Fact Sheet

CLEAN ENERGY INNOVATION

Background

To renew the U.S. economy, respond to global climate change, foster the nation's energy security, and help provide the energy necessary to sustainably power global development, America must transform its outdated energy policy.

Innovation and its commercialization must move to the center of energy system reform. The nation must move urgently to develop and harness a portfolio of clean energy sources that are affordable enough to deploy on a mass scale throughout the U.S. and the world. In short, we must make clean energy cheap. To that end, the federal government should establish a national network of regionally based energy discovery-innovation institutes (e-DIIs) to serve as the hubs of a distributed research network linking the nation's best scientists, engineers, and facilities.

Although H.R. 2454, The American Clean Energy and Security Act of 2009 (ACES) does include several crucial innovation provisions, it makes only a modest start toward promoting the technology breakthroughs that will make clean energy cheap, reduce carbon emissions, and create thousands of cleantech jobs. Increasing investments in energy research and development (R & D) must become a top priority of lawmakers in the coming months as action moves to the Senate.

Recommendations

The challenge is clear now that ACES has passed the House. Pricing and regulatory responses won't by themselves get America where its needs to go when it comes to "decarbonizing" the world economy. In addition, America and the world need to catalyze—with large government research interventions—radical scientific and technological breakthroughs and their commercialization.

- According to a Brookings analysis, the federal government needs to invest as much as $20 to $30 billion per year in energy R&D alone simply to approach the federal R&D engagement level in the health care sector.

- The problem with H.R. 2454 is that, while the legislation provides important placeholder provisions on R&D investment, the revenue applied remains paltry. While a $20 to $30 billion a year R&D outlay would be optimal, ACES would invest just 1.5 percent of the 40-year revenue stream of the cap-and-trade system in the R&D efforts of the Energy Department's Advanced Research Energy Project's (ARPA-E) and the innovation hubs—which comes to an additional $1.4 billion a year or so at accepted permit price forecasts.

That's an important increase from the current $5 billion or so U.S. energy R&D level but still not enough.

- The Senate should also begin to build a powerful energy-innovation system in the U.S. by broadly engaging the scientific community through the funding of Energy Frontier Research Centers, conducting transformative research through ARPA-E, and starting eight of its own "energy innovation hubs" for translational research to get new energy technologies into the market. By funding those items, this year, the country could initiate an energy innovation agenda free of the vicissitudes of cap-trade politics and emissions-permit trading.

- New Energy Discovery-Innovation Institutes (e-DIIs) would:
    - Foster partnerships to pursue cutting-edge, applications-oriented research among multiple participants and disciplines;
    - Develop and rapidly transfer highly innovative technologies into the marketplace;
    - Build the knowledge base and human capital necessary to address the nation's energy challenges; and
    - Encourage regional economic development by spawning clusters of nearby start-up firms, private research organizations, suppliers, and other complementary groups and businesses.

Key Facts

- Overall, total U.S. emissions have risen by 17 percent from 1990 to 2007. This trend is projected to continue at about 1 percent per year assuming current trends in economic growth and fuel consumption continue.
- Today's investment in energy R&D by the federal government and large industrial firms is only one-fifth the level of the early 1980s, making up just 1.1 percent of the nation's total R&D investment and 0.03 percent of the nation's GDP.

Brookings Experts

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William Antholis, managing director, previously served at the National Security Council during the Kyoto Protocol negotiations.

Required Reading

"Energy Discovery-Innovation Institutes: A Step toward America's Energy Sustainability," by James Duderstadt, Gary Was, Robert McGrath, Mark Muro, Michael Corradini, Linda Katehi, Rick Shangraw, and Andrea Sarzynski, Report, February 2009.

"Time for a Price Collar on Carbon," by Warwick J. McKibbin, Peter Wilcoxen, Adele Morris, *Politico*, July 24, 2009.

"Climate Change and Vulnerable Societies," by Kemal Derviş, Congressional Testimony, June 23, 2009.

"Carbon Offsets and the Emerging Climate Coalition," by Bryan K. Mignone, *The Hill*, July 9, 2009.

"U.S.-European Union Cooperation on Climate Change," by William J. Antholis, Speech at the International Conference, Essen, Germany, June 10, 2009.

"Challenges and Opportunities for U.S.-China Cooperation on Climate Change," by Kenneth Lieberthal, Congressional Testimony, June 4, 2009.

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