.

COMMISSIONER CLEVELAND: --being confrontational. I'm just trying to understand how it would work.

MS. MALLORY: Yeah.

COMMISSIONER CLEVELAND: If it's non-binding in the first instance, how is it in any respect legal or illegal when it comes to trying to establish, I guess--what's the word--origin of the fish? I'm confused on the, I guess maybe I'm stumbling over the term "illegal." What makes it illegal other than a non-binding agreement amongst nations?

MS. MALLORY: Yeah. I mean to be completely honest, I don't have a legal background.

COMMISSIONER CLEVELAND: Okay.

MS. MALLORY: I mean the second Treaty of the Port States is binding. I'd have to look it up for you and see if they have some of the same language from the non-binding measure in the binding one, and maybe that's, I mean my guess right here is that maybe they're using that definition, and I don't actually know. Yeah.

COMMISSIONER CLEVELAND: I just think we often get in a position of making recommendations --and I'm not speaking to yours--where something sounds very reasonable in principle, but the legal framework behind it is confusing and complicates enforcement.

MS. MALLORY: Sure.

COMMISSIONER CLEVELAND: What do you think--you talk about the traceability issue, and I guess, is it the World Bank that has come up with a report on traceability of fish?

MS. MALLORY: Uh-huh.

COMMISSIONER CLEVELAND: What do you expect that would cost the fishing industry if they had to actually have certificates of origin for fish.

MS. MALLORY: I mean it would be, it would definitely be a rising cost, but I think it's important to consider the overall costs, too. And I mean those recommendations are really aimed at the United States and what the West can do--

COMMISSIONER CLEVELAND: Uh-huh. I appreciate that.

MS. MALLORY: --in terms of contributing to these problems, and a lot of the demand for these fish products that are being caught illegally come from developed countries, and so I think it's important to address those areas where we can in our country, also in Europe and Japan, and I think it would be great for them to do that, too.

I think in terms of the rising costs, there are already a lot of costs associated with illegal fishing, and if we think long term, too, about how we want our stocks to continue so we can have them as an ongoing source of food, I think in the long run implementing measures like this is a good idea.

There are also some issues with hygiene and safety standards that I think are important to consider. I do think a lot of the fish that are caught in Africa, I think a lot of that is more of a problem for Europe, but I think the United States imports 89 percent of its seafood. I think it's a good idea to know where this is coming from and if it's going to pose any risks to the consumer.

So I think in the long run if we're thinking about U.S. citizens, if we're thinking about long-term sustainability of our stocks, I think the costs are actually worth it.

COMMISSIONER CLEVELAND: Thank you.

MS. MALLORY: Thanks.

COMMISSIONER BARTHOLOMEW: I would just point out that several years ago, we actually did a hearing on Chinese--we went down to New Orleans and did a hearing on Chinese seafood and seafood safety issues, and for the most part, it was about the aquaculture that was taking place, but there were a lot of questions about health and safety standards, and we did some examination of the inadequacy of the U.S. resources to determine, to even expect.

MS. MALLORY: Yeah. Can I actually make one more point, too? I don't know if you saw some of the news reports. I actually haven't really followed up on them, but there was some preliminary testing of fish in the United States, and it showed that a really large percentage of it was labeled as fish that it actually was not. So, you know, any kind of traceability schemes would kind of address that problem, so, you know, yeah.

COMMISSIONER BARTHOLOMEW: I think some of that was, there was actually a very interesting, in New York City, they went around and they took samples of purportedly wild salmon and did DNA testing on it.

MS. MALLORY: Right.

COMMISSIONER BARTHOLOMEW: And determined that even the most expensive stores were selling stuff that wasn't actually wild caught. So--

MS. MALLORY: Yeah.

COMMISSIONER CLEVELAND: And can I ask another question?

HEARING CO-CHAIR D'AMATO: Go ahead.

COMMISSIONER CLEVELAND: Dr. Goldstein, you indicated that U.S. interests should not be the sum of other countries' interests, and I think it's a valid point. But did I hear you right when you said that you think that the reason why there has been an increase in the level of vitriol or rhetoric in China started or the point of departure for that escalation was Secretary Clinton's comments about multilateralizing the Spratly issue? I thought I heard you say that that was sort of the key.

DR. GOLDSTEIN: Yes, that's correct. Quite correct. I believe that was a kind of watershed moment.

COMMISSIONER CLEVELAND: Okay.

DR. GOLDSTEIN: The evidence is in here if you take a look.

COMMISSIONER CLEVELAND: I am interested. If you could leave that behind, that would be terrific.

And you gave three case scenarios of sort of what the options look like. If you were--

DR. GOLDSTEIN: Those three scenarios are if we persist with the current policy.

COMMISSIONER CLEVELAND: Which I anticipate that we will. So in that, I guess that's--and I don't say that because I agree or disagree with it. I just, I don't, I see the administration on a path that, for at least the foreseeable future, is likely to be persistent.

If you were providing policy advice, if you were in Kurt Campbell's job or providing policy advice, what specifically is it that you would recommend that we do differently in the context of--I mean we should abandon the notion of this "pivot to Asia"? Wouldn't that do more harm at this stage to U.S. credibility than the alternative? How would you suggest we proceed to reduce this level of suspicion and vitriol?

DR. GOLDSTEIN: Well, thanks very much for the question.

I do think that there are some, I think we need to recognize that we're in rather a strong position in East Asia. There are many countries that sort of won't accept China's version of the world and that have--you know, our country fought a war with Vietnam. It wasn't pleasant in any respect. Vietnamese do not roll over. In effect, Vietnam doesn't need help, and our taxpayers, our people are not served by getting in the middle of that one.

So the worst case scenario is we're dragged into something where we do not have a major interest. U.S. interests should be determined by the global balance of power. There are some countries that could impact the global balance of power, to our detriment, but, you know, most of these small countries are not in that category.

You know, perhaps Indonesia--

COMMISSIONER CLEVELAND: Is China?

DR. GOLDSTEIN: Indonesia at some point could, could impact that. Now, of course, treaty commitments and credibility and so forth, that is a question. But I believe we could have a much more modest kind of policy where we said, you know, China-Vietnam relations are not really our concern. We have a neutral position on this, on these disputes.

On the other hand, Philippines, moreover, our position with Philippines, I think, should be, yes, they're our treaty partner and, yes, if China invades Palawan, we will be there till the last man, but if they're going to have a spat about fish or about, you know, oil profits under the South China Sea, it is of no great consequence for U.S. national security, and we should accept that.

In fact I believe, in general, our military forces will be much better served by having a less-forward position. For example, if we can concentrate on training and experimentation instead of sending our forces around to clink glasses at various events, which in the Georgia case our National Security Advisor, our Secretary of State, even our President, was in Georgia frequently. So we were broadcasting the message that, yes, you are part of our alliance network.

But it's what I call "bad friend syndrome." In other words, we encouraged them to be very strident with Moscow, and they paid a huge cost for that. I think the same thing could happen with one of these countries, you know. Vietnam, in particular, I'm quite worried.

But we should be confident in our position. We have many states, Japan, India, that are disposed to kind of, let's say, again, oppose China's expansion. Therefore, we are not served by what I call "exaggerating the security dilemma." That is kind of piling on, and I've got a whole list of exercises I can go through that we've done in the last year, but that is, to my view, is, again, it's like pouring gasoline on a fire, and Chinese nationalism, as many of you have no doubt come to conclude, is fairly volatile.

I think China could do something quite irrational in the South China Sea. China will not be served by going to war with Vietnam, and most Chinese get that, but they might anyway.

COMMISSIONER CLEVELAND: I guess I'm interested in the material that you have to leave behind, but I guess what Dr. Cronin mentioned about 30 defense ministers in the region being interested in seeing a U.S. presence

weighed against Chinese objections, I don't know how you balance that scale, but it strikes me in the context of your comment that our strategic interests, or our national interests, are defined by a balance of power. It is true that Vietnam or the Philippines or Brunei may not be the bilateral relationship that we live or die for, but China certainly is a part of that strategic balance of power so--

DR. GOLDSTEIN: Yeah. Can I--two finger on that?

COMMISSIONER CLEVELAND: Sure.

DR. GOLDSTEIN: Yeah. I'm, by the way, you know, look, I'm not naive. I realize that war sometimes just happens, and I believe there is, unfortunately, a possibility that the U.S. and China could go to war at some point, and so I'm on record repeatedly advocating for a strong Navy.

In particular, I think I would like to see the U.S. build three or more submarines a year instead of the two. So we have to hedge, but we should not-- at this point, I think we are talking loudly and carrying a small stick. I'd like us to speak softly and carry a big stick. That's the policy we need.

HEARING CO-CHAIR D'AMATO: Thank you.

Commissioner Shea.

CHAIRMAN SHEA: Thank you.

I was going to ask a question similar to yours, Robin, but, Doctor, I was trying to get Dr. Goldstein and Dr. Cronin to talk to one another about something that Dr. Goldstein wrote in his testimony, and you say that these disputes--talking about the East China Sea and the South China Sea--do not directly involve U.S. national security interests, and the U.S. should avoid, basically that the U.S. should be less concerned with these disputes in the East China Sea and the South China Sea.

Now, you just wrote a big document there, Dr. Cronin, edited a big document, saying that we do have a great stake in the great national security interests in the South China Sea and the East China Sea. So if you would explain to me why Dr. Goldstein is wrong, assuming you think he's wrong, and Dr. Goldstein, if you could explain why you think Dr. Cronin is wrong, I'd like to hear, hear that conversation.

DR. CRONIN: It's difficult for me to say since I haven't read his testimony, but what I will state is why I think the South China Sea, the East China Sea is increasingly in the U.S. interests.

I mean I am interested in the long term of U.S. national security. We need a strong economy. We're only going to get that by further engaging with the rising Indo-Pacific region and especially East Asia.

Secondly, I'm very interested in the balance of power as well. Well, what is the one country in the world that in the next two or three decades could really truly challenge that balance of power? And it's China. And where does it come together geographically? It comes together in the South and East China Sea, and it even comes together specifically with whether this country, the Great United States of America, is going to invest in the right next generation of anti-access strategies and build a strong integrated economy so that we can have a strong position throughout this century.

I'm sorry for being, you know, wanting a strong America. I don't disagree, though, with Professor Goldstein's argument about essentially engage and hedge. There's no difference really. I mean I think the main difference is

that how you do it, perhaps in terms of how you implement.

I'm a little less worried about what we say publicly about this and being more up-front. I think Chinese understand power. As long as they understand we want to cooperate with strength, I think more Chinese will, however skeptically, at least see the reality of this relationship, that we're going to be there. We want to work with China; we want to cooperate with China; we want a growing economic tie with China. But we're not going to do it from a position of weakness.

And here's the last point. United States is seen as in sharp decline in the eyes of many Chinese, especially for economic reasons, because our economy seemed to be pulled out from under us with the 2008 financial crisis. We seem to be culpable. The Chinese were triumphal on this issue.

So for all the problems that China has and all the future that we cannot foresee because it's not linear, and we don't know, and nobody knows for sure in this room or elsewhere where China will be in ten or 20, 30 years, I think we're prudent to make sure we have a strong naval presence, that we try to build multilateral institutions, that we deepen our trade and investment in this region, that we keep a realistic engagement strategy with China and try to grow the cooperation agenda, but understand that we have some strategic differences as well. That's my position.

CHAIRMAN SHEA: Dr. Goldstein.

DR. GOLDSTEIN: Right. Well, I'm afraid that we, I think, don't quite understand how in these areas that are so close to China, how the operation of the "security dilemma"--and I'm sure you've all read Robert Jervis; if you haven't, you should--illustrates how rivalry can become raised, how it can spiral out of control through misperception and so forth.

So, in this case, if we are strong, and, undoubtedly, the United States is very strong, and Japan is strong, and so forth, that when added in aggregate, from Beijing's point of view, it can look extremely threatening. So I think we need to recognize that.

And the proximity to China matters, and these, you know, I would wholeheartedly agree that we should pressure the Chinese all day about fisheries in Africa, by all means, and I think it will have very good effect.

But in these areas so close to China, I fear that the security dilemma is taking hold, and we are, as it were, going to feel the effect of this. How will we feel the effect? Well, as I said, on issues like Iran and North Korea where we need China's support, we will not have it, and indeed, over the last two years, we don't have it.

This is comparable. And Americans never think this way, but we need to think this way, you know, what if China was very involved suddenly in our issues on the Mexican border or our issues with Cuba on this and that, and that is how it looks from Beijing, and I really think Americans have to step out.

Now, why? Part of it is China has a very difficult history, including with the United States. You know, American gunboats were patrolling the Yangtze River from roughly 1840 up until the '30s. I mean think about that. Imagine if Chinese gunboats were patrolling the Mississippi for 100 years. That would, I think, resonate for Americans. So that will move the Chinese to behave, I believe, in some possibly irrational way. So far they've been fairly rational, and

I think the fact that they're using white hulls, let's say, instead of gray hulls, I think that is profoundly positive. We ought to recognize as such and continue our engagement along that.

But, look, let's consider a world where China's GDP surpasses ours. The Economist predicts that's in 2018 now. They lowered their estimate from 2019 recently. So 2018, their GDP is larger than ours, and their defense spending is pretty decently low, as far as I can gather. They're not breaking a sweat.

What if they decide to break a sweat? And what happens when their GDP is double the United States GDP, which is possible, by the way, people are saying as soon as 2050, then we're in a very different world. So right now we have an opportunity to build a modus vivendi with China--okay. And that involves a little bit of give and take.

You know, telling China how to act in the South China Sea and right around its maritime approaches does not get us where we need to go with China. So it may be painful, and in Hanoi, they may be very upset, but these are the realities of the world we live in. I don't think, you know, let's compare China to the Soviet Union and so forth, whether their naval development or their activities abroad or their ideological fervor, it's a good story. So we needn't fear. We're also I think strong.

So we need to go about this with confidence but also realism that we're entering a new world, folks.

CHAIRMAN SHEA: Thank you.

HEARING CO-CHAIR D'AMATO: Thank you very much, and we are out of time for this panel. We want to congratulate the panel on very interesting and lively testimony and discussion on the subject of fish.

[Laughter.]

HEARING CO-CHAIR D'AMATO: I'd also like to thank all Commissioners for their participation and welcome Commissioner Carte Goodwin to our ranks for a first hearing. Welcome aboard, Commissioner.

And at this point I'd like to also take the opportunity to thank our staff for putting together an excellent hearing, Executive Director Mike Danis, and particularly Caitlin Campbell who worked very hard on this hearing. Thank you very much, and that concludes today's hearing.

[Whereupon, at 3:05 p.m., the hearing was adjourned.]

