PEMBINA institute

Case Study: Illinois State

FutureGen/FutureGen 2.0, and Illinois Basin–Decatur Project

Photo: US Department of Energy

FutureGen/ FutureGen 2.0 – In the initial project (FutureGen), CCS was to be installed on a new 275 MW Integrated Gasification Combined Cycle facility with pipeline transportation and storage near Mattoon, Illinois in a saline geological zone. The revised project (FutureGen 2.0) will see the capture of 1 million tonnes of CO_2 per year from a retrofitted 200 MW power plant in Meredosia, Illinois using oxy-combustion technology with pipeline CO_2 transportation and storage in saline geological zones in Morgan County.

Illinois Basin–Decatur Project – CCS capture from an ethanol plant in Decatur, Illinois. Ultimately the project wishes to confirm the ability of the Mount Simon Sandstone formation to accept and store 1 million tonnes over three years (~0.33 Mt/yr)

Developer

FutureGen 2.0 was developed by the FutureGen Industrial Alliance, which currently includes Alpha Natural Resources, Anglo American, Joy Global, Peabody Energy, and Xstrata Coal.

Illinois Basin–Decatur Project was developed by the Midwest Geological Sequestration Consortium led by the Illinois, Kentucky, and Indiana State Geological Surveys, Schlumberger Carbon Services and Archer Daniels Midland (ADM).

Key stakeholders

Industry: FutureGen Industrial Alliance, Ameren Energy Resources, ADM, Schlumberger Carbon Services

Academic: University of Illinois

Government: U.S. Department of Energy, Midwest Geological Sequestration Consortium, Illinois State Geological Survey, Illinois Department of Commerce and Economic Opportunity, Mattoon County, Morgan County

Landowners and communities

Timeline

2003 U.S. Department of Energy (DOE) develops two complementary carbon storage research efforts: the Regional Carbon Sequestration Partnership Program and FutureGen, a competitive bid program to support a large-scale CCS project.

2007 The FutureGen Alliance selects the site at Mattoon, Illinois, out of the 12 potential FutureGen sites originally identified across the U.S.A. The site had been proposed by the Illinois Department of Commerce and Economic Opportunity and the state's Geological Survey.

2008 The separate Regional Carbon Sequestration Partnership Program process is won by the Midwest Geological Sequestration Consortium, which proposes to develop a large-scale CCS demonstration project in Decatur, Illinois. The project will test the ability of the Mount Simon Sandstone geological zone to accept and store 1 million tonnes of carbon dioxide over three years.

2010 The DOE determines that costs of the Mattoon FutureGen project are too high and reconfigures the project, now named FutureGen 2.0, to include an oxy-combustion retrofit of an existing power plant.

Engagement and communication processes

A unique aspect of these projects is that they were primarily championed by the State of Illinois. State business development officers and Illinois Geological Survey staff engaged with regional and local governments to identify potential sites for sequestration. They also engaged with industrial stakeholders to help identify potential sources of CO_2 from existing or new facilities.

Once potential projects were identified, engagement activities with the local communities began to help educate them on what CCS is and to highlight the local benefits for these developments. This also allowed these communities to voice any concerns about the projects. All efforts were made to address stakeholder concerns, and if necessary, redesigns were considered to resolve these issues.

Location analysis/impact

The locations chosen in Illinois are facing economic challenges and held a desire to reinvigorate their communities. Both iterations of the FutureGen project were sited in largely rural agricultural communities which have been through a number of cycles of growth and instability in the past 30 years. Decatur is a largely industrial town, but has seen a decline in activity due to the closing of other industrial or manufacturing facilities. As these CCS opportunities re-enforced the communities' economic goals, there was strong local support for the projects.

In both cases, the industrial partners of the project have been in operation in the community for decades, and the public is well informed of their operations and activities.

Outcome in terms of project developer's aim

The reconfigured FutureGen 2.0, now including oxy-combustion technology, has recently begun phase two which involved preliminary design, pre-construction and engineering for the host facility.

Permitting and monitoring activities began at the Illinois Basin–Decatur Project in 2008. Construction and infrastructure development activities at ADM's Decatur ethanol plant began in 2009. Test injection began in 2011 at a rate of 1,000 tonnes/day. Injection is expected to be completed in 2014 followed by three years of post-injection monitoring that will assess the ability of the Mount Simon Sandstone to accept and store CO_2.

Outcome in terms of communication and engagement

The community engagement fostered civic pride in the CCS developments and allowed local residents to gain of sense of ownership of the project. Consideration of local needs and issues enhanced the understanding of geologic concepts and resulted in a safe and effective project design.

Withdrawal of U.S. DOE funding damaged efforts made during FutureGen 1.0 with the city of Mattoon. The community was frustrated after committing significant effort to secure the development, and lost much of the motivation for the subsequent phases of the project. Subsequently, when the DOE announced the new plans for FutureGen 2.0 involving retrofitting a coal-fired power plant in Meredosia, Illinois, the city of Mattoon withdrew from the FutureGen alliance.

Lessons

1. You have to build relationships with the stakeholders, ideally in one-on-one or small focus groups where stakeholders are comfortable bringing up concerns.
2. Multiple interactions with the same stakeholder groups will be necessary to fully explore issues and come to resolution.
3. Understand and respect audiences' differences, and use different engagement approaches for differing audiences as necessary (e.g. meet with landowners in their homes, organize meetings with stakeholders with similar concerns and encourage coordination, etc.).
4. Clearly outline the stakeholder and project development processes to help manage stakeholder expectations, especially in regards to factors that may lead to project cancellation or delay.
5. Allow and promote access to experts to build stakeholder confidence.
6. Close tracking of media reports is highly valuable in identifying arising concerns and understanding where stakeholders receive information.

The Pembina Institute thanks Shell and Natural Resources Canada for their support of this work.