



CENTER FOR U.S.-KOREA POLICY

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CARBON CAPTURE AND STORAGE RAMPS UP IN THE UNITED STATES AND KOREA

JILL KOSCH O'DONNELL

Demonstration projects now underway in the United States and South Korea to capture CO₂ emissions from coal-fired power plants and store them deep underground have one critical factor in common: a reliance on government funding. In recent months, both governments have announced new funding to test carbon capture and storage (CCS) technology. In a world where cheap and abundant coal-fired power accounts for about 40 percent of man-made CO₂ emissions, CCS is a way to reduce emissions without giving up coal.

In pursuing CCS, both governments are effectively giving the nod to coal, acknowledging that it will continue to be a critical source of power for many decades. Coal-fired power supplies about half the electricity in the United States and approximately a quarter of South Korea's energy needs. The United States has vast coal supplies; Korea has few. Korea relies heavily on imports for coal—and they're rising. The country's imports of heating coal rose 11 percent in January over a year earlier. Writing for *Scientific American*, David Biello has noted that "CCS is, in large part, a lifeline for burning coal in a world trying to avoid the CO₂ emissions such coal burning produces in copious quantities."

That lifeline has become a lot stronger in the United States in recent months. Last October, the Department of Energy (DOE) announced the selection of 12 CCS projects that will re-

ceive a combined total of \$1.4 billion of Recovery Act funding. That is over and above the \$1 billion that DOE has already committed to FutureGen, a large-scale CCS plant that has been slow to get off the ground. DOE also provides co-financing for CCS projects under the Clean Coal Power Initiative (CCPI), aimed at speeding the commercial deployment of low-emission coal technologies. President Obama gave CCS another boost when he unveiled a new Interagency Task Force on Carbon Capture and Storage on February 3. The Task Force has 180 days to study the barriers to widespread deployment of affordable CCS and come up with a plan to overcome them, with an aim of bringing five to ten commercial demonstration projects online by 2016. That will require government funding.

Bob Hilton, Vice President of Power Technologies for Government Affairs at Alstom, one of the companies at the forefront of CCS, told *Clean Skies News*, "To drive these projects at that level, we need federal support. We need the government to intervene. It can't be done solely on private money, which is the way we've operated to date."

That federal support is now funding an expansion of the world's first carbon capture and storage facility. In March, DOE announced a cost-sharing award under the CCPI for the Mountaineer Commercial Scale Carbon Capture and Storage Project in New Haven, West Virginia. The project is led by American Electric Power (AEP) and uses Alstom's chilled ammonia process (CAP) to capture the CO₂. The technology in use at Mountaineer is already capturing 90 percent of the carbon emissions from a 20-megawatt unit of the plant. This represents only two percent of the plant's total emissions, but the new DOE award will cover up to 50 percent of a \$668 million plan to expand the technology to capture more of the carbon.

The story is different in South Korea, where lagging CCS efforts have left the country in a come-from-behind position. One year ago, a scientific panel advising the country's Presidential Committee on Green Growth rated the sophistication of Korea's green technologies—including CCS—at half the level of advanced countries. The government is racing to catch up, pledging to spend 100 billion won (\$87 million) over five years on research and development of CCS technologies. Korea Electric Power Corporation (KEPCO) announced last fall it would spend 1.3 trillion won (\$1.1 billion) by 2020 on CCS.

In March, testing began on a carbon capture pilot facility at a 0.5-megawatt coal-fired thermal power unit in Hadong run by Korea Southern Power Co. It is a far cry from the 500 megawatt pilot plant the government hopes to build by 2015. Moreover, the possibility of storing large amounts of carbon underground in South Korea is still uncertain. Geological research to locate potential storage sites is due to begin this year, and the government said it plans to develop technology to recycle carbon if large-scale storage does not turn out to be viable.

As carbon capture technology continues to mature, serious concerns about storage remain. These revolve around cost-sharing, siting, and safety. In some cases, there is strong “not-in-my-backyard” resistance to hosting underground carbon storage. There are unresolved questions about long-term liability, as the consequences of storing large amounts of carbon underground are unknown. The question of who would bear the costs if something went wrong in the future remains unsettled.

Still, the renewed push toward CCS in the United States and South Korea shows no signs of slowing at the moment. And it's clear that partnerships will be necessary to achieve the goal that some industry leaders, such as Duke Energy CEO Jim Rogers, are proposing of deploying CCS on a commercial scale in five years.

Rogers, a vocal proponent of CCS, said in an interview with Clean Skies News, “It's only working together with other companies with the same mission that we'll be able to hit that deadline. So the conventional wisdom is it'll be 10 to 15 years. We're trying to accelerate that process.”

There seems to be a hospitable environment for such cooperation in South Korea. Speaking about green technology partnerships in March, Minister of Knowledge Economy Choi Kyunghwan said, “the government is prepared to support investment in cutting-edge technology and ensure equal access to incentives for high-tech research regardless of the nationality of the researchers.”

As companies in the United States and South Korea work with domestic partners to put together all of the pieces that go into the complicated CCS process, they might look across the Pacific, too.

Jill Kosch O'Donnell, a former Junior Associate of The Asia Foundation, is a writer with a special interest in energy policy. She holds an M.A. in International Relations and International Economics from the Johns Hopkins University Paul H. Nitze School of Advanced International Studies (SAIS). Her latest report is *The U.S.-ROK Alliance: A Catalyst for Green Growth?*, Center for U.S.-Korea Policy, March 2010.

NEWS & EVENTS

MARCH 31, 2010 – KOREA ECONOMIC DAILY AND HYUNDAI RESEARCH INSTITUTE, SEOUL, KOREA
2010 GLOBAL FORUM ON NORTH KOREA ECONOMY
9am-5pm, Millennium Hilton Hotel

The Korea Economic Daily and Hyundai Research Institute co-hosted an international forum in Seoul on the North Korean economy, focusing on the impact of the recent currency reform. Scott Snyder, Center for U.S.-Korea Policy Director, participated as a panel speaker on the domestic implications of currency revaluation in North Korea.

APRIL 8-9, 2010 – CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES, SEOUL, KOREA
INTEGRATION OF THE KOREAN PENINSULA: FRAMEWORK FOR A POSITIVE FUTURE
Grand Intercontinental Hotel

The Center for Strategic and International Studies, Hansun Foundation, and Chosun Ilbo are co-hosting a conference in Seoul on the integration of the Korean Peninsula and regional implications. Scott Snyder, Center for U.S.-Korea Policy Director, will participate in a panel discussion.

APRIL 28-30, 2010 – PACIFIC FORUM CSIS, MAUI, HI
U.S.-ROK STRATEGIC DIALOGUE
Royal Lahaina Resort

Pacific Forum CSIS will convene U.S. and South Korean experts for the U.S.-ROK Strategic Dialogue, sponsored by the U.S. Defense Threat Reduction Agency. Scott Snyder, Center for U.S.-Korea Policy Director, will serve as a U.S. presenter on Korean Peninsula dynamics.

PUBLICATIONS

Walter L. Sharp (April 5, 2010), *Commander's Welcome*, Transformation Conference, Seoul, Korea.

Scott Snyder (April 1, 2010), "Rajin-Sonbong: A Strategic Choice for China in Its Relations with Pyongyang," *China Brief* Vol. 10 Issue 7, The Jamestown Foundation.

Jill Kosch O'Donnell (March 2010), "The U.S.-ROK Alliance: A Catalyst for Green Growth?" Center for U.S.-Korea Policy.

Scott Snyder (March 31, 2010), "North Korea Currency Reform: What Happened and What Will Happen To Its Economy?" Paper presented at "2010 Global Forum on North Korea Economy," co-hosted by Korea Economic Daily and Hyundai Research Institute, Seoul, Korea.

Lee Kyung-sook (March 31, 2010), "To Prevent Human Trafficking, Cambodia Bans International Marriages to Koreans," *In Asia*.

Scott Snyder (March 27, 2010), "Inter-Korean West Sea Tensions," Council on Foreign Relations.

Hwang Jin Ha (March 25, 2010), "Should We Continue the Planned ROK-U.S. OPCON Transfer?" Keynote address presented at the "Symposium on OpCon Transfer and Its Implications for the U.S.-ROK Alliance," Washington DC.

"Symposium on OpCon Transfer and Its Implications for the U.S.-ROK Alliance," Event transcript, Center for U.S.-Korea Policy and The Maureen and Mike Mansfield Foundation, Washington DC, March 25, 2010.

Larry A. Nicksch (March 24, 2010), "The Opcon Military Command Issue Amidst A Changing Security Environment on the Korean Peninsula," Paper presented at the KORUS Forum, Embassy of the Republic of Korea, Washington DC.

Jill Kosch O'Donnell (March 24, 2010), "Green Growth Brings New Dimension to U.S.-ROK Alliance," *In Asia*.

Scott Snyder (March 23, 2010), "South Korea's Emerging Global Security Role," *World Politics Review*.

Scott Snyder (March 16, 2010), "U.S.-North Korea: Stalemate," Interview with Bernard Gwertzman, Council on Foreign Relations.

Scott Snyder (March 11, 2010), "Rajin-Sonbong: North Korea's (New?) Strategy to Attract Foreign Investment," *Asia Unbound*, Council on Foreign Relations.

For a complete list of publications, please visit:
www.centerforuskoreapolicy.org.

VIEWS ON THE U.S.-ROK ALLIANCE

"A strong ROK-U.S. Alliance, with a meaningful U.S. force presence on the Korean Peninsula, is essential to meet the security challenges posed in the dynamic and economically growing region of Northeast Asia."

--**Gen. Walter Sharp**, Commander, UN Command, Combined Forces Command, and U.S. Forces Korea, Testimony before the House Armed Services Committee, Washington DC, March 25, 2010.

"The OPCON transfer would impede the successful evolution of the ROK-U.S. alliance into a global partnership...implementing OPCON transfer seems to widen the strategic gap between the two nations rather than strengthening our solidarity."

--**Hwang Jin Ha**, ROK National Assemblyman, "Should We Continue the Planned ROK-U.S. OPCON Transfer?" Keynote address presented at the Symposium on OpCon Transfer and its Implications for the U.S.-ROK Alliance, Center for U.S.-Korea Policy and The Maureen and Mike Mansfield Foundation, Washington DC, March 25, 2010.

"[The Joint Vision Statement] is truly an alliance vision. It's also a clear statement that Washington is really happy and pleased that the Republic of Korea sees themselves, not as just an alliance partner on the peninsula but as a regional partner and even a global partner."

--**Adm. Michael McDevitt**, Vice President, Center for Naval Analyses Strategic Studies, Keynote address presented at the Symposium on OpCon Transfer and its Implications for the U.S.-ROK Alliance, Center for U.S.-Korea Policy and The Maureen and Mike Mansfield Foundation, Washington DC, March 25, 2010.

"If the United States were to enter into a free trade agreement with South Korea, North Korea would realize South Korea was more closely allied with the U.S."

--**Hwang Jang-yop**, Former Foreign Affairs Secretary of the DPRK Workers' Party, CSIS Korea Platform Special Session, Washington DC, March 31, 2010.

"The United States remains steadfastly committed to the defense of the Republic of Korea and to an enduring military presence on the Peninsula. The relationship also continues to evolve from one solely focused on peninsular challenges to one that is also playing an increasingly important role in the international arena."

--**Kurt M. Campbell**, Assistant Secretary of State for East Asian and Pacific Affairs, Testimony before the House Committee on Foreign Affairs Subcommittee on Asia, the Pacific, and the Global Environment, Washington DC, March 3, 2010.

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The Center for U.S.-Korea Policy is based in the Washington DC office of The Asia Foundation with seed funding from the Smith Richardson Foundation. The Center accepts donations from the public and private sector for its programs and operations. Inquiries should be directed to Scott Snyder at ssnyder@centerforuskoreapolicy.org.

This newsletter is produced by the Center for U.S.-Korea Policy to provide updates and analysis on current policy issues related to the U.S.-ROK alliance partnership. All views expressed in this publication are those of the author(s).

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The Center for U.S.-Korea Policy aims to deepen and broaden the foundations for institutionalized cooperation between the United States and South Korea by promoting a comprehensive U.S.-ROK alliance partnership on emerging global, regional, and non-traditional security challenges. A project of The Asia Foundation, the Center is based in the Foundation's Washington DC office.

The Asia Foundation is a private, non-profit, non-governmental organization committed to the development of a peaceful, prosperous, just, and open Asia-Pacific region. Drawing on 50 years of experience in Asia, the Foundation collaborates with private and public partners to support leadership and institutional development, exchanges, and policy research.