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Snapshot of Chinese Energy Investment into the United States

By: Devin Kleinfield-Hayes

This country needs an all-out, all-of-the-above strategy that develops every available source of American energy—a strategy that's cleaner, cheaper, and full of new jobs.

-President Barack Obama State of the Union 2012

When speaking of using an “all-of-the-above strategy,” President Obama prioritized the development of both traditional hydrocarbon and alternative energy to help kick start economic growth. Like China, the United States' energy consumption exceeds current supply levels, and both countries are aggressively seeking solutions to their common energy challenges. Over the past seven years, the Chinese leadership has been pursuing an all-encompassing energy development agenda with massive infrastructure investments within China. More recently the country's drive for diversifying energy supply has become a prominent area for overseas investments.



Chinese companies, with strong support from China Export-Import Bank and the China Development Bank, have:

- Invested in natural gas infrastructure in Russia, Australia, as well as Central and Southeast Asia;
- Expanded extractive resource investments for oil in Canada, Africa and Latin America;
- Joined forces with Australian companies to access coal in Australia and Mongolia; and,
- Looked to the United States and Europe for expanding renewable energy markets and building oil and gas extraction technology partnerships.

The big U.S. oil and gas companies are still the primary investors in hydrocarbons throughout Latin America and Africa, but have seen their energy portfolio in the Middle East become somewhat marginalized by the emerging economies of China and India. According to the Energy Information Administration (EIA), the United States imports approximately 60 percent of its oil, and in an effort to reduce dependence on imports the U.S. government is putting increasing focus on developing its domestic oil and gas reserves, including shale gas. This priority has in turn opened the door for U.S. companies to attract Chinese investment for sorely needed capital.

Chinese energy investment in the United States has accelerated over the past five years, with Chinese companies investing heavily in traditional energy as well as in alternative energy. With similarly voracious appetites, the United States and China could strengthen economic and energy security by jointly developing renewable and natural gas technology, as well as exploring other promising clean energy technologies. It was this goal of ensuring mutual energy independence over the long term that spurred the seven bilateral clean energy agreements in 2009, yet both sides could do more to improve collaboration. While the ongoing trends of investments are promising, if Chinese investment is stymied by antagonistic American policy or by insecure

U.S. business partners, such investments may come to a screeching halt.

This snapshot looks into the investments made by Chinese companies that aim to expand energy supply and improve their access to new technologies to tap unconventional energy sources domestically. These investments by China's national oil companies seeking foreign technology and expertise abroad aim to help meet aggressive clean energy targets set by the central government in the coming decade. Clean energy, in the form of wind, thermal, solar, hydroelectric and nuclear—which is mandated to represent 15 percent of Chinese primary energy consumption by 2020—will need to continue to expand capacity and technology to lower its costs and ensure its broad adoption. The burgeoning imports of traditional hydrocarbons in the form of oil, gas and coal, which often go through water-intensive treatment prior to reaching China, will also grow enormously. Such virtual water imports will likely become increasingly important as China faces growing water choke points in accessing domestic coal resources. Chinese companies have been pursuing a joint venture or merger and acquisitions (M&As) strategy in the U.S. shale gas sector with the aim to acquire the necessary technology and expertise to develop China's own potentially abundant shale reserves.

We should step up worldwide energy dialogue and cooperation, jointly maintain energy security and energy market stability, and ensure a well-supplied, secure, cost-effective and clean energy environment conducive to global economic growth.

- President Hu Jintao¹

Motives Driving Chinese Investment in Foreign Energy

China's economy is booming. With an average annual GDP growth of 10 percent over the past three-plus decades and cities, industries, and infrastructure expanding at a breakneck speed, China's demand for coal, oil and gas seems insatiable.



In 2010, China passed the United States as the world's largest energy consumer. In aggregate terms, in 2010 China's energy use rose to 104.6 thousand trillion British thermal units or BTU, whereas the United States consumed 97.88 quadrillion BTU.² Seventy-one percent of China's skyrocketing energy consumption comes from coal; this dirty hydrocarbon composes only about 22-23 percent of total U.S. energy consumption, according to the U.S. Energy Information Administration.

Constraints on tapping oil and coal domestically due to water and transport choke points have meant that the world's largest energy consumer and second largest economy is facing growing energy supply challenges. Furthermore, environmental constraints in the form of extreme weather and water scarcity have made extraction of these domestic water-intensive forms of energy particularly difficult in China.³ As demand explodes and supply plateaus, the Chinese government and energy companies are looking for alternative means to make up the country's energy deficit and are eager to pursue and 'all of the above' cleaner energy strategy.

Is Chinese Investment Squeaky Clean?

"If we [in the United States] are serious about being a leader in clean energy and building out substantially, China is an important partner," says Thilo Hanemann, research director at the New York-based Rhodium Group. Chinese investment in the U.S. clean energy industry is a growing and promising trend on which the two countries could build a cooperative platform. In 2011, Chinese investment in clean energy in the United States amounted to less than 0.5 percent of U.S. investments in clean energy. However, there are signs of a marked and long-term rise in Chinese outward investment in the United States. China's investment into the United States has grown at an annual rate of 130 percent over the past two years.⁴ Between 2003 and 2010, Rhodium Group reported 230 Chinese energy investments, which included both greenfield projects and acquisitions. In 2010 alone, Chinese firms spent \$5 billion on American greenfield projects, which include wind, solar and other

renewable infrastructure projects.⁵ For example, Xinjiang based Goldwind has invested in Shady Oaks, Illinois to develop a wind farm and is expected to do the same in a new acquisition in Montana. A-Power Project and SunTech have also invested heavily in wind and solar power in Texas and Arizona, respectively, sparking construction of new plants and locally sourced jobs. According to U.S. business sources, Chinese clean energy investment has created a modest 6,000 jobs since 2006,⁶ but given the last two years of almost exponential growth, job creation is likely to expand from these nascent levels. In Q3 of 2011, Chinese investors spent over \$1 billion on 9 additional greenfield projects and 9 acquisitions, which speaks to the continuing robustness of this investment.⁷ Rhodium Group did report a drop in investment in Q4 with "the number of greenfield projects dropped to only 5, with a combined value of just \$37 million."⁸

The Chinese investment trends for 2012 have started out promisingly, with a number of new clean energy deals targeting manufacturing in the United States:

- Yingli Green Energy Holding Co. Ltd. agreed in February to purchase materials from E.I. du Pont de Nemours and Co. to produce photovoltaic panels.
- EmberClear Corporation and China's Huaneng Clean Energy Research Institute agreed to build a coal-to-gas plant that could create more than 1,000 U.S. jobs, according to the two companies.
- China's Wanxiang (USA) Holdings Corp. invested \$420 million in Massachusetts-based GreatPoint Energy to develop technology that converts coal to gas.

These M&As reflect a strategy pursued by both Chinese state-owned enterprises and private companies alike, namely to invest in the U.S. clean energy industry for its relatively safe, reliable and growing market and to acquire technological and operational skills that could be applied in China.⁹



Despite these promising new investments, Albert Lin, CEO of EmberClear, observed that Chinese clean energy companies are still tepid and erring on the side of caution when investing in the United States because of what they see as an unpredictable policy sector and complex legal system. Chinese companies are accustomed to a direct government structure and prefer simple business agreements, as they have experienced at home and in many African nations. In short, the bureaucratic barriers of American partnership are intimidating to Chinese businesses.

Cool Welcome For Solar?

Despite the increased priority given, joint meetings, and exchanges catalyzed by the 2009 Obama-Hu Clean Energy Agreements, not all clean energy investment has been met with enthusiasm by U.S. businesses, specifically those from competing manufacturers of clean energy equipment. More recently, an anti-dumping and countervailing case was brought against Chinese solar panel manufacturers by the Coalition for American Solar Manufacturers (CASM). In this highly publicized solar panel case, in May 2012 the Commerce Department levied antidumping tariffs of up to 250 percent in addition to earlier imposed anti-subsidy tariffs of 2-4 percent on Chinese solar panels. These tariffs are meant to offset the subsidies that Chinese solar companies such as SunTech receive from provincial and local governments in the form of access to cheap credit, cheap land and utilities, tax credits and governmental assistance with export-related procedures. Some U.S. solar manufacturers claimed these companies were flooding the U.S. market with below marginal cost prices of solar panels, effectively wiping out competition from American companies.

Given the tense economic recovery in the United States over the past several years, politicians and businesses are quick to blame poor performance on perceived unfair trade practices of foreign competitors. Tom Weirich of American Council on Renewable Energy (ACORE) expressed concern about the negative impact of such

antagonistic rhetoric: “In this political season, the scrutiny of Chinese and American collaboration and competition in the still embryonic but rapidly changing renewable energy industry has been distorted by sound bites and glib assertions.”¹⁰

Furthermore, the collapse of solar manufacturer Solyndra, a supposed consequence of the falling price of solar panels, led to a partisan firestorm in Congress regarding the subsidies of clean energy, as the Obama administration gave Solyndra a \$535 million loan guarantee. However, government subsidies for clean energy in both China and the United States have been a mere fraction of the total subsidies that have traditionally been provided to hydrocarbons. According to one estimate, in the United States the “well-established fossil fuel industry received over \$72 billion in federal subsidies from 2002-2008.”¹¹ Companies and environmental organizations supporting U.S.-China clean energy cooperation argue that the political tussles within the United States over government assistance and trade spats between both countries on solar and other renewables should be toned down and that efforts should focus on the mutual goal of energy security.

State-level Opportunities

Despite the high-level tensions over unfair trade, U.S. states are increasingly seeing the economic advantage of opening their doors to Chinese investment. Many states have been successfully implementing Renewable Portfolio Standards (RPS) that mandate how much energy consumption should come from renewables on an annual basis. According to Tom Weirich, “the RPS has been the single most effective program for encouraging the development and installation of renewable energy projects” in the United States.¹² Cash-strapped states have opportunistically used these higher renewable standards as a means of courting foreign investment. The result is a growing trend of Chinese investment in states that have used this program as a stepping stone for job-creating investment.



The Squeaky Wheel Gets the Grease...and Gas and Coal

Two other burgeoning investment areas for Chinese companies, private and state-owned alike, are U.S. coal imports and research and development into the U.S. shale gas sector. Coal is abundant and still the reigning king in China's energy mix, yet the eastern coast of the country still faces regular brownouts. Thus, coastal cities and provinces are increasing their coal imports. In 2011, China imported 182 million tons (Mt) of coal—mainly from Australia and Indonesia.¹³ In 2011, China imported 5 million metric tons of coal from the United States, and in 2012 this is set to rise to 12 million metric tons, with most being exported through British Columbia. To help lower dependence on dirty and water-intensive coal, the Chinese government expressed striking intent in its 12th Five-Year-Plan to not only expand investments in renewable energy but also to more aggressively pursue the development of natural gas and coal.

Natural gas, which emits approximately half of the carbon that oil and coal emit, is anticipated to represent 8 percent of China's energy portfolio by 2015 given current gas consumption. China currently receives most of its natural gas from Qatar, Malaysia, Australia and Indonesia.¹⁴ In 2010, China's natural gas demand was around that of Germany, but it is expected to rise to match that of the entire EU by 2035, absorbing one-third of global LNG supply.¹⁵ More conservative estimates by EIA place China's primary energy consumption of natural gas at 7.6 percent by 2030, up from its current level of 3.8 percent.¹⁶ Natural gas remains a relatively nascent and protected energy source due to the Chinese central government's strict price controls and supply quotas that have made it difficult for foreign companies to invest. Natural gas will not be a replacement for power plants, but for household consumption as well as transportation. Yet as China transitions its power away from coal, it is just now opening its energy market, one of the last holdouts of market liberalization, to foreign investment, development and distribution throughout the country.¹⁷

Shale We Dance?

Shale gas has already constituted a growing proportion of the U.S. energy mix, accounting for 10 percent of the country's gas production. EIA projects shale gas could climb to 13.6 trillion cubic feet by 2035 in the United States, constituting 49 percent of natural gas production.¹⁸ This increasingly widespread extractable natural resource has considerable implications for Chinese foreign policy, as it positions itself closely with American oil and gas companies in an attempt to acquire the necessary technology and human capital for extraction in China. While promising, the future of shale gas is largely undetermined due to concerns over methane leaks and water demand and contamination. Nevertheless, shale gas represents a platform for huge mutual benefit to the United States and China, as well as an energy source that will ensure energy security for both countries, lessen their dependence on foreign sources of energy, and potentially lower their aggregate carbon emissions.

According to *Business Insider*, China is estimated to have over 25 trillion cubic meters of recoverable shale gas, whereas the United States only has potentially 12-13 trillion cubic meters.¹⁹ This quantity, which could have an enormous influence on outward Chinese gas demand, is expected to lead to the drilling of over 160,000 wells over the next five years. The Chinese have a 6.5 bcm target for natural gas within their energy portfolio by 2015, but shale gas estimates are difficult to project much further into the future given the current geological and technical unknowns in the extractive process. While shale gas, a form of natural gas that is found within deep layers of shale deposit far below the earth's crust, is a far cleaner form of energy than crude oil or coal, its extraction process still involves large quantities of water and chemicals which can negatively affect the environment. Of the 27 U.S. states that produce 99.99 percent of the country's gas, 18 require a list of products used in the hydraulic fracturing process to be submitted to state agencies, 19 states require that volumes of products used be disclosed, and 22 require reporting on treatment



depths.²⁰ The Obama Administration and the EPA are working towards streamlining federal regulations and setting new water and air quality standards, which will save the oil and gas industry time and money.²¹ The Ground Water Protection Council and Department of Energy produced a report that quelled fears about the chemical and water hazards that could be a result of fracturing.²² However, many environmental groups see the disposal of these fluids as a significant threat to underground water networks and seismic stability. The Chinese are looking to the United States to study the sophisticated extraction technology necessary in order to bring this R & D home for its own nascent and burgeoning industry. A couple of China's largest energy companies took the following actions:

- Sinopec and CNOOC—two of China's largest energy companies—have expressed interest in acquiring a 30 percent stake in privately held Texas-based fracking company Frac Tech International to operate in the United States. If that deal is closed, “these Chinese companies would gain the necessarily expertise to pursue shale gas exploration at home.”²³
- In October 2010 CNOOC paid \$2.16 billion for rights to a Texas shale gas project owned by Chesapeake Energy Corporation, the second-largest natural gas producer in the US.²⁴
- Sinopec Group recently announced that its fully-owned subsidiary Sinopec International Petroleum Exploration and Production Corporation has signed an agreement with America's Devon Energy Corp, buying one third of the equity of Devon's five shale gas assets in America for \$2.2 billion. This is Sinopec's first investment into American shale gas, but reflects a robust trend of Chinese investment into the shale gas industry, one that will undoubtedly develop over the next several decades.²⁵

Coal is King

According to the U.S. Energy Information Administration, China's coal imports spiked fourfold from 2008 to 2010 by importing 195,063 thousand short tons in comparison to 44,467 in 2008. The United States in comparison imported a mere 20,567 thousand short tons in 2010.²⁶ This trend of massive energy importations by China has several consequences for the United States. Firstly, the sheer amount of energy consumption through traditional hydrocarbon sources in gross terms is already having an impact on world energy supplies. Secondly, the high carbon emission of coal and its quickly evaporating supply has prompted both the United States and China to develop their respective shale gas supplies, the new energy boom of the 21st century. By 2020, China's coal consumption is projected to increase by 30 percent.²⁷

Since 1980, China's coal production has increased 400 percent and by 2010 accounted for 75 percent of total Asian coal production, followed by India at 13 percent and Indonesia at eight percent.²⁸ China's economy would not have blossomed with such vitality had it not been for the growth of the coal industry. Just as coal played an enormous role in the Industrial Revolution and remained an important energy source for the US throughout the twentieth century, coal became king in China. Since the year 2000, coal production has tripled to 3.15 billion metric tons a year. Supply will have to increase by another billion or 30 percent if it is to keep up with annual demand by 2020.²⁹

China has also sought to become more efficient within its coal production. Improved efficiency in Chinese coal power plants and turbines has converted an average of 37 percent of coal to usable power in comparison to 30 percent in the US in 2011.³⁰ Provincial and local governments have also played a significant role in the implementation of more efficient traditional or renewable energy throughout China. Tax credits, access to cheap credit, land, utilities and export assistance have all greatly improved the proportion of efficient coal power plants as a percentage of overall usage. These



improved provincial standards are then given preferential status by the central government, which all seek to promote a strong national agenda of energy independence.

Closing Thoughts

The Chinese energy portfolio is largely dominated by highly polluting and water intensive coal. Despite the aggressive investment into renewables, nuclear, and natural gas, coal will continue to dominate Chinese primary energy consumption at least through 2020. Like the United States, China has pursued an ‘all of the above’ strategy in acquiring energy and technology in the United States as well as developing its energy portfolio domestically and encouraging diversity for the benefit of its energy security, environmental conservation and international cooperation. In fact, according to Jigar Shah, President of the Coalition for Affordable Solar Energy, \$243 billion was invested in solar, double the amount for coal and natural gas.³¹ However, the push in the research and development of renewable energy as well as shale gas reflects a progressive trend in Chinese energy: the more these alternatives push down the overall percentage of traditional hydrocarbons, the more efficient the economy and the healthier the environment and people can be. Still, expectations must be managed, as China’s leadership must delicately balance economic growth, environmental protection, and political stability.

Sino-U.S. cooperation on energy initiatives has enormous potential considering the long-term demand for affordable domestic energy. However, political rhetoric, an inhospitable business environment, and trade wars could sabotage Sino-U.S. clean energy relations. Joanna Lewis, assistant professor of Science, Technology and International Affairs (STIA) at Georgetown University’s Edmund A. Walsh School of Foreign Service, points out that clean energy cooperation between the United States and China dates back to 1979. It is a long-standing relationship that has evolved from technical focus to policy initiatives and now even joint research and development. As clean energy becomes an increasingly

competitive sector and lack of an overarching legal framework persists, Lewis warns that trade disputes will only intensify.³² Both sides must exercise restraint when dealing with each other as cooperation can achieve mutually desired energy independence in the long term.

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³ For a comprehensive examination of China's water-energy confrontations see China Environment Forum and Circle of Blue's online multimedia reports:

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⁶ Author calculations from public news sources. Publicly announced job creation projections by three high-profile renewable energy farms built with Chinese investment (A-Power, Goldwind and Suntech) indicates that about one job is created for every million dollars invested. Multiplied by the total Chinese investment in the sector this could be estimated at approximately 6,000 jobs since 2006.

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