Case Study Experience from CCS Research and Demonstrations

Although CCS is a new technology, there is a growing body of literature and experience in engaging communities around potential CCS projects. The following case studies are examples of the various strategies that have been employed and the different outcomes that have occurred by the time of publication in late 2010, unless otherwise noted. Each is written by one or more members of the stakeholder group convened to produce the Guidelines. The case studies are preceded by a synthesis (Figure 4 below) summarizing for each case the author's perspective, key engagement tools, and the project outcome, and are followed by a brief analysis of some potential lessons to be drawn.

In addition to the six experiences detailed below—four from the United States and one each from the Netherlands and Australia—there are scores of other communities currently considering CCS project proposals and working in support or opposition of the proposed activity. This number will tend to grow as the deployment rate of CCS projects increases over time. The lessons from early engagement experiences, such as the ones presented below, should be instrumental in determining the interaction environment in which future CCS community engagement processes will take place.

Figure 4: Synthesis of Case Studies

CASE STUDY	AUTHOR PERSPECTIVE	PROJECT TYPE	ENGAGEMENT TOOLS USED	PROJECT OUTCOME
Barendrecht	Independent observer	CCS at an oil refinery (0.3 million tCO_2/year)	■ Formal hearings as part of impact assessments ■ Information center at shopping mall ■ Websites and informational flyers ■ Personal visits by national ministers	Project cancelled by the Government due to extensive delays and complete lack of local support
Wallula	Project developer	CCS research at a paper mill	■ Interviews and focus groups ■ Communications about project made publicly available ■ Site tours for public	Initial community resistance; project was reconfigured and moved to a new site where local community supports project
FutureGen	National project developer, local project team, and community representative	Research-oriented IGCC with CCS (1 million tCO_2/year)	■ Economic development perspective emphasized ■ Educational demonstrations and meetings with local residents ■ Public hearings	Strong community support for hosting the original project; later rejection due to project's redesign
Otway	Project developer	Research-scale injection	■ Formal social science assessment and two-way consultation plan ■ Formed a community reference group ■ Project has a community liaison	Project supported by local community
Jamestown	Community opposition	50 MW new coal plant with CCS research	■ Scoping meetings ■ Informational community meetings ■ Workshops on CCS ■ Media attention	Strong opposition to project remains while developers continue to seek full financing
Carson	Project developer	500 MW IGCC with CCS (2 million tCO_2/yr)	■ Briefings with state and local officials ■ Briefings for key community groups ■ Emphasis on project benefits	Project developer did not proceed with this project, and is instead looking at a similar project in another location

CASE STUDY #1

Barendrecht CCS Project—Barendrecht (The Netherlands)

BY H. C. DE CONINCK AND C.F.J. (YNKE) FEENSTRA, ENERGY RESEARCH CENTRE OF THE NETHERLANDS

The Dutch Barendrecht CCS project planned to capture CO_2 from a pure CO_2 point source in a large Shell refinery in the port of Rotterdam and store the CO_2 in two recently depleted onshore gas fields under the town of Barendrecht. The capture-ready CO_2 source, existing pipelines, and well infrastructure, as well as the short distances between capture and storage, made the project an economically attractive demonstration of CCS. The CO_2 stored would amount to some 300,000 metric tons per year, and the total storage capacity in the reservoir is around 10.3 million metric tons of CO_2. The project was subsidized by the Dutch Government. In addition, Shell, as the owner of the refinery, covered part of the costs. Other project participants included NAM, the corporation that owns the depleted gas fields; OCAP, the distributor of CO_2; and TNO, an independent research institute, for the underground monitoring.

Regulations required Shell and NAM to perform an environmental impact assessment (EIA) of the proposed project. The impact assessment process included providing information to the community members of the area where the CO_2 would be stored. Information was provided in two informational meetings in Barendrecht in the spring of 2008. The meetings showed that both inhabitants and local politicians had many questions about the project that could not be answered sufficiently at the time. The project developers performed additional research and communication on the items that were raised in the following months. Additionally, an administrative discussion platform and communication working group were set up, in which the project developers, the national government, and the local government (at municipal and provincial levels) were represented. Despite these outreach efforts, the city council unanimously voted against the project because of the concerns of local politicians and inhabitants.

In November 2008, the national government decided to allocate EUR 30 million to the project. This decision was followed by two additional informational events for local communities in the spring of 2009, organized by local parties in the city council, where both opponents and advocates (project developers) presented their views. Surprisingly, no NGOs joined the meetings, which attracted over 1,000 people, who demonstrated emotion and concern about the CCS plans for Barendrecht. The meeting was reported on Dutch national and international news, which gave the project wide media exposure and recognition.

In April 2009, the environmental impact assessment was officially approved by the independent EIA commission, which paved the way for the project to be licensed. The independence of the EIA commission was immediately questioned by local politicians and community members in Barendrecht. The Dutch Government delayed any decision on the project until December 2009, to allow the local situation to calm down and better inform local stakeholders. It set up an information centre on CCS in a shopping mall, arranged visits by two government ministers to Barendrecht to talk face-to-face with community members about CCS and the project, performed additional research on other possible locations for CO_2 storage, and hired additional external experts to answer specific questions. Meanwhile, a group of citizens set up a foundation to organize resistance to the project.

The drivers for this strong resistance against the project have not yet been investigated in depth, as the events are quite recent. However, official documents and reports of city council discussions show a variety of concerns, including possible devaluation of properties, and the existing environmental pressures on the town, due to its location close to the industrial harbour of Rotterdam and the recent construction of a new neighborhood, a major goods train track, and a highway extension. Other arguments included the lack of a "100 percent safety guarantee," the fact that the project is a "demonstration," and that technologies should not be "tested" in a densely populated area. Arguably, the style of the project's communication—mainly created by the industrial developer and focused on providing information rather than consultation and engagement—led to the community, including local politicians, feeling disengaged and even ignored. The implementation of a national law that makes it easier for the national government to overrule local decisions concerning projects of national interest (including CCS) in March 2009 may have also increased these feelings.

In December 2009, the national government decided to continue with the Barendrecht project, despite local opposition and negative votes in the city and provincial councils. The ministers came to Barendrecht to explain their decision at a public meeting, which was very emotional, and received significant media coverage. This raised some questions in the national parliament. However, a subsequent debate in January 2010 concluded that the government would continue with the project, creating a fund to cover possible devaluation of local property due to the project.

In November 2010, the national government reverted its decision and cancelled the Barendrecht project. In an official letter to the parliament, the Government explained that the project was no longer essential to CCS development because there were other CCS initiatives elsewhere in the country. In this context, the Government decided to stop pursuing CO_2 storage in Barendrecht due to the extensive delays faced by the project, and the "complete lack of local support".

CASE STUDY #2

Wallula Project—Wallula, Washington (USA)

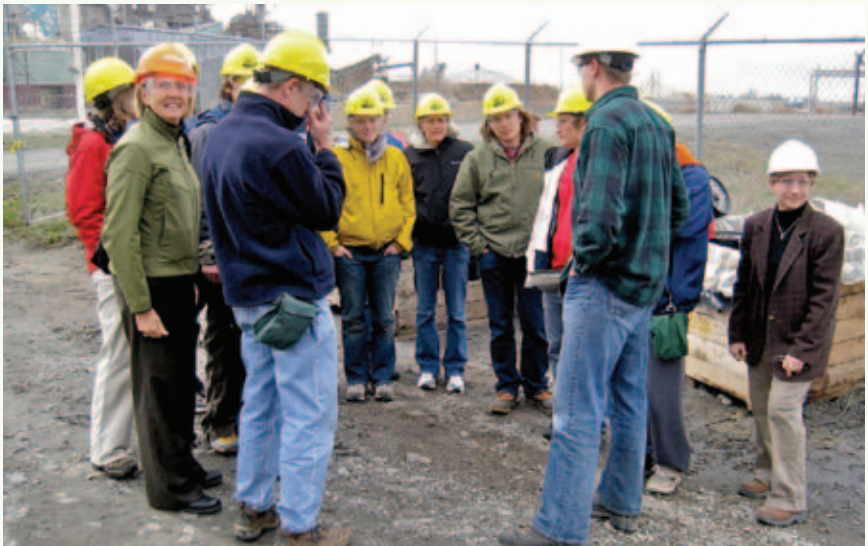
BY G. HUND, BATTELLE

With support from the Big Sky Carbon Sequestration Partnership, funded by the DOE's National Energy Technology Laboratory and several private partners, Battelle, a contractor to the DOE, has led efforts to design and conduct a pilot CCS project in an expansive, deep basalt formation in eastern Washington state, in the United States. The project would purchase small quantities of food-grade CO_2 from a third party to be injected and monitored in the basalt formation, in order to learn more about CO_2 storage in this kind of geology.

Initially, the technical team hoped to site the pilot on the Hanford site—a remote site used in support of the Manhattan Project to develop a nuclear weapons capability. The site was significantly contaminated, and an extensive cleanup effort has resulted in numerous well-characterized deep wells. However, a decision was made by the lead DOE office managing the site that the pilot could be seen as competing with the primary cleanup mission. Shortly thereafter, an invitation was received to move the pilot site to land owned by the Port of Walla Walla, in Washington. However, another company consortium—in an unrelated move parallel with the pilot CCS test—demonstrated its interest in developing an innovative coal plant on the site, with hopes of storing its eventual CO_2 emissions in the basalt formation. Because of the small-scale scientific and technical focus of the pilot Battelle study, limited community engagement had occurred up to this point. When the community realized that there was separate interest in building a coal plant, a group of citizens convened to oppose the proposal. The Port felt that they could not move forward with the CCS pilot project among such public outcry.

The CCS pilot was reconfigured a third time to be sited on private land, at a nearby paper mill in Wallula, Washington. In coordination with the new partners, a communications and community engagement plan was developed. A fact sheet and question and answer sheet were drafted. Interviews were conducted with community leaders to describe the new partnership and emphasize that no coal plant was part of the plan. The outreach team also met with the media before the partnership between Battelle and the paper mill was announced, in order to answer questions and clarify misconceptions. After the announcement, the team met with dozens of stakeholders and several community groups representing a broad range of interests to describe the project and answer questions. This included meetings with the previously vocal group against the project. Outreach coordinators from both Battelle and the paper mill attended, as well as senior management from the paper mill and a technical CCS lead from Battelle. These discussions were frank, and a commitment to share correspondence was made between Battelle/paper mill staff and the state regulator with this group, to demonstrate the team's interest in being transparent. In addition to interviews and small meetings/focus groups with stakeholders, an open house and tours of the proposed site were provided for stakeholders and members of the media. Geology classes from a local college toured CCS laboratories and the drilling site. This engagement resulted in hiring summer interns and increased the community's awareness and understanding of CCS.

The outreach team emphasized the win-win attributes of the project—the community would gain from the removal of CO_2 (and other associated compounds that cause odors) from a nearby plant, the paper mill was receiving support from DOE and Battelle to conduct the pilot project, and Battelle was gaining important scientific knowledge to further evaluate CCS occurring in basalts. The team further stressed that the paper mill was not required to investigate the feasibility of capturing and storing its CO_2 onsite, but did so proactively. As a result of the various community engagement approaches and associated accurate media coverage, there was a much better understanding of the pilot's objective and that promoting the siting of a coal plant was not the focus of the research. This community engagement has resulted in little to no public opposition, positive press articles, and improved public trust. The community engagement around this project is still ongoing in late 2010, with the results from the characterization well shared with community members.



CASE STUDY #3

FutureGen—Mattoon, Illinois (USA)

BY S. GREENBERG, ILLINOIS STATE GEOLOGICAL SURVEY, AND G. HUND, BATTELLE

FutureGen is a public-private partnership between the DOE and the FutureGen Alliance (the Alliance), a consortium of national and international coal companies and power utilities. The Alliance is a not-for-profit organization created with the mission of disseminating information and lessons learned in the process of creating and operating an integrated gasification combined cycle (IGCC) power plant with CCS, somewhere in the United States. Knowledge sharing, worldwide, is a fundamental goal of the project and is integral to the communications strategy. A competitive process was conducted between 2001 and 2007 to choose the eventual site for FutureGen. A dozen communities from seven American states responded, generally motivated by job potential, economic development, and the opportunity to host a world-class research facility. Based on extensive siting criteria, four sites were selected as semifinal candidates to host the facility: two in Texas and two in Illinois.

Site selection was based on several technical and social components, with community engagement a major focus. Due in part to the competitive nature of the FutureGen project, the community engagement process was conducted on multiple levels. The Alliance, as the project developer, focused on the selection of a suitable site and conducted social characterization of sites as one of their criteria. For example, newspaper articles were reviewed daily from all of the candidate sites to gauge community support. Additionally, stakeholders in the four semifinalist communities were identified and interviewed. The states and communities competing to host the project conducted community engagement on a more local level, building project-developer teams. Public engagement on the local level included hosting meetings, giving presentations, providing demonstrations explaining the project and CCS, and providing opportunities for stakeholders to ask questions of project developers, economic developers, and state officials.

In Illinois, the FutureGen for Illinois project team (the Illinois Project Team) was driven by the Illinois Department of Commerce and Economic Opportunity, along with the Illinois State Geological Survey, the competing cities of Mattoon and Tuscola, community economic development teams, industry partners, consultants, and state and local politicians. The Illinois Project Team focused first on bringing FutureGen to Illinois and then on individual communities. Mattoon and Tuscola are 40 km (25 miles) apart and share similar geological sequestration site characteristics, as well as social characteristics. Both are rural farming communities interested in job opportunities and located near major universities and community colleges.

Community engagement served different purposes for the Alliance and for local project developers. The Alliance engaged community stakeholders to determine issues, concerns, and overall perceptions of a potential host community, and to answer any questions about the technology and project in general. The Illinois Project Team focused on educating stakeholders about FutureGen, CCS, and the potential opportunities the project brought to the region, which has considerable coal resources, suitable CCS geology, an active interest in reducing pollution from coal, and preexisting experience with analogous industries, such as oil production and natural gas storage. The community engagement process was successful from both the Alliance and the Illinois Project Team perspective.

Members of the Illinois Project Team, especially local business development specialists, were crucial contacts for the Alliance stakeholder involvement team. The Illinois Project Team identified interested local parties and then arranged numerous meetings with a diverse range of stakeholders, so that the Alliance team could describe the project, but more importantly, so that the Alliance team could hear local issues and concerns. The Alliance team visited all four sites and met with over 200 stakeholders. The vast majority of citizens from all sites were interested in having the facility sited in their community. Examples of groups with whom the Alliance team met included residents who live within a 16-km (10-mile) radius of the proposed site, community leaders, farming association members, educators, nearby industrial business representatives, state regulators, environmental interest groups, and the media.

The Alliance team shared a fact sheet describing the project and walked through a technology flow diagram, illustrating how the integrated system would work. If the Alliance team did not know the answer to a particular question, it committed to finding the answer and getting back to the stakeholder. Questions asked during these interviews greatly influenced the content of a "frequently asked questions" section developed for the Alliance's website. The Illinois Project Team was helpful in getting specific responses back to the appropriate stakeholder. The major topics of interest were:

- Job opportunities
- Use of local coal
- Potential disturbances (e.g., light, noise)
- Water requirements
- Groundwater contamination risk

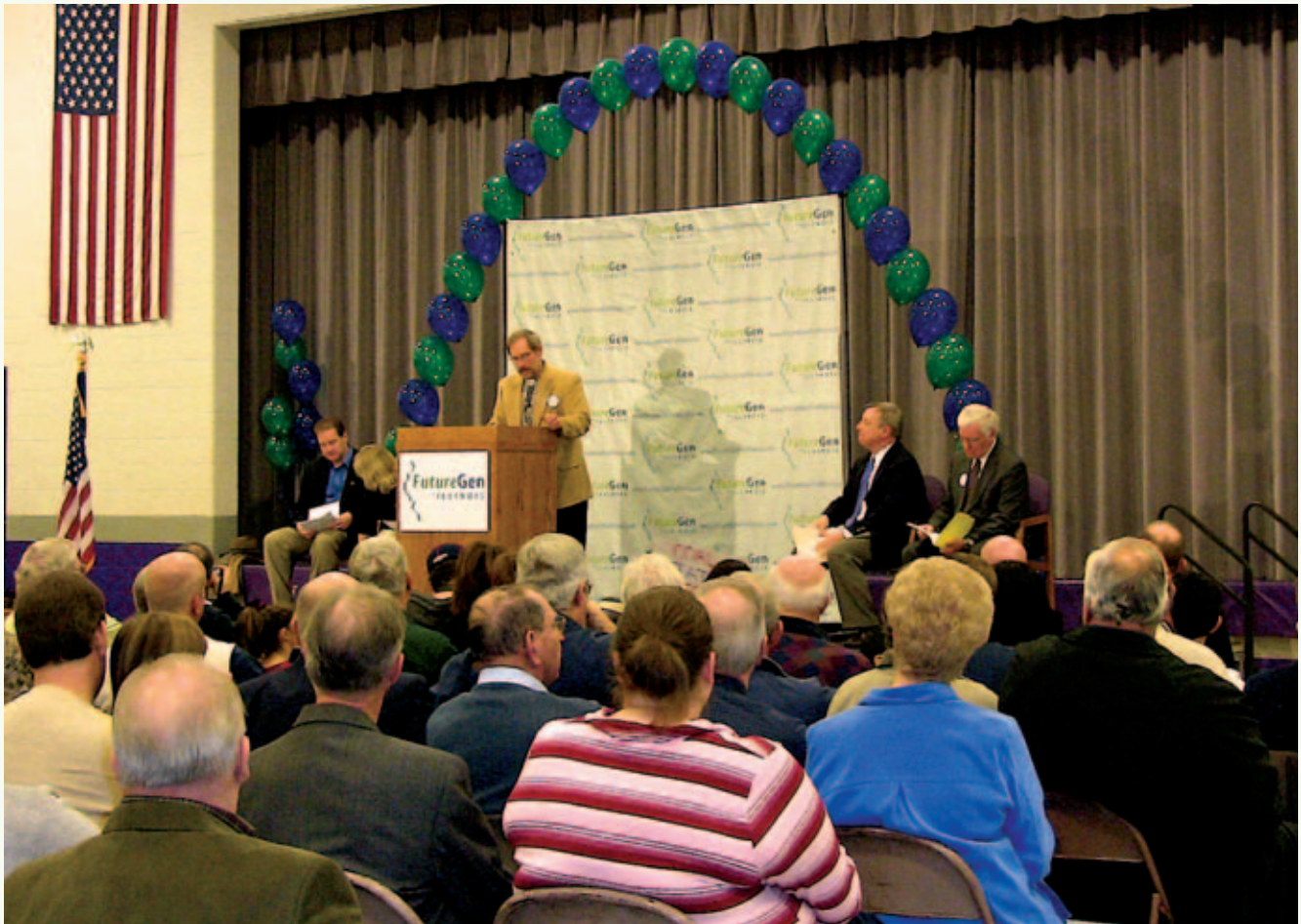
CASE STUDY #3 (CONTINUED)

- CCS and monitoring process
- Maintaining land use rights
- Impact on power costs
- Decommissioning plans
- Potential for research user facility

The Illinois Project Team began community engagement during the proposal writing stage with a series of four public meetings at proposed project sites. Once the two Illinois semifinal sites were chosen, the Illinois Project Team created a task force to broaden the scope of outreach and communication. A task force briefing for major community leaders, university presidents, trade groups, business developers, farming groups, industry, media, legislators, utilities, and many others provided briefing material, FAQs, and materials to use when discussing the project with constituents and stakeholders. A series of meetings was held with stakeholders to educate the community about FutureGen and CCS, using hands-on, physical demonstrations—such as rock samples and a three-dimensional sequestration model that shows how CO_2 behaves in the subsurface—and had a great impact on creating understanding. Major questions and topics of interest included:

- What happens to stored CO_2 in the event of an earthquake?
- Where does formation water go when CO_2 is injected?
- Will the siting of a pipeline impact my property value?
- How does CO_2 stay in the rock formation?

A formal component to community engagement occurred when the DOE held its public hearings as required under the National Environmental Policy Act. This is an official opportunity for stakeholders to testify and raise issues about the proposed project. For 2 hours prior to each meeting, the Illinois Project Team and the Alliance participated in an open house, where technical experts were stationed at public displays related to aspects of the project. One station included representatives from the Illinois State Geological Survey demonstrating the sequestration model. Other stations held FutureGen engineer experts, state officials, and other project developers there to answer questions. Members of the public took this opportunity to ask questions in an informal setting, so during the official hearing, testimony focused on positive aspects of bringing FutureGen to Illinois, and very few negative comments were received. The benefits of jobs, added economic opportunity for the community, and the prestige of hosting the innovative facility were perceived as much greater than the possible risks associated with the project.



Changes in FutureGen and the Reaction from Local Communities

The U.S. Department of Energy (DOE) initiated the FutureGen project in 2003. In December 2007, the DOE put the project on hold and developed a plan for restructuring, which was not implemented. In 2009, Congress allocated US$1 billion in stimulus funding for the stalled project. In August 2010, 7 years after the initial announcement, the DOE announced another restructuring, to FutureGen 2.0.[1] The redesigned project would not include the construction of a state-of-the art IGCC plant and research laboratory, but would instead repower an existing power plant in Meridosia, Illinois, to be the largest oxygen-combustion carbon dioxide capture and storage (CCS) retrofit in the world, and transport the captured carbon dioxide (CO_2) through pipeline to Mattoon, where it would be injected underground for permanent storage.

The following letter was submitted to WRI for use in this report in the weeks immediately following the announcement and reflects the position of the local economic development lead in Mattoon, Illinois, on the restructured project, as of October 2010.

[1] U.S. Department of Energy. 2010. "Secretary Chu Announces FutureGen 2.0". Fossil Energy Techline, Department of Energy Office of Public Affairs, August 5, 2010.

An open letter from a local community leader in Mattoon, IL

I think it is entirely appropriate for my piece to continue where the case study above ends. The authors provide a framework for community engagement that clearly worked and a backdrop for why our community felt it needed to back out after the recent changes.

The last sentence of the case study is particularly poignant given the latest, and perhaps final, twist in the FutureGen project. Clearly, WRI is developing guidelines for community engagement to address misconceptions about CCS and community resistance to CCS. The irony of the FutureGen case study is that a community, actually a region, was willing to be the first to test, demonstrate, and host—all those words that can make other communities afraid—a prototype, large-scale integrated coal plant with CCS. Mattoon supported this project. Our citizens embraced it. They were proud to play a role in proving this forward-thinking technology works, that it is safe, and that it has the potential to help address climate change and the impact of CO_2 emissions. While many communities across the globe have rejected CCS projects because there is a belief it is unproven and may jeopardize public health and safety, our community of more than 50,000 people was willing to stake its future on the emerging science of CCS and the probability that there are no immediate or long-term dangers associated with it. We spent a great deal of time with members of the FutureGen Alliance. We trusted them and their motives. They were sincere in their quest to develop, share, and deploy technology that could make a meaningful impact on the environment we are leaving future generations. Those were the kind of partners we wanted. As a result, we didn't merely open our minds and our community to the project. Our citizens, community leaders, and business leaders enthusiastically dedicated more than 4 years of work and substantial financial resources to support the siting, development, and construction of the project. This community was vested intellectually, financially, and emotionally in the FutureGen project. We believed our role to be vital and fundamental to the project's success. At the end of the testing, research, and vetting period, we knew our site would be highly regarded for CCS projects, perhaps even for projects where permanent employment would be higher, yet we were still eager for our partners to use it in this important endeavor.

The community engagement and education process was critical in generating the support the original FutureGen project enjoyed in Mattoon. That process was

CASE STUDY #3 (CONTINUED)

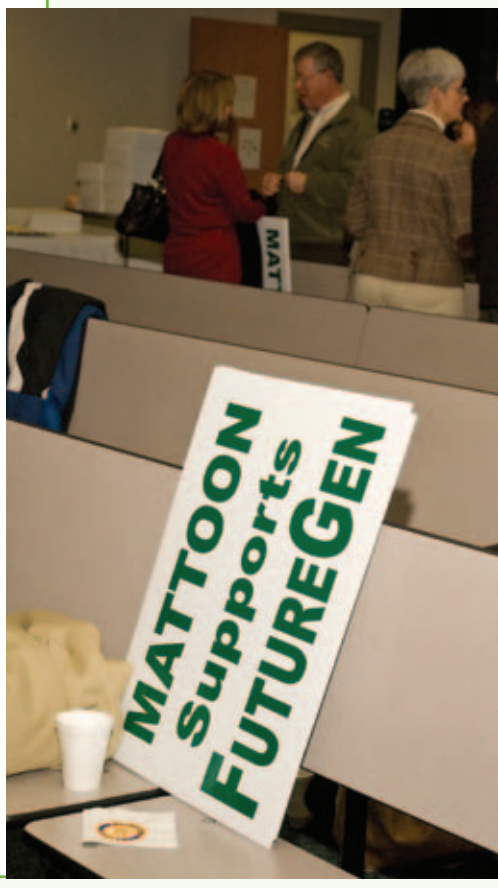
the solution to any unfounded, unsubstantiated, or provocative reactions to the project. Eventually most of the local stakeholders, special interest groups, and concerned citizens across the county supported the project. While a few remained skeptical of the science or of industrial development in general, ultimately even they were willing to trade their skepticism for the promise of job creation and a project that would change the local economy for their children and the global environment for their grandchildren.

That all changed when FutureGen 2.0 was announced. The reason I've gone into such great detail to convey the depth of support and sentiment for the original FutureGen project and for the private sector partners at the Alliance is to be clear about the reasons we pulled out of FutureGen 2.0. They had nothing to do with apprehension or opposition to CCS in our community. Rather, it was because of the enormously diminished role our federal partners envisioned for this community. Our citizens, business leaders, and elected officials had a sophisticated understanding of the FutureGen project. The tangible (job creation) and intangible benefits (focal point for development of technologies that address greenhouse gas emissions) of participating in FutureGen were immeasurable. Unfortunately, in the revised FutureGen 2.0 there would have been very few jobs created, few opportunities for spin-off economic development, and a trivial role in advancing solutions to climate change. During the community engagement process, this community came to view our ability to participate in cutting-edge technologies that could provide solutions to climate change or provide a platform for continued development of technologies that push the envelope in research and scientific study as an enormous reward. Given everything the community sacrificed, the opportunities lost as we pursued FutureGen, and the years we continued to support the project—even when federal partners at various times did not—we were unwilling to be a partner in FutureGen 2.0, wherein our role would simply have been to store the CO_2 generated and piped from a prototype power plant on the other side of the state. Doing so would have effectively eliminated the role of our community in the pursuit of technologies that may offer dramatic and prolonged solutions to environmental challenges.

As the economic developer who took the lead for the community in the recruitment of this project and the education and engagement of the citizens, and who was the standard bearer in the movement to create public acceptance and support for this project, I could not ask the citizens one more time to accept less than they worked for or deserved. They responded vehemently, clearly, and in large numbers that FutureGen 2.0 was not welcome in our community. Their verbal, written, and online comments overwhelmingly reflected their beliefs in the merit of the original project, and anything short of that would have to find another home. They continue to believe our community and our site have a higher and better purpose than FutureGen 2.0; one that hopefully resembles the original FutureGen project. My obligation is to work to bring something back that is as close to the original project as possible, and that unquestionably includes CCS.

Angela Griffin

—Angela Griffin, COLES TOGETHER



CASE STUDY #4

CO2CRC Otway Project—Nirranda, Victoria (Australia)

BY T. STEEPER, THE COOPERATIVE RESEARCH CENTRE FOR GREENHOUSE GAS TECHNOLOGIES (CO2CRC)

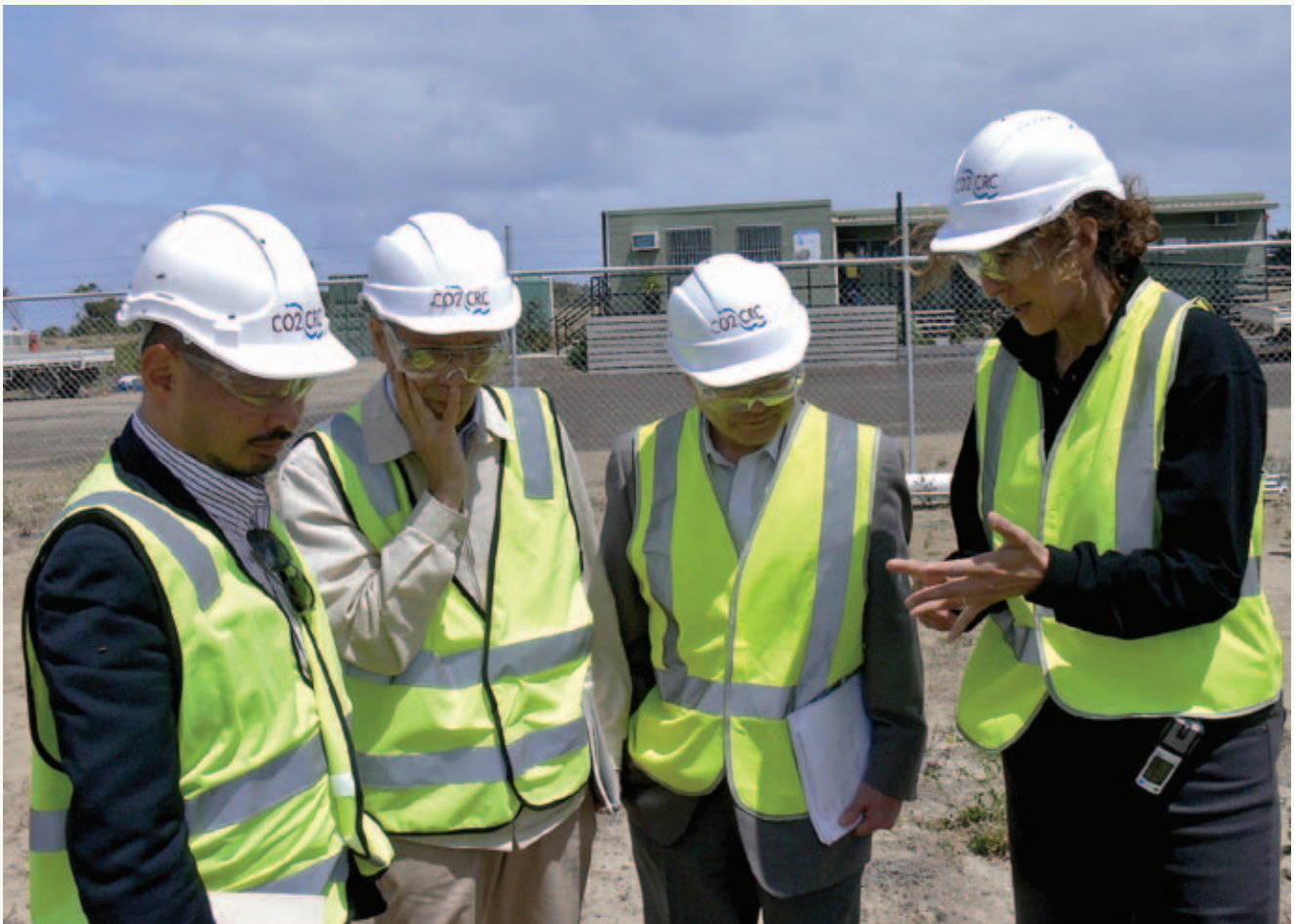
The Cooperative Research Centre for Greenhouse Gas Technologies (CO2CRC) is an international joint venture CCS research organization based in Australia. CO2CRC partners include industry, government, universities, and research organizations. The CO2CRC Otway Project in rural southwestern Victoria, currently Australia's only geosequestration project, is researching and demonstrating CO_2 storage, monitoring, and verification at an industrially significant scale.

In 2004, after considerable research, a site was identified in the Otway Basin near Nirranda, a dairy farming area of about 300 people with a growing tourism industry. The site is highly suitable for geosequestration research, as the geology contains suitable storage reservoirs, and there is a source of naturally occurring CO_2 nearby (from an existing natural gas production facility), which minimizes the additional costs of CO_2 capture and transportation by limiting the necessary new construction.

Because the site is within a close network of established farms, a community consultation program was a priority and critical to success. The aim of the program was to establish a relationship of trust with the Nirranda community, because the project—including construction of three wellheads, regular monitoring visits and surveys, ongoing tours, and media attention—would have a considerable effect on peoples' daily lives and farming operations. Indeed, one useful outcome has been finding out just how much of an impact monitoring, especially seismic monitoring, can have on agricultural land, and the best ways to manage it.

Early in the project, CO2CRC engaged an independent social research company that used focus groups and individual interviews to assess the local and regional community's attitudes toward CCS and identify concerns with the project. Research results showed that the community believed climate change was an important issue but had little knowledge of geosequestration or CCS.

Therefore, the initial focus was on provision of information. Promoting understanding of CCS and the aims of the project required that the community be informed about complex science and technological concepts, including global warming, the production of greenhouse gas emissions, geophysics, geochemistry, and risk analysis. The community had considerable experience with the oil and gas and natural gas storage



CASE STUDY #4 (CONTINUED)

industry, which from a project developer's perspective was both an advantage (familiarity with operations such as drilling of wells and seismic surveys) and a disadvantage (overconsultation on resource projects, high expectations of remuneration). One farmer noted there had been 12 seismic surveys on his land in the past 15 years.

CO2CRC used public meetings, publications such as newsletters and fact sheets, briefings, face-to-face meetings, and the media to inform the community about climate change, CCS and the project aims. Other tools used were CO2CRC's comprehensive and regularly updated website on CCS and CO2CRC research and a project update newsletter that is regularly mailed to the local community. The results of the social research were used to develop a two-way consultation plan, using the best-practice recommendations of the International Association of Public Participation.

An important element of the plan was the establishment of a community reference group comprising landowners, regulators, local NGOs, and project management. This provided an avenue for two-way communication, acting as a conduit between the community and project developer and assisting with early identification of emerging issues. The group has credibility in the community and met frequently in the early days of the project. It currently meets twice yearly, or as needed. Through the group, CO2CRC undertakes to listen and provide feedback and/or action on community issues and concerns.

Also a vital part to continuing consultation is the Community Liaison Officer, who provides a focal point for landholders, researchers, visitors, and the local community. The Community Liaison Officer is a local resident with excellent community links, as well as a background in education. With other project staff, the officer runs regular tours of the project for industry, researchers, and community groups and has found this an excellent way of communicating the project aims and the science of CCS. A crucial part of the officer's role is working with landholders and researchers to ensure good relations regarding access to local farms for monitoring and sampling surveys.

The Otway Project has been highly successful, with minimal public opposition, generally positive media coverage, and a considerable body of knowledge of geological storage and monitoring achieved. While the community consultation program was effective overall, it should be noted that some access issues were unable to be resolved without resorting to legislative avenues. This highlights the fact that despite a developer's best efforts, community consultation cannot guarantee a trouble-free project.

Jamestown Oxycoal Project—Jamestown, New York (USA)

BY W. SIMPSON, CLEAN ENERGY FOR JAMESTOWN

In 2004, the Jamestown, New York, Board of Public Utilities (JBPU), a municipal utility, announced plans to build a US$145 million, new, 50-megawatt (MW) coal-fired power plant to replace its existing Carlson coal plant. The project was billed as "clean coal" and would have used circulating fluidized bed (CFB) technology with no CO_2 emissions controls. The project proceeded through state-mandated draft and final environmental impact analyses, but as a result of criticism, in 2007 was discontinued in its initial form and redefined as a CCS demonstration project. The JBPU announced that it would seek federal funding for the CCS portion of the project, which was variously estimated to cost from US$250 million to $350 million, from the DOE Clean Coal Power Initiative (CCPI).

In June of 2008, New York Governor David Paterson announced his support for the modified project. Like the 2007 JBPU's CCS announcement, Governor Paterson's announcement occurred without any prior discussion with opponents of the project—who, not surprisingly, felt blindsided and reacted critically. While the JBPU and governor viewed the CCS redefinition of the project as reflective of fundamentally new "pro-environment" goals and aspirations, opponents were unconvinced.

Early JBPU community engagement efforts consisted of a series of "scoping" meetings for the initial CFB project, as required by New York's State Environmental Quality Review Act. After the project was redefined as a CCS demonstration, JBPU community engagement primarily consisted of informational community meetings that were sponsored and staffed by the JBPU, its Oxycoal Alliance corporate partners, and occasionally Governor Paterson's office. A series of workshops was also conducted by the New York State Department of Environmental Conservation. These were intended to discuss only CCS, though it was difficult for some participants to separate CCS from the controversial proposed new coal plant through which the CO_2 capture technology would be demonstrated.

Some community members perceived community engagement meetings conducted by all of the above as promotional and one-way in nature in order to minimize public criticism and controversy. From the beginning, it was perceived that the JBPU was intent on building a new coal plant of one kind or another, irrespective of community concerns or the validity of opposing arguments. This view was reinforced by the fact that the JBPU never commissioned a study of alternatives to a new coal plant with CCS, and an early JBPU study of power supply options glossed over energy efficiency and renewable energy sources. Critics of the project viewed this omission as unacceptable, especially since 80 to 90 percent of the electricity consumed by JBPU ratepayers is very low-cost hydropower from the New York Power Authority, leaving just a small load to be met by some other means.

The project's developer, the JBPU, is a branch of city government. Thus, the developer and local government are more or less the same—with the effect of removing local government as an independent agency to challenge the developer and represent community concerns and criticism.

Even though the JBPU is part of local government and describes itself as transparent, local activists and those representing a larger coalition of project critics found it increasingly difficult to obtain information about the proposed project. For example, the JBPU never publicly released its study on the cost of building and generating power from a new coal plant, its application for funding to the DOE, or a NYPA-funded study that concluded that the JBPU could reduce its ratepayer electric load by nearly 20 percent within 5 years with a properly designed energy efficiency program. In most cases, the New York State Freedom of Information Law was required to produce disclosure, and even then requested information was difficult or impossible to obtain. The lack of disclosure extended to the drilling of test wells to determine whether local geology is suitable for CO_2 sequestration. While the JBPU maintains that the drilling was done legally with proper state government oversight, the community was not informed of the drilling, which worried some residents and infuriated at least one county legislator in whose district the drilling occurred.

Community engagement for this project was further complicated and compromised by the nature of small-town politics. While a small core of local activists criticized the project (with support from a large coalition of environmental groups outside of Jamestown), other local residents steered clear of the controversy either out of apathy or fear of alienating the local "powers that be." Local news media aired some of the controversy, but coverage of opposing points of view was slim in the local daily newspaper, which was perceived by activists as a house organ for the JBPU. No regulatory agency provided guidelines for or enforced a public engagement process of any kind, let alone one that would have required full disclosure on the part of the

CASE STUDY #5 (CONTINUED)

project developer or imposed a process for bringing the community together to air issues and work constructively and openly on the project. Activists contend that basic issues were never addressed by the JBPU or through a community engagement process, including:

- Whether the new coal plant is needed by ratepayers
- How much electricity from the plant would cost and how it would impact electric rates
- Who would pay for the high costs of CCS after the 3-year DOE CCPI grant expired
- How the project would impact the local economy after construction, when the bills would be due and electric rates would rise
- Whether the JBPU's payments-in-lieu-of-taxes formula could be changed to ensure that the city and school district could receive the revenue they needed without building a new power plant
- What the alternatives were to building a new coal plant with CCS and how much these alternatives would have cost and impacted the environment compared to the JBPU's "clean coal" project

For the last 5 years, Clean Energy for Jamestown, a coalition of 20 regional, statewide, and national environmental groups, has joined local activists—who gathered under the banner of Concerned Citizens of the Jamestown Area—in opposing the JBPU project. This coalition, through a team of volunteers with energy and legal expertise in the nearby Buffalo area, has provided local activists with expert support. The Natural Resources Defense Council, which nationally supports the development of CCS, joined the critics of this project. Together they argued that the project was not suited for a CCS demonstration because neither the JBPU's existing Carlson coal-fired power plant nor its proposed new coal plant are needed to meet the electrical needs of the JBPU ratepayers and because alternatives—principally energy efficiency—would be much cleaner and cheaper. Interestingly enough, in the 6-year history of this project, no polls have ever been conducted to learn what fraction of Jamestown residents or JBPU ratepayers support or oppose the project. While a few local community members have been intensely engaged, most have been seemingly disinterested bystanders.

As of late 2010, the JBPU continues to pursue this project, having already spent—by its critics' estimate, based on JBPU data—US$10 million, or $500 per ratepayer, in development and promotions. However, in 2009, the JBPU's project was turned down for funding twice by the DOE CCPI, and the JBPU lost support from key Oxycoal Alliance partners, Praxair Inc., and the University at Buffalo. The JBPU's test drilling did not identify rock formations suitable for CO_2 injection. Also, CCS-enabling state legislation proposed in New York did not address liability issues and has not been passed by the New York State Legislature. And project critics were successful in a recent JBPU rate case before the New York State Public Service Commission (PSC) in convincing the commission to require that the JBPU stop spending ratepayer funds to develop and promote the new coal plant project with CCS. Also, in response to project critics, the PSC established a process to evaluate whether continued power generation and coal burning in Jamestown is in the best economic interests of JBPU ratepayers.

To improve community engagement on this project, the JBPU should have:

- Fairly considered alternatives to building a conventional coal-fired power plant or one demonstrating CCS; and
- Established a community engagement process that invited dialogue and criticism and was fully open to the possibility that not building a new coal-fired power plant, with or without CCS, was in the best interests of JBPU ratepayers, the city, and the environment.

An open, public process would include full disclosure of all project reports and documents, open town meetings that invited and encouraged honest exploration and the expression of divergent views, and a request to the local daily newspaper to function independently and cover and explore all views. Such a process would also have included the selection or appointment of a JBPU board of directors that held a diversity of opinion on how best to serve the future needs of electric ratepayers, the city, and the local economy.

Finally, the JBPU should have been willing to meet with and engage the organized opposition to its proposed project, the Clean Energy for Jamestown coalition. This never occurred, at least in part because of JBPU legal counsel opinion that a contact should be avoided because the opponents "have threatened a lawsuit." This "threat" was at best hypothetical (i.e., anyone can sue as a last resort if they disagree with the outcome of the state-mandated environmental review process), but it was used to prevent dialogue—though, admittedly, dialogue is difficult once battle lines have been drawn, and would have been fruitless if the JBPU remained committed to its project and unwilling to consider alternatives.

Carson Hydrogen Power (CHP) Project—Carson, California (USA)

BY G. MINTER, HYDROGEN ENERGY REPRESENTATIVE

Carson Hydrogen Power (CHP) was a proposed 500 MW integrated gasification combined cycle (IGCC) power plant with 90 percent capture, which would have sequestered over 2 million metric tons of CO_2 annually. The project, announced by a partnership of BP Alternative Energy and Mission Energy in 2006, was to be sited in Carson, California, in the United States. The town is adjacent to several oil refineries and to the Wilmington oil field, a sufficiently depleted oil reservoir that could serve as a geologic storage reservoir. Carbon dioxide was also to be used to support EOR operations, thus offsetting project costs. The project team began considering alternative site locations in the fall of 2007, because of its inability to obtain a commercial agreement with the operator of the Wilmington field on the purchase of CO_2 for EOR operations.

Project sponsors reached out to the community after the announcement of the project, during the period when preliminary studies were being prepared to submit a permit application to the state's energy regulatory authority. Initial outreach was conducted with state and local government officials, informing jurisdictional representatives of the project and its benefits. Additional outreach provided briefings for leaders of local community-based organizations, homeowners associations, environmental and air quality organizations, environmental justice organizations, business associations, and local labor.

Early outreach activities indicated that there would be support from business, labor, select state and local elected officials, several neighborhood organizations, and local community leaders. There also was indication of local opposition, primarily from local environmental justice groups.

Although the project never reached the point of submitting a permit application, and thus never entered a public approval process, CHP had briefed most of the local stakeholders likely to be involved in the public review. Special emphasis was focused upon key stakeholders, including adjacent Latino communities, environmental organizations, labor, and the city in which the facility was to be sited. CHP also formed a Latino outreach team and an environmental affairs outreach team, to focus efforts on these respective constituencies.

The project's location was an area of significant industrial activity and adjacent to predominantly minority and lower-income residential neighborhoods. While the project sponsors had focused on the benefits of existing infrastructure minimizing the need for new infrastructure, the addition of another industrial facility in an overburdened area developed into a community concern. Additionally, the local atmosphere was also significantly affected by other sources of emissions, making project-related criteria emissions an air quality concern, despite the benefit of CO_2 emissions reductions.

One unique aspect of the project that received both favorable and negative responses was the use of petroleum coke (pet coke), a by-product of oil refining, as the feedstock fuel. On one hand, processing of pet coke on-site was praised by some, because it would have resulted in reduced port truck traffic, and also would have eliminated the CO_2 emissions from the combustion of pet coke abroad. However, others did not approve of the use of pet coke, or any fossil fuel, in an area already home to several other petrochemical operations, because it was perceived as an overburdening of the local area.

In 2008, the lack of agreement with the operator of the Wilmington oil field resulted in a commercial decision by project sponsors to halt the CHP project. A new partnership was formed to pursue another project, to be sited adjacent to an oil reservoir located in Kern County, California, where there was a stronger interest in the use of CO_2 for EOR operations. This new Hydrogen Energy California (HECA) project is planned to be a 250 MW (net) base load IGCC power plant, also with 90 percent CCS. HECA is currently under public review by the California Energy Commission.

Case Study Experience: Common Themes and Lessons

Although each of the cases presented reflects a unique situation with respect to local community dynamics and site-specific project design, some common themes can be observed. A summary of the key characteristics in each case study is presented in Figure 4, on page 40.

It is evident that effective community engagement cannot happen where the community has the impression—correct or incorrect—that the decision to move forward with a project has already been made without engagement and consultation. A community's real or perceived lack of ability to influence the decisionmaking process is exacerbated when engagement focuses only on one-way information exchanges.

Gaining the trust of the community is key to successful engagement. In the Otway example, trust was gained by emphasizing two-way engagement and establishing a community liaison. In the Wallula case, the project was at first rejected by the local community—probably fruit of the misplaced association of the pilot project with a completely unrelated coal plant, due to an initial lack of information provision—but later reconfigured with more engagement and outreach, and the community supported the revised proposal.

However, if Wallula provides an example of engagement and community involvement in decisionmaking that generates trust and eventual community support, FutureGen 2.0 represents the opposite. Community support for the project was initially strong, but evaporated quickly when key benefits the local community anticipated were unilaterally stripped from the project design.

The Jamestown example highlights the complexities in local relationships. In this case the project developer is the local government, and the lack of trust between some community members and the developer is underscored. Opposition in Jamestown is centered not on CCS technology, but rather on the negative local economic impact for ratepayers, who arguably do not need what is viewed as surplus electricity, and on local opposition to coal.

Communities that already have a substantial industrial presence were once thought to be places where public support for CCS would be easier to gain, compared to sites without existing industry presence. However, in both Barendrecht and Carson, the communities involved respectively felt that having additional environmental risk or one more big industrial plant in the area was not acceptable. Several research projects, including FutureGen and Otway, have benefited from being the first-of-a-kind, but it is worth noting that some communities have opposed research-oriented projects for that very reason. Community engagement is affected not only by the local political and social dynamics, but also by the structure of the engagement process itself.

> ***"Effective community engagement cannot happen where the community has the impression—correct or incorrect—that the decision to move forward has already been made without engagement and consultation."***