



FutureGen 2.0

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The FutureGen 2.0 project represents a major economic development opportunity for Illinois and local communities. With a total investment of more than \$1.3 billion dollars, it will substantially advance clean energy technology. The non-profit FutureGen Alliance and Ameren Energy Resources will lead the project.

Project Overview

- FutureGen 2.0 will be the world's first, near-zero emissions commercial scale coal-fueled power plant.
- FutureGen 2.0 will incorporate:
 - *Carbon Dioxide (CO₂) Capture:* Repowering an existing Ameren coal-fueled power plant in Meredosia, Illinois with cutting edge oxy-combustion clean coal technology
 - *Transport:* Construction of a CO₂ pipeline from Meredosia to a CO₂ storage facility
 - *Storage:* Development of a regional CO₂ storage facility at a location in Illinois
 - *Facilities:* Construction of visitor, research, and training facilities

FutureGen 2.0 will create 2,000 jobs in Illinois.

The project will create approximately 1,000 construction jobs in Illinois associated with upgrading the power plant, building the CO₂ pipeline and storage facility, as well as constructing visitor, research, and training facilities. The project will create another 1,000 indirect jobs in Illinois relating to the supply chain for the project.

The total budget for the project is approximately \$1.3 billion.

The total budget for the project is approximately \$1.3 billion, of which the DOE will contribute over \$1 billion and industry partners will contribute the remainder. Approximately \$730 million of the budget will go toward retrofitting and repowering Ameren's Meredosia power plant, and approximately \$550 million will go toward the construction of a CO₂ pipeline and storage facility, as well as a training and research center.

Construction will begin late-2012 and be complete in late-2015.

The current project schedule has construction beginning on both the Meredosia power plant and the CO₂ pipeline and storage facility during the second half of 2012. The repowering of the Meredosia plant, the CO₂ pipeline and storage facility and the training and research center should be completed by end of 2015.



The CO₂ will be stored deep underground.

The CO₂ will be compressed, injected and stored more than one-half mile below the earth's surface into the Mt. Simon sandstone formation. This is far deeper than where drinking water, oil, and gas generally exist. The CO₂ storage facility will have various monitoring wells located at the site to monitor the sequestered CO₂. The FutureGen Alliance and the Illinois State Geological Survey will review the storage process for safety. The Illinois Environmental Protection Agency will have the regulatory authority to stop injection if required.

CO₂ pipelines are proven and safe.

There are currently about 3,600 miles of CO₂ pipelines operating throughout the United States. In overall construction, CO₂ pipelines are similar to natural gas pipelines, requiring the same attention to design and monitoring to ensure pipeline integrity. CO₂ pipeline technology is mature, stemming from its extensive use since the 1970s.

CO₂ is non-toxic, non-corrosive, and non-flammable.

CO₂ is piped and stored as fluid (i.e., a compressed gas). CO₂ is an integral part of the basic life cycle in nature. It is inhaled and exhaled by humans and animals every day. It helps plants grow. In some parts of the United States, CO₂ occurs naturally in geologic formations where it has been stored by Mother Nature for millions of years.

FutureGen 2.0 is looking for excellent geology that can act as a CO₂ storage site, mimicking the way Mother Nature stores CO₂ every day. Further, CO₂ storage is very similar to natural gas storage. There are many safe, secure natural gas storage sites in operation within Illinois today.

FutureGen 2.0 will prove-out the integration of a power plant, CO₂ pipeline, and CO₂ storage site. The results will be used to develop additional projects in Illinois and around the world.

Carbon capture and storage (CCS) is a proven technology that has been used in a variety of industrial applications since the 1930s, and it is common industrial practice to safely transport CO₂ through thousands of miles of U.S. pipelines. The DOE has seven pilot demonstration CO₂ storage sites around the country, including one in Central Illinois. These pilot projects have taught us that CO₂ storage is safe and it is time to scale-it-up to commercial size.

Additionally, the Illinois geology has been rigorously studied by independent scientists and is ideal for CO₂ storage because the porosity, permeability, depth, and the presence of an impermeable caprock all contribute to an ability to safely store it. Lessons learned from FutureGen 2.0 can be replicated at other power plants, fertilizer plants, cement plants, and other sources of CO₂ across the country and around the globe. This technology will be essential to Illinois' economic future if the climate change regulations someday go into effect.



A visitor's center and training and research facilities will create an excellent economic development opportunity. The project team will work with the community to design the facility access to avoid significant traffic and congestion on local roads.

The site will include visitor, research and training facilities valued at \$25 million to \$50 million. The project will work with the community to refine the design and location to ensure compatibility with the community. The storage site itself is relatively easy to construct. A limited number of wells will be drilled and involve equipment onsite for periods of time. After installation, the well field and most of the pipeline will be buried and barely noticeable. These facilities will create direct jobs and spin-off service sector jobs. These facilities will provide local employment and purchase goods and services from local businesses.

Regulations for safe CO₂ storage exist today.

The Administrator of the US Environmental Protection Agency (EPA) signed the *Federal Requirements Under the Underground Injection Control (UIC) for Carbon Dioxide (CO₂) Geologic Sequestration (GS) Wells*, Final Rule, as authorized by the Safe Drinking Water Act (SDWA). The final rule establishes new federal requirements for the underground injection of CO₂ for the purpose of long-term underground storage (also called geologic sequestration), and a new type of well, called Class VI, to ensure the protection of underground sources of drinking water (USDWs) from injection related activities.

Link to document: <http://water.epa.gov/type/groundwater/uic/upload/GS-fact-sheet-111210.pdf>

Protections will be in place to assure long-term continuity of operations.

This storage hub and the associated facilities are valuable assets. As such, there is an incentive to manage them properly over the long-term. In fact, existing Illinois law includes certain provisions that address current and possible future owners. Further, there will be contractual obligations to run the storage site for at least 20 to 30 years. During their life they will help create other spin-off economic development. At the end of their life, the wells are plugged and certified by the State as safely closed. At the end of the 20 to 30 years, the surface facilities may run longer or they may be available for other economic development purposes.

Funds for this project are coming from federal government stimulus funds AND private sector companies. This helps assure long-term stability.

At the outset of the site selection process, the FutureGen Alliance informed communities interested in hosting the site that it is committed to a long-term sustainable strategy for the facilities. While this will be a 3 to 5 year project for DOE, the industrial partners are planning to operate it for at least 20 to 30 years.

For more information see www.FutureGenAlliance.org