

CCS STAKEHOLDER ISSUES REVIEW AND ANALYSIS

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About the CO₂ Capture Project

The CO₂ Capture Project (CCP)

The CO₂ Capture Project (CCP) is a partnership of several major energy companies working together to advance the technologies and to improve operational approaches in order to reduce costs and accelerate the deployment of CO₂ Capture and Storage (CCS). The CCP is dedicated to advancing and sharing the industry's knowledge to ensure that CCS can make a significant impact on CO₂ emissions. CCS has an important role to play in reducing emissions from power plants and heavy industrial processes such as oil and gas refining, gas processing and cement manufacture.

This report is available for download on www.co2captureproject.com



CO₂ Capture Project Phase Three participating organizations

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EXECUTIVE SUMMARY

In 2007, the CO₂ Capture Project undertook a stakeholders' priorities and issues review and analysis. In this study, the CO₂ Capture Project commissioned consultancy Environmental Resources Management (ERM) to update and extend the previous work. More specifically, ERM was asked to:

- Compile and review the full range of issues raised by stakeholders of CCS projects
- Indicate which stakeholder views appear to be most strongly held and identify what drives their sensitivity
- Review existing surveys and studies associated with CCS issues and develop a number of selected case studies in different regions of the world
- Provide perspectives from stakeholders on barriers and gaps associated with addressing these CCS issues from their perspectives

The aim of this work was to identify and analyse the main stakeholder concerns and hot spots and provide an overview of options available to project developers and industry for responding to them. It should be noted that the conclusions drawn here have not been tested directly with the stakeholder groups studied in this report.

The study identified eight key categories of stakeholder's priorities related to:

1. Environmental, Health and Safety Impacts;
2. Awareness and acceptance of CCS;
3. Technical aspects associated with CCS;
4. Commercial and local development benefits;
5. Policy and legal issues;
6. Diversion of resources away from renewable energy;
7. CCS as contributing to positive impacts on climate change;
8. CCS as contributing a negative impact on climate change;
9. Groups with variable positions on CCS and issues of concern.

The following table illustrates the main areas of concern to different stakeholder groups, highlighting those that are the focus of their attention, but also noting the full range of issues that were raised in this study.

Table 1. Areas of concern of different stakeholder groups

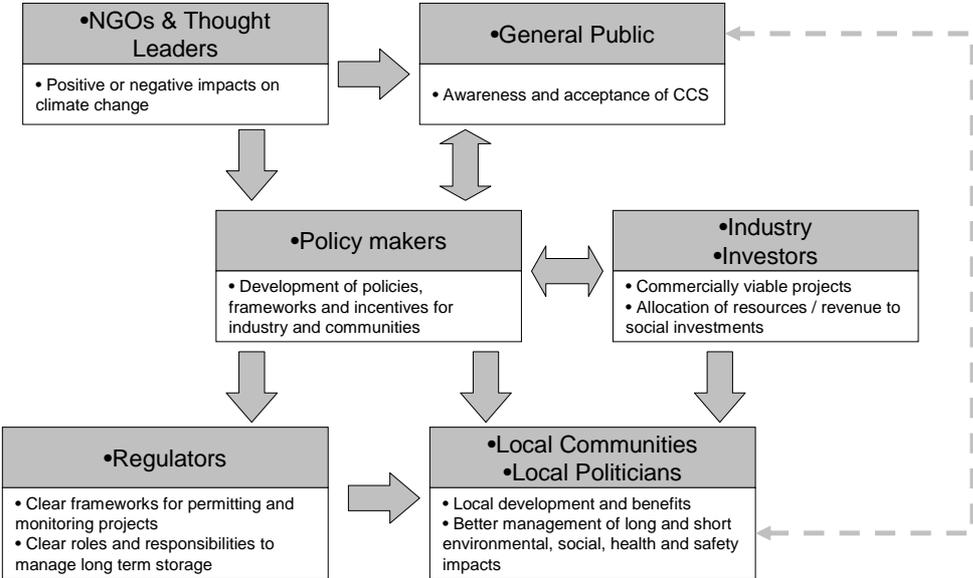
| | EHS Impacts | Awareness & acceptance of CCS | Technical aspects | Commercial & local development benefits | Policy & legal issues | Diversion from renewable energy | Positive impact on climate change | Variable positions on CCS |
|-----------------------------|-------------|-------------------------------|-------------------|---|-----------------------|---------------------------------|-----------------------------------|---------------------------|
| NGOs & Thought Leaders | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| General Public | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Politicians & Policy makers | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Industry | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Local Community | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Regulators | ✓ | ✓ | ✓ | | ✓ | | | |
| Investors | ✓ | ✓ | | ✓ | ✓ | | | |
| Media | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ✓ Focus of interest | | ✓ Issue noted | | | | | | |

The distribution of issues shows that the concerns of NGOs and Thought Leaders, the General Public, and Politicians and Policy makers is focused on climate change, the diversion of resources away from renewable energy projects and associated policy discussions. Local communities and regulators are particularly focused on project related environmental, social and health impacts and benefits. Industry and investors have concerns about project impacts and stakeholder opposition at the project level, and also an interest in the policy debate which may impact the commercial viability of CCS.

The focus of the interests of different stakeholders suggests that there is a continuum of stakeholder interests which are broadly directed at two different outcomes:

- Project / local level discussions associated with management of social, environmental, health and safety impacts, and delivery of local benefits;
- Global level discussions on climate change and the role of CCS.

Figure 1. Global and Local Interactions



Policy makers are at the centre of this continuum as their interest and commitment to CCS in resolving CCS concerns may influence the commitment and support provided to a project in putting in place a regulatory framework and communicating to stakeholder the value of the project.

The most important stakeholders for project development are consistently:

- Policy Makers - National Government;
- Local Community; and
- Regulators.

NGOs, Thought Leaders and the Public, often did not feature as having significant influence for each project. However, it is clear that their interest and level of influence is within the wider climate change debate and the role of CCS in its resolution.

This is not to suggest that project development and the direction of policy discussions on climate change are not linked; indeed emissions targets, carbon taxes and other incentives may make CCS projects commercially viable and facilitate the delivery of local benefits, as companies will have more money to invest in projects. Given these different priorities, management of stakeholder issues in project development and management of stakeholder issues in the broader climate change debate may require different emphases.

At the project level there are two key areas which fundamentally aid in addressing stakeholder concerns: Communication and Engagement and addressing stakeholder issues through the Project Development Process. Key lessons learned at project level are:

- Start early to raise awareness with politicians, regulators and community.
- Educate local government and other community opinion leaders so they can answer questions about the project.
- Aim to build trust by using multiple channels to provide information and involve 'objective' stakeholders such as academics or other independent experts.
- Have good project people on the ground in the community and / or find a good representative from the community who will support the project.
- Understand community specific concerns and answer questions – don't assume what information will be needed.
- Good engagement will not necessarily result in acceptance of CCS – it is not a guarantee of success.

Projects that have successfully responded to stakeholders issues have invested more resources than usual at early stages in project development in order to:

- Demonstrate understanding of the geology, containment and monitoring feasibility to company decision review boards and regulators;
- Assess local capacity to regulate the development of the project and manage long term monitoring and liability issues;
- Identify stakeholder sensitivity, raise awareness of key stakeholder groups and understand and respond to stakeholder concerns;
- Avoid and mitigate social and health impacts or perceptions of health impacts during site selection; and
- Develop mechanisms to deliver community level benefits (a value proposition).

Key lessons learned about communication and engagement with global stakeholders are:

- The role of CCS can be discussed more meaningfully only once people (i.e. the public) have a more balanced and complete understanding of the process itself and what it can offer in the wider context of mitigating climate change; investment in broadening this understanding may be of value.
- It is important to consider the perceived trustworthiness of sources when communicating on the topic, and to take care to build and maintain the public's trust in CCS and its proponents.
- Public opinion could be strongly shaped by the media, which has yet to take a great interest in CCS.
- Working with NGOs to undertake research, or set the scope of research will help ensure studies answers the questions and concerns raised by these groups as well as CCS specialists. It can also help to demonstrate how industry is building its experience and technical capacity in CCS.
- Open and regular engagement with a range of NGOs and thought leading organisations and individuals is advisable in order to maintain an understanding of the variety of views of these stakeholders and changes in their views.

The remainder of this executive summary presents a concise overview of the main stakeholders associated with CCS projects and the issues and concerns they have about CCS based on the findings of the study.

The General Public

Public perception can have a significant influence on the success or failure of major planned projects involving new technologies and structures. If the general public is not supportive of – or is even actively opposed to – a new technology, it can become politically and/or socially unacceptable. Project developers should therefore be mindful of the potential power of the general public (and the media, as discussed below), to ‘make or break’ a new technology (regardless of the scientific basis for doing so).

There are two contextual conditions that serve to support acceptance of CCS. First, climate change should be recognised as a problem; and secondly, a significant reduction in CO₂ should be recognised as the only solution to the problem. An understanding of climate change and the associated need for concerted action can constitute a prerequisite for acceptance and support for CCS and other climate mitigation options by stakeholders.

The lack of knowledge about CCS in the general public could be due to the fact that there is relatively little information on CCS that is designed for the public, and CCS as a concept requires careful explanation. There can also be confusion about the difference between CCS and the broader category of carbon sequestration.

Part of the reason for the lack of general information about CCS, and the consequent lack of understanding about it, is that to date, little interest in the issue has been exhibited by the mass media in most countries.

A lack of general understanding of CCS and acceptance of its application remains a concern for those developing projects. Current perceptions can include that CCS is expensive, risky and perpetuates fossil fuel dependence.

Public understanding of technical aspects of CCS is not as important as trust in those providing information. The public will often trust universities and research institutions more than government or industry.

Local Communities

Local communities can have significant influence on the success or failure of projects. Policy makers, regulators, investors and civil society increasingly advocate for the consultation of local communities and assessment of impacts to communities in the development of major projects. Local communities can also create significant delays to projects, not only by influencing permitting processes, but also by physically restricting activities with demonstrations or blockades if there are significant levels of concern about a project.

Locals can also have direct access to media, giving them the ability to communicate their concerns to a wide audience. The media often cover high-profile aspects of CCS where a project has failed to obtain planning permission due to highly vocal local opposition.

Key insights on local community issues include:

- Concerns vary from place to place but typically involve safety and financial impact;
- It is possible to identify some 'first principles' for engagement which will help to allay some of these concerns at the outset such as amongst others integrating public outreach into project management, conducting and applying social characterisation, developing key messages and outreach material tailored to its audience
- Engagement will not necessarily result in acceptance of CCS;
- Local opposition is an issue with CCS as with other major infrastructure projects;
- Perception of risk may not equate to actual technical risk, but it is still valid;
- Trust is a key determinant of the success of a CCS project;
- The history of a project location is a key determinant of the project's success;
- Demographic characteristics are important factors in acceptance of CCS.

Responses to CCS are very much determined by context. People tend to object less to CCS where they have already got experience of the energy industry or other large-scale industrial processes. By contrast, in cases where opposition occurs, the fossil fuel industry is generally new, and/or does not have a good long-term relationship with local stakeholders. Thus, the history of a given location can predispose people either for or against a project.

Having a value proposition for the local community from the outset of the project is vital. The value proposition needs to be developed to respond to the local context; what works in one area may not be acceptable in another.

CCS can deliver benefits to communities, e.g. if projects pay for CO₂ stored or some enhanced oil recovery revenues are re-invested locally.

Non-governmental Organisations (NGOs)

Many NGOs perceive CCS as a bridging technology, and are neutral or provide support on the condition that it is a step in moving towards a low carbon economy. Conditional support can mean NGOs vary their position from project to project, e.g. supporting CCS with regard to gas-fired power stations, but not with regard to growing reliance on coal-fired power stations.

Other NGOs are still developing their positions on CCS.

Four main positions on CCS have been identified amongst NGOs:

- Positive about CCS and its contribution to addressing climate change
- CCS is a bridge to a renewable future
- CCS may help to provide a bridge but it is an unproven technology
- Against CCS as a technology to support addressing climate change

Key concerns identified amongst NGOs can include:

- Diversion of effort from renewable energy;
- Impact on ecosystems;
- Cost of deployment;
- Threat of leaks;
- Long term economic impacts;
- Continued fossil fuel use; and
- The scale of deployment.

The general public and local communities often identify with or are influenced by NGOs' viewpoints on debates like those surrounding CCS. This makes NGOs a potentially powerful lobby that can be a difficult adversary or a useful ally in project approval.

Polymakers and Politicians

Politicians at all levels are influential stakeholders in the CCS debate. Their support for the technology at large and for specific projects at regional or local level is critical to success, whilst opposition can prove to be very problematic. As policy makers, politicians set the terms under which CCS must operate and can facilitate or hinder its progress accordingly.

At local level, politicians can distance themselves from a proposed CCS project if they sense public opposition, even if their party is officially supportive of CCS at national level. It is important to develop good relationships with local politicians to try and understand their comfort with or concerns about CCS, and if possible help to avoid politicising a project.

Projects take many years to develop, so proponents should therefore engage politicians and policy makers early to help manage risks associated with government approval.

Regulators

Regulations of relevance to CCS are often not clear cut. Some jurisdictions have enacted or are working on legislation to clarify the ownership and stewardship aspects of underground pore space for CO₂ storage sites and for transfer/management of long-term liability. There are other regulatory issues beyond pore space and liability which must be dealt with as well.

Where there is a lack of regulations, the expectations of a regulator can be unclear and unpredictable. This creates uncertainty which may result in delays or complications. The fact that legislation and regulation governing CCS is still not clear cut in many contexts and countries is a problem for the regulator seeking to manage projects in this area. Governments need to develop comprehensive regulatory frameworks for CCS, and they need to support the regulator to build capacity to regulate CCS.

Investors

Fundamentally, CCS projects should not present a greater or lesser risk to investors than other infrastructure projects. Typical financial community issues will include:

- The commercial viability of CCS as an investment and potential provision of incentives for industrial deployment of CCS;
- Reputational risks when CCS is associated with coal fired power stations or because of CCS elements; and
- The extent to which employment of CCS will support a bank's climate change and energy policies.

The acceptability of a project including CCS elements to local and other stakeholders is important to investors who want to avoid financing a technology that proves to be socially or politically unacceptable. Investors will expect that these reputation risks are effectively managed by the developer. Therefore, banks will seek to understand how a project is managing stakeholder related issues as part of their investment decision-making process.

Different investors have different drivers for investment:

- Government is an important investor as CCS is often not a commercially viable; government willingness will be linked to the position of policy makers;
- Multi-lateral banks and export credit agencies may provide investment, or facilitate funding in line with international and regional policy objectives;
- Commercial banks will invest in CCS where it supports the banks' internal policies;
- Industry will invest for research and development and where CCS will be commercially viable, for example where CCS can be tied to enhanced oil recovery.

Where banks do have energy and climate change policies they may see value in:

- Project finance for activities like CCS that significantly reduce emissions;
- Corporate finance to companies that demonstrate a willingness and commitment to implementing CCS in order to reduce CO₂ emissions.

Regional Differences

Analysis at a country/region level does not appear to provide an accurate indicator of overall stakeholder views on CCS and associated sensitivity. Sensitivity will be context and location specific reflecting a number of factors including amongst others location, population density, historic issues / circumstances. In this sense, the study reflects common conclusions on broad stakeholder views however, this is not to suggest that all stakeholder groups across the world will hold the same positions described in the following sections.

Finally, although much of the literature reflects upon negative experiences, it should be noted that there are examples of more positive stakeholder responses to CCS, particularly in Alberta, Canada.

PREFACE & ACKNOWLEDGEMENTS

This report has been prepared for Phase 3 of the CO₂ Capture project (CCP3) by Environmental Resources Management Limited (ERM) over the period June – November 2011.

The primary objective of the CO₂ Capture project (CCP) is to develop new, breakthrough technologies to reduce the cost of CO₂ separation, capture, and geologic storage from combustion sources such as turbines, heaters, and boilers. The CCP also has a parallel work stream exploring 'softer' issues relating to Policies and Incentives around CCS activities. Following the assessment of CO₂ capture technologies in Phase 1, and development of the most promising of these in Phase 2, Phase 3 of the CCP aims to support an industrial-scale demonstration of some CCP2 technologies, which would be a major step towards commercial deployment.

This study provides an update on a number of important stakeholder issues pertaining to CCS capture, transport and storage activities that are of particular interest to the CO₂ Capture project this year. The aim of the report is to identify and analyse the main stakeholder concerns and hot spots. ERM has made every effort to draw upon prior and ongoing work on this topic in order to avoid duplication and take into account the information gathered and conclusions reached by others in this area. ERM has also conducted its own interviews of industry experts and performed its own analysis in preparing this report.

1 INTRODUCTION

1.1 OBJECTIVES

Public and stakeholder acceptance is seen as critical to the success of carbon capture and storage projects. The primary focus of the work is to outline industry perspectives and experience with CCS stakeholder issues.

The objectives of this study are to:

- Undertake a review of important CCS stakeholder issues to reflect the full range of issues raised, indicate which views appear to be most strongly held and identify what drives their sensitivity;
- Review existing, and to the extent possible ongoing, surveys and studies associated with CCS issues and develop a number of selected case studies;
- Provide perspectives from stakeholders on barriers and gaps associated with addressing these CCS issues from their perspectives, and options available to industry for responding to them.

It should be noted that the conclusions drawn have not been tested with the stakeholder groups studied in this report.

1.2 STAKEHOLDER GROUPS STUDIED

Stakeholders are defined as persons or groups that are directly or indirectly affected by a project, as well as those that may have interests in a project and/or the ability to influence its outcome, either positively or negatively.

CCS offers a potential technical solution for mitigating the climate impacts of fossil-fuel combustion and the release of carbon dioxide during oil and gas production or processing. However, there are potential risks either perceived or real that are directly and indirectly associated with its widespread use. Thus, stakeholders develop opinions and assert views that that can inform and influence critical decisions on CCS projects.

This study has grouped stakeholders into the following types in order to understand differing positions and levels of influence between them:

- General public;
- Local communities near to proposed CCS sites;
- Non Governmental Organisations (NGOs);
- Thought leaders in energy and environment;
- Politicians and policy makers – international, national and local;
- Regulators – national and local;

- Industry (companies and associations); and
- Investors (lenders and financial analysts).

While not a stakeholder in the true sense of the word, the media in all its forms has a critical role to play in the CCS debate and it is considered in the analysis of the issues.

Depending on the nature and context of a CCS project, some or all of the above stakeholders will be influencing its viability and without stakeholder acceptance, CCS projects risk being seen as technically feasible but unrealistic or unacceptable climate change mitigation options.

1.3 *APPROACH*

1.3.1 *Overview*

In order to achieve a representative, coherent and relevant understanding of the range of key stakeholder issues associated with CO₂ capture and storage, ERM adopted a practical approach for the development of this study by:

- Undertaking a review of existing literature to draw on previous practical experiences of individuals and organisations who have been involved with CCS projects;
- Utilising ERM's full range of in-house knowledge of major energy infrastructure projects and deep understanding of the stakeholder issues that they pertain combined with aspects of existing and emerging CCS regulations; and
- Engaging with industry stakeholders to understand lessons learned on addressing stakeholder issues in the countries studied and developing project specific case studies.

1.3.2 *Literature Review*

There are a number of research institutions and networks focused on CCS, many of which have conducted some in-depth studies on stakeholder perceptions of CCS and strategies for stakeholder engagement. They have identified and analysed some of the main issues surrounding CCS as perceived by different stakeholder groups. *Table 1.1* provides an overview of institutions researching CCS.

To avoid duplication wherever possible, ERM reviewed the main research institutions and networks working on stakeholder issues, and the most significant studies conducted in recent years (see *Table 1.1* and *Table 1.2*), including the 2007 CCP report *Public Perception of Carbon Dioxide and Storage*. More detail on the institutions and networks listed here can be found in *Table*

1.1. An overview on the scope of the studies reviewed can be found in *Table 1.2* and more detail in *Annex A*.

The literature review also included a review of websites of selected NGOs in order to ascertain their positions and issues regarding CCS.

The literature did not address in depth the concerns of potential investors from financial institutions. In order to better understand the perspectives of potential CCS project investors, ERM interviewed a couple of representatives from financial institutions to supplement the literature review.

In order to help focus the study, the CCP3 P&I team suggested that the geographical scope of the study address the following countries and regions:

- Australia
- Brazil
- Canada
- EU
- US

ERM has followed these geographical priorities in its work, while also taking into account broader trends and issues which may be driven by factors other than country location. Please note that ERM has only been able to access limited information specific to CCS and stakeholder issues in Brazil.

Table 1.1 *Overview of institutions researching CCS stakeholder issues*

| Name of institution | Areas of research | Status of operation |
|--|---|-----------------------------------|
| <i>Global level</i> | | |
| Global CCS Institute | Aims to inform and influence domestic and international low carbon policies and at the same time work towards increasing awareness and benefits of CCS as a low carbon technology. It also supports the commercialisation of CCS by advancing understanding of funding and risk whilst developing specific project solutions for early movers in the field. | Set up in 2009. Still operational |
| <i>Regional level</i> | | |
| European CCS Demonstration project Network | Established by the EU to coordinate the world's first network of CCS demonstration projects. The Network allows early-movers to exchange information and experience from large-size industrial demonstration of the use of CCS technologies, to maximise their impact on further R&D and policy making, and optimise costs through shared collective actions. | Still operational |

| Name of institution | Areas of research | Status of operation |
|--|--|--|
| Acceptance of CO ₂ Capture, Storage Economics, Policy and Technology (the ACCSEPT project) | Aimed to measure EU social acceptance; assist with the establishment of CCS guidelines for the EU Emission Trading System; and identify and address gaps in existing socio-economic studies. Funded by the DG Research of the European Commission under the Sixth Framework Programme. | Completed in December 2007 |
| New Participation and communication strategies for neighbours of CO ₂ capture and storage operations (NEARCO ₂) | Aimed to develop effective strategies for effective communication to stakeholders and the general public about risks and advantages of CCS; and to involve stakeholders and the public in local decision-making on CCS projects. Sponsored by DG Research of the European Commission under the Seventh Framework Programme | Ran from April 2009 until the end of June 2011 |
| Carbon Capture and Storage Social Research Network (C2S2RN) | Aims to foster the conduct and dissemination of social science research related to CCS in order to improve understanding of public concerns as well as improve the understanding of the processes required for deploying CCS projects. Formally organised after a pre-meeting of researchers and sponsored by the then UK DTI (now BERR). Now housed by IEAGHG | Set up in January 2006. Still operational |
| <i>National level</i> | | |
| Carbon Capture & Storage Association (CCSA) – UK | Industry association which works to raise awareness, both in the UK and internationally, of the benefits of CCS as a viable climate change mitigation option, and the role of CCS in moving the UK towards a low-carbon economy | Set up in 2006. Still operational |
| Regional Carbon Sequestration Partnerships – USA | Seven public/private partnerships comprised of more than 400 organizations covering 43 states and four Canadian provinces. The RCSPs include representatives from state and local agencies, regional universities, national laboratories, non-government organizations, foreign government agencies, engineering and research firms, electric utilities, oil and gas companies, and other industrial partners. | Set up in 2003. Still operational |
| The Commonwealth Scientific and Industrial Research Organisation (CSIRO) – Australia’s national science agency | CSIRO is currently involved in Australia’s largest underground CO ₂ storage project, The Cooperative Research Centre for Greenhouse Gas Technologies (CO ₂ CRC) Otway project, located in south-west Victoria, Australia | Still operational |

| Name of institution | Areas of research | Status of operation |
|--|--|---------------------|
| Integrated CO ₂ Network - ICO ₂ N | <p>ICO₂N is group of Canadian companies representing multiple industries, including coal and the oil sands. All ICO₂N member companies have a strong interest in and a commitment to develop Carbon Capture and Storage (CCS) in Canada.</p> <p>ICO₂N has completed extensive technical, economic and policy analysis on CCS, and developed an economic model of large-scale CCS in Canada.</p> <p>ICO₂N works with multiple levels of governments, industry partners, academia and environmental organizations to advance CCS, and is an advocate for the development of integrated CCS infrastructure.</p> | Still operational |
| <i>Industry Groups</i> | | |
| CO ₂ Capture project - CCP | <p>The primary objective of the CO₂ Capture project (CCP) is to develop new technologies to reduce the cost of CO₂ separation, capture, and geologic storage from combustion sources such as turbines, heaters, and boilers. The CCP also explores issues relating to Policies and Incentives around CCS activities.</p> <p>Following the assessment of CO₂ capture technologies in Phase 1, and development of the most promising of these in Phase 2, Phase 3 of the CCP aims to support an industrial-scale demonstration of some CCP2 technologies, which would be a major step towards commercial deployment.</p> | Still operational |

| Name of institution | Areas of research | Status of operation |
|-------------------------------------|---|---------------------|
| MIT Carbon Sequestration Initiative | <p>Since 1989 the Carbon Capture and Sequestration Technologies Program at MIT has conducted research into technologies to capture, utilize, and store CO₂ from large stationary sources. A major component of the program is the Carbon Sequestration Initiative, an industrial consortium launched in July 2000.</p> <p>The initiative research examines carbon sequestration from multiple perspectives, including technical, economic, and political. Current research interests include technology assessments, economic modelling, analysis of regulatory and political aspects, and development of a Carbon Management Geographic Information System (GIS).</p> <p>The initiative also has a commitment to stakeholder outreach and education and holds an annual Carbon Sequestration Forum and participates in the IPCC Special Report on Carbon Dioxide Capture and Storage and the Carbon Sequestration Leadership Forum.</p> | Still operational |

The main studies reviewed for this research are detailed in *Table 1.2*.

Table 1.2 *Literature reviewed for this report*

| Title and author of study | Date | Region covered | Issues covered | Stakeholders covered |
|---|---------------|---|---|----------------------|
| Public Awareness and Acceptance of CCS, survey by Eurobarometer | May 2011 | 12 EU nations: Germany, United Kingdom, Italy, Spain, the Netherlands, Poland, Finland, France, Greece, the Czech Republic, Bulgaria and Romania. | Levels of awareness of climate change and CCS, CO ₂ and electricity production. The future of CCS in Europe. | General public |
| Public perceptions of CCS, by NEARCO ₂ | November 2010 | UK, the Netherlands, Poland, Germany, Belgium and Spain | Ways of delivering information to the public on CCS (in Europe) and the impact that different approaches have on their perceptions. | General public |

| Title and author of study | Date | Region covered | Issues covered | Stakeholders covered |
|--|----------------|--|---|--|
| Carbon Capture and Storage Communication Workshops, by C2S2RN | September 2007 | UK, Australia, the Netherlands, USA, Canada, Japan and France | Communication about CCS | General public, local communities, NGOs |
| Stakeholder Perceptions of CO ₂ Capture and Storage in Europe, by the ACCSEPT project | April 2007 | UK, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Spain, Sweden | Stakeholder perceptions of CCS | General public, government, media, NGOs, companies |
| Communication, project planning and management for carbon capture and storage projects: An international comparison, by CSIRO for the Global CCS Institute | 2011 | The Netherlands (Barendrecht), USA (Carson and FutureGen), Australia (ZeroGen and CO ₂ CRC) | Comparison of public communication and outreach practices associated with large scale CCS projects | Mainly general public |
| Public engagement: lessons learned in 2010, by the European CCS Demonstration project Network | 2010 | Poland, Spain, UK, Germany, Italy, Netherlands | Public engagement activities and lessons learned in six European case studies | Mainly general public |
| Public Perception of Carbon Capture and Storage Technology, by Bielicki, J. and Stephens, J. | 2008 | USA | Risk communication and public perception of CCS | Mainly general public |
| Communicating the risks of CCS, by CSIRO for the Global CCS Institute | 2011 | Non-specific | Risk communication and public perception of CCS | Mainly general public |
| Public Acceptance Challenges for Onshore CO ₂ Storage in Barendrecht, by Kuijper, M. | 2010 | The Netherlands | Key elements of a comprehensive public acceptance strategy, and analysis of what went well and what didn't go well on the Barendrecht project | Local communities |

| Title and author of study | Date | Region covered | Issues covered | Stakeholders covered |
|--|-------------------|--|---|--|
| Public Perception of Carbon Dioxide Capture and Storage: Prioritised Assessment of Issues and Concerns, by the CO ₂ Capture project | Undated (c. 2006) | North America, Europe, Australia and New Zealand, Japan, China, India and South Africa | Assessment of perceptions and issues affecting the deployment of CCS. Recommends strategies to address those issues and to develop regulatory and policy frameworks for CCS | NGOs, Public, Government, Industry, and Research and Development Organisations |
| Towards a public engagement and communication strategy for CO ₂ Capture and Storage projects in Scotland, by Hammond, J. and Shackley, S. | 2010 | Scotland, plus wider literature review | Best practice in public engagement and outreach on CCS | Local communities, politicians, NGOs |
| Brazil CCS Roundtable Summary, by OECD/IEA | 2009 | Brazil | Financing, regulatory issues, public awareness | General public |
| Understanding and Improving NGO Positioning on CCS, by Anderson, J. and Chiavari, J. | 2008 | Non-specific | NGO positioning on CCS | NGOs |

1.3.3 *Industry Perspective Case Studies*

Industry cases studies have been developed to:

- Identify the priority issues that affect stakeholder decision-making and attitudes towards CCS;
- Discuss what worked and what did not in how the project were developed
- Understand lessons learned.

The findings from case studies were used to complement the literature in ERM's analysis.

In developing industry perspective case studies ERM was guided by the geographical scope ⁽¹⁾. Case studies were developed through a combination of literature review (where publicly available information about stakeholder issues on a specific project was available) and through interviews with project representatives. Case studies were developed on the following projects:

(1) Due to practical constraints it was not possible to develop a Brazilian project case study.

- Quest (Canada);
- Future Gen 2.0 (USA);
- Barendrecht (EU);
- In Salah (Algeria);
- Gorgon (Australia).

Detailed results from these case studies are not provided due to confidentiality reasons. ERM has used the outcomes, broad conclusions and key lessons learned from the case studies to provide a consolidate view of the main findings.

1.3.4 *Limitations*

The scale and scope of the study is industry perspectives on stakeholder views and the literature review. Conclusions have not been tested with the stakeholder groups studied in this report.

The majority of case studies related to CCS associated with oil and gas projects, so results may reflect stakeholder perspectives in this project context rather than a power sector context.

The majority of the literature reviewed relates to the European context, which may be reflected in findings.

1.4 *REPORT STRUCTURE*

The remainder of this report is structured as follows:

- *Section 2: Literature Review* - presents an overview of issues and areas of concern relating to CCS from different stakeholder groups, drawing on the findings of the literature review. It provides suggestions as to possible actions in response to these concerns.
- *Section 3: Case Studies* presents the case studies researched for this report, including background information on each project, an overview of the main stakeholder groups and issues raised during the project and lessons learned.
- *Section 4: Analysis and Conclusions* draws together the conclusions and lessons learned through the literature review and case studies and presents ERM's analysis and conclusions.

2.1

INTRODUCTION

This section presents an overview of the main stakeholders associated with CCS projects and the issues and concerns they have about CCS based on the findings of the literature reviewed. It also includes an analysis by ERM of each stakeholder group's level of influence and identifies possible responses, or management/communication strategies, for addressing some of the issues.

It should be noted that existing research in the area of stakeholder opinions and perceptions of CCS has been mostly restricted to the general public, local communities and, to a limited extent, NGOs, politicians and regulators. The sections which deal with other stakeholder groups are therefore based on what is available in the literature and ERM's understanding of the issues.

This section reflects common conclusions on stakeholder views identified through the literature review; however, this is not to suggest that all stakeholder groups across the world will hold the positions described in the following sections. Much of the literature reflects upon negative experiences, but it should be noted that there are examples of more positive responses to CCS, particularly in Alberta, Canada.

2.2

GENERAL PUBLIC

2.2.1

Stakeholder definition and level of influence

The general public is defined as those that do not have a special type of knowledge, do not represent a particular organisation in this context and are not specifically or directly impacted by activities associated with CCS.

Public perception can have a significant influence on the success or failure of major planned projects involving new technologies and structures. If the general public is not supportive of – or is even actively opposed to – a new technology, it can become politically and/or socially unacceptable. This was seen clearly, for example, in the case of genetically modified foods, which became the subject of intense media coverage and political debate in the UK and elsewhere in the late 1990s/early 2000s and stirred up considerable public hostility resulting in part of the food industry withdrawing the use of GM ingredients. Project developers should therefore be mindful of the potential power of the general public (and the media, as discussed below), to 'make or break' a new technology (regardless of the scientific basis for doing so).

The literature reviewed reveals a number of issues surrounding the general public's understanding of climate change and CCS, as well as some key areas of concern expressed by this stakeholder group on these topics. These are:

- Understanding of climate change and its causes is not widespread;
- There is a lack of awareness of, and information about, CCS;
- The general media has not shown great interest in CCS;
- CCS is perceived to be expensive, risky and to perpetuate the dependence on fossil fuels; and
- Trust is critical in obtaining acceptance of CCS.

These issues are discussed in more detail below.

Understanding of climate change and its causes is not widespread

The research highlights that there are two contextual conditions that serve to support acceptance of CCS. First, climate change should be recognised as a problem; and secondly, a significant reduction in CO₂ should be recognised as the only solution to the problem⁽¹⁾. An understanding of climate change and the associated need for concerted action can constitute a prerequisite for acceptance and support for CCS and other climate change mitigation options by stakeholders and society as a whole.

Research has shown that people's perception and awareness of climate change is varied (see *Box 2.1*) and in recent years (post COP15) there has been a shift away from climate change as being *the* most critical environmental issue, with most people concerned about food security, water, energy and population.

Box 2.1

Awareness of climate change in the EU

The Eurobarometer Survey on Public Perceptions, which was conducted across 12 EU Nations in 2011, found that just under half (49%) of respondents felt well informed about the causes and consequences of climate change. In only five countries more than half of the population considered themselves well informed: the Netherlands (72%), the UK (66%), Finland (64%), France (57%) and Germany (55%). At the other end of the spectrum, people in Romania and Bulgaria felt least well informed about the causes of climate change (25% and 26% respectively).

In the UK, research shows that although climate change scepticism remains a minority view, most people occupy an inactive 'middle ground', with only a minority (20%) actually believing that climate change is a problem that needs to be acted upon.⁽²⁾

(1) Public Acceptability of CCS, The Accsept project, July 2006

(2) CCSA Public Perceptions Workshop 17 May 2011 - Event Report, May 2011

- This picture implies that there is considerable work to do in terms of ‘setting the scene’ for CCS – that is, raising people’s awareness of climate change as a problem, after which CCS as a potential solution can be discussed.

There is a lack of awareness of, and information about, CCS

Just as awareness of climate change as a problem is a necessary precondition to acceptance of possible solutions, so an accurate understanding of CCS and its potential to combat climate change is critical to the uptake of the technology around the world.

Research has shown that public awareness and understanding of CCS both as a process and as a low carbon technology is generally very low (see Box 2.2), even in countries where CCS projects are taking place. There are also misconceptions about the safe transport and storage of CO₂, and the role CCS will play in a broader response to climate change.

Box 2.2

CCS awareness levels around the world

Within the 12 EU nations surveyed as part of the Eurobarometer Survey on Public Perceptions, only 10% of respondents had heard of CCS and knew what it was, compared to 58% who had heard of solar PV. A further one in five (18%) had heard of it but did not really know what it was. The same conclusions were echoed by the Accsept project⁽¹⁾ which concluded that awareness of CCS was generally low in Australia, Canada, Japan, Netherlands, Sweden, United Kingdom and United States. Even in six countries where there is a major EU co-financed CCS project, just under nine out of ten (88%) said they had not heard of the project. The exception to this is the Netherlands, where more than 50% of people had heard of CCS and knew what it meant, while in Barendrecht (the location of the project), this figure rose to 96%. Several of the interviewees in the Otway Case Study⁽²⁾ in Australia also noted that their knowledge of CCS had been gained as a direct result of involvement in the CO₂CRC Otway project.

The lack of knowledge about CCS could be due to the fact that there is relatively little information on CCS that is designed for the public, and CCS as a concept requires careful explanation. There can also be confusion about the difference between CCS and the broader category of carbon sequestration.

- The role of CCS can be discussed more meaningfully only once people have a more balanced and complete understanding of the process itself and what it can offer in the wider context of mitigating climate change.

The general media has not shown great interest in CCS

Eurobarometer showed that most people in the EU get their information about climate change and CCS from the mass media (see Box 2.3).

(1) Public Acceptability of CCS, The Accsept project, July 2006

(2) Case Study of the CO₂CRC Otway project, November 2010

The overwhelming majority indicated that television was the most usual source, mentioned by over eight in ten (81%). Newspapers were cited by less than half (44%) of respondents, whilst over a third (32%) mentioned the Internet. Interestingly, 2% mention the Internet and no other information source. Again, these averages vary by country. In the Netherlands, for example, 70% of respondents cited newspapers as their primary information source compared to 22% in Romania. In Finland, 52% of respondents cited the Internet as their primary information source compared to 22% in Bulgaria.

Source: Eurobarometer Survey 2011

Part of the reason for the lack of general information about CCS, and the consequent lack of understanding about it, is that to date, little interest in the issue has been exhibited by the mass media in most countries. Proceedings of the CCSA Public Perception Workshop indicate that in the UK, the Guardian and other newspapers are interested in covering CCS, but only when there is something 'new' to report, e.g. new bits of kit being brought into the market, new projects being introduced or technological advances being realised.

However, the media do cover high-profile aspects of CCS where a project has failed to obtain planning permission or NGOs campaign against a specific project. If journalists do not have a feel for the broader issues surrounding CCS and its potential role in combating climate change, then they are less likely to be able to present a balanced case and offer a broader perspective.

When CCS is covered by the media, the positive aspects usually discussed are the impact of continued use of coal-fired generation without CO₂ emissions, contribution to energy security and facilitating an alternative to nuclear power, while the negative attributes include costs, unproven technology, concerns about storage capacity and technical concerns including safety.

- Public opinion on CCS could be strongly shaped by the media. As such, efforts should be made to educate the media about the technology and its potential contribution to combating climate change.

People perceive CCS to be expensive, risky and perpetuating fossil fuel dependence

Opposition to CCS on cost grounds is often linked to a lack of understanding of the high costs associated with any large infrastructure project, and (to an even greater extent) the costs associated with economic decarbonisation and climate change impact⁽¹⁾. Public perception of CCS on economic grounds, where it exists at all, can also be influenced to a certain degree by the type of project, whether heavy investments are needed exclusively for the project and especially if public money will be spent on it.

(1) Ibid.

Lack of familiarity with CCS, for the reasons outlined above, reinforce the general perception of CCS as an ‘unproven’ technology. There is concern around the risk of storage and leakage, especially in the long-term (where no prior cases of long-term CCS can be drawn upon) ⁽¹⁾.

The Global CCS Institute’s Public Engagement Strategy notes that at present most stakeholders (including government institutions and NGOs) are somewhat sceptical of the role of CCS; this is echoed by the NEARCO₂ study.

The most common question revolves around the ‘burying of CO₂’, when it would make more sense to stop creating the emissions in the first place. As NEARCO₂ puts it, “CCS was generally seen as an uncertain, end-of-pipe technology that will perpetuate fossil-fuel dependence.” Instead of seeing CCS as a ‘bridging technology’ to cover the transition to renewable energy supply, as well as the only low carbon option for many industries including steel and cement producers, many people in Europe and elsewhere perceive it to be in direct competition with renewables.

There are also wider objections around the fact that CCS allows the burning of coal to continue, and around the technology’s perceived alignment with the economic (as opposed to environmental) interests of the coal industry. The perception that the highly profitable fossil fuel industry is receiving public money to solve a problem they caused themselves can lead to public mistrust.

- These perceptions could be addressed as part of a concerted awareness raising campaign if CCS is to be accepted more widely.

Trust is critical in obtaining acceptance of CCS

Experience in the USA suggests that public understanding of technical issues is not as important as is commonly believed by industry and government ⁽²⁾. Rather, public trust in the developer, regulators and government to deliver truthful information, operate a fair decision process, be accountable and treat the public fairly in the distribution of economic benefits is most important when engaging with the general public as well as the local communities over CCS projects.

The Global CCS Institute, as part of its Public Engagement Strategy ⁽³⁾, suggests that the general public usually take their cues from trusted, influential sources who win this trust and influence by presenting them with information based on a balanced set of facts. This balance helps build credibility as well as providing reassurance. It is also essential when disseminating information to a potentially sceptical audience which might

(1) Strategies of communication and effective engagement in CCS projects: Results of the European NEARCO₂ project (2011). NearCO₂ project Workshop, June 23rd, London.

(2) Towards a public communication and engagement strategy for carbon dioxide capture and storage projects in Scotland, October 2010

(3) Public Engagement Strategy, Global CCS Institute (no date available)

misconstrue overtly positive messaging about CCS as suspicious and become hostile quickly, thus exacerbating the situation and causing costly delays at a project level.

Levels of public trust in different information providers in the EU are shown in *Box 2.4*.

Box 2.4 *Public trust in different information providers*

The Eurobarometer Survey found that for provision of information about CO₂ storage, universities and research institutions were the most trusted, just under half (45%) trusted them. Just under a third (31%) trusted NGOs whilst just under a quarter trusted journalists (24%). The regional and local authorities are named by 23 % of respondents, the national governments by 20 % and the European Union by 14 % as trustworthy to provide information on CCS.

However, this trust can be lost when it is thought that key information is being withheld, the public's concerns are not being taken seriously and/or risks are not being thoroughly assessed. ⁽¹⁾ As discussed in the case of FutureGen ⁽²⁾, public trust is fragile and once lost, any constructive dialogue can become increasingly difficult with positions becoming polarised.

- It is important to consider the perceived trustworthiness of sources when communicating on the topic, and to take care to build and maintain the public's trust in CCS and its proponents.

2.3 *LOCAL COMMUNITIES NEAR TO PROPOSED CCS SITES*

2.3.1 *Stakeholder definition and level of influence*

Local communities are those that might be directly impacted by any element of a specific CCS project, and their representatives.

Local communities can have significant influence on the success or failure of projects. Policy makers, regulators, investors and civil society increasingly advocate for the consultation of local communities and assessment of impacts to communities in the development of major projects. Local communities can also create significant delays to project, not only by influencing permitting processes, but also by physically restricting project activities with demonstrations and blockades if there are significant levels of concern about a project. Locals can also have direct access to media, giving them the ability to communicate their concerns to a wide audience.

(1) Public engagement and CCS
Why, how, when and with whom?, March 2011

(2) FutureGen Case Study, November 2010

Local communities and their responses to CCS have been well documented by the literature. It reveals a number of areas of concern expressed by this stakeholder group, as well as other issues arising. These include:

- Community concerns vary from place to place, but typically encompass safety and financial impact issues;
- It is possible to identify some 'first principles' for engagement which will help to allay some of these concerns at the outset;
- Engagement will not necessarily result in acceptance of CCS;
- Local opposition is an issue with CCS as with other major infrastructure projects;
- Perception of risk may not equate to actual technical risk, but it is still valid;
- Trust is a key determinant of the success of a CCS project;
- The history of a project location is a key determinant of the project's success; and
- Demographic characteristics are important factors in acceptance of CCS.

These are discussed in more detail below:

Community concerns vary from place to place, but typically encompass safety and financial impact issues

Naturally, there is some variation in the specific concerns expressed by communities faced with the prospect of a CCS project taking place nearby. However, typically these encompass concerns around safety (especially leakage and the viability of long-term storage, as well as potential impact on subsidence), pollution, environmental justice, perpetuation of dependence on fossil fuels, property prices, traffic implications, compulsory land purchase and compensation issues ⁽¹⁾.

Of these concerns, those relating to safety seem to be ubiquitous among communities near to proposed CCS sites. To some extent this is connected to a lack of understanding of the technology, and of the nature of CO₂ (there is a widespread misapprehension that it may be flammable and/or explosive) ⁽²⁾.

- The list of concerns likely to be raised by communities can largely be anticipated based on others' experience, with safety issues paramount. All should be dealt with sensitively and respectfully, regardless of the technological case for concern.

(1) Carson CCS project case study 2010, CO2CRC Otway project case study, 2010

(2) Upham, P. and Roberts, T. (2010). Public perceptions of CCS: the results of the NearCO2 European Focus Groups.

Available online at:

http://www.communicationnearco2.eu/fileadmin/communicationnearco2/user/docs/Near_CO2_WP4_report_final.pdf

- It is important to clarify the nature of CO₂ and thereby allay some of the key safety concerns raised by communities.

It is possible to identify some 'first principles' for engagement which will help to allay some of these concerns at the outset

The literature reviewed covered the experience of a number of different case studies around the world, which provided valuable 'lessons learned' for engagement. These are summarised most effectively by the European CCS Demonstration project Network, which covered six European countries (see Box 2.5); but they are borne out by other case studies such as Carson in the US and Ottway in Australia.

Box 2.5

Best practice for public outreach and education on CCS

- **Integrate public outreach into project management** - All projects should have integrated public engagement into project management. Close collaboration between technical staff and communications staff is important.
- **Establish a strong outreach team** - Competences include communications and public engagement, but also public and regulatory affairs, permitting, knowledge dissemination, fund agreement management.
- **Identify key stakeholders** - Including NGOs, local and regional governments, regional business platforms, national government, media, knowledge institutes.
- **Conduct and apply social characterisation** - Including research into regional, socio-economic and historical factors, awareness of the role of CO₂, perceptions regarding CCS technology and acceptance of the project and attitudes towards available solutions.
- **Develop an outreach strategy and communication plan** - Built based on a dialogue with stakeholders, involvement with independent messengers, flexibility in approach and alignment with corporate communication.
- **Develop key messages** - Focussed on abating climate change.
- **Develop outreach material tailored to audience** - Including a large variety of materials and activities checked by both technical and communications professionals.
- **Actively oversee the outreach throughout the life of the CO₂ storage project**/monitor the performance of the programme and changes in public perceptions and concerns. Monitoring the progress of communication activities (including media activities) is important to anticipate changes in opinions or behaviours.
- **Be flexible, refine the outreach** - It is wise to adopt a flexible approach that draws on experiences as well as evolves using the eyes and ears in the community.

Source: Experiences and lessons learned - European CCS Demonstration project Network, 2010

Risk communication theory can also offer some useful insights into how to approach communication in relation to CCS. According to C2S2RN, questions frequently asked after disasters often contain great similarities, and similar themes can be expected about CCS (see Box 2.6).

Questions frequently asked after disasters often contain great similarities:

- Many concerns and questions that upset people can be predicted in advance;
- When people are stressed or upset, they typically want to know that you care before they care what you know.
- When people are stressed or upset, they often have difficulty hearing, understanding and remembering information.

Similar themes can be expected about CCS:

- Factual: What happens to the CO₂ once you inject it?
- Emotional: How can we trust it will be safe?
- Challenge: What about today's problems? How does capturing CO₂ from a coal plant help kids with asthma?

Source: *Carbon Capture and Storage Communication Workshops, C2S2RN, 2007*

- Draw on others' experience to develop a communications strategy which anticipates many of the questions likely to be raised and the concerns likely to be expressed.

Engagement will not necessarily result in acceptance of CCS

It is important to realise at the outset that engagement will not necessarily result in a positive outcome for a CCS project developer, even when it is conducted according to prevailing best practice recommendations.

Some studies have shown that participants in focus groups tend to become more supportive of CCS technology once they are provided with basic information and a better sense of the overall context of the problem⁽¹⁾. However, this is not always the case: in the NEARCO₂ Study, opinions on CCS moved from being 'undecided' to negative following engagement and dialogue in focus groups⁽²⁾.

Unfortunately, NEARCO₂ also states that "studies rarely reveal exactly what aspects of information motivate participants to change their opinion". Nonetheless, there is some indication that a key factor in obtaining support for CCS is ensuring that stakeholders feel they can trust the source(s) providing the information (see discussion about trust in *Section 2.2.2*).

- Be prepared to accept that true engagement is not a guarantee of success – it is a two-way dialogue which will sometimes result in a project being rejected.

(1) SPECIAL EUROBAROMETER 364, Public Awareness and Acceptance of CO₂ capture and storage Report, May 2011

(2) Upham, P. and Roberts, T. (2010). Public perceptions of CCS: the results of the NearCO₂ European Focus Groups.

Available online at:

http://www.communicationnearco2.eu/fileadmin/communicationnearco2/user/docs/Near_CO2_WP4_report_final.pdf

Local opposition is an issue with CCS as with other major infrastructure projects

As with any major infrastructure project, local communities often operate from a position of self-interest when it comes to CCS. As long as the gas fields or other infrastructure are not located in the vicinity of their houses or communities, people are much less likely to become actively involved with, or opposed to, a project. This fact is clearly demonstrated by the experience of the Barendrecht Case Study ⁽¹⁾ and is linked to the issue of the importance of a site's history in selecting a location for a project (see below).

- Local opposition is a potential barrier to success with CCS projects and should be considered during the process of site selection.

Perception of risk may not equate to actual technical risk, but it is still valid

The literature search points towards the fact that people often hold opinions for emotional rather than intellectual reasons. It is also known that people's beliefs and values frame the way they perceive risks and benefits. As one paper puts it, "the definition of perceived risk... becomes technical risk multiplied by the nature of the hazard and the context of the receiver" ⁽²⁾ This is explained further in Box 2.7.

Box 2.7

Risk perception and CCS

[People's] perception can either amplify or reduce the extent to which risk is felt and it is impacted by two factors:

- The nature of the risk. That is, do we have control of it or not, is it created by mother nature or man-made, is it fairly distributed or not, does it involve adults or children, is it familiar or exotic, and is it personal or does it affect others?
- The outrage factor. This factor is dependent on life experiences, values systems, social context, culture, age, gender, etc. It can either mitigate or intensify perceptions (e.g. the experience of seeing a drilling rig by an oil field worker versus someone not experienced in seeing drilling equipment).

Source: Carbon Capture and Storage Communication Workshops, C2S2RN, 2007

This is sometimes difficult for experts in CCS to understand; but *perception* of risk is as important as – sometimes more important than – the *actual* risk. It is critical that project proponents do not ignore perceived risk when communicating with stakeholders, especially local communities. It is also important that they do not dismiss concerns they know to be unfounded on a technical basis: these are still important in the minds of the person asking.

In fact, it is worth noting that emotional objections to technologies can still be entirely rational. For example, as the CCSA Public Perception Workshop ⁽³⁾ points out, it is completely justifiable for people to be scared of the scale of

(1) What happened in Barendrecht?

Case study on the planned onshore carbon dioxide storage in Barendrecht, the Netherlands, November 2010

(2) Carbon Capture and Storage Communication Workshops, C2S2RN, 2007

(3) CCSA Public Perceptions Workshop 17 May 2011 - Event Report, May 2011

damage witnessed at Fukushima, even if the chances of a similar event happening near them are extremely low.

- Communication has to address 'outrage' and 'hazard' factors, not just technical risk. It is critical that experts do not dismiss concerns of non-experts, even if they are unfounded on technical grounds alone. They should be addressed respectfully and in full.

- In analysing possible risks or perceived risks associated with CCS, it is useful to consider the NEARCO₂ classification of, which separates risks into physical risks (i.e. concerns about safety), financial risks and governance risks (i.e. concerns about the way the technology will be managed).

Trust is a key determinant of the success of a CCS project

At a local level, trust or lack of it is focused on the individual project proponents, local government and politicians, compounded by the broader issues of trust affecting the general public, which relate to the fossil fuel industry at large, regional or national government. This is discussed in more detail in *Section 2.2.2* above.

A lack of trust in those facilitating engagement can bring about resistance by local communities to CCS developments. The literature suggests that this could be mitigated by involving stakeholders perceived by the public to have a more objective or 'neutral' stance in engagement and dialogue – including, for example, scientists or NGOs ⁽¹⁾. In addition, it has been found that communities are more likely to believe information that is provided by a number of different sources ⁽²⁾.

- Building trust should be a key goal of project proponents from the outset. The possibility of involving stakeholders perceived to be objective or neutral, and/or using multiple channels to provide information, should be considered.

The history of a project location is a key determinant of the project's success

As discussed above, people's perception of risk is informed in part by their experience. To restate the example given by the C2S2RN workshop, an oil rig will be perceived very differently by an oil worker than by someone unused to seeing drilling equipment.

(1)FutureGen Case Study, November 2010; Experiences and lessons learned - European CCS Demonstration project Network, 2010

(2) FutureGen Case Study, November 2010

As such, responses to CCS are very much determined by context. People tend to object less to CCS where they have already got experience of the energy industry or other large-scale industrial processes. By contrast, in the cases where opposition occurs, the fossil fuel industry is generally new, and/or does not have a good long-term relationship with local stakeholders. Thus, the history of a location can predispose people either for or against a project. In the 2010 report *Towards a public communication and engagement strategy for carbon dioxide capture and storage projects in Scotland*, the authors stated that:

In all of the successful CCS examples analysed, there was a history of extractive and fossil fuels industry in the area, predisposing local acceptance. The acceptance of the early stage projects may have been a consequence of: an offshore location (Sleipner); the very low population densities in the storage areas (In Salah, Weyburn); and / or of the historical use of Enhanced Oil Recovery (EOR) (Weyburn, Rangley), such that CO₂ storage was, in effect, a moderate addition to an existing practice.

- The history of a project location plays a critical role in determining a project's success. Project proponents should pay close attention to site selection as a factor in planning.

Demographic characteristics are important factors in acceptance of CCS

Demographics have proven to be an extremely important factor in the acceptance of CCS. According to a survey on the public perceptions in France ⁽¹⁾, women tend to be less accepting than men and frequently abstain from giving an opinion. They are also more concerned with uncertainties.

Other key demographic characteristics such as education level and age are also correlated. The survey found that aged or retired respondents or respondents holding no degree, or an elementary degree only, tended more often to abstain from giving an opinion. Accordingly, they are less often supportive of the technology, but also less often opposed to it. Respondents holding executive positions or intellectual jobs were more frequently supportive of the technology than those in other job categories. This is often true for respondents in the highest income bracket.

The Eurobarometer Survey on Public Perceptions ⁽²⁾ also found that awareness of complex issues such as climate change and CCS are clearly linked to the education of a person. *'The better educated people are, the more they look for information, and the more they know about certain aspects of climate change and particularly about CO₂.'* These respondents typically use different sources of information, and are more likely to actively inform themselves the internet.

(1) A survey on the public perception of CCS in France, November 2008

(2) SPECIAL EUROBAROMETER 364, Public Awareness and Acceptance of CO₂ capture and storage Report, May 2011

Box 2.8

Impact of demographic characteristics on awareness levels

Those respondents who felt more well informed about the causes of climate change than the average were the following:

- Those who have a higher terminal education age compared to those who finished education before the age of 16 (64% vs. 33%);
- Those who are managers (69%) compared to those who are house persons (37%), unemployed (42%) or manual workers (37%)
- Those who used the Internet everyday compared to those who never use it (61% vs. 36%);
- Those who position themselves high on the social staircase compared to those who position themselves low (59% vs. 39%);

It is also interesting to note that older respondents (those who are aged 55 +) see themselves as less informed than the average. More than half of them, indeed, say that they are not well-informed (53%).

Source: Eurobarometer Survey 2011

- The process of site selection should not only take into account a location's history (as discussed above) but also the socio-demographic background of the relevant communities, to determine the most effective means of communication and the strongest messages.

2.4 NON-GOVERNMENTAL ORGANISATIONS AND THOUGHT LEADERS

2.4.1 *Stakeholder definition and level of influence*

NGOs help to influence the opinion of policy makers and local communities. They may do this through public campaigns, either locally or internationally, to raise awareness of their concerns among local communities and policy makers and if possible delay or prevent a project from taking place, or make changes to the project design or scope. Equally, support from NGOs or other civil society organisations for an issue can help to dispose the public and policymakers favourably towards it⁽¹⁾.

Thought leaders often come from inside the industry or from academic or research institutions and can influence the information released about CCS. They often gain greater trust from communities and the public than industry and therefore can have considerable influence over the CCS debate; the very term 'thought leaders' confirms this. Furthermore, they often have strong connections to government at all levels (including international) and are therefore influential in policy-making.

2.4.2 *Issues and areas of concern*

The literature reviewed by ERM does not cover NGOs' responses to CCS in depth, though there is some analysis at a local level (i.e. in individual case

(1) NearCO₂ project Workshop, June 23rd, London

studies). However, some points emerge from the literature which should be considered:

- Many NGOs perceive CCS as a bridging technology, and are neutral or provide support on the condition that it is a step in moving towards a low carbon economy:
 - a. this conditional support can mean NGOs vary their position from project to project, e.g. supporting CCS with regard to gas-fired power stations, but not with regard to growing reliance on coal-fired power stations;
 - b. some NGOs are still formulating their positions on CCS and viewpoints are split within the organisation.
- The public often identifies with the NGO viewpoint, making them a powerful lobby.

ERM undertook a desk based review of positions held by NGOs vocal on CCS an overview of which is provided in *Figure 2.1*

Figure 2.1 Overview of positions held by NGOs on CCS

| | | |
|--|---|---|
| Positive about CCS and its contribution to addressing climate change | Bellona | Norway  |
| CCS is a bridge to a renewable future | WWF | International  |
| | NRDC | USA  |
| | Environmental Defence Fund | USA  |
| | Royal Society for the Protection of Birds | UK  |
| | Green Alliance | UK & Europe  |
| | Clean Air Task Force | USA  |
| CCS may help to provide a bridge but it is an unproven technology | Friends of the Earth International | Global  |
| | Climate Action Network | Europe  |
| | NABU | Germany  |
| Against CCS as a technology to support addressing climate change | Greenpeace | International  |
| | The Future is in our Hands | Norway  |
| | SSNC | Sweden  |
| | Friends of the Earth Denmark | Danish  |

Source: Based on a desk based review undertaken by ERM in August 2011 of selected NGO websites and/or press releases issued during the period 2008-2011.

As it can be noted from *Figure 2.1* the review identified broadly four main positions held by NGOs:

- Positive about CCS and its contribution to addressing climate change
- CCS is a bridge to a renewable future
- CCS may help to provide a bridge but it is an unproven technology
- Against CCS as a technology to support addressing climate change

In addition to this, a 2008 review of NGO positioning on CCS ⁽¹⁾ identifies some key concerns, specifically:

- Diversion of effort from renewable energy;
- Impact on ecosystems;
- Cost of deployment;
- Threat of leaks;
- Long term economic impacts;
- Continued fossil fuel use; and
- The scale of deployment.

Another concern relates to the concept of 'capture ready' power stations, which allows new coal-fired power stations to be built without providing any guarantee that capture technology will be actually installed. Lastly, NGOs have expressed concern regards the use of public resources to fund CCS projects.

As individuals, Thought Leaders will not hold a single position, but similarly to NGOs their positions are evolving and can be variable. The literature does not examine the positions of Thought Leaders as a specific group.

Many NGOs are still formulating their position on CCS, but are generally neutral rather than negative

At the moment public awareness of CCS is low and the issues surrounding it are complex and not clear cut. In this scenario, many stakeholders including NGOs and the media are still in the process of choosing their positions, which can in turn influence the position of the general public. It should be noted that the public opinion on CCS could be strongly shaped by these stakeholder groups.

Public often identifies with the NGO and Thought Leader viewpoint, making them a powerful lobby

As discussed above, the general public and local communities often identify with NGOs' viewpoints, or those of 'Thought Leaders' on debates like those surrounding CCS. This makes them a powerful lobby, as well as a potentially difficult adversary or useful ally.

- Open and regular engagement with a range of NGOs and civil society organisations is advisable in order to maintain an understanding of the variety of views in this groups and changes in the views of this group.

(1) Anderson, J. and Chiavari, J. Understanding and improving NGO positioning on CCS, 2008

- It may be possible to work with NGO and Thought Leaders to undertake research, or set the scope of research in order that research answers the questions and concerns raised by these groups as well as the questions and concerns raised by CCS specialists.

2.5 *POLICY MAKERS AND POLITICIANS – INTERNATIONAL, NATIONAL AND LOCAL*

2.5.1 *Stakeholder definition and level of influence*

Politicians – meaning those who hold positions in government or seek to hold positions in government – at all levels are influential stakeholders in the CCS debate. Their support for the technology at large (at international or national level), and to specific projects (at regional or local level), can be critical to its success and their opposition can prove to be very problematic for success. As policy makers, politicians set the terms under which CCS must operate and can facilitate or hinder its progress accordingly.

2.5.2 *Issues and areas of concern*

There is not much discussion in the literature about politicians as a stakeholder group in CCS. The main points arising are:

- The political system can affect levels of political support for CCS; and
- Local politics can sometimes trump national politics.

These are discussed below:

The political system can affect levels of political support for CCS

In countries such as the UK, where there are a small number of parties which have historically well-developed political profiles, support for or opposition to CCS is unlikely to be a significant political issue at a national level. In a multi-party political system, CCS can become a 'political football' if, for example, parties have to compete to differentiate themselves and a major CCS project is making the headlines in such a country.

Local politics can sometimes trump national politics

It has been seen that at local level, politicians have distanced themselves from a proposed CCS project if they sense public opposition, even if their party is officially supportive of CCS at national level (see Box 2.9). It is important to develop good relationships with local politicians to try and understand their levels of comfort with CCS, and if possible help to avoid politicising a project, for example, avoiding announcing a project close to elections.

Box 2.9 *Influence of local politics on decision-making around CCS*

In Beeskow, Germany, local elections were coming up around the time of explorations for sequestration sites, and it became popular to oppose the project. All party representatives then opposed the project regardless of their party position, as to not have opposed it would have given the other parties an advantage.

Source: Towards a public communication and engagement strategy for carbon dioxide capture and storage projects in Scotland, October 2010

2.6 *REGULATORS – NATIONAL AND LOCAL*

2.6.1 *Stakeholder definition and level of influence*

Regulators have a role to implement the policies and standards determined by government legislation and policy. Typically regulators are apolitical (the function is usually carried out by the civil service) though of course their powers and responsibilities are determined by politicians.

In terms of CCS projects, regulators will review planning applications for CCS projects and determine to what extent they meet national or state level requirements. These will vary from country to country or region, but may relate to fulfilment of national targets on GHG emissions reduction, targets on energy security, environmental performance, community and/ or economic development or community support.

However, legislation of relevance to CCS is often not clear cut. For example, some jurisdictions have enacted or are working on legislation to clarify the ownership and stewardship aspects of underground pore space for CO₂ storage sites and for transfer/management of long-term liability. Legislative solutions to such issues are critical, but there are other regulatory issues beyond pore space and liability which must be dealt with as well.

Where there is a lack of regulation the expectations of regulator can be unclear and unpredictable. If expectations, and therefore the response of regulators, are unpredictable this creates uncertainty for the development and implementation of a project which may result in delays to the progress and approval of CCS projects or lead to penalties during the implementation of a CCS project.

2.6.2 *Issues and areas of concern*

Again, the literature reviewed by ERM does not document issues and areas of concern expressed by regulators. As individuals, of course, regulators may experience any of the concerns felt by other stakeholder groups. As an official body, however, the regulator is likely to be preoccupied largely by:

- The lack of regulations, and or the lack of clarity (in some countries and contexts) surrounding legislation governing CCS projects;
- Opposing national and local political priorities (as discussed above) and the regulator's ability to satisfy both of these; and
- Issues around long-term stewardship and liability.

Lack of clear legislation and regulations governing CCS

The fact that legislation and regulation governing CCS is still not clear cut in many contexts and countries is a problem for the regulator seeking to manage projects in this area. Governments need to develop comprehensive regulatory frameworks for CCS, and they need to support the regulator to build capacity to regulate CCS.

Opposing national and local political priorities relating to CCS

As discussed above, local and national priorities relating to CCS are not always consistent which can cause tensions for the regulator.

Issues around long-term stewardship and liability

Storage aspects of CCS are the main focus of health and safety concerns about the technology. As such, policy makers need to devise adequate provisions for long term liability to increase stakeholder confidence in the permanency and security of storage. A stable regulatory framework should also help to address these concerns for regulators.

2.7 **INDUSTRY (COMPANIES AND ASSOCIATIONS)**

2.7.1 *Stakeholder definition and level of influence*

A number of industries have an interest in CCS: those that will benefit from CCS such as oil, gas and coal energy companies or steel and cement producers

who need it to dispose of their CO₂, but also the renewables industries which may see CCS diverting interest and incentives from them.

Industries will lobby government at national, regional and even international level (e.g. the EC) to have an influence and impact on the direction of policy and the types of incentives that are instituted. Industry may also provide an alternative source of funding for CCS research and projects.

2.7.2 *Issues and areas of concern*

The literature reviewed by ERM does not discuss issues and areas of concern raised by industry stakeholders. However, it may be assumed that these would relate to, inter alia:

For supporters of CCS:

- Management of stakeholder concerns around CCS; and
- Policy trends at national and international levels.

For detractors of CCS:

- Climate change and diversion of investment and/or attention from renewables projects.

Management of stakeholder concerns around CCS

As discussed above, public opposition to CCS has the potential to derail it, as has been seen with other new technologies such as genetically modified food. Management of stakeholder concerns to avoid such a scenario will therefore be a key issue for supporters of CCS.

Policy trends at national and international levels

Political support for CCS, in the form of policy and regulation, is critical for its success. Supporters of CCS will lobby at national and international levels to gain political support for the technology.

Climate change and diversion of investment and/or attention from renewables

As discussed above, there is concern in some circles (in particular among the renewables industry and some NGOs) that CCS will take attention and/or investment away from renewables, and that it effectively perpetuates the current dependence on fossil fuels.

2.8 *INVESTORS*

2.8.1 *Stakeholder definition and level of influence*

Investors are all those who may fund CCS projects. Potential investors include governments; financial institutions such as multi-lateral and

commercial banks and industry itself. Each of these investors has different drivers for investing. This section is focused on financial institutions.

Financial institutions have a commercial interest in CCS projects, or energy and power projects with CCS elements. Different types of financial investors may have different interests e.g. regional /national development banks and export credit agencies may be particularly concerned with meeting international standards and addressing sustainability.

Investors ultimately provide the resources for the development of CCS projects and research and development therefore are highly influential in the development of CCS projects.

2.8.2 *Issues and areas of concern*

Again, the literature does not explicitly discuss the concerns of lenders and financial analysts as regards CCS. However, interviews with members of the financial community indicate issues will include:

- The commercial viability of CCS as an investment and potential provision of incentives for industrial deployment of CCS ⁽¹⁾;
- Reputational risks when CCS is associated with coal fired power stations or because of CCS elements; and
- The extent to which employment of CCS will support a bank's climate change and energy policies.

Fundamentally, however, CCS projects do not present a greater or lesser risk to investors than other infrastructure projects.

The commercial viability of CCS as an investment

The CCP's 2007 report identified cost of deployment has been identified as the single greatest hurdle to CCS deployment. Projects involving CCS will be considered by investors where there is a good likelihood of a financial return.

Incentive schemes or regulatory requirements may help to remove this barrier to implementation. For example, the UK's Carbon Capture and Storage Commercial Scale Demonstration Programme and the EU's NER300 program have encouraged CCS project development across the UK and the EU, and have illustrated to investors the belief by national and international governments that CCS will be an important means of acting on GHG emissions and climate change ⁽²⁾.

Reputational Risks for Investors

The acceptability of project including CCS elements to local and other stakeholders is equally important to investors who will want to avoid

(1) NearCO₂ project Workshop, June 23rd, 2011 London

(2) Ibid.

investment in a technology which proves to be socially or politically unacceptable and therefore unviable. Investors will expect that these reputation risks are effectively managed by the project or company in question. Therefore, banks will seek to understand how a project is managing stakeholder related issues as part of its investment decision-making process.

Where a bank is considering project finance, it is not unusual for it to conduct a detailed due diligence of the social and environmental performance of a project. This is particularly the case with regard to multi-lateral banks, development banks and commercial banks that are signatory to the Equator Principles.

Support of Climate Change or Energy Policies

Where a bank has its own Climate Change or Energy policies it may see value in providing finance to projects that will significantly decrease their CO₂ emission through CCS, or to companies that demonstrate a willingness and commitment to reducing CO₂ emissions including through the application of CCS.

3 ANALYSIS AND CONCLUSIONS

3.1 INTRODUCTION

This section presents the results of ERM's analysis of the information collected through the literature review, interviews and case studies. ERM has derived key findings based on our professional experience and judgement in stakeholder engagement, project development and permitting and environmental, social and health impact assessment (ESHIA).

Our analysis pulls together the findings of the literature review, interviews and case studies to determine:

- key findings on the issues of concern and influence for each of the stakeholder groups identified as relevant in this study;
- An analysis of issues and stakeholder groups and how this may inform project development;
- Conclusions on the influence of stakeholder groups, drivers of stakeholder sensitivity, and lessons learned in addressing stakeholder concerns.

3.2 KEY FINDINGS ON STAKEHOLDER GROUPS

3.2.1 *Overview*

This study has considered the issues of concern for the following stakeholder groups:

- General public;
- Local communities near to proposed CCS sites;
- Non Governmental Organisations (NGOs) and Thought Leaders in energy and environment;
- Politicians and policy makers - international, national and local;
- Regulators - national and local;
- Industry (companies and associations); and
- Investors (lenders and financial analysts).

This section outlines the key issues of concern for each of these stakeholder groups, and how this can affect project development.

3.2.2 *General Public*

Key findings associated with the general public are:

- There is a lack of general understanding of CCS and acceptance of its application remains a concern for those developing projects.
- There is a lack of recognition of climate change as problem which requires immediate action contributes to the lack of acceptance of CCS;
 - there has been a recent shift away from climate change as the most critical environmental issue with greater concern for food security, water, energy and population growth;
 - interviews indicate concern about public funds being used to finance CCS project e.g. the Quest project in Canada.
- There is a lack of understanding of CCS; current perceptions are that CCS is expensive, risky and perpetuates fossil fuel dependence.
- Public understanding of the technical aspects of CCS is not as important as trust in those providing information; the public will more likely trust universities and research institutions than government or industry.
- The media has not shown great interest in CCS; but public opinion could be strongly shaped by media.

Case studies indicate that where the general public has had any interest in a project, it has a moderate level of interest and influence on the project.

3.2.3

Local Communities

Key findings associated with local communities are:

- Climate change is not an important consideration at the project level.
- Core concerns about EHS impacts (e.g. community safety issues and long term storage, soil and groundwater contamination) were confirmed and remain:
 - it appears that, under the right conditions, it is possible to address these concerns through substantial preparatory work, and good, early communication; the existing literature provides good guidance on effective communication;
 - the perception of risk is as valid and influential as actual technical risk;
- Perceived and real indirect impacts on house prices can exacerbate the feeling that a community will not receive benefits from the project.
- Having a value proposition for the local community from the outset of the project is vital:

- The value proposition needs to be developed to respond to the local context; what works in one area may not be acceptable in another;
 - a business case for CCS will make it more likely to progress as benefits can be delivered more easily to communities e.g. if projects are paid for the CO₂ stored or associated with enhanced oil recovery some of this revenue could be shared or invested;
 - to avoid setting a precedent, careful weighing of pros and cons is needed on a project by project basis.
- Some communities may not accept any change, whether or not any benefits can be delivered.

Analysis at country level does not appear to provide an accurate indicator of stakeholder sensitivity; sensitivity will be context and location specific reflecting:

- site location (offshore sites do not appear to attract any community level concerns);
- population density and historic issues / circumstances;
- presence of other industrial activity in the locality;
- existing levels of awareness of CCS amongst the community and regulators;
- political position of local policymakers and political opposition;
- demographic patterns and trends;
- existing community sense of place and willingness to accept change.

Where there is a local community that is impacted by a CCS project local community stakeholders are highly influential and have high levels of interest in the project because they are directly impacted by the project.

3.2.4 *NGOs and Thought Leaders*

Key findings on NGOs and Thought Leaders are:

- Many NGOs perceive CCS as a bridging technology, and are neutral or provide support on the condition that it is a step in moving towards a low carbon economy:
 - this conditional support can mean NGOs vary their position from project to project, e.g. supporting CCS with regard to gas-fired power stations, but not with regard to growing reliance on coal-fired power stations;
 - some NGOs are still formulating their positions on CCS and viewpoints are split within the organisation.
- NGOs can be very influential as the public often identifies with their viewpoint

- Academics, technical experts and opinion leaders on CCS have high levels of trust with the public and often have strong connections to government which makes them an influential group

Case studies indicate that where NGOs and Thought Leaders are stakeholders they have variable levels of interest and influence, usually with low – moderate levels of interest in a project, and low – moderate levels of influence. It should be noted, however that whilst this group does not appear to be influential and the project level, NGOs and Thought Leaders have high levels of interest in CCS and its role in climate change, and can influence this wider debate.

In addition, the majority of cases studies are oil and gas projects and NGOs may take more project specific interest for new coal fired power stations, as CCS is seen as facilitating the increased use of coal.

3.2.5 *Politicians and policy makers – international, national and local*

There are different levels of politicians, local politicians and national /international politicians and policy makers.

Key findings on local politicians are:

- Local politicians can change their views on CCS to maintain or gain political position.
- Local politics can sometimes trump national politics:
 - Local level politicians have been seen to distance themselves from CCS even if their party is officially supportive.
- Projects take many years to develop and should therefore engage both politicians in government and those seeking government to help manage risks associated with a change in government at local and / or national levels.
- The response of local politicians is varied; it is important to develop good relationships with local politicians in order to understand their levels of comfort with CCS and help to avoid politicising a project if possible.

Local politicians do not often emerge as a stakeholder group in their own right in case studies, however if there is local opposition to a project, local politicians may acquire a negative position on a project and consolidate opposition in order to build political leverage.

Key findings on national politicians and policy makers are:

- The National Government is vital to development of policies, frameworks and incentives for industry and communities and thus critical to the success of CCS projects.
- Level of facilitation can vary depending on local country appetite for CCS deployment. This is likely to be influenced by national policy objectives dictated by issues such as:
 - Energy policy and security;
 - Climate change commitments;
 - National economic interests associated with local industry.
- Due to CCS commerciality issues, now and in the near future CCS projects will be undertaken in countries where they support National Government policy objectives.
- It significantly helps with project acceptance if National Government is prepared to openly support the project, and explain to stakeholders its importance / role.
- Where a government has a commitment to CCS it is more likely to put in place the necessary regulatory framework, and build capacity to manage and monitor long-term storage.

Case studies and key findings indicate that the National Government can significantly influence the success of a CCS project. Moreover, it is important for projects to recognise that the ruling party may change in the course of project development, and therefore projects should consider both national governments and their opposition as stakeholders in this category.

3.2.6 *Regulators - national and local*

Key findings associated with regulators are:

- Key issues:
 - Lack of clarity of permitting processes in many cases
 - Navigating potentially opposing national and local priorities
 - Managing long-term stewardship and liability
- A lack of CCS specific regulation may mean the expectations of the regulator are unclear and unpredictable, which creates a source of uncertainty for project development.
- It is vital that regulators are comfortable to oversee a CCS project. This level of comfort should be identified and actions to address concerns discussed early on:
 - There is varied experience with regulators; in some projects regulators are comfortable to use existing oil and regulations, in others, new legislation has been created, and in others new

legislation has been created and/or regulators have brought in additional resources to review project information.

Case studies indicate that regulator have high levels of interest and influence on a project. Where the regulator does not have capacity to authorise a CCS project, this can create a barrier for project progress.

3.2.7 *Industry (companies and associations)*

- There are a number of industries with an interest in CCS, some with opposing interests:
 - Oil and gas;
 - Renewables;
 - Coal mining;
 - Power;
 - High CO₂ emitters such as steel and cement sectors.
- Key issues for supporters:
 - How to manage stakeholder concerns around CCS;
 - Policy and incentives to implement CCS at national and international levels;
 - Commercial viability.
- Key issues for those opposed
 - Diversion of interest, policy and incentives from renewables projects.

Industry has not been raised as a stakeholder group during case studies, however, it is clear that different interests in different industries will have an interest in the broader debate about climate change and the role of CCS and may take up positions for or against CCS projects.

3.2.8 *Investors (lenders and financial analysts)*

Key findings associated with investors are:

- Different investors with different drivers for investment:
 - Government is an important investor as CCS is often not a commercially viable; government willingness will be linked to the position of policy makers;
 - Multi-lateral banks and export credit agencies may provide investment, or facilitate funding in line with international and regional policy objectives;
 - Commercial banks will invest in CCS where it supports the banks' internal policies on Energy and / or Climate Change or will add value to the project or be commercially viable;

- Industry will invest for research and development and where CCS will add value to the project or be commercially viable, for example where CCS can be tied to enhanced oil recovery.
- Currently investing in CCS does not pose a greater or lesser risk to investors than other infrastructure projects.
- Issues for commercial banks investing in CCS are:
 - reputational risk when CCS is associated with coal fired power stations – exacerbating ongoing dependence on fossil fuels – this risk will be managed by the bank;
 - reputational risks where there is significant opposition to a project because of the risks posed by CCS elements – banks will expect these risks to be managed by the project.
- Where banks do have energy and climate change policies they may see value in providing:
 - project finance where projects look at ways to significantly reduce emissions through CCS;
 - corporate finance to companies that demonstrate a willingness and commitment to implementing CCS in order to reduce CO₂ emissions.

Case studies indicate that the key investors are government and the industry or company that is driving project. It is clear that these two groups have significant influence over the outcomes of projects. However, the investor landscape may change in the future and any investor in a project has the potential to influence project progress. Different investors have different interests and these should be identified and steps taken to address any concerns early on in the development of projects.

3.2.9 *Media*

At the time of writing it does not appear that international or national media have taken a firm position for or against CCS. However, it is clear that the media in all forms can have influence across all stakeholder groups and has proven to take a varied approach to CCS.

3.3 *ISSUES ANALYSIS*

In 2007 the CCP project report on *Public Perception of Carbon Dioxide and Storage: Prioritised Assessment of Concerns* identified the following range of issues as being of concern to stakeholders:

1. Cost of deployment
2. Scale of deployment
3. Perceived Risks

- Dangerous levels of leakage for humans
 - Impact on ecosystems
 - CO₂ pipeline safety
 - Land use and related issues
 - Capture process / chemicals issues
 - Impact on drinking water
 - Concerns about miner safety
 - Effects of natural or induced seismicity
 - CO₂ pipeline routing
 - Impacts on property values
 - Mineral rights / landowner approvals
4. Information and Communication
- Importance of broader context in shaping attitudes
 - Access to information
 - Information fit for purpose / useful to stakeholder group
 - Are efforts adequate to communicate
5. Policy Hurdles
- Ability of CCS to reduce emissions dramatically in the short-term
 - Diversion of efforts from renewable energy
 - Possible competition with nuclear
 - Impact of EOR on extending oil markets
 - Impact of CCS on expanding coal market
 - Full cycle impact of fossil fuel use
 - Differential acceptability of different kinds of CCS
 - CCS is not just a bridging technology
 - Energy penalty
6. Adequacy of regulatory frameworks to address risks

As illustrated through the case studies, it is certainly possible for any of these issues to arise during the course of a CCS project. In addition, this study identifies the delivery of benefits to communities impacted by all CCS elements, including storage, as a critical issue. However, the extent to which these issues will be relevant to a project will be determined by the specific context of the project.

At this very detailed level it is difficult to consider the range of and priority that stakeholders place on different potential issues. ERM has identified eight categories of issues to help our analysis of stakeholder's priorities related to:

10. Environmental, Health and Safety Impacts;
11. Awareness and acceptance of CCS;
12. Technical aspects associated with CCS;
13. Commercial and local development benefits;
14. Policy and legal issues;
15. Diversion of resources away from renewable energy;
16. CCS as contributing to positive impacts on climate change;
17. CCS as contributing a negative impact on climate change;

18. Groups with variable positions on CCS and issues of concern.

Table 3.1 illustrates which issues are of concern to different stakeholder groups, highlighting those that are the focus of their attention, but noting the full range of issues raised.

The distribution of issues shows that the concerns of NGOs and Thought Leaders, the General Public, and Politicians and Policy makers is focused on climate change the diversion of resources away from renewable energy projects and associated policy discussions. Local communities and regulators are particularly focused on project related environmental, social and health impacts and benefits. Industry and investors have concerns about project impacts and stakeholder opposition at the project level, and also an interest in the policy debate which may impact the commercial viability of CCS.

Table 3.1 *Priority Stakeholder Issues*

| | EHS Impacts | Awareness & acceptance of CCS | Technical aspects | Commercial & local development benefits | Policy & legal issues | Diversion from renewable energy | Positive impact on climate change | Variable positions on CCS |
|-----------------------------|-------------|-------------------------------|-------------------|---|-----------------------|---------------------------------|-----------------------------------|---------------------------|
| NGOs & Thought Leaders | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| General Public | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Politicians & Policy makers | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Industry | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Local Community | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Regulators | ✓ | ✓ | ✓ | | ✓ | | | |
| Investors | ✓ | ✓ | | ✓ | ✓ | | | |
| Media | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

✓ Focus of interest ✓ Issue noted

The focus of the interests of different stakeholders suggests that there is a continuum of stakeholder interests which are broadly directed at two different outcomes:

- Project / local level discussions associated with management of social, environmental, health and safety impacts, and delivery of local benefits.
- Global level discussions on climate change and the role of CCS;

Policy makers are at the centre of this continuum as their interest and commitment to CCS to resolving CCS concerns may influence the commitment and support provided to a project in putting place a regulatory framework and communicating to stakeholder the value of the project.

This reflects the discussion and assessment of influence of these different stakeholder groups in the previous section. Our analysis shows that the most important stakeholders for project development are consistently:

- Policy Makers - National Government;
- Local Community; and
- Regulators.

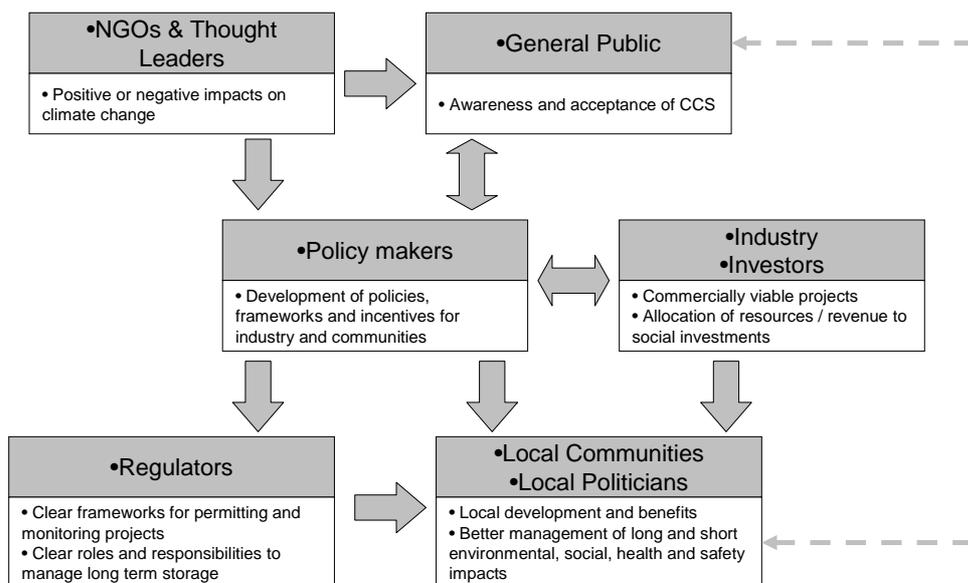
NGOs, Thought Leaders and the Public, often did not feature as having significant influence for each project. However, it is clear that their interest and level of influence is within the wider climate change debate and the role of CCS in its resolution.

This is not to suggest that project development and the direction of policy discussions on climate change are not linked; indeed emissions targets, carbon taxes and other incentives may make CCS projects commercially viable and facilitate the delivery of local benefits, as companies will have more money to invest in projects. However, understanding these different priorities suggests that management of stakeholder issues in project development and management of stakeholder issues in the broader climate change debate may require different emphases.

Figure 3.1 provides a summary of how different stakeholder groups and issues influence each other, and also how the wider climate change debate may be able to influence the delivery of local benefits.

It may also be possible that delivery of local benefits and developing positive local community perspectives of CCS projects may help to influence the acceptance of the general public of CCS; however, this was not raised in the literature or case studies, and has not been tested.

Figure 3.1 Global and Local Interactions



3.4 LESSONS LEARNED AND RECOMMENDATIONS

As discussed in the previous section, the differing focuses of interest may require different approaches to address stakeholder concerns. This section outlines the lessons learned from the literature review and the case studies in addressing stakeholder issues at the project level and the global debate on climate change.

3.4.1 Lesson Learned at the project Level

At the project level there are two key areas which fundamentally aid in addressing stakeholder concerns: Communication and Engagement and addressing stakeholder issues through the project Development Process, these are summarised below.

Key lessons learned about Communication and Engagement at the project level are:

- Start early to raise awareness with politicians, regulators and community.
- Educate local government and other community opinion leaders so they can answer questions about the project.
- Aim to build trust by using multiple channels to provide information and involve ‘objective’ stakeholders such as academics or other independent experts.
- Have good project people on the ground in the community and / or find a good representative from the community who will support the project.

- Understand community specific concerns and answer questions – don't assume what information will be needed.
- Good engagement will not necessarily result in acceptance of CCS – it is not a guarantee of success.
- Key References for Guidance on Communication:
 1. CSIRO for the Global CCS Institute Communication, project planning and management for carbon capture and storage projects: An international comparison (2010)
 2. European CCS Demonstration project Network Public engagement: lessons learned in 2010
 3. CSIRO for the Global CCS Institute Communicating the risks of CCS (July 2011)
 4. CSIRO 2011 Communication/Engagement Toolkit for CCS projects

Key lessons learned about the project Development Process are:

- projects that have managed stakeholders issues have invested more resources than usual at early stages in project development in order to:
 - understand the geology and demonstrate containment and the feasibility of monitoring to company decision review boards and regulators;
 - understand local capacity to regulate the development of the project and manage long term monitoring and liability issues;
 - understand stakeholder sensitivity, raise awareness of key stakeholder groups and understand and respond to stakeholder concerns;
 - avoid and mitigate social and health impacts or perceptions of health impacts during site selection;
 - develop mechanisms to deliver community level benefits (a value proposition).
- A 'self-selection' process (e.g. FutureGen) will help to raise the awareness of CCS and avoid communities that will be completely opposed.
 - Communities are not homogeneous and this does not mean a project will completely avoid the issues encountered by other CCS projects; it is not a guarantee.

Box 3.1 suggests factors that could indicate a project will encounter significant barriers to progress.

Box 3.1 *Potential Barriers to project Development*

1. National Government does not provide overt support, and therefore it is not clear to stakeholders why the project is going ahead.
2. There are no benefits offered to the communities impacted by transport and storage elements.
3. Local communities are opposed to change or development.
4. Regulators are struggling with providing authorisations for the project and lack capacity to assure long-term monitoring.

3.4.2 *Lessons Learned at the Global Level*

The literature review highlighted that there remains considerable work to do ‘setting the scene’ for CCS and raising public awareness of climate change as a problem which requires immediate action. In addition, the positions of NGOs and Thought Leaders will certainly influence the public that tends to trust third parties more than industry. NGOs and Thought Leaders also have influence with policy makers. Whilst some of these stakeholders will have entrenched positions and will not be moved, lessons learned in addressing the concerns of NGOs and Thought Leaders may help with addressing the concerns of the general public, and also indirectly influence policy makers.

Key lessons learned about Communication and Engagement with Global level stakeholders are:

- The role of CCS can be discussed more meaningfully only once people (i.e. the public) have a more balanced and complete understanding of the process itself and what it can offer in the wider context of mitigating climate change; investment in broadening this understanding may be of value.
- It is important to consider the perceived trustworthiness of sources when communicating on the topic, and to take care to build and maintain the public’s trust in CCS and its proponents.
- Public opinion could be strongly shaped by the media, which has yet to take a great interest in CCS.
- Working with NGOs to undertake research, or set the scope of research will help ensure studies answers the questions and concerns raised by these groups as well as CCS specialists. It can also help to demonstrate how industry is building its experience and technical capacity in CCS.

- Open and regular engagement with a range of NGOs and thought leading organisations and individuals is advisable in order to maintain an understanding of the variety of views of these stakeholders and changes in their views.

| Publication title | File name and location | Date | Geography | Stakeholders covered by type | Issues identified (barriers to acceptance) | Other themes discussed |
|--|---|---|--|--|---|---|
| SPECIAL EUROBAROMETER 364, Public Awareness and Acceptance of CO2 capture and storage Report | \UKlonsv01\WEC C\Projects\013075_0 Stakeholder Issues Review\8. Working documents\Resources\EUPost-2008 | Fieldwork: February – March 2011 Publication: May 2011 | 12 European Union countries: Germany, United Kingdom, Italy, Spain, the Netherlands, Poland, Finland, France, Greece, the Czech Republic, Bulgaria and Romania | CCS demonstration projects co-financed by the European Union are currently underway in six of these 12 Member States: the Netherlands, United Kingdom, Italy, Spain, Germany and Poland. There have been different levels of publicity about the projects in these Member States. The other six Member States were chosen as they either have existing CCS projects, or have been planning them, while. Greece was included due to its high domestic coal dependence. | <ul style="list-style-type: none"> • Across all countries, there was a reasonably good understanding of the main issues relating to climate change - causes, consequences and how to fight it. • For each of these measures the proportion who felt well informed had fallen since the 2009 study, mainly as a result of a higher proportion who indicated that they were 'not at all informed'. • It is more difficult for those with a poor understanding of the basic issues relating to climate change to have a good understanding and hold educated opinions about CCS. • Development of industries supplying environmentally friendly technologies and promotion of cleaner cars powered by electricity/ low-carbon fuels were preferred over reducing CO2 emissions. • This suggests a need for further awareness raising about the causes of climate change as most did not identify CO2 emissions as the priority. • Awareness of CCS was also low. Whilst over a quarter (28%) were aware of it, only one in ten (10%) said they had heard of it and 'knew what it was'. • There was a good level of awareness of CCS in the Netherlands, but a low level in other European countries. | <ul style="list-style-type: none"> • Knowledge, perception and awareness of rather complex topics, such as climate change and actions/measures to fight and combat it are clearly related to the education of a person. The better educated people are, the more they look for information, and the more they know about certain aspects of climate change and particularly about CO2 • It is interesting to note that a lack of knowledge about certain aspects of climate change, CO2 and CCS is linked to a distrust of both information and institutions. People in this category also tend to perceive CCS as not being efficient to fight climate change. • Correlations drawn from the results clearly demonstrate the need to communicate the facts about CO2 properties and the lack of risk regarding CO2 storage. |
| | | | | <ul style="list-style-type: none"> • The basic sample design applied in all states is a multi-stage, random (probability) one. In each country, a number of sampling points was drawn with probability proportional to population size and to population density. • The sampling points were drawn systematically from each of the "administrative regional units", after stratification by individual unit and type of area. They thus represent the whole territory of the countries surveyed according to the EUROSTAT NUTS II (or equivalent) and according to the distribution of the resident population of the respective nationalities in terms of metropolitan, urban and rural areas. In each of the selected sampling points, a starting address was drawn, at random. Further addresses (every Nth address) were selected by standard "random route" procedures, from the initial address. | <ul style="list-style-type: none"> • Interestingly, respondents in the Netherlands, where there is higher awareness and knowledge of CCS, had the second lowest proportion of respondents who thought that it would be beneficial. In contrast, however, the proportion of people who were unconcerned about a local underground storage site was highest in the Netherlands. • There was generally strong endorsement that 'public authorities should be able to monitor power plants' operations to capture and store CO2'. • There was also strong endorsement that CCS technology should be 'harmonised and consistent methodologies should be developed within the EU to manage the capture and storage of CO2'. • People were evenly split in terms of their preference as to where CO2 should be stored. Just under a quarter (23%) indicated that they preferred onshore storage, in areas of low population density. • The majority of people, indicated that 'they would like to be directly consulted and to participate in the decision-making process'. • NGOs were the second most preferred organisation people would like to be involved in the decisionmaking process • Overall one in five people trusted their government to give them information about • Of the 83% who think CO2 emissions have a high impact on climate change, 52% use of coal in their country. However, of this same 83%, 43% think CCS will be effective climate change. | |
| | | | | <ul style="list-style-type: none"> • In each household, the respondent was drawn, at random (following the "closest birthday rule"). • All interviews were conducted face-to-face in people's homes and in the appropriate national language. As far as the data capture is concerned, CAPI (Computer Assisted Personal Interview) was used in those countries where this technique was available | <ul style="list-style-type: none"> • Those who mentioned that they have heard of CCS and know what it is are less worried about a CO2 storage site located within 5km of their homes. • Across Europe, people had an inaccurate picture of the amount of electricity produced from coal in their own country or the proportion produced from renewable energy sources. • People had awareness of alternative energy sources including solar photovoltaic energy, nuclear fusion, biogas and geothermal energy. Coal was the second least favoured energy source after nuclear energy. • Whilst television was cited most frequently as the source of information used most to find out about climate change, the Internet is likely to be the most important medium for finding information in the future • Furthermore, the better informed people are about climate change, the more supportive of CCS they are likely to be, highlighting the importance of explaining climate change if we seek widescale implementation of CCS Knowledge. • Nearly half of respondents think fossil fuels will remain in the energy mix beyond 2050; if this proves to be the case, this is a further rationale for using CCS to reduce • Projects should consider the sociodemographic background of locals to determine means of communication and the strongest messages. How well educated are people level of unemployment or a high number of house persons? | |

| Publication title | File name and location | Date | Geography | Stakeholders covered by type | Issues identified (barriers to acceptance) | Other themes discussed |
|---|---|-------------------------------|-------------|--|--|---|
| A survey on the public perception of CCS in France | \\Uklonsv01\WEC\C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resources\EU\Post-2008 | November 2008 | France | <ul style="list-style-type: none"> • A survey on awareness and 'approval of or opposition to' the use of Carbon Capture and Storage in France was conducted to explore the variability of opinion to two key factors: information and semantics. • The survey was designed as a split-sample, before/after experiment. To look at the effect of information, we asked about approval of / opposition to CCS twice: first after a short presentation on the technology focusing on global warming mitigation; second after explaining its potential adverse consequences. The semantic effect was analyzed by splitting the sample in two: <ul style="list-style-type: none"> • one half heard about Storage, the other half about 'Sequestration'. • In addition to these two core issues, respondents were asked about their awareness of various CO2 mitigation technologies. | <ul style="list-style-type: none"> • Gender and the opinion on CCS are significantly not independent • Results show that women tend to be less accepting than men, frequently abstain from giving an opinion and are more concerned about uncertainties. • Education level and age are also correlated. Aged or retired respondents as well as respondents holding no or an elementary degree tended more often to abstain from giving an opinion. Accordingly, they are less often supportive of the technology, but also less often opposed to it. Respondents holding executive positions or intellectual jobs were more frequently supportive of the technology than those in other job categories. This is also true for respondents in the highest income bracket. • NGO's were found to be trusted most and industry least by the general public. Trust was found to depend on perceived competence and intentions. • Climate change is largely recognized by the French public as a serious problem calling for action. Overall, the sample said that the environment/economy balance tilts toward the former term. | <ul style="list-style-type: none"> • At the local level, NIMBY concerns, environmental justice, planning procedures and specific features of the local project can drive opposition to or approval of it. • Questionnaire-based surveys create very artificial communication situations. In reality, people form opinions by dialogue. Actual opinions are diverse, volatile, history and situation-dependent. • A known bias is that when answering a questionnaire, people tend to pay more attention to what they have heard last. • The scientific literature about the effect of information provision on CCS approval is ambiguous. Once (even limited) information is provided as to its role in reducing CO2 emissions, opinion shifts considerably towards a slight support for the concept. |
| | | | | <ul style="list-style-type: none"> • The sample of 1076 individuals aged 15 and above was selected by the Institute. • Representativity of the metropolitan French population (in both subsamples) was achieved by using the quota method on sex, age, head of household profession/social category and through stratification on the region and the type of urban area. • Respondents were interviewed face to face at home by their network of surveyors using a computer-assisted system. • For each individual, three groups of data were collected. Twelve questions specifically related to CCS were asked, followed by 11 questions on the social and demographic characteristics of the respondent. • Six additional variables describing the respondent's neighbourhood were looked up in a national database. | <ul style="list-style-type: none"> • Yet, several alternative sources of energy remain unknown and the request for information is real, in particular about the causes of climate change and the solutions to be brought. • CCS Technology is not known by the large majority of the French public, only one third of the population had heard about it and only one in twenty was able to correctly describe its principle. • How the public learns / might learn about CCS appears to be a significant stake. The rate of approval was insignificantly higher when 'sequestration' was used to describe the technology, compared to storage. But the word 'storage' appeared clearer than the word 'sequestration', even if it does not convey the idea of monitoring and irreversibility. • Overall, this study reveals that French public is not strictly opposed to CCS, but rather suspicious than supportive. Support is conditional at best, its level depends critically on technical risks and the political use of this technology. | |
| Public engagement and CCS Why, how, when and with whom? | \\Uklonsv01\WEC\C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resources\EU\Post-2008 | November 23rd 2010 - 3/3/2011 | Netherlands | unavailable | <p>Many projects face resistance and it mostly revolves around</p> <ul style="list-style-type: none"> • Different expectations and knowledge about project design, decision making process and consequences • The technology used • Public participation in the project • How people fit into the external context • National and local political, social, cultural and geographic factors | <ul style="list-style-type: none"> • Many major projects face resistance which includes energy projects, infrastructure projects and industrial projects. • Public awareness of CCS is still low. |

| Publication title | File name and location | Date | Geography | Stakeholders covered by type | Issues identified (barriers to acceptance) | Other themes discussed |
|--|--|--------------|-----------|------------------------------|---|------------------------|
| Towards a public communication and engagement strategy for carbon dioxide capture and storage projects in Scotland | \\Uklonsv01\WEC C\Projects\0130750 Stakeholder Issues Review\8. Working documents\Resources\EU\Post-2008 | October 2010 | Scotland | unavailable | <p>The purpose of this report is to stimulate the design of effective engagement strategies between the public and proponents of CCS projects in Scotland. It also delivers a non-prescriptive approach to designing an engagement and communications or outreach strategy.</p> <ul style="list-style-type: none"> • To develop CCS technology and deploy it in time to mitigate the worst effects of climate change many more facilities must be constructed. The IEA CCS Roadmap suggests that 100 large projects will be required by 2020 and 3,400 large projects by 2050 (IEA 2009). • Public is a key stakeholder in this process as since 2008 many CCS projects have encountered opposition from local communities and were either cancelled or have gone ahead in a reduced form. • Successful engagement is not a guarantee that every project will go ahead. However if the reasons for a CCS project are sound, the plans carefully laid, and social conditions favourable, a good engagement strategy should greatly increase the chances of acceptance. • Offshore storage seems preferred to onshore storage, although there is currently little empirical evidence to back this up. | |
| | | | | | <ul style="list-style-type: none"> • Engagement with the wider public on CCS is extremely useful in enabling them to make informed decisions about individual projects. There is at present a gap in this area. • Such a process would also help to align public understanding of the role of CCS within wider policy attempts to limit greenhouse gas emissions, and provide a forum for the public at large to decide if it is indeed an approach they wish to endorse. • A more systematic approach to public and stakeholder engagement at the EU scale is greatly needed. • Public understanding of technical issues is not as important as is commonly believed by industry and government. Rather, public trust in the developer, regulators and government to deliver truthful information, operate a fair decision process, be accountable and treat the public fairly in the distribution of economic benefits. | |
| | | | | | <ul style="list-style-type: none"> • Locations and communities differ greatly, even within a small geographic area, and the 'social fit' of a project in its local context can be an important factor in CCS projects. • Other relevant factors to be assessed include social characterisation, historic and contemporary relationships (with the fossil fuel and energy industries), suitability of a project to the character of a place, reactions to other recent infrastructural developments and needs of the local economy • Successful engagement strategies have maintained a civil dialogue between publics / stakeholders and developers, have often involved independent expert and stakeholder endorsement, and have created transparent, participative processes for decision making. • Public trust in a developer can be lost when it is thought that: information is being withheld, public's concerns are not being taken seriously and/or that risks are not being thoroughly assessed. • Once public trust in a developer is lost it is very hard to regain, and constructive dialogue becomes much more difficult and without constructive dialogue, positions may become polarised | |

| Publication title | File name and location | Date | Geography | Stakeholders covered by type | Issues identified (barriers to acceptance) | Other themes discussed |
|---|--|------------------|--|---|---|---|
| European CCS Demonstration Project Network Report | \Uklonsv01\WEC C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resour ces\EU\Post-2008\European CCS Demonstration Project Network | 6-7 October 2010 | Poland, Spain, UK, Germany, Italy, Netherlands | <p>This knowledge sharing event organised by the European CCS Demonstration Project Network brought together 28 representatives from 6 large-scale integrated CCS projects, supplemented by 3 EC officials, 2 guest speakers and a team of DNV facilitators. As at the previous meetings in April and June, six projects granted funding under the European Energy Programme for Recovery (EEPR) participated, namely:</p> <ul style="list-style-type: none"> • Belchatów, Poland • Compostilla, Spain • Hatfield, United Kingdom • Jämschwalde, Germany • Porto Tolle, Italy • Rotterdam, the Netherlands <p>The main objective of the this meeting was to further share experiences in each of the themes and to discuss forthcoming annual thematic reports.</p> | <p>The meeting progressed in the following sessions</p> <p>Permitting session</p> <ul style="list-style-type: none"> • The main objective of the session was for projects to update each other on recent developments within permitting and review lessons learned from CCS and other relevant industry permitting processes. • Each of the six projects gave a presentation of the status on the permitting process. • The lessons learned and good advice was categorised as a) general advice b) practices directed towards authorities/regulators c) practices directed towards the consultation process. All topics were discussed in detail. <p>Public engagement session</p> <ul style="list-style-type: none"> • There was a discussion of NETL best practices with a particular focus on branding CCS. Branding seemed to be something that almost all the case studies were focusing on with some of the projects setting up stand-alone websites separate from their corporate owners. • The goal of the public engagement group was identified to be production of a document, which outlines what activities each project is undertaking in line with the practices outlined in the NETL guidance. • Participants were also asked to prepare public engagement cases studies that could be shared with the group. Three cases from different projects were discussed and documented at the meeting: ROAD, Hatfield and Belchatów projects. | <ul style="list-style-type: none"> • There is a need for stronger links between risk management and communication; • It is time for the Network to become the authoritative source of information on CCS demonstration in Europe; • There are opportunities to work together with the Global CCS Institute to deliver knowledge-sharing objectives - network members should look for synergies and avoid duplication; • The knowledge-sharing process can become more project-driven; the EC will be less involved in the organisation of activities; • It is up to the Steering Committee to deliver the Network's objectives in the most beneficial manner and to consider key topics, such as the interaction with smaller projects and how to disseminate progress results through public events. |
| | | | | | <p>Eurobarometer survey on CCS Public Awareness and Acceptance</p> <ul style="list-style-type: none"> • The Eurobarometer survey's results were assessed in detail. The feedback was mostly related to tailoring the questions to get more relative feedback on the perception of CCS. • There is a need to understand how people compare the risks of nuclear, CCS and driving a car for example. It should also be known how much more people are willing to pay for clean electricity • There is also a need to establish how awareness levels correlate to the levels of education amongst stakeholders. <p>The Statoil experience</p> <ul style="list-style-type: none"> • The main issues in a CCS transport system are: a) Interface control, b) Transient behaviour and c) Safety. These were discussed in Statoil's context. • In the discussion it was concluded that the degree of cooperation between the industry and the regulators in developing national regulations may vary from country to country. • It was also concluded that the regulators in some countries are moving towards a greater degree of performance-based/goal-based regulations while the regulators in other countries have a more prescriptive system which sets specific demands for str | <p>The ESTEEM toolkit</p> <ul style="list-style-type: none"> • ESTEEM is a tool to measure and create public acceptance developed by the Energy Research Centre of the Netherlands (ECN) with the help of funding from the European Commission's research programme. • A guest speaker presented the differences between societal acceptance of projects and support for projects which are fundamental to the ESTEEM philosophy • The ESTEEM process was applied to the Zero Emission Power Plant (ZEPP) project in Drachten, Netherlands as a case study and the results were discussed. • It was found that it is essential to start the dialogue with the project as early as possible at a stage when plans still have an element of flexibility and stakeholders have yet to form opinions • It was also found to be essential to have two-way communications through trusted sources and to focus on the benefits for and expectations of the stakeholders and include as many of these as possible in the design. • There was a discussion if CCS is where nuclear was 20 years ago. |
| | | | | | <p>Introduction to the risk register</p> <ul style="list-style-type: none"> • A short introduction to the risk register was provided. A risk register lists identified risks and is used to manage those risks. It helps to communicate risks across project interfaces and between different disciplines • ROAD, Hatfield and Belchatów indicated that they have developed a risk register. Porto Tolle and Jämschwalde have started. • A high-level analysis of the risk register was presented and the way forward discussed. <p>Knowledge market</p> <ul style="list-style-type: none"> • participating projects were asked to create a timeline for the next 1.5 years, presenting major activities and milestones. • The projects were then asked to list their top 3 lessons learned from the recent past, their top 3 knowledge needs for the future and the top 3 offers of knowledge that they believe will be developed within their project. These were developed into a list of common themes and discussed further. | |

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|---|---|------------------|--|--|--|---|
| Public engagement 2010 Experiences and lessons learned - European CCS Demonstration Project Network | \\Uklonsv01\WEC\C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resour ces\EU\Post-2008\European CCS Demonstration Project Network | 10-May-11 | Porto Tolle project, Joao Duarte, Enel, Italy | <p>This knowledge sharing event organised by the European CCS Demonstration Project Network brought together 28 representatives from 6 large-scale integrated CCS projects, supplemented by 3 EC officials, 2 guest speakers and a team of DNV facilitators. As at the previous meetings in April and June, six projects granted funding under the European Energy Programme for Recovery (EPR) participated, namely:</p> <ul style="list-style-type: none"> • Belchatów, Poland • Compostilla, Spain • Hatfield, United Kingdom • Jämschwalde, Germany • Porto Tolle, Italy • Rotterdam, the Netherlands <p>The main objective of the this meeting was to further share experiences in each of the themes and to discuss forthcoming annual thematic reports.</p> | <p>The document presents excerpts from the best practice guide for Public Outreach and Education for Carbon Storage Projects, National Energy Technology Laboratory (NETL) (Dec 2009) upfront. The components are:</p> <ul style="list-style-type: none"> • Integrate Public Outreach into Project Management - All projects should have integrated public engagement into project management. Close collaboration between technical staff and communications staff is important. • Establish a strong outreach team - Competences include communications and public engagement, but also public and regulatory affairs, permitting, knowledge dissemination, fund agreement management • Identify key stakeholders - including NGOs, local and regional governments, regional business platforms, national government, media, knowledge institutes • Conduct and apply social characterisation - including research into regional, socio-economic and historical factors, awareness of the role of CO2, perceptions regarding CCS technology and acceptance of the project and attitudes towards available solutions | <ul style="list-style-type: none"> • Relations with stakeholders are managed at the highest project level • Engagement is dialogue, especially with local stakeholders. This is especially true for those projects who foresee on-shore storage • Early planning and timing is essential, especially when (local) elections are due • Involvement of third parties in the dialogue is particularly important, especially government and the research community. • Levels of trust appear to depend on who the messenger is and are often higher if independent sources are involved • It is felt that social characterisation is vital, as is differentiated communication depending on the stakeholder group concerned |
| | | | | | <ul style="list-style-type: none"> • Develop an outreach strategy and communication plan - built based on a dialogue with stakeholders, involvement with independent messengers, flexibility in approach and alignment with corporate communication. • Develop key messages - focussed on abating climate change • Develop outreach material tailored to audience - including a large variety of materials and activities checked by both technical and communications professionals. • Actively oversee the outreach throughout the life of the CO2 storage project/monitor the performance of the programme and changes in public perceptions and concerns. Monitoring the progress of communication activities (including media activities) is important to anticipate changes in opinions or behaviours. • Be flexible, refine the outreach - It is wise to adopt a flexible approach that draws on experiences as well as evolves using the eyes and ears in the community. | <p>Public engagement moving forward in 2011</p> <ul style="list-style-type: none"> • Continued sharing in this area • Further work on understanding the role of social media to be undertaken. • A discussion topic on risk communication will be started. A lessons and a communication toolbox in this area to be developed |
| Public engagement: lessons learned in 2010 - A report From the European CCS Demonstration Project Network | \\Uklonsv01\WEC\C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resour ces\EU\Post-2008\European CCS Demonstration Project Network | 6-7 October 2010 | Poland, Spain, UK, Germany, Italy, Netherlands | <p>This knowledge sharing event organised by the European CCS Demonstration Project Network brought together 28 representatives from 6 large-scale integrated CCS projects, supplemented by 3 EC officials, 2 guest speakers and a team of DNV facilitators. As at the previous meetings in April and June, six projects granted funding under the European Energy Programme for Recovery (EPR) participated, namely:</p> <ul style="list-style-type: none"> • Belchatów, Poland • Compostilla, Spain • Hatfield, United Kingdom • Jämschwalde, Germany • Porto Tolle, Italy • Rotterdam, the Netherlands <p>The main objective of the this meeting was to further share experiences in each of the themes and to discuss forthcoming annual thematic reports.</p> | <p>This report presents an overview of key activities undertaken in the area of public engagement and lessons drawn in this area from the six member projects of the European CCS Demonstration Project Network. The main purpose of this document is to share experiences with the Network's external stakeholders in order to help advance take-up of CCS in Europe and beyond. Using the structure of the National Energy Technology Laboratory (NETL) best practice guide for Public Outreach and Education for Carbon Storage Projects, the Network members have jointly developed a record of their main communications activities and have also generated a series of lessons learned that can be summarised as:</p> <ul style="list-style-type: none"> • Across Europe, 6 project teams have ensured that their interfaces with stakeholders are managed at the highest project level and with the help of communications professionals; key messages have been developed and supported by a wide variety of materials. • It is generally felt that engagement and dialogue with local stakeholders is to be preferred above one-sided dissemination of 'corporate' project information. This is especially true for those projects who foresee on-shore storage of CO2. | |

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| | | | | | <ul style="list-style-type: none"> All Network member projects agree that early planning and timing is essential, especially in cases where (local) elections are due. A number of Network member projects have felt growing opposition against their activities and have invested in local, tailored and two-way communication with the aim of establishing a platform for voicing concerns and clear channels to respond to those. Involvement of third parties in the dialogue, especially government and the research community is also important Some thorough work has been undertaken in mapping stakeholders. Force-field analysis is also being applied to better understand their stakeholders. Across the Network membership, it is felt that social site characterisation and stakeholder mapping are vital, as is differentiated communication depending on the stakeholder group concerned. It is interesting to see that CCS public engagement activities are seen as part of a wider corporate communication strategy. All member projects have set up plans for continued public engagement in 2011 and beyond | |
| CCSA Public Perceptions Workshop 17 May 2011 - Event Report | \Uklonsv01\WEC C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resource\UK\CCSA Public Perception Workshop | 17/05/2011 | UK | This was a workshop. Each of the 7 breakout groups were presented with 3 questions on a range of topics pertinent to the public perception of CCS. | <ul style="list-style-type: none"> The approach for communicating with local communities and national audiences would differ, as would their interest and knowledge of CCS. At UK national level, there was very little knowledge, or interest, in CCS outside a small set of well informed and engaged energy or environmental "geeks". The main media hook appears to be CCS as a catalyst and creator of employment opportunities and regional development. Views on whether the CCS community should engage proactively with the public to promote CCS were found to be polarised | The evidence from the Netherlands that where there is a high level of public knowledge of CCS, there is hostility towards it. However, ironically this is not true of one of the most advanced European projects is at Maasvlakte in Holland which has encountered little public opposition so far. The high level of public opposition to CCS in the Netherlands resulted from vociferous local objections to Shell's Barendrecht project. |
| | | | | | <ul style="list-style-type: none"> The vast majority of the public do not know what CCS is and even fewer have formed a view about it. However, negative views held by the public on new technologies, are strongly held, difficult to dislodge and often emotionally based. Increasingly NGOs are talking about the impacts of climate change rather than climate change per se. The UK has a unique opportunity, given storage capacity under the North Sea-bed and energy industry experience, to lead the development of CCS. Media coverage for clean energy/renewable energy technologies is highly competitive. CCS is a critical technology in all IEA and Climate Change Committee trajectories for decarbonisation; therefore, any failure of the technology would be a big media story and something that should be prepared for. UK media would welcome examples and news of progress and developments on international CCS projects and to position them for a UK audience | <ul style="list-style-type: none"> There was some discussion at how the same CCS related information was treated differently internationally e.g. between USA, UK and Germany, where there has been some opposition. It was suggested German opposition may, in part, have been due to the multi-party political system and the need for parties to take political positions to differentiate themselves from other parties. |
| | | | | | <ul style="list-style-type: none"> UK is not the first to develop CCS. UK needs CCS not only for decreasing CO2 emissions, but the technology can also help economic regeneration and give local economic impulses. The CCS projects often are time consuming as time is needed to answer questions around safety and the technology is very expensive. In the discussion about CCS different voices are needed. Apart from the oil companies to talk about the technical storage, regulators should talk about/decide on safety and governments should talk about/decide on the general energy mix. The overall communication about CCS in the UK is not well organized yet. Important is also to have not only text, but also good images to illustrate CCS There has been lots of concerns about gas leaks and how a CO2 leak would be detected. Proposals to stretch CO2 were also discussed. The actual risk of a leak is very low, and even lower risk of a catastrophic seabed leak. However, it should be noted that leaks, however unlikely, can be mitigated - and work is going on to optimise and refine methods for mitigation. Moreover CO2 leaks will leave no residues. | <ul style="list-style-type: none"> Politically in the UK it was noted there was cross-party support for CCS, which has prevented it becoming a 'political football'. But in a time when increasing cuts are a reality, the move to fund CCS (an unproven technology) with taxpayers money was questioned. There is need for a clear, consistent and realistic energy policy from Government The ability of CCS to create jobs was questioned. It was found that many thousands of jobs will be created as we create the infrastructure for a UK carbon capture and storage system. That will involve creating new specialist skills to support the supply chain and provide employment opportunities for those currently working in the North Sea oil and gas industry |

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| | | | | | <ul style="list-style-type: none"> • Although safety is rightly a primary concern of CCS project developers, engagement with the public in context of specific projects has not identified safety as a substantial public concern. However significant work continues to be done in several forums – and this is planned to continue • All storage sites across the world are very carefully selected and the safety of any site proposed is evaluated on seismicity • Whilst the UK is not pursuing onshore storage there are a number of international examples of successful onshore storage • It should be understood that to tackle climate change, we need CCS alongside other low carbon technologies. CCS is a bridging technology to cover the transition to renewable energy supply. It is also the only low carbon option for many industries including steel and cement production • Using CCS with biomass offers the possibility of 'carbon negative' power generation, as the process actively removes carbon dioxide from the atmosphere • Industry needs to set out a vision but the Government needs to be honest that there is no low cost decarbonised energy future – consumers will have to pay for the • CCS should be promoted within the wider context of solutions to climate change. | |
| CCSA Public Perception Workshop | \\Uklonsv01\WEC\C\Projects\013075\0 Stakeholder Issues Review8.Working documents\Resources\UK\CCSA Public Perception Workshop | 17/05/2011 | UK | unavailable | <ul style="list-style-type: none"> • We're at a tipping point with regard to public perception – make or break • The perception from the outside is that CCS is suffering from a loss of momentum, opposition is beginning to build with people questioning the benefits of CCS, coupled with a subtle shift in attitudes to climate change. • CCS is generally 'below the radar' when it comes to public perception, but it could come back very soon. • It is seen as a speculative, long-term technology (like nuclear fusion) • EU also promoted CCS, but it is 'taking forever' to sort out the regulations in detail • It all comes down to trust. Trust in those companies, such as the utilities and energy companies – and trust in those companies is at an all-time low. • There is a surprising lack of change in peoples' opinions about climate change, there is an inactive 'middle ground' majority; and 20% who actively believe there is a problem that needs to be acted upon. • There is a shift away from climate change as being the environmental issue. Today, it is about food security, water, energy, population. • Most people in UK equate energy to utility bills.CO2 is intangible. | <ul style="list-style-type: none"> • Excerpts from the Eurobarometer survey - In general, people overestimate the amount of renewables in the energy mix, people who think CCS will benefit them, think of 'job creation' and only 10% of people have heard of CCS. • The role of CCS can be discussed most meaningfully only once people have a good understanding of CO2 itself. • The results are potentially benign and optimistic – there is potential support for CCS. |
| | | | | | <ul style="list-style-type: none"> • Very limited awareness about CCS – which can be linked to minimal coverage in the media. When it is reported, it is often in the language of an unproven, expensive technology. Surprisingly not much coverage about safety issues (yet). • People hold opinions for emotional reasons rather than intellectual ones. These emotional reasons can still be entirely rational – eg. it is entirely rational to be afraid of the scale of the potential damage at Fukushima. • CCS is not unique: many energy projects, industrial and infrastructure projects face opposition. • Public awareness is still very low – in a range of 4% to 49%, Although in towns where there are CCS projects or anti-CCS campaigns, this is of course different | |
| WWF - CCS - an uncomfortable but necessary option | \\Uklonsv01\WEC\C\Projects\013075\0 Stakeholder Issues Review8.Working documents\Resources\Pipelines Study\Post-2008 | 8th May 2007 | Varied/General | unavailable | <p>Overview</p> <ul style="list-style-type: none"> • Global carbon budget max 400/500 Gt C til 2200 - translates into c 2 Gt C/a (8 Gt C/a now) • -85% to -50% CO2 cut by 2050 below 2000 levels • Key role for energy conservation, key renewables are biomass & wind, probably CSP • CCS for fossil fuels & biomass <p>CCS Legitimacy</p> <ul style="list-style-type: none"> • Priority for RES and Efficiency • Strong Caps in EU ETS and overall EU • WWF support for CCS conditional on reducing nuclear power, strong support for renewables & DSM | <p>EU needs</p> <ul style="list-style-type: none"> • Carbon-free power sector by 2035 • Need Moratorium on all conventional new built power stations including a) priority for EIA, DSM assessment b) priority for CHP/cooling c) no permit from [2015] for new built with emissions >CHP CCGT and d) same standards for all existing by [2020] |

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| | | | | | <p>Time plan for EU</p> <ul style="list-style-type: none"> • Early site assessments, geological suitability - most of EU's scheduled at least 12 CCS pilots shall focus on storage • Parts of the CCS pilots should be in coal-rich developing Nations • If site assessment is positive and independently monitored (2012?) strong emissions standards developed for new (2015) and all (2020) power stations in EU <p>Without CCS</p> <ul style="list-style-type: none"> • Still, if only 1/3 of coal will be build til 2030 (500 GW), without CCS it will emit approx. 1 Gt C/y alone - 1/10 of all current GHG emissions • Increase of global energy demand probably impossible to meet while staying below 2 Degree • Sustainable renewables are presently <5%, & CO2 emissions rose globally by ca. 3% p.a. in last years | |
| Acceptability of CO2 capture and storage - A review of legal, regulatory, economic and social aspects of CO2 capture and storage | \Uklonsv01\WEC\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resources\Pipelines Study\Post-2008 | May-06 | Varied/General | <p>In the context of this project, a workshop was held with a small group of experts. The participants, twelve in total complemented by the project team, represented a broad range of stakeholders, including government, oil industry, electricity industry, academia, and environmental NGOs. The discussions were grouped into three main topics: CCS in the energy system (mitigation portfolio and decentralisation), public perception, and regulation. Rather than reaching consensus on the issues, the participants flagged major questions and controversies, agreed on a common language, and discussed the context.</p> | <p>Legal issues:</p> <ul style="list-style-type: none"> • Main gaps appear to relate to domestic law. Analysis is required of the extent to which current EU and national legislation regarding property rights and liability might apply to CCS activities. • Preferably, existing regulatory arrangements will be utilised and, where necessary, amended to fill gaps and provide certainty. • Public international law's relevance to CCS is better known; clarification (and possibly amendment) is required of several provisions in the marine protection treaties, which have the potential to act as a barrier to CCS activities. • Permitting and assessment requirements are likely to be imposed by existing EU Directives, however they do not appear to represent a barrier to CCS development. <p>Regulatory issues:</p> <ul style="list-style-type: none"> • Guidance on CCS is required under the international climate change regime before it can be broadly deployed. • The main current showstopper is that the permitting requirements for site-selection and long-term monitoring. It would be preferable if an international institution with indisputable credibility would develop standards related to those issues | |
| | | | | | <p>Costs and economics</p> <ul style="list-style-type: none"> • There are no real showstoppers for the development of CCS. However, despite the role they play in policymaking, do not receive sufficient attention and may lead to misinformed decision-making. • Major models appear to use low values for the costs of CCS, which would result in an overestimation of the role of CCS in the mitigation portfolio. • The difference in relative increase of the electricity price following large-scale application of CCS around the globe might negatively influence acceptance of the public in regions with low electricity prices. | |

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| | | | | | <p>Social and acceptability issues</p> <ul style="list-style-type: none"> In several other technology fields, unexpected public opposition has halted progress. The public is not well informed about CCS, although that might be changing with enhanced media attention. The limited and in several cases incomparable research into public perception of CCS yields a more neutral than negative opinion on CCS, It also points at two contextual conditions for CCS acceptance: climate change should be recognised as a problem, and significant CO2 reduction as the only solution. The position of NGOs can also change the perception of a technology. At this point, their position varies highly, although none are vehemently against CCS as such, but also none favour it over renewable energy or energy efficiency. According to some NGOs, CCS should not divert resources from renewable energy and energy efficiency, and it should therefore not be sponsored by R&D money or by specific policy measures. <p>Crosscutting issues:</p> <ul style="list-style-type: none"> Several crosscutting issues were identified: the overall potential of geological storage and the difficulties in determining reservoir suitability, the upstream greenho externalities associated with continued use of fossil fuels, and the availability of afford over the coming 50 years. | |
| CO2 capture and storage: Policy and public perception | \\uklonsv01\WEC\C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resour ces\Pipelines_StudyPost-2008 | 19th May 2006 | UK, Netherlands, Norway | unavailable | <ul style="list-style-type: none"> If incentives in place, CCS could deploy rapidly, and try to gain public acceptance Regulatory framework urgently needed to ensure safety and permanence Public still volatile; could probably be persuaded that CCS is necessary, but could also be dissuaded easily in case of irregularities <p>Position of NGOs</p> <ul style="list-style-type: none"> Public opinion could be shaped by stakeholder groups Public often identifies with NGO viewpoint All opposed to ocean storage (as are most governments) Mostly not principally opposed against geological storage Dependent on diversion from renewables Against spending public money (subsidies) or policy efforts (ETS, CDM) | <p>National policies, Netherlands:</p> <ul style="list-style-type: none"> Government policy announced but the form is still unclear K-12B project: sponsored by CO2-reduction plan Other projects announced; similar financial assistance R&D policy for fundamental research Technological development support for full-scale demonstration Financial gap compensation for electricity prices (parallel to feed-in tariffs for renewable energy), support beyond the ETS, decarbonised electricity certificates, etc.. |
| | | | | | <p>CCS technology available</p> <ul style="list-style-type: none"> Limited no-regret potential for CCS Structural incentive for CCS needed Legal framework needed to ensure safety of storage sites and to provide clarity for project developers <p>What do the countries have in common?</p> <ul style="list-style-type: none"> Awareness and knowledge of CCS generally very low Knowledge of other mitigation options better but also poor Initial reaction sceptical Climate change seen as a problem, Significant CO2 reductions as a solution Level of trust in key institutions important Trustworthy government and regulatory framework Smaller relative increase in electricity prices Attitude seems to be more neutral than negative <p>Notable differences</p> <ul style="list-style-type: none"> Pseudo-opinion Support for CCS Renewable energy > CCS > Nuclear energy But not everywhere; US exception - Impact of provision of information Some Not-Under-My-BackYard feelings observed | <p>National Policies Norway:</p> <ul style="list-style-type: none"> Sleipner and Snøhvit project through offshore CO2 tax Shell/Statoil project proposed in combination with EOR Government plan to only install gas-fired plants with CCS <p>National Policies United Kingdom:</p> <ul style="list-style-type: none"> BP DF-1 project planned - financial support from government More structural financial support through energy review <p>Germany:</p> <ul style="list-style-type: none"> Ketzin in-situ underground laboratory; EU research project Projects announced; Vattenfall claims to expect long-term viability through emissions trading |

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| Public Acceptability of CCS, The Accept Project | \\Uklonsv01\WEC\C\Projects\013075_0_ Stakeholder_Issues_Review8_Working_documents\Resour ces\Pipelines_Study\Post-2008 | 4-5 July 2006, | Varied/General | unavailable | <p>Public perception may have a very significant, effect upon major planned projects involving new technologies and structures – its importance has been expressed at highest levels. Although a number of technical issues dealing with storage safety, monitoring and longevity are still outstanding, the public acceptance of geological storage is probably the overriding issue</p> <p>Studies of Lay Public Perception</p> <ul style="list-style-type: none"> • Studies conducted in Australia, Canada, Japan, Netherlands, Sweden, United Kingdom and United States - Awareness and knowledge of CCS generally low, Initial reaction sceptical; information generally improves view. • Contextual conditions for acceptance • Climate change seen as a problem, significant CO2 reductions as a solution • Level of trust in key institutions important • Attitude seems to be more neutral than negative, NGOs may have an important role shaping opinion | <p>ACCSEPT workshop, April 2006, some points discussed on public perceptions</p> <ul style="list-style-type: none"> • Distinction should be made between perception of CCS in general and the public response to a single project. • Many environmental NGOs are still in the position of choosing positions. Lay public may base their position on the position of NGOs • The lay public currently has low recognition for climate and energy problems. • The successes of the first few projects are important to establish a positive perception. A single failure may lead to a sharp rise in public opposition. • Public perception may be influenced by the type of project (e.g. on or offshore) and whether heavy investments are needed exclusively for the project. • CCS could be seen as a "first aid" solution, whereas renewables are the sustainable solution. |
| | | | | | <p>Stakeholders group and media</p> <ul style="list-style-type: none"> • Risk perceptions can become amplified through media presentation and subsequent stakeholders response, the public opinion on CCS could be strongly shaped by stakeholder groups, including media. • Few studies on media portrayals of CCS. Most articles classified as either positive or neutral. • Positive aspects commonly cited include continued use of coal-fired generation without CO2 emissions, energy security and an alternative to nuclear power. Negative attributes cited include costs, unproven technology, concerns about storage capacity and technical concerns over safety, leakage, and the energy penalty <p>Stakeholder perceptions</p> <ul style="list-style-type: none"> • Large number of CCS policies, programmes and projects include some form of stakeholder participation, mostly workshops. • Few independent studies of the involvement in, and perceptions of stakeholders regarding CCS. • The position of NGOs on CCS is presently rather contingent and hard to characterise with any degree of certainty as they are generally focused on "here –and-now" political discussions and developments and tactical in nature | |
| Acceptance of CCS and implications for regulation | \\Uklonsv01\WEC\C\Projects\013075_0_ Stakeholder_Issues_Review8_Working_documents\Resour ces\Pipelines_Study\Post-2008 | 31-Oct-06 | Varied/General | Institute for European Environmental Policy | <p>Studies of Lay Public Perception</p> <ul style="list-style-type: none"> • Studies conducted in Australia, Canada, Japan, Netherlands, Sweden, United Kingdom and United States - Awareness and knowledge of CCS generally low, Initial reaction sceptical; information generally improves view. • Contextual conditions for acceptance • Climate change seen as a problem, significant CO2 reductions as a solution • Level of trust in key institutions important • Attitude seems to be more neutral than negative, NGOs may have an important role shaping opinion <p>Identifying CCS as a 'bridging' solution has implications:</p> <ul style="list-style-type: none"> • Incentives will have to be structured in a way that adds action, rather than taking from other options • Companies have to be seen to do their fair share (including paying for, if not actually managing, liability) • Action has to start now • Frameworks linking environmentally sound risk assessment and site management must be developed, through installations and research • There are several linked types of public opinion, one cannot 'manage' opinion separate from actions | <p>Hawaii/ Norway ocean experiments</p> <p>Site approval: denied for 'contractual reasons'</p> <ul style="list-style-type: none"> • Hawaii State Legislature Resolution • Permitting: not excluded from EA/EIS, but found no significant impact • New site sought...but ran out of time • Moved to Norway, became target of a Greenpeace campaign and a political battle and was not approved. <p>Opposition:</p> <ul style="list-style-type: none"> • Those opposed to the experiment • Those opposed to ocean sequestration • Those opposed to sequestration in general |

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| | | | | | <ul style="list-style-type: none"> • Renewable energy sources and energy efficiency and conservation are proven, mature and environmentally friendly. CO2 Capture and Storage must not divert public investments or political attention away from renewable energy and energy efficiency. • The application of carbon dioxide capture results in a higher consumption of fossil fuels [and] rising system costs for energy, thus appearing an economic burden on climate protection. • Leakage rates need to be near-zero or the benefits to the climate will be negligible. • If nuclear power is excluded, there is a need to create a situation where fossil fuel power stations are made as carbon friendly as possible. If presented with a choice to bury CO2 or plutonium, CO2. will be buried. • No explicit CCS policy as such, yet. Currently there is a European legal thicket to traverse to do CCS - need to clear up this legal thicket. | |
| Building confidence in CCS through online deliberation | \\Uklonsv01\WEC\C\Projects\013075_0 Stakeholder Issues Review\8. Working documents\Resources\Generic - International\Post-2008 | 2008 | Japan | Thirty members consisting of experts and interested non-experts | <p>This paper realises that there are a variety of stakeholders involved with CCS, including the general public who may not have relevant scientific knowledge. Although CCS is an issue for everyone, only a few people have, or have access to knowledge of it. The key strategy of the current study is to utilize information technology as a vehicle for disseminating knowledge of CCS and for expediting deliberation among interested individuals.</p> <ul style="list-style-type: none"> • As a mechanism that allows efficient dissemination of knowledge and expedites discussion among the stakeholders, a prototype of community-ware for disseminating knowledge of CCS and for expediting deliberation among interested individuals was developed by using a JAVA-based collaborative software. • An "Internet forum" titled CO2 -CoBWeb came into existence which offered a range of functionalities including, online consultation, online deliberative polling, online argumentation and online facilitation. • It enabled a variety of questions to be asked by a wide range of stakeholders, including those concerning the scientific basis for geological storage, monitoring and | |
| | | | | | <ul style="list-style-type: none"> • This dialogue with stakeholders should be regarded by the technical community as a mechanism to develop their knowledge through chains of argumentation into common knowledge of a merged 'community' that will be formed in parallel. • The system had 2 dry runs and the results revealed that on-line deliberation helps non -experts to acquire knowledge and experts to know what non-experts wish to know • Online argumentation among the experts on topics selected by non -experts highlights key issues in a transparent manner and offers opportunity for the members to evaluate their confidence based on the evidence referred to by the experts. • Online facilitation supported collaboration between experts and non-experts to identify set of requirements for building confidence of the "community". | |

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| Engaging the public on Carbon Dioxide Capture and Storage: Does a large group process work? | \\Uklonsv01\WEC\C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resources\Generic - International\Post-2008 | 2008 | Australia | <p>Two workshops with large groups (up to 100 people) of the general public were undertaken. One was conducted in Brisbane, Queensland and the other in Melbourne, Victoria, early in 2008</p> <ul style="list-style-type: none"> • Participants for each large group process were identified from a direct marketing list of over 2.1 million Australians. • Within this list a random sample was drawn from the individuals that were within a 200 km radius of each city's CBD and 18 years or older. Specifically, 6100 Brisbane residents and 5358 Melbourne residents were emailed invitations. • Overall, 146 people registered interest in attending the Brisbane workshop and 159 registered for the Melbourne workshop. On further screening of the submissions, duplicates and incomplete entries meant the pool of applicants was reduced to 134 and 157 respectively. | <p>This paper reviews the use of a large group process for engaging the public on energy sources and technologies with a low emission profile. The research had two main aims: to explore Australian society's acceptance of energy technologies; and to assess the effectiveness of dialogue with large groups for informing knowledge and changing attitudes of low emission energy technologies.</p> <ul style="list-style-type: none"> • In the CCS context, it is useful to examine the effects of information provision on the way the technology is perceived. • Given the large group process has proven to be a successful method for accessing and informing larger numbers of stakeholders, it is one recommended to policy makers and other researchers with an interest in low emission energy technologies • Large group process used in this research, can be effective in informing individuals' knowledge and attitudes towards low emission technologies. • However, the effectiveness in bringing about changes in attitudes will be influenced by an individual's strength of existing attitudes about the technology and whether they are exposed to information that will create dissonance with their current | |
| | | | | <ul style="list-style-type: none"> • The quantitative and qualitative structure and measures used in the large workshops were based on the small group process. Quantitative data was collected using questionnaires which participants completed at the beginning and end of the process. • The mean age category of each workshop was 40, with ages ranging between 18-69 years in Brisbane (B) while the age range of Melbourne (M) participants was between 18 and 72 years. • Three measures of environmental concern were taken - values, beliefs and behaviours. | <ul style="list-style-type: none"> • It was found that most individuals have low levels of knowledge about technologies they are unfamiliar with and are not currently deployed in their communities. This was true for CCS. • A number of risks were identified in the discussions and participants were actively seeking more information to allay their concerns. • The richness of the information gained from this deliberative process can be extremely valuable to policy makers and research developers and gives credibility to the research for participants. • The researchers found participants had a keen interest in participating in the research knowing that their messages would be delivered to the highest levels of government within Australia. • Within these workshops recurring themes included the need for an identified path of action, strong leadership from government and the need for education and information on the range of low emission technologies available. | |
| | | | | | <ul style="list-style-type: none"> • If governments and research developers are truly committed to the successful implementation of low emission technologies, including CCS there is a need to make a concerted effort to begin the dialogue process. • The large group process trialed in this research offers one possible method that can access larger numbers of stakeholders in a non-resource intensive way and that still provide rich insights into the societal acceptance of the technologies being proposed. | |

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| Public engagement strategy, Global CCS Institute | \\Uklonsv01\WEC C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resources\Generic - International\Post-2008 | No date available | Varied/General | unavailable | <p>The Global CCS Institute has provided strategies and work programs on policy and regulatory, financial and commercial, and capacity building. This paper sets out a draft of the Institute's work program for the public engagement strategy by identifying the key issues facing projects, providing an analysis of what is driving these issues, outlining what the institute is seeking for its members and committing to a range of actions the Institute will take to meet member needs.</p> <ul style="list-style-type: none"> • As an industry, CCS has seen some poor outcomes in this area, with a number of projects delayed or stopped because of public concerns. In particular, the following inter-related barriers are facing project proponents on public engagement. • Information gap: a gap exists in the availability of balanced, fact-based information on CCS from trusted, credible sources for those who will seek it. • Stakeholder engagement: community outrage is causing project delays and cancellations exacerbated by, overall, a lack of understanding and experience from CCS project proponents to effectively plan and deliver stakeholder engagement. | <ul style="list-style-type: none"> • Specific public concerns vary case-by-case, depending on what is proposed and what is at stake. However, several common themes have emerged, including the safety of transport and storage, in principle disagreement with the continued use of fossil fuels, and impact on place attachment - There are some regional differences between Australia, Europe and North America. • Safety concerns are generated when the fear of perceived unsafe storage practices outweighs the fear of global climate change. They are most pronounced in western democracies, where people feel empowered about such issues, and in land-locked countries where storage must be on-shore. • Other key concerns include the fear of health effects, potential of gas leakages and impact on air and water quality. • The place attachment response is not simplistic; it is often generated by an emotional, economic, cultural or social attachment to the local community. CCS or any major development project can fundamentally challenge the attachments that a community has with a particular location. |
| | | | | | <ul style="list-style-type: none"> • There are both gaps in knowledge about the definition of CCS, as well as misconceptions about the safe transport and storage of CO2. • The state of awareness and understanding ranges from unaware through to hostile. Between these two extremes sits a group of influential people and organisations, including governments, who are currently somewhat aware and in some cases sceptical of the role of CCS. Given the gap in available and trusted information, they are still weighing up the pros and cons, but their intuition suggests that it may not be a good idea. • Projects require an effective operating environment that includes communities which understand and accept a case for CCS. • Communities will take their cues from trusted, influential sources who win this trust and influence by presenting them with information based on a balanced set of facts. Currently, there is not enough balance in information provided. | |
| | | | | | <ul style="list-style-type: none"> • Project proponents seeking to gain licence to operate from decision-makers, especially in local communities, can encounter hostility if people are not able to understand the rationale or feel threatened by the project. Hostility can lead to community outrage and cause significant project delays. The risk to the CCS industry around this type of awareness building is that it may promote itself into a bad community reputation. • Compounding these issues are very low levels of trust between communities, governments and corporations globally. • The recent environmental disasters in particular the oil spill in the Gulf of Mexico will have exacerbated a loss of confidence in large-scale engineering projects, particularly in oil and gas, and the government oversight. The case for CCS needs to be expressed in a balanced and nuanced way by trusted and credible sources • The CCS industry has seen a number of demonstration projects delayed due to community hostility. Where outrage meets hazard, or perceived hazard, the levels of non technical risk to delivering a project on time and on budget can become unac | |

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| | | | | | <ul style="list-style-type: none"> • Projects being delayed or cancelled, together with projects asking for advice and support and communities expressing concern, point to the need for a more robust approach to stakeholder engagement. However, the data to substantiate what is lacking is limited. • The CCS industry requires resources for listening to and acknowledging these concerns and finding ways to respond to each, whether pragmatic or emotional. Further, it needs to understand the range of engagement options available at a local level. • The risk of inaction in this area is two-fold: an increase in projects not proceeding cost efficiently, and political risk surrounding governments financially supporting costly delays. • The CCS industry has a range of mechanisms through which knowledge is exchanged. Currently these avenues, including conferences, workshops, reports and case studies, are not providing enough support on stakeholder engagement. The outcome is that project proponents are not able to carry out effective stakeholder engagement. | |
| Keeping CCS Stakeholder Involvement in Perspective | \\Uklonsv01\WEC C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resources\Generic - International\Post-2008 | 2008 | Varied/General | unavailable | <p>Recent surveys, polls, and other research focused on stakeholder attitudes revealed that the general public knows relatively little about CCS. Given this lack of knowledge with respect to the concept of CCS—let alone first-hand experiential knowledge derived from seeing these technologies deployed in local communities—it is imperative to re-examine how research on CCS stakeholder involvement is conducted and how the results of these studies are reported.</p> <ul style="list-style-type: none"> • Given the very low level of knowledge about CCS, surveys are not an appropriate research methodology; the most surveys can do at the present time is to confirm this lack of knowledge. • The almost total lack of knowledge is a formidable barrier to conducting a valid survey of opinions - the opinions of respondents who know little or nothing about an issue are of little use to the researchers or the larger community. Such opinions are called "pseudo opinions" or "non-attitudes". | <ul style="list-style-type: none"> • Another thing to wonder is will the diversity of viewpoints among the various NGOs regarding CCS be a barrier for the deployment of the technology? Some argue that the diversity is not bad per se, as it can be used as a lever to put pressure on policymakers. • Ultimately the possibility exists for NGOs to come to more coherent approaches and agreements in a way that maximizes their effectiveness both as a counterweight to, and partner of, other stakeholders and government |
| | | | | | <ul style="list-style-type: none"> • Moreover surveys and polls measure public opinion at one point in time. Opinions are dynamic. A key issue is the relationship between opinion and action. • Broader discussions with stakeholders are needed, to include climate change, energy supply, and tradeoff issues in forums where information can be provided and questions can be asked. • Many established approaches are available to conduct stakeholder involvement, including ongoing focus groups, citizen panels and juries, advisory boards, and specialized techniques, such as Deliberative Polling. • The context also must include the recognition that any course of action or inaction entails some risk. • The CCS-focused surveys often seek to understand the public's willingness to pay to address climate change and/or to address climate change via the large-scale commercial deployment of CCS. The first is the artificial construct of the public being "offered" a choice as to how much they want to pay for their electricity – an essential service. Second, it is prejudicial to explicitly state that it will cost consumers to "solve global warming". | |
| | | | | | <ul style="list-style-type: none"> • Ideally, therefore, participation should (1) improve the quality of the decisions and their legitimacy among those involved and affected; (2) lead to increased understanding and decision-making capacity among agency officials, scientists and those affected; and, (3) by producing legitimate, credible and well-understood decisions, enhance the ability to implement those decisions, once made. • It is worthwhile to 1) consider the specific goals of public involvement in specific places at specific times and match the method to the goals; 2) determine and accommodate various levels of knowledge held by the various stakeholders to be involved; and 3) understand the frames of reference of those stakeholders and the decision context in which stakeholder involvement takes place. • Stakeholder involvement must be seen as part of a fair, open, and accountable decision process, bringing a wide variety of voices together in the dialogue. | |

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| Understanding and Improving NGO Positioning on CCS | \\Uklonsv01\WEC C\Projects\013075 0 Stakeholder Issues Review8. Working documents\Resources\Generic - International\Post-2008 | 2008 | Varied/General | unavailable | <p>As mediators between regulators, project developers and the public, NGOs can create attention both in support and opposition of CCS technologies and policies. This paper outlines some characteristics of CCS technology that contribute to determine differences in their position.</p> <ul style="list-style-type: none"> • There is generally very low awareness about the technology, opinions are not very firm, and can change with the provision of information. • There is a firm distinction between the general public on one side, and stakeholders like environmental NGOs on the other. This latter group will be more engaged in the issue before the public at large is aware of it. • Global surveys suggest that there is greater public trust in NGOs than in government, private sector corporations, or international organizations. • However CCS represents an emerging technology that requires a policy position that challenges NGOs on several fronts, mainly because it's fairly technical. The notion of fossil fuels as part of a climate mitigation strategy can also be counterintuitive. Lastly, the national context for discussions strongly colours opinions | As the discussion on CCS shifts from an expert debate to a general debate, and subsequently turns into a local debate, the role of NGOs will become more difficult for project supporters to ignore, while putting NGOs more and more into a position of making overt public stands that they have largely avoided to date. |
| | | | | | <ul style="list-style-type: none"> • Most NGOs seem to be convinced that ruling out CCS at this moment is counter-productive. This is mainly because CCS is considered a hedging strategy, in case energy efficiency and renewables do not fulfil their potential. • The most important concerns from the NGOs point of view include 1) Diversion of effort from renewable energy 2) Impact on ecosystems 3) Cost of deployment 4) Threat of leaks 5) Long term economic impacts 6) continued fossil fuel use and 7) the scale of deployment. • Another issue which has been gaining momentum is the concern about the concept of 'capture ready' power stations, which allows new coal-fired power stations to be built without providing any guarantee that capture technology will be actually installed. • Another concern regards the use of public resources to fund projects. • However NGOs appear to have found common ground on some principles that should guide public funding towards CCS: it has to be targeted, limited, and constrained, focusing on demonstration projects only. | |
| | | | | | <ul style="list-style-type: none"> • It should also be noted that people's beliefs and values frame the way they perceive risks and benefits. The issues of greater concern should be merits and demerits of CCS. • Attention should be paid to achieving active participation of the public and stakeholders. Particularly in the early stage of a technology's development, public consultation is not simply a box to be ticked on a project plan, but an opportunity to steer ideas, avoid problems and create spillovers for other projects and policy. • Poor communications can lead to an amplified negative reaction in the event of problems. • An important lesson is that stakeholder engagement needs to take place early and often, as an ongoing activity. Last minute efforts or mere public relations are unlikely to have lasting positive impact. | |
| Communication/Engagement Toolkit for CCS Projects | \\Uklonsv01\WEC C\Projects\013075 0 Stakeholder Issues Review8. Working documents\Resources\CCS case studies and toolkit from Globalccsinstitute\oolkit | Mar 2011 | Varied but focussed on 5 case studies including Barendrecht, FutureGen, Carson, Otways and ZeroGen. | varied, more detail available in individual case studies | <p>This Toolkit has been designed as a universal guide for implementers and developers of CCS projects. It is intended to be a practical and informative tool to assist in the design and management of communication and engagement activities for individual CCS projects. The Toolkit provides best practice methods for addressing the various social components that surround CCS deployment. The guide provides good practice guidance and urges us to undertake surveys which will elicit from the participants their knowledge, opinions and attitudes to the issue of climate change, CCS and other energy technologies and their local community. The topics which should be covered are:</p> <ul style="list-style-type: none"> • General knowledge of climate change and related issues • Knowledge of energy sources and related technologies • Attitudes towards climate change and related issues - including questions such as what do people believe has contributed towards climate change, technologies that help in mitigating their impacts and people's opinion/concerns on CCS in their community. Questions relating to the value of the environment as a whole are also • Willingness to accept changes – would people be willing to pay more for household • Trust in information sources – how much do people trust information sources such newspapers, magazines, flyers, books and academia articles. • Knowledge of company – what is their knowledge of the company developing the C | <p>The practice guide informs us of a number of key guidelines which focus on achieving a widespread understanding of the populations affected as well as the key elements of the human environment related to the project. These include</p> <ul style="list-style-type: none"> • Local empowerment – is there a strong sense of community amongst landowners? • Trust - Who do the community trust in regard to information? • Media Information - Where do community members source information? • Fundamental Views - Does the community have major views on climate change, alternative energies, greenhouse gases, coal mining, etc? |

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| | | | | | <p>Trust has been identified as a critical component for any project to be positively accepted in a community. One way to assist and overcome the issue of building trust is to establish an Independent Steering Group early in the life of the project which can be used to oversee the communications in relation to the overall project plan. Ideally, this group will work closely with the Community Liaison Officer to meet, communicate and manage any issues raised from the community. A citizen task force/advisory board can also be established.</p> <p>The toolkit makes it clear that different stakeholders require different forms of engagement and to determine what this engagement will be, strategies for each group will need to be formed. All stakeholders are divided into</p> <ul style="list-style-type: none"> • Greatest effort – regulators, local government, tax payers, local community • High commitment – other fossil fuel industries, CCS scientists • Least effort – cynics and • Low influence – neighbouring communities and education sector. | |
| | | | | | <p>Key Requirements for Enhancing Effectiveness are listed as</p> <ul style="list-style-type: none"> • Strategic recruitment of diverse members • Clear establishment of goals and operational ground rules • Objective, respected facilitator • Management commitment • Staff resources for preparation and follow up • Good discussion topics such as project schedule, site visits of other CCS projects, interaction with other stakeholders, webinars, larger discussion of IPCC, IEA, CSLF and other global efforts on CCS. • Developing strategies for engaging stakeholders, such as a SWOT analysis. It should ask questions such as how can we leverage each of our strengths? How can we improve our weaknesses? How can we take advantage of each opportunity? How can we minimize each threat? • Establishing a Communication and Engagement Plan which will use a combination of formal and informal engagement processes. Cultural appropriateness and demographic considerations will also need to be factored in. • Engagement activities and materials that could be used when developing communication strategy include briefings/presentations, public meetings, public disp | |
| What happened in Barendrecht? Case study on the planned onshore carbon dioxide storage in Barendrecht, the Netherlands | \\Uklonsv01\WEC\C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resources\CCS case studies and toolkit from Globalccsinstitute\case studies | Nov 2010 | Barendrecht, the Netherlands | local people/local community | <p>This report outlines the defining moments that influenced relationships between the stakeholders and their opinions in the Barendrecht project. It focuses on the characteristics of communication between stakeholders and to the community. All shortcomings in communication are identified and presented as lessons for future CCS project developers.</p> <p>Project overview/timeline</p> <ul style="list-style-type: none"> • Public opposition to the project began immediately after it was presented to the local community in early 2008. Between 2007 and June 2010, opposition to the project increased, became more formalised and better organised. • In 2008 the municipal government formally opposed the project followed by the Provincial Government in 2009. During a 'time-out' period announced by the national government, the so far only government opposition was extended with a local community initiative to oppose the project. • The formal final decision of the national government to continue with the project increased the opposition on a national scale in 2010. <p>Shortcomings in Communication</p> <ul style="list-style-type: none"> • The national government allocated a grant to the project to take place in Barendrecht • In the initial phase, no discussion or dialogue took place between the project devel | <p>Why local opposition was increased</p> <ul style="list-style-type: none"> • When the project was introduced to the local community, the reasons why CCS is needed, the link to national and international policy on climate change and CCS, the effect of CO2 emissions and the choice of this location, were not explained well enough. • The project was perceived as an idea from Shell. The context of the proposal was not well laid out. • The initial presentation of the project and the procedures was too complicated and technical for the public to understand. • Shell and the national government were not considered trustworthy information suppliers by the community because they were perceived to benefit from the continuation of the project. This perception could have been different if the process has been more open and transparent from the beginning |

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| | | | | | <ul style="list-style-type: none"> • After the local opposition became clear, a dialogue between stakeholders was set up via the BCO2 (administrative consultation group). Members of the group were however only the public parties involved in the project. Shell or other industrial parties, NGOs, research institutes or community groups were not involved. This group failed in bringing the viewpoints of the members closer to each other or decrease local opposition. • The debate between the stakeholders took place mostly in public via formal procedures. • Little (informal) direct contact existed between the project developers and opponents. This made it difficult to reconsider or add nuances to earlier expressed opinions. • Within this process, the project could have been further designed to take into account the needs, values and demands of the different stakeholders. They were not involved in an open, fair and transparent process. • Through various institutional procedures, the national government gradually withdrew executive decision-making abilities from the municipal government (the project was included in the RCR). These changes in procedures increased the distrust and increased their opposition to the project. If these changes in procedures would have been more openly with the local stakeholders (especially with the municipal government), these changes would have had less negative impact on the debate. | <ul style="list-style-type: none"> • If the project developers would have shared their ideas, uncertainties, underlying reasons, this could have created more trust in the project developers and the information they provided. • There were almost no communal communication efforts in which opponents and proponents cooperated with each other. This increased the idea within the public that you had to be in favour or against the project and that a more nuanced point of view was not possible. • Shortcomings in the communication led to opposition to the project, which increased throughout the project process. This led to delays in the project planning, the impasse between stakeholders which left no room for manoeuvre or an open dialogue and the still possible cancellation of the project. |
| | | | | | <p>Lessons learned about communication in CCS projects</p> <ul style="list-style-type: none"> • All stakeholders, should be involved early in the project process to create mutual trust and commitment to each other and the process of developing the project together. • The values, needs and opinions of all stakeholders and the community should be defined and considered adequately. It should be noted that there is not just one solution put forward by the project developer without leaving room for adaptation. • Regular formal and informal contact should take place with all stakeholders to discuss changes in the project, the process and procedures. • Stakeholders should not only discuss the actual CCS project, but also available alternatives and the larger context of CCS. • Communication towards the community must answer the specific needs of the community, which must be investigated before starting the communication. • The following elements should always be investigated - the existing knowledge about climate change and CCS, the need for further information, environmental elements of the project, existing local and national discussions related to the project • The visibility of national government representatives at project meetings is an important factor especially in the early stages of the project. | |
| | | | | | <ul style="list-style-type: none"> • Questions and concerns about technical details and safety should be addressed adequately and timely. • Formation of an independent consultation group to act as a link between the developers and the community is a good idea and topics such as safety, risk analysis, geological research, changes of property, values, legal issues and monitoring can be discussed transparently. • It was noted that people literally checked whether their house was located above the Barendrecht gasfields or not. If it was not, they were less concerned. • The project got increasing media coverage as time proceeded. Interestingly the media generally took the role of event following rather than active opinion former; although the project was often described as a 'test' or 'experiment'. • Shell and the national government performed additional research and found the location in Barendrecht the best onshore location for a CCS demonstration project and that no health, safety or environmental boundaries would be reached. These outcomes however did not decrease local opposition. | |

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| FutureGen Case Study | \\Uklonsv01\WEC C\Projects\0130750 Stakeholder Issues Review\8. Working documents\Resour ces\CCS case studies and toolkit from Globalccsinstitute\c ase studies | Nov 2010 | Illinois, USA | local people/local community | <p>Mattoon, Illinois (the site for FutureGen project) was chosen after reviewing 100 sites. The selection criteria included quality of reservoir, seals, available water source, and a multitude of other factors including public acceptance. This report outlines the public engagement tools used in the FutureGen project, and assesses the local perceptions of the project overall, especially the engagement process.</p> <p>Lessons learned</p> <ul style="list-style-type: none"> • Cultivating community pride through competition, self-selection, education, and engagement can be beneficial throughout the early planning, site selection and site operation phases of a project. • Early adopter communities may value altruistic benefits associated with being at the forefront of energy research. • Creating a collaborative, unified work team that is seamless across geographies (state, regional, local) and political boundaries is critical. Having strong leaders responsible for coordinating the players at the outset and throughout the process is also important. • Understanding specific and varied audiences is critical to stakeholder engagement. Background, generational influences and social characteristics of the understanding | <p>Other discussion points were</p> <ul style="list-style-type: none"> • Respondents reported that, during the course of the four years, there has been a growth of knowledge and understanding throughout the Mattoon community about CCS, clean coal technology, climate change mitigation in general and FutureGen specifically. • There has been an increase in knowledge of carbon sequestration among the community including schools. • The competitive nature of the FutureGen process created a scenario in which the community was in a position to assess individual and global benefits that stem from FutureGen. • Different levels of engagement were used throughout the project. Some people chose to participate in the process, others chose to observe, and still others waited and/or wanted to be engaged or brought in by the project developers. All respondents agreed that the project developer, the FutureGen Alliance, and project proponents in the state and the community made public engagement a priority. |
| | | | | | <ul style="list-style-type: none"> • Seeking input from audiences about what information will be of interest to them and providing that information in a timely manner can be beneficial to engagement. • Allowing time for audiences to absorb information and keeping the lines of communication open to answer additional questions as they arise is essential. • Understanding where people get their information and being prepared to provide it early and often is an important strategy. Messages from multiple sources with potentially varying perspectives may carry more weight. • It is wise to release accurate and consistent information to avoid false expectations. • Ensuring that stakeholders have access to technical experts is important for building trust. Informal sessions provide stakeholders with the opportunity to become more familiar with the technical issues. • Meetings with people with similar backgrounds allow a free exchange of ideas and can result in a shared understanding of the project. • A range of forums should be used to maximise the opportunity to reach a diverse set of stakeholders. | <ul style="list-style-type: none"> • Engagement happened in many forums and different sized groups. Public meetings were held throughout the FutureGen process. • Most respondents mentioned the role that the media played in information dissemination and airing of public opinions. • The Illinois economic development office, DCEO, was seen by most respondents as the coordinator of community engagement from the state level. The engagement process was described as very sophisticated and well managed. • The openness and transparency were stated as important variables in the FutureGen process, both in information delivery and in the selection process itself. • Having the FutureGen Alliance hold its board meetings in Mattoon demonstrated its local commitment |
| | | | | | <ul style="list-style-type: none"> • Having third-party scientists describing how CCS works provides clarity and credibility, particularly if that organisation is regional and scientists are knowledgeable about it and live in the region. • Transparency may build trust, encourage input and engage stakeholders by providing information in a timely and open manner. • Acceptance may be facilitated if project developers spend time in and getting to know the community. | <ul style="list-style-type: none"> • The local benefits were originally assumed to be job related, but the actual jobs to be gained was smaller than originally anticipated. However, the potential of FutureGen to revitalise the Illinois coal industry was recognised by many as an important regional/local benefit. • Questions and concerns expressed by community members centred on immediate and local impacts mostly revolving around health, environmental safety, coal usage, leaks, contamination, dust, ash, hazards, environmental benefits, land acquisition and noise. • Some people had negative comments and feelings, but these did not taken hold in the community primarily because of transparency, openness and accessibility of the process. • Also seen as important were stakeholder meetings with specific groups from industry, academia and the farming community. • However the on again and then off again nature of the proposal was a negative point – and not the project itself. |

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| Case Study of the Carson CCS Project | \\Uklonsv01\WEC C\Projects\0130750 Stakeholder Issues_Review8_Working_documents\Resour ces\CCS case studies and toolkit from Globalccsinstitute\c ase studies | | California, USA | local people/local community | <p>The Carson Project demonstrates very clearly the complex nature of CCS siting and its integral link to the political and social context, including broader energy policy issues and associated controversies. While the project team may have done some things well and others not so well, additional factors outside its control had an enormous role in the project outcome. The purpose of the study is to identify key lessons learned in communicating about future projects</p> <p>Project overview/timeline</p> <ul style="list-style-type: none"> • The project team reported that its strategy was to stay out of the media early – until all the key stakeholders were fully briefed and had a better understanding of potential concerns and benefits. Pre-announcement contacts were primarily with state and local officials as well as local groups that represented the community. • The team however did not brief some of the state’s leading environmental justice group spokespeople before the event. • The news release and announcement ceremony was the first, and very public, disclosure of the project. | <p>There was also some discussion about property rights - who owned the rights to the pore space in the subsurface and what happened if the mineral right rights were actively being used for mining, hydrocarbon production, natural gas storage or some other activity?</p> <p>It was also not clear if CO2 would be deemed a commodity (it was being purchased for or was it a waste, and if a waste could it trigger liability issues?</p> |
| | | | | | <ul style="list-style-type: none"> • A lot of interest was shown in the project over the next three years especially by non governmental groups although they were giving out mixed signals. Some of them were inclined to believe the advantages offered by CCS whilst others were downright against it. • Outreach activities centered on the Carson site tailed off during 2007 after the decision of its abandonment. • Development of the Carson Project and discussion of AB 705, a bill which was intended to provide the regulatory framework for sequestration, overlapped in time. However final reports did not mention any linkages between AB 705 and the decision to abandon Carson. | |
| | | | | | <p>Factors affecting the outcome of the project</p> <ul style="list-style-type: none"> • The project team conducted extensive communication and outreach using a tiered approach. Initially the team contacted decision makers and opinion leaders at the state and community level. However, after the announcement, communication efforts became overwhelmed by concerns about air quality, and these rolled into concerns about the role of CCS in the broader energy arena, particularly in the debate over AB 705. As a critique, public outreach could have been more integrated into initial project planning and management. The project carried so many benefits, but local concerns over air quality and pollution issues clouded them. This was compounded by the delay in contacting and potentially gaining support from vocal environmental justice spokespeople and the absence of a community voice at the celebratory announcement. The earliest media coverage also focussed on air pollution instead of its benefits. | |
| | | | | | <ul style="list-style-type: none"> • The high visibility focus on a first-of-a-kind power plant dominated the message. Although there was strong interest from state leaders and incentives to developers and host communities from emerging financial incentive programs, the public announcement of the project highlighted the power plant and carbon capture and downplayed the storage component. As the project progressed, the storage aspects were increasingly questioned. Significantly, while media attention highlighted opposition from environmental justice activists, problems that emerged with the technical and commercial viability of the storage ultimately led to the abandonment of Carson and selection of an alternative site. • Furthermore, when questions about leakage, the safety of storage, and the potential impact on subsidence were finally raised, those who were already opposed on the grounds of pollution, environmental justice and linkage of CCS to continuation of fossil fuels were more inclined to be suspicious. The suspicion was strengthened by the lack of a specific site that had been adequately characterised to point to. | |

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| | | | | | <ul style="list-style-type: none"> • Efforts by others to clarify what regulatory framework would or should apply added an unwelcome complication. There was not a clear cut set of regulatory safeguards and requirements for the project. In theory, California AB 705, the bill requiring development of regulations for CO2 storage, should have reduced this regulatory uncertainty. It did not. Coming on the heels of several bills that supported CCS as a climate option, the introduction of AB 705 was seen by environmental justice activists as an effort to prevent them from having a forum for consultation. Although the Carson team was not involved in the legislation, the Carson project became a symbol in what turned into a heated debate about the future of energy projects in California. • Connections to the national and international debate on climate brought favourable as well as negative attention to the Carson Project. Key interest groups acted somewhat opportunistically, pointing to technology projects as both distractions and potential solutions. This created a confusing backdrop for local stakeholders' consideration of CCS. | |
| Case Study of the CO2CRC Otway Project | \\Uklonsv01\WEC C\Projects\013075\0 Stakeholder Issues Review\8. Working documents\Resources\CCS case studies and toolkit from Globalccsinstitute\case studies | Nov 2010 | Nirranda South, Victoria, Australia | local people/local community | <p>The CO2CRC Otway Project will provide many valuable lessons for successful deployment of CCS projects. The recommendations formulated from the successes and difficulties of stakeholder consultation and engagement activities can help to inform other CCS projects as they move from concept to deployment into communities</p> <p>The successful aspects of the stakeholder and community engagement were</p> <ul style="list-style-type: none"> • Early proactive engagement with stakeholders to build trust and form working relationships, creating two-way dialogue. Project developer activities including face-to-face meetings, research into the community perceptions through interviews, surveys and focus groups as well as public meetings and the distribution of information packs, advertisements and newsletters. • Undertaking social research in the community to establish a baseline understanding. • The consultation plan 2005 aimed to build successful relationships with stakeholders, inform and educate the community about CCS, ensure that landholders heard of the project from CO2CRC directly, and provide opportunities for transparent and joint communication. | |
| | | | | | <ul style="list-style-type: none"> • Face-to-face meetings with key landholders and stakeholders. This was an important step in building relationships and trust between CO2CRC and the community, and in discovering issues and concerns relating to compensation and access to land. • A local former school teacher was appointed as a liaison officer to build trust between CO2CRC and the community. This appointment opened up the channels of communication and was crucial in overcoming and eliminating any barriers regarding concerns and issues raised by the community. • The establishment of a community reference group was perceived as integral in communicating the issues and concerns of the community back to the developers. • An open day, providing the public with a tour of the site followed by an open formal discussion | |

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| | | | | | <ul style="list-style-type: none"> • The official launch of the project in April 2008 was particularly successful with federal, state, industry and other dignitaries attending along with invited members of the local community. This launch was also able to draw attention to the project on a global level, with multiple media covering its progress • Another aspect perceived positively in the local community was that the head of CO2CRC visited the area many times to meet the community and stakeholders and to discuss issues and concerns. <p>The least successful aspects of the stakeholder and community engagement were:</p> <ul style="list-style-type: none"> • The lack of communication, by a seismic crew when seismic testing was conducted. Efforts to repair damage were seen by some community members as inadequate and the communication process poorly handled. • Several incidents relating to seismic surveys were perceived in a negative light which includes the talk of using dynamite as part of the survey. Potential distortion of land surfaces was also a concern. • Another issue of concern was the compulsory land acquisition. | |
| | | | | | <ul style="list-style-type: none"> • Residual concerns revolved around issues such as safety, potential hazards, contamination issues, property prices, traffic implications, potential leaks, financial impacts and compensation. • Zoning regulations were also a matter of concern. There was a lack of understanding between the project's scientists and planners. This demonstrated the importance of two-way communication and the need to ensure all processes, whether they are science or policy, be adequately explained to the uninitiated. <p>Lessons learnt</p> <ul style="list-style-type: none"> • Several of the interviewees noted that their knowledge of CCS had been gained as a direct result of involvement in the CO2CRC Otway Project. • It was emphasised that the project was not there to make money but to determine viability for future application. • The science of the technology behind the concept of CCS was perceived to be baffling to most community members initially. However, once the process became clearer and there was time to question project proponents to gain a better understanding, to enable concerns to be allayed and a more positive response to be instilled. | |
| | | | | | <ul style="list-style-type: none"> • During the launch of the project several NGOs were active in the early CCS debate and critical of the perceived 'dumping' of greenhouse gases underground and potential cost and safety issues. However, over time engagement with these groups has helped to allay their concerns. • It was noted that NGOs in Australia tend to take a range of positions from those staunchly against any CCS projects to those believing that it should be tried and tested in this research and development phase. However, all feel that this should not be done at the expense of renewables and that energy efficiency measures. | |

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| | | | | | <p>Five critical factors that affected the outcome</p> <ul style="list-style-type: none"> • Gaining a baseline understanding – the appointment of a market research company to conduct focus groups and coordinate a survey across the region to gain a good understanding of how the local community perceived CCS. • Early, proactive engagement –a concerted effort to ensure that engagement with the community was a priority. Every effort was made to communicate openly using jargon-free language with community members. CO2CRC representatives consciously attempted to 'lose the suits' for their engagement activities. • Establishing trust –It was also a priority to ensure this trust was maintained throughout the project. Ongoing open and transparent communication was seen as critical to achieve this goal. A fundamental component for developing trust was to ensure the dissemination of accurate and up-to-date information at all times. • Appointment of Community Liaison Officer from the local community –a paid local representative was appointed to the position and the officer is well respected. • Development of protocols for engaging with local landowners – there were so many protocols that were developed to ensure that the local community was not overwhelmed. To overcome any negative feelings or unnecessary repetitions of such events, CO2CRC reacted promptly to develop formal processes in relation to access and site clean-up and these were appreciated by the local community | |
| Case Study of ZeroGen Project | \\Uklonsv01\WEC\C\Projects\0130750\Stakeholder Issues Review\8_Working documents\Resources\CCS case studies and toolkit from Globalccsinstitute\case studies | Nov-10 | Central Queensland, Australia | local people/local community | <p>The ZeroGen Project will provide many valuable lessons for successful deployment of CCS projects. From the developer's perspective the following list of communication and engagement processes were imperative for effective stakeholder engagement:</p> <ul style="list-style-type: none"> • A comprehensive stakeholder plan • A very specific and deliberate communication strategy was used to emphasize on an engagement processes that permitted information dissemination back to the community, and encourage honest and transparent dialogue. • Approaching stakeholders from a staged perspective (involved determining different level stakeholders from a national, state and local perspective) • Ensuring all stakeholders, particularly landowners were treated with respect at all times • Ensuring respect of property privacy issues • Engaging directly with all levels of stakeholders using a variety of methods such as fact sheets, website, face-to-face meetings, workshops, public conferences, industry groups and national and international conferences. • Engaging local bureaucracy – keeping them 'in the loop' • Compensating for access when possible, as well as damage to and use of property • Seeking stakeholder input regarding site selection on properties | <p>Local perceptions of the project</p> <ul style="list-style-type: none"> • Longer-term benefits are perceived to include job creation, infrastructure improvements (to roads and transport options) and improved health services. • Social benefits were perceived to include construction and earthworks, base-load electricity supply, increased local investment, sustainability of the local coal industry and corresponding improvements to the local economy. • Several national non-government organisations were involved in the national consultation when the Ministerial Council of Minerals and Petroleum Resources was developing regulatory guidelines for CCS. This assisted with several of the leading environmental NGO organisations becoming more accepting of the need for trials of CCS at a more commercial scale. |
| | | | | | <ul style="list-style-type: none"> • Engaging the local indigenous community, and ensuring respect of land and culture. • Articulating the local benefits as well as wider benefits – state, national, global and economic. • Communicating and engaging at the local stakeholder level via individual meetings or public forums such as community liaison meetings. • Making information available about CCS, how it worked, the reasons for its use and application, why it is necessary, and its proposed contribution towards climate change mitigation. • Sending project milestones and other newsworthy issues to local newspapers and relevant publications. | <ul style="list-style-type: none"> • When the ZeroGen project was announced, there was some opposition to the proposal, in particular some local conservation groups expressed concerns and doubts about the feasibility of CCS as well as the potential for damage to local ecosystems. It has been interesting to see that over time some of those NGOs became more positive and open about the project. |

| Publication title | File name and location | Date | Geography | Stakeholders covered by type | Issues identified (barriers to acceptance) | Other themes discussed |
|-------------------|------------------------|------|-----------|------------------------------|---|------------------------|
| | | | | | <p>Pitfalls</p> <ul style="list-style-type: none"> • Timing of engagement events was identified as an issue, with engagement schedules not sensitive to landowners' non-specific hours of work. Corrective measures undertaken by ZeroGen to address these issues appear to have met the needs of affected stakeholders. • From a local community perspective, minimal local benefits were perceived to have been generated from the project to date. This belief is mainly due to an understanding that the project's nature, permitted little benefit apart from some small economic gains • Grievances mainly appear to be in relation to access to property, lack of respect of landowners' rights, damage to property, damage to local infrastructure, property acquisition, lack of compensation, uncertainty of project outcome, and security and safety concerns. • Housing availability and increased prices appear to be another issue of concern • Questions identified by stakeholders were extensive and varied. Some focused specifically on CCS and the technology that supported it, while others related to local physical, social and economic impacts. In particular, questions covered issues contamination, hazards, safety, economic opportunity, infrastructure creation and maintenance, property access, financial compensation, safety and security, and responsibility and | |
| | | | | | <ul style="list-style-type: none"> • Another concern identified was the practice of mining companies in the region and the underground storage of CO2. • Another issue which negatively impacted on engagement activity was natural and man-made disasters that occurred overseas pricked community members' fears about the possibility of similar incidents happening in relation to CCS | |
| | | | | | <p>Five critical factors that affected the outcome</p> <ul style="list-style-type: none"> • Develop clearly defined stakeholder plan – great importance was placed on identifying all of the stakeholders that may have an influence on their project and prioritising them accordingly. • Execute and evaluate the stakeholder management plan – once the appropriate levels of engagement had been identified, it was critical to execute the plan and continually monitor and evaluate its effectiveness. Ongoing monitoring allowed potential significant events to be avoided and the stakeholder management plan was kept on track. • Understand the current political climate at all levels – ZeroGen found it essential to understand more than the overarching national perspective. Specifically, the state and local context was very important – particularly when local agendas tend to override national objectives. • Be aware of extraneous issues – For example, being unfamiliar with a local community event caused a community engagement meeting to be poorly attended. • Positively address all stakeholder requests and include them in project decision if appropriate. | |



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