

**THE AMERICAN ENERGY INITIATIVE, PART 2:
CHINA'S ENERGY PORTFOLIO AND THE IMPLI-
CATIONS FOR JOBS AND ENERGY PRICES IN
THE UNITED STATES**

HEARING

BEFORE THE
SUBCOMMITTEE ON ENERGY AND POWER
OF THE
COMMITTEE ON ENERGY AND
COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED TWELFTH CONGRESS

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**THE AMERICAN ENERGY INITIATIVE, PART 2:
CHINA'S ENERGY PORTFOLIO AND THE IM-
PLICATIONS FOR JOBS AND ENERGY
PRICES IN THE UNITED STATES**

MONDAY, APRIL 4, 2011

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND POWER,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 3:10 p.m., in room 2322, Rayburn House Office Building, Hon. Ed Whitfield (chairman of the subcommittee) presiding.

Present: Representatives Whitfield, Shimkus, Walden, Terry, Bilbray, Scalise, McKinley, Gardner, Pompeo, Griffith, Rush, Markey, Green, and Waxman (ex officio).

Staff Present: Ray Baum, Senior Policy Advisor/Director of Coalitions; Maryam Brown, Chief Counsel, Energy and Power; Allison Busbee, Legislative Clerk; Garrett Golding, Legislative Analyst, Energy; Cory Hicks, Policy Coordinator, Energy and Power; Jeff Baran, Minority Senior Counsel; Phil Barnett, Minority Staff Director; Greg Dotson, Minority Energy and Environment Staff Director; Caitlin Haberman, Minority Policy Analyst; and Jocelyn Gutierrez, DOE Detailee.

OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF KENTUCKY

Mr. WHITFIELD. I call this hearing to order. Ranking Member Rush, I know, has been in Illinois and was expected to be delayed on his return, but we do expect him to be here soon. Certainly Ranking Member Waxman is here, so as I said, I will call this hearing to order, entitled the American Energy Initiative, and I would say that this is the second hearing that we have actually had on this topic of the American Energy Initiative. It will be a wide-ranging discussion of the domestic energy needs of our country and the impact that decisions in other parts of the world have on what we are proposing to do here.

The dominant area focused in today's discussion is the rising role of China. For the past 30 years China has experienced a remarkable economic boom in an effort to modernize and assert its position in the global economy. In fact, the International Energy Agency recently projected that the world will require 40 percent more energy in the next 25 years. Now, that is quite an increase in demand for energy. And I might also say that the International En-

ergy Agency has called China, China, a coal-fueled economic miracle. Last year China became the largest energy consumer in the world.

The economic progress in China has been made possible through the availability of affordable, secure, and abundant sources of energy. China understands the importance of acquiring the resources necessary to power new manufacturing consumers, fuel millions of new automobiles, and electrify the homes and businesses of the world's largest population. Becoming the largest energy consumer in the world has helped China become the U.S. chief economic competitor.

As a result of the tremendous surge in demand, world energy markets have taken notice and are adjusting. China's increased oil demand over the past 10 years has had a major impact on global oil prices. Coal consumption in China has risen at a tremendous rate and is projected to continue on the same path for the foreseeable future. Nuclear renewable and alternative energy technologies have also taken significant steps forward this decade as well.

China is playing for keeps in its quest to modernize this economy to become globally competitive and improve the standard of living for 1.3 billion citizens. To do so, it realizes the value in pursuing energy in all its forms. Rather than abandoning fossil fuels in exchange for renewable energy, China continues to burn coal at an astonishing rate, using 3.5 times more coal than the U.S. and building, last year, one new coal-fired plant every 2 weeks with technology that exceeds our own.

It is reported they are undergoing a safety review as a result of the situation in Japan. But China, my understanding, is continuing to build 25 nuclear plants, 25 times more than the U.S. is building. China leads the world in hydroelectricity usage. China is the second largest consumer of oil behind the United States, but the difference is quickly shrinking.

During the recession, instead of billions of dollars of wasteful stimulus spending, the Chinese put their billions toward ensuring oil resources around the globe, some with our allies but some with countries who are not.

With this hearing we hope to explore these issues and many more. If we are to win the future, as our President says, we must understand the role China plays in energy markets and the various sectors affected by it. Part of this strategy must be to prevent the EPA from increasing U.S. energy prices by regulating greenhouse gases through the Clean Air Act, and allow for the environmentally friendly use of our domestic resources such as coal, natural gas, and oil. Greenhouse gas regulation and policies to stop the use of domestic sources of fuel make the U.S. less competitive with China, not more.

Instead, we must unleash the innovation and efficient allocation of resources made possible only through a free enterprise system in the absence of burdensome Federal regulations and mandates.

On the subject of oil, as you know, there are about 85 million barrels of oil being produced each day throughout the world. They are projecting by the year 2030 that China alone may be consuming 50 million barrels of oil. That is a lot of oil.

[The prepared statement of Mr. Whitfield follows:]

Opening Statement of the Honorable Ed Whitfield
Chairman, Subcommittee on Energy and Power
Committee on Energy and Commerce
Hearing entitled "The American Energy Initiative" (Second Day)
April 4, 2011
*** As Prepared for Delivery ***

Today's hearing is the second day of our series on the American Energy Initiative – a wide-ranging discussion we plan to continue over the next several weeks on domestic energy solutions, with a view toward both energy security and economic security.

As we all know, energy markets are influenced by global events such as what we have seen in the Middle East, North Africa, and most recently, Japan. Beyond unforeseen disruptions in supply and demand due to political turmoil and natural disasters are long-term trends that are a topic of increasing concern for policymakers, businesses, and households.

The dominant area of focus in today's discussion is the rising role of China. For the past 30 years, China has experienced a remarkable economic boom in an effort to modernize and assert its position in the global economy.

This economic progress has been made possible through the availability of affordable, secure, and abundant sources of energy. China understands the importance of acquiring the resources necessary to power new manufacturing consumers, fuel millions of new automobiles, and electrify the homes and businesses of the world's largest population. Becoming the largest energy consumer in the world has helped China to become the U.S.'s chief economic competitor. As a result of the tremendous surge in demand, world energy markets have taken notice and are adjusting. China's increased oil demand over the past ten years has had a major impact on global oil prices. Coal consumption in China has risen at a tremendous rate and is projected to continue on the same path for the foreseeable future. Nuclear, renewable and alternative energy technologies have also taken significant steps forward this decade as well.

China is playing for keeps in its quest to modernize its economy, become globally competitive, and improve the standard of living for 1.3 billion citizens. To do so, it realizes the value in pursuing energy in all its forms.

- Rather than abandoning fossil fuels in exchange for renewable energy, China continues to burn coal at an astonishing rate (using 3.5 times more coal than the United States) and building 1 new coal-fired power plant every two weeks with technology that exceeds our own.
- It is reported that they are undergoing a safety review as a result of the situation in Japan, but China is continuing to build 25 nuclear plants (25 times more than the United States is building).

- o China leads the world in hydroelectricity usage.
- o China is the second largest consumer of oil, behind the U.S., but the difference is quickly shrinking. During the recession, instead of billions of dollars of wasteful Stimulus spending, the Chinese put their billions towards ensuring oil resources around the globe. Some with our allies, but some with countries who are not.

With this hearing, we hope to explore these issues and many more. If we are to “win the future” as our President says, we must understand the role China plays in energy markets and the various sectors affected by it. Part of this strategy must be to prevent the EPA from increasing U.S. energy prices by regulating greenhouse gases through the Clean Air Act and allow for the environmentally friendly use of our domestic resources, such as coal, natural gas, and oil. Greenhouse gas regulation and policies to stop the use of domestic sources of fuel make the U.S. less competitive with China, not more.

Instead, we must unleash the innovation and efficient allocation of resources made possible only through a free enterprise system in the absence of burdensome Federal regulations and mandates.

I thank the witnesses for their participation today and look forward to their testimony and answers to questions. With that I yield the balance of my time.

Mr. WHITFIELD. So we look forward to the testimony of our witnesses today. And, Mr. Rush, we are delighted to see you. We appreciate you coming back from Illinois. I know that you had some issues you were dealing with there. And if you are prepared at this time I would recognize you for your introductory remarks.

OPENING STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. RUSH. I thank you, Mr. Chairman, and I thank the guests for being here today. Today's hearing is timely in that it falls on the heels of President Obama's call to increase the Nation's import of foreign oil by one-third in 10 years, as well as the President's drastic cuts forwarding Republican-backed proposals to the Department of Energy programs such as the Renewable Energy Loan Guarantee program and the Office of Science which invests in basic energy research.

I find it quite ironic, Mr. Chairman, that we hold this hearing focusing on China's energy and portfolio and implications for jobs and energy prices in the U.S. against the backdrop of my Republican colleagues' continuous calls for cuts of our own investment in the technologies and programs that would help build and strengthen our economy for the future.

As President Obama noted in his speech last week, and I quote: "We want to cut our research and development into new technologies. These cuts will eliminate thousands of private sector jobs, terminate scientists and engineers, and end fellowships for researchers, graduate students, and other talent we desperately need for the 21st century.

"At a moment like this, sacrificing means investment. Reducing our energy security makes us more dependent on oil, not less dependent on oil. That is not a game to win the future, that is a vision to keep us mired in the past."

As China steadily increases its own investment in clean energy technology, my colleagues on the other side are proposing drastic cuts to the very program that would help us compete in the 21st century.

In one of my amendments to the Upton-Inhofe bill in the full committee markup, I repeatedly cited China's investment in clean and renewable energy technologies as yet another reason why the mostly Republican-passed H.R. 1 continuing resolution and the Upton-Inhofe bill was bad policy for this country. H.R. 1 would drastically reduce Department of Energy loan guarantees for renewable energy and energy efficiency projects by billions of dollars.

Upton-Inhofe would prohibit EPA from regulating greenhouse gases, which would in turn hinder additional research and development in this country for newer, cleaner energy technologies.

Like President Obama articulated, many of my constituents also feel that we cannot afford to relinquish our leadership role in the area of investment in clean and renewable energy, not to China, not to anyone. My constituents understand that investing in these technologies will provide jobs and business opportunities here in America that can help propel our economy forward.

Mr. Chairman, just weeks ago in a hearing on the Department of Energy's budget, Secretary Chu confirmed the importance of in-

vesting in clean energy and technology, and told us that the draconian cuts proposed by my Republican colleagues will make the U.S. much less competitive globally. Repeating this theme, just last Thursday in a report of the National Academy of Sciences, Secretary Chu emphasized the importance of investing in scientific research as being crucial for our security now as it was during the Cold War.

When speaking about a race between the U.S. and China in investing in clean energy and technology, and how we have seen it ground to the Chinese, Secretary Chu said, "Chinese leaders are moving aggressively, not because of environmental concerns, but because they see great economic potential. He went on to say that China, and I quote, "has taken over the world in high-tech manufacturing. That is our Sputnik moment. This is not a threat to our national security or our mission, but our economic security.

And despite some of the testimony that we may hear today, downplaying China's commitment to aggressively increase its investment in clean energy technology, I would point to the report just issued by the Pew Charitable Trust. The Pew report found that for the past 2 years China has outpaced the U.S. in clean energy investment.

In 2010 China attracted \$64.4 billion in clean energy technology, a 39 percent increase from 2009, compared to just \$34 billion in the U.S. In fact, Pew reports that the U.S. Has slipped from first to third in clean energy investment in a span of just 3 years, ranking behind both China and Germany, which doubled its investment in solar installation to \$41 billion in 2010.

Mr. Chairman, the American people will not accept us willingly ceding ground to other countries in this race to secure the future. As President Obama, Secretary Chu, and a host of other leaders have warned, we cannot sacrifice our investment in clean energy now and we expect to lead the world in the future.

With that, I yield back the balance of my time.

Mr. WHITFIELD. Thank you, Mr. Rush.

At this time, Mr. Bilbray, I will recognize you for 5 minutes.

OPENING STATEMENT OF HON. BRIAN BILBRAY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. BILBRAY. Thank you, Mr. Chairman. Mr. Chairman, I appreciate you holding this hearing, and especially the emphasis of what is going on in China, because, you know, you hear a lot of people saying let's invest in this or let's do that. Let me tell you something. If you look at the statistics of China, it sure looks a lot like the let's-do-it-all proposal. Short of the fact that they tend to have no commitment to expansion of solar, the fact is the Chinese are finding reasons to do things, rather than finding excuses not to do things.

Just in their nuclear involvement commitment themselves, we are looking at a threefold increase. In fact, the latest data that we have seen is they are looking at 20 new units going in and nuclear power plants. We have, what, two, maybe three possibly. We are talking about an economy one-tenth our size. That is almost 100

times more commitment to nuclear than what we are talking about in this country.

And let me point out that there are opportunities for us. Some may say, What about the safety issue? The fact is next-generation technology, such as gas-cooled reactors, totally avoid the problem that we have seen in Japan and some of the concerns there; at the same time, addressing one of the big bugaboos that we talked about with nuclear, and that is the disposal issue. The fact is gas-cooled reactors have the potential to be developed very quickly, to be able to not only use uranium, but also to be able to use plutonium and burn up not only weapons-grade material, but also waste from other power plants. These are all technologies that we ought to be pushing forward now, continue to push forward, rather than retreating.

Obviously from the data we seen here, Mr. Chairman, China is not retreating. They are not stalling. They are not putting moratoriums. They are going full steam ahead into a future that provides their citizens with cost-effective energy, and we darn well ought to be leading them, not following them down this road.

And I yield back, Mr. Chairman.

Mr. WHITFIELD. Thank you.

The gentleman from California, Mr. Waxman, is recognized for 5 minutes.

OPENING STATEMENT OF HON. HENRY A. WAXMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. WAXMAN. Well, thank you, Mr. Chairman. Today we have an opportunity to dispose of some persistent myths about China and energy that we have heard from special interest groups for years. It has become almost an article of faith among those who oppose any efforts to cut domestic carbon pollution that China will never take meaningful action to cut their pollution. For years they have argued, Why should we take steps if China refuses to?

Today we will hear that this is a myth and China is taking action. In its new 5-year plan, China set a target of reducing carbon dioxide emissions per unit of GDP by 17 percent by 2015. That means fewer carbon emissions for each dollar of economic growth. The Chinese have set a goal of getting over 11 percent of China's energy from non-fossil fuels by 2015. That target includes 70 gigawatts of new wind capacity, which is equivalent to over 100 coal-powered plants. China's current wind capacity is 41 gigawatts, and that is already the highest wind capacity in the world. The 5-year plan also calls for China's successful industrial energy efficiency program to be expanded.

These targets are consistent with meeting China's commitment under the Copenhagen Accord to reduce its carbon intensity by 40 to 45 percent from 2005 levels by 2020. Chinese officials are even talking about pilot cap-and-trade programs and a carbon tax to reduce pollution. China has also shut down 70 gigawatts of its most inefficient coal-fired power plants.

Last year, investment in China's clean energy sector rose to over \$54 billion. That made them the world's leader in attracting clean energy investment. The United States ranks just third in the world

with \$34 billion in clean energy investments. We are now behind China and Germany.

The Chinese are now the world's largest manufacturer of wind turbines and they are the world's largest manufacturer of solar panels. Over the next decade, the global clean energy market is going to be worth \$2.3 trillion. The Chinese know this and are pursuing policies that will help them compete. China's number one priority is jobs and economic growth. They know that clean energy and climate policies create jobs and economic opportunities.

While China is moving forward, we are headed in reverse. The Republican budget cuts investments in renewable energy and energy efficiency by 35 percent. So we are going in the wrong direction. This week the House will take up legislation to block EPA's modest carbon pollution requirements for the Nation's largest polluting facilities.

The policy being pursued in the committee is based on science denial, and it will be an economic debacle for our Nation. Money, investments, and jobs will flow to China and other nations that are investing for the future.

We need to stop the partisan fear-mongering. We should embrace setting commonsense, cost-effective rules of the road for carbon pollution. Ensuring that our largest facilities are energy efficient is going to boost their competitiveness and spur innovation.

Ambitious clean energy policies are going to produce clean energy jobs. China has figured it out. We need to start getting serious about winning these global clean energy markets.

I look forward to hearing the testimony of our witnesses, especially Debbie Seligsohn from the World Resources Institute. She is an expert based in China and can tell us what is really happening on the ground there. I am pleased she is here with us today.

I yield back the balance of my time.

Mr. WHITFIELD. Thank you very much.

And at this time, we will go to our panel of witnesses. We have with us this morning Mr. Steven Kopits who is Managing Director for Douglas-Westwood. We have Mr. Fred Palmer who is chairman of the World Coal Association. We have Ms. Deborah Seligsohn who is Principal Advisor, China Climate and Energy program, with World Resources Institute. And we have Ms. Mary Hutzler, Distinguished Senior Fellow, Institute for Energy Research.

Once again I welcome you to the hearing. We appreciate your being here and look forward to your testimony.

STATEMENTS OF STEVEN KOPITS, MANAGING DIRECTOR, DOUGLAS-WESTWOOD; FREDRICK PALMER, CHAIRMAN, WORLD COAL ASSOCIATION; DEBORAH SELIGSOHN, PRINCIPAL ADVISOR, CHINA CLIMATE AND ENERGY PROGRAM, WORLD RESOURCES INSTITUTE; AND MARY J. HUTZLER, DISTINGUISHED SENIOR FELLOW, INSTITUTE FOR ENERGY RESEARCH

Mr. WHITFIELD. Mr. Kopits, I recognize you for 5 minutes of your opening statement.

Mr. KOPITS. Thank you very much.

Mr. WHITFIELD. Be sure to turn your microphone on.

Mr. KOPITS. Which button is it? All right.

STATEMENT OF STEVEN KOPITS

Mr. KOPITS. Mr. Chairman, and members of the committee, I am deeply honored for the opportunity to appear here before you today to discuss China's oil and gas market. Our firm, Douglas-Westwood, is a leading consultancy in market research covering oil field services offshore and in difficult-to-access markets like China and Russia, among others. I manage our New York offices. And I am solely responsible for any opinions expressed herein.

Let's begin with China's oil demand. China consumes 10 million barrels of oil per day on global consumption of about 88 million barrels. China is already the second biggest consumer of oil in the world, as the chairman has noted.

How will China's demand develop? The historical record suggests that oil demand evolves quite similarly across a range of countries, with demand ascending an "S" curve as the country motorizes. China entered this "S" curve around 2005 and we forecast China to reach steady state consumption in a 2025 to 2030 period. At that time, we would anticipate that China might have per capita oil consumption around that of South Korea, implying demand in excess of 50 million barrels a day. That contrasts to the U.S. with 19 million barrels of consumption today. Further, we see China surpassing U.S. consumption levels around 2018.

As for China's oil supply, China's conventional oil fields are mature. The country currently produces around 4-1/2 million barrels a day and this level is anticipated to remain broadly stable for the rest of the decade. Like the U.S., China currently meets about half its needs through imports, and this is new.

As late as the 1990s, China was self-reliant in oil. Today it must be active in global markets to secure domestic needs. Indeed it has to obtain about an additional 1 million barrels per day each year just to keep up with the demand, and the situation will deteriorate markedly in the coming decade. By 2020 China's dependence on foreign oil may be as much as 80 percent versus an anticipated 40 percent for the U.S. China's vulnerability is a cause for concern for that country's policymakers.

Turning to natural gas. China consumed 3.9 trillion cubic feet of natural gas in 2010. The U.S. consumes six times as much. China's per capita consumption is even lower, about 1/26th of U.S. As a consequence, there is considerable scope for rapid consumption growth of natural gas in China well past 2030. China's natural gas demand surged 22 percent last year and growth has averaged nearly 15 percent over the last decade annually. We anticipate this pace to continue. This would imply demand doubling to 2015 and nearly quadrupling from current levels to 2020.

China's natural gas production has tripled in the last decade from 1 trillion cubic feet in 2000 to 3.3 trillion cubic feet in 2010, a growth rate over 13 percent per annum. We project this to double to 6 trillion cubic feet in 2015 and nearly triple to 8.6 trillion cubic feet in 2020, implying a 10 percent growth rate for the balance of the decade.

Coal bed methane and shale gas are hoped each to contribute 5 to 10 percent of the natural gas supply in 10 years' time.

As late as 2006, China was self-sufficient in natural gas; however, the country has been a net importer since then, with imports

soaring to 550 billion cubic feet in 2010. Our forecast calls for imports of 1.5 trillion cubic feet by 2015, rising to 4 trillion cubic feet by 2020, representing an import dependence of more than 30 percent by that time.

Indeed by the end of decade, China may import more than total consumption today. China has three leading options for the import of natural gas: Central Asia, Russia, and LNG shipments. Overall, China's natural gas import prospects look promising from a diversity of sources, each with substantial supply capacity.

The Chinese oil and gas sector comprises essentially of three companies: Sinopec, PetroChina, and CNOOC. Sinopec and PetroChina operate primarily in onshore fields and have refining and distribution operations. CNOOC specializes in offshore oil and gas exploration and production, although it is has diversified recently. All three Chinese majors are medium- to large-size oil companies and have a combined market capitalization of about \$450 billion. That is about the market cap of Exxon. PetroChina, the largest of the three, has about the same capitalization as General Electric. The shares of all three companies are listed on the New York Stock Exchange and the companies provide standard disclosures in English, as required by the SEC.

Our analysis suggests that Chinese oil majors act much like other companies to maximize revenues and profits to gain exposure to growth plays like shale gas; to partner with other oil companies to obtain capital and technical knowledge; and to diversify their portfolios to manage risk. We believe they do not represent the material risk on the supply side, but China's oil demand will likely keep pressures on oil prices for the indefinite future.

I thank you for your attention and will try to answer any questions you may have.

[The prepared statement of Mr. Kopits follows:]

STATEMENT OF

STEVEN KOPITS

**MANAGING DIRECTOR
DOUGLAS-WESTWOOD LLC**

before the

**US HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON ENERGY AND POWER**

“THE AMERICAN ENERGY INITIATIVE”

regarding

CHINA’S OIL AND GAS OUTLOOK

APRIL 4, 2011

Summary

The presentation considers the supply of and demand for oil and gas in China, as well as touching on key market players there. Key points include:

China Oil Demand

- China's oil demand is approximately 10 mbpd vs 19 mbpd for the US
- Demand has been growing at approximately 10% per annum—slightly more than GDP
- We expect this growth to continue, and China to reach US consumption levels by 2018
- China's potential demand for oil is 50+ mbpd in 2030, were the oil supply available

China Oil Production

- 4.4 mbpd at year end 2010, up 10% over 2009
- Not considered likely to expand much beyond current levels

China Import Requirements

- About half of consumption currently; up from no net imports in the 1990s
- Import dependence may reach 80% by 2020
- Important consideration for Chinese policy-makers

China Natural Gas Demand

- Historically less utilized resource in China; coal is more favored traditionally
- Chinese consumption was 3.9 tcf in 2010—one sixth of US levels
- Chinese per capita consumption is 1/26th US levels; 1/9th Korean levels
- Demand increasing at 15% p.a. in the last decade
- Anticipated to increase at 14% p.a. to 2015; 11% p.a. from 2015-2020
- Demand doubles to 2015 to 7.5 tcf; nearly four-fold to 2020 at 12.6 tcf

Chinese Natural Gas Supply

- Chinese supply at 3.3 tcf in 2010; 13% growth per annum over last decade
- Growth over 10% per annum anticipated over next decade
- Supply of 6 tcf by 2015; 8.6 tcf by 2020
- China has substantial coal bed methane (CBM) and gas shales reserves
- CBM production has substantially lagged expectations
- Shell and PetroChina together drilled China's first gas shale wells in December 2010

Chinese Natural Gas Imports

- From nil in 2006 to 1.5 tcf in 2015 (20% of consumption), to 3.3 tcf in 2030 (31% of consumption)
- Major sources: pipeline from Central-Asia (operational); pipeline from Russia (under negotiation); LNG imports from Australia, among others
- Imports in 2020 will be greater than total consumption today

Chinese Oil and Gas Companies

- Essentially PetroChina, Sinopec and CNOOC
- All listed on the New Stock Exchange, report in English per SEC requirements
- Behavior viewed as essentially commercial in nature

Testimony

Mr. Chairman and Members of the Committee:

I am deeply honored for the opportunity to appear before you today to discuss China's oil and gas markets.

Our firm, Douglas-Westwood, is a leading consultancy in market research covering oil field services in difficult-to-access countries like China and Russia, among others. I manage our New York office.

China's Oil Demand

Let us begin with China's oil demand. China consumes 10 million barrels of oil per day (mbpd) on global consumption of about 88 mbpd. China is already the second biggest consumer of oil in the world.

How will China's demand develop? The historical record suggests that oil demand evolves quite similarly across a range of countries, with demand ascending an "S" curve as a country motorizes. China entered this "S" curve around 2005 and we forecast China to reach steady-state consumption in the 2025-2030 time period. At that time, we would anticipate that China might have per capita oil consumption similar to that of South Korea, implying demand in excess of 50 mbpd, versus 19 mbpd today for the US. Further, we see China surpassing US consumption levels around 2018.

China's Oil Supply

China's conventional oil fields are mature. The country currently produces around 4.4 mbpd, and this level is anticipated to remain broadly stable for the rest of the decade. Like the US, China

currently meets about half its needs through imports. This is new. As late as the 1990s, China was self-reliant in oil. Today, it must be active in global markets to secure domestic needs. Indeed, it has to obtain about an additional one mpbd each year just to keep up with demand.

And the situation will deteriorate markedly in the coming decade. By 2020, China's dependence on foreign oil may be as much as 80%, versus an anticipated 40% for the US. China's vulnerability is cause for concern for the country's policy-makers.

China's Natural Gas Demand

Turning to natural gas: China consumed only 3.9 tcf of natural gas in 2010. The US consumed six times as much.

China's per capita consumption is even lower, about 1/26th of the US. As a consequence, there is considerable scope for rapid consumption growth in China, well past 2030.

China's natural gas demand surged 22% last year and growth has averaged nearly 15% over the last decade, and we anticipate this pace to continue. This would imply demand doubling to 2015, nearly quadrupling to 2020.

China's Natural Gas Supply

China's natural gas production has tripled in the last decade, from 1.0 tcf in 2000, to 3.3 tcf in 2010, a growth rate of 13.3%. We project this to double to 6.0 tcf in 2015 and nearly triple to 8.6 tcf in 2020, implying 10% annual growth. Coal bed methane and shale gas are hoped to each constitute 5-10% of the natural gas supply in ten years time.

China's Natural Gas Imports

As late as 2006, China was self-sufficient in natural gas. However, the country has been a net importer since then, with imports soaring to 550 bcf in 2010. Our forecast calls for imports of 1.5 tcf by 2015, rising to 4.0 tcf by 2020, representing an import dependence of more than 30%. Indeed, by the end of the decade, China may import more than current total consumption.

China has three leading import options for natural gas: Central Asia, Russia and LNG shipments. Overall, China's natural gas import prospects look promising from this diversity of sources, each with substantial supply capacity.

The Chinese Energy Companies

The Chinese oil and gas sector comprises essentially three companies: Sinopec (China Petroleum & Chemical Corporation Limited), PetroChina (China National Petroleum Corporation) and CNOOC (China National Offshore Oil Company). Sinopec and Petrochina operate primarily in onshore fields and have refining and distribution operations. CNOOC specializes in offshore oil and gas exploration and production, although it has diversified recently.

All three Chinese majors are medium to large-sized oil companies and have a combined market capitalization (value) of around \$450 billion. PetroChina, the largest of the three, has about the same capitalization as General Electric. The shares (ADRs) of all three companies are listed on the New York Stock Exchange and the companies provide standard disclosures as required by the SEC.

Our analysis suggests the Chinese oil majors act much like other oil companies to maximize revenues and profits; gain exposure to growth plays like shale gas; partner with other oil companies to obtain capital and technical knowledge; and diversify their portfolios to manage risk.

We believe they do not represent material risk on the supply side; but China's oil demand will likely keep pressure on oil prices for the indefinite future.

I thank you for your attention and will try to answer any questions you may have.

Mr. WHITFIELD. Thank you, Mr. Kopits.
Mr. Palmer, you are recognized for 5 minutes.

STATEMENT OF FREDRICK PALMER

Mr. PALMER. Mr. Chairman, thank you very much. It is a delight for me to be here; it is a high honor and deep privilege.

I am here to talk to you today about the growing use of coal around the world, the second Industrial Revolution now underway in the developing world, particularly in Asia, and led by China.

I am chairman of the World Coal Association, the global voice of coal for international producers from the United States, Australia, South Africa, India, China, Europe and Indonesia.

Shenhua, a state-owned enterprise in the People's Republic of China and largest coal producer in the world, recently joined World Coal Association. Coal-India is also a member. World Coal Association regularly collaborates with trade associations, with coal freight associations around the world, including the China National Coal Association. And I am happy to say we will have our first board meeting ever in Beijing this June.

I present this testimony today in my role as chairman of the World Coal Association. I am also Senior Vice President of Government Relations at Peabody Energy, the world's largest private sector coal company, and a global leader in clean coal solutions, as an international coal producer in the United States and Australia.

America and other mature economies have a unique opportunity to create a 21st century energy policy through 21st century coal technology, following the lead of China-led Asia, through the installation of state-of-the-art low carbon coal technologies and what we call "green coal."

Energy is as essential as food, shelter, and clothing. The United States has linked life expectancy and income with per capita energy use. The World Resources Institute found that with every 10-fold increase in energy use, individuals lived 10 years longer. Half the world population, 3.6 billion people, lack adequate access to modern power. As many of you know, energy disparities are growing in your own districts. Studies show that today's middle-class Americans pay a disproportionate amount of their after-tax income on energy, and it is due, with respect, to what we believe is a flawed energy policy in the United States.

This energy inequality will only escalate as populations multiply and electricity use increases. The world is in the early stages of global hypergrowth and energy demand, as nations such as China, India and Indonesia industrialize and urbanize. The International Energy Agency projects that nations will require 40 percent more energy in the next quarter century.

We believe coal is the only fuel with the low cost and large scale to satisfy this long-term need. Alternatives to coal are limited, strained, or centered in political flashpoints. Coal was widely dispersed, broadly available, easily transported, energy dense, and very affordable. In the U.S. the delivered cost of coal averages just one-half to one-sixth that of more volatile natural gas. Oil hovers around \$100 a barrel and new nuclear construction brings unique risk, both physical and financial.

By contrast, the world has trillions of tons of coal resources. That is why coal has been the fastest growing fuel in the world for the last decade, reaching about 6.5 billion tons of coal consumption per year in 2010. Coal was the catalyst for economic growth, in the last 20 years has almost doubled with an increase of about 3 billion tons of coal per year. We know it can and will be a low-cost, low-carbon path for our environmental objectives.

Of course we have choices in the United States. We can pursue complex and punitive regulations through the EPA with unintended consequences, or we can build advanced coal technologies that are available, affordable, and deployable today.

Coal technologies in our country have always met environmental objectives. In the U.S., electricity from coal and GDP have more than tripled since 1970. At the same time, criteria emissions per megawatt hour declined more than 80 percent according to the EPA. Today's efficient plants receive a CO₂ rate that is typically 15 percent better than the existing fleet and as much as 40 percent better than the older plants.

The world's leading economies have taken notice, and China models itself and patterns itself in their infrastructure and energy development after the United States. There are some 430 gigawatts of supercritical and ultra-supercritical power plants in operation or under construction worldwide.

China's coal consumption in the last 10 years has more than doubled to more than 3.5 billion tons in 2011, as the chairman noted. China alone is home to 36 percent of the world's most advanced coal fleet, and the growth of coal use will approach 4.5 billion tons per year by 2015. That is up from about a billion tons from here in 5 years, or one U.S.

China is investing in clean energy technologies on an unprecedented scale, as you will hear. And Peabody is part of this revolution advancing the next generation of clean coal technologies. Chief among these is the GreenGen project, near Tianjin, China, one of the world's largest near zero-emission initiatives, and Peabody is a partner in that. Peabody in fact is the only nonstate-owned enterprise partner in Tianjin.

We also are advancing green coal partnerships on three continents. While the developing world is investing in energy innovation, the U.S. is still debating options. My question to the subcommittee is simple and respectful: What are we waiting for?

Advanced coal in the U.S. will combat energy poverty, and fuel an industrial rebirth. The U.S. should set a national goal to ensure at least half of all new generation is fueled by coal, and next-generation clean coal technologies are demonstrated and commercialized. These technologies should include coal for electricity generation, coal for natural gas, coal for liquids, coal for chemicals, and CO₂ from combustion or gasification of coal, for a robust and enhanced oil recovery program primarily for the Gulf States and Rocky Mountain west. NTL says we can do 2-1/2 million barrels per day. This is the path for the People's Republic of China. It should be our path as well.

Mr. Chairman, we appreciate the opportunity to appear in front of you today, believe strongly that coal alone has the power to ad-

dress energy inequality, reindustrialize our economy, and improve the environment. Coal is energy, and energy is life. Thank you.
[The prepared statement of Mr. Palmer follows:]

**U.S. House of Representatives
Committee on Energy and Commerce
Subcommittee on Energy and Power**

**Hearing
“The American Energy Initiative”**

April 4, 2011

Testimony submitted by:

**Fredrick D. Palmer
Witness for the World Coal Association
Peabody Energy - Senior Vice President, Government Relations**

Summary Statement

America and other mature economies have a unique opportunity to create a 21st Century energy policy. Yet, we continue to depend on an aging energy infrastructure rather than advance the regulatory measures and investment incentives necessary to secure our energy future. By contrast, the world's fastest-growing economies – primarily in Asia – recognize that energy and environmental objectives are compatible and achievable with 21st Century clean coal technology.

Energy is as essential as food, shelter and clothing. Yet, energy inequality and poverty is pervasive and growing as populations multiply and the world enters the early stages of global hyper-growth in energy demand.

Coal is the only fuel with the low cost and large scale to satisfy enormous long-term need. We believe it can be a significant catalyst for economic growth and the low-cost, low-carbon path to our environmental objectives. China is the global model, with the world's most advanced coal fleet and unprecedented investment in clean coal technologies. Peabody is part of this revolution, advancing the next generation of green coal technologies. Led by China, Asia has created a new model for energy innovation with coal, and America can adopt this model as our own.

Mr. Chairman and distinguished members of the Subcommittee, good afternoon. It is my privilege to speak on a topic of vital importance to the American people and the U.S. economy – the global clean energy revolution powered by coal.

I am Chairman of the World Coal Association and Senior Vice President of Government Relations at Peabody Energy, the world's largest private-sector coal company and a global leader in clean coal solutions.

My testimony today will focus on what we see as a widening gap between the energy approaches of the developed and developing worlds.

- First, I will address the unique opportunity for America and other mature economies to create a 21st Century energy policy amid a complex landscape.
- Second, I will touch on the ways in which we continue to depend on an aging energy infrastructure rather than advancing the regulatory measures or investment incentives necessary to secure our energy future.
- Finally, I will address how the world's fastest-growing economies – primarily in Asia – recognize that energy and environmental objectives are compatible and achievable with advanced coal technology – what we call green coal. Asia has created a new model for energy innovation; I will address how America can adapt this model as our own.

* * *

Peabody's market position gives us a broad, global perspective on energy trends. We are the world's largest private-sector coal company with 127 years of mining expertise and a record of world-class practices in safety, productivity and land

restoration. Peabody also is advancing more than a dozen low-carbon projects and partnerships around the world to achieve our ultimate goal of near-zero emissions.

Peabody's market capitalization is currently more than \$17 billion. That may sound significant, but we are responsible for just 2 percent of the world's coal-fueled energy.

The global energy system is massive, and its foundation – fossil fuels – is ubiquitous. What does this energy bring us? Simply put, it delivers our way of life. Energy is as essential as food, shelter and clothing. The United Nations has linked life expectancy, educational attainment and income with per capita energy use,¹ and the World Resources Institute found that with every tenfold increase in per capita energy use, individuals live 10 years longer.² Study after study supports the link between energy, health and wealth.

Abundant, affordable energy is a key reason why those of us in the United States have a standard of living that most of humanity is still trying to achieve. The average American annually consumes as much as 44 million Btus of energy. This is six times the per capita electricity use of the average citizen in China and 25 times that of India's population. About half of U.S. energy comes from coal, and yet, as a new report by the Centers for Disease Control (CDC) finds, the U.S. death rate is now at "an all-time low," with the population living longer and healthier than ever before.³

¹ International Energy Agency, World Energy Outlook; Analysis by Dr. Frank Clemente, Pennsylvania State University.

² Dr. Mark P. Mills, "Want to Improve Your Nation's Health? Burn Coal," Fueling Our Future, World Climate Report, vol. 3.

³ National Vital Statistics Reports, "Deaths, Preliminary Data for 2009," Centers for Disease Control, Volume 59, Number 4 March 16, 2011 by Kenneth D. Kochanek, et al.

Many are not so fortunate. Half the global population – 3.6 billion people – lack adequate access to modern power. As many of you know, energy disparities are growing in your districts. Studies show that today even middle-class Americans pay a disproportionate amount of their after-tax income on energy. Nearly six in ten Americans say a monthly increase of as little as \$20 in utility bills would create hardship.⁴

This gap will widen as populations multiply and energy use increases. By 2050, global GDP is expected to increase 255 percent. Electricity generation will be up some 140 percent. The world population will reach 9 billion.

Large emerging nations such as China, India and Indonesia are seeking to increase living standards by industrializing and urbanizing at an unprecedented pace. As a result, the world is in the early stages of global hyper-growth in energy demand. The International Energy Agency (IEA) projects that the world will require 40 percent more energy in the next quarter century.

China alone is responsible for 30, 40 or 50 percent of the growth in many of the world's natural resources. It currently surpasses Japan as the second largest global economy, and last year China exceeded the United States to lead the world in energy consumption. India is close on China's heels, and Indonesia has another 300 million people with rapidly advancing economic gains. All of this growth requires energy – a lot of it.

⁴ "Research Findings on Climate Change, Electricity Usage and Cost, and Cap and Trade Auction Legislation," Lauer Johnson research, April 20, 2009; American Coalition for Clean Coal Electricity (ACCCE), Eugene M. Trisko based on U.S. Bureau of the Census, and U.S. Department of Energy's Energy Information Administration (EIA) data, March 2010.

So, as the Congress considers oil sands and shale gas, nuclear power and geothermal, wind and solar, it is abundantly clear we need them all... and that all these sources are not enough to provide security of supply in the 21st Century.

We believe coal is the only fuel with the low cost and large scale to satisfy long-term need in the United States and around the world. Alternatives to coal are small, strained or centered in political flashpoints. Perhaps that is why coal has been the fastest growing fuel in the world for the last decade. The IEA projects that the growth in coal for electricity generation will exceed the growth of any other fuel by more than double in the next 10 years.

Coal's growth only makes sense. It is widely dispersed, broadly available, easily transported, energy-dense and very affordable. In the United States, the delivered cost of coal has averaged just one-half to one-sixth that of natural gas, while oil is headed to \$100 a barrel, and new nuclear construction brings unique risks, both physical and financial.

* * *

Against this backdrop, we believe coal is the catalyst for economic growth. China is a case in point. Here low-cost coal-fueled energy use increased 475 percent since 1990, even as China's GDP also has risen 375 percent, prompting the IEA to call China a "coal-fueled economic miracle."

China is currently the world's largest coal consuming nation – and it is 80 percent coal fueled. China overtook the United States in 2009 to become the world's largest

energy user. Keep in mind that China's energy use was only half that of the United States in 2000. It has quadrupled in a decade.

So, perhaps more than any other nation, China appreciates the urgency of energy investment. In fact, coal-fueled generation is expected to grow 2.5 times in China and 3.5 times in India by 2030. Every four years, China's coal demand growth equals an entire United States of total demand.

China's leaders know that they will need to produce more energy far more rapidly to keep pace with the needs of the Chinese people. They also understand that economic and environmental goals are achievable with technology.

* * *

This brings me to my final point: There are multiple pathways to a high-growth, environmentally responsible energy future. To achieve our environmental goals, we believe we can pursue complex regulatory schemes with unintended economic consequences or advance low-cost, low-carbon clean coal technologies that are available today and can succeed at scale.

The choice seems clear. Advances in coal technologies have always met environmental objectives. In the United States, electricity from coal and GDP have more than tripled since 1970; at the same time, criteria emissions per megawatt hour declined more than 80 percent.⁵ This is both an environmental success story and a lesson for the future.

⁵ Peabody analysis of U.S. generation from the U.S. Energy Information Administration and total criteria emissions as reported by the U.S. Environmental Protection Agency, most recent available data.

Advanced coal-fueled technology – what we call green coal – builds on past progress. Today's efficient plants achieve a carbon dioxide (CO₂) emissions rate that is typically 15 percent better than the existing fleet and as much as 40 percent better than older plants being replaced. Replacing the world's older coal plants with new construction would be the carbon emissions equivalent of removing the entire U.S. passenger car fleet from our roads.

The world's fastest-growing nations have taken notice. While the United States debates energy options, China is deploying solutions. As part of its current Five Year Plan and 863 Program,⁶ the Chinese are building the world's most advanced coal-fueled fleet. China is home to one-third of the 430 gigawatts of supercritical and ultrasupercritical power plants in operation or under construction worldwide. That's more than any other nation.

Indeed, China has become a testbed and factory for the most advanced coal-fueled technologies. China is investing in clean energy technologies on an enormous scale. In 2010, China increased advanced energy spending 30 percent to a record \$50 billion. While it can take a decade to get a permit for an advanced coal plant in the United States, in China permitting can be completed in a matter of years. The U.S. can claim some of the best scientific minds and strongest research institutions in the world, but the Chinese have a unique capability to implement ideas generated by our academics.

⁶ "The Green Giant," Dec. 21, 2009, The New Yorker.

China's President Hu Jintao continues to emphasize China's leadership putting in place a system that supplies, and I quote... 'stable, economic and clean energy.' China in the next decade will have a state-of-the-art coal-based electric generating system that is cleaner and more efficient than any on earth. So we have much to gain through a U.S.-China partnership to advance this technology.

And Peabody is doing its part to advance the next generation of advanced coal technologies in China. In 2011, the company announced plans for a 2,000 megawatt supercritical power plant and large synthetic natural gas (SNG) facility through a partnership with Yankuang Group, a major Chinese mining enterprise. On a parallel path Peabody is pursuing a 1,200 megawatt supercritical power plant with carbon capture through a partnership with Huaneng Corporation, one of China's five largest power generators and Calera. This latter project would capture a portion of carbon dioxide to create cement products.

Another signature project is GreenGen, which is among the world's largest near-zero emissions projects in which Peabody is a partner. Carbon capture and storage (CCS) is often discussed in the abstract, but the science of CO₂ capture and storage is solid: CO₂ can be separated from the emissions stream and compressed into a fluid-like state, making it easier and less costly to transport via pipeline. CCS involves injecting CO₂ into aging oil fields to recover stranded oil or deep into saline aquifers or other geology for safe storage. GreenGen has steel in the ground and is on track to turn on its first 250 megawatt unit this year. Peabody is very proud to be the only non-Chinese partner in this project.

China, along with much of the rest of the world, is investing in energy innovation while the United States is still debating options.

My question to the Subcommittee is simple: What are we waiting for? I sincerely doubt any member supports a policy to import energy innovations from China's high-growth industrial economy. Still, this is the result of inaction.

There is a better way. Advanced coal can combat energy poverty and fuel an industrial rebirth of a magnitude not seen in decades. We believe it will take five steps – what we call the Peabody Plan:

- First: We must work to eliminate energy poverty by ensuring that at least half of new generation is fueled by coal;
- Second: Replace older traditional coal plants with advanced coal technologies;
- Third: Develop at least 100 major CCS projects around the world within 10 years;
- Fourth: Deploy significant coal-to-gas, coal-to-chemicals and coal-to-liquids projects globally in the next decade; and
- Finally: Commercialize next generation clean coal technologies to achieve near-zero emissions.

* * *

Mr. Chairman and members of the Subcommittee, the current U.S. energy system took more than a century to develop and only time and continuous technological development will build the low-carbon, high-growth economy we seek. But one fact is undeniable: Coal alone has the power to address energy inequality, reindustrialize economies and improve the environment. Coal is energy, and energy is life. Thank you.

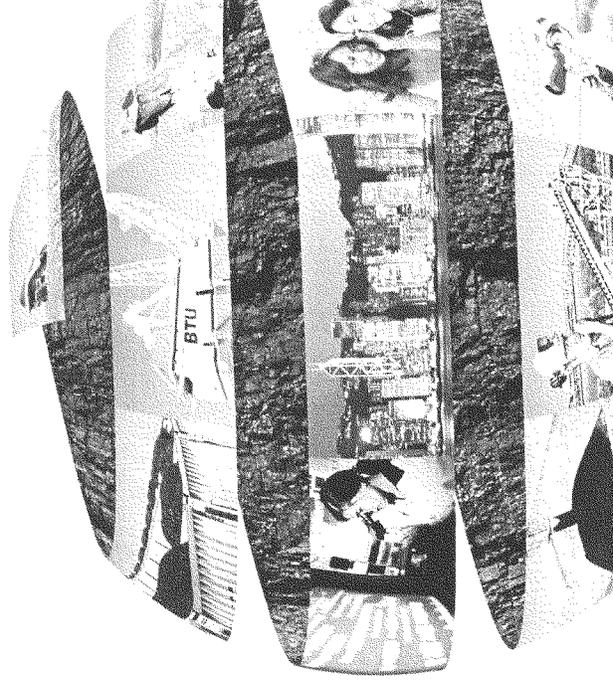
ENERGIZING THE WORLD
AT A TIME
ONE BTU

Peabody

**Green Coal and
21st Century
Energy Policy**

April 4, 2011

*Fredrick D. Palmer
Senior Vice President
Government Relations
Peabody Energy*



Who We Are...

Peabody

Industry Leader With a 127-Year History...

- *World's largest private-sector coal company*
- *Known for safety, productivity, land restoration*
- *Large-scale open-cut mining expertise and optimizing resources*
- *Customers on six continents*
- *More than 30 honors for safety and environmental responsibility in 2010 alone*

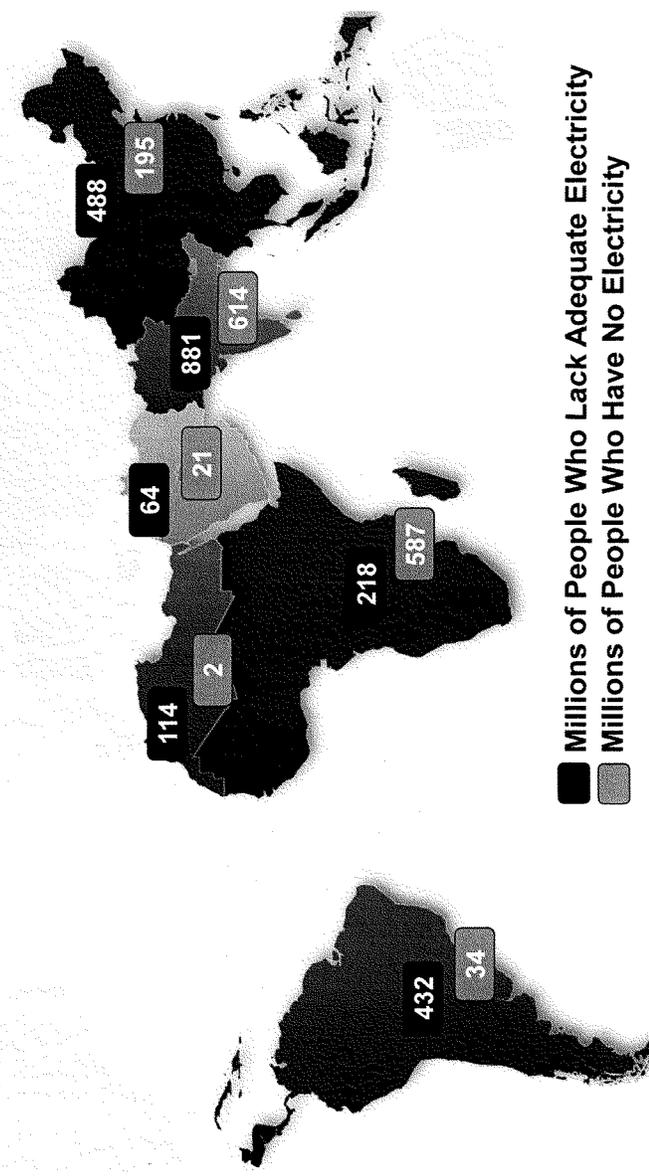
The 25-meter thick coal seam at Peabody's North Antelope Rochelle Mine, Wyo., one of the world's largest and most productive coal mines.

The PRB coalfield is the most important energy resource on earth, fueling 25% of U.S. electricity.

**Good Energy Access is a Human Right
and Rapidly Rising Need**

Peabody

3.6 Billion People Have No or Only Partial Access to Electricity



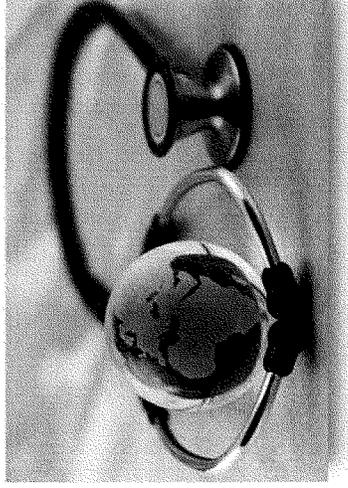
Source: International Energy Agency 2009 World Energy Outlook and The World Bank, 2010.

Electricity = Life; Coal = Electricity

Peabody

“The economic costs of [anti-coal] regulations – particularly the impacts on income and employment – tend to worsen individual health or safety and can shorten lifetimes.”

– Klein and Keeney, Duke
“Mortality Reductions From Use
of Low-Cost Coal-Fueled Power”



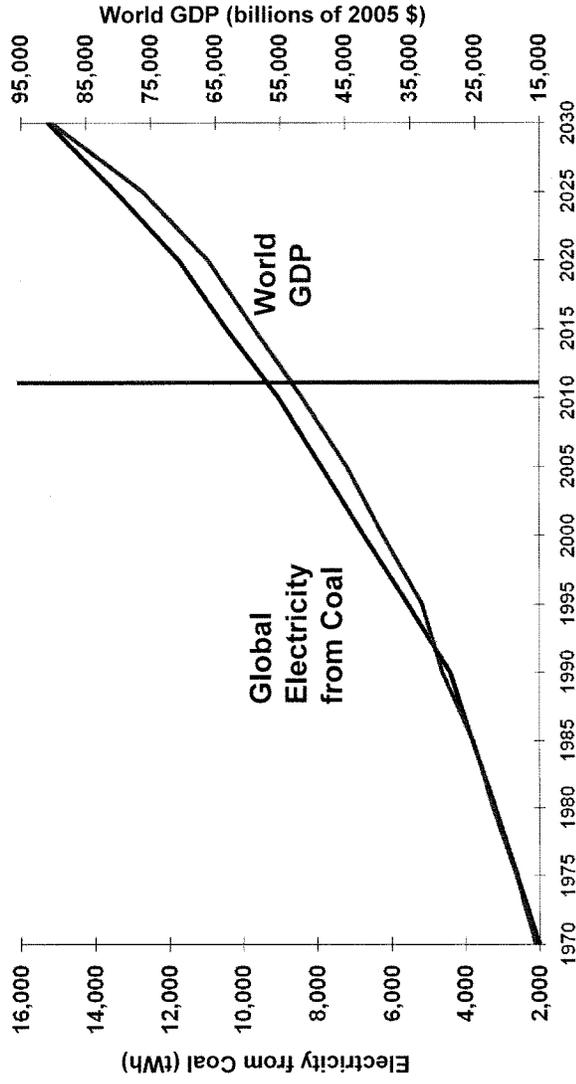
“By increasing the costs of goods and services such as energy, and decreasing disposable incomes, regulation can inadvertently harm the socioeconomic status of individuals and, thereby, contribute to poor health and premature death.”

– Johns Hopkins University, Professor M. Harvey Brenner

Global Coal Use and Economic Growth: Near Perfect Correlation



Coal-Fueled Electricity in 2030: Equal to Current Power in the Western Hemisphere, the EU and Five Times Japan

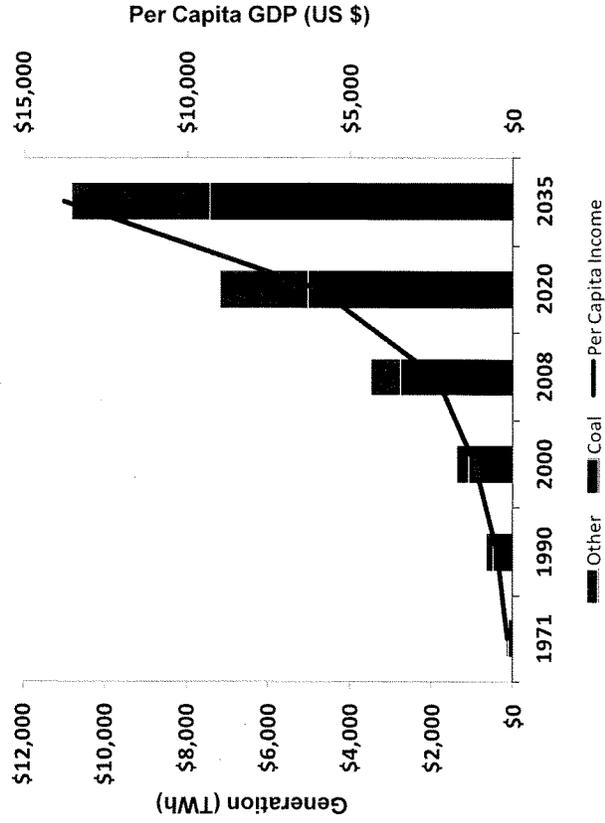


Source: Developed from International Energy Agency World Energy Outlook 2009 and Energy Information Administration International Energy Outlook 2010.

China a Global Model, Propelled by the Power of Coal



“Coal has underpinned China’s massive and unprecedented growth in output, fueling an economic miracle...” – IEA

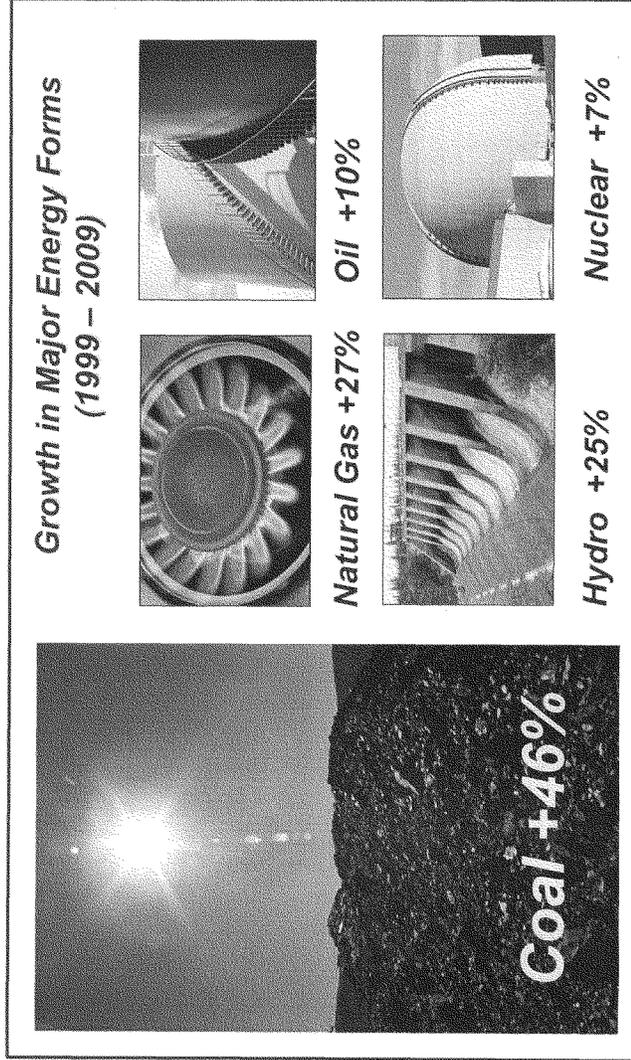


Source: Clemente and Considine, Pennsylvania State; Developed from IEA 2010 and USDA (Shane) 2010.

Coal: Entering the Early Stages of a Long-Term Supercycle

Peabody

Coal: The World's Fastest Growing Fuel for Past Decade

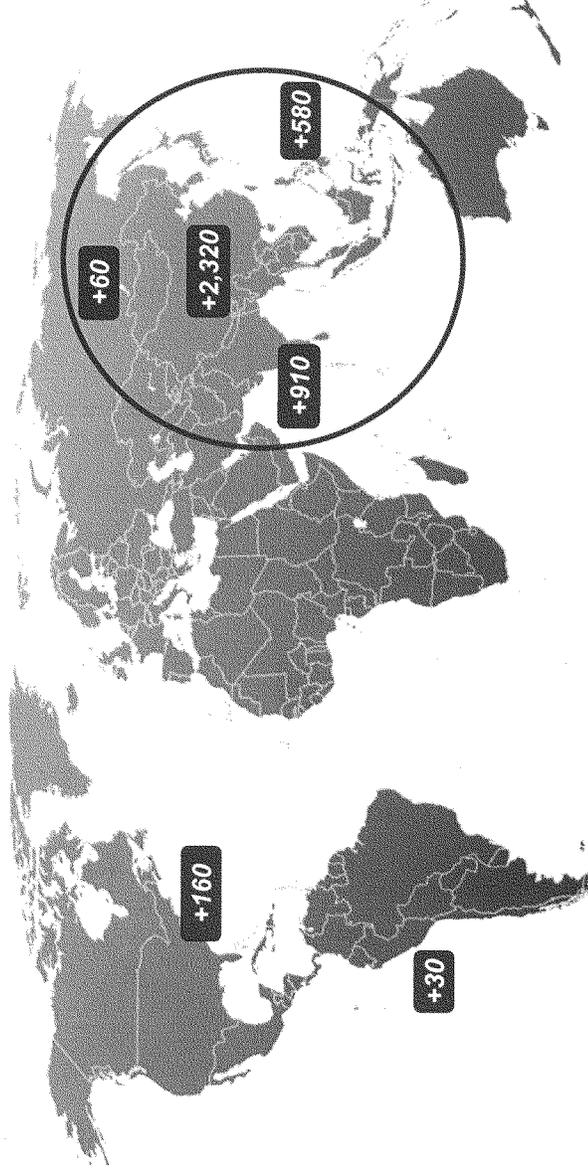


Source: BP Statistical Review of World Energy, June 2010.

Asia Represents 90+% of 4 Billion Ton Long-Term Global Demand Growth



China and India Lead Long-Term Coal Demand Growth



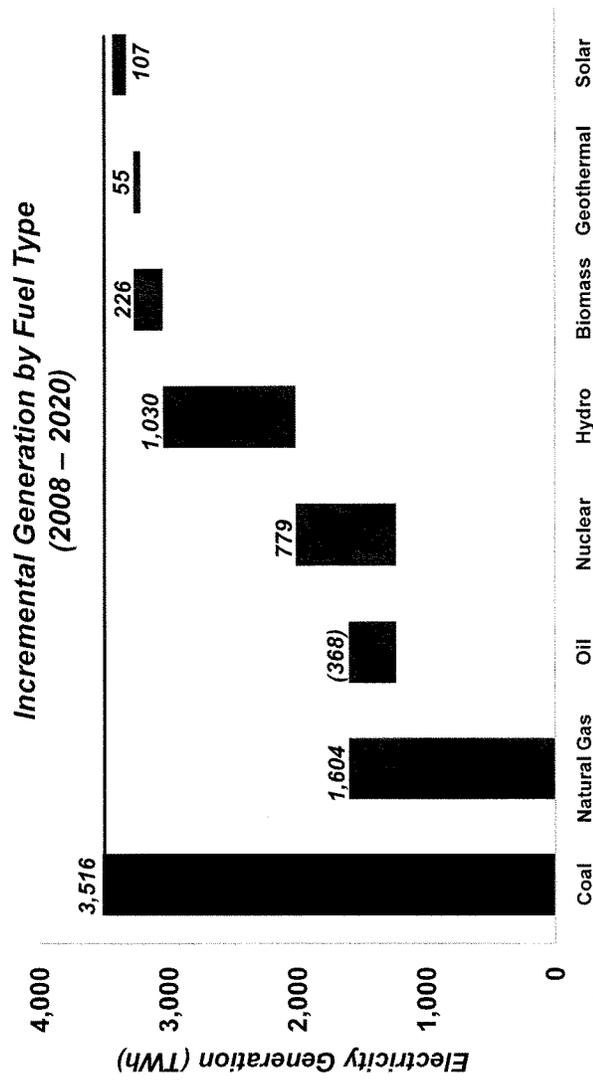
Growth 2008 - 2035 (Tonnes in Millions)

U.S. growth presented in short tons.
Source: World Energy Outlook 2010, International Energy Agency, Annual Energy Outlook 2011 Early Release, Energy Information Administration; Peabody analysis.

Future Coal Generation Growth: More Than Double That of Any Other Source



Exceeds Growth in Gas, Oil, Nuclear, Hydro, Biomass, Geo & Solar

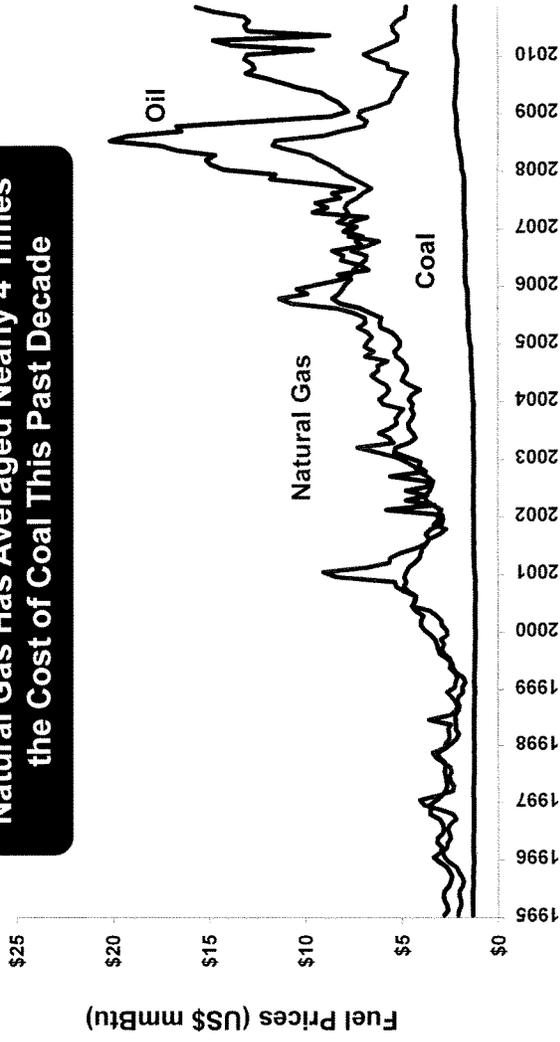


Energy Access Means Reasonable Costs and Reliability

Peabody

U.S. Natural Gas Cost More than 2x Coal, Oil Cost 6x Coal in 2010

Natural Gas Has Averaged Nearly 4 Times the Cost of Coal This Past Decade

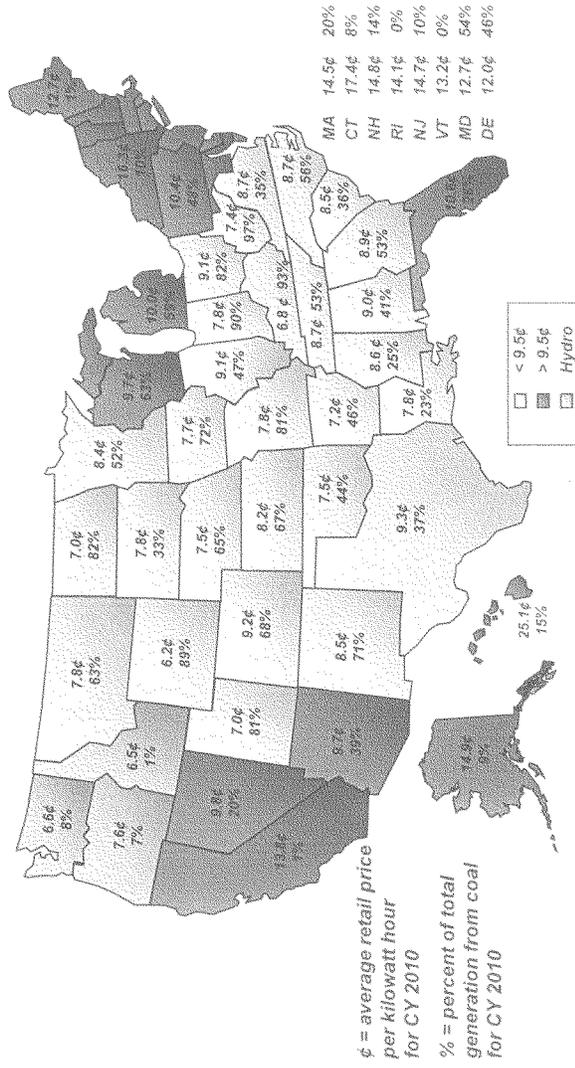


Price of fuel delivered to the plant includes all commodity, freight, taxes and other costs incurred in the delivery of the fuel.
Source: Ventyx, Monthly Plant Fuel Purchase Price (modeled), Jan 1995 - Nov 2010 (monthly).

Coal is the Rock that Built America's Middle Class



Some 217 Million Americans – 70%+ – Depend on Low-Cost Coal

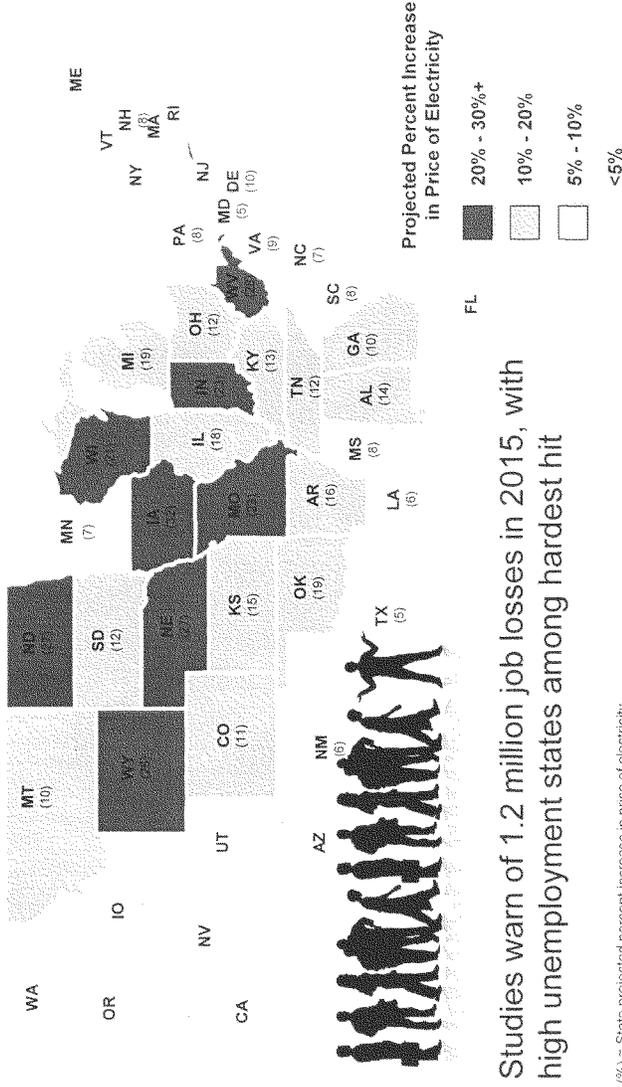


Source: Energy Information Administration, March 2011.

Growing Recognition that Regulatory Approach Takes Wrong Path

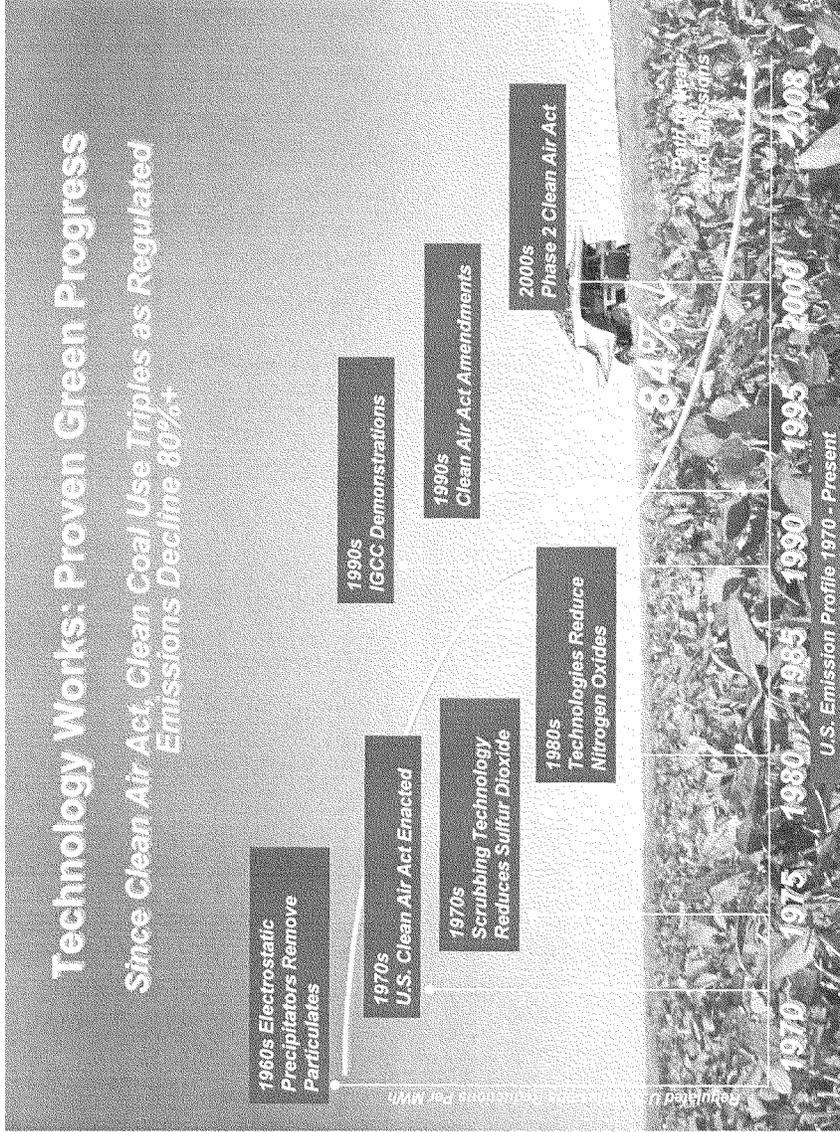


Regulation Drives Electricity Rate Increases Across Heart of Nation



Studies warn of 1.2 million job losses in 2015, with high unemployment states among hardest hit

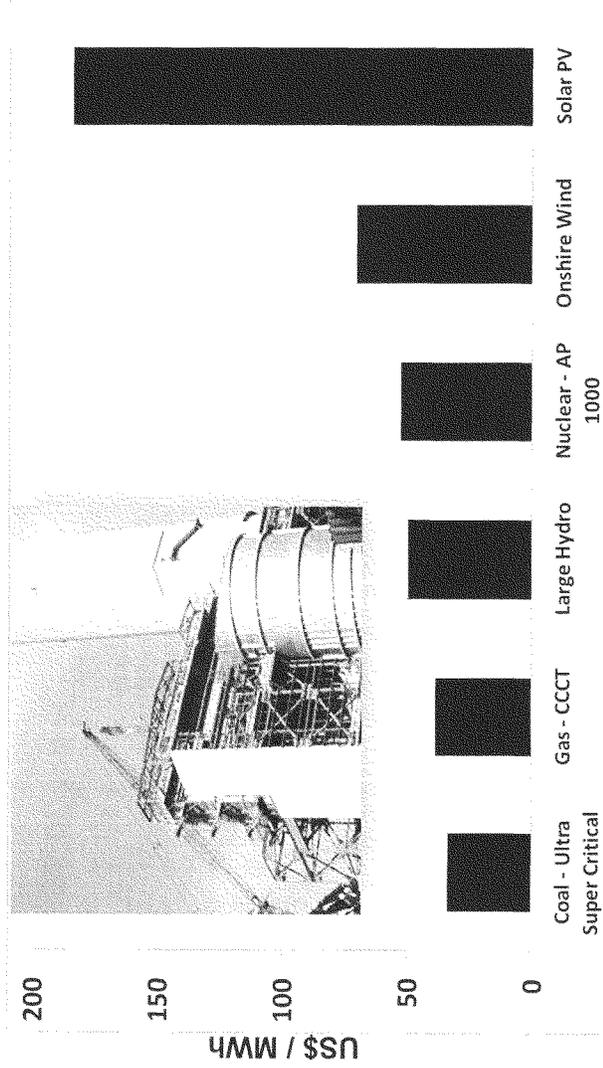
(%) = State projected percent increase in price of electricity
 Source: Burns & McDonnell Analysis (December 2010). Management Information Services, Inc. analysis, January 2011.



Supercritical Technology Offers Cost, Environmental Advantage



Technology Reduces CO₂ Emissions Rate 50% Over Oldest Fleet

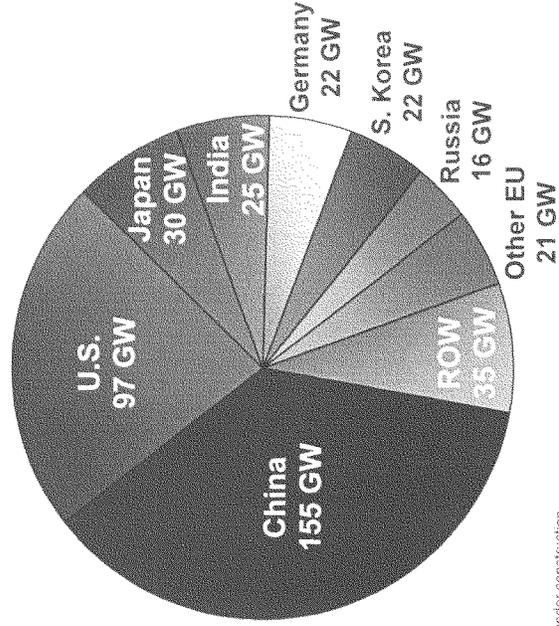


**Advanced Generation Vital to
Economic and Environmental Goals**



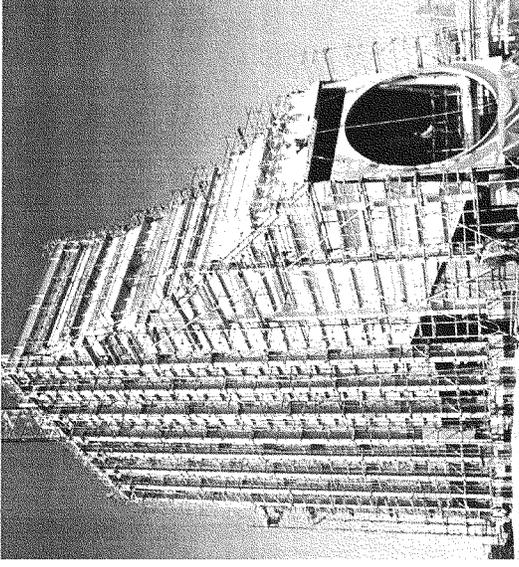
**Replacing Older
Coal Plants with
Supercritical
Technology
Would Equal
Removing the
Entire U.S. Auto
Fleet from the
Road**

*429 GW On Line and
Under Construction*



Supercritical and ultrasupercritical operating plants and plants under construction.
Source: World Bank, 2008 and Peabody analysis.

Peabody Answers Call: Global Leader in Clean Coal Solutions



- Australia COAL21 Fund
- Global Carbon Capture and Storage Institute
- Consortium for Clean Coal Utilization
- U.S. Department of Energy National Carbon Capture Center
- Coal-to-gas: ConocoPhillips and GreatPoint Energy
- Calera Corp. equity participant; "CO₂ to cement"

Peabody Plan Would Drive Major Reindustrialization

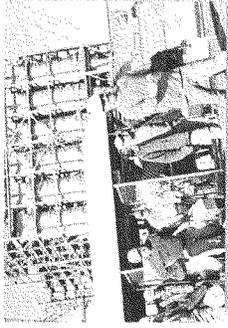


2050 Energy Access



- Eliminate Energy Poverty
- Build Electricity Access for 3.6 Billion People
- Fuel 50% of New Generation with Coal

Economic Growth



- Replace Older Plants with Supercritical Technology
- Deploy Coal-to-Gas, -Chemicals and -Liquids by 2020
- Achieve \$4.3 Trillion Benefits, 21 Million Jobs During Build

Environmental Solutions



- Avoid 1.5 Billion Metric Tons of CO₂ Annually
- Develop 100 CCS Projects by 2020
- Commercialize Near-Zero Emissions Technology

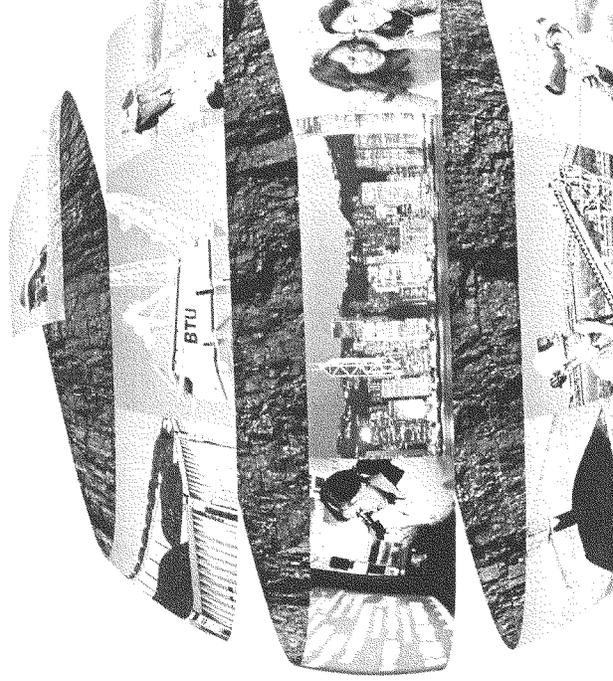
ENERGIZING THE WORLD
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Peabody

**Green Coal and
21st Century
Energy Policy**

April 4, 2011

*Fredrick D. Palmer
Senior Vice President
Government Relations
Peabody Energy*



Mr. WHITFIELD. Thank you.

Ms. Seligsohn, you are recognized for 5 minutes.

STATEMENT OF DEBORAH SELIGSOHN

Ms. SELIGSOHN. Thank you, Chairman Whitfield and members of the committee, for inviting me to testify here today. My name is Deborah Seligsohn and I am Senior Advisor to the World Resources Institute's Climate and Energy program based in Beijing. We have an active program with Chinese partners, working on Chinese energy policy and transformation.

I joined WRI 3½ years ago, coming from the U.S. Department of State, where I was in the Foreign Service for 21 years, with over a decade at the U.S. Mission in China, completing my work there as the U.S. Ambassador science counselor in Beijing.

In my time in China, which began actually in 1984, I have seen an incredible transformation in Chinese life and Chinese society. Riding my bicycle through the streets of Beijing in 1984, I was often showered in coal dust, and the city was dark, and the sidewalks basically rolled up by 8 o'clock at night.

I think you all know, either from seeing China firsthand or from reports on television, that China and Beijing are very different today, with world-class subways, the largest intercity rapid rail transport in the world, booming industrialization and urbanization. This has really changed the perspective in China and what people want from their country, from their community, and from their energy policy.

I want to present to you today three ideas that perhaps challenge some of the conventional wisdom about Chinese energy policy. The first is that the Chinese are doing what they are doing on energy transformation because they are concerned about energy security and about their economic future.

Secondly, China's energy policy has the result of curbing fossil fuels over time and expanding the use of multiple alternative sources. And finally, China is doing this because they see it as a real opportunity to dominate in the new industrial area.

So turning to my first point, energy security has always been very important to China. As a number of people have already noted, China is very dependent on imported oil. It has also depended on trying to move coal around the country, which can be difficult, especially in snowstorms and dealing with rail capacity.

China today is less than 10 percent of the global oil market and they are already concerned about the impact on relations with other countries and on that economic impact. But going beyond this traditional energy security concern, China is now concerned about what its future economy will look like and sees energy policy as part of the way to drive the economy in a transformation from heavy industry to higher value-added, more knowledge-based, more service-oriented economy.

Looking at these things by working on energy efficiency, through its energy intensity targets, trying to reduce the amount of energy use per unit GDP, and by developing its nonfossil energy sources of all kinds.

If you walk around in China, no one thinks there is room for U.S. levels of consumption. The country is simply too dense and crowd-

ed. There is no room for all that energy, all those cars and roads. And that is why they are really looking at trying to create a much more efficient country for addressing some of these issues.

Secondly, the way they are doing that is by really trying to curb fossil fuel growth and expand alternatives. They are promoting this transformation through policy mandates at the national and local level.

Now, I am not trying to present with you a naive idea that China is trying to abandon coal overnight. While it is true that China is building coal plants now, every 2 weeks; remember that 4 years ago it was two plants a week. So that is a rather rapid change. Efficiency is improving. They have the largest wind capacity in the world, and they are looking to have the largest nuclear capacity by 2020.

Finally, they are doing this because they see it as an opportunity. China missed the Industrial Revolution, it was late to the IT revolution, and they see this new clean energy revolution as one where they can be first, and they do very, very well.

If you think about an area like electric vehicles, China see this as a solution to its imported oil dependence and a way to domesticate its vehicle fleet. It also sees other countries as fairly late to the table in this area, and a real opportunity.

We have talked about its lead in wind and solar industries. They are looking now at whether they should perhaps be doubling their solar goal again in this 5-year plan. They are leading in carbon capture and storage for a time when they may need to control the carbon emissions from coal. So they are looking across the board.

So in conclusion, let me suggest that while China sees energy policy as critical to its economic future and it wants to dominate this global industry, this is not a game where the U.S. is going to be left out, unless we choose to. This is a game where we can win. We are a world technology leader; we have the skills and the innovation hub to do it. The question is do we have the supporting policies to make that possible here at home. And that is what is really going to make a difference, what kind of market do we create in the United States? Thank you very much. Thank you.

[The prepared statement of Ms. Seligsohn follows:]

The Transformation of China's Energy System: Challenges and Opportunities

Deborah Seligsohn

Senior Advisor, China Climate and Energy Program

World Resources Institute

Before

The Subcommittee on Energy and Power

Committee on Energy and Commerce

U.S. House of Representatives

April 4, 2011

Summary

In my testimony today, I will start by discussing both where China is now and its plans for the upcoming five years, and then I will talk about some of the business opportunities this creates for other countries, including the United States, that want to compete in new energy technologies.

Energy, environment and climate policy has become increasingly important in China in the last decade. As with any policy focus, there are a number of interests and drivers involved. The confluence of concerns about energy security, environmental protection, climate change and economic restructuring has strengthened the Chinese government's commitment to both energy efficiency and non-fossil fuel development. Under the 11th Five-Year Plan (2006-2010), China made considerable progress. It came quite close to its energy intensity target, reducing energy intensity over the five-year period by 19.1%, and it increased non-fossil fuel use by 3.1% per year, so that non-fossil energy now comprises 8.3% of China's total energy use.

In March, China's National People's Congress adopted its 12th Five-Year Plan. The plan sets 2015 goals that continue to focus on energy efficiency and non-fossil energy development and set China well on the way to meeting its 2020 goals made at Copenhagen. The five-year goals are to reduce carbon intensity by 17% and energy intensity by 16%, to increase the share of non-fossil fuels in China's total energy mix to 11.4%, and to increase forest cover by 12.5 million hectares and forest stock volume by 600 million cubic meters.

While decreasing as a percentage of total energy used, coal will continue to be an important energy source for many years. To address the greenhouse gas issue, China is actively pursuing a research and commercial scale pilot program looking at carbon capture and storage, a technology China has a strong interest in mastering.

International partnerships with Chinese clean technology companies are growing rapidly. What makes China attractive to U.S. and international investors is the clear policy framework which gives businesses the certainty they are looking for before investing. Companies including First Solar, GE, Duke Energy and American Electric Power have all announced new initiatives in the last year. Increasingly entrepreneurs with new ideas are looking to China to make those ideas become a reality. With a similarly supportive policy environment, the U.S., with its unsurpassed research resources and proven track record in new technologies, could be an unsurpassable winner.

The Transformation of China's Energy System: Challenges and Opportunities

Thank you for the opportunity to contribute to the deliberations of this Committee. My name is Deborah Seligsohn, and I am Senior Advisor to the China Climate and Energy Program at the World Resources Institute. 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 environment 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 address problems like climate change and the degradation of ecosystems and their capacity to provide for human well-being.

I am delighted to speak with you today about the ongoing transformation of China's energy system, and the challenges and opportunities these changes present not only for China, but also for the United States. I will start by discussing both where China is now and its plans for the upcoming five years, and then I will talk about some of the business opportunities this creates and the real challenge this speed of change in China presents for other countries, including the United States, that want to compete in new energy technologies.

Drivers of climate and energy policy

Energy, environment and climate policy has become increasingly important in China in the last decade. As with any policy focus, there are a number of interests and drivers involved. The confluence of these concerns has strengthened China's commitment to policy implementation. The major drivers include:

- Energy security: Energy security has been one of China's major historic concerns, going back at least as far as the Sino-Soviet split in the late 1950s/early 1960s, when China was left without a stable supply of imported oil.¹ When China began to import oil in the 1990s it faced a period of global stable prices, and energy security became more of a back burner issue. This began to change in the last decade, as energy prices became more unstable, political instability in source countries became more apparent, and potential conflict with other consumer countries also became a greater concern. At the same time, China became increasingly concerned about security of supply, even from domestic sources. In other words, heavy dependency on coal from a single region leaves China very vulnerable

to natural disasters, such as the blizzards of 2008.ⁱⁱ Diversifying supply both domestically and internationally helps address the multiple energy security concerns. Improving efficiency also reduces these pressures, whether they be logistical, economic, or political.

- Environmental protection: In the past decade the Chinese government and the Chinese public have become increasingly concerned about protecting the Chinese environment, and in particular about the impact of urban air pollution. These concerns have been driven partly by a series of well-publicized disasters, partly by China's demonstrated ability to improve air quality during the 2008 Olympics,ⁱⁱⁱ and partly as a result of increased affluence that has driven public demand for a more comprehensive view of development. Although China's gross domestic product on a per capita basis is still quite modest by global standards, less than \$5000 per capita per year,^{iv} this is still a considerable increase in wealth from just a few years ago. Starting in the early 2000s, there has been a growing sense that China can provide more than just economic growth to its people, that quality-of-life improvements, including social services as well as environmental protection, are also important.
- Climate change: The Chinese in the 1990s viewed the climate discussion purely in terms of external pressure. If there were an opportunity it was perhaps to acquire some additional technology. Today that picture is much more complex. In its latest report on national progress on the climate change issue, China's own National Development and Reform Commission (NDRC) states: "China is one of the countries that are highly vulnerable to the impact of climate change."^v This concern about the impacts of climate change is a driver not only in China's domestic policy formation, but also in China's approach to international climate negotiations and its interest in seeing stronger developed country targets.
- Economic transformation: Chinese policymakers have developed an increasingly sophisticated conception of what they need to do to maintain strong economic growth, and this includes the notion that they need to move away from reliance on heavy industry. As Tsinghua Professor Hu Angang explained in a piece on the development of the 12th Five-Year Plan, its key theme determined early in the drafting process is "transformation."^{vi} Transforming China's economic structure is viewed as

critical not just to reducing the environmental impact of growth, but to ensure that China does not wind up in a “middle income development trap,” in other words, be unable to grow beyond the middle-income developing country status.^{vii}

As a result of all of these factors, energy policy has grown considerably in importance in national economic planning over this past decade. As someone who has lived in China for much of the last three decades, I can tell you the change is quite visible. In the early part of the 2000s, energy policy was managed by one Vice Premier and one Vice Chairman of the NDRC, and climate change was the purview of scientists and international negotiators. This is no longer the case. Starting in 2007, Premier Wen Jiabao began to weigh in heavily on energy issues, regularly convening meetings of provincial and sectoral leaders. By 2009, President Hu Jintao was addressing not only energy, but also climate change in international fora.

The Five-Year Plans

Energy and environment played a critical role in the 11th Five-Year Plan, China’s national policy for the period stretching from 2006 through the end of 2010. Three key targets were put in the plan: reducing energy intensity per unit GDP by 20%, and reducing sulfur dioxide (a key air pollutant) and COD (chemical oxygen demand, a key water pollution measurement) by 10% each. China actually exceeded both the sulfur dioxide and COD targets, in fact reducing sulfur dioxide by more than 13%. It came quite close to its energy intensity target, reducing energy intensity over the five-year period by 19.1%.^{viii} To get to that energy intensity target required a great deal of heavy lifting, especially in the last year of the plan period. This was particularly true because provinces had been slow to start implementing the plan targets in 2006. The pressure they were under to reach this goal in 2010 should ensure they begin implementation of the next Five-Year Plan with more alacrity.

We already see indications that the provinces are focusing on these energy and environmental goals. Our organization, the World Resources Institute, just hosted a meeting with Provincial Development and Reform Commission officials to discuss improving city-level environmental planning. Twenty-eight of the thirty-one provinces in China sent representatives. In other words, contrary to

popular perception, China has not only set goals for itself in environmental and energy policy improvements, but it has also made significant strides in achieving them. It is in fact heartening that China reported an energy intensity number that fell a little bit shy of the target, showing increased seriousness about measurement and reporting.

This hearing occurs at a particularly opportune moment for discussing where China is heading from a climate and energy perspective. China's 12th Five-Year Plan was adopted at the National People's Congress (NPC) in March of this year. This plan in some areas is quite similar to the previous Five-Year Plan, and in other areas goes well beyond the previous plan.

The most striking advance in the current Five-Year Plan is the attention paid to climate change. While energy and environment were important in the previous Five-Year Plan, five years ago climate change was barely addressed. This time around climate change is the first topic in the environmental portion of the plan, and environment itself has more prominence than ever before. The plan sets 2015 goals congruent with the three commitments that China made at Copenhagen^x and then reaffirmed in Cancun. These commitments were:

- To reduce carbon intensity by 40% to 45% by 2020 as compared with 2005;
- To increase the share of non-fossil fuels in China's primary energy mix to 15% by 2020; and
- To increase domestic forest cover by 40 million hectares and forest stock volume by 1.3 billion cubic meters by 2020 over a 2005 baseline.

Each of these is addressed in the 12th Five-Year Plan:

- The five-year carbon intensity reduction goal is 17%;
- The 2015 non-fossil fuel goal is set to reach 11.4% of China's total energy mix; and
- The 2015 forest goals are to increase forest cover by 12.5 million hectares and forest stock volume by 600 million cubic meters.^x

China also set a goal to reduce energy intensity by 16% over the next five years. And there were key environmental targets as well: both sulfur and COD are targeted for an additional 8% overall reduction and several new air and water pollutants are added with reduction targets of 10% each. The goals for the

three items that were covered in the previous Five-Year Plan, energy intensity, sulfur and COD, are somewhat lower in the 12th Five-Year Plan. This is not surprising, because many of the “low hanging fruit,” the easiest reduction measures, have already been taken.

In the case of energy intensity, studies by the Lawrence Berkeley National Laboratory show that two programs in particular contributed to the recent energy intensity reduction. The first is the Top-1000 Energy-Consuming Enterprise Program, which focused on improving energy efficiency in China’s largest 1000 companies, responsible for one third of China’s total energy use.^{xi} The second is a program of plant closures, where China closed down the smallest, dirtiest and least efficient factories in a number of heavy industry sectors including power, steel, cement, other metals and paper.^{xii} NDRC Vice Chairman Xie Zhenhua just reported in a speech during his visit to Australia last week that China’s cumulative shutdowns of inefficient electric power plants over the last five years totaled 72 GW or approximately 8% of China’s total installed capacity—that is almost equal to the total installed capacity of electricity in South Korea or Spain.^{xiii} This type of shutdown of inefficient plants is really unprecedented globally and is a significant part of the reason that the Chinese coal-fired power plant fleet is now more efficient than that of the United States.^{xiv}

China has committed not only to a carbon intensity reduction, but to tracking that reduction. At last month’s national People’s Congress, Premier Wen Jiabao stated that China will put in place “well-equipped statistical and monitoring systems for greenhouse gas emissions, energy conservation and emissions reductions” to ensure these policies are tracked and properly implemented. It is worth noting that we also have independent corroboration of some of the results of the 11th Five-Year Plan. In particular, atmospheric scientists at Harvard University have been working with colleagues at Tsinghua and Beijing universities to evaluate both energy efficiency and air pollution results. Using independent monitoring stations they were able to measure a pattern of improving fuel combustion efficiency consistent with the 11th Five-Year Plan goal to reduce energy intensity by 20%.^{xv}

Energy efficiency has provided the major portion of China’s carbon emissions control to date, and the most significant gains have come from this combination of focusing on the largest and the

smallest enterprises. As China moves forward, it will need to expand its programs to the very large number of companies in the middle. Significantly, in the 12th Five-Year Plan the 1000 Enterprises Program is being expanded to a 10,000 Enterprises Program. The essence of this program has been to provide clear guidelines, technology recommendations and benchmarks to the participating companies, so they know specifically what to do to improve their energy efficiency, and then to audit these results.^{xvi}

The 12th Five-Year Plan also encourages new approaches to energy and carbon savings. These include encouraging experiments with market-based mechanisms, such as cap and trade systems and carbon taxes. They also include new approaches to energy efficiency, such as demand-side management and encouraging Energy Service Companies (or ESCOs), a financing mechanism specifically mentioned in the plan.

As is clear from the fact that the energy intensity target is 16% and the carbon intensity target is 17%, efficiency is a critical part of the plan. However, developing non-fossil energy sources is a significant part of China's strategy, and one likely to increase in importance in the years ahead. Non-fossil sources today account for 8.3% of China's total primary energy use, and the goal under the 12th Five-Year Plan is to reach 11.4% in 2015.^{xvii} At the same time Chinese energy officials have also suggested that under the sectoral energy plan, due to come out soon, there will be a total energy cap for 2015 of 4 billion tons coal equivalent (TCE).^{xviii} This total energy cap equates to the 16% energy intensity reduction target at the target GDP growth rate of 7.5% per year. What we can see with a cap is that the goal for non-fossil fuel essentially implies a constraint for fossil fuels, as well. China also has goals to increase natural gas production and use, which further constrains oil and coal growth. Moreover, given China's rather low base of energy use in transportation and its growth rate in oil demand,^{xix} the total cap creates an even more stringent control on coal use—thus, on the most carbon intensive fuel.

Non-fossil development is an important part of China's energy security and environmental protection strategies. Not only do these options reduce greenhouse gas emissions, they are generally domestically available, are supplied from different parts of the country than is coal, and avoid many of the

urban air pollution problems that come from fossil fuels. China's non-fossil strategy includes both nuclear power and renewables.

China has very ambitious nuclear power plans. With about 10 GW of installed capacity currently, the 12th Five-Year Plan set a goal for an additional 40 GW. The goal in the current plan is now under review in light of the nuclear crisis in Japan. Approvals of new plants have been halted, and there is an active discussion of how to address safety concerns and how to add additional non-fossil capacity elsewhere if growth in nuclear power slows.^{xx} China has traditionally moved cautiously in developing nuclear power. During the 1990s it did not meet its nuclear development goals. However in recent years development has speeded up considerably. Analysts I have spoken with expect the most likely outcome of the review to be an enhancement of safety procedures, followed by continued implementation of China's nuclear goals.^{xxi} However there is also already widespread speculation that China will speed up its solar power installation and double the solar power goal in the 12th Five-Year Plan to address the gap in nuclear output.^{xxii}

China is installing renewable energy at an unprecedented rate. Traditionally hydropower has been the main source of renewable power in China, and it will continue to have considerable growth potential through 2020. But the Chinese are actively involved in developing as many different renewable sources as they can. China now not only is the world's largest producer of wind turbines, it also has the world's largest installed wind capacity, just overtaking the U.S. at the end of this last year. It leads the world with 42 GW,^{xxiii} but is about to change the parameters for what is viewed as large wind capacity—its goal for the next five years is 70 GW, which would almost triple its installed capacity. As in most countries, the solar figure is smaller. The goal for the next Five-Year Plan had been 5 GW, but as I mentioned there is now talk of raising it to 10 GW, in other words as much as China currently has in nuclear capacity.

Coal is a major challenge for China, because it is dirty to mine, dirty to burn and cumbersome to transport. Thus there is an interest in both improving the efficiency of its use and in substituting other energy sources. Nevertheless, China has a great deal of coal and is directly addressing the challenge of how to burn it more cleanly and mine and burn it more safely. Some of the mine safety issues are being

addressed by encouraging the use of coal mine methane. Methane is also less carbon-intensive than coal. China is actively pursuing a research and commercial-scale pilot program looking at carbon capture and storage, and China has a strong interest in mastering this technology.^{xxiv}

Oil presents other challenges for China, since it not only carries a significant pollution and carbon burden, but also is increasingly imported. 2009 was the first year that China imported more oil than it produced domestically, and given China's limited domestic resources the trend will be for more oil imports. China is addressing this challenge by strongly encouraging the development of electric vehicles.

Technology Innovation and the U.S. Opportunity

In overall terms, Chinese economic strategists recognize that China was late to the industrial revolution and even late to the IT revolution, but it believes it can be a leader in a green revolution. If we think specifically about electric vehicles, they see the existing carmakers as having long since mastered conventional vehicle technologies and even having a significant edge on China with hybrid vehicles. But they see a real opportunity with electric vehicles.

We've seen the same type of advances with rail transport already. China now leads the world in installing high-speed intercity railroad. China already has over 5000 km of high-speed rail. But its plans are much more ambitious. The goal in the next Five-Year Plan is for 35,000 km (almost 22,000 miles) of new high-speed rail linking every major city with a population of over 500,000. The next plan also calls for considerable investment in urban subway systems and regional commuter rail networks.

The clear medium and long-term goals for both energy efficiency upgrades and new technology development have garnered China global interest from investors. The Pew Charitable Trusts just released a new report on clean investment and China's 2010 figure was the highest in the world, \$54.4 billion or 27.5% of total G-20 investment in clean energy. This is \$20 billion more than U.S. investment, which ranked third behind China and Germany.^{xxv} International business has seen the opportunities in China. In just the last year we have seen an increasing number of alliances, involving U.S. companies working with Chinese partners on everything from solar power to algae biofuels. We at WRI are involved in the U.S.-China Clean Energy Research Center (CERC) for clean coal. We have seen business members eager to

work with Chinese partners, because they believe there is information and opportunity that can flow in both directions.^{xvi} China is now developing many technologies of interest, but this does not mean the U.S. is behind. The fact is that the United States continues to be a hub of innovation. What makes China attractive to U.S. partners is the Chinese companies' willingness to invest and the clear policy framework under which this investment happens. Increasingly, entrepreneurs with new ideas, such as concentrated solar designs and many others^{xvii} are looking to China to make those ideas become a reality. This is not a problem with Chinese policy – it is a challenge for other countries. With an equally supportive environment, the U.S., with its unsurpassed research resources and proven track record in new technologies, could be an unsurpassable winner.

ⁱ "China's Energy Diplomacy and Its Geopolitical Implications," Kent E. Calder, 2005 by the Edwin O. Reischauer Center for East Asian Studies, 2005 http://www.reischauer.jp/pdf/China_Energy_Diplomacy.pdf

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^{iv} The World Bank lists China's GDP in 2009 at \$3,744 per capita <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

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^{vi} "How China Developed Its 12th Five-Year Plan," Deborah Seligsohn and Xiaomei Tan, March 23, 2011. <http://www.chinafaqs.org/blog-posts/how-china-developed-its-12th-five-year-plan>

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^{ix} Letter from Su Wei, Director-General of the Department of Climate Change, National Development and Reform Commission, to Yvo de Boer, Executive Secretary of the UNFCCC, January 28, 2010. http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/chinacphaccord_app2.pdf

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^{xi} "Assessment of China's Energy-Saving and Emission-Reduction Accomplishments and Opportunities During the 11th Five-Year Plan," Mark D. Levine, et al, Lawrence Berkeley National Laboratory, 2010. <http://china.lbl.gov/publications/the-ace-study>

^{xii} "Assessment of China's Energy-Saving and Emission-Reduction Accomplishments and Opportunities During the 11th Five Year Plan," *Energy Policy*, in press. http://china.lbl.gov/sites/china.lbl.gov/files/ACESTudy_2011.pdf

^{xiii} Transcript of speech in Canberra, March 30, 2011. International comparison data from the energy information Administration. <http://www.eia.doe.gov/oiaf/ieo/ieoecg.html>

^{xiv} "WRI Policy Brief: China, the United States, and the Climate Change Challenge." http://www.chinafaqs.org/files/chinainfo/china_united_states_climate_change_challenge.pdf

- ^{xv} “ChinaFAQs: Atmospheric Changes Reveal China’s Energy Trends.” http://www.chinafaqs.org/files/chinainfo/ChinaFAQs_Atmospheric_Changes_Reveal_Chinas_Energy_Trends.pdf; Based on: Wang, Y.X., J.W. Munger, S.C. Xu, M.B. McElroy, J.M. Hao, C.P. Nielsen, H. Ma. 2010. CO₂ and its correlation with CO at a rural site near Beijing: Implications for combustion efficiency in China. *Atmospheric Chemistry and Physics* 10: 8881-8897.
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- ^{xx} “China Feb crude oil imports 3rd highest on record,” Reuters, March 9, 2011. <http://www.reuters.com/article/2011/03/10/china-crude-trade-idUKTOE72807120110310>
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- ^{xxiii} “China may set higher targets for solar power,” *People’s Daily Online*, March 30, 2011. <http://english.peopledaily.com.cn/90001/98649/7335636.html>
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- ^{xxviii} “U.S. and Chinese Companies Deepen Ties on the Eve of Obama-Hu Summit,” Joel Kirkland and Peter Behr, *The New York Times*, January 19, 2011. <http://www.nytimes.com/cwire/2011/01/19/19climawire-us-and-chinese-companies-deepen-ties-on-the-87015.html>

Mr. WHITFIELD. Thank you.

Ms. Hutzler, you are recognized for 5 minutes.

STATEMENT OF MARY J. HUTZLER

Ms. HUTZLER. Mr. Chairman and members of the committee, thank you for the opportunity to appear before you today to discuss China's energy portfolio. I am a senior fellow with the Institute for Energy Research, a nonprofit organization that conducts historical research and evaluates public policies and energy markets.

Secretary Chu and other officials tell us the U.S. is losing the race with China regarding clean energy. That is a very narrow picture of the energy situation in China. China is not leading a clean energy revolution, but instead is leading a global race for all fuels, to fuel an economy growing at 7 to 9 percent per year and to provide a better life for its people.

China has a goal of producing 15 percent of its primary energy consumption from carbon-free energy by 2020. It expects to meet that goal primarily with hydroelectric and nuclear technologies because non-hydro renewables, mainly wind and solar, supply only a small amount of energy on a primary consumption basis. China is planning on hydroelectric power to supply 9 to 10 percentage points of its 15 percent goal by reaching a capacity level of 300 gigawatts, about 50 percent more than it has today.

At the pace China is adding hydroelectric capacity, it will have not trouble exceeding that goal by 2020. It currently has twice the amount of hydroelectric capacity as the U.S. has, and will have almost four times as much once it reaches its goal. China is expecting nuclear power to contribute up to 6 percentage points towards its 15 percent goal in 2020. China has 13 nuclear reactors operating, and at least 25 reactors under construction, half of the units in the world's construction pipeline.

Official China nuclear capacity projections are 70 to 80 gigawatts by 2020, and 400 to 500 gigawatts of nuclear by 2050. If China meets its 2030 target of 200 gigawatts, it will have twice the amount of nuclear capacity as the U.S. The U.S. has not issued a construction permit for a new nuclear plant since 1979.

China's goal for wind in 2020 is 150 gigawatts, and it is almost one-third of the way there. As Mr. Waxman noted, China now has more installed wind power than any country in the world, but the U.S. is a close second. Because China's wind capacity is not all connected to the grid, the U.S. has 30 percent more usable wind capacity than China.

China has one-fourth the solar capacity of the U.S. and generates a mere 1/100 of a percent of its electricity from solar. So China does not have much solar capacity. It leads the world in solar cell manufacturing, exporting 95 percent of its production. Because manufacturing costs are lower in China, some U.S. solar manufacturers are moving there.

Part of China's goal is to be self-sustaining in energy technology, and it is learning from U.S. experts in solar energy, nuclear power, and other technologies. For example, China has a goal to enter the global nuclear marketplace by 2013, just a few years from now.

China relies on coal for over 70 percent of its energy and over 80 percent of its electricity. The U.S. relies on coal for 21 percent

of its energy and 45 percent of its electricity. According to the Energy Information Administration, China will be heavily reliant on coal 25 years from now, generating 74 percent of its electricity from it. With its massive coal use, China will be emitting more carbon dioxide emissions than any other country in the world, over 30 percent of the world's total in 2035, and twice the amount the U.S. is expected to emit. China passed the CO₂ emissions years ago, and recently in energy use.

In summary, the Chinese are not fixated solely on green technology. China is on a fast track to bring on line new generating units of all types. Because China is endowed with a sizeable amount of resources, and because coal is the cheapest energy source in China, coal-fired generating additions will far outpace those of other technologies.

Thank you. I will be happy to answer any questions.

[The prepared statement of Ms. Hutzler follows.]



BEFORE THE SUBCOMMITTEE ON ENERGY AND POWER
COMMITTEE ON ENERGY AND COMMERCE
HEARING ON THE AMERICAN ENERGY INITIATIVE
APRIL 4, 2011
TESTIMONY OF MARY J. HUTZLER
THE INSTITUTE FOR ENERGY RESEARCH

The Institute for Energy Research (IER) is a non-profit organization that conducts historical research and evaluates public policies in energy markets. IER articulates free market positions that respect private property rights and promote efficient outcomes for energy consumers and producers. IER staff and scholars educate policymakers and the general public on the economic and environmental benefits of free market energy. The organization was founded in 1989 as a public foundation under Section 501(c)(3) of the Internal Revenue Code. Funding for the institute comes from tax-deductible contributions of individuals, foundations, and corporations.

Energy Secretary Steven Chu and other administration officials paint a very dire picture of the U.S.-vs.-China race for clean energy, implying that China is quickly outstripping United States in that race.¹ However, all the facts are not on the table. In both 2008 and 2009, the United States added more non-hydroelectric renewable capacity than it added traditional capacity (natural gas, coal, oil, and nuclear).² At the end of 2010, the United States and China each had over 20 percent of the world's installed wind

¹ Climate Wire, Energy policy: U.S. clean tech outpaced by China—Chu, March 9, 2010, <http://www.eenews.net/climatewire/2010/03/09/3>

² Energy Information Administration, Annual Energy Review 2009, Table 8.11a, http://www.eia.gov/emeu/aer/pdf/pages/sec8_42.pdf

capacity.³ While it is true that China's total installed wind capacity was about 5 percent more than that of the United States in 2010, not all of China's wind capacity is connected to the electric grid. Adjusting for that difference, the United States has in essence over 30 percent more useable wind capacity than China. At the end of 2009, the United States ranked fourth in solar capacity, with only Germany, Spain, and Japan having a larger amount; China did not even make the list of the top 8 countries.⁴ According to the Pew Environment Group, in 2010, China had about 75 percent less solar capacity installed than the United States.⁵

Where China is outstripping us in domestic construction is in coal-fired, nuclear, and hydroelectric generating technologies. Legal and bureaucratic red tape makes it much more difficult to build these energy technologies in the United States than in China. China is eclipsing the United States in all forms of energy, and especially the most cost-efficient energy sources. For example, their ability to quickly permit energy projects allows them to build the cleanest and most efficient coal plants.⁶ China is building supercritical plants that produce about 15 percent less carbon dioxide emissions for \$500 to \$600 per kilowatt⁷, much lower than the \$2800 per kilowatt cost in the United States, exclusive of financing costs, according to the Energy Information Administration.⁸

China realizes that it needs affordable energy to fuel its economic growth and manufacturing productivity, and it is building all forms of generating technologies at breakneck speed. By contrast, the electric generating construction program in the United States has slowed tremendously, owing to regulatory, financial, legal and demand problems. Economic growth has slowed in the United States and with it our energy demand has grown more slowly. History shows that the United States became the world's workshop – replacing Britain – shortly after we became the world's largest consumer of energy. Since energy is literally, "the capacity to do work," the United States needed enormous amounts of energy in the 20th century to do more work than our competitors, and ended up the lone superpower in the world. Policymakers need to understand that energy availability and affordability spur economic

³ Global Wind Energy Council, <http://www.gwec.net/fileadmin/images/newsletter/Top%2010%20total%20installed%20capacity%202010.jpg>

⁴ Solar Energy Industries Association, US Solar Industry: Year in Review 2009, April 15, 2010, <http://seia.org/galleries/default-file/2009%20Solar%20Industry%20Year%20in%20Review.pdf>

⁵ The Pew Environment Group, <http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Report/G-20Report-LOWRes-FINAL.pdf>

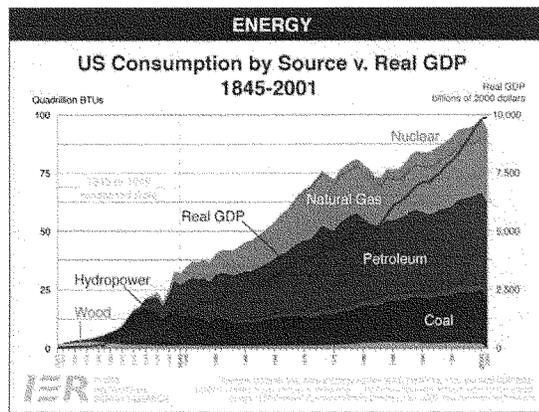
⁶ New York Times: China Outpaces US in Cleaner Coal-Fired Plants-May 10, 2009 <http://www.nytimes.com/2009/05/11/world/asia/11coal.html>

⁷ Reuters, Analysis: China clean energy plan hinges on coal price, August 27, 2010, <http://www.reuters.com/article/2010/08/27/us-china-clean-energy-idUSTRE67Q0Y520100827?pageNumber=2>

⁸ Energy Information Administration, http://www.eia.doe.gov/oiaf/beck_plantcosts/index.html

growth. Without reasonably priced energy, it will be difficult to achieve high levels of economic growth in the United States, and industry will move offshore where energy is more affordable, taking jobs away when we can least afford to lose them.

As the following chart illustrates, the use of energy to propel the U.S. economy and increase the capacity to do work led to unprecedented growth and opportunity. Of note is the fact that the U.S. economy once ran entirely on renewable forms of energy from well before our founding until well after the Civil War, at which time the advent of new forms of concentrated energy enabled us to surpass Britain in energy consumption and economic output. It is therefore important to understand China's energy path today realistically. Data from the International Energy Agency indicated that China consumed more energy than the United States in 2009 – the first time since 1885 that the United States was no longer the number one user of energy.⁹ Just 8 short years ago the United States used twice as much energy as China, according to statistics from the Energy Information Administration.¹⁰



Comparison of Generating Capacity Data for the U.S. and China

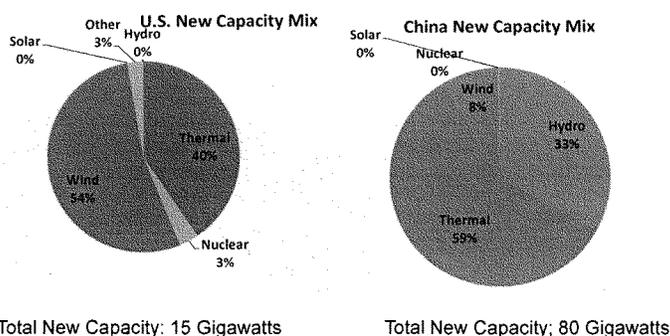
Energy Information Administration data for 2008 (the most recent year available from the Energy Information Administration) indicates that China added more than 5 times the total generating capacity that the United States did (80 gigawatts of total capacity for China, versus 15 gigawatts of capacity for

⁹ The Wall Street Journal, China Passes US as the World's Biggest Energy Consumer IEA, July 19, 2010, http://online.wsj.com/article/SB10001424052748703720504575376712353150310.html?hat_input=China+Passes+U.S.+as+World%27s+Biggest+Energy+Consumer

¹⁰ Energy Information Administration, <http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=44&pid=44&aid=2&cid=regions&syid=1996&eyid=2008&unit=QBTU>

the United States).¹¹ While that statistic is in itself interesting, the split between fuel types is even more interesting. Embedded in these capacity addition statistics is China's 26 gigawatts of hydroelectric capacity to none for the United States. China also added 47 gigawatts of thermal capacity (primarily coal), while the U.S. added 6 gigawatts (primarily natural gas). That's almost 8 times more thermal capacity and on a carbon dioxide-emitting basis, over 15 times more.

Comparison of New Generating Capacity Mix for U.S. and China, 2008 (Percent)



Note: New thermal capacity for the U.S. is natural gas-fired; new thermal capacity for China is coal-fired.

Source: Energy Information Administration, International Energy Annual

So, based on an apples-to-apples comparison of newly built capacity in 2008, China is outstripping us in hydroelectric and coal-fired capacity, which the Administration and environmental organizations fail to mention. Not only did they build more hydroelectric and coal-fired capacity in 2008 than we did, but their total hydroelectric capacity is over twice that of the United States, and as of the end of 2008, their coal-fired capacity was almost twice that of the United States.

Why is China Building Wind and Solar Capacity?

China builds wind and solar partly because ratepayers in other countries pay them to do so. China has taken advantage of the Clean Development Mechanism (CDM) under the Kyoto Protocol to obtain

¹¹ Energy Information Administration, <http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=2&pid=2&aid=7>

funding for its solar and wind power.¹² Under this program, administered by the United Nations, wealthy countries can contribute funds and get credit for “clean technology” built elsewhere as long as it is additional, that is, as long as that technology would not have been built otherwise. China is the world’s largest beneficiary of the program and has benefited to the point where about 30 percent of its wind capacity is not operable because it is not connected to the grid.¹³ However, in mid 2009, the United Nations started questioning whether the Chinese CDM program was in fact “additional,” because the U.N. found that China was lowering its subsidies to qualify for the program.¹⁴ That is, China was reducing its own government’s support in order to get international subsidies.

What are China’s Electric Construction Plans?

Both China’s generating sector and its industrial sector rely heavily on coal, with 80 percent of its electric generation being coal-fired.¹⁵ Even with China’s substantial clean energy targets, the Energy Information Administration expects fossil fuels, mostly coal, to generate 75 percent of the country’s electricity in 2035. Clean energy sources (nuclear, wind, solar, biomass, and hydroelectric power) generated 19 percent of China’s electricity in 2009, and they are expected to increase their share to 25 percent by 2035. China has the world’s largest hydroelectric capacity, generating 16 percent of its electricity from water.

Hydroelectric Power

Most of China’s hydroelectric capacity is from very large dams on major rivers. China’s most famous hydroelectric project, the Three Gorges Dam that many thought was an impossible engineering feat, brought its final generator on line in October 2008, with a total capacity of 18.2 gigawatts. The Three Gorges Project Development Corporation plans to further increase the project’s total installed capacity to 22.4 gigawatts by 2012. The 12.6-gigawatt Xiluodu project on the Jinsha River is scheduled for completion in 2015 as part of a 14-facility hydropower development plan. China also has the world’s second tallest dam (at nearly 985 feet) currently under construction, as part of the 3.6-gigawatt Jinping I project on the Yalong River. It is scheduled for completion in 2014 as part of a plan by the Ertan Hydropower Development Company to construct 21 facilities with 34.6 gigawatts of hydroelectric capacity on the Yalong.

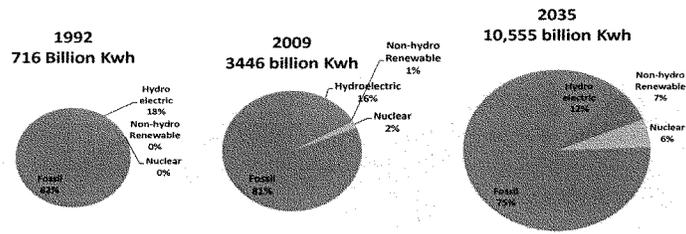
¹² CNN, U.N. halts funds to China wind farms, December 2, 2009, <http://edition.cnn.com/2009/BUSINESS/12/01/un.china.wind.ft/index.html>

¹³ The Wall Street Journal, “China’s Wind Farms Come with a Catch: Coal Plants”, September 28, 2009, <http://online.wsj.com/article/SB125409730711245037.html>

¹⁴ CNN, U.N. halts funds to China wind farms, December 2, 2009, <http://edition.cnn.com/2009/BUSINESS/12/01/un.china.wind.ft/index.html>

¹⁵ Energy information Administration, International Energy Outlook 2010, Tables H11 and H14, <http://www.eia.doe.gov/oiaf/ieo/index.html>

Electricity Generation Shares in China by Generator Type (Percent)



Source: Energy Information Administration

The Chinese government has set a target for 300 gigawatts of hydroelectric capacity by 2020, and according to the Energy Information Administration, the Chinese government has sufficient projects underway to meet the target.¹⁶ China currently has about twice the hydroelectric capacity of the United States and its 2020 goal is almost four times more capacity than the United States is expected to have by then.

China has a goal to produce 15 percent of its primary energy from renewable energy by 2020.¹⁷ According to an official from China's National Energy Administration, "Hydropower is the key to reaching that target. It will make up 9 to 10 percentage points out of the 15."¹⁸ By comparison, most proposals for renewable energy mandates in the United States do not include existing hydroelectric power as a source.

¹⁶ Energy Information Administration, International Energy Outlook 2010, page 88, <http://www.eia.doe.gov/oi/af/ieo/index.html>

¹⁷ USA Today, "China Pushes Solar, Wind Power Development", http://www.usatoday.com/money/industries/energy/environment/2009-11-17-chinasolar17_CV_N.htm

¹⁸ Analysis: China clean energy plan hinges on coal price, August 27, 2010, <http://www.reuters.com/article/2010/08/27/us-china-clean-energy-idUSTRE67Q0Y520100827?pageNumber=26>

Wind

The Global Wind Energy Council reports that China had 42,287 megawatts of wind capacity at the end of 2010, 5 percent more than the U.S. total of 40,180.¹⁹ China added 16,500 megawatts in 2010 to 5,115 megawatts added by the United States. Both Europe and the United States saw a slowdown in installations of wind turbines due to the financial crisis, reduced electricity demand expectations, and issues regarding the future forms of subsidies.

According to the Pew Environment Group, China has a goal to produce 150,000 megawatts of wind by 2020.²⁰ To help meet this goal, China is planning to build the world's largest wind farm in the northwest part of the country. The plan was to complete 5 gigawatts in 2010, and expand to 20 gigawatts by 2020, at a cost of \$1 million per megawatt,²¹ or \$1,000 per kilowatt, about 40 percent of the cost of an onshore wind unit in the United States, according to the Energy Information Administration.²²

Unlike the United States that can back up its wind power with several fuel types, China backs up its wind power with coal-fired plants when the wind does not blow or when the electric grid is inadequate to handle the wind capacity. According to the China Power Union, only 72 percent of the country's total wind power capacity is connected to the grid.²³ Adding to the problem is poor connectivity between regional transmission networks, which makes it difficult to move surplus power from one part of the country to another and thus requires each region to have sufficient reserve capacity.²⁴ For example, the wind project in Jiuquan in Gansu, although fairly large at 10 gigawatts, is located too far from the regional load-bearing center. In Inner Mongolia, less than 2 gigawatts of wind power was originally connected to the grid, with an additional 8.3 gigawatts needing to be connected. China plans to spend

¹⁹ Global Wind Energy Council, <http://www.gwec.net/fileadmin/images/newsletter/Top%2010%20total%20installed%20capacity%202010.jpg>

²⁰ The PEW Environment Group, <http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Report/G-20Report-LOWRes-FINAL.pdf>

²¹ The Wall Street Journal, "Wind Power: China's Massive and Cheap Bet on Wind Farms", July 6, 2009, <http://blogs.wsj.com/environmentalcapital/2009/07/06/wind-power-chinas-massive-and-cheap-bet-on-wind-farms/>

²² Energy Information Administration, http://www.eia.doe.gov/oiaf/beck_plantcosts/index.html

²³ Asia Times, China's wind power has faulty connection, June 16, 2010, http://www.atimes.com/atimes/China_Business/LF16Cb03.html

²⁴ The Wall Street Journal, "China's Wind Farms Come with a Catch: Coal Plants", September 28, 2009, <http://online.wsj.com/article/SB125409730711245037.html>

over \$600 billion to upgrade its power grid to accommodate all of its new electricity expansion over the next decade.²⁵

Currently China is mainly manufacturing wind turbines for domestic use, but with saturation in China's domestic market, many wind turbine manufacturers have looked to overseas markets to meet their expanding output. With the Investigative Reporting Workshop of the American University finding that 79 percent of U.S. stimulus funds for renewable projects have gone to overseas firms, mainly for wind projects, it is no wonder that the Chinese are looking into U.S. markets.²⁶ China's wind industry tried to enter the U.S. market to build a 600-megawatt wind farm in West Texas as part of a consortium of Chinese and American companies. The original proposal had the wind turbines manufactured in China, creating thousands of jobs there, but only a few hundred temporary installation jobs in the United States.²⁷ Due to criticism from some U.S. senators, the Chinese firm agreed to build a plant in Nevada to manufacture turbine parts. However, although the Chinese are providing the financing for the project, the consortium needs \$450 million, 30 percent of the wind farm's cost, to come from a federal stimulus grant. The \$1.5 billion cost for the project is \$2.31 million per megawatt, or \$2,310 per kilowatt,²⁸ over twice the cost of wind farms in China.

Not only does China want to enter in the U.S. market by building wind farms, but U.S. manufacturers have plants in China, capitalizing on their lower labor cost. GE, a major U.S. wind turbine producer, already owns three facilities in China that produce turbine components.²⁹ And it opened a factory³⁰ in Vietnam that employs 500 local workers and will export 10,000 tons of components to GE Energy assembly plants around the world.³¹

²⁵ Asia Times, China's wind power has faulty connection, June 16, 2010, http://www.atimes.com/atimes/China_Business/LF16Cb03.html

²⁶ Investigative Reporting Workshop, Renewable energy money still going abroad, despite criticism from Congress, February 8, 2010, <http://investigativereportingworkshop.org/investigations/wind-energy-funds-going-overseas/story/renewable-energy-money-still-going-abroad/>

²⁷ www.reuters.com/article/pressRelease/idUS200008+29-Oct-2009+BW20091029

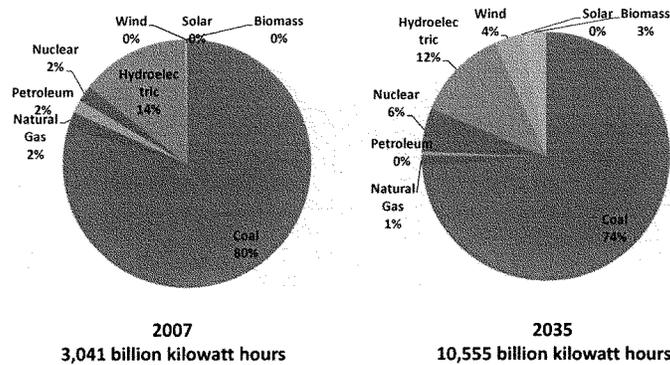
²⁸ <http://theheartofamerica.wordpress.com/2011/01/10/wind-farms-courtesy-of-china/>

²⁹ "Overseas firms collecting most green energy money", October 29, 2009, <http://investigativereportingworkshop.org/investigations/wind-energy-funds-going-overseas/>

³⁰ Viet Nam Business News, GE factory to be put into operation, October 15, 2010, <http://vietnambusiness.asia/ge-energy-factory-to-be-put-into-operation/>

³¹ "Vietnam's first turbine component plant underway", May 13, 2009, <http://www.vietnewsonline.vn/News/Business/Companies-Finance/6072/Vietnams-first-turbine-component-plant-underway.htm>

Coal Dominates China's Electric Generation Even in 2035 (Percent)



Source: Energy Information Administration, International Energy Outlook 2010

Solar

China leads the world in solar cell manufacture, but 95 percent of its production is exported.³² According to the Pew Environment Group, China had 800 megawatts of solar capacity at the end of 2010 compared to 3,100 megawatts in the United States. China's target for 2020 is 20,000 megawatts of solar capacity so it has a long way to go.³³ In 2009, China generated only 0.01 percent of its grid-connected electricity from solar energy.³⁴ However, Arizona-based First Solar has signed a deal to build the first phase (30 megawatts) of what was to be the world's largest solar farm (2,000 megawatts) in China in cooperation with China Guangdong Nuclear Solar Energy Development Company Ltd. (CGN SEDC). CGN

³² <http://www.guardian.co.uk/world/2009/may/26/china-invests-solar-power-renewable-energy-environment>

³³ The Pew Environment Group, <http://www.pewenvironment.org/uploadedFiles/PEG/Publications/Report/G-20Report-LOWRes-FINAL.pdf>

³⁴ Energy Information Administration, International Energy Statistics, <http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=2&pid=36&aid=12&cid=regions&syid=2005&eyid=2009&unit=BKWH>

SEDC will be the majority project owner and operator, providing the engineering, procurement and construction functions. First Solar will supply its thin-film solar photovoltaic modules and will support CGN SEDC with advisory services.³⁵

Realizing that the United States may be a good market for solar, China's Suntech, the world's largest supplier of solar panels, opened a solar manufacturing plant in Arizona last year.³⁶ Suntech will be supplying solar panels to the 150-megawatt Mesquite solar plant in Arizona with construction beginning this year and completion in 2013. The company has orders for 350 megawatts of utility sales in 2011.³⁷ Suntech's factory will create finished panels from subcomponents that will be manufactured in the company's Chinese facilities. According to Suntech, locating the assembly in the U.S. will lower delivery time and costs, as well as reduce the overall carbon footprint of getting finished panels to U.S. customers.³⁸

Due to lower operating costs in China, a U.S.-based firm, Evergreen Solar, after receiving at least \$43 million in incentives from the state of Massachusetts, moved its assembly plant to China, laying off 800 workers in the United States.³⁹ Chinese solar manufacturers have been able to lower prices because of financing from state-owned banks and lower manufacturing costs. World prices for solar panels have fallen as much as two-thirds in the last three years.

Nuclear

According to the World Nuclear Association, China has 13 nuclear reactors operating and at least 25 reactors under construction, half of the units in the world's construction pipeline. Many more units are planned with construction due to start within three years. As of June 2010, official installed nuclear capacity projections were 70 to 80 gigawatts by 2020, 200 gigawatts by 2030 and 400 to 500 gigawatts by 2050.⁴⁰ If China meets its 2030 target, it will have twice the amount of nuclear capacity as the United

³⁵ First Solar and China Guangdong Nuclear to co-develop Ordos project, January 7, 2011, http://www.semiconductor-today.com/news_items/2011/JAN/FIRSTSOLAR3_070111.htm

³⁶ Suntech opens solar panel factory in Goodyear, Arizona, October 8, 2010, <http://www.brighterenergy.org/17375/news/solar/suntech-opens-solar-panel-factory-in-goodyear-arizona/>

³⁷ Suntech Solar Panels Head to Arizona Plant, February 26, 2011, <http://www.earthtechling.com/2011/02/suntech-solar-panels-head-to-arizona-plant/>

³⁸ Business Week, "China Solar Panel Maker Sets First U.S. Plant", November 15, 2009, http://www.businessweek.com/technology/content/nov2009/tc20091115_970512.htm

³⁹ Solar Panel Maker Moves Work to China, January 14, 2011, <http://www.nytimes.com/2011/01/15/business/energy-environment/15solar.html>

⁴⁰ World Nuclear Association, March 10, 2011, <http://www.world-nuclear.org/info/inf63.html>

States.⁴¹ China Daily reports that nuclear power should contribute up to six percentage points towards China's goal of attaining 15 percent of primary energy consumption from non-fossil energy by 2020.⁴²

China has under construction the world's first Westinghouse AP1000 units, a demonstration high-temperature gas-cooled reactor plant. China's four AP 1000 reactors under construction at two different sites, Haiyang and Sanmen,⁴³ are the same reactors that the U.S. Nuclear Regulatory Commission (NRC) has ruled need additional analysis, testing, or design modifications of the shield building to ensure compliance with NRC requirements.⁴⁴ At least eight more at four sites are planned, and about 30 more are proposed to follow. For the first four units, construction is expected to take 50 months from pouring of concrete to fuel loading and an additional six months to be connected to the grid. The construction time is expected to be significantly reduced for the following units. The cost of the first four is expected to be less than \$2000 per kilowatt and \$1600 per kilowatt for future units.⁴⁵ The initial cost is over 2.5 times the cost projected for a plant built in the United States exclusive of financing costs, according to the Energy Information Administration.⁴⁶ China builds these reactors at lower cost than the United States because of less red tape, state-owned financing, and low cost labor familiar with large infrastructure projects.

The Chinese are aiming to enter into the global nuclear marketplace by 2013—just a few short years. With Western know-how being transferred and low-cost manpower, China can become a formidable competitor, as they have become to wind and solar markets. The World Nuclear Association indicates that the Chinese are very quickly becoming self-sufficient in reactor design. That is not surprising, when western nuclear companies provide technical training and related documents to the Chinese. Westinghouse, for example, as part of their contractual agreement with its Chinese customers, turned over more than 75,000 technical documents.

The United States is not the only country working with the Chinese to construct nuclear plants. France, for example, is honchoing a project of third-generation reactors in the Guangdong province, where construction on two European pressurized reactors is underway based on a contract signed in

⁴¹ Energy Information Administration, Annual Energy Review, Table 8.11a

⁴² China Daily, China's nuclear power set to increase sevenfold by '20, August 27, 2010, http://www.chinadaily.com.cn/business/2010-08/27/content_11217181.htm

⁴³ Westinghouse News Releases, Westinghouse and the Shaw Group Celebrate First Concrete Pour at Haiyang Nuclear Site in China, September 29, 2009, <http://westinghousenuclear.mediaroom.com/index.php?s=43&item=200>

⁴⁴ Westinghouse Statement Regarding NRC News Release on AP1000 Shield Building, <http://westinghousenuclear.mediaroom.com/index.php?s=43&item=203>

⁴⁵ World Nuclear Association, March 10, 2011, <http://www.world-nuclear.org/info/inf63.html>

⁴⁶ Energy Information Administration, http://www.eia.doe.gov/oiaf/beck_plantcosts/index.html

November 2007 with France's Areva. In fact, work is progressing much better than the company's other projects due to the experience Areva gained on them and to the 9,000 Chinese laborers on-site, who work 7 days a week at 10-hour shifts. The first reactor should be on-line at the end of 2013 and the second in the fall of 2014. Two more may follow in the future.⁴⁷ Clearly, western nuclear companies are hoping for a long-term partnership with the Chinese, but, in reality, they may only be gaining near term profits, instead.

Public concern over Japan's nuclear accident has led China to review the safety of its operating and proposed nuclear units. The country temporarily suspended approvals for new nuclear units to revise its safety standards and has asked for safety checks at their six operating nuclear plants.⁴⁸ One of the problems at the Japanese nuclear units affected by the earthquake and the tsunami has been fixed in the design of advance nuclear reactors. Instead of using diesel generators to pump cooling water into the reactors, Westinghouse's AP1000 uses a passive cooling system where water circulates by natural convection instead of needing electricity to pump the cooling water.⁴⁹

Coal

China gets over 70 percent of its energy from coal,⁵⁰ and 80 percent of its electricity. According to the Department of Energy's National Energy Technology Laboratory (NETL), from 2006 through 2009, China has been building 55 to 80 gigawatts of coal-fired power a year, and has over 70 gigawatts more under construction. NETL reports that China has plans to build over 200 gigawatts of coal-fired plants in the near future.⁵¹ (See figure below.)

According to Australia, China is planning to build 500 coal-fired plants over the next ten years.⁵² That means every week or so, for the next decade, China will open another large coal-fired power plant. The Energy Information Administration forecasts that coal will still generate about 75 percent of China's electricity in 2035, even with its massive building programs in other generating technologies. According

⁴⁷ Guardian, Construction schedule on Chinese third-generation nuclear plants races ahead of European models, December 28, 2010, <http://www.guardian.co.uk/environment/2010/dec/28/china-areva-taishan-nuclear-thibault>

⁴⁸ China freezes nuclear plant approvals, March 16, 2011, <http://edition.cnn.com/2011/WORLD/asiapcf/03/16/china.nuclear/?hpt=T2>

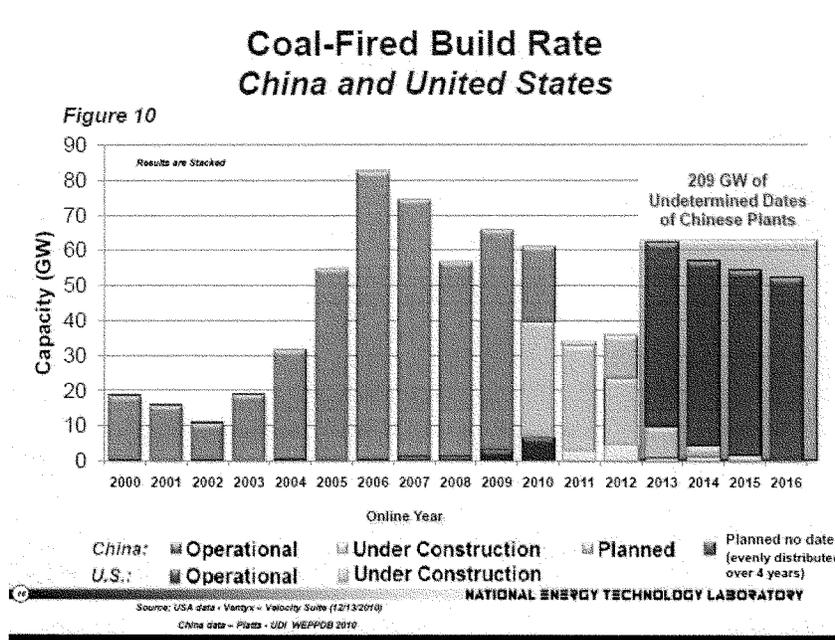
⁴⁹ The Wall Street Journal, Japan Does Not Face Another Chernobyl, March 14, 2011, <http://online.wsj.com/article/SB10001424052748704893604576198421680697248.html>

⁵⁰ Energy Information Administration, <http://www.eia.doe.gov/countries/cab.cfm?fips=CH>

⁵¹ National Energy Technology Laboratory, Tracking New Coal-fired Power Plants, January 14, 2011, <http://www.netl.doe.gov/coal/refshelf/ncp.pdf>

⁵² <http://windfarms.wordpress.com/2009/01/29/china-building-500-coal-plants/>

to Ashok Bhargava, a China energy expert at the Asian development bank, "No matter how much renewable or nuclear is in the mix, coal will remain the dominant power source."⁵³



Prospects for Electric Capacity in the United States

The United States has made it difficult to build generating plants in this country, particularly coal-fired and nuclear power plants. According to NETL, only eleven coal-fired plants totaling 6,682 megawatts became operational in the United States in 2010, but this was the largest increase in coal-fired capacity additions in one year since 1985.⁵⁴ Prospects of cap-and-trade legislation, reviews and re-reviews by the Environmental Protection Agency, direct action protests, petition drives, renewable portfolio mandates

⁵³ New York Times, China Outpaces U.S. in Cleaner Coal-Fired Plants, May 10, 2009, <http://www.nytimes.com/2009/05/11/world/asia/11coal.html>

⁵⁴ National Energy Technology Laboratory, Tracking New Coal-fired Power Plants, January 14, 2011, <http://www.netl.doe.gov/coal/refshelf/ncp.pdf>

in many states, competition from subsidized and mandated wind power, and lawsuits have slowed the construction of new coal-fired plants.⁵⁵ According to the Sierra Club, plans for over 150 coal plants have been shelved due to their activities.⁵⁶ The graph above compares the coal-plant additions in the United States to that of China, showing only a handful of coal plants under construction in the United States. Because the capital cost of most of our existing coal-fired plants has been paid, that fleet produces 45 percent of our electricity at very little cost. Average production costs for coal-fired generators in 2009 were only 2.97 cents per kilowatt hour, slightly higher than our nuclear plants at 2.03 cents per kilowatt hour.⁵⁷

No nuclear plant has started up in the United States since 1996, and no construction permits have been issued since 1979. NRC requirements, financing difficulties, and slow fulfillment of the nuclear provisions of the Energy Policy Act of 2005 have slowed the construction of new nuclear power reactors. However, as part of the 2005 Energy Policy Act, President Obama announced that his administration is offering conditional commitments for \$8.33 billion in loan guarantees for nuclear power construction and operation. Two new 1,100 megawatt Westinghouse AP1000 nuclear reactors were to be constructed at the Alvin W. Vogtle Electric Generating Plant in Burke, Georgia, supplementing the two reactors already at the site. Before the nuclear accident in Japan, the two new nuclear generating units were expected to begin commercial operation in 2016 and 2017 at a cost of \$14 billion. As part of the conditional loan guarantee deal, the U.S. Nuclear Regulatory Commission must determine if the AP1000 fulfills the regulatory requirements for a construction and operating license. (These are the same units permitted, licensed, and being constructed in China right now.) But, as a recent Wall Street Journal energy conference noted, loan guarantees are “meaningless in the absence of regulatory certainty.”⁵⁸

Natural gas and wind power are the technologies that seem best able to surmount the financial, regulatory, and legal hurdles of getting plants permitted and operational in the United States. However, organized local opposition has halted even some renewable energy projects by using “not in my back yard” (NIMBY) arguments, changing zoning laws, opposing permits, filing lawsuits, and bleeding projects

⁵⁵ A messy but practical strategy for phasing out the U.S. coal fleet, <http://www.grist.org/article/death-of-a-thousand-cuts/>

⁵⁶ Sierra Club, <http://www.sierraclub.org/coal/contact.aspx>

⁵⁷ Nuclear Energy Institute, <http://www.nei.org/resourcesandstats/documentlibrary/reliableandaffordableenergy/graphicsandcharts/uselectrityproductioncosts>

⁵⁸ The Wall Street Journal, An Energy Head Fake, March 11, 2010, http://online.wsj.com/article/SB10001424052748704784904575112144130306052.html?mod=WSJ_Opinion_AboveLEFTTop

of their financing.⁵⁹ Delay in capital intensive energy projects many times equates to denial, because of the economic exposure.

Generating Costs of New Technologies

According to the Energy Information Administration (EIA), the annualized cost of solar photovoltaic technology is 21.07 cents per kilowatt hour (in 2009 dollars), and solar thermal is 31.18 cents per kilowatt hour. Offshore wind is expected to cost 24.32 cents per kilowatt hour, and onshore wind is less at 9.7 cents per kilowatt hour. These costs are levelized costs, which is the present value of the total cost of building and operating a generating plant over its financial life, converted to equal annual payments and amortized over expected annual generation. The EIA estimates these costs for the year 2016, which is the first future year that generating technologies can be compared because of the different lead times for building the plants. Some plants, such as photovoltaic plants, require 1 or 2 years to build, while others (such as nuclear plants) require 6 or more years.⁶⁰

The costs for new solar and wind technologies are generally higher than the costs of competing technologies. For 2016, natural gas combined-cycle technologies have costs estimated at 6.31 to 6.61 cents per kilowatt hour, and pulverized coal and coal-fired integrated gasification combined-cycle technologies have costs of 9.48 and 10.94 cents per kilowatt hour, respectively. EIA includes a 3-percentage point increase in the cost of capital when evaluating investments in greenhouse gas intensive technologies to represent the difficulties in obtaining financing, which is equivalent to a \$15 per ton carbon dioxide emission fee.⁶¹ (See figure below.)

If one considers just the capital cost of building these plants, without finance charges, the EIA estimates those at \$4,755 per kilowatt (in 2009 dollars) for photovoltaic technology, \$4,692 per kilowatt for solar thermal technology, and \$5,975 for offshore wind.⁶² Of course, plant costs can vary depending on site locations, terrain, labor costs, and other factors. For a solar photovoltaic plant that came on line last October in southern Florida, Florida Power and Light spent \$152 million building a 25-megawatt plant, which is equivalent to \$6,080 per kilowatt.⁶³

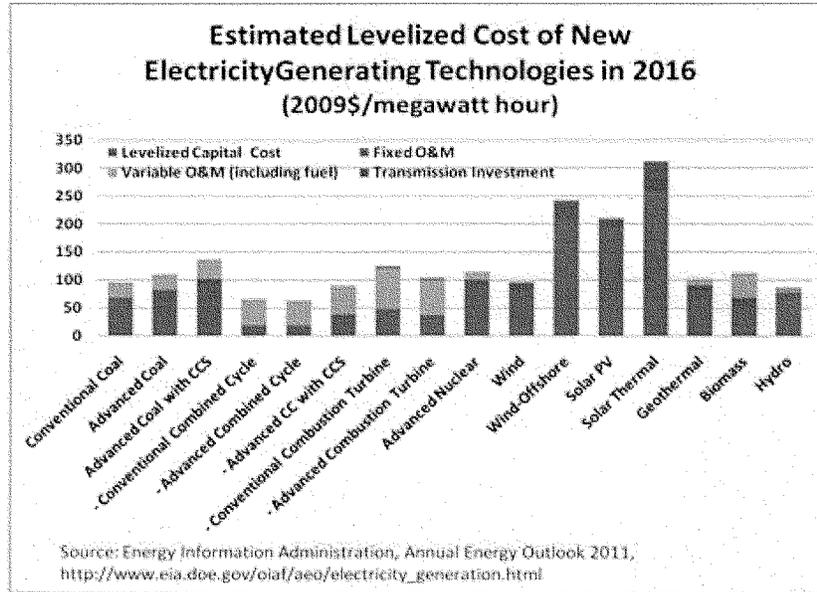
⁵⁹ For a repository of stalled and stopped energy projects, see U.S. Chamber of Commerce, "Project No Project Energy-Back On Track", <http://pnp.uschamber.com/>

⁶⁰ Energy Information Administration, 2016 Levelized Cost of New Generation Resources from the Annual Energy Outlook 2011, http://www.eia.doe.gov/oiaf/aeo/electricity_generation.html .

⁶¹ *Ibid.*

⁶² Energy Information Administration, http://www.eia.doe.gov/oiaf/beck_plantcosts/index.html

⁶³ "Solar plant set to open, even as shadows loom", Herald Tribune, Zac Anderson, Oct. 14, 2009, <http://www.heraldtribune.com/article/20091014/ARTICLE/910141033/2055/NEWS?Title=Solar-plant-set-to-open-even-as-shadows-loom>



The Cape Wind project, off the coast of Cape Cod in Massachusetts, is expected to be the first offshore wind farm in the United States. The 130-turbine wind farm is estimated to cost at least \$2 billion and was approved last year by Interior Secretary Ken Salazar after more than eight years of federal review. National Grid, the state's largest utility, is to buy half of Cape Wind's power, starting at 18.7 cents per kilowatt hour,⁶⁴ less than EIA's estimate of 24.32 cents per kilowatt hour, but increasing annually at 3.5 percent in a 15 year deal. But that's still about twice what the utility pays for power from conventional sources, and almost twice the average U.S. cost of electricity—9.9 cents per kilowatt in 2010.⁶⁵ As one

⁶⁴ The Associated Press, Mass. court rejects challenge to Cape Wind permit, August 31, 2010, <http://www.google.com/hostednews/ap/article/ALeqM5gz8VVwo2TgZdHn9MmdvajdSGq2QD9HUN0T03>

⁶⁵ Energy Information Administration, http://www.eia.doe.gov/totalenergy/data/monthly/pdf/sec9_14.pdf

might expect, the project is having trouble getting buyers for the other half of the project's output due to its high cost.⁶⁶

Summary

China is on a fast track to bring online new generating units using coal, nuclear, hydroelectric, solar, and wind power, which will allow its economy to continue to grow. Because China is endowed with a sizable amount of coal resources and because coal is the cheapest energy source in China, coal-fired generating additions will far outpace those of other technologies. By continuing to rely heavily on currently available coal technology, China will remain the number one emitter of carbon dioxide. According to the Energy Information Administration, China's carbon dioxide emissions are already 5 percent higher than those of the United States, and by 2035, they are expected to be over twice that of the United States.⁶⁷

The United States, on the other hand, has made it difficult to build generating plants in this country. Prospects of cap-and-trade legislation and reviews and re-reviews as well as changing emissions requirements by the Environmental Protection Agency have slowed the construction of new coal-fired plants. NRC requirements, financing difficulties, and slow fulfillment of the nuclear provisions of the Energy Policy Act of 2005 have slowed the construction of new nuclear power reactors. Even renewable energy projects have been halted by "not in my back yard" (NIMBY) protesters. They have blocked energy projects by organizing local opposition, changing zoning laws, opposing permits, filing lawsuits, and bleeding projects dry of their financing. Without reasonably priced energy, it will be difficult to achieve high levels of economic growth, and U.S. industry will just move offshore where energy is more affordable.

Our President has a goal to reduce oil imports by one-third by 2025 to improve our energy security. However, we may be just trading one energy source for another since Chinese manufacturers can easily produce solar and wind generating technologies for far less than manufacturers in the United States. After many years of relying on unstable governments in the Middle East and elsewhere for oil, the United States may now turn to China for renewable energy technologies.

The United States became the world's most productive economy by using its energy resources to increase output and make life better for its citizens. Contrary to the claims of some, the Chinese are not fixated on "green technology" solely, and in fact, are growing other parts of their energy mix much more extensively. The Chinese are building all generating technologies much more quickly than the United States, and are using energy to build an economy for the future.

⁶⁶ Associated Press, Wanted: Buyer for controversial Cape Wind energy, December 19, 2010, <http://www.sfgate.com/cgi-bin/article.cgi?f=/n/a/2010/12/19/national/a081715S27.DTL> and <http://www.instituteforenergyresearch.org/2010/12/29/expensive-offshore-wind-in-need-of-customers/>

⁶⁷ Energy Information Administration, International Energy Outlook 2010, Table A10, <http://www.eia.doe.gov/oiaf/ieo/index.html>

At IER, we urge Members of the Committee to look at this matter comprehensively, since history tells us energy consumption is directly linked with economic growth. Should the United States choose to concentrate solely on a path of expensive energy sources for our future "capacity to do work," our nation will do less work. That is a stark departure from the path that led and sustained our position in the world, and has implications far beyond those related to energy security.

Thank you for the opportunity to supply this testimony for the Committee's use.

Mr. WHITFIELD. Well, thank you, Ms. Hutzler. And thank you all for your testimony. We appreciate it very much.

Mr. Palmer, I believe you said world energy demands will increase by 40 percent by what year?

Mr. PALMER. 2030.

Mr. WHITFIELD. 2030. Now in my view, it is impossible for the world to have any chance of meeting its electricity demands without using coal anytime in the near future. Would you agree with that, Mr. Kopits?

Mr. KOPITS. I would indeed.

Mr. WHITFIELD. Mr. Palmer?

Mr. PALMER. As certain as the lights in this room.

Mr. WHITFIELD. Ms. Seligsohn?

Ms. SELIGSOHN. There are technical ways, but it seems unlikely that that will be the choice that people make.

Mr. WHITFIELD. Ms. Hutzler?

Ms. HUTZLER. Yes, they will.

Mr. WHITFIELD. OK. Now, one the things that I am concerned about is we all recognize with that kind of increase and demand we are going to have to have energy from all sources. But I genuinely believe that this administration is adopting a policy to penalize fossil fuels. That is my belief just from the action being taken at EPA, particularly when you consider how clean our air already is compared to the rest of the world. It looks like we are adopting a policy to penalize fossil fuel. And I am concerned about that because of the increased cost of producing electricity and for us to remain competitive in a global marketplace as we try to seek jobs and to grow our economy.

Ms. Hutzler, we have heard a lot about China's moving forward, making great strides in wind power and solar power; but even so, my understanding is that the U.S. over the last few years has actually produced more wind power and solar power than China, particularly if it is connected to the grid. Would you agree with that?

Ms. HUTZLER. Yes, certainly in terms of grid-connected capacity, we have.

Mr. WHITFIELD. With all the wind power that they are building, how much of it—it is my understanding like 30 percent of it is not connected to the grid.

Ms. HUTZLER. That is my understanding also.

Ms. SELIGSOHN. Can I clarify that?

Mr. WHITFIELD. Sure.

Ms. SELIGSOHN. Basically China doubles its wind capacity every year, and so it is always running behind in connecting it to the grid. So they were 6 months behind a couple of years ago, they are now about 4 months behind, so they are catching up. It gets connected to the grid; it just runs late.

Mr. WHITFIELD. OK. Now, the thing that really disturbs me about their development of wind power, and I may be wrong on this, but it is my understanding that under the Kyoto Protocol there was a clean development mechanism established so that countries from around the world, like the U.S. and other countries, their taxpayers would pay into this fund and that other countries would be able to utilize that fund to develop wind power, solar power, that would not be built without that fund. And so China,

who has one of the strongest economic engines out there in the world, is taking taxpayer dollars from Americans to build wind power and solar power in China through this fund. Is that correct, Ms. Hutzler, or not?

Ms. HUTZLER. Yes. My understanding is that is the way China started their wind program.

Mr. WHITFIELD. So U.S. taxpayers are subsidizing China's development in wind that many people in this country are applauding China for doing; is that correct?

Ms. HUTZLER. That is correct in terms of them getting off the shelf in terms of building wind power, yes. But my understanding, the U.N. has recognized that they were lowering their subsidies and that was why they were qualifying for the program. And that has stopped at this point.

Mr. WHITFIELD. And then I read an article, I guess just in the last few days, that the World Bank is going to limit funding for coal-fired power stations. And it says primarily bowing to pressure from green campaigners to radically revise its rules, that the World Bank is planning to restrict money for coal-fired power stations. Now I would like for somebody to explain, How are we going to meet our electricity demands worldwide if we are going to stop funding coal-fired plants?

Mr. PALMER. Mr. Chairman, if I might. I think the World Bank ought to careful what it asks for, because there is a bank called the Asian Development Bank. And like everything else in Asia, the growth of welfare at the World Bank over time will become irrelevant if it gets out of the business of funding developing-nation fossil projects, because there will be Asian banks that will absolutely do that. It is absolutely in our interest, the World Bank's interest, to continue as a World Bank, to be funding these projects. The projects will absolutely go ahead because the demand is there, and the resources are there, and these international entities that have been created in Asia, through ASEAN and other entities will supplant the United States and the OECD countries in terms of world leadership with the developing world, no question.

Mr. WHITFIELD. Well thank you, Mr. Palmer. My time has expired. I recognize the gentleman from Illinois for 5 minutes.

Mr. RUSH. Ms. Seligsohn, your facial expression really indicated that you wanted to answer the question that the chairman asked Ms. Hutzler and you didn't have an opportunity. Would you like to expound upon that?

Ms. SELIGSOHN. Yes. The United States is not a party to the Kyoto Protocol and the clean development mechanism is under the Kyoto Protocol so no U.S. money goes through the clean development mechanism. The money basically comes from private investors in Kyoto party nations, like in Europe, who choose to get some of their emissions credits through the clean development mechanism by investing in countries like China or India, or African countries, or developing countries around the world.

The other thing I wanted to clarify, the World Bank isn't really needed for investing in coal-fired power plants in China. There is plenty of commercial money for investing in new power plants in countries like China. Both the World Bank and the Asian Development Bank are quite interested in working with the Chinese to in-

vest in carbon capture and storage technology, and those next-generation coal-fired power plants would enable the Chinese to produce low emissions or zero emissions coal-fired power plants.

So there is a lot of interest in that area among the international banks. But the idea of those banks is to promote the kinds of things that private sector banks don't promote already.

Mr. RUSH. I understand that you live in China or have lived in China for a number of years.

Ms. SELIGSOHN. I have lived in China for 17 of the last 27 years.

Mr. RUSH. And in your prepared remarks, you made an observation that the international partnerships with Chinese clean technology companies are growing rapidly. And you go on to say that what makes China so attractive to U.S. international investors is a clear policy framework that gives businesses the certainty that they are looking for before investing.

Can you expound on this observation and talk about how the political climate in China, where policymakers are actually engaging in short- and long-term comprehensive policy decisions, making investments more enticing than the environment that we have here in the U.S. With the lack of congressional leadership? Does the certainty that stems from a clear policy framework make it easier to attract foreign investment or domestic investment, or both, for clean energy technologies in China?

Ms. SELIGSOHN. Yes, sir. I think one thing that all of us would agree on is that building a new power plant or a refinery or any other kind of energy infrastructure takes a number of years. And so the Chinese have a 5-year planning process that sets out clear goals for the next 5 years in terms of percentages of different fuel sources and what kinds of new policies they might be introducing, everything from energy service companies to new energy efficiency guidelines. They also have medium- and long-term goals; they have a medium- and long-term research and science plan, they have energy plans. They also have a renewable energy law that provides clear guidelines as well as targets.

So the net result of all of this is that, yes, companies both domestic and foreign know what the policy picture is, know which kinds of energy projects are going to be supported over a number of years.

Of course, there is also a certain amount of change from year to year. One of the changes that has happened is, for example, in the wind area; wind has grown much more quickly than policymakers imagined, even 4 or 5 years ago, and so they have actually increased the goals a number of times. But there are a number of supported policies and they tend to stay for a number of years; whereas, you know, in the United States, new energy developers have worried about tax breaks coming and going and that kind of thing. It is worth noting that in the United States 70 percent of all energy subsidies are to fossil fuels.

Mr. RUSH. Your 5-year framework over the years—on the 5-year plan to reduce energy intensity stuff for dioxide and chemical oxygen demand, or COD. Can you tell the subcommittee if the Chinese have been successful in meeting these goals set forth in their reduction plans? Have they fallen short, met their expectations, or

exceeded their expectations? And how have the Chinese been so successful if they met this goal and how have they met these goals?

Ms. SELIGSOHN. The Chinese almost met the goal for energy intensity. They got 19.1 percent and the goal was 20 percent. This is a good sign that they were so clear about being just shy of the goal rather than trying to sort of meet it. They actually exceeded the sulfur dioxide and the COD goals in the last 5-year plan. The 10 percent goals were exceeded by both. And that was an extraordinary victory for the Ministry for Environmental Protection, which is China's newest Ministry. It only reached Ministry status in 2007.

In earlier years they have had much more trouble enforcing their environmental targets. And this really reflects a change in Chinese society and in Chinese government, in just the last 5 years, in focusing much more closely on these types of environmental goals.

Mr. WHITFIELD. Mr. Terry, you are recognized for 5 minutes.

Mr. TERRY. Thank you, Mr. Chairman. First of all, I want to say that I am impressed with China's measures. I am impressed with the amount of electrical generation that they have been able to bring on rather quickly. Since pollution is a global issue, I am pleased that they are taking measures to reduce it. I just want to make sure, as we discuss and we put China up on a pedestal, that we are looking or comparing apples to apples here. And so—forgive me, Ms. Seligsohn, did I say that right?

Ms. SELIGSOHN. Seligsohn.

Mr. BILBRAY. Deborah.

Mr. TERRY. Yes. When we talk about China meeting their goals for NO_x and SO_x and all of the particulates that we have already in our Clean Air Act, I don't want you to itemize, but would you supply to this committee a side-by-side of what China's particulate regulations are to the United States', because I want to see how they compare?

Ms. SELIGSOHN. We would have to get that to you.

Mr. TERRY. I would appreciate that, because that will help us really look—

Ms. SELIGSOHN. It is worth noting that NO_x, for example, only comes in as a goal in this next 5 year—

Mr. TERRY. Well, out of all the particulates, particularly from electrical generation.

Ms. SELIGSOHN. Well, my point is it is a work in progress. There definitely—

Mr. TERRY. And my point is we are not dealing with apples to apples, and I would like to know. Because I think it is unfair to have this discussion in generalities instead of specifics.

The other question is, I am impressed with China's portfolio. In fact, that is part of the battles that we have had on this committee with past. I am embarrassed that we don't have a long-term energy policy, but then we haven't been able to use hydro, and China has a 22 gigawatt Yangtze River. That is impressive. But we can't do that in the United States because of environmental policies. We want to do coal and clean coal technologies, but any use of coal or mention of coal, my gosh, shall you would think that you were pilaging. And so we can't use coal or even clean coal technology.

So, Deb, once again, you had mentioned in a very positive way that coal, gassification, capture, sequestration, zero emission, coal-

fired plants that China is building, I want to do that, too. But we can't seem to get it off the ground here. The Obama administration, this administration, there has been a NexGen sitting on the books for years, but Bush didn't go forward with it because of environmental, and now our current President isn't going forward with it. So what is China doing that we can't do here?

And then—well, let's go with that question, real quick. How can they build it so quickly over there and we can't even get a pilot project off of the ground?

Ms. SELIGSOHN. There definitely is more of a policy consensus in China on the importance of developing new coal technologies for their portfolio. I think there are arguments on both sides here in the United States. There are people who really believe that it is going to be part of it, and there are people who recognize the enormous renewable resources we have. We do have more renewable resources than China does in terms of availability of wind and solar.

Mr. TERRY. In regard to building plants, how does China compare with environmental impact studies, permitting processes?

Ms. SELIGSOHN. They are more streamlined. I mean, China has an EIA process, it has a permitting process, but it is definitely more rapid.

Mr. TERRY. Do they also have a right of citizen lawsuit? For example, when a wind project is designed in the sand hills of Nebraska or a pipeline and then citizens sue and stop the project—does China have that right?

Mr. PALMER. They do not.

Mr. TERRY. Well, I am not asking you.

Ms. SELIGSOHN. There are citizen suit rights. I can't give you more—

Mr. TERRY. The answer is no. Does China have citizen suits?

Ms. SELIGSOHN. They have citizen suits for certain kinds of things like pollution, and I would have to get back to you with a specific range.

Mr. TERRY. Can they stop a project? Because that is part of our problem with even wind and solar projects. The environmental groups sue them.

Ms. SELIGSOHN. I don't know whether it is legally conceivable. I do know that it is unusual for it to happen.

Mr. TERRY. I appreciate that.

Does somebody else want the last 13 seconds?

Mr. PALMER. I would just like to say on that, the process goes through the NEA, the National Energy Administration, and the NDRC, the National Development Resource Commission; and it as an application grant project. There is very—I have seen—Peabody is active in China in a major way. I have seen no evidence of citizen activity in this process at all.

Mr. TERRY. Mr. Kopits, my time is up, but maybe—

Mr. WHITFIELD. Mr. Waxman is recognized for 5 minutes.

Mr. WAXMAN. Ms. Hutzler, you heard Ms. Seligsohn's answer, which was contradictory to yours, about this bank funding Chinese activities and whether U.S. taxpayers are contributing to it. She said that we are not because we never ratified the Kyoto Protocol. Do you agree with her?

Ms. HUTZLER. Yes, I do agree with what she said. But it is true that developed nations get credits for the clean development program, and that is how China started with their wind program.

Mr. WAXMAN. But the United States is not one of those developed nations.

Ms. HUTZLER. That is correct.

Mr. WAXMAN. OK. So your answer to the chairman was not correct. Because his question was, are American taxpayers subsidizing these activities in China; and the answer should have been no. Isn't that right?

Ms. HUTZLER. Yes.

Mr. WAXMAN. The chairman said something that the government has policies that penalize coal. What policies does the U.S. government have that penalizes coal?

Mr. Palmer.

Mr. PALMER. There is a great controversy right now, Congressman, over the Environmental Protection Agency's proposed rules for particulate emissions from coal plants and also greenhouse gas emissions.

Mr. WAXMAN. Do you think those were set in place to penalize coal or to protect the public health from particulates which can be a danger, to—

Mr. PALMER. Mike Morris, who is the chairman of AEP, analogized it this way. He said, if you took the Convention Center in Washington, D.C., and filled it with ping pong balls, what EPA is trying to do is take out one ping pong ball, and we have—

Mr. WAXMAN. In other words—

Mr. PALMER. I am not finished, Congressman.

Mr. WAXMAN. Yes, but I want to ask you this.

Mr. PALMER. I am going to finish my answer.

Mr. WAXMAN. No, it is my time, and you will answer my questions.

Mr. PALMER. OK.

Mr. WAXMAN. And my question is this: Is the EPA not going against other sources of particulate matter and only going after one? I gather the ping pong they are going after is the coal ping pong; is that a fair statement?

Mr. PALMER. The study that I have seen in connection with the coal plants would result in a 15 to 20 percent increase in electricity rates in the heartland of the United States, damaging manufacturing, lost employment, and hurting people in their—

Mr. WAXMAN. Is there another way we can reduce the particulate matter? Or should we ignore the harm it does to public health?

Mr. PALMER. Well, first of all, Congressman, the issue of harm to public health is contradicted by recent figures that came out last week that show more people living better, living longer in the United States, even as coal use, coal consumption has—

Mr. WAXMAN. You are really not an expert on public health. You are a representative of the coal industry. I would submit to you and to anybody watching this that the U.S. EPA has an obligation to deal with particulate matters which get into the lungs and can cause disease, whatever the source may be. So I don't think it is particularly singling out the coal industry when the EPA says that

they want some technology that is already available, the best control technology to be used.

But it is interesting, I haven't heard in these discussions the idea that China is not doing anything. That is what we usually hear: China is not doing anything, so why should we?

Ms. Seligsohn, you testified China has a 5-year plan that actually calls for a number of significant actions to address carbon emissions. If this plan is implemented, will China be on track to meet its commitments under the Copenhagen Accord?

Ms. SELIGSOHN. Yes. Actually, it will be ahead of the curve. It will be more than two-thirds of the way to the commitments made for 2020.

Mr. WAXMAN. Now, why should we believe them? Have they met their targets they set in their previous 5-year plan?

Ms. SELIGSOHN. They came quite close on some, and they exceeded on others.

Mr. WAXMAN. Some of their energy policies appear to be quite aggressive. Is it true that China has shut down over 70,000 megawatts of old, inefficient coal plants during the last 5 years and replaced those plants with newer, more efficient coal plants?

Ms. SELIGSOHN. Yes.

Mr. WAXMAN. And now China is planning pilot programs involving cap-and-trade and carbon taxes?

Ms. SELIGSOHN. They are actively talking about it, and both were listed in the party's documents about the 5-year plan, so it seems likely that we will see them in the next 5 years.

Mr. WAXMAN. Now, is China uninterested in jobs and economic growth? Is it safe to conclude that they would be adopting all of these climate and energy policies if they were killing jobs and slowing China's economic growth?

Ms. SELIGSOHN. I think it is safe to say that they don't think so, that the wealthiest areas of China are the areas that face the highest energy prices, not the lowest energy prices, and that they think that transforming to a much higher value-added society and not depending on heavy, dirty industry is part of their future.

Mr. WAXMAN. I want to add my voice to all the members of the panel. I think we are going to continue to use coal for the foreseeable future. We shouldn't use coal—if we can get it to pollute less, if we can get cleaner coal, that would be great for this country and for the world. And we shouldn't put all of our baskets in coal. Because if we can develop alternatives in supplementing energy from coal, we have a chance to reduce some of these carbon emissions.

I yield back my time.

Mr. WHITFIELD. Mr. Bilbray, you are recognized for 5 minutes.

Mr. BILBRAY. Thank you very much.

Deborah, you wanted to answer a question to this guy; and he cut you off. The issue about—were you trying to say, when we were talking about the citizen litigation against that, it hasn't happened, but it could theoretically in the future?

Ms. SELIGSOHN. I need to actually go check with an environmental lawyer. There are areas where there is actually limited citizen litigation. It is a very different system than ours and so—but it isn't simply the NDRC and the NEA. There is permitting from the Lands Ministry, the Environmental Protection Ministry—

Mr. BILBRAY. Right. The big issue, though, is the private action of where people actually can make money by litigating.

Ms. SELIGSOHN. There have been a number of dams blocked by citizen protests and then, you know, Premier Wen Jiabao has actually—

Mr. BILBRAY. But what I am saying was that protest was actually grass roots, but it was not somebody suing and basically taking an action and then actually being able to make a living off of these—you don't have lawyers making—you know, you don't have large corporate firms that specialize in blocking these projects. Is that fair to say?

Ms. SELIGSOHN. It is fair to say the Chinese legal profession is—

Mr. BILBRAY. OK. I am very impressed with the 5-year-plan concept. I will just tell you for a fact you could not do—you know, I have done methane recovery systems on landfills. You can't even get the environmental impact reports done in this country in 5 years. So it is really exciting to hear about a country that actually can have implementation plans in 5 years. And how long does it take to hook to the grid or to get the lines from the grid over to these wind generators?

Ms. SELIGSOHN. Well, they generally run about 4 months behind. So they may be completed, and it may take another 4 months to connect. They had a problem with connections in remote rural areas, and they put in an additional fund last year to build more rural lines.

Mr. BILBRAY. And how long would they take from the time that somebody asked for it to the time that it—or the time that somebody decides in government to build it and it actually ends up hooking up?

Ms. SELIGSOHN. Well, it is pretty quick.

Mr. BILBRAY. How fast?

Ms. SELIGSOHN. I would have to check to get you a number. What I can say is the average grid connection is 4 months after completion of the project.

Mr. BILBRAY. OK. I appreciate that.

I mean, San Diego County, with 3 million people have been trying for 20 years to get another grid connection so that we could hook up to the outlying areas. We are trying to hook up to solar now out in the deserts. The trouble is getting the permit. So I think we are really on a big issue.

The fact is, China does not have the gauntlet that we have in this where—the huge gap between the concept of implementation and the completion—or just getting the permit. You know, there is a totally different world here that we need to talk about.

Let me just say this. Would you agree that if we are going to be as aggressive with this broad portfolio as China, those of us in government have to take a look at how we are managing our procedures to be able to make that possible in a timely manner?

Ms. SELIGSOHN. Yes, but there a number of other countries like Germany, Denmark that we can look at for ideas. It is not that China, with all of its other governance problems, is going to be the model for how to address all of these issues.

Mr. BILBRAY. But then again, Germany doesn't have nuke, but it buys its energy from the nuclear power plants in France, right?

Ms. SELIGSOHN. I am not actually sure about that. But I am just saying there are number of European countries, including France, that deal with these questions within a democratic—

Mr. BILBRAY. I know. And including France has proven that we can recycle and do a lot of other things. But China is the one we are really focusing on here. And that is where I just wanted to point out that we have some major, major differences between the regulatory structure in the United States and the regulatory structure in China. That is fair to say?

Ms. SELIGSOHN. That is absolutely fair to say.

Mr. BILBRAY. Do you think that their streamlined regulatory structure has been a major contributor to their ability to be so aggressive at developing a broad spectrum of energy technologies?

Ms. SELIGSOHN. I think it has been one way. But if you look at the gains in wind in other countries, there are ways to do it with more protections.

Mr. BILBRAY. But what I am saying is you are talking one over here, one over here. We keep talking about that broad portfolio where you don't just pick one technology, you draw on it all. And that seems to go into—

Mr. PALMER, do you know if we have any nuclear—I mean, any coal plants left in California?

Mr. PALMER. California buys coal. I think there may be a couple of very small units, but coal-based electricity operating. But I just think you are so right—correct in terms of identifying the regulatory morass in the United States in getting something built. Certainly you can't do it California.

Mr. BILBRAY. I think Richmond was our last coal-fired plant. In all fairness, I think you go to jail if you burn coal in California.

Mr. PALMER. Well, you have to meet a natural gas standard, which is to say you have to have carbon capture and storage. And that is—

Mr. BILBRAY. I really look forward to that. I mean, I will tell you, with our State we actually developed the technology and the genetic research that allowed us to develop alternative fuels like algae. But our scientists at Scripps Institution of Oceanography and the University of California San Diego had to leave the State to go into production. Because you couldn't get a permit, not in 5 years, you couldn't get a permit in California in 10 years. OK? So, believe me, California, we understand the challenge. So thank you very much.

Mr. PALMER. Let me just make one point, and that is China may not be a model. I know what isn't a model. The State of California is no model.

Mr. WHITFIELD. Mr. Green, you are recognized for 5 minutes.

Mr. GREEN. Thank you, Mr. Chairman.

Let me take a different line of questioning, I guess, because I am amazed that we are talking about how great China is in trying to compare it to our system. Do they have trial by jury in China?

Ms. SELIGSOHN. No.

Mr. GREEN. Freedom of speech?

Ms. SELIGSOHN. No.

Mr. GREEN. You know, freedom is expensive. And we may not have the lawsuit—they may not have the lawsuits we have, but at least we go to court instead of having to protest down at the local dam and threatening to overthrow or kill the local province officials for building that dam.

Is that what typically happens? Is that the way the Chinese can protest a particular plant being built, or the expropriation of their land they have lived on for generations, actually owned by the government? Is that how it works?

Ms. SELIGSOHN. Well, their protests—they don't usually involve threatening to kill anybody.

Mr. GREEN. Well, I have heard other things. But that is their avenue to get the attention of their government. They can't go to the courthouse and sue their government.

Ms. SELIGSOHN. As I said, there are areas where they can, and there are certain—there has actually been some quite successful environmental lawsuits. There is also a growing effort to use public hearings in China. There is also a system of petitions. But it is a work in progress, and the Chinese would be the first to say that they are trying to improve their governance in this area; it is not that they have a perfect system.

Mr. GREEN. Well, and I am not—but, obviously, we don't have a perfect system. But I think if you have a command economy, you lose a lot of freedoms that I think both sides of the aisle we would enjoy and we enjoy in our country. So I think comparing how Chinese make a decision, that may work in China, but it really doesn't work with the history we have in our country since 1776. And so I think holding us up to—they are a command economy. If the leadership in China is sold on a certain idea, that is what they do. Is that correct?

Ms. SELIGSOHN. It is more complicated than that, because it is—there are lots of different interests, and the companies are separate from government, and there is a lot of negotiation that goes on.

Mr. GREEN. Well, I know some of the companies are not separate from government.

Ms. SELIGSOHN. State-owned enterprises are separate from government ministries, and they do rival with each other quite a lot, actually.

Mr. GREEN. Well, I guess it is—you know, a free enterprise economy, which is truly free enterprise and not controlled free enterprise, and I guess that is what bothers me.

Ms. Hutzler, this chart that you put up from the Energy Administration Institute—or Administration—and I was a business major and went to law school, so I have to admit numbers sometimes get in the way. But I don't see how in 2007 they produced a little over 3,000 billion kilowatt hours; in 2035, they plan to over triple their kilowatt hours with reducing their coal by only 6 percent and going from 2 to 6 percent nuclear. They are actually going to reduce their natural gas, reduce their coal, reduce their hydro, go from zero to four in wind power and zero to three in biomass.

It seems like the expansion is actually in things that we know we want. We want wind, we want solar, we want biomass. But I wish I could tell you we are ever going to be able to turn on the lights in this room with wind, solar, and biomass.

So I don't know. I am going to find out where these numbers come from, because I think some of them are questionable because it just doesn't seem like it adds up, that they can over triple their kilowatt hours by reducing from the traditional sources, whether it is coal or natural gas, and even only tripling their nuclear power. Because now they only have 2 percent nuclear power, and they are going to 6 percent.

Do you know how much nuclear power our country produces, and we haven't built a plant since the '80s? I think we only produce about—what—20 percent, 22 percent?

Mr. PALMER. That is about right, 20 percent.

Mr. GREEN. So, even at 22 percent, we are way far ahead of where China is right now in nuclear power.

Ms. HUTZLER. That is right.

Mr. GREEN. I know China, they have some natural gas from around the Xi-an area, because I was there a number of years ago. But they were pretty inefficient. I don't know if they have discovered additional natural gas domestically. I know they are buying a lot. In fact, they are bidding up the price around the world.

I also know they are buying coal. Can China produce enough domestic coal to generate their electricity?

Mr. PALMER. No. They are now a major coal importer, and that is new. There was a time of about 7 or 8 years ago when the fear in the seaborne market what that China exports would swamp. But they are very opportunistic.

Mr. GREEN. I am almost out of time. Let me ask something. Those plants that China is building that are new coal plants—we know we build coal plants today much cleaner and better than we did 30 years ago. What are they doing? Are we just not replacing our coal plants?

Ms. HUTZLER. Yes, that is correct. They are building supercritical plants at a very fast pace, but we are building coal plants at a very slow pace, if at all. We have built more in 2010 than since 1985. But then it is only about 6 gigawatts. They build 10 times as much as what we do in a year.

Mr. GREEN. Mr. Chairman, I will close by saying I guess if the President and his Cabinet can decide they are going to build a coal plant in my area and not have to go through any of the local regulations or anything like that, and even take the land that I own to do it, which sometimes you can—but, again, they are a very command economy, as compared to a free enterprise and freedom economy that we are accustomed to.

Thank you, Mr. Chairman.

Mr. WHITFIELD. Mr. McKinley, you are recognized for 5 minutes.

Mr. MCKINLEY. Thank you, Mr. Chairman.

Ms. Hutzler, just a couple of quick questions. Can you compare the average wages for a Chinese worker and an American miner?

Ms. HUTZLER. They are vastly different. The Chinese work for a mere fraction of what they cost.

Mr. MCKINLEY. Both in the mining and energy production and China would be—I am told as much as a factor of 10 to 15 times.

Ms. HUTZLER. I would believe so.

Mr. MCKINLEY. Do you have a sense of how many families are dependent, either directly or indirectly, on coal production in America?

Ms. HUTZLER. No, I don't have that number, but I can get it for you.

Mr. MCKINLEY. Have you seen that report that was produced, apparently by the EPA, that said that if all the greenhouse gases were fully implemented under the Clean Air Act that the global temperature would only drop less than a tenth of one degree?

Ms. HUTZLER. Yes.

Mr. MCKINLEY. So, from your viewpoint, is it worth all the expenditure and the distraction from our manufacturing and our base to spend that kind of money for a tenth of—less than a tenth of a degree?

Ms. HUTZLER. From my viewpoint, no, it is not.

Mr. MCKINLEY. Thank you.

Maybe the question was asked, but if I could try again. I didn't hear all the questions. Do you have a record or has someone published anything about the number of coal-fired—these super-critical facilities in China say over the last 5 years? Do we have a sense? I have heard as much as one a week. I have heard four a month or two a month. Is there a reliable source of information on that?

Ms. HUTZLER. The source I use is the National Energy Technology Laboratory, and they are saying it is probably about one gigawatt a week, which would be one or two plants, one if it is a gigawatt and two if it is 500 megawatts.

Mr. MCKINLEY. And who provided that?

Ms. HUTZLER. The National Energy Technology Laboratory.

Mr. MCKINLEY. Thank you for bringing that subject up. You are aware that the President's budget slashes their research by over \$800 million on coal technology.

Ms. HUTZLER. No, I wasn't.

Mr. MCKINLEY. For someone that we want to out-innovate, outproduce, we are going to slash the very thing that could create cheap—

I am just curious—in a little bit of time, it just seems to me kind of self-evident with the Chinese energy production they have little environmental constraints on their water discharge, their greenhouse gases, their particulate matter, their fly ash, their wages are a fraction, like you just pointed out. Their health care is poor. Their retirement pension plans almost nonexistent, other than government-run. Their monetary system is being subsidized. Why do you think we keep using China as the poster child for energy?

Ms. HUTZLER. Well, probably because people would like to look at them as leading the clean energy race. But, as I tried to point out, they are leading the race in all fuels, and they are doing that to make a better life for their citizens and to keep their economy growing at the fast pace that it is growing now.

Mr. MCKINLEY. At the detriment of their people.

Ms. HUTZLER. No, I think you need all fuels for—

Mr. MCKINLEY. Really?

Ms. HUTZLER. Certainly.

Mr. MCKINLEY. Can you share with us—because one of the issues we are facing here in America, obviously, is the issue of fly

ash, that the EPA has a knee-jerk reaction to a dam collapsing in Tennessee and they want to make it a hazardous—treat it as a hazardous material. How does China treat its fly ash?

Ms. HUTZLER. I am not an expert on that. Maybe Mr. Palmer might know.

Mr. MCKINLEY. You spent 17 of your last 27 years—what are they doing with fly ash in China?

Ms. SELIGSOHN. I don't know. I would have to check. I can get back to you.

Mr. MCKINLEY. OK. And if the production of power—if we don't have the ability to recycle fly ash, what do you think would happen to the price of power in America?

Ms. HUTZLER. It would increase dramatically.

Mr. MCKINLEY. Thank you.

I yield back my time.

Mr. WHITFIELD. Does the gentleman from Massachusetts seek recognition?

The gentleman is recognized for 5 minutes.

Mr. MARKEY. Thank you, Mr. Chairman, very much.

So, Ms. Hutzler, we are really making tremendous gains in wind power in the United States, huh? Twenty-seven thousand new megawatts were installed in the last 4 years? And that is quite a number. Do you expect to see that growing dramatically in the years ahead?

Ms. HUTZLER. Yes. The Energy Information Administration sees about half of the increase in capacity in renewable technologies to come from wind.

Mr. MARKEY. So what do you think by 2020 we could have? If it is 27,000 in the last 4 years, what do you think we can see by 2020 in installed wind capacity?

Ms. HUTZLER. I don't think they are projecting that, even though the increase is large, that will get more than 50 or 60 gigawatts.

Mr. MARKEY. Additional gigawatts?

Ms. HUTZLER. No, that is total. There is only about 20 gigawatts extra.

Mr. MARKEY. Only 20? So you are saying we have already passed the peak in terms of new wind installation?

Ms. HUTZLER. Probably.

Mr. MARKEY. Well, I think you are 100 percent wrong on that.

And how about in solar? How do you see solar going? There were 1,000 new megawatts this year. The solar industry says it should be 1,500 this year. Last year, it was 1,000 new megawatts; 1,500 new megawatts this year will be installed; and they are predicting 2,000 megawatts next year. Do you see that slowing down, too, after next year?

Ms. HUTZLER. No. Actually, solar, they have increasing more, but that is because we have very little today. We only have about one gigawatt today.

Mr. MARKEY. Well, do you think we can have—well, there was one gigawatt installed in 2010, so we have more than that.

Ms. HUTZLER. One point three, something like that.

Mr. MARKEY. So what do you see by 2020, the installation for solar?

Ms. HUTZLER. Maybe another 10 gigawatts.

Mr. MARKEY. Ten altogether?

Ms. HUTZLER. Yes.

Mr. MARKEY. So you are saying that last year's pace, 1,000, will just be the same pace, and it won't increase over the next 10 years?

Ms. HUTZLER. Well, I am saying it is going to increase but not at the same rate.

Mr. MARKEY. You only see 1,000 a year? Is that what you are saying?

Ms. HUTZLER. Actually, less.

Mr. MARKEY. You see less than 1,000.

Do you see the price of solar coming down over the next 10 years, with the global investment in China and other countries? Or do you see it staying the same?

Ms. HUTZLER. It will come down, but it is going to come down as a basis of what is being built. And even the Chinese feel that solar is more expensive than other technologies, and they are pushing the non-solar ones.

Mr. MARKEY. Actually, in the Bloomberg story here, China, the world's biggest energy consumer, will cut its 2020 target for nuclear power—this is a story from 2 days ago—nuclear power capacity and build more solar farms, following Japan's atomic crisis, said an official at the National Development and Reform Commission in Japan. It is going to cut its goal of 80,000 megawatts by 2020 and, instead, it is going to dramatically increase its goal of 20,000 megawatts of solar. It is going to dramatically increase its goal by 2020 in China.

So don't you think that the totality of all of the investment that is going to be made in China and Japan now and other countries is going to dramatically lower the price of solar and make it more competitive and not have it just be a grand total of 1,000 per year every year from now on but maybe 2,000 or 3,000? You don't think that is going to happen?

Ms. HUTZLER. It has a long way to go. It is about three times as much as other technologies and even more than that of natural gas.

Mr. MARKEY. I understand that. If the price is cut in half, do you see any increase above your 1,000 per year projection?

Ms. HUTZLER. There might be a slight increase, but it is going to be very difficult to get it down to that level.

Mr. MARKEY. You are a very pessimistic person, technologically. You know, it is like talking to maybe the owner of a typewriter company in 1990 seeing no threats from computers over the next 20 years so we are going to double our investment in typewriters because how can we ever have all people using computers only in 20 years because the price is just not competitive with Underwood typewriters so I am investing all my money in Underwood right now.

And you could go through other industries. But you can have these revolutions very quickly, as you know; and I just think that you are displaying an amazing amount of—let me say, you just don't believe in the market system.

Ms. HUTZLER. I most certainly do.

Mr. MARKEY. Oh, no, you don't.

Ms. HUTZLER. I do.

Mr. MARKEY. You are projecting today 10 years from now, even though there is a global investment that is being made in wind and solar that is going to drop the price and make it much more likely that there is going to be an investment, even as the market has been moving away from coal and moving towards renewables and natural gas. I mean, natural gas and wind have been the largest single additions to our grid in the last 4 years. You agree with that.

Ms. HUTZLER. Yes, I do.

Mr. MARKEY. But you see wind falling off and solar not contributing, and do you see coal increasing going forward?

Ms. HUTZLER. Yes, but very little.

Mr. MARKEY. Yes. But larger than wind and solar?

Ms. HUTZLER. No, about the same, I would say.

Mr. MARKEY. About the same. So you see wind kind of slowing down to the pace at which new coal is being installed in the country, and I kind of disagree with you on that. Just looking at the market forces over the last 4 or 5 years, I mean, the charts for wind and for solar and for natural gas are way up high and for coal and for nuclear is nonexistent, way down here. So the market has moved, Wall Street has moved, private investors have moved, and they have moved globally; and the more that there is a doubling of the installed capacity across the planet, the more you are going to see—

Mr. BILBRAY. [presiding.] The gentleman's time has expired, and the chair will remind the gentleman that we still are—as somebody who just made a purchase of solar panels myself, we are still using monocrystal, which is the same technology we have had for 30 years. The price is modified, and that is great, and the thin film has major—a lot more technical problems than what people talk about, and still monocrystal is still the cutting edge. And the same thing it was when we were in school and we started making those little kits. So, hopefully, we will see the balance where it is appropriate, where it is down.

Mr. MARKEY. Mr. Chairman, the price has dropped precipitously from the time when we were kids. When we were kids, the price was \$10 a kilowatt hour; and it is now down into the 20 to 25 cents. And that is all I am talking about. I am talking about the significant reduction in the price.

Mr. BILBRAY. I understand that. In San Diego, we have a major manufacturer of solar panels, owned by the Chinese, manufactured in the Chinese with their coal and then exported it and assembled in San Diego for the market that is basically being created by our government regs and subsidies.

So, hopefully, the gentleman from Colorado, Yuma, might be able to enlighten us, too, about how maybe we ought to change our laws so people get on solar rather than having power lines required by government to be brought way out into the boonies of the plains of Colorado.

I yield to the gentleman from Colorado at this time.

Mr. GARDNER. Thank you, Mr. Chairman; and, to the witnesses, thank you for your time and testimony today.

Just a couple of points. I was reading an article recently in the Denver Post. It cited an author of a publication called Power Hungry. Robert Bryce, the author, reminded the audience that Ameri-

cans get 140 time as much energy from coal, oil, and natural gas as they do from the clean energy sources such as wind and solar. Is that an accurate statement?

Ms. HUTZLER. Yes.

Mr. GARDNER. Do you see that changing dramatically in 20 years? Will it be 140? Will it be 100? Will it be 5?

Ms. HUTZLER. It will change but very little.

Mr. GARDNER. So in 20 years from now you are still saying that we will get be 140 times more energy from traditional sources than some of the new sources that have been talked about today?

Ms. HUTZLER. Yes.

Mr. GARDNER. Thank you.

And, Ms. Hutzler, just to continue with our conversation, what lessons can the United States learn from China's experience in constructing wind farms? And to further that a little bit, specific question, under what geographic and engineering conditions is wind generation appropriate and beneficial?

Ms. HUTZLER. Well, I certainly believe that we need all technologies. The trouble with wind is that you have better sites. There are good resources versus more difficult resources. And so, as you add on wind capacity, you eventually get to the point where it is going to cost you more because you have got sites that aren't as conducive in terms of constructing the wind units.

Mr. GARDNER. And do you see land use problems in the United States affecting our ability to access good wind sites?

Ms. HUTZLER. More than likely. I mean, certainly with solar we have people complaining about the massive land use issues there, so I imagine that will eventually happen with wind as well.

Mr. GARDNER. And does China have an equivalent of like a United States Department of Interior that prohibits the siting of certain wind opportunities or transmission lines?

Ms. HUTZLER. I am not an expert on China's government, so maybe Deborah could answer that question.

Mr. GARDNER. Thank you.

And just, Mr. Palmer, to turn to you, what do you see is the biggest impediments to the United States to building new energy technologies? Not new energy in the sometimes modern-day acceptance, but just energy technologies overall.

Mr. PALMER. Well, you asked me energy, Congressman. I apologize. I am a coal guy, so I am going to answer with coal.

The impediments to coal right now are really regulatory, and that is really EPA, and it is the new source review. It is the best available control technology. It is where are we going with greenhouse gas regulations? Is it legal, the lawsuits that are going on, the efforts going on in the Congress to change that regime? And the need to put in—

Our CEO, Greg Boyce, gave a talk last year to the World Energy Congress in Montreal and talked about the Peabody plan which is super-critical—ultra-super-critical—to replace the older units and to give us growth and to re-industrialize. And it is more efficient from a carbon standpoint, near-zero criteria pollutants, carbon capture ready as we develop CCS technologies and a regulatory regime and put the industrial heartland back to work, make the front range safe for coal again and your State, and we have been in-

volved in natural gas wars there. And nothing against natural gas or shale gas, but it is no carbon answer. And the problem is Washington, D.C. You live outside the Beltway, people understand the need for coal. You come—

Mr. GARDNER. Thank you.

And if I could just go down and get a yes-or-no answer from every single one of you. Do increasing energy prices pose a threat to our economy? Mr. Kopits.

Mr. KOPITS. Well, we haven't spoken about oil today. I am amazed we have been sitting here for, I don't know, about an hour and not nary a word on oil. And I was hoping Mr. Green from Texas would come up with an oil question.

Right now, from where we sit, the U.S. has fallen into recession every time crude oil consumption as a share of GDP has exceeded 4 percent. And that is about \$88. We are at \$119—

Mr. GARDNER. I hate to interrupt. We only have about 50 seconds. So do rising energy prices pose a threat?

Mr. KOPITS. The issue is that energy prices, particularly oil, are critical right now for the U.S. economy.

Mr. GARDNER. Mr. Palmer.

Mr. PALMER. I would agree.

Mr. GARDNER. Ms. Seligsohn.

Ms. SELIGSOHN. Without proper policies, it can be a problem, but there are ways to plan for that.

Mr. GARDNER. So the answer is, yes, rising energy prices pose a threat to our economy.

Ms. SELIGSOHN. Well, China has coal prices above the world average, and it is doing oK right now. So I think there are indications that—

Mr. GARDNER. If that increases, they will be fine then? Prices increase?

So, no, you do not believe that increased energy prices—

Ms. SELIGSOHN. It can be a threat.

Mr. GARDNER. Ms. Hutzler.

Ms. HUTZLER. I agree.

Mr. GARDNER. And I want to cite a recent study by the Beacon Hill Institute at Suffolk University in Boston concluded that by 2015 consumers in Colorado will be paying about \$1.4 billion in higher energy costs as a result of the renewable energy standard. Do we see energy costs increasing as a result of that kind of policy?

Mr. HUNTER. Yes.

Mr. PALMER. Absolutely. Skyrocketing.

Mr. GARDNER. Thank you.

Mr. BILBRAY. The gentleman's time has expired, and the chair would just say those of us in California really feel for your pain in Colorado.

At this time, I will yield to the gentleman from Kansas.

Mr. POMPEO. Thank you, Mr. Chairman.

I will be happy to talk about oil there in just a second, but first I want to just make a comment.

I heard Mr. Markey say to you, Ms. Hutzler, you are a pessimist because you didn't believe these things would happen. We have been investing taxpayer money in wind and solar since the Syn-fuels Corp. You can go back through the ages. And the typewriter

is still around. That is, the energies we have been using for a long time are still around, and everything that I see from everyone on this panel suggests they are going to be around for an awfully long time. So you are dually noted that your pessimism is appropriate, given the reality of the energy situation I think that the world faces.

Ms. Seligsohn, you said I think that 8 percent of the coal plants in China have been taken offline and replaced. Is that right? Is that the right number that I read from your testimony?

Ms. SELIGSOHN. Yes.

Mr. POMPEO. And that is not—a similar phenomena has not taken place in the United States?

Ms. SELIGSOHN. By government mandate. Yes.

Mr. POMPEO. And so what is it that has prevented us from doing that in the United States? What has stopped the United States from taking older coal plants off-line and putting new coal plants online?

Ms. SELIGSOHN. That is not the way our laws are written.

Mr. POMPEO. So it is a regulatory burden.

Ms. SELIGSOHN. Well, no. I mean, this would be an additional regulation if you did this. It is the opposite.

Mr. POMPEO. So you are suggesting mandate it. Today, we are doing just the opposite. We are penalizing companies that want to take off old power plants and want to put on newer, more efficient plants; is that correct?

Ms. SELIGSOHN. Right.

Mr. POMPEO. Let me give you an example. Mr. Palmer, maybe you can help me with this. Today, there is a plant in Kansas called the Holcomb plant. We have been trying to get Holcomb online in Kansas for a long time. Our former Governor, now creating havoc at Health and Human Services, stopped it. We are now starting to moving forward, and EPA has stuck their ugly hand in the cookie jar again. They are trying put on a newer, cleaner technology. Can you tell me what it is besides EPA that is stopping Holcomb from moving forward?

Mr. PALMER. First of all, in my past, before Peabody, I was coal supplier to Holcomb. I knew the guys that built the first unit and had a great relationship. I love Western Kansas, and I won't go into that. But it is near and dear to me.

Secondly, it is all about carbon, full stop. We have the super-critical, pulverized coal today. Your ultra-super-critical gives you near-zero criteria emission pollutants—SOX, NOx, and Mercury. There is no argument over that. It is state-of-the-art stuff.

It is more efficient on carbon. But it is a carbon agenda. It has been since it started. It is right now. It will continue. And that is what is holding up the next generation of generation in the United States of America of coal generation, is this fixation on emission, carbon emissions above everything else as the driving policy here, not in China, in the United States.

That is what is preventing Western Kansas from having an additional unit for Holcomb. And that electricity would go to the front range. And Tri-State, who is a part of my past as well, was going to build that transmission line; and they have been in the carbon wars on these plants since Governor Sebelius stepped into it. And

now she skipped town, and she is here. But it is a bad day for Western Kansas, and it is a bad day for the U.S. when carbon emissions govern our lives every day, and that is what is going on.

Mr. POMPEO. Let me just ask you a different question.

Is there anything equivalent to EPA's new Utility MACT Rules in China?

Ms. SELIGSOHN. Yes, there is review that—well, I mean, they do it independently. They close the old ones and then they have requirements on the new ones, including EIA—

Mr. POMPEO. So if, by chance, the Chinese were going to follow the rules and there were Utility MACT Rules, you say they would still be able to build these new plants?

The answer is no. They can't. I mean, Holcomb is going to be shut down by these new Utility MACT Rules. There are not going to be able to make it.

Ms. SELIGSOHN. The point is the Chinese just shut down when they feel it ought to be shut down.

Mr. POMPEO. Right. Precisely. Precisely. A government agency shutting it down. That is what is, unfortunately, not happening here. We are not allowing new technology to move forward, at least in Kansas.

I have been to the Chinese oil fields, most all of them, spent a significant amount of time there. Are there any regulations, whether they are local, provincial regulations, or national regulations on fracking in China?

Ms. SELIGSOHN. I don't believe they are yet. It is one of the things they are looking at, and they have a cooperative agreement with DOE that they signed during President Obama's visit to China 2 years ago.

Mr. POMPEO. Do you think there will be better compliance with those new fracking regulations than, say, with IP rules today?

Ms. SELIGSOHN. China's compliance in most areas of environmental governance has improved considerably in the last 5 years. As I say, their ministry is new. This is a new area, and the rate of increase is quite impressive. But how fracking will work, I think it would be a little too early to tell.

I would also note that the Chinese don't see climate change goals as in any way contradictory with all of their other energy and environmental goals. Climate change is the pillar in their 5-year plan.

Mr. POMPEO. Thank you, Ms. Seligsohn.

My time is up. I yield back the balance of my time.

Mr. BILBRAY. Thank you.

There are no speakers on this side, so I will yield to the gentleman from Virginia, the Commonwealth of Virginia.

Mr. GRIFFITH. Thank you, Mr. Chairman.

I was interested in Congressman Green's comments. I think he missed some of the sarcasm on this side when he thought we were holding China up as the example. I think the point was that so many of my colleagues were asking questions about China doesn't do this and China doesn't do that, and then they were being sarcastic when they said, well, don't you think it would be great if we did that?

Because I think that everybody understands that the Chinese have a completely different governmental system than we do. But

we are getting a little tired of having the administration, the current administration, and its allies come in here and say, well, China is great, and you ought to be like China. Because we are not going to move 22 million people out of their ancestral home areas in order to have a more efficient hydroelectric system, and we are not going to do some of the things that China has done. All we are asking for, I believe, speaking for myself, is that we have some reasonable regulations and not unreasonable regulations; and I don't believe the Chinese are anywhere near our regulatory scheme.

And, in that regard, Mr. Palmer, can you tell me, are the Chinese anywhere near our regulatory scheme when it comes to coal, since you are the coal guy?

Mr. PALMER. No, and I want to put in context my comments about China. Because I do go to China, and I have high admiration for what they have done there. I am not in here talking about political systems or ideology or any of that, but I see a society that believes in energy supply for people, to raise people up and out of poverty. And I think that is what we ought to do here.

In terms of the specific question on the regulatory regime, they have a—you know, they have decided, as a matter of national policy, they have an ability to do it directly. They have the money in the bank that they have amassed very shrewdly over a period of time. They are putting in state-of-the-art clean coal technology. That is what they are doing. And they are driving carbon capture and storage research and development and this GreenGen Project that we are in, and that is what they are doing.

From that standpoint, from the standpoint of getting our regulations right so we can use our own technology, we are state-of-the-art in terms of technology. We know how to do these things. That is our point, is that the value, the people value associated with low-cost, abundant, always available, reliable electricity, as opposed to high prices and scarcity, are values we ought to adopt. They have adopted. And we had it before, but, right now, in Washington, that is not popular to talk that way, period. Full stop. And we think that needs to change. That is why we come at it the way we do.

Mr. GRIFFITH. And if we continue down our regulatory scheme, you anticipate that we will have some scarcity or high prices?

Mr. PALMER. Absolutely. It is designed to do that. If you look at the ideology behind the environmental community and you go back 10 or 20 years, it is absolutely designed to do that.

Mr. PALMER. And when we do that, we not only drive businesses offshore, am I correct—

Mr. PALMER. Yes, you do.

Mr. GRIFFITH. —but we also raise the cost of the average citizen of the United States to have the power to heat and make sure that their homes are reasonably—

Mr. PALMER. And every metric says that low-cost electricity is a requirement for more people to live longer and live better; and if you take up the cost of energy, you drive down human health and welfare.

So EPA has it exactly wrong in terms of how they come at this. Not to argue with the values on emissions, but there is no attention paid to the underlying value of the activity that creates the emissions. In other words, what are we making with this fuel that

creates emissions and what are the benefits of that? They don't consider that, they don't look at it, and it is not relevant. And we are on a path to high prices in the United States. Absolutely, we are.

Mr. GRIFFITH. And would you agree with me that if you represented a district where the median household income was somewhere around \$35,000 a year, that on the trajectory we are on on energy costs that I am going to have some people that are going to be cold in the wintertime; isn't that correct?

Mr. PALMER. I would totally agree with you, and I would expect they will be pounding the table in the mornings when you are having coffee with them saying, go back to that city and tell them what is going on here.

Mr. GRIFFITH. And, in fact, we are already seeing it; isn't that correct? And are you aware that Appalachian Power has just asked the Commonwealth of Virginia for I think a 9.6 percent increase? I may be off a little bit.

Mr. PALMER. I wasn't aware of that, specifically. But, for sure, the capital investment associated with this, what I call—people call a train wreck. We have friends in the railroad industry don't like that. I call it a tsunami.

Mr. GRIFFITH. It is just a mess.

Mr. PALMER. It is a high-priced—

Mr. GRIFFITH. And the end result is you don't have to be an expert in health to understand that this is going to have a negative impact on the health of the citizens, particularly those who have less economic means than others.

Mr. PALMER. I would agree. It is common sense.

Mr. GRIFFITH. Thank you.

I yield back my 17 seconds.

Mr. BILBRAY. Thank you very much.

I appreciate the discussion especially about keeping seniors warm. As a Californian, it was always interesting that this town talks a lot about helping to keep the seniors get enough fuel so they can stay warm, but they don't talk about those of us in California that our seniors need enough gas to get to the shopping center to be able to buy food. But it is a different world all around this country.

Mr. Shimkus, you are recognized.

Mr. SHIMKUS. Thank you, Mr. Chairman. I appreciate the panel for being here today, and I am sorry about running back and forth, as we all do on fly-in day and then are pulled out for another meeting. Obviously, we would like to go in numerous directions but have limited time.

Does anyone know about the Judgment Fund? Can anyone tell me about the Judgment Fund?

Mr. Palmer.

Mr. PALMER. I know a little bit about it.

Mr. SHIMKUS. Can you briefly explain what the Judgment Fund is?

Mr. PALMER. I believe it is a path for NGOs typically—

Mr. SHIMKUS. An NGO is a—

Mr. PALMER. A nongovernment organization.

Mr. SHIMKUS. An example of that would be—

Mr. PALMER. Sierra Club or the NRDC or Friends of the Earth.

Mr. SHIMKUS. And what happens in this process?

Mr. PALMER. They sue the United States.

Mr. SHIMKUS. OK.

Mr. PALMER. On an environmental issue.

Mr. SHIMKUS. Right.

Mr. PALMER. Let's say an agency wants to settle that on the grounds that the environmental group is willing to settle it. They get their attorney fees that comes out of the Judgment Fund, is my understanding.

Mr. SHIMKUS. And who funds the Judgment Fund?

Mr. PALMER. The US of A, the Treasury. I think it is on automatic pilot. I think it is—

Mr. SHIMKUS. Let me get this right. So you are saying that an NGO, a nongovernment organization, can sue the national government; and then they can, after there is the legal process, then maybe the agency decides to settle it—

Mr. PALMER. Or the NGO wins the lawsuit.

Mr. SHIMKUS. Then the NGO can go to this Judgment Fund, which is funded by taxpayers—

Mr. PALMER. Correct.

Mr. SHIMKUS [continuing]. To pay their legal costs.

Mr. PALMER. Correct.

Mr. SHIMKUS. So that taxpayers are funding these lawsuits against the private sector.

Mr. PALMER. I wouldn't characterize. I will let you characterize it, Congressman.

Mr. SHIMKUS. I am just asking questions.

Mr. PALMER. For sure it is taxpayer money that is paying the legal fees for these lawsuits. No question.

Mr. SHIMKUS. Ms. Seligsohn, does China have anything like a Judgment Fund?

Ms. SELIGSOHN. No.

Mr. SHIMKUS. OK. Thank you.

Ms. HUTZLER, I kind of like this. We do—you know, we have been preaching all of the above. Energy strategies, I think you mentioned that in some of the question and answers that what China is doing is trying to have more energy across the board, whether it is renewable, whether it is nuclear, whether it is coal. And I think it is important to put into perspective that this is 2035. Ten thousand billion kilowatt hours, 74 percent still being produced by coal. But that 74 percent, even though it is 80 percent, has to be much more coal use; is that correct?

Ms. HUTZLER. Yes, exactly.

Mr. SHIMKUS. Do you have a percentage of the increase in electricity generation by coal for China in 2035?

Ms. HUTZLER. No, but I can get that for you.

Mr. SHIMKUS. But it is pretty massive.

Ms. HUTZLER. Yes.

Mr. SHIMKUS. And that is based upon the other question you had about a gigawatt, a coal-fired power plant every week, correct?

Ms. HUTZLER. Yes.

Mr. SHIMKUS. And those are the stats we have used here for the last couple of years. So I find those very, very similar.

The regulation was also discussed by my colleagues back and forth—and anyone who wants to answer this, if there is uncertainty of future regulation, what does that do to the capital markets to build new facilities? Anyone want to take a stab at that?

Mr. PALMER. I think in our space, Congressman, in the context of the utilities, you can talk to co-ops, you can talk to Amron in St. Louis, you can talk to AEP, you can talk to Southern Company, but they look at the framework, and they say, I have got to put in 3 or \$400 million on a 250 or a 300 or 400 megawatt power plant, and I have still got out here greenhouse gas emission potential and—

Mr. SHIMKUS. Sorry to cut you off, but I have limited time.

The Morning Energy reported that the national air quality standard for ozone, boiler MACT, toxic standards for power plants, coal ash rules, and climate regs, a final report should be due August 1, 2012. Does that discourage—

Mr. PALMER. It freezes everybody in their tracks.

Mr. SHIMKUS. It freezes people.

Mr. PALMER. Right. Freezes them. So the old units continue operating that are inefficient. No, you can't upgrade them, because you have got to go through—

Mr. SHIMKUS. Well, it is interesting, because we talked a lot about super-critical power plants; and we are working with one now that is state-of-the-art, high-tech, and they are being frozen because of the transport rule. New reg, new power plant, state-of-the-art, unsure whether they can start because of transportation.

Let me finish up. Mr. Kopits, because you have been pretty quiet since I have been up here. I was real interested in this, because it really kind of addresses this same issue about percentage increase. You project China's oil demand exceeding 50 million barrels per day in 2025, 2030?

Mr. KOPITS. That is correct.

Mr. SHIMKUS. And so how are they going to do that?

Mr. KOPITS. They are not. What you end up with is, in 2030, the range of forecasters put it at 105 million barrels a day that we can do. Chinese is about half of global demand growth. So if you take that, you just can't make the numbers work.

Mr. SHIMKUS. So that supertanker coming from somewhere, China is going to bid against us if we don't do energy security here in this country. They are going to buy up the world demand—I mean, the world supply, I should say.

Mr. KOPITS. They already have. Yes. OECD consumption since the beginning of the recession is down 5 million barrels, and non-OECD consumption is up six million barrels.

Mr. SHIMKUS. Great. Thank you.

Mr. WHITFIELD. [presiding.] Thank you, Mr. Shimkus.

Mr. Scalise, you are recognized for 5 minutes.

Mr. SCALISE. Thank you, Mr. Chairman. I appreciate you holding this hearing.

We have spent a lot of time today going through the various changes in China's energy needs and how they are planning to meet it. I know many of us on this side are strong proponents of an all-of-the-above energy strategy for the United States. I have been very disappointed by this administration's failure to embrace

that same kind of approach. In fact, frankly, I know more right now about, based on your testimony, about the things that China is planning over the next 20 or so years than I do about how this country is going to meet the energy needs, based on mixed messages we have gotten from the President, especially just over the last few weeks.

Of course, I represent an area, South Louisiana, where we are still reeling from the impact of the President's permatatorium, his refusal to let our people go back to work drilling safely in the Gulf of Mexico. Gas prices have nearly doubled since President Obama took the oath of office; and I think the fact that they are still holding so many vast reserves away from production in America—

You know, the President said last week he wants to reduce imports by a third, and yet the week before that he said he wants to drill in Brazil. And the weeks and weeks before that he refuses to let our people go back to work drilling safely. And these are companies that had nothing to do with the BP disaster, companies that were drilling and exploring for energy in a very safe way that are not going back to work. In fact, 12,000 jobs have been lost because of the President's refusal to let them go back to work drilling safely for domestic energy.

So, Mr. Kopits, if you can talk about what you see in terms of the impact of especially the President's actions here in America and specifically as it relates to the Gulf of Mexico with the refusal to have a real consistent policy that lets people go back to work who never had any safety issues and the jobs that we have lost from it and the energy security we have lost from it.

Mr. KOPITS. Yes. The EIA forecasts production in the Gulf of Mexico to drop 600,000 barrels a day from May, 2010—so that is immediately following Macondo—to May, 2012. That is 11 percent of U.S. crude production. So that is a very, very material number; and I would describe that drop as catastrophic.

Mr. SCALISE. The drop in exploration? What specifically would you characterize—

Mr. KOPITS. The drop in production.

So we anticipate—this is government numbers. EIA anticipates U.S. crude oil production in the Gulf of Mexico to drop about 600,000 barrels a day from the day after Macondo to May, 2012. That is 11 percent of U.S. crude oil production.

Mr. SCALISE. And I know, again, getting back to these mixed messages—

Mr. KOPITS. The supply is about \$30 billion. I think from memory it is about \$30 billion of economic activity, it is about \$8 billion in taxes, and I calculated about 65,000 man years.

Mr. SCALISE. Those are massive numbers. And, clearly, if the President wants to talk publicly about a strategy to reduce imports by a third, which, frankly, I think if we were actually utilizing an all-of-the-above strategy that I know our chairman, that many of us here would like to see us use, we could absolutely eliminate our dependence on Middle Eastern oil—and, of course, we have seen the volatility over there that is only increasing. But you don't get there by shutting off American resources and literally running these resources to other countries.

We have been tracking the deepwater rigs that have left America because of the President's policies. Two of those rigs went to Egypt. Egypt. And so you have got employers saying I would rather do business in Egypt than in the United States of America exploring for energy.

And so I will ask you, Ms. Hutzler. You had talked about—and I know you have done some studying on this. But when we talk about the—looking long range and production and the President is bragging today about how high production is. Of course, production today is really an accumulation of efforts and exploration over years and years, in many cases, long before the President came into office. If you look at the drop in production, we would see, especially because of his policies, have y'all looked at how those policies, the lack of clear clarity on issuing permits, how that affects our ability to produce in America to meet those growing demands?

Ms. HUTZLER. I don't have a forecast on that. But certainly I agree with Mr. Kopits that the Energy Information Administration has shown that offshore production in the Gulf of Mexico has gone down dramatically because we are not drilling there.

Mr. SCALISE. And, again, I reiterate, we have lost over 12,000 jobs. Another company just went bankrupt a few weeks ago. And with gas as high as it is, you would think—we know we have reserves—these companies would be out there working 24/7. And, in fact, because of the President's own policies, they can't even go back to work drilling safely.

And I will just reiterate, companies that had absolutely nothing to do with the BP horizon. These are companies who had great safety records who are shut down today because of this President's policies. And then, you know, he gives these mixed messages, but we don't see a clear policy. So I appreciate your comments and yours, as well, Mr. Kopits; and, hopefully, we can get an all-of-the-above energy strategy.

I yield back the balance of my time, Mr. Chairman.

Mr. WHITFIELD. Thank you, Mr. Scalise; and I want to thank the panel today. We appreciate your being here very much. Obviously, the policies in China as it relates to energy has a direct impact on what we are doing in America as well as the rest of the world, and your testimony has been quite helpful.

We will keep the record open for 10 days for any additional material.

And, with that, this concludes today's hearing. And we look forward to working with all of us as we move forward.

[Whereupon, at 5:04 p.m., the subcommittee was adjourned.]