



Written by [Rebecca Terrell](#) on May 4, 2012

## Worldwide Energy Boon: Ice that Burns

The U.S. Department of Energy (DOE) is expanding research in technology to extract natural gas from Alaska's North Slope. On Wednesday U.S. Energy Secretary Steven Chu (pictured) [announced](#) these plans in the wake of DOE's successful field trial to obtain natural gas from methane hydrates trapped in ice crystals. He called the test unprecedented and credited the potential reserves with a possible 30 percent reduction in gas prices by 2025 and the creation of thousands of American jobs. "While this is just the beginning, this research could potentially yield significant new supplies of natural gas," explained Chu.



While DOE's technology is groundbreaking, the discovery of this resource is not new. In 1992 the U.S. Geological Survey reported major economic implications of methane hydrates and conservatively estimated worldwide reserves contained "twice the amount of carbon to be found in all known fossil fuels on Earth." Writing for [The New American](#) in 2007, Ed Hiserodt compared annual U.S. natural gas usage of 25 trillion cubic feet (Tcf) to geologists' assessments of natural gas in methane hydrates ranging from 7,000 to 73,000 Tcf, which equates to a 280- to 2,920-year supply. Such resources could mean a massive boost to the economy since natural gas runs about [10 percent](#) the cost of oil. Utilities and chemical companies are investing heavily in ways to replace oil with natural gas.

The source of this natural gas is a compound called methane hydrate, which looks like white ice because of its three-dimensional lattice arrangement. It traps natural gas inside this structure. DOE reports, "When methane hydrate is 'melted,' or exposed to pressure and temperature conditions outside those where it is stable, the solid crystalline lattice turns to liquid water, and the enclosed methane molecules are released as gas." Arctic ice and ocean sediments along most continental shelves contain vast, untapped stores of methane hydrates.

DOE conducted the test in partnership with [ConocoPhillips](#), the [Japan Oil, Gas and Metals National Corporation](#) and the University of Bergen, Norway. Their unique production technology exchanges carbon dioxide and nitrogen for methane locked inside the hydrate. Conducted between February 15 and April 10 of this year, the test indicates that the new exchange mechanism is both safe and efficient. The research introduces a reliable way to economically harvest these vast reservoirs.

Alaska's Republican U.S. Senator Lisa Murkowski is an outspoken supporter of research to tap sources of energy potential in her state. "Longer-term research is still needed to guarantee soil stability," she pointed out in a [press release](#), but "if we can bring this technology to commercialization, it would truly be a game changer for America."

In addition to ramping up research in Alaska, DOE plans to test additional technologies to safely extract natural gas in the U.S. Gulf Coast. Secretary Chu announced \$6.5 million this year in funding for such studies and plans to request an additional \$5 million in fiscal year 2013. These are modest amounts



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compared to [DOE's budget](#) for so-called renewable energy sources: \$1.8 billion in FY 2012 and projected \$2.3 billion in FY 2013. Reporting for the [American Enterprise Institute](#), Vaclav Smil points out, "Spending toward [natural gas extraction] would bring faster and more durable gains than subsidizing such dubious conversions as turning corn into ethanol or pouring huge sums into money-losing solar enterprises."



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