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Putting a lid on global warming

Utah on forefront of 'CO 2 sequestration' project

By Brian Maffly
and Judy Fahys
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Utah may be about to take center stage in the battle to curb greenhouse emissions.

The U.S. Department of Energy (DOE) plans to spend \$67 million over the next decade on a technology solution for climate change that will be tested in Utah. Plans call for pumping carbon dioxide, a greenhouse gas blamed for global warming, into mile-deep rock formations under Carbon County for long-term underground storage.

If this "carbon sequestration" succeeds, it would be like stuffing the climate-change genie back into the bottle. And it would potentially give Utah's energy industry new life, providing huge offsets for the fossil-fuel pollution produced by power plants and energy development and put Utah

at the center of efforts to enhance production from old oil fields.

Gov. Jon Huntsman Jr. is expected to formally announce the project this morning at the University of Utah's Energy and Geoscience Institute.

Leading the sequestration project is engineering professor Brian McPherson, who was recruited last year to work for the Utah Research, Science and Technology (USTAR) initiative, the new public-private venture to develop commercial applications for technologies at Utah's two major state universities.

"Dr. McPherson is doing ground-breaking applied research in carbon engineering, and we are extremely excited to have his group and Utah playing a leading role in the commercialization of a technology that has such promise for mitigating CO2 emissions," USTAR executive director Ted McAleer said.

The sequestration project is the product of the Southwest Regional Partnership, which McPherson founded in 2003 to pool the resources of seven energy-producing states to explore ways to keep carbon emissions from power generation out of the atmosphere. As the project's principle investigator, McPherson will direct the science and engineering, while the DOE contracts will remain under the control of the New Mexico Institute of Mining and

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Technology, McPherson's former employer.

A total of \$88 million is being spent on expanding research and testing that is already under way, much of it in abandoned oil and gas fields of the southeastern corner of Utah on and around the Navajo Indian Reservation. But the project holds promise for an area from New Mexico to Montana, where underground, geological basins hold a vast storage potential, perhaps enough capacity to contain 100 years of carbon emissions from major sources, according to a USTAR release.

This new phase is centered in an area called Farnham Dome, east of Wellington. Researchers will compress and nearly liquefy carbon dioxide gas, then inject it into muddy layers of rock about 5,000 feet below the desert surface. The target formation is capped by an impervious layer of shale.

One way to think of this process is by imagining the muddy layer as a roasting pan filled with marbles. The carbon dioxide is pumped into the space between the marbles that is now occupied by salt water, and the salt water oozes back into the surrounding rock. Much of the money for the test project will go to ensuring the injected carbon doesn't leak out and create new environmental problems.

The Farnham Dome is a natural location

for such an experiment because it has naturally captured and contained carbon for millions of years. It contains a natural pool of CO2 that formed between 10 and 50 million years ago that was harvested until 1979 to make dry ice and soft drinks.

Utah has been on a crash course to understand and address climate change. Huntsman recently accepted a report from a yearlong task force to look for ways to reduce its impacts on global warming. He also joined California Gov. Arnold Schwarzenegger in signing the Western Climate Initiative, with a goal to reduce greenhouse gas emissions 15 percent regionwide by 2020.

While many Utahns remain skeptical that global warming is a problem worth tackling, many see some value in updating the state's energy strategy, which goes hand in hand with reducing greenhouse gases. One reason is that many believe market-based or government-ordered carbon controls are on the way. Such limits could hurt the fossil fuel industry, but also create new opportunities in energy

USTAR's central role in the Farnham Dome studies will keep Utah near the center of an emerging industry within the energy sector, backers say.

"If the world believes carbon management is an answer to global warming, there will be a lot of companies that own land assets that

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will explore whether their land is capable of managing carbon," said USTAR's McAleer. "Who are they going to call? They are going to call [those] doing the research for the Department of Energy."

McPherson said sequestration will be a good short-term solution for dealing with climate change as the world shifts to renewable energy sources that are now in their infancy.

"Ultimately, the purpose of this project is to develop a blueprint, a template for commercial scale sequestration associated with new power plants to be built in the region," he said.

McPherson emphasized that the project is a partnership, one with more than 31 participants. Twenty-one industry and university groups have committed to supplement the \$67 million in Energy Department money with matching funds totaling \$21 million, he said.

Along with the University of Utah, participants include the Utah Geological Survey, Questar Gas, Rocky Mountain Power, Savoy Energy, Blue Source, Pure Energy Corp., the Navajo Nation and the New Mexico Institute of Mining and Technology.

Another possible player is Southern California's Edison, one of the nation's largest utilities, which has sought permission to use ratepayer money to fund a \$50 million carbon-management

project to explore the feasibility of coal gasification power plant. Using new technology, such a plant's chief byproducts would be liquid carbon dioxide, which would be captured and injected into the ground, and hydrogen, which would be used as fuel, according to Al Walker, who leads technology outreach efforts for USTAR in energy-rich eastern Utah.

Huntsman's energy adviser, Dianne Nielson, told lawmakers Wednesday that sequestration technology like this will help keep Utah coal competitive. If the salt-water formations prove effective at containing man-made carbon, they will serve as carbon sinks that will allow the state to provide a solution to the pollution caused by the gases its power plants and autos produce in a world that most people agree is moving to constraining carbon.

When lawmakers doubted the viability of such technological solutions, Nielson, a geologist, gently disagreed.

"I don't think they are as far out as some people say," she responded.

"We [in Utah] have a leg up on research and development."

bmaffly@sltrib.com fahys@sltrib.com

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