



Institute for
European
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Policy

**REVIEW OF THE PUBLIC PARTICIPATION PRACTICES FOR CCS AND
NON-CCS PROJECTS IN EUROPE**

Lead Author:

Jane Desbarats (IEEP)

Contributing Authors:

Paul Upham (Tyndall Centre, University of Manchester)

Hauke Riesch and David Reiner (Judge Business School, University of Cambridge)

Suzanne Brunsting and Marjolein de Best-Waldhofer (ECN)

Elisabeth Duetschke (Fraunhofer Institute)

Christian Oltra and Roser Sala (CIEMAT)

Carly McLachlan (Tyndall Centre, University of Manchester)

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Acronyms

ACCC	Aarhus Convention Compliance Committee
APIA.....	Access to Public Information Act (Poland)
BMM	Management Unit of the North Sea Mathematical Models
BMU	Federal Ministry for the Environment, Nature, Conservation and Nuclear Safety (Germany)
CCS	Carbon Capture and Storage
CEC	Communication from the European Commission
COM.....	Commission Communication
DEFRA.....	Department for the Environment, Food and Rural Affairs (UK)
DG	Directorate General
E-PRTR	European Pollutant Release and Transfer Register
EC.....	European Community
ECJ	European Court of Justice
EEC	European Economic Community
EECCA.....	Eastern Europe, Caucasus and Central Asia.
EEZ.....	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EIAA	Environmental Impact Assessment Act (Poland)
EIR.....	Environmental Information Regulation (UK)
EPER	European Pollutant Emission Register
EPLA.....	Environmental Protection Law Act (Poland)
EU.....	European Union
FANC	Federal Agency for Nuclear Control (Belgium)
FoE	Friends of the Earth
FOIA.....	Freedom of Information Act (UK)
FPS	Federal Public Service (Belgium)
FPS PHFSE	Federal Public Service for Public Health, Food Safety and the Environment (Belgium)
IPCC	Intergovernmental Panel on Climate Change
IPP	Institute for Politics and Citizens (The Netherlands)
IPPC.....	International Plant Protection Convention
MS	Member State (of the European Union)
MW.....	Megawatt
NGO	Non-Governmental Organization
NIRAS	Agency for Radioactive Waste and Enriched Fissile Material (Belgium)
POST	Parliamentary Office of Science and Technology (UK)

PRTR.....Pollutant Release and Transfer Registers
SEAStrategic Environmental Assessment
SME.....Small and Medium-sized Enterprises
UIG.....Environmental Information Act (Germany)
UNECE.....United Nations Economic Commission for Europe
VROM.....Ministry of Housing, Spatial Planning and the Environment (The
Netherlands)
WFDWater Framework Directive

EXECUTIVE SUMMARY

The European project *NearCO₂* is investigating European public perceptions of carbon capture and storage (CCS) via case studies (both CCS and analogous energy infrastructure), surveys, and focus groups. The overall aim of the project is to investigate and develop communication strategies that are designed to convey the advantages and risks of CCS to stakeholders and to the public, which strategies may also be used to involve these parties in local decision-making on CCS projects.

This report describes the results of the first phase of investigation, which focuses on lessons learned from CCS and analogous developments in recent years. Eight case studies are reviewed to help determine the nature of the communications and consultation strategies used by project developers as part of the energy project approval processes. The chosen range of case studies represents a number of different regulatory environments throughout the European Union and a number of different technologies. The consideration of a number of different contextual factors as part of a multi-case study approach has helped to identify factors involved in the relationship between communications and project outcomes, as a means of informing consultation exercises for future CCS projects.

In particular, the following findings stand out (note that some of these recommendations are not necessarily easy to achieve):

- It is important to understand the existing, typically local, political context at an early stage. Doing so involves preparatory research ('profiling' or 'social site characterisation') which includes for example talking to local opinion formers and stakeholders. There will almost certainly be local and regional factors that need to be taken into account when planning CCS communications relating to a specific project. These might include, for example, a history of distrust or bad experiences with particular firms; a perception of excess industrial development in the area; local political cycles and schedules etc – there is a large number of possibilities.
- People tend to experience place-attachment: their natural tendency is to defend locality against perceived threats, and CCS developments are likely to be no exception. Threat perception needs to be minimised and perception of benefits needs to be maximised – but without incurring the perception of bribery.

- People expect procedural justice and more: they expect their concerns to be listened to and to be taken seriously. After undertaking the preparatory research referred to above, to avoid unnecessary entanglement in local issues that pre-date the proposed development, the next stage is to begin to engage frankly *outside* of the formal planning processes. These processes typically support the developer and place them in a strong position in any case. It is only fair to communities that the developer goes beyond the minimum legal consultation requirement when it is known in advance that there may be perceptions of significant risk, however remote such risk might be in practice.
- Engagement needs to use good quality information and a mix of contexts: formal, informal, technical and simple. The information sources and the messenger need to engender trust, and from a contextual position need to address questions around project timing and location. People need to be given sufficient reason to tolerate what is inevitably some degree of intrusion, be this additional direct or indirect employment, or some other form of compensation. The quality of information given also depends on the fit between information and prior knowledge of the general public; often a higher level of knowledge and awareness is assumed than is warranted, leading to misunderstandings. Preparatory research can help avoid such misunderstanding.
- In terms of engendering trust, it will help to involve experts who are likely to be perceived as independent, and it will help to have convincing responses to many of the concerns that we already know that communities may raise. These may include: being able to explain the difference between incidents such as the Lake Nyos incident and the proposed development (specifically, how the two contexts differ radically); an explanation of the nature of CO₂; and differences between CO₂ storage and other storage of gas and industrial/hazardous substances (particularly the depth involved). However, it should be noted that there is little practical experience in dealing with the above in a communications context – this is still somewhat uncharted territory, which the present project can go only some way to remedying.

1 INTRODUCTION

1.1 Public Acceptance of CCS: The Bigger Picture

Although there are numerous technical uncertainties associated with the implementation of carbon capture and storage (CCS), a combination of energy needs and greenhouse gas emissions mitigation targets may necessitate its increased uptake. In Europe, energy supply possibilities are perhaps more debatable, but with every delay in reducing emissions, some use of CCS becomes more likely. EU climate policy requires renewable energy generation to more than double by 2020. The EU will also need to replace half of its power stations by 2020, even assuming energy efficiency improvements are made across the economy (Market Observatory for Energy, 2008). Even with this major increase in renewable energy generation, plus new nuclear power plants, it is unlikely that we can avoid building at least some new power plants that use either coal *or* gas in the next ten years. Although energy scenarios from a variety of sources envisage differing supply mixes and levels of energy efficiency, coal and gas remain prominent in all for decades to come (Luukanen et al, 2009).

At the same time, public awareness of CCS is relatively low in Europe (De Best-Waldhober et al, 2006, 2008; Ha Duong et al, 2009; Reiner et al, 2006) and some CCS development projects have encountered public opposition in both Europe and in the United States. From a communications and consultation perspective, CCS presents a significant challenge given that the technology does not have a long standing implementation history or a representative data set that can be used to demonstrate the relatively low risks posed by underground storage.

As many scholars argue and recent CCS demonstration projects show, a number of factors need to be considered in effectively communicating the costs and benefits of CCS to the general public. In this report, public reactions to communication and consultations strategies are analyzed in order to extract lessons learned. While these lessons learned can be used as the basis for recommendations in designing future communications strategies, they are not provided with the intention of endorsing the technology. For the purposes of this report, improving communications is a question of promoting transparent public awareness campaigns that will allow the public to make informed decisions in the context of local consultation exercises.

Drawing on the appended case studies, grounded in insights from empirical research, we identify a number of factors that need to be considered in effectively communicating the costs and benefits of CCS to the general public and in undertaking associated consultation. We draw conclusions based on analysis that seeks to answer the following questions in relation to the consultation processes of the eight cases considered:

- 1) **Who** is presenting information? Is it being presented on behalf of an impartial stakeholder? Trust in the messenger is particularly important.

- 2) **What** information is being presented? Is CCS being explained in the context of overall energy supply needs and European greenhouse gas mitigation targets? Is it placed in the context of a suite of options?

- 3) **When** is information being presented? Is information on CCS being presented at an early stage of the project development cycle? The case study evidence clearly indicates that the timing of consultation is crucial to securing positive project outcomes.

- 4) **How** is information provided to the general public? What types of communication methods and information materials are used? The case study evidence evaluates the success of various tools in effectively communicating project details to the public.

This document reports on Task 1.2 “Review of public participation practices in CCS and non-CCS case studies” of the *NEARCO₂* project. Having laid the legal groundwork for consultation in WP1 as part of the report “Review of the regulatory context for public participation“, the report for Task 1.2 looks at the situation with respect to effective communication as part of the public consultation process for a number of different case studies. The case study analysis serves to provide lessons learned with respect to the implementation of communications and consultation strategies for eight case studies involving the implementation of projects utilizing CCS and non-CCS technologies. It provides an empirical overview of the issues faced in the progress of certain projects, and what factors have helped shape public perception of the technology in question. Observations that can be made with respect to the relationship

between public dissatisfaction and project outcome are summarized for all case studies on the basis of comparative analysis.

The variables used to compare different case studies are based (in part) on the issues that were highlighted as part of a case study template used to investigate each project. This template was designed on the basis of a number of different communications theories, on the basis of analysis completed for the communications dynamics of a number of existing European projects, and on the basis of inputs from the project team. Therefore, although the template served as a useful basis in terms of collecting data, it was not able to foresee the impact of additional variables. These variables became more obvious as a result of the case study comparison, and thus supplement the initial methodology used as part of the data collection process.

1.2 Factors influencing public perception of CCS

New technologies face different barriers to adoption (Oltra et al, 2009). The diffusion of the technology by the market may be hindered by a combination of technical and economic challenges as well as by a lack of stimulating policies, laws and regulation (Kemp, 2000). Acceptance by the key stakeholders, policy actors and the general public may play a role in technology deployment decisions (Wüstenhagen et al, 2007), and the presence of multiple stakeholder groups with competing interests might make the successful development of a technology difficult (Seager et al, 2007). Social acceptance of the technology might be narrowed by the opposition to CCS of non-governmental organisations (NGOs), experts and other industries. In order to determine the actual social perception of the technology involves researching the CCS context, the primary areas of concern (as exemplified by an EC Consultation in 2007) and the activities of industry (as shown by the outreach activities of CCS technology platforms at the EU and national levels). But a key issue in the sustainable embeddedness of the technology in society may be local acceptance of specific onshore CO₂ storage projects. The cancellation of a CO₂ ocean storage project in Hawaii (De Figuerido, 2003), and the local opposition towards projects in several countries, show the importance of taking public concerns into account when developing projects that are perceived as hazardous technological facilities.

There are two broad issues that define the context for CCS projects and the opposition that is generated as a result of their implementation: environmental risk and technology cost (Renn and Kastenholz, 2000). Looking specifically at environmental risk, the local public tends to voice concerns related to project location and the possibility that projects could pose a health and safety risk to the local population. Earlier

work, for example, on the siting of waste landfills, prisons and other contentious infrastructure suggests that compensation may be required to facilitate public acceptance (Kunreuther, Slovic and MacGregor, 1996). However this itself is not a straightforward strategy or solution, as we discuss subsequently.

Several recent studies (Van Alphen et al, 2007; Ramírez et al., 2008) show that stakeholders are concerned about the potential national and local resistance to concrete projects, and acknowledge the fact that more needs to be done in order to engage the general public. However, it is not clear what form this engagement will take (Reiner et al, 2007). It is unclear whether project developers will avoid engaging with the public simply to avoid alarming the public or whether they will initiate a two way communication and participation process with the public in order to increase actual public awareness (Renn et al 2007).

In the mean time, researchers have begun exploring current public perceptions of CCS. Studies that have aimed to understand public attitudes towards CCS have used an array of methods, which have all supplied information on CCS to respondents (Ashworth et al 2006; De Best-Waldhober et al, 2006, 2008; Itaoka et al, 2006; Palmgren et al, 2004; Reiner et al 2006; Shackley et al. 2005; Tokushige et al, 2008). Attitudes towards CCS identified as a result of these studies indicate a range in support from moderate to sceptical, although generally speaking strong opposition to the development of CCS is hardly encountered. Opinions on CCS could be expected to change with the development of recent projects in the EU, when people are likely to be confronted with CCS while uninformed. Given the relative unimportance of CCS to the everyday life of the average EU citizen, public awareness as well as public knowledge of CCS is found to be very limited (Ashworth et al., 2006; De Best-Waldhober, 2006, 2008; Eurobarometer, 2007; Ha Duong et al, 2009; Itaoka et al, 2006; Reiner et al., 2006; Solà et al., 2007). Moreover, when indeed confronted with the possibility of CCS, the first reactions of the public can be quite different than anticipated by experts. For instance, Bradbury et al (2009) observed in local communities that an important factor for the opinion of CCS was past experience with government, existing low socioeconomic status, and/or desire for compensation. Benefits of CCS to the community were observed to be of greater concern than the concern about the risks of the technology itself. Experimental surveys (de Best-Waldhober et al 2006; 2009) show that lay people, given expert information on the consequences of these technologies, base their opinion of CCS technologies only in part on consequences that experts deem important. A recent study into lay people concepts of CO₂ and CCS showed that some people were worried that CO₂ might cause cancer, or even that CO₂ leaking from storage might cause DNA changes (Wallquist et al, 2009).

The relationship between awareness and perception has therefore been a topic of investigation. Several studies provide participants with information about CCS, showing that individuals' reactions to the technology can change with the provision of information. But how reactions change varies, with some studies showing a more positive opinion, some a more negative opinion, and some studies showing that it is mostly the quality of opinion that changes, with accurate, balanced and understandable information leading to more stable opinions (de Best-Waldhober et al, 2008). Shackley et al (2004) find that information given in Citizen Panels seems to lead to a more positive opinion of CCS. Two Japanese studies not only found positive effects of information provision but also analyzed what these effects were based on. Itaoka and colleagues (2004) found that the more information respondents obtained about CCS, the more likely they were to support storage options, except for the onshore option of geological storage.

More elaborate statistical analysis of public perception data (Itaoka et al, 2006) revealed that the effect of CCS on CO₂ emission reduction as an argument for the use of CCS was most influential for public acceptance of CCS. Tokushige et al. (2007) found that part of the information used to influence individual perception as part of their study was effective in decreasing the risk perception and increasing public acceptance. However, the most important factor for public acceptance was the perception of benefit, which was not influenced by any kind of information used in the study. This has been exemplified in recent Dutch studies which show a significant influence of the benefits of CCS (de Best-Waldhober et al., 2009; 2008) on perception. Another factor influencing the opinion of CCS that became apparent from this study was that, in the opinion of the respondents, CCS compares slightly unfavourably with other climate mitigation options such as energy efficiency, wind energy, nuclear energy or energy from biomass.

Issues related to communications research notwithstanding, the complexity of competing socio-political factors and policy priorities may mean, particularly in light of current local opposition to CCS found in Europe and in the United States, that the development of public acceptance for on-shore storage of carbon dioxide may be a challenging process. The case study analysis completed in this report provides some lessons learned that should be considered in the context of consultation undertaken for these projects.

1.3 Overview of Work Package 1.2

This report includes the following case studies:

- 1) The Netherlands: Barendrecht CCS
- 2) Germany: Vattenfall's application for an Exploration Permit for Beeskow CCS Project

- 3) Germany: CO₂ Sink research project at Ketzin
- 4) Spain: La Pereda gas-fired power plant
- 5) United Kingdom: Lessons from the Milford Haven – Gloucestershire Gas Pipeline
- 6) United Kingdom: Lessons from UK Bio-energy: Winkleigh
- 7) United Kingdom: Lessons from UK Bio-energy: Eccleshall
- 8) The Netherlands: Burgervlotbrug Wind Farm

As a result of a brainstorming session held on June 4th 2009, the project team came up with a number of criteria that could be used to select case studies for analysis. In summary, case studies were chosen based on the following considerations:

- Projects needed to be at relatively advanced stages of their development; permits should have been submitted either as part of the IPPC process or as part of local Environmental Impact Assessment requirements;
- Projects needed to be situated in proximity to a population base, otherwise there may not have been enough of a population base to accurately gauge a representative reaction from the local public;
- As many CCS case studies as possible were chosen, including examples of projects that seemed to have developed satisfactorily to all involved, including the local public, as well as projects that seemed to have caused a stir during their development; and
- All non-CCS projects chosen are of commercial scale.

The impact of effective communications has been considered in the context of different regulatory environments and in the context of different project types in order to highlight the importance of local considerations. Considering consultation in the context of different regulatory environments as part of the case study analysis, illustrates that local populations can delay projects thus incurring cost to the project developer, despite their inability to overturn final project implementation decisions. This is based on the premise that CCS is likely to be subject to similar concerns and that public opposition is likely to be amenable to understanding through existing conceptual frameworks. Of course CCS-related objection has its own particular characteristics, and we discuss these, but this objection is not fundamentally unique: concepts from environmental psychology, particularly risk perception and place attachment, as well as communication theory, can all help to inform appropriate responses.

It should also be noted that there is no mechanistic, causal relationship between the quality of communications and the final acceptance of technologies and the implementation of the project in question. The case study analysis completed as part of the NearCO₂ project is intended to gain an appreciation of fair and open communication with the public, and is not intended to outline communications tools that can guarantee public acceptance of CCS. Moreover, it is statutory authorities who exercise political and decision-making power. At the same, however, there are studies documenting and analyzing local context, public controversy and opposition surrounding other potentially hazardous facilities where there are perceived health, safety and environmental risk demonstrating that planned and credible risk communication strategies help to ensure success in the siting of controversial facilities (Kunreuther et al, 1996; Rogers, 1998; Löfstedt, 2002).

1.4 Status of CCS Projects in the EU27

CCS projects throughout Europe are at various stages of the project development cycle. Projects that are close to implementation, in terms of injecting CO₂ underground, are primarily small-scale research and development projects. These projects are not required to undergo public consultation according to the EU CCS Directive 2009/31/EC, yet they have gone beyond the legislative requirements in terms of undertaking public consultation and public opposition to these projects has been low. It is not clear whether this is related to the low volume of CO₂ injection and the fact that developers have typically made use of existing gas storage reservoirs. Despite the fact that it is a pilot project with few financial dividends, the Barendrecht project is the only example of a project that has been implemented by a large-scale private sector consortium that has gone ahead.¹ For this reason, the study uses a range of different project types from across Europe, with the intention of drawing inferences from other energy infrastructure installations.

The diagram provided below provides an example of the project implementation timelines for current research and development projects compared to large-scale commercial projects, at the time of writing. Looking at the project implementation schedules for the projects listed below, only the Ketzin project has proceeded to the injection phase, this being a research and development project. Additional information on CCS case studies may be uploaded on to the *NearCO₂* website throughout the course of the project if additional information from the private sector becomes available.

¹. Barendrecht could be considered a research and development project given that injection is being tested in a smaller gas reservoir prior to being injected in a reservoir representative of a more commercial volume of CO₂.

Project	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Ketzin	Project Launch				Injection						
	Consultation Ongoing										
Vattenfall/Beeskow						Injection Permit Application					
						Consultation Initiated					
Barendrecht						Consultation completed					
						Project gains approval				Injection starts	
Belchatow						EU Financing Secured					
						Consultation Ongoing					
							Selection of Storage Site				
									Permit for Storage Site		
											Construction Complete
											Injection starts

While preliminary information has been obtained for Belchatow, project developers have provided little information related to their communications and consultation strategy given that project financing has only recently been secured.

1.5 Report Outline

Having introduced the report topic, the next section provides the rationale for the case study review and a description of the methodology. This section further provides an overview of report findings, places them in comparative perspective, and outlines a number of additional concepts that could be used to explain project outcomes. Section 3 then looks more closely at the actual influence of communications and consultation on public perception. This analysis is separate from the consideration of communications and consultation in a project context. Section 4 provides overall conclusions related to the analysis of the case studies and issues to consider as part of future CCS consultation exercises.

2 COUNTRY CASE STUDIES

2.1 The Rationale for Case Study Research

The goal of this particular report is to make empirical observations with respect to the way in which communications and consultation practises have been implemented as part of different projects. Using a case study template, utilized by all case study authors, this report looks at the following elements of communications and consultation practices: the target (stakeholder) groups addressed; the concerns identified; the communication materials and processes used, and the extent to which public involvement has comprised a dialogue as opposed to a one-way information campaign. As the case study analysis reveals however, there are many factors other than communication that impact public perceptions of CCS. As stated in the introductory section to this report, there is no simple, causal relationship between communications and project outcome.

The need to look at multiple case studies helps to isolate the extent to which local context can impact both public attitudes and perception of the technology. At the same time, according to theory related to case study analysis, multi-case study analysis and the identification of patterns in relation to the variables considered, can serve as a means of evaluating the effectiveness of policy (Baxter and Jack, 2008). In this instance, the lessons learned could be applied to the development of communications exercises (or even as part of consultation policy) for future CCS projects.

In addition to considering specific elements of the consultation, we have also reviewed the nature of the regulatory environment, and have provided a non-exhaustive list of other factors colouring public perception. The importance of contextual relevance is stated by a number of theorists on public attitudes and environmental change, who emphasise that there is no simple relationship between attitudes, engagement and behaviour change: a very wide range of contextual factors influence attitudes and constrain behaviour; habit and routine are also important. If engagement is undertaken for the purpose of changing attitudes and/or encouraging behaviour change, then these wider factors also need to be addressed (Upham et al, 2009).

2.2 Project Methodology and Data Collection: Challenges and Opportunities

In each of the selected case studies, processes for interaction with the local stakeholders and the general public have been inventoried. This inventory has been based on literature review and in some cases,

interviews with stakeholders involved in and affected by project implementation. Each case study was analyzed using a template (see Appendix A.) This template allowed case study authors to gather information on the following project characteristics.

- 1) The type of communication tools used throughout the consultation process;
- 2) The range of stakeholders consulted;
- 3) The nature of opposition, if any, to the project;
- 4) Stakeholder satisfaction with the engagement process; and
- 5) Individual contexts related to respective projects.

These variables have been used to assess the quality of communications and consultation undertaken in the context of each project; a comparative methodology is outlined in the next section. The standard data uncertainties normally associated with the qualitative assessment of data apply to the analysis completed herein. While evaluating the quality of communications as part of this report helps demonstrate that it has limited impact on the decision to proceed with projects, it has also been completed in a subjective manner using numerous generalizations. There may be a vast difference between the language used to describe communications and its actual quality.

The way in which authors interpreted the data collection template also varied thus explaining the different styles used to present information. The amount of detail obtained for each case study varies based on the willingness of the project developer to provide information, the ability of the author to participate in the consultation process and the amount of publicly available information. For this reason the presentation of information for all case studies may appear somewhat asymmetrical.

2.3 Comparative Methodology for Case Studies

The scope of case studies chosen provides both geographic representation for projects across Europe and technology scope as it covers projects relating to biomass energy, renewable energy, fuel switching and CCS itself. Although the focus of this research is to help enhance communications related to CCS projects in particular, looking at other technology types helps illustrate the dynamics between communications and consultation and technology specific factors colouring public perception. As outlined above, the geographic representation of different projects helps illustrate the importance of both the regulatory context and the political culture in impacting the effectiveness of communications and consultation efforts.

Despite the challenges associated with data collection, the case study template described above allowed case study authors to compile basic information concerning project communications and consultation status using the five key characteristics outlined in the preceding section. These characteristics have been compared in the context of all eight case studies, to illustrate the extent to which communications and consultation can differ in the context of different countries and different project types. The countries in which projects are found (the United Kingdom, Spain, Germany and the Netherlands) are then compared and assessed looking primarily at the adequacy of existing law in encouraging a democratic consultation process. The results of both comparisons are provided in a third table, summarizing project outcomes and essential characteristics. All comparisons are designed to illustrate the complexity of competing priorities in the context of project implementation.

Three sets of tables comparing project variables are outlined further below:

- 1) The first set of tables provides an *assessment of the type of communications and consultation* carried out by project developers in the context of each project. This ranking is based primarily on the extent of proactive engagement undertaken by project developers, and the reaction of stakeholder groups to information requests throughout project development. This overview therefore addresses the different groups that were addressed, the type of material and participation processes used, the concerns identified, and extent to which a two-way dialogue was achieved. This assessment is placed in the context of a broader comparison of case studies that looks at the relationship between site characteristics, regulatory environment, project developer and communications. A separate assessment of communications and consultation on technology acceptance per se, in isolation of the project outcome, is provided in section 3.

The information provided in relation to the table headings can be described as follows:

Consultation Approach and Information Provided: A description of the communications tools and consultative approaches used to educate the local population. Any shortcomings associated with the implementation of the consultation approach are described under “Quality of Stakeholder Engagement”, or under “Concerns of Stakeholders.”

Stakeholders Addressed: A description of those consulted. It is worth noting that the omission of certain stakeholders does not necessarily imply that they were marginalized as part of the consultation process. Referring to the information provided by case study authors, the exclusion

of a particular stakeholder group would have been included under the next heading on stakeholder concerns.

Concerns of Stakeholders: A description of concerns expressed by stakeholders.

Quality of Stakeholder Engagement: Stakeholder Perspective: The quality of the overall process has been completed using the standard NGO evaluation tool. The following ranking approach was applied:

Ranking	Justification
	An above average ranking was provided in cases where public satisfaction with engagement was explicitly stated.
	A medium ranking was provided in cases where communications tools were used and where information was provided, but where the public was not fully satisfied with the engagement process. This refers primarily to the inability of the project developer (and local authorities) to engage in a two way dialogue with the general public. ²
	A below average ranking was provided in cases where access to information was denied to the local public, and where dissatisfaction with the engagement process manifested itself in organized opposition. This refers primarily to the inability of the project developer (and local authorities) to engage in a two way dialogue with the general public.

². The term two-way dialogue could be used to a broad scope of engagement activities. These could range from a highly sophisticated effort where the public helps to decide on the location of a project at the earlier stages of the project cycle, to the provision of responses to questions from the public by either approval authorities or project developers on the basis of the minimum legal requirement.

- 2) The second set of tables provides an *assessment of the legal environments* in the countries of the case study to determine whether a sound legal basis for consultation exists. This assessment was based on the legal analysis completed as part of WP1.1. Placing this assessment in the context of a broader comparison in the third set of tables helps illustrate that there are other competing policy agendas that could override consultation processes.

The information provided in relation to the table headings can be described as follows:

Compliance with Aarhus Convention: Referring to the previously completed legal analysis, to what extent have all four countries complied with the Aarhus Convention.

Access to Environmental Information Directive; Public Participation Directive: Again referring to the legal analysis, to what extent have all four countries made information readily available to the general public? Do all four countries have a history of actively promoting public participation?

Additional Public Participation Requirements at Member State Level: Do countries go beyond the minimum legal requirement in terms of promoting public participation?

Quality Ranking: Countries are ranked using the following approach:

Ranking	Justification
	Countries are provided an above average ranking in cases where they have both a history of promoting public participation, have not been brought before European courts for violating either conventions or directives, and go beyond the minimum legal requirement in terms of promoting public participation.
	Countries are provided a medium ranking in cases where they have both a history of promoting public participation, and have not been brought before European courts for violating either conventions or directives.
	Countries are provided a below medium ranking in cases where they have been brought before European courts for violating either conventions or directives.

- 3) The third set of tables *summarizes the impact of key variables on project outcomes*. The headings in this table can be described as follows:

The information provided in relation to the table headings can be described as follows:

Type of Project Developer: Is the project developer a research institute, private corporation, etc?

Site Characteristics and Local Dynamics: Is the project located in a rural or urban setting? Is there a history of industrial development in the area? Is there anything specific to the project type that has affected implementation of the project?

Status of Regulatory Environment: Is the project located in a country with a sound legal environment encouraging transparent public participation processes?

Project Outcome/Quality of Communications/General Conclusions: Has the project been implemented? What was the quality ranking awarded to engagement as part of the project? What, if any, are the key characteristics of the project that have intensified opposition? What elements of the communications and consultation process can be said to have influenced project implementation?

Assessment of Communications and Consultation

CCS Projects	Consultation Approach and Information Provided	Stakeholders Addressed	Concerns of Stakeholders	Quality of Engagement Process (Stakeholder perspective)
Vattenfall CCS (Commercial) See Appendix B	Press conference, letters distributed to local residents, Internet site, media coverage, public events, information office at project site, hotline.	Local government, General public, political parties.	Information gaps in material presented, CCS prolongs use of coal, CO ₂ storage risks, and impacts of storage on real estate market.	Information received late, opponents misunderstood, Vattenfall not trusted and failed to engage in a two way dialogue. NGO Ranking: 😞
Ketzin CCS (R&D) See Appendix B	Public presentations, Internet site, site tours	Local government General public	None voiced.	Well received by the public NGO Ranking: 😊

Dutch CCS (Commercial) See Appendix G	Public presentations and meetings, project website, mailbox and hotline, information office, site tours, extensive media coverage	Local government, general public, political parties	Information gaps, storage risks, impacts on real estate market, objection against procedure of decision making followed by Shell and national government.	Information received late, project developer not trusted, Public had no involvement in the decision process, perception of public opinion and worries being ignored. NGO Ranking: 😞
Non-CCS Case Studies	Type of Engagement Processes	Members of opposition	Concerns of Opposition	Quality of Engagement Process (Perspective of Opposition)
UK Bio-energy Projects: Eccleshall See Appendix C	Distribution of questionnaires, public meetings, Internet site, distribution of informational leaflets			Public initially satisfied that they had been involved early on the process but then confused by not being consulted when the planning proposal changed. Project developer misjudged the significance of the changes, which he perceived as minor. NGO Ranking: 😞
UK Bio-energy Projects: Winkleigh See Appendix C	Distribution of questionnaires, public meetings, Internet site, distribution of informational leaflets	Local residents, local MP	Odour, increased traffic, developer's credibility, gaseous emissions from plant, impact on human health, ad hoc changes to planning procedure.	Public very strongly opposed to the proposed development, frustrated by inability to access to information and the fact that their opinion was not considered at the initial stages of project planning. NGO Ranking: 😞
UK Gas Pipeline and Depressurization Facility See Appendix D	Project advertising in local media, public information evenings	Local government, general public, residents associations, NGOs	Unfair burden on Wales, untested technology, noise issues, impact on wildlife, planning process accelerated, earthquake risk, safety concerns of depressurization facility	Numerous protests concerning mismanagement of local authorities, denied access to key information including the environmental impact assessment. Developer only engaged in consultation that was legally required. NGO Ranking: 😞
Spanish Gas Power See Appendix E	Bare minimum – public consultation	Local government, general public,	Health impacts, impact on quality of	No access to information – project developer in violation of

	from EIA only	political parties, residents associations	life, negative impact on tourism industry.	the Aarhus convention, complaint submitted on EIA to European Parliament NGO Ranking: 
Dutch Wind Power See Appendix F	Extensive media coverage, interviews with individual residents, public meetings.	Members of wind cooperative, Residents affected by wind farm development, other interested parties.	Dissatisfaction with planning procedure (unannounced changes to project capacity), noise, glare, impacts on real estate market, visual impact, impacts on birdlife.	Frustration of protesters with the decision making process, and the failure to consider objections to the project despite numerous legal appeals. Public was informed at the start of the planning process but was not engaged afterwards. One sided dialogue was evident with little initiative taken by the project developer to initiate informal discussion of project. NGO Ranking: 

The NGO rankings provided above are based primarily on the scope of engagement activities initiated by the project developer and the satisfaction of project opponents with the project approval process.³ The Ketzin project is the only one to have received an above average ranking, while the Spanish Gas Power project, the Dutch wind power project, the UK gas pipeline project and the UK Winkleigh bio-energy projects all received a below average ranking given issues related to information access and the failure of project developers to initiate a two-way dialogue. The project developers for all four cases undertook the bare minimum with respect to consultation requirements. All other projects received adequate rankings given that those project developers all provided some type of information, but failed to fully satisfy stakeholders affected by the engagement process.

Assessment of Legal Environments

The *NearCO₂* project consortium completed an overview of the legal environments relating to public consultation for all countries where case studies were located, with an emphasis on the core principles of the Aarhus convention, and the transposition of Directives for public participation, access to information and access to environmental justice. This overview can be used to help assess the legal basis that

³. This is a standard policy evaluation tool used by non-governmental organizations such as the Institute of European Environmental Policy, the primary author of the case study comparative overview.

determines the extent to which national environmental decision making is democratic, and the ability of the public to freely access information.

	Compliance with Aarhus Convention	Access to Environmental Information Directive; Public Participation Directive	Additional Public Participation Requirements at Member State Level	Quality Ranking
Germany (Ketzin and Vattenfall)	Successfully implemented; 1 case before the compliance committee	The Directive has increased access to information	Scope for additional mandatory hearings exists as part of selected legislation.	NGO Ranking: 
The Netherlands (Wind power project and Barendrecht)	Successfully implemented; no cases before the compliance committee	The Directive has increased access to information; the Netherlands has the highest rate of access to web-based environmental information in the EU.	Public participation is encouraged by the Dutch government, but there are no additional mandatory requirements	NGO Ranking: 
United Kingdom (Bio-energy and gas pipeline)	Successfully implemented, however 4 cases have been brought before the compliance committee	No indication that the transposition of either Directive has impacted either phenomenon in the UK; in fact the cost of court hearings is cited as an obstacle to justice.	Public participation is encouraged by the UK government, but there are no additional mandatory requirements	NGO Ranking: 
Spain (Gas power project) See Appendix E	Principles promoted by national government, but not enforced at local levels. No data available concerning cases before the compliance committee.	Poor access to environmental information remains despite recent efforts, public participation has been legally adopted but no procedures have been established.	None	NGO Ranking: 

In the case of the United Kingdom, a medium ranking was provided based on the number of cases brought before the Aarhus Convention compliance committee; for Spain a below medium ranking was provided given that no real laws have been passed related to any of the principles encouraging democratic environmental decision-making. (A law on environmental information and participation has been passed in Spain. Although it does not help establish a mechanism for participation, a Law was passed in 2006 as a transposition of both EC Directives). Based on the report completed as part of WP 1.1, both Germany and the Netherlands appear to have embraced the Aarhus principles as is reflected in rates of access to environmental information, the enactment of numerous domestic laws encouraging public participation, and in the absence of cases before the Compliance Committee.

As the summary of all case studies demonstrates below however, national legal frameworks related to consultation and public participation may have little bearing on project outcomes. Changes to regulation as part of other project elements can have significant cross-cutting impacts with respect to the public perception of the project in question. This could include policy or regulation related to the project type or technology, to overarching energy policies, to overarching environmental policies, and other policies beyond the realm of the consultation process in and of itself. An example of this is an environmental impact assessment paid for by the project developer, which is then disregarded by other stakeholders as biased research even when performed by an independent party given its source of financial backing. Developments with respect to relevant environmental policies at the national level, or even in the international level, cannot be ignored. While it was not within the scope of this project to analyze the impact of all cross-cutting regulation and policy, it has been considered in the summary of the project outcomes. The tables outlined below place the outcome of project implementation decisions in the context of communications, site characteristics, type of developer, and the regulatory environment. General conclusions are provided describing the reasons for the project outcome. Based on the analysis completed, there are numerous factors (other than effective communications and consultation) that have come to bear on the project outcome.

2.4 Overview of Consultation Outcomes

CCS Projects	Type of Project Developer	Site Characteristics and Local Dynamics	Status of Regulatory Environment	Consultation Outcome Quality of Communications General Conclusions
Vattenfall – Beeskow for Germany	Vattenfall – large scale state-owned energy company; backed (but not financed) by state/regional government	Project developer submitted application for underground CO ₂ exploration permit; located in rural area – valued by locals.	NGO Ranking: 	Project decision still pending. NGO communications ranking:  Given that an application can only be refused on the basis of factual information, it is difficult to determine whether opposition has had an impact on the delay in deciding on an exploration permit.
Ketzin for Germany	Co-ordinated by a research institute (GFZ); financial contributions from the federal government.	Using an existing gas reservoir - local public familiar with relevant storage issues; small project; project to be stopped in event of leaks; located in rural area.	NGO Ranking: 	Project implemented – CO₂ injection has begun NGO communications ranking:  No significant opposition to the project was noted. Public involved at early stages of the consultation process; high trust in the developer GFZ.
Barendrecht for the Netherlands	Shell, NAM and OCAP - large scale energy companies; funding provided by federal government.	Located in an industrial area which is densely populated; existing gas reservoirs for storage; existing pipelines for transportation.	NGO Ranking: 	Project to be implemented, but delayed at least two years up to now. Further delay likely due to legal procedures. NGO communications ranking:  Despite significant opposition to the project, a Ministerial decision to proceed with Barendrecht indicates that there is no data to refute project safety. At the same time, larger scale CO ₂ injection is conditional on successful injection in to smaller gas fields. It is unclear whether safety concerns at the provincial and municipal levels have lead to this compromise. It is even unclear if this is, in fact, a compromise, since Shell had already mentioned earlier on that the small field would be filled first.

Non-CCS Projects	Type of Project Developer	Site Characteristics and Local Dynamics	Status of Regulatory Environment	Project Outcome Quality of Communications General Conclusions
Wind farm proposed by Dutch co-operative Kennemerwind	Co-operative; based on contributions from its members. Wind farm built with support from Senternovem (federal government)	Located in rural area; history of personal wind use in region (solitary turbines owned by farmers). Already one existing wind farm (9 small turbines) owned by Kennemerwind	NGO Ranking:  Although changes to local wind policy intensified public opposition; the public believed the policy was changed for this particular project.	Project implemented NGO communications ranking:  Despite what is considered above average consultation practises for the Netherlands with regard to the wind policy in the project area, public consultation completed in relation to the project was almost non-existent. A local NGO (KPO de Zijpe) played a key role in mobilizing opposition.
Bio-Energy in the United Kingdom: Winkleigh	Private sector development with contributions from local development agency	Technology unknown to public; Rural location; Retirement home near site; Capacity of 21.5 MW	NGO Ranking:  In addition, the local development agency was not accountable to the local population.	Project not implemented NGO communications ranking:  Public opposition successful based on the efforts of key individuals, and the involvement of a local MP.
Bio-energy in the United Kingdom: Eccleshall	A number of private sector companies, contributions from federal government and local development agency	Unlike Winkleigh, small project of 2.6 MW; Located on greenfield site	NGO Ranking:  Local elected representatives accessible to the public despite limited engagement requirements	Project implemented although still contested NGO communications ranking:  Developers sought early involvement of local residents. Project was also too small to raise too much opposition.

Gas Pipeline and Depressurization Facility in the United Kingdom	National Grid: large private company responsible for energy transmission	Pipeline run through national park, nationalistic element – Welsh involvement, proximity of facility to homes	NGO Ranking:  In addition, local council refused to release environmental impact assessment.	Project implemented NGO communications ranking:  Although the project was implemented, protesters were successful in lobbying for relocation of the facility. National government officials were influenced by concerns with respect to the integrity of local geology.
Gas Power in Spain	Endesa and Hunosa – large scale private energy companies	Capacity of 410 MW, heavily industrialized area, numerous other gas plants planned for area.	NGO Ranking:  Spain has a history of overlooking public opinion in the face of large scale industrial projects.	Project implemented NGO communications ranking:  Despite vocal opposition from political parties and local environmental groups, the project is pushed through.

Based on the information provided above, a number of common factors can be observed. As stated in the introduction to this report, it is beyond the scope of this project to determine what factors have led to final project outcomes. The summary tables provided above are meant to illustrate the complexity of factors influencing project outcomes, and that the communications and consultation process is but one influential factor. With respect to the first table, outlining qualitative assessment of communications and consultation, some fifty percent of projects are considered inadequate from this perspective, with the other fifty per cent considered adequate or above average by stakeholders. Six out of eight of these projects will proceed or have proceeded (with one awaiting a decision) indicating that while the quality of communications and consultation can influence the outcome, there appears to be no simple causal relationship between the two variables. Sections 3.1 and 3.3 of this report explain how communications

may have impacted public acceptance of the technology in isolation of any decision to proceed with project development.

As explained above, there are other national issues that override public opinion in the interest of climate change, energy needs and the environment in general. Unlike other development issues, public authorities may find it easier to approve projects (despite public opinion) that have benefits to the national or even global environment. All the projects mentioned can positively contribute to clean energy demand considerations (in relation to gas supply projects), to Kyoto greenhouse gas reduction targets, to EU greenhouse gas reduction targets, to national greenhouse gas reduction targets, and to EU renewable energy targets. Given these pressures on national governments, there are tensions with environmental decision making at the local level. As outlined below, six out of the eight projects reviewed have either been approved on the basis of national interests, or have received government support. A seventh is likely to go ahead; a project that is also backed by the respective regional government.

Other notable trends:

- Looking specifically at the non-CCS projects, projects that have gone ahead can be attributed to either the fact that *consultation with the general public was completed at the onset of project planning* (UK Eccleshall biomass), or based on national energy needs (UK National Grid gas pipeline and Spanish Gas Power project). Projects that have not gone ahead, or that were significantly delayed, can be attributed to either *the efforts of local individuals* (UK Winkleigh biomass), and *the establishment of NGOs* created specifically to mobilize opposition (KPO for the Dutch wind case and their dissatisfaction with the applicable wind policy).
- Looking specifically at the CCS case studies, two out of the three projects have gone ahead. For Ketzin, this can be attributed to *trust in the project developer* and the fact that *the public was consulted at the early stages* of the project planning process. For Barendrecht, a Ministerial decision was made that considered the input of local and provincial officials but ultimately placed national interests above against those of the local population. The Vattenfall project is conditional on the basis of evidence disproving the safety of the project; it does not appear likely that their request for an exploration permit will be turned down unless the public can come up with credible data.

2.4 Insights from the literature

Socio-psychological and political factors

A wide range of social and psychological factors have a bearing on the public acceptance of projects and technologies. These mediate and moderate public perception, and can pose significant challenges to project developers to implement effective communications and consultation. The academic literature on these factors is large and has accumulated over decades. Here we highlight a few key concepts that we consider particularly relevant, including place attachment and risk perception, media ‘amplification’, local politics, and community benefit. Some of the following is also available in the appended biomass case study.

Place Attachment

Characterising siting controversies – i.e. location-based objection – as NIMBYism (‘Not In My Back Yard’) has been widely critiqued in the academic literature, for its lack of empirical foundation, its derogatory implications and its general lack of explanatory power – e.g. (Wolsink 1994; Burningham 2000; Bell, Gray et al. 2005; Devine-Wright 2005; Kempton, Firestone et al. 2005; Wolsink 2006; van der Horst 2007). Many authors have called for a more sophisticated understanding of the different reasons for local opposition to specific renewable energy developments. For example, Bell et al (2005) suggest that the general public’s support for renewable energy developments may be conditional, and that this is revealed in actual developments but tends to be masked in opinion poll research.

A body of theory particularly relevant to siting controversies is that of place attachment and place identity. In this way of thinking, *place* describes not only the physical characteristics of a location, but also the meanings and emotions associated with that location by individuals or groups e.g. (Gieryn 2000); (Devine-Wright 2009; Devine-Wright 2009; Devine-Wright forthcoming). The term *place attachment* has been applied to both the process of attaching oneself to a place and the outcome of this process (Giuliani 2002). *Place identity* refers to the ways in which physical and symbolic attributes of particular locations contribute to an individual’s sense of self or identity (Proshansky, Fabian et al.). Change to a location is sometimes termed a ‘disruption’ to place attachment (e.g. (Brown and Perkins 1992) or a ‘threat’ to place identity - e.g. (Bonaiuto, Breakwell et al. 1996).

(Devine-Wright 2009) describes the three-stage models of place disruption developed by Brown and Perkins (1992) and (Inalhan and Finch 2004), distinguishing between pre-disruption, disruption and post-disruption phases, and also Stedman's study of 'place-protective' actions when there are strong place attachments (Stedman 2002); he then proposes an extended, five-phase model of place disruption (Devine-Wright, 2009). In terms of policy implications, the challenge is to design changes to places, and employ associated engagement procedures, that are likely to be interpreted by those affected as enhancing rather than disrupting places, while also being mindful of the symbolic, emotional and evaluative aspects of place attachments and place identities (Devine-Wright, 2009). It needs to be acknowledged that this may not always be possible, in which case policymakers face the choice of ignoring local opinion and accepting the consequences; or locating the development elsewhere; or withdrawing the development proposal completely.

In terms of the CCS and non-CCS case studies, the notion of place attachment is perhaps most obviously exemplified by the UK gas pipeline project, given the Welsh dimension of project development. The perception that the project was a violation of Welsh sovereignty caused significantly delays in project development particularly given that place attachment in this instance was articulated by a regional government. Local attachment to the site for the Vattenfall project, for the UK Winkleigh bio-energy project, and for the Dutch wind energy project, all coloured public perception of proposed development. Place attachment as illustrated by the Dutch wind energy project is remarkable given Dutch acceptance of wind technology generally speaking, and the use of wind turbines in individual homes.

Both the Spanish Gas Power project and the Barendrecht project illustrate the extent to which the public opposed project location given their history with industrial development. Residents surrounding both projects perceived proposed development as continued exploitation of their local resources, and had jaded views of project developers' motives. Continued use of their region for profit seeking activities was considered unfair despite the benefits further development could have to the local and national economy.

Risk perception and CCS characteristics

The risk perception literature is particularly relevant in a CCS context: many of the characteristics of CCS are likely to be problematic for reasons already known in the literature, and which need to be anticipated. According to the psychometric tradition in risk studies, risk perception is influenced by whether risks are viewed as involuntary, catastrophic, dreaded, fatal, delayed, known, controllable or old (Slovic 2000; Etkin and Ho 2007). The primacy of direct experience in learning and perception is well-established in the psychological literature - e.g. (Chawla 1999) - direct experience is more likely than communication to result in stronger, more confident, clearly focussed and persistent attitudes, and in attitude-behaviour consistency (Fazio and Zanna 1981). Similarly, the literature on risk perception highlights the role of *direct experience and sensory evidence* in people's evaluation of environmental threats (e.g., (Slovic, Fischhoff et al. 1979; Weber 2006)) (Upham, Whitmarsh et al. 2009).

According to the 'availability heuristic' concept, the perceived likelihood of a risk increases if it has been experienced or can be readily imagined (e.g., (Slovic 1986)), so local risks are likely to seem more important than global risks ((Slovic, Fischhoff et al. 1978; Hinchliffe 1996; Burgess, Harrison et al. 1998). Also, an important influence on how risks are perceived and whether they are considered 'acceptable' is the balance between the *costs and benefits* associated with the risk issue (Eiser, Spears et al. 1988; Slovic 2000). In terms of communicating such risks, in general, expertise, independence and familiarity are qualities that tend to be associated with credibility - e.g., (Worcester 2001). Indeed, perceptions of the communicator are often as important (or more so) than the message itself - e.g. (Rayner and Rickert 1988) (Ter Mors, 2009) (Whitmarsh, in (Upham, Whitmarsh et al. 2009). All of these factors need to be considered when designing CCS communications.

Community Benefit and Ownership

Community ownership and other benefits are often discussed as a means of improving levels of local support for renewable energy and offering local empowerment, learning opportunities and building civic capacity e.g. (ODPM 2004; Devine-Wright 2005; Walker 2007; Walker, Hunter et al. 2007; Rogers, Simmons et al. 2008) in (McLachlan 2009). However, it is important not to build false hope of a community style development if, in practice, local stakeholders and the public will have little influence on, and receive little direct benefit from, the proposed development (McLachlan Forthcoming). A report for DTI (Centre for Sustainable Energy 2005) offers more insight into *community benefits*, finding that whereas community benefits in the UK tend to consist of voluntary contributions to a community fund by

the developer, in Spain, Germany and Denmark, benefits are routine in the form of local taxes, jobs, manufacturing and/or ownership. Community negotiation and provision of community benefits can both in principle be adopted in the case of CCS, but, as suggested below, may well be insufficient to resolve opposition.

The relationship between the extent to which a project benefits a local community, and public perceptions of a proposed development, is variable, uncertain and contested. This is also true for our cases: in the Dutch wind case, for example, the fact that the project was developed by a co-operative did not seem to impact public opinion. On the other hand, although co-operatives are often known for their collaborative decision making processes and ability to engage in transparent consultation with the local public, its chair and most of its members were not from the local community. Looking at the German CCS examples, Vattenfall's attempts to help encourage local development around Beeskow were perceived as bribes and did not install any sense of community ownership among the general public. In general, it is likely that communities will positively value co-benefits from projects, but that these need to be provided as part of a package agreed to by the location population: where a project is strongly contested, provision of benefits is unlikely, by itself, to be sufficient to resolve the situation.

The Impact of Local Context - Party Politics and Local Government

Opposition to project development, as illustrated by some of the case studies, has been mobilized either by incumbent local governments in opposition to federal policy, or by opposition parties looking to exploit public controversy to gain political support. The involvement of opposition parties was particularly key in the Spanish example, and in the case of the Barendrecht project.

Engagement and Dialogue

Calls for such engagement in energy supply (and more recently in active demand management) have come from industry, academia, NGOs and government, but conceptions of this engagement vary greatly. Indeed engagement may not deliver in practice what actors expect, and the impact of both positive and negative experiences of particular renewable energy developments on wider energy and environmental beliefs and behaviours need to be considered: managing stakeholder and public expectations in engagement processes is of the utmost importance in this context.

Public engagement in renewable energy has been dominated in academic, policy and media circles by the notion of 'Not In My Back Yard' (NIMBY). As mentioned earlier, this concept has received criticism for its lack of empirical foundation, its derogatory implications and the way in which objectors are often able to strategically and justifiably defend their position from such accusations (e.g. stressing more 'socially acceptable' elements of their opposition; (Wolsink 1994; Burningham 2000; Bell, Gray et al. 2005; Devine-Wright 2005; Kempton, Firestone et al. 2005; Wolsink 2006; van der Horst 2007)). The general call for a more nuanced understanding of the different reasons for local opposition to specific renewable energy developments, is exemplified by Bell et al ((2005)), whose *Social Gap* framework has stressed the importance of considering the conditionality of the general public's support for renewable energy developments.

The quality of engagement and dialogue is likely to be a key factor in local public acceptance of CCS projects. In terms of communication and consultation, the above literatures imply that this should be early, full and frank – typically going well beyond that required legally - but they also imply that this may not be sufficient to prevent or mitigate substantial opposition. If a community perceives that CCS-related development poses a threat, be this to health or to quality of life, and that there is little benefit to the community in return, then this may quickly become difficult to remedy. As the characteristics of CO₂ storage sites are to some extent site-specific, so that uncertainties about the security of storage cannot be eliminated, and as there are few examples of CCS that can be used to reassure people, the risk literature also suggests that it may be difficult to allay public concern. In this respect, CCS transport and onshore storage can be expected to be more challenging than renewable energy siting: onshore storage is likely to trigger both place-related concerns and risk concerns.

Dynamics among individuals can often impact the outcome of public consultation. Cases where human interaction has the ability to reinforce a negative perception of projects can be attributed to tone of voice, to the use of language, and even personal appearance (McGuire, 2001). Dialogue between project developers and project proponents can be influenced by the way in which arguments are labelled; project developers often refer to arguments of the opposition as “emotional” and imply that these are not based on sound science. As such, despite efforts of the opposition to substantiate their claims, their arguments continue to be perceived as invalid by developers. Prospects for a two way dialogue in the Barendrecht case have been limited by the preconceived notions of the developers, and the perception of the opposition that developers are arrogant. The opposition reacts by attacking the integrity of experts (Fischhoff 1995).

Awareness and the role of the media

Although the evidence on this is limited, it may well be that public attitudes to energy policy have commonalities with attitudes to climate policy. The media plays a role in this, both locally and nationally. Public awareness and reported concern about climate change is widespread, yet climate change is perceived as a remote issue, with (a) awareness not being the same as understanding, with some studies showing more than half of people not understanding the relationship between energy use and climate change, (b) other social, personal and environmental issues more pressing, (c) impacts befalling future generations and other regions, (d) others' (e.g., industry) actions as primary causes, (e) responsibility for tackling it assigned principally to government. Public perceptions of the risks associated with climate change are limited by various issue characteristics (global, long-term, and uncertain) and social-psychological processes (media framing, perceptions of communicators, dissonance, and denial). While public support for mitigation action is high, willingness to change personal (particularly travel) behaviour is limited by various perceived individual, social and structural barriers (Upham, Whitmarsh et al. 2009).

Of the many factors above, the news media are but one, and their role, while important, should not be over-emphasised. The media play an intermediary role as a conveyer of information, and they can be significant as an 'amplifier' of concerns, but are only one factor among many. Nonetheless some of the case studies reviewed here do indicate a significant role for the news media, both in terms of the way in which project risks are conveyed and in terms of contributing to subsequent opposition. For CCS in particular, articles that surfaced in response to the Barendrecht case, equated lethal exposure to CO₂ with the safety of underground storage. This exposure was illustrated through an unrelated incident involving the alleged lethal exposure of ducks to CO₂ under a nearby bridge, and given the fatalities resulting from the Lake Nyos incident in Cameroon. While the media coverage in relation to the cases considered for this report are described by most authors as "neutral", or as merely reinforcing existing developments in public opinion, CCS will continue to be an issue in the media, given its international importance and its relative novelty. It should also be borne in mind that due to information available on the Internet, campaigners now have the ability to obtain and share information much more readily than before. Although the accuracy of this information source is routinely criticized by project developers, the general public has much quicker access to a number of information sources for CCS projects all over the world. Print, radio and television media are not the only sources of news; the Internet may play an even more important role in terms of impacting the public perception of CCS particularly given the international dimension of the issue.

3. COMMUNICATIONS AND PUBLIC ACCEPTANCE

3.1 Overview of Communications and Consultation

Apart from helping to determine the role of communications and consultation as part of project outcomes, the case studies also help illustrate the extent to which it has led to public acceptance of the technology.

Answers to the following three questions are answered based on examples taken from the case studies:

- 1) What has been the nature of stakeholder relations for all case studies considered? How have they influenced public acceptance of technologies or projects?*

In this instance, stakeholder relations refer to the efforts of the project developer to engage with different entities involved in the development of the project. Stakeholder relations vary considerably based on the type of project developer and the consultation culture. Project developers in the British (excluding the Eccleshall project) and Spanish examples only engaged with stakeholders as was legally required, even denying access to public information in some cases. Although companies like Shell and Vattenfall made significant effort to engage with the local public, the actual influence of stakeholder relations on public acceptance appears to have been minimal. The Ketzin project is the only example of a situation where the public has been satisfied with the role of the project developer in terms of adequately consulting with the general public. If anything stakeholder relations appear to have negatively impacted public acceptance of the technology in question. However, as stated before, the relationship between public consultation and satisfaction with that consultation is not a simple one. Many factors affect the effect of public consultation, not the least factor being quality of consultation and communication.

It is difficult to determine the influence of stakeholder relations on public acceptance without considering the nature of the project developer itself, and the circumstances surrounding each project. The Barendrecht case is a unique example of the efforts of the federal government to maintain a degree of impartiality surrounding the presentation of information. Referring to the establishment of an information centre near the Barendrecht project site, the national government and the principal project developer Shell entered into a joint stakeholder initiative with different entities from the public and private sectors. This was in addition to the creation of stakeholder consultation structures such as the BCO₂ communication workgroup including Shell and other stakeholders others which sought to co-ordinate stakeholder

presentations of CCS related information. These multi-stakeholder efforts were nonetheless perceived as biased given the dominance of Shell in the communication process and Shell's involvement of national governmental bodies that are strongly in favour of CCS.

2) What types of communication approaches have been used by project developers? What has been the influence of these on the acceptance of technologies or projects?

The most sophisticated communication approaches considered here are those developed by Vattenfall and Shell (presumably reflecting their financial means), while other project developers have done relatively little to engage in proactive communication. The Spanish and UK examples provide few examples of instances where project developers have gone beyond what is legally required, and as previously stated, there is evidence to suggest that information has been withheld in the Spanish case. While information was not withheld in the Dutch wind case, the case study does not suggest that not much was provided in terms of communications. By comparison, CCS project developers have typically set up information centers, websites, and provided tours of injection sites.

It is difficult to determine the extent to which communication has impacted the acceptance of technologies. Often, it seems to be mostly project opponents who voice opinions. To determine definitively whether the public has been influenced by CCS communications to date would involve undertaking surveys of the general and local public.

3) At what stage of the project development process has public concern arisen and why did this arise?

Opposition has typically arisen at the initial stages of project development, once projects are announced or proposed by the project developer. In the case of CCS, this has been voiced by elected politicians at the municipal level, and by local opposition parties. Opposition has tended to intensify throughout the development of CCS project implementation at times when, for example, key information was published, such as an Environmental Impact Assessment, following key media interviews, or following decisions from local authorities in which public concerns were ignored.

Looking at the non-CCS projects considered here, opposition has resulted from a number of different triggers. In the UK bio-energy case for Winkleigh, opposition was prompted by the fact that the proposal was presented as a *fait accompli*, without seeking input from the general public. In the Dutch wind case,

opposition intensified after a public appearance that was perceived as overconfident and arrogant because of the expressed assertions concerning eventual project implementation. In the UK pipeline case, opposition was fuelled less by communication but more by the inability of project opponents to access what should have been publicly available information.

3.2 Lessons Learned With Respect to Communications and Consultation

Referring to the questions raised in the introduction to this report, the lessons learned with respect to all case studies can be summarized as follows:

- 1) **Who** is involved in the communication? Trust in information sources is very important in this type of context.

Nearly all of the case studies indicate that public perceptions of a self-interested private sector entity pose a significant challenge to project implementation. The public questions the profit-making motives of project developers, causing them to consider communication materials as too positive given that they do not site the risks of project implementation outright. This is particularly true in the case of CCS related information. The profit making motives of the wind co-operative Kennermerwind were even questioned, despite the fact that this type of developer does not typically stand to benefit from projects economically. Referring to this particular example, the case study indicates that Kennermerwind should have provided more information with respect to its financial status as part of its outreach efforts.

The Ketzin example illustrates the importance of using an impartial observer as part of communications efforts. Public trust in GFZ, given its identity as a research institute, was high and resulted in public acceptance of both the technology and the project. In this case it is unclear whether it was the scale of the project that led to acceptance, or the leadership of the project, or both or some other factor. For CCS, given the distrust of Shell and Vattenfall, the role of impartial bodies in communicating project details will be crucial in order to gain public acceptance. Information could be more impartially communicated by NGOs, research organizations, or even academic institutes although involving these partners may not be straightforward. If the engagement efforts of what are considered “impartial stakeholders” are funded by the private sector, or any other party with a vested interest in CCS, their “impartiality” could be questioned further.

- 2) **What** information is presented? Contextualisation in terms of overall energy supply needs, European greenhouse gas mitigation targets, and the suite of energy supply options may well influence perceptions.

In cases where proactive CCS communication is undertaken, there is some indication that attempts have been made to link the project in question to positive environmental outcomes. The Vattenfall information centre did provide information related to climate change, for example. Generally speaking, based on the information provided as part of the case study material, it does **not** appear that the CCS and non-CCS projects sought to emphasise the wider environmental and energy planning contexts. Although results from several studies indicate a lack of public understanding about the larger context, public understanding of the use and necessity of CCS in a broader context is often taken for granted. This would certainly be something to consider for future CCS projects.

Generally speaking, the limited level of direct experience with CCS may make it harder for the public to accept the risks inherent in CCS technology, despite these risks being remote. This means that apart from providing data related to enhanced oil recovery projects, consultation for larger scale commercial projects in the EU (which may not commence with injection until 2014 or 2015) may have to rely on the experience of the smaller scale research and development projects that are soon to enter to injection phase. Projects in North America, Norway, Australia, and a number of smaller scale R&D projects throughout Europe, could help alleviate public concerns with respect to the risk perception of underground CO₂ storage.

- 3) **When** is information presented? The case study evidence clearly indicates that the timing of consultation is crucial to securing positive project outcomes.

The opposition voiced in relation to seven of the eight case studies was most significantly heightened by the failure to include the public at the initial stages of the consultation process. This poses a significant challenge for some projects, where locations have to be determined before a consultation and outreach program could even be justified by project developers. The EU announcement to allocate funding to various CCS projects throughout Europe has not made public consultation with the local population a precondition for the receipt of funding. In recent discussions with Commission officials concerning the role of public acceptance as part of their CCS funding decisions, acceptance was described as an

“obstacle”, but was not considered a factor in terms of selecting project locations.⁴ It would certainly be worth re-considering this aspect of the demonstration programme, and making project funding conditional on consultation with the local population in order to avoid creating the perception that projects are being developed without a thorough two-way dialogue.

- 4) **How** is information provided to the general public? What types of communication methods are used? The case study evidence evaluates the success of various methods in effectively communicating project details to the public.

A variety of methods have been used by project developers to provide information to the general public. These include: public meetings; the distribution of questionnaires or information leaflets to residents in the project vicinity; the establishment of local information centres that display project details; the establishment of project dedicated internet sites; and in the case of the Vattenfall project, the installation of a telephone hotline. Efforts by project developers range from providing the bare minimum in terms of information provision, complying only with the basics of the planning process, to providing more sophisticated communication tools. Sometimes project developers that have undertaken additional efforts, such as Shell and Vattenfall, have however been treated with suspicion; in these cases, members of the general public were typically not impressed with corporate information claiming that it was consistently too “positive”.

In many cases, the general public has not been able to access information that should have been readily available as part of a legislated public consultation process. Determining the prevalence of two way dialogues is difficult, given that a large number of projects have gone ahead in spite of public opposition. It is impossible to conclusively say whether communications and consultation has really influenced the public in any way. Given that only those who oppose projects were likely to voice opinions, it is virtually impossible to determine what effect specific communications methods may have had without undertaking a survey of the general public. In practice, the effects of specific forms of communication need to be informed by experimental studies in controlled settings, as a complement to the study of real-world settings and the inferences drawn from the explanatory concepts found in the relevant literature.

Some of the case studies indicated (including that for Vattenfall) that stakeholders involved in the implementation of the project are unaware of the number of residents who are either in favour, against, or

⁴. IEEP was present at a conference in London sponsored by the Westminster Energy Forum on CCS on October. This question was raised following a presentation from an EC official.

indifferent to the project. The size of public protest is not a determinant of the overall public approval of a given technology or project. Information cited by the local media, with respect to interviewing people on the street, can be considered anecdotal and not necessarily representative of the majority of the local population.

3.3 Beginning to map opinion-shaping factors

As stated in section 3.2, determining the effectiveness of communication in terms of positively influencing the public at large can only be determined by undertaking surveys. This underlines the importance of consecutive steps in the overall *NearCO₂* project. One of the next steps is the mapping of opinion-shaping factors which will draw on a range of sources, including this report, to determine which precise factors can be said to influence public perception of CCS. Given the role of regulation and decision-makers as part of all case studies, a description of the public perception of various technologies, is likely to be a function of confidence in project developers and in public institutions.

4. OVERALL PROJECT CONCLUSIONS

Previous work on CCS and communications and consultation funded by the Framework Programme, provided a number of conclusions that highlighted the importance of engaging with the public at a national level. The work completed as part of the ACCSEPT (Acceptance of CO₂ Capture, Storage Economics, Policy and Technology) project funded under the 6th Framework Programme while similar to those of this report, overlooked the complexities of engagement at the local level. Nonetheless, the final report from this project provided the following recommendations for stakeholder engagement:

“1. Plan an information campaign – now: In order to implement CCS on a large scale, widespread public support will be required. This should take into account research into current public perceptions of CCS and climate change. Groups such as national and European parliamentarians, journalists, environmental pressure groups and representatives of civil society are particularly important targets.

2. Ensure communication is a dialogue, not one way: Establishing an information campaign about CCS is not without danger, and the advice of professional agencies is required to help define the message, the messenger, the medium used and the target public. Planning for such a campaign needs to begin soon, with a focus on providing clear scientific information as part of a dialogue that encourages all voices to be heard and involved.

3. Assign a significant budget: A well-organised outreach campaign is not cheap – estimated around €250k per country⁵ – and funds must be set aside. Timing is also critical – in some countries CCS is moving onto the policy agenda relatively quickly; whereas in others, there is still virtually no recognition of CCS, even in policy circles.

4. Regularly monitor the public reaction and respond when necessary: Both before and after the launch of any campaign, public opinion needs to be gauged, and listened to, regularly. The Eurobarometer survey instrument could be used, supplemented by focus groups⁶ in different countries, in order to watch the evolution of opinion and catch objections early. Negative perspectives and objections must be addressed and responded to thoroughly and honestly using the right messengers.

⁵. Several authors in the NearCO₂ project would like to point out that this number is quite an understatement for an effective national campaign or for effective local consultation.

⁶. Following from the case studies done for this project, to understand local public opinion, motives and beliefs, it is necessary to add surveys with representative samples to focus group research.

5. An information and communication campaign needs to be supplemented with public and stakeholder engagement activity. The aim of engagement is not to ‘win over’ or change the opinions of sceptical NGOs, other stakeholders or the public, but rather to understand and engage with different perspectives, including highly critical ones. At the same time, information should be provided that informs and raises the level of the debate over energy futures. It should be emphasised that stakeholders and the public will not judge CCS in isolation, but relative to the alternatives and complementary options. For this reason, it is recommended that public information on CCS is provided in the context of other low-carbon technologies and options.” (Anderson et al, 2007)

A number of these recommendations are similar to those made as part of this report. They further underline the importance of: the need to establish a two-way dialogue; the need to consider the medium through which CCS information is being provided (that it ideally be an impartial party); and the need to present CCS as part of a suite of options. Nonetheless, the ACCSEPT recommendations relate principally to the broader stakeholder context and do not consider the dynamics of consultation at the local level. As the case studies considered here demonstrate, it is difficult to assess the extent to which the use of different communication methods has influenced planning outcomes, given the wide variety of local considerations. It is still possible, however, to make general assertions that draw on related psychological and sociological concepts.

The conclusions and recommendations arising from the case studies are as follows:

- 1) Regulations and local considerations can have a significant impact on public perception of projects. These considerations can complicate the communications and consultation efforts of project developers.**

As the case study analysis indicates, there are a number of issues that moderate communications efforts. These factors include:

- 1) Legal environment and public participation culture: the Spanish case reveals how the lack of a consultative participation culture helped incite local opposition to the project.
- 2) The relationship between different levels of government as part of the approval process: in the UK pipeline case, the mismatch between national energy requirements and local concerns played a significant role in antagonizing opposition to the project in question.

- 3) The prevailing importance of higher level policy issues: in the Barendrecht case, there was government support for the development of impartial communications materials. Given the importance of greenhouse gas reduction targets at the national level, there is the possibility that the “two-sidedness” of the dialogue with the public was limited. Approval authorities may have pushed through a project approval decision given pressure from national authorities and the Dutch need to meet both its Kyoto target and its European greenhouse gas reduction target.
 - 4) Site characteristics: the Ketzin project indicates how characteristics specific to the project site influenced perception of CCS. Although the project developer went beyond the basic legislative requirements in terms of carrying out consultation, public resistance to the project was low given the volume of CO₂ injection, and the fact that developers made use of existing gas storage reservoirs. The local population was familiar with the concept of underground storage.
 - 5) Local and historical context: the UK Winkleigh bio-energy case illustrated the attachment that local populations can have to the attributes of their locality, and, in this case, the perception that building a bio-energy facility would disrupt the local environment.
 - 6) Technological considerations: a segment of the opposition described in the UK pipeline case, illustrated how concern related to the location of a depressurization facility and its potential impact on local geology helped shape opposition to the project.
 - 7) Stability of the regulatory environment: the Dutch wind study illustrates how inconsistencies between policies can influence public perception of a project or technology. Opposition to this project was intensified by constant revisions to wind policy, and the perception that the revisions were motivated by the need to make them consistent with the plans of the project developer.
- 2) **Numerous factors can influence the effectiveness of communications and consultation at the local level.**

The case studies suggest a number of considerations in terms of improving communications and consultation in the context of project approval. These include:

- 1) The timing of consultation: information needs to be provided extremely early as part of the overall project development process. Failure to do so has served to fuel opposition in seven out of the eight case studies. In disclosing information at such early stages of the project development cycle, developers will need to ensure that they have access to all necessary information in order to address a wide range of local questions and concerns. Their potential inability to respond to local questions could jeopardize their perceived trustworthiness by the general public.

- 2) The type of material being communicated: there needs to be full disclosure of project risks as part of project materials. Material provided by either Vattenfall or Shell was deemed to be too positive, causing the public to reject both projects. It would be interesting to investigate how public perception of the technology would develop in cases where project developers are more transparent about the potential risks.
- 3) Improving the potential for a two-way dialogue: a number of approval authorities were quick to dismiss the validity of opposing arguments. Top down decisions were made based on: the perception that arguments of the opposition were emotional (Barendrecht); that the public did not have access to the right scientific data to prove safety concerns (Vattenfall); and in some cases were even made as a result of denying access to information (Spain, UK pipeline, and Winkleigh).

3) The effectiveness of communication and consultation is not amenable to simple inference.

Not only is there no simple relationship between communication, consultation and public perception, but inferring the nature of this relationship in real-world settings is rarely straightforward, due to a wide variety of additional, simultaneous influences. Indeed, there were negative perceptions in all but one case study, regardless of the presence of communications strategies implemented by the project developers.

The behaviour of the approval authority and the applicable regulation are important elements of project development. As the Dutch wind case demonstrated, opposition to the project intensified with changes that were made to the wind policy without additional public consultation. This example illustrates how the general public could be in support of a technology general speaking, but lose faith in a project that is seen to be poorly handled by local decision makers.

As a general rule, new industrial-style infrastructure can be problematic in terms of public relations where a community places a high value on the rural qualities of a place, or where it anticipates little benefit from the intrusion. One of the key public perceptions challenges for onshore CCS is the need to give affected populations sufficient and convincing reasons to tolerate additional impact and risk, however slight these may be considered by experts. Experience with renewable energy developments suggests that this can sometimes prove difficult or impossible to achieve in practice. This may be doubly so in the case of onshore CCS storage – though at this stage this remains a working hypothesis. Onshore CCS may not only threaten people's sense of place by introducing new infrastructure, but may also pose a degree of uncertainty and risk that even a very careful communication strategy may be unable to satisfactorily resolve to local residents' satisfaction. Given this, where possible, it may be better from a public relations

point of view to simply avoid onshore storage in populated locations, and to target offshore sites instead. It is difficult to see how CCS communications relating to storage can appeal positively to the public's sense of place and place-identity. The provision of economic benefits may help but may also be seen as a bribe. Perceptions are more likely to be positive in relation to the manufacturing of CCS infrastructure, which can draw on the idea and reality of industrial manufacturing traditions and provision of employment. It can be further hypothesised that CCS storage itself, however, is likely to be conceived of in terms of waste disposal and industrial siting. These may be reluctantly tolerated by populations who have little choice, but they are unlikely to be welcomed.

To sum up, real-world study of CCS perceptions in Europe is at an early stage due to the limited number of cases available for study. Based on the risk and place attachment literatures, and on other renewable energy experience, it can be hypothesised that onshore CCS is likely to be problematic in public perceptions terms wherever there is a potentially exposed population. It can be further hypothesised that there may be significant challenges to resolving this through communication and consultation techniques. While these are unpalatable conclusions that will require empirical investigation as more projects come on-stream, it is better that policymakers are aware of this possibility, as we head towards a roll-out of EU CCS demonstration projects.

APPENDIX A: CASE STUDY TEMPLATE

Public Participation Practices in CCS and Non-CCS Case Studies

This template provides guidance and sets a common structure for the review of public participation practices in CCS and non-CCS case studies under task 1.2 of the NearCO₂ project.

Working hypothesis/Key premise

The key premise to be considered in reviewing case study information, is that the roll-out of CCS would need to be undertaken in a way that takes much more account of experience gained with respect to engagement with stakeholders, and in the provision of communication materials.

Main issues to address

- ✓ What are the engagement processes used and what stakeholder groups will/do/did they target?
- ✓ What are/were the concerns of stakeholders raised in relation to CCS (or non-CCS in case study e.g. biomass or wind)?
- ✓ What can we learn from this about the factors that shape public perceptions of CCS (or non-CCS in case study e.g. biomass or wind) (particularly as part of the input to WP1.3)?
- ✓ What was the experience (either positive or negative) of different stakeholders of the engagement process?
- ✓ What can we therefore conclude about the adequacy of the stakeholder engagement process on this project?

Available project communication materials:

- ✓ Web based materials
- ✓ Legally required information and communication from/to stakeholders and the public;
- ✓ Information on the public participation process such as minutes of public hearings;
- ✓ Voluntary information and communication from/to stakeholders and the public;
- ✓ Free publicity/media coverage (if any);
- ✓ Interviews with key actors.

Data interpretation

The interviews and other data sources used will provide different perspectives on the process, which the researcher will then have to interpret in the context of overall project implementation.

Appendix I - Checklist for data collection

Project features:

- ✓ What does the project address?
- ✓ Type of project (demo, pilot, R&D...);
- ✓ Description of location, size of area, size of community involved;
- ✓ Timing of the project: initial planning versus actual project implementation timeline including a discussion of project delays;
- ✓ Outcome/current status of the project;
- ✓ Organization and financial matters: which party carries which responsibilities (e.g., for example for operation, maintenance, dismantling), who pays for what, and who benefits and how? Project budget, shareholding, compensation measures, and resources allocated to developing communication and participation activities.

National and local project context:

- ✓ General national and local context of the project (historical, technological, socio-cultural, and economic). For example: General history/experience with project type in the country in question. Is this project considered suitable for the area in question? National/local view on this and other technologies (skepticism)? Similar projects in area? Past accidents that may be associated with present project? Demography and political orientation of community involved? General economic trends (what is the main business in the area)?
- ✓ Reference to the regulatory context for public participation applicable to the activity in the country/region, covered as part of the deliverable D1.1.

Public participation: Parties

- ✓ Identify key local stakeholders and general public (e.g. local authorities, local/ national NGOs, business groups, active local individuals, etc.). Identify the role of each stakeholder (sponsor, land owner, project developer, regulator, researcher, opinion maker, ...).

- ✓ Which target groups were addressed? Who participated/ was involved in the process (i.e. narrow expert and stakeholder participation vs. wider public participation process)? Were there any key stakeholders that were not consulted?
- ✓ How did each stakeholder become involved? Prior knowledge about the topic? What are/were desired project outcomes for each of them? How is the project personally relevant to them? (e.g., possibilities for ownership, perceived effectiveness to mitigate climate change.)

Public participation: Process

- ✓ Provide information on the overall duration of the participation process and the stages at which the public participated in the process (e.g. from the beginning or later in the process?). To achieve this, it may help to make a systematic inventory of all interactions between stakeholders and general public throughout the project: who communicated what to whom, when, and why? How did target groups respond to communication directed at them?
- ✓ Identify key concerns and questions of key local stakeholders and the general public. How were these concerns taken into account (or not)? Were there any changes to the proposed activities as a result of the concerns, questions and wishes raised?
- ✓ Provide any comments of stakeholders participating in the process regarding the outcome of the participatory process. Identify positive and negative experiences. How have these influenced their opinion regarding the proposed activity?
- ✓ What do stakeholders think of each other and how has this developed over time in the project at hand (perhaps also in previous projects)? To what extent do they trust each other?
- ✓ Describe the outcome of the public participation exercise;
- ✓ Was the level and processes of public participation in the case more than the minimum required by law? If so, what additional elements were undertaken?
- ✓ To what extent has the public involvement been a dialogue rather than a one-way information campaign?

Information/Communication materials

- ✓ Identify what information was made available to the public, in particular the communication material used, who was responsible for preparing this material, and how was it made available.

The following characteristics of the communication materials may be relevant to describe:

- ✓ Message source (which stakeholder(s) or medium)?

- ✓ Directed to whom?
- ✓ Through which channel was the message disseminated? (newspaper, brochure, etc.)
- ✓ Level of objective. A message may be intended to inform, to raise awareness, to instruct, to persuade, or to mobilize the public.

Identify type of message content, for example:

- ✓ Information about the scale of the project, location, timing, etcetera.
- ✓ Announcement of participation opportunity (such as a meeting) / invitation to join, shareholding opportunities.
- ✓ Discussion of risks, such as leakage into atmosphere or basements, accidents, and health risks.
- ✓ Discussion of other disadvantages, such as effect on property values.
- ✓ Discussion of benefits, such as relevance to climate effort, economic advantages, local employment.

Media coverage

- ✓ Was the proposed activity discussed in the media? If so, how was it presented by the local press, television, blogs, etc.? At which point in the project? And how (if at all) did this affect the project?

Translation to CCS

- ✓ Which are the main elements that make this case a best/ worst case example of public participation? Among these elements, can you identify the ones which you consider are potentially the most influential in the development of further CCS projects?
- ✓ Is it possible to determine whether this example of public participation process is likely to be applied to other consultation exercises in the region? Could or should they be applied to CCS consultation?
- ✓ Summarize the key features of the participating process, lessons learned and potential impact in future CCS cases.

Appendix II – Topics to Consider in Conducting Interviews

- ✓ Basic demographics, residential status in community;
- ✓ Professional experience, including level of education and field of work;
- ✓ How long have you been living in/involved with the community?
- ✓ Let interviewee describe the community in terms of social, historical, and economic trends. Ask for examples.

- ✓ What is your role in the project?
- ✓ Why/how did you get involved in that role?
- ✓ How and when did you first hear about the project? Any prior knowledge?
- ✓ What were the main questions/issues raised by stakeholders in the community?
- ✓ What information would stakeholders have liked to have heard – what were the unanswered questions?
- ✓ What benefits did the developers or community perceive? How were they presented?
- ✓ Can you think of an event or circumstance when things went poorly in relation to the project, or went very well, and that marked a change in the level of public acceptance towards the project?
- ✓ Can you describe a time when you met project opposition or support for the project? What did you see as the cause or driver for this reaction from the community and how did you respond?
- ✓ Was there a turning point in the project? Were people open minded about the project and then either became opposed or in favor? What did you see as the cause or driver for this shift?

APPENDIX B: GERMAN CCS CASE STUDIES

NearCO₂ WP1.2

Public participation practices and onshore CCS: Learning from Case Studies in Germany - CO₂ sink (Ketzin) and Vattenfall's exploration permit (Beeskow).

Elisabeth Dütschke (Fraunhofer ISI).

1. Introduction

Two CCS-projects from Germany were selected for this work-package: *First*, the CO₂Sink research project at Ketzin is analyzed; *second*, the events surrounding Vattenfall's application for an exploration permit for the area around Beeskow are documented. Both case studies are located in the German state (*Bundesland*) of Brandenburg in Eastern Germany within 100 km of Berlin. In both cases, the projects aim to store CO₂ underground. Because of this common ground, the cases are presented together in order to point out their similarities and differences.

1.1. National context

The case studies had to be undertaken both during and shortly after the election campaigns in Germany. In addition to federal elections, elections at the regional and local levels also took place. When data collection commenced, Germany was still being governed by the coalition of CDU and SPD, i.e. by conservatives and socialists, under the Chancellor Angela Merkel (CDU). The election results resulted in a coalition of the CDU and FDP, i.e. the Liberal Party. Angela Merkel continues to be the chancellor in the new coalition. Generally, all the political parties mentioned so far are in favour of CCS, or at least have no definite objections to it. At the national level, *Die Grünen*, i.e. the Green party, and *Die Linken*, i.e. a newly formed left-wing party of former socialists and the PDS⁷, have adopted a position opposing CCS. Despite the establishment of positions on CCS by various political parties, it was discussed at the national level throughout the election campaign.

Within this section, further background information relevant to the cases is given regarding the cultural and the legislative context as well as a summary of recent events that might be of relevance for public

⁷. The PDS is the party that succeeded the SED, the Communist party that ruled the former GDR.

perception of current CCS-projects. This is followed by a brief outline of the current status of CCS in Germany.

In cross-cultural studies, Germany is usually found to be high on the uncertainty avoidance dimension (Szabo et al, 2002). Countries that score high with respect to uncertainty avoidance are known to emphasize the reduction of risks and to introduce a number of formal regulations forming part of a complex bureaucracy. This means that, within this kind of culture, society strives to reduce risk and uncertainty through precise regulation and strong norms – a tendency that might make it difficult to introduce new technology if its effects are not fully known.

As in other European countries, the German population prefers renewable energy sources to fossil fuel sources and nuclear energy (Eurobarometer, 2007). About one third of respondents in the 2007 Eurobarometer claimed to be in favour of coal, with 13 % against. Support for coal is equivalent to that for oil, while higher than that for nuclear power (20 % in favour).

Germany does not yet have legislation on CCS. Thus, the conditions and possibilities for building and operating a CCS facility are at best unclear. At the moment, many different laws could apply (Schulze et al, 2008). Some experts assume that it would not be possible to integrate CCS technology into a commercial power plant due to the potential legislative boundaries. Generally speaking, experts agree that the current legislation would not permit the operation of a large-scale commercial storage site (Fischedick et al, 2008). However, there are still some ways to get permits for research projects, mainly under existing mining law (*Bergrecht*).

Under German *Bergrecht*, public participation is not an obligatory requirement as part of the permit planning process, although public participation may take place in the context of an environmental impact assessment (EIA). If this is the case, public participation is governed as follows: Any proposals or plans to apply for a permit have to be made available to the public by the competent authority for four weeks before said authority may rule on the application. This four-week-period is followed by a two week period in which written objections may be submitted. Objections may then be further discussed in a hearing (*Erörterungstermin*). However, these hearings are neither mandatory nor necessarily open to the public. Furthermore, the public is not included in the scoping of the project and does not have the possibility to comment on drafts.

Under *Bergrecht*, EIA is restricted to certain cases which so far do not include CCS-projects. Implementing a large-scale commercial storage site would make it necessary to have an EIA although it is not obligatory for research projects or in order to obtain an exploration permit. The specific regulations regarding public participation for the case studies in question are outlined in more detail below.

Several events have occurred in Germany in the recent past that might be perceived as being related to CCS-projects from the public's point of view.

- *Storage of nuclear waste in Asse*: Germany has been looking for suitable sites for the disposal of nuclear waste for several years. However, research at specific sites has always been accompanied by strong public criticism and protests. Research at Asse, a former salt mine, on storing nuclear waste was stopped in 1995. Since then, authorities and research institutions have worked on a proposal to close the site which has turned out to be very complicated and associated with large risks due to technical problems und uncertainties. The Asse-project was recently the subject of heavy criticism, among others by the then German Federal Minister for the Environment, Sigmar Gabriel, for not applying common scientific standards and for continuously holding back important information regarding safety issues and unexpected events (Gabriel, 2008). This issue has been covered extensively by the German media, was discussed widely by the public and has had the effect of intensifying public distrust of pressure groups from the energy sector and their political affiliations. In the course of these events, Asse was placed under the jurisdiction of the *Bundesamt für Strahlenschutz* (German Federal Office for Radiation Protection), and is now being handled under the *Atomgesetz* (nuclear law) instead of the mining law.
- *Landslide in Nachterstedt* (18/07/09): A heavy landslide occurred this year in Nachterstedt, *Sachsen-Anhalt* (Saxony-Anhalt), in Eastern Germany at a former coal mine, which is currently being reclaimed. Two houses were completely destroyed and three people killed. Following this, forty individuals had to be evacuated immediately, and have since had to leave their homes permanently. It is still not entirely clear what caused the landslide; however links are being made to the mining history of the region as well as to a small earthquake which happened shortly before the landslide.
- *Nuclear power plant Krümmel*: The name Krümmel has strong connections to a nuclear power plant with a bad reputation. It is jointly owned by E.ON and Vattenfall and operated by Vattenfall. There have been repeated discussions about whether Krümmel is the cause of leukaemia among an unusually high number of children who live in the vicinity of the power

plant. However, although it has been proven that the incidence of leukaemia is above average in the neighbourhood, it could not be demonstrated that these cases were caused by the power plant and/or possible nuclear radiation (Kaatsch et al, 2009). On top of this, several incidents have taken place at the power plant, including fires. Due to technical problems, the power plant is currently not running.

- *Referendum against lignite in Brandenburg*: In 2008, several groups⁸ tried to initiate a referendum against new surface mining projects for lignite. The initiative failed as only about 25,000 people registered to support the initiative by February 2009, while 80,000 would have been necessary for the referendum to go ahead.⁹

Having received backing from the federal government as well as the German *Bundesländer*, several CCS projects have been initiated over the past few years. The federal government is financially supporting two projects on carbon storage, CO₂Sink at Ketzin, described in detail below, and the CLEAN-project (*Altmark, Sachsen-Anhalt*, eastern Germany), which investigates the storage of CO₂ in a nearly depleted natural gas field. Up to now, the research projects have been well accepted by local residents. From industry, Vattenfall and RWE are heavily involved in this field; both companies are currently running demonstration plants¹⁰ for carbon capture technology, and both have started to look for storage sites. While RWE is concentrating its search in *Schleswig-Holstein*, in northern Germany, Vattenfall is looking in *Brandenburg*, eastern Germany, in the area around Beeskow – analyzed in detail below – and in the Oderbruch. These explorations of possible storage sites by industry have, however, been met by strong public resistance.

Despite local opposition, a study (Denkstell Hamburg, 2009) from spring 2009 shows that knowledge on CCS and CO₂ as a substance is low in Germany. Only 4 % of 1000 respondents stated to know the term CCS. Of those 4 % only 18 individuals were able to correctly explain CCS. Within another sample in the same study, 600 individuals were interviewed about problems connected to CCS. If CCS is explained

⁸. Initiators included environmental NGOs like BUND, NaBu as well as political parties (the Green and the Left). Cp. <http://www.keine-neuen-tagebaue.de/> (retrieved 19/10/09).

⁹. The procedure for a referendum in the Bundesland *Brandenburg* has to pass through three stages; first, at least 20,000 signatures have to be collected in favour of the initiative. Second, at least 80,000 inhabitants have to register in favour of the idea at the local authority. Then, third, the initiative is turned into a referendum. To be successful, at least one quarter of the eligible voters of *Brandenburg* have to take part in the referendum and the majority of these have to vote in favour. Thus, the initiative regarding lignite failed at the second stage.

¹⁰. The RWE-plant is located in Hürth, near Cologne, Western Germany, the Vattenfall plant at Jänschwalde/Schwarze Pumpe, near the border with Poland.

according to three different steps: capture, transport and storage, only a small group of respondents (20 %) expects that carbon capture is likely to cause problems whereas a wide majority assumes that transport (72 %) and storage (76 %) may lead to negative side-effects.

1.2. Project descriptions

The following table summarizes basic information about the two projects and the locations.

<i>CO₂Sink, Ketzin</i>	<i>Vattenfall, Beeskow</i>
Aim of the project	
The scientific research project focuses on observation and analysis of the effects of injecting CO ₂ into a reservoir.	To explore whether the area underground around Beeskow is suitable to store CO ₂ from power plants and industry on a commercial scale.
Project leadership and support	
The project is coordinated by the GFZ, German Research Centre for Geosciences. The site is operated and owned by the <i>Verbundnetz Gas</i> (VNG). With respect to scientific collaboration, numerous research institutions and universities from several countries are part of the consortium as well as the IEA and a few representatives from industry.	The exploration was initiated and is being led by Vattenfall; however, it is also being backed by the government of Brandenburg and is in line with the energy concept of the <i>Bundesland</i> .
Current status	
The CO ₂ SINK project started in April 2004. The injection of CO ₂ started on June 30th 2008. Up to October 18th 2009, 23,411 tons of CO ₂ had been injected into the underground aquifer. Currently the GFZ is trying to extend the funding and duration of	In March, 2009, Vattenfall submitted its application for an exploration permit to the competent authority LBGR Brandenburg. ¹¹ This application has to be discussed with other affected authorities, e.g. authorities concerned with environmental issues in the

¹¹. The Landesamt für Bergbau, Geologie und Rohstoffe (state office for mining, geology and resources) is responsible for issues, permits and supervision related to these three areas.

the project in order to reach a total of 60,000 tons of CO₂.

area. They have the chance to raise objections which usually lead to certain constraints being raised in response to the permit application.¹² An outright refusal of the application is only possible if serious factual objections are raised. Up to now, no decision has been announced (20/10/2009).

Funding

The CO₂SINK project is funded by the EU Commission, the Federal Ministry of Economics and Technology (BMWi), the Federal Ministry of Education and Research (BMBF) with some contributions from industry.

The enterprise is funded by Vattenfall.

Location

The storage site is situated about two km from Ketzin. Ketzin is about 20 km from Potsdam and about 70 km west of Berlin. The community includes the town of Ketzin as well as the villages of Etzin, Falkenrehde, Tremmen and Zachow (roughly 6500 inhabitants). The rate of unemployment in the area is about 10 % (September, 2009, data from IAB).

The intended storage site lies around the town of Beeskow. About ten more villages are situated above the storage site currently being discussed and about 50 villages lie within the total area for exploration work. Beeskow has roughly 8000 inhabitants. The area is about 80 km south-east of Berlin. The rate of unemployment in the area is 11 % (September, 2009, data from IAB).

General setting

Ketzin has a long history related to the natural gas industry. One hundred and ten years ago a facility was built to produce gas for the neighbouring town. Later, when Ketzin was connected to the natural gas pipeline, an underground reservoir to stock

The area does not have a significant amount of industrial activity and bigger cities are located several kilometres away. The project site is found in a predominantly rural area. Local communities are trying to enhance tourism in the region, which features forests,

¹². E.g. no exploration work in a certain area during certain periods of the year because of breeding seasons.

natural gas was installed below the site now used by the CO₂Sink-project¹³. During the installation of the gas reservoir some leakages occurred, probably in relation to the drilling holes, and a small village, Knoblauch, had to be relocated in 1965. The inhabitants were offered new houses and apartments in Ketzin (Augustiniak, 2006). The gas reservoir was closed in 2004. Near the CO₂Sink site, the community has installed a biomass plant and is currently planning a photovoltaic field (“Renergiepark Ketzin”). The community is also equipped with wind turbines, which are placed as far away as possible from the town. Ketzin would like to encourage tourism in their region.

several small lakes and rivers. Over the past few years, the local council has invested in the renovation of the historical town centre.

Regulatory context for public participation

The Ketzin project site utilizes an existing natural gas reservoir. Thus the project developer only needed to apply for an official adaptation of the existing permit – held by VNG - for the research project. Public participation was not necessary but the community and the public were informed about the project during the planning stage.

The exploration is to be performed under mining law, and relates to existing regulations for exploring brine. Thus, public participation is not obligatory. It is sufficient to inform and hear the authorities affected by the enterprise, i.e. environmental authorities. However, the communities and the public were informed at an early stage as well and it was openly communicated that the aim of the project is to assess the suitability of the underground area for the storage of CO₂.

Elections

Both projects are situated in Brandenburg, where regional and local elections took place during the data collection process (concurrently with the national elections). The government

¹³. The CO₂ is not actually stored in the former reservoir for natural gas but in a deeper layer beneath this.

of Brandenburg was and will continue to be led by Matthias Platzeck (SPD). However, up until the elections, the government was formed by Platzeck's socialist party and the conservatives (SPD and CDU). This situation has changed due to the elections and, at the moment, the SPD is discussing a coalition with the left-wing party of *Die Linke*. While SPD and CDU have always been in favour of CCS in Brandenburg, *Die Linke* voiced its opposition to this during the campaign.

Additionally, the mayor of Beeskow was elected as well. All candidates, including the successful Frank Steffen (SPD), were opposed to CCS and especially to Vattenfall's exploration plans during the campaign.

2. Methodology: Data collection

Information on the cases was collected using internet sources and media archives. An exemplary list of internet sources is provided below:

- General information on the projects: www.co2sink.org, www.vattenfall.de/ccs
- Information on the communities and the area: www.ketzin.de, www.beeskow.de, entries in www.wikipedia.de, data from www.iab.de
- Internet-pages of stakeholders, e.g. www.lbgr.brandenburg.de as the competent authority, <http://www.bund-brandenburg.de> as a local environmental NGO, internet-pages of local candidates for the elections and of local action groups, www.co2-endlager-stoppen.de and www.co2bombe.de.

The local newspapers, *Märkische Allgemeine* (Ketzin, www.maerkischeallgemeine.de, MAZ) and *Märkische Oderzeitung* (Beeskow, www.moz.de, MOZ) were screened for past and current information on the projects as well as significant events in the area. Relevant documents were collected as well, e.g. brochures issued by Vattenfall, and material used by local action groups.

Additionally, 13 in-depth interviews were conducted with stakeholders. Data collection efforts aimed at covering all the relevant stakeholders including the leaders of each project (GFZ, Vattenfall), the authority responsible for granting the project permit (in both cases LBGR Brandenburg), local authorities, local

stakeholders and opponents. The interviews were conducted during the election campaign and within a defined timeframe (after the German summer holidays and before the deadline of the work package). This restricted the availability of some interviewees, but apart from the local authority at Ketzin, all the targeted categories of interview partners were able to be covered.

<i>Interview partners at</i>	
<i>CO₂Sink, Ketzin</i>	<i>Vattenfall, Beeskow</i>
Project leader	
Dr. Michael Kühn (project leader, GFZ), by phone 28/09/09	Damian Müller (head of CCS-communication, Vattenfall) by phone 04/09/09
Fabian Möller (operational engineering, on-site tours, GFZ), in person, 07/10/09	Elvira Minack (local representative of Prof. Dr. Günther Borm (former project leader and founder of CO ₂ Sink, GFZ) ¹⁴ , interviewed 2007)
Responsible authority	
Hans-Georg Thiem, Head of Department 3, Rohstoffe, Energie, Service (resources, energy, service), by phone 17/09/2009	
Local authorities	
Bernd Lück (mayor of Ketzin), by phone 08/10/09	- no one was available for an actual interview -
Local stakeholders	
Helmut Augustiniak (chairman of "Heimatverein Ketzin", a local citizens club), by phone	Ruth Buder (editorial journalist of the newspaper at Beeskow)
Opponents	
Axel Kruschat (press officer of BUND Brandenburg, regional environmental NGO), by phone 01/10/09	
- no local opponent could be identified -	Ulf-Michael Stumpe (action group "CO ₂ ntra Endlager", Oderbruch), by phone 16/09/09

¹⁴. This interview was conducted by a colleague, Dr. Annette Roser (IREES), within a project on societal acceptance of CCS ("Sozioökonomische Begleitforschung zur gesellschaftlichen Akzeptanz von Carbon Capture and Storage (CCS) auf nationaler und internationaler Ebene. ").

and 21/09/09

Sabine Niels (action group “CO₂-Endlager stoppen”, Beeskow, newly elected member of the *Landtag* of Brandenburg, Green Party), by phone 18/09/09

Udo Schulze (action group “CO₂-Endlager stoppen”, Beeskow), personally 06/10/09

An interview guideline was developed in advance, identifying relevant topics for the interviews. The interviews focused on the two projects, the information provided to the public and public acceptance of the projects. However, due to the diverse backgrounds, prior to conducting each interview, the guideline was revised in order to adapt it to the knowledge and the role of the interview partner.

Where possible, interviews were recorded and transcribed. If recording was not possible¹⁵, extensive notes were taken during the conversation.

In order to refer to the interviews, the initials of the interview partners will be used in the following report. Data taken from the local newspapers is referred to using the respective abbreviation (MAZ, MOZ).

Further observations were gained by visiting both towns. At Ketzin, the author of this report went to an exposition on the history of gas in Ketzin at the city hall and had a guided tour of the CO₂Sink project site. At Beeskow, the author of this report also visited the information bureau established by Vattenfall at the marketplace in the town centre.

3. Data interpretation

The following chapter *first* summarizes the communication to the public including press coverage, *second* describes local public acceptance for the respective projects and *third* aims at identifying factors that influenced public acceptance of the technology as part of both case studies.

¹⁵. Eight of the 13 interviews were recorded. In some cases recording was not possible, e.g., two of the interview partners objected to fixed appointments and preferred to talk about the projects informally and spontaneously.

3.1. Communication to the public and public perception

Ketzin

At Ketzin, the mayor claims to have been actively looking for energy-related utilization of the former gas reservoir site (B.L.). Thus, from the first stages of planning the project, officials from the community were informed (B.L., G.B.). Once the GFZ obtained funding for the project, it was presented to the town council and the public. Whereas B.L., the mayor of Ketzin, recollects high public interest, G.B., the initial project leader, says that only those who were somehow obliged to attend came to the project presentation. In any case, the project was positively received by the public in Ketzin (B.L., H.A., M.K.).

This initial information event was followed by several other presentations regarding the progress of the project either in Ketzin or directly at the research site. B.L. stated that public interest in project presentations continuously decreased. It rose again after it became clear the CO₂ would have to be transported to the research site by truck. However, this issue has been resolved due to the expected low number of trucks per day. On-site presentations usually enjoyed greater public interest and were partially conducted in cooperation with local associations (e.g. catering organized by them) (M.K., B.L.).

Recently – probably sparked by greater awareness of CCS-projects following the discussions of the nearby Vattenfall project – a presentation of the project’s first results received significant attention (B.L.).

Information about the project is available on a website provided by the GFZ. However, this site does not seem to be directed at the local general public, as it is in English and includes various technical details. Updates also do not seem to be added regularly (the last entry on the “news” page dates from 30/06/08).

Tours of the site are offered by the GFZ on Wednesdays by appointment. Tours are usually led by Fabian Möller from operational engineering/GFZ and are often fully booked for weeks in advance even though they are not promoted very actively by the GFZ. Participants are from various backgrounds including international scientists, employees from related industries, politicians, NGOs as well as local citizens (F.M.).

The Ketzin project is regularly covered by the local as well as by the national press. Press conferences were held, e.g. at the beginning of the injection. Due to the innovativeness of the project, some international media also reported on the project. Newspapers from other German regions that are also

affected by CCS-projects contacted the GFZ as well and brought articles about the project.¹⁶ The general tone of the media coverage is neutral and factual, concentrating on project descriptions.

Beeskow

Vattenfall applied for an exploration permit at the end of March 2009. The public was informed about the project a few days in advance via a press conference which was widely covered by the media. All the households in the area concerned were supposed to receive a letter and a flyer providing basic information about the project. While Vattenfall states that this was successfully managed (D.M.), interviewees from the opposition either disagree or do not remember (A.K., U.M.S., U.S.). Representatives of the local authorities were informed beforehand at special meetings – a fact that has now been criticised (U.M.S.).

The government of *Brandenburg* had been informed about the project in advance of the public announcement and had been working on a communication campaign together with Vattenfall for several months (D.M.). Politicians, i.e. members of the national and the *Brandenburg* parliaments, as well as other relevant stakeholders, e.g. from the church, NGOs, also received a letter and brochures informing them about the project (D.M.).

After the official announcement, Vattenfall began a series of public events at which further information on the project was presented and questions could be asked. Additionally, Vattenfall openly communicated its willingness to provide further information if requested and to attend all kinds of meetings that deal with the subject. In July 2009, Vattenfall set up an information office at Beeskow, which opens twice a week and upon request. Visitors are given information about climate change, underground storage of CO₂, a description of saline aquifers and general information on CO₂ (e.g. usage, occurrence) as well as a detailed map of the exploration area. Since August, Elvira Minack has been constantly representing Vattenfall in the region and actively seeks to make contacts and to distribute information on the project, e.g. contacting local schools. (Articles from MOZ, D.M., E.M.)

Additionally, Vattenfall provides a comprehensive internet site on the topic, which includes general data on CCS, films and animations, as well as information about local projects. A regularly updated brochure can be downloaded featuring answers to questions raised by the public (D.M.). Vattenfall also provides a free telephone hotline for the public to obtain information and ask questions.

¹⁶ E.g. Aachener Zeitung, Interview with project leader Michael Kühn, 10/07/09. Aachen is next to Hürth where the RWE demonstration plant is located.

Although the project is regularly discussed in the local press and several stakeholder groups have publicly stated their opposition to it, public interest in the project seems to be somewhat limited. Only a few people have visited the information office and presentations on the project as well as events organized by opponents are usually only attended by a limited number of people (D.M., E.M., R.B.), perhaps with some exceptions (U.S.).

As mentioned above, the project was covered by the media from the very beginning. Opponents successfully voiced their resistance to Vattenfall's plans in the media as well. Media interest in the project has continuously been rising since March 2009. Locally and regionally, it was especially high during the election campaigns when several groups declared their opposition. The project and resistance to it has occasionally been covered by nationwide media as well as internationally. However, in Germany, beyond Brandenburg and other affected regions¹⁷, few people probably know about it.

3.2. Current status of public acceptance

Ketzin

All interview partners agreed that CO₂Sink is well accepted by the local public. No information, such as that available in local newspapers, could be found that suggested otherwise.

Beeskow

Vattenfall has met with strong local resistance to the project – in Beeskow as well as in the Oderbruch, the second area selected for exploration. On a local level, all the political parties are opposed to the project. For example, within the CDU, local candidates formed a special group (“Fürstenwalder Kreis” <http://fuerstenwalder-kreis.de/>) during the election campaign to oppose CCS.¹⁸ As already mentioned above, all four candidates for the position of mayor at Beeskow openly stated their opposition to the project.¹⁹

Shortly after the announcement of the project, local action groups emerged that set up internet pages and organized some events in protest (e.g. demonstration in Berlin against CCS legislation). Opposition of

¹⁷ E.g. regions that are affected by RWE's CCS-plans.

¹⁸ At the same time, Ulrich Junghanns, who was minister of economic affairs in *Brandenburg* until the election, was one of the most fervent supporters of CCS and is also a member of the CDU.

¹⁹ Cp. internet pages of the candidates: www.birnack-eberhard.de, <http://www.zuhauseinbeeskow.de/positionen.php>, www.fuer-beeskow.de, http://karin-niederstrasser.de/nc/karin_niederstrasser/positionen/

these groups is fundamental – their aim is to block CCS in general, especially in their home region (S.N., U.M.S., U.S.).

All communities voted against the project and officially registered their opposition at the LBGR.²⁰ Several other stakeholders have declared their opposition to the project, e.g. farmer associations (MOZ, 09/07/09) and opposition posters have been put up at churches in the area.



Posters stating opposition to Vattenfall’s exploration permit in front of a church (“No CO₂-storage neither here nor elsewhere!!!”) and at the city hall of Beeskow at the marketplace (“No. Final storage of CO₂ is no energy solution”)

However, up to now, it is not clear if opposition is deeply rooted among the general public. On the one hand, opponents were able to collect several ten thousand signatures against the exploration within a few weeks (A.K.). On the other hand, as stated above, the presentation on and discussions about the project were only attended by a limited number of individuals (R.B.). On both sides, interviewees had doubts about the true potential for continuous resistance (D.M., U.M.S., S.N.). It is not clear whether a large number of people are really willing to commit to taking action against the project. Furthermore, doubts were raised whether local politicians would maintain their opposition, especially if this deviates from their parties’ opinion on a federal or a *Länder* level (S.N.).

3.3. Factors relating to public acceptance

²⁰. As stated above, mere opposition to the project is not relevant for the authority’s decision regarding the application.

3.3.1. Communication processes and arguments presented

Ketzin

Based on the interviews, it can be concluded that the inhabitants of Ketzin feel sufficiently informed about the CO₂SINK-project. The mayor, B.L., states that “there was always a straight information policy, right from the beginning”.²¹ These statements are supported by H.A., who emphasizes that the project was established in close cooperation with local authorities as well as a well-informed public.

Beeskow

Opponents claim to have first learned about the project when it was discussed at their town’s council meetings and that they were taken by surprise when they fully understood the implications (U.M.S., U.S.). It was stated that the information material issued by Vattenfall did not reach everybody in time (A.K.) and that there was no steady flow of information (S.N.).

Generally, the arguments presented by Vattenfall regarding the technology are seen as being too positive, excluding knowledge gaps regarding the technology and downplaying safety issues (U.M.S., A.K., S.N.). Opponents suspect that it is simply not possible to safely store CO₂ – or anything else – for the hundreds of years that would be necessary to positively influence global warming (A.K., S.N.). Thus, they conclude that the technology is only being promoted by industry as a way of prolonging the use of coal as part of the energy supply mix in the near future (A.K., S.N.).

The way the project is illustrated by drawing comparisons to other usages of carbon, e.g. in mineral water, is criticized as well. This is seen as a strategy to trivialize the risks of large-scale storage (S.N., U.M.S.). The same impression is portrayed by the statement that carbon is not toxic.

Another issue present in the interviews was the feeling that Vattenfall is willing to bribe local citizens and communities by financing sports clubs or investing in infrastructure (U.M.S., S.N.). On the one hand, these rumours may have a basis in Vattenfall’s claim to become a “partner of the region” – a slogan that is used by Vattenfall in relation to marketing and by sponsoring activities all over Germany. On the other hand, Vattenfall declares that it has not made any kinds of promises in advance and is misunderstood in this regard (E.M.).

²¹. “...weil eben auch ordentliche Informationspolitik gegeben hat, von Anfang an.”

Additional criticism was made of Vattenfall's application for an exploration given that it was made public shortly after the failure of an initiative for a referendum on lignite (U.M.S., S.N.). It is suspected that an earlier announcement might have led to different results and greater interest in the initiative concerning lignite in the area potentially affected by carbon storage.

At the same time, opponents feel misunderstood especially by the media and by politicians (S.N., U.M.S.). They have the impression that they are being treated as though they were irrational and hostile towards technological progress thereby setting the energy supply of the country at risk.

3.3.2. *Perception of risks related to CCS*

Ketzin

CCS is regarded as a technology that is necessary because of climate change (H.A., B.L.), which has already been delayed too long (B.L.). Minor and even major risks are seen as possibly being related to it, however "there wouldn't be any progress if we just said no to this, that and everything"²² (H.A.). The main source of risks is seen in the complexity of storing carbon underground and the unknown difficulties connected with handling such a system (H.A.). B.L. also relates that some may be worried that CO₂ is toxic, and that given its invisibility, it is something mysterious with unknown negative effects. However, he assumes that these kinds of fears can be diminished through further information about CCS and CO₂ as a substance.

Regarding risks to the community, the local community in Ketzin not concerned with the safety risks given the minor quantities of CO₂ injected and the fact that the project would have to be stopped in the event of leakages (B.L., H.A., A.K.).

Beeskow

Opponents doubt whether sufficient research has been done on carbon storage to be able to proceed to the next step (U.M.S., S.N.). At the same time, people fear that storage sites will not be safe and that leakages will occur, possibly causing fatal accidents (U.M.S.) and parallels are drawn to the Lake Nyos disaster in 1986 (S.N.). Another risk surrounds the fact that carbon cannot be controlled once it has been injected, and it is not possible to fully remove it once it has been stored. There are doubts whether it is possible to guarantee its safety at all. In addition to leakages, it is feared that groundwater may be polluted either by suppressed salt water or by substances that are injected with the CO₂ (U.M.S., S.N.).

²². "Sonst könnten wir ja überhaupt keinen technischen Fortschritt mehr haben, wenn man zu allen Sachen jetzt sagt, nee, das nicht und das nicht und das nicht."

Furthermore, opponents are afraid that the real estate market in the area will suffer which may have negative consequences for mortgage loans (U.M.S.). It is also suspected that tourism will suffer and that the area may be regarded as dangerous and therefore not attractive to visit (U.M.S.).

Locals actively engaged in resistance to the project do have a high degree of knowledge about CCS. However, other people ask questions that show that knowledge about the project and the facilities necessary to store carbon, is still low. Locals worried that the landscape might be severely disturbed by the installation of the project (E.M.), illustrate this low level of awareness. CCS is also seen as being in competition with further development and implementation of renewables (U.M.S.). Opponents to CCS are afraid that efforts to promote renewables may be negatively affected if the possibility to use clean coal exists.

3.3.3. Perception of project leader and trust in information

Ketzin

No doubts were stated regarding the project information received from the GFZ. The research institute is seen as a trustworthy partner that is accessible to the community.

Beeskow

Those opposing the Vattenfall project distrust the authorities responsible for granting an exploration permit. At the same time, in the event that the area is declared unsuitable for injection, the opposition fears that Vattenfall will not disclose the results of the planning refusal (S.N., U.M.S.). Thus, opponents would prefer the exploration to be led by a scientific institution or a public authority that does not stand to benefit from certain results.

In line with this, information on CCS from sources other than Vattenfall is preferred. Opponents claim to have greater trust in scientific institutions, e.g. the GFZ. As mentioned above, the information provided by Vattenfall is seen as being too positive about the implications of CO₂-storage. Scientific presentations that also mention disadvantages and risks are therefore preferred (S.N., U.M.S.). Opponents also state that they do not see any point in closer contact with Vattenfall as they do not trust the information provided (U.S.).

Besides this, environmental NGOs doubt that CCS will be able to counter climate change as they believe that the technology is too late and that other strategies should be given priority. These arguments are also

promoted by local opposition groups (A.K., U.S.), who also state that Vattenfall has failed to explain exactly how CCS is going to help fight global warming.

3.3.4. Case-specific factors

Ketzin

It has been repeatedly stated that project acceptance is high because Ketzin has a history of storing gas and that local people are therefore familiar with the concept. This is also despite the fact that mismanagement of the former gas reservoir, led to the forced relocation of the village of Knoblauch. In hindsight, even this fact demonstrates why acceptance is high: people from Ketzin know the downside of gas storage and how to deal with it – and are therefore less afraid (H.A., B.L.). Second, the project is a research project that is limited in its duration and the quantity of carbon injected (H.A., B.L., A.K.).

Additionally, the community benefits from the project as it has attracted visitors from all over the country and indeed the whole world (B.L.). Visitors often stay at Ketzin for the night, or at least for a meal. Moreover, the village has become better known to greater numbers of people and it is hoped that they may decide to return for a holiday.

Beeskow

The region is described by interviewees (U.M.S., S.N.) as unique given that it has been left undisturbed on a grand scale and is not densely populated. They describe those who live there as having strong ties to the area and claim that those with weaker ties have already moved to other regions – due to the better chances for employment elsewhere. At the same time, several individuals have moved into the area from Western Germany and Berlin in order to live closer to nature (U.M.S.). There is a general perception that these people are especially engaged in resisting CCS (E.M., U.M.S.). In summary, local opponents do not see any advantages for them that may counterbalance the associated risks (A.K.).

4. Conclusions for communication on CCS

In both cases, the project leaders have tried to comprehensively inform the local public about the projects from an early stage. However, the results have been quite contrary. While the CO₂Sink-project is welcomed by the affected public, Vattenfall's application is disliked. Opponents blame Vattenfall of providing biased information. However, they also state that they do not trust Vattenfall. Thus, it is not clear if this criticism is really due to information gaps or if it is biased by the opposing attitude.

The two cases are comparable in many aspects: Ketzin and Beeskow are projects about storing CO₂ in an underground site. They are located in the same area; the respective regions are rural and industries producing CO₂ on a large scale are several km away. However, the cases also differ on important dimensions that were seen as being related to public acceptance in the interviews: The scale of the project and project leadership.

Project scale is important – interview participants from Ketzin hypothesized that there might have been resistance to the project if it had been of a commercial scale.

While the project in Ketzin is run by scientists, the exploration permit for Vattenfall has been submitted by a powerful energy company. Thus, Vattenfall has the problematic double role of being the one benefitting from the project and at the same time being the main source of information for a public that has little prior knowledge of CCS. Trust in industry is generally low (Huijts et al, 2007). In summary, this lowers the chances for Vattenfall to initiate an open discussion of the topic which can serve as the basis for the development of local acceptance for carbon storage.

Thus, communication on CCS needs to be put forward not only by industry members but also by other stakeholders. From today's point of view, a communication strategy for CCS in Germany needs to include stakeholders from various backgrounds, e.g. politics and science (Gruber, 2009). Risks and advantages as well as the current state of knowledge have to be communicated openly and via trusted channels. At the same time, it is necessary that decision strategies about sites are communicated openly, e.g. through establishing boards that include members from the industry, from the competent authorities as well as the local public. These boards could monitor exploration of sites and thus guarantee a transparent flow of data from the exploration work. However, the local public may always develop negative attitudes towards CO₂-storage as there is some uncertainty related to it and no local benefits resulting from it. To address this problem, Axel Kruschat, the interviewee from the local environmental NGO, suggested that storage sites should be explored by the government and afterwards put into the responsibility of local communities. Communities should then have the right to decide if and at what price they are willing to offer the sites to industry.

APPENDIX C: UK BIOENERGY CASE STUDIES

NearCO₂ WP1.2

Public participation practices and onshore CCS: Lessons from UK bio-energy

Drs Paul Upham and Carly McLachlan, Tyndall Manchester, September 2009

1. Introduction

This section draws on the experience of public participation in two UK bio-energy developments, as well as the theoretical literature on place attachment and risk, to inform discussion of public engagement in CCS. Bio-energy in the UK has considerable utility as an analogue to CCS in the UK: both are relatively unfamiliar to the UK public, involve risks and impacts that the public are unfamiliar with, and both can involve large industrial-style infrastructure. The larger of the two bio-energy examples is given most attention, as this raised a very high level of public objection. It is concluded that public engagement and communications strategies for onshore CCS may well face severe challenges and prove insufficient to resolve public concern.

2. Methodology

The section draws on post-hoc analysis of recent, in-depth bio-energy case studies. These are, firstly, an unsuccessful proposal to develop an advanced 21.5MWe biomass gasifier near the village of Winkleigh in Devon, England; and secondly a successful, though still contested, development of a 2.6MWe biomass combustion plant at Eccleshall, Staffordshire, England. The 21.5MWe Winkleigh case has been studied over a number of years under the UK EPSRC Supergen Biomass and Bio energy Consortium, which has provided several publications on the dynamics of the associated public opposition (Upham and Shackley 2006; Upham and Shackley 2006; Upham 2009). The 2.6MWe Eccleshall case draws on recent doctoral research (McLachlan 2008; McLachlan 2009; McLachlan 2009). For both cases, a substantial quantity of interview and documentary evidence is available. Interviews were conducted with selected stakeholders and members of the public involved in opposing the developments. Selection of respondents for interviews was on the basis of the individuals either being key figures involved in the public opposition to the proposed developments, or key stakeholders known to have expressed an opinion on the case. In the Winkleigh case, interviews were supplemented by material from two focus groups with concerned public in the village and a total of 763 questionnaire responses (573 in 2004 [40% of adults in the village] and 290 in 2009). Two questionnaires were issued to every household in the village, allowing for a response by up to two adults per household; the survey was not of a poll type, but undertaken to investigate the

controversy. In the Eccleshall case, interviews were supplemented by analysis of a substantial number of letters of objection submitted by the public to the local planning authority.

3. National context

3.1 UK planning law on public participation

Formal routes by which the public can influence a development proposal in the UK are very limited. The public may submit comments in writing to the planning committees of county, district, town or metropolitan borough councils, depending on where they live and which is the relevant body. If a proposed development is likely to have ‘significant’ environmental impacts, it will require an EIA and this, together with the planning application, must also be made available to the public in a comprehensible form. The public may, subject to specific considerations, make short oral presentations at council committee meetings. If the case goes to appeal – and only the developer may appeal against a planning committee decision, not the public – then the public may make written and oral representations to the Planning Inspector.

The scope or content of the public’s comments that are considered relevant is also highly constrained. Of principal concern in the planning system is the degree to which the proposal is consistent with the Development Plan, which sets out higher level policies for the locality. Effects on neighbouring properties, on traffic and safety are also considered material. Ethical, policy and other issues that are not referred to in the Development Plan are not considered material, and in general there is a presumption in favour of development in the UK. Under the Planning Act 2008, a new Infrastructure Planning Commission (IPC) will have responsibility for the consenting of energy developments with a capacity of over 50MW onshore and 100MW offshore. At present it is not clear what this will mean for public participation, but the issue of a reduction in local influence is politically contentious and the IPC may even not be established if there is a change of government in the UK (Greeman 2009).

3.2 National and regional energy policy context

The 2003 UK government’s Energy White Paper set a target of 10% electricity from renewable sources by 2010 (DTI 2003). The renewable energy directive provides a further imperative. In relation to the Winkleigh case, Regional Planning Guidance (RPG) for the South West region of England (where the proposed development would be sited) set a target of a minimum of 11-15% of its electric power capacity (as distinct from production or consumption) from renewable energy by 2010 (GOSW 2001). In practice, the region looks likely to achieve only 31% of its target, which is the lowest percentage in England

(BWEA 2009). In contrast, the West Midlands region in which Eccleshall is located is projected to reach 44.9% of its target by 2010 (ibid). The average achievement for England is expected to be 50.5% of the 2010 all-England target (ibid).

3.3 Attitudinal context: studies of UK public attitudes to bio energy

This section draws on a review of UK public attitudes to energy options (Upham, Whitmarsh et al. 2009). (Poortinga, Pidgeon et al. 2006) found that just over half of the British population have mainly or very favourable opinions or impressions of bio-energy. Other nationally representative surveys (e.g. (TNS 2003)) produced similar findings: while opinions of biomass are less favourable than those of solar/PV and wind power, perhaps due to unfamiliarity (see below), on balance they are still positive. Nonetheless, (Eurobarometer 2007) research shows that support for biomass in the UK is among the lowest in Europe. It is then perhaps not surprising that relatively few people in the UK believe that biomass will contribute to reliable and secure supplies of electricity in Britain in the future (Poortinga, Pidgeon et al. 2006). Focus group work suggests that in principle support for bio-energy may also be qualified. Barker and Riddington (2003a) reported that many participants question the ‘environmental friendliness’ of bio-energy. Some find it difficult to understand how biomass is a renewable fuel, as it is perceived as having features of traditional fossil fuels. As such, participants were concerned about emissions and odours from bio-energy power plants; and there was some discussion as to whether the smoke would be filtered to reduce emissions. Participants also found it difficult to distinguish between biomass and waste incineration for energy production. When shown an image of a bio-energy plant, concerns were expressed about the aesthetic impacts on local landscapes. Nonetheless, a recent repeat survey on renewable energy opinion has shown a notable rise in awareness of biomass and bio-energy in recent years (BERR 2008).

4. Project features: the Winkleigh biomass gasifier case

4.1 Characteristics of the locality

The gasifier was proposed for the outskirts of Winkleigh, an historic village of about 1,000 people, some 35kms W.N.W. of Exeter in Devon, in S.W. England. The Local Plan (revised deposit, 2001) designates Winkleigh as a ‘Local Centre’ and identifies the nearby ex-Royal Air Force airfield as suitable for renewable energy (Torrige District Council 2001). The airfield site is on a plateau, is some 119ha in area and is locally served by small, narrow roads. The Local Plan describes the site as currently supporting a wide range of economic uses, but also as containing a significant area of degraded and derelict land, a land

type that the District Council seeks to restore and reclaim (ibid: sec. 10.7). Figure 1 shows the proposed location for the gasifier on the old airfield.

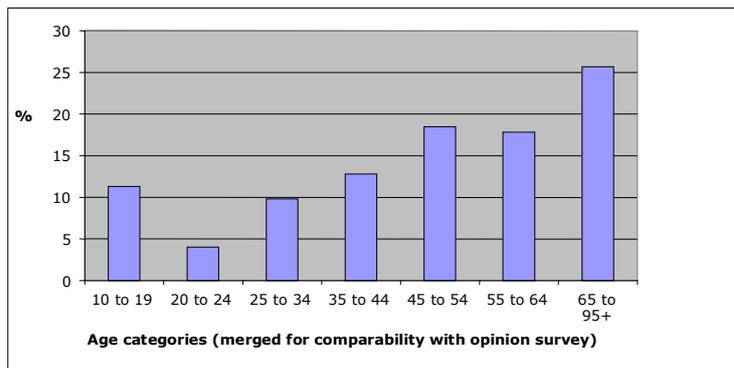
Figure 1 The proposed location for the gasifier



On the basis of the 1991 census, the wealth score of Winkleigh village is near the median for Torridge District. However in the 2001 census, 50% of Winkleigh parishioners were 50 years old or older; in the same terms, Winkleigh ranked seventh oldest of the 64 parishes in Torridge District. For Torridge District as a whole, 42% of people were 50 years or

older; for SW England, 37% and for England and Wales 33%.

Figure 2 Age distribution in the Winkleigh 2001 census



In addition, people 65 years and older constituted 33% of the 2004 questionnaire respondents and 43% of the 2007 questionnaire respondents. For comparison, the 2001 census showed people of 65+ constituting 26% of the parish population. In short, the population of the locality is older than the regional and national average and the questionnaire respondents were even older. Yet the role of age in the opposition was not a simple one. Filtering the questionnaire responses by age did not reveal a consistent association between age and negative opinion of the gasifier; however, increasing age did correlate with assigning importance to WINBEG as an issue; with a variety of concerns about WINBEG; and with increasingly negative opinion towards other renewable energy alternatives to WINBEG (Upham 2009). The latter concurs with a series of national opinion surveys undertaken for the government department BERR, which show that those aged 65 and over are much more negative towards renewable energy and are more likely to actively oppose the use of renewable energy, wind power usage and government policy on generation targets (BERR 2008). Moreover, the village did have a retirement park and was a location to which older people had moved from urban areas specifically for its rural features. On balance, it would seem likely that an

attachment to the rural characteristics of the location, particularly strongly valued by older people, some of whom had specifically moved to the location for its rural qualities, did play a significant role in the case.

4.2 Technical and financial aspects

In April 2003, local people learned of the WINGEG proposal, when Peninsula Power Ltd (PPL) of Chulmleigh, North Devon, was publicly awarded a capital grant of £11.5 million by the Department of Trade and Industry (DTI), towards the £37 million cost of WINBEG. South West Regional Development Agency (SWRDA) investment and appraisal documents from 2003, obtained by a member of the public under the Freedom of Information Act, state that PPL was established specifically to progress WINBEG and that there was a commitment by an unnamed equity partner of £7.5m. WINBEG would be an integrated combined cycle gasifier with a nominal electrical export capacity of 21.5 MWe, with the potential for enhancement to 23 MWe. A second phase of similar scale, WINBEG 2, was originally suggested by the developer (European-Energy-Focus 2003) and is referred to in the October 2004 planning application for WINBEG, submitted to the planning authority, Torridge District Council (planning application reference 1/2149/2004/FUL). For phase one and two, the patented gasification system would be supplied as a Licensed Engineering Package through AMEC plc, as developed and demonstrated by Future Energy Resources Corporation (FERCO) of the USA, supplying peak-demand fuel gas to the wood-combustion McNeil Power Plant in the State of Vermont, prior to the withdrawal of grant funding and the eventual bankruptcy (seeking of Chapter 11 protection) of FERCO in 2002 (ENVIROS Consulting Ltd 2004). The final planning application for the gasifier envisaged a fuel mix that changes over time, stabilising at year six. Expressed as dry percentages of the energy input, the year six fuel mix was envisaged as: 55% miscanthus grass, 25.8% cellulosic fibres (from municipal solid waste)/compost, 8.7% forestry biomass, 5.3% clean wood waste and 5.2% sawmill co-product (Table 5.1, (Scott Wilson Kirkpatrick & Co Ltd 2004). Truck movements associated with this fuel mix were expected in the Environmental Statement to be a peak of 56 movements (in year 2) declining to 50 movements per day in year six, assuming trucks of 60m³ capacity (Scott Wilson Kirkpatrick & Co Ltd, 2004, section 7.4). Some 50 vehicles (100 round trips) were expected daily during the construction phase (ibid). Fifty movements equally distributed over the presumed twelve hour day (0700-1900) are about one every fifteen minutes. Local people contest these quoted figures regarding the expected fuel mix and number of trucks, anticipating that they would be higher.

4.3 Project chronology

A selective chronology of events is available for the Winkleigh case and is given in Box 1.

Box 1 A chronology of events in the WINBEG gasifier case (public relations focus)

January 2001	Torrige District Council Local Plan, Revised Draft, identifies the airfield as suitable for 'renewable energy', among other uses, and supports the principle of 'a wood burning power station' on the site.
June 2001	EPR Ltd presents a proposal for a straw-fired power station to Winkleigh Parish Council.
June 2001	Terence O'Rourke plc is commissioned by SWRDA to advise on the biomass power plant proposal of IDP Ltd.
July 2001	Winkleigh Parish Council agrees to write to EPR expressing support in principle, subject to further details. EPR withdraw in May 2002 and the village and Parish Council are still, at this stage, unaware of any other interest in bioenergy on the airfield.
July 2001	Terence O'Rourke Plc produce their brief assessment of an initial conception of WINBEG as mooted by Mr. Barton (of Peninsular Power Ltd). The report expresses qualified support for the proposal, a need for caution and recommends further study.
April 2002	Peninsula Power Ltd submits to DTI a proposal for WINBEG, to be considered for funding under the Bioenergy Capital Grant Scheme.
April 2003	WINBEG is publicly announced as 'the largest bioenergy plant of its type in Europe'
May 2003	Mr. Barton tells Winkleigh Parish Council that WINBEG will broadly replicate the successful plant in Vermont, which is "working robustly".
July 2003	Mr. Barton refuses to answer specific questions at the meeting with Winkleigh Parish Council but tells WPC about the technological process, that the planning application will be submitted in August 2003 and that construction would start in Spring 2004.
August 2003	Local people discover that the Vermont FERCO SilvaGas plant was for demonstration purposes only, had closed in mid 2002 and that FERCO had gone into Chapter 11 protection in November 2002.
December 2003	SWRDA's involvement is publicly announced to pre-empt a Western Morning News (WMN) 'exclusive'. On December 8th, WMN carries three pages about SWRDA's involvement. Local people had written to and telephoned SWRDA since July 2003 without any response.
January 2004	Local protest group DUST is launched: 'Devon Under Serious Threat'.
January 2004	SWRDA produce a four page briefing justifying their involvement with WINBEG. SWRDA claims not to be supporting Peninsula Power.

Box 1 continued...

March 2004	Local people begin to query Torridge District Council on the scope of the EIA.
April 2004	DUST launches road shows around villages potentially affected by WINBEG traffic.
Sept 2004	UMIST (Upham and Shackley) questionnaire survey results published and demonstrate a very high degree of local opposition to WINBEG.
October 2004	(16 th) Planning application for WINBEG submitted to Torridge District Council by Peninsula Power Ltd.
December 2004	(10 th and 21 st) English Nature and English Heritage recommend rejection of WINBEG for deficiencies in the EIA.
January 2005	(26 th): Devon County Council recommends rejection of WINBEG due to deficiencies in the EIA and the adverse effect of the large fuel catchment area on smaller bio energy proposals.
January 2005	SWRDA investment and appraisal documents and minutes obtained by protestors under the Freedom of Information Act, reveal more about SWRDA's reasoning and management of the project. The documents express awareness that "public relations" "will be a key issue" and that a "communications plan" will need to be considered to avoid the RDA being construed as supporting the project. PPL is shown to have been established specifically for the WINBEG project, supported by several advisory companies and an unnamed equity partner prepared to commit £7,578,000.
May 2005	E-mails between the National Audit Office and DTI Energy Group, obtained by protestors under the Freedom of Information Act, show that the DTI would be willing to consider reducing the percentage of energy crops required by the criteria of the Bio energy Capital Grant Scheme under which WINBEG is funded (DTI, 2002), from 50% of 'input fuel energy' by year six, to 20%. The potential fuel change reinforces objectors' concerns about WINBEG as a waste management plant.
November 2005	Devon County Council's earlier recommendation for rejection was recommended for withdrawal by council officers in late November 2005, subject to the developer agreeing to source miscanthus within a 25 mile radius, and subject to the developer applying biodiversity constraints mapping and archaeological advice. One week later, councillors unanimously voted to reject this advice (Western Morning News, 2005). The regional newspaper (ibid) cites councillors as doubting that sufficient miscanthus could be grown within a 25 mile radius of the proposed power plant.
April 7 th 2006	Torridge District Council, the planning authority, rejects the planning application for WINBEG. Reasons include: the scale of the proposed development would require biomass supply from throughout the South West, resulting in "excessive transport distances from source farms and the potential undermining of other small scale local biomass schemes, which would be in conflict with the sustainable development objectives of the Devon Structure Plan" (Torridge District Council, 2006a). Further reasons: WINBEG would not serve the energy needs of local business or make a positive contribution to the energy needs of the local community, without having an adverse impact on area character; visual intrusion and nuisance; the proposal does not conserve, enhance or restore the natural and historic character, natural beauty, and amenity of the Torridge Landscape; it does not secure the comprehensive restoration and reclamation of the site; it does not provide a conditions survey of the former airfield (Torridge District Council, 2006b).
September 2006	DTI withdraws its grant offer of £11.5 million.

October 2006	The regional development agency (SWRDA) informs Peninsula Power Ltd that it can no longer commit to making the airfield site available to the project. Reasons given by SWRDA: all major studies of UK bio energy have argued for much smaller scale combined heat and power projects and that: “the government’s new approach is to support smaller biomass projects” (SWRDA, 2006).
End of 2007	Although the developer persisted and lodged an appeal, with a planning inquiry scheduled for January 2008, they withdrew this towards the end and the project is no longer live. In the meantime, the protestors develop an alternative plan for renewable energy and other development on the airfield, but this has no major financial backing and may be to some extent a campaign tactic. Either way, it is not needed, as WINBEG is defeated.

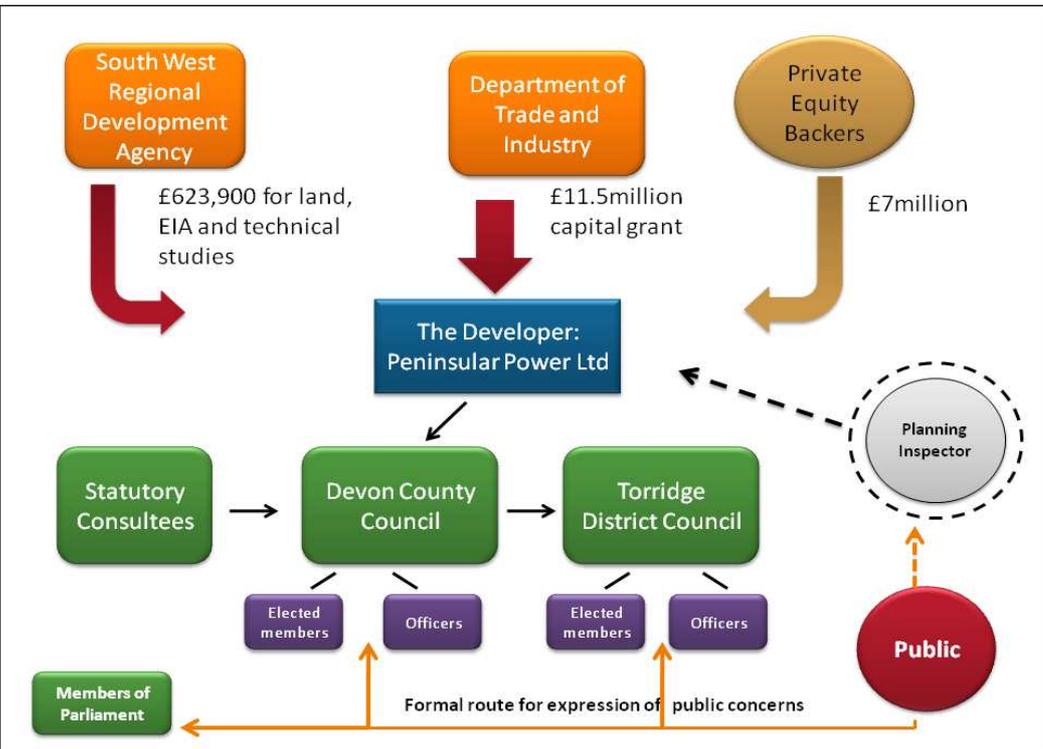
The concerns of local people were varied, but the highest levels of shared concern were the high level of truck movements; doubts about the developer’s credibility; and gaseous emissions from the plant, particularly associated with waste combustion, and including odour. In general, local people felt that they were being asked to accept an industrial scale development that would lead to a major deterioration in their quality of life and that would set a precedent for further such development. They did not trust the EIA as likely to be independent or to reflect their concerns (Upham and Shackley, 2007).

4.5 Stakeholder relationships and communication

4.5.1 Stakeholder relationships

Figure 3 describes the notable stakeholder relationships and financial flows in the Winkleigh Biomass gasifier case. Only the payment by the South West RDA was actually made. The developer was a very small company, highly dependent on its financial backers.

Figure 3 The relationships of stakeholders, public bodies and the public in the Winkleigh Biomass gasifier case



4.5.2 Communications aimed at the public

A full description of the developer's engagement with the public is given in a 'facts reference document' issued by PPL Ltd <news.bbc.co.uk/2/shared/bsp/hi/pdfs/29_03_06_biomass.pdf>. The developer's engagement included several public meetings, a website with documents and the issuing of a four page 'Questions and Answers' leaflet to householders within a 10 mile radius, explaining the project in considerable detail (also appended). Although changes were made to the development proposal as a result of public consultation, the core proposal was presented as a fait accompli and the leaflet argued that the development had to take place in the chosen location. The Regional Development Agency entered into public communication on a largely reactive basis, only when obliged to by increasing public pressure. The DTI avoided engagement in so far as possible and the identity of the equity backer(s) was unknown. Opposition groups had to use Freedom of Information law to obtain answers to a variety of questions.

4.5.3 Public response

As described above, the formal routes by which the public can represent their views are very limited. An opposition group therefore mobilised a small group of active local people, who (our survey suggested) very likely spoke for most of the Parish. The group gained the support of a local MP; targeted the local press with letters; used a community newsletter, their own website and email list to share information and maintain morale; and took up the issue with a variety of local and national statutory bodies. One of the public's main complaints about the planning process was that there was no redress or effective oversight of the regional development agency, which provided critical financial support to the development proposal (Upham and Shackley 2006).

There was a moderate level of local press coverage, letters in the local press, at least one local radio article and at least one national press article. However, media coverage was not critical in this case: of more importance were: (a) the concerns of local councillors, reflecting the high level of local opposition; (b) the concerns of district-level decision-makers that the development would have various negative consequences (described in Box 1); (c) a high level of determination and resourcefulness on the part of objectors, who included people with a variety of professional skills, experience and contacts, and who persisted over several years.

5 Project features: the Eccleshall biomass case

5.1 Characteristics of the locality

Section 5 draws on recent doctoral research (McLachlan 2009). The Eccleshall Biomass development is situated about 1.5km from the town of Eccleshall in Staffordshire. The site is classified as 'greenfield' and is next to Raleigh Hall Industrial Estate (RHIE), which is owned by the developer.

5.2 Technical and financial aspects

Eccleshall biomass is a relatively small bio energy development consisting of a 2.6MW steam turbine combustor fuelled by miscanthus, other energy crops and clean wood chip (<http://www.eccleshallbiomass.co.uk/?page=home>). The plant is said to require up to eight lorry movements per day (Eccleshall Biomass Limited 2009), some six times fewer than the Winkleigh proposal.

The development received a grant of £500,000 from the DTI's Bio energy Capital Grants scheme and Advantage West Midlands (the regional development agency). The company BiECC was established jointly by local farmers and the miscanthus developers BICAL to operate as the miscanthus supply manager for the Eccleshall Biomass Project (<http://www.hcladv.co.uk/staffsrenewables/casestudies/biecc.php>).

5.3 Project chronology

The development was first discussed with local residents in early summer 2003 before any formal submission was made to the local planning authority, Stafford Borough Council. The developer invited those residents that they considered to be 'local' to the development (around 20 dwellings) to a meeting at RHIE to discuss the proposed development. In this meeting, the developers stated that the plant would be a biomass combustion electricity facility, rated at 2.6 MW and that it was to be solely fuelled by Miscanthus, which would be grown within a 25 mile radius of the plant. The use of agricultural land adjacent to the RHIE was justified by the developers on the basis of the development's 'agricultural' nature. The application received planning permission in October 2003. In November 2005, changes were made to the proposed development. These changes were submitted via a new planning application, rather than a revised one, for the same site. The new proposal identified that there was a shortfall of Miscanthus and therefore 'clean woodchip' would be used as an interim fuel (Miscanthus is only harvestable at least three years after initial planting). In seeking a Power Purchase Agreement, the developers were required to store more fuel on site to ensure reliability, and planned to construct buildings to cover this fuel (McLachlan 2009).

Although the developer had held meetings with local people before the original planning application, the new proposal was submitted without any direct contact being made between the developer and the local residents. Therefore, local residents first heard about the new proposal when they received a letter from the local council informing them that a plan had been submitted. At this point some of the local residents began to object. They raised concerns with the council, organised a petition, distributed a standard objection form, organised a public meeting and wrote to the local paper in response to articles that it had carried about the development (McLachlan 2009).

The planning committee sent the proposal back to the developers, asking them to address a number of issues raised by local residents, including the height of the buildings and the possibility of ‘just-in-time’ delivery rather than onsite storage. The developer submitted revised proposals which included the relocation of some buildings within the site and the reduction in height of some of the buildings (although the overall area covered would increase) and outlined their plans to plant trees to ‘screen’ the buildings. In addition, they rejected the use of offsite storage, arguing that it would incur ‘double handling’ costs and be uneconomic (Stafford Borough Council 2006). The Planning Committee visited the site in January 2006 and a local resident who asked to attend this was given permission to do so. For this site visit, the developers erected a number of poles in order to indicate the height of the proposed buildings. As well as going to the site itself, the councillors also visited a number of surrounding properties that overlooked the development. Following this site visit the committee granted planning permission in February 2006 (McLachlan 2009).

5.4 Public concerns

Four key issues were contested in relation to the Eccleshall plant: whether the development was technically viable; the need for a change in the planning application; the impact on human health; the local benefits of the power generation. Of these, the primary concern related to the change in the planning application following the developer’s realisation that insufficient miscanthus could be sourced and hence that waste wood chip would have to be stockpiled. This led to concerns about emissions, environmental performance, the perception that it would just be a ‘normal power station’ and surprise at how little influence the affected public has formally on a development proposal (McLachlan 2009).

5.5 Stakeholder relationships and communication

5.5.1 Stakeholder relations

The key stakeholders were: BiEcc, the miscanthus energy crop supply company; BICAL, the miscanthus market development company; Talbotts, suppliers of biomass power and heat equipment; Raleigh Hall Properties Ltd, who provided the site and undertook construction. Additional funding was granted by the DTI Bio energy Capital Grants Scheme (£500,000), Advantage West Midlands (the regional development agency, £1m via SRB6 – a national regeneration fund) and Stafford Biomass, an intermediary company established to facilitate renewable development locally.

5.5.2 Communications aimed at the public

With respect to the first planning application, the developer invited ‘local residents’ (their definition) to a meeting on the Raleigh Hall Industrial Estate, where the plant would be sited. At this the developer explained the purpose of the project and took questions. Representatives from Eccleshall biomass (biomass farmers) and Talbotts (boiler manufacturers) also attended. However the developer considered that there was no need to consult on a second application, this being based on the same ‘principle’ as the original development, which had been generally well received by local residents. The developer believed that any issues or concerns had essentially already been dealt with satisfactorily through the initial meeting with residents: for him, the second application was merely an update of the first in response to changed circumstances, namely the conclusion that insufficient miscanthus could be delivered. With hindsight, there was a general acceptance from the developer, the planning officer, and supporters of the development, that it had been a mistake to assume that no consultation was necessary in relation to the change to the planning proposal, and that the initial process, whilst above and beyond what was stipulated in planning legislation, had raised expectations amongst local people.

5.5.3 Public response

The development process encountered public relations problems by not anticipating that a change in the fuel mix and building would be questioned. As in the Winkleigh case, residents engaged in the planning process as well as taking action outside of the official process. For example, they knocked on doors locally and handed out pro-formas which listed some concerns over the development and gave a space for additional comments. Over eighty of these pro-formas were sent to the planning department. Objectors organised a local petition and their own public meeting, which the developers attended, and wrote to the local newspapers (particularly in response to articles about the development). Also in the Winkleigh case, residents considered applying for a judicial review but this

was deemed to be prohibitively expensive. For some local residents, the topic of bio-energy was technical to the point of being impenetrable. They therefore welcomed those whom they saw as local experts to access the debate for them, and who were willing to speak at the most consultative exercise (on the second application), namely a public meeting organised by the residents themselves (McLachlan 2009).

6 Implications for CCS

6.1 The pattern of public response

The pattern of public response in these cases is typical for the UK. Objectors tend to draw on available resources and the internet increases these possibilities by providing information and means of communication. In the case of CCS, a higher level of amplification by the news media is also possible – i.e., more people may hear of the proposal, and this may increase the number of objectors involved. Objectors from outside of the locality may also become involved if the proposal is perceived as pro-fossil fuel. Despite this, in the UK the public will have little formal access to the decision-making process and will have to make use of other channels and means of influence. Drawing on (Upham, Whitmarsh et al. 2009), the sections below selectively consider theories of *why* such objection takes place, beyond the specific circumstances and characteristics of individual cases, and what this may mean for located (as opposed to ‘in principle’) public perceptions of CCS.

6.2 Insights from the literature

6.2.1 Place disruption

Characterising siting controversies – i.e. location-based objection – as NIMBYism (‘Not In My Back Yard’) has been widely critiqued in the academic literature, for its lack of empirical foundation, its derogatory implications and its general lack of explanatory power – e.g. (Wolsink 1994; Burningham 2000; Bell, Gray et al. 2005; Devine-Wright 2005; Kempton, Firestone et al. 2005; Wolsink 2006; van der Horst 2007). Many authors have called for a more sophisticated understanding of the different reasons for local opposition to specific renewable energy developments. For example, Bell et al (2005) suggest that the general public’s support for renewable energy developments may be conditional, and that this is revealed in actual developments but tends to be masked in opinion poll research.

A body of theory particularly relevant to siting controversies is that of place attachment and place identity. In this way of thinking, *place* describes not only the physical characteristics of a location, but also the meanings and emotions associated with that location by individuals or groups e.g. (Gieryn 2000); (Devine-Wright 2009; Devine-Wright 2009; Devine-Wright forthcoming). The term *place*

attachment has been applied to both the process of attaching oneself to a place and the outcome of this process (Giuliani 2002). *Place identity* refers to the ways in which physical and symbolic attributes of particular locations contribute to an individual's sense of self or identity (Proshansky, Fabian et al.). Change to a location is sometimes termed a 'disruption' to place attachment (e.g. (Brown and Perkins 1992) or a 'threat' to place identity - e.g. (Bonaiuto, Breakwell et al. 1996).

(Devine-Wright 2009) describes the three-stage models of place disruption developed by Brown and Perkins (1992) and (Inalhan and Finch 2004), distinguishing between pre-disruption, disruption and post-disruption phases, and also Stedman's study of 'place-protective' actions when there are strong place attachments (Stedman 2002); he then proposes an extended, five-phase model of place disruption (Devine-Wright, 2009). In terms of policy implications, the challenge is to design changes to places, and employ associated engagement procedures, that are likely to be interpreted by those affected as enhancing rather than disrupting places, while also being mindful of the symbolic, emotional and evaluative aspects of place attachments and place identities (Devine-Wright, 2009). It needs to be acknowledged that this may not always be possible, in which case policymakers face the choice of ignoring local opinion and accepting the consequences; or locating the development elsewhere; or withdrawing the development proposal completely.

6.2.2 Risk perception

Drawing on (Upham, Whitmarsh et al. 2009), according to the psychometric tradition in risk studies, risk perception is influenced by whether risks are viewed as involuntary, catastrophic, dreaded, fatal, delayed, known, controllable or old (Slovic 2000; Etkin and Ho 2007). The primacy of direct experience in learning and perception is well-established in the psychological literature (e.g., (Chawla 1999)): direct experience is more likely than communication to result in stronger, more confident, clearly focussed and persistent attitudes, and in attitude-behaviour consistency (Fazio and Zanna 1981). Similarly, the literature on risk perception highlights the role of direct experience and sensory evidence in people's evaluation of environmental threats (e.g., (Slovic, Fischhoff et al. 1979; Weber 2006)).

According to the 'availability heuristic', the perceived likelihood of a risk increases if it has been experienced or can be readily imagined (e.g., (Slovic 1986)), so local risks are likely to seem more important than global risks ((Slovic, Fischhoff et al. 1978; Hinchliffe 1996; Burgess, Harrison et al. 1998). Also, an important influence on how risks are perceived and whether they are considered 'acceptable' is the balance between the *costs and benefits* associated with the risk issue ((Eiser, Spears et al. 1988; Slovic 2000). In terms of communicating such risks, in general, expertise, independence and familiarity are qualities that tend to be associated with credibility (e.g., (Worcester 2001)).

Indeed, perceptions of the communicator are often as important (or more so) than the message itself (e.g. (Rayner and Rickert 1988)) (Whitmarsh, in (Upham, Whitmarsh et al. 2009)).

6.3 Implications for CCS communication and Consultation

As means of mitigating opposition to energy projects, commentators have discussed a variety of options. In terms of consultation, Bell et al (2005) and (Upham, Shackley et al. 2007), for example, discuss the relative power that local and national interests should have in project implementation, with the latter discussing the possibility of *agreeing upper limits* of new energy infrastructure in a locality with residents, as a response to public concern about new developments setting a precedent for an unknown level of further new infrastructure. *Community ownership* has also been discussed as a means of improving levels of local support for renewable energy and offering local empowerment, learning opportunities and building civic capacity e.g. (ODPM 2004; Devine-Wright 2005; Walker 2007; Walker, Hunter et al. 2007; Rogers, Simmons et al. 2008) in (McLachlan 2009). However, it is important not to build false hope of a community style development if, in practice, local stakeholders and the public will have little influence on, and receive little direct benefit from, the proposed development (McLachlan Forthcoming). A report for DTI (Centre for Sustainable Energy 2005) offers more insight into *community benefits*, finding that whereas community benefits in the UK tend to consist of voluntary contributions to a community fund by the developer, in Spain, Germany and Denmark, benefits are routine in the form of local taxes, jobs, manufacturing and/or ownership. Community negotiation and provision of community benefits can both in principle be adopted in the case of CCS, but, as suggested below, may well be insufficient to resolve opposition.

In terms of communication and consultation, the above literatures imply that this should be early, full and frank – typically going well beyond that required legally - but they also imply that this may not be sufficient to prevent or mitigate substantial opposition. If a community perceives that CCS-related development poses a threat, be this to health or to quality of life, and that there is little benefit to the community in return, then this may quickly become difficult to remedy. As the characteristics of CO₂ storage sites are to some extent site-specific, so that uncertainties about the security of storage cannot be eliminated, and as there are few examples of CCS that can be used to reassure people, the risk literature also suggests that it may be difficult to allay public concern. In this respect, CCS transport and onshore storage can be expected to be more challenging than renewable energy siting: onshore storage is likely to trigger both place-related concerns and risk concerns. In the bio-energy cases considered above, risk-related concern was limited: risk played a role in relation to gaseous emissions (in relation to the combustion of waste wood) and (in the Winkleigh case) traffic accidents, but the primary public concern was the threat of major disruption to place qualities that were highly valued by local people.

Moreover, it is important to note that enhanced communication and consultation would be unlikely to have mitigated concerns in the Winkleigh case. What this might have achieved, if communication had been two-way and responsive, would be an understanding that the development was unwanted by the majority of residents and that relocation should be seriously considered. Instead, the developer persisted and the project eventually failed. In the Eccleshall case, the developer undertook early discussion and only encountered opposition upon failing to realise that affected residents would want to be consulted on a modified version of the proposal. The project arguably succeeded because its adverse impacts were modest, its local economic benefits to farmers were considerable and the developer rectified the mistake of not taking local opinion on the changed proposal into account.

6.4 Conclusions

As a general rule, new industrial-style infrastructure can be problematic in terms of public relations where a community places a high value on the rural qualities of a place, or where it anticipates little benefit from the intrusion. This has certainly been the case with bio-energy: relatively large development proposals with a sizeable, potentially exposed population have been the subject of considerable opposition in the UK (Upreti 2004; Upreti and van der Horst 2004); (Upham and Shackley 2006; Upham and Shackley 2007), whereas smaller, community-level installations are more likely to be viewed positively (Upham and Shackley 2005). This is despite smaller bio-energy combustion plants potentially posing air quality-related health risks in large numbers (Thornley, Upham et al. 2009), unless adequately regulated.

One of the key public perceptions challenges for onshore CCS is the need to give affected populations sufficient and convincing reason to tolerate additional impact and risk, however slight these may be considered by experts. Experience with renewable energy developments suggests that this can sometimes prove difficult or impossible to achieve in practice. This may be doubly so in the case of onshore CCS storage – though at this stage this remains a working hypothesis. Onshore CCS may not only threaten people's sense of place by introducing new infrastructure, but may also pose a degree of uncertainty and risk that even a very careful communication strategy may be unable to satisfactorily resolve to local residents' satisfaction. Given this, where possible, it may be better in public relations terms to simply avoid onshore storage in populated locations, and to target offshore sites instead. It is difficult to see how CCS communications relating to storage can appeal positively to the public's sense of place and place-identity. The provision of economic benefits may help but may also be seen as a bribe. Perceptions are more likely to be positive in relation to the manufacturing of CCS infrastructure, which can draw on the idea and reality of industrial manufacturing traditions and provision of employment. It can be further hypothesised that CCS storage itself, however, is likely to

be conceived of in terms of waste disposal and industrial siting. These may be reluctantly tolerated by populations who have little choice, but they are unlikely to be welcomed.

To sum up, study of CCS perceptions remains at an early stage due to the limited number of cases available for study. Based on the risk and place attachment literatures, and on other renewable energy experience, it can be hypothesised that onshore CCS is likely to be problematic in public perceptions terms wherever there is a potentially exposed population. It can be further hypothesised that this is unlikely to be satisfactorily resolved through communication and consultation techniques. While these are unpalatable conclusions that require empirical investigation, it is better that policymakers be aware of this than proceed with onshore CCS over-optimistically.

NearCO₂ WP1.2

Public participation practices and onshore CCS: Lessons from the Milford Haven – Gloucestershire Gas Pipeline

Dr. Hauke Riesch and Dr. David Reiner, Judge Business School, University of Cambridge, November 2009.

1. Introduction

The UK has been heavily reliant on its own national gas reserves since the 70's oil crisis forced a rethink of its national energy policy. Britain's gas reserves however are now slowly receding, and given the existing reliance on a gas-supplying infrastructure as a relatively clean energy source, the UK now needs to increase its gas imports. Therefore a couple of infrastructure projects have sprung up around the importation of gas over the last five years or so. Among these are the Liquefied Natural Gas (LNG) terminals that have been established on Britain's coastline to receive gas from overseas, and the construction of the associated pipelines to transport it the existing gas network.

In the case of Milford Haven in south west Wales, the location of one of the busiest ports in the country, the plans were to build two LNG terminals and a pipeline that connects them to the national gas networks. As existing pipelines in south Wales were too small and reached only as far as Swansea, a pipeline was planned that was to cross all of south Wales and connect with the national grid at Tirley, Gloucestershire.

The operator responsible for building the pipeline was National Grid, known at the time as National Grid Transco. The company is a privately owned operator arising out of the privatisation of the UK electricity industry in 1990. National Grid assumed responsibility for the electricity control and transmissions system, and in 2000 merged with Transco and now owns and operates the UK's electricity transmission system and the gas transmission network. Under their licence they are responsible for building and maintaining the pipelines that transport the gas from the LNG terminals to the rest of the grid.

2. Project Details and Implementation Timeline

Several gas and oil suppliers planned to build two major LNG terminals in Milford Haven, Dragon and South Hook (currently the largest LNG station in the world). They connect to the pipeline which runs from Milford Haven to a decompression station in Aberdulais, from where the pipeline will feed the South Wales gas network and supply that region with gas. A further pipeline will run from a compression station at Felindre which connects to the other pipeline to Tirley across the border in England. This section of the project was the most contentious as it is far longer and had to cross the Brecon Beacons National Park at a point for a few miles (see figure1). The pipelines themselves are working at a higher pressure than is usual in the UK, and are buried about a meter underground for most of the route.

The implementation of the project has involved the following stages:

Feb. 2003: The planning permit was granted for LNG storage depot (now the Dragon site).

April 2003: Plans for a second storage site were announced by Exxon (now the South Hook site). The planning permit was granted in March 2004.

August 2004: Centrica announced 15-year deal with Petronas for LNG supply to Dragon.

October 2004: The newly formed local protest group “Safe Haven” unsuccessfully petitioned councillors. Dragon is granted a hazardous substances licence.

Feb. 2005: National Grid starts meeting with farmers and landowners to discuss compensation for the disruption caused by building the pipelines.

July 2005: Safe Haven is refused permission to seek a judicial review of the planning consent for the terminals by the High Court.

September 2005: Contractors start working on the terminals. Some problems reported with housing shortage in Milford Haven.

October 2005: Route for the second pipeline was announced by National Grid, showing that it will pass through the Brecon Beacons National park.

May 2006: Safety concerns cause workers to stop operations in South Hook.

June 2006: Cilfrew residents protest at the Welsh Assembly, eventually forcing the need for a new planning application for an alternative site for the depressurisation facility.

August 2006: A Bronze Age canoe found during excavations for the pipeline

November 2006: Residents in Trebanos victorious in their attempt to stop Transco using explosives while building the pipeline section running near the village. Campaigners start occupying the pipeline near Trebanos and other sites for more than a week.

December 2006: Concerns over damage from vehicles during the construction of the pipeline in the Brecon Beacon national park.

Jan. 2007: Protest group “Rising Tide” tried to prevent the demolition of rocks at Trebanos.

June 2007: A protest camp was set up near Brecon. Some protesters are forcibly removed after chaining themselves to trees.

Nov. 2007: Campaigners at Trebanos were successful in having their section of the pipeline built without using explosives. A second section of the pipeline was opened by the then UK energy minister Malcolm Wicks

Key stakeholders:

National, regional and local governments; National Grid; local residents and campaigning groups (“Safe Haven”, “Cilfrew Residents Association”, “Cwmtawe Residents’ Association”); National global warming protest groups “Climate Camp for Action” and “Rising Tide”

3. Data Collection Methodology

An evaluation of the public consultation process for this particular project has been completed based on information retrieved from the following sources:

- 1) Interviews were held with: David Mercer, the project manager for the pipeline; Ivan Stone a communications manager from 3G; and with a consultancy firm hired by National Grid for the project specialised in consultations and community relations for major infrastructure projects.
- 2) Information obtained as a result of a brief email exchange with the Neath Port Talbot head of planning, Geoff White.
- 3) Presentations given by members of the Rossport pipeline protesters at the Climate Camp London, as well as brief interviews with the presenters and literature handed out at the event
- 4) A thorough Internet search using keywords from the project in local and national newspapers, as well the website of the BBC. Getting precise keywords proved difficult at times as “pipeline” is also a frequently used metaphor for unrealised plans. Searches were completed for the terms “Wales”, “pipeline” and “LNG” for the national newspapers and only “pipeline” and “LNG” for the local papers. For the BBC website, the term “Milford Haven” was used instead of “Wales” given that Wales appears as a menu item on all news stories. This search obviously cut out all relevant stories that did not feature the terms LNG or Milford Haven. Once the events in Trebanos and Cilfrew were determined, this allowed for more precise searches related to terms relevant to those events. This search technique revealed that was, no significant difference in the stories uncovered.
- 5) Information was taken from local blogs and campaign websites, such as the Neath Ferret, “Pipeline twitter” and Linda Ware's personal webpage.
- 6) Reports and minutes from the Neath Port Talbot planning committee.

4. Site Characteristics and Local Political Background

The pipeline travels through several localities, almost all of them are situated in Wales. Wales is historically a nation with strong local traditions and history and its own language which is spoken by around 21% of the population. Welsh is also an official language which required National Grid to provide access to Welsh language speakers and literature in their consultations. Since 1998 Wales has had its own assembly as a devolved regional government. The Assembly has been given more widespread powers through the Government of Wales Act 2006, which came into effect after the elections in 2007. This period unfortunately coincides with the building of the pipeline, so attention has to be paid to the precise date to assess the possible involvement of the Welsh government in any particular episode.

The political landscape in Wales is slightly different to the national political landscape: traditionally Labour party support is very strong particularly in the south Wales mining communities. Next to a strong support for Labour, the Welsh National Party, Plaid Cymru, is also very strong. The current Welsh Assembly government is a Labour-Plaid Cymru coalition since the election of 2007. Between 2003 and 2007, the Welsh Assembly was led by a large Labour majority, with Plaid Cymru being the second largest party.

Demographically, South Wales is one of the more socially deprived areas in the UK, having been the location of extensive coal mining which (similar to other areas in the country) that has now been almost completely shut down. Consequently, communities that used to rely on coal mining are now facing huge levels of unemployment. The strong traditional (and recently legislative) independence of Wales from the rest of the UK seems to have influenced the perception of the pipeline to a large degree. With regard to England, traditional nationalist sentiments can become somewhat heated as England is regarded in some quarters as a colonising power that has been subjugating the Welsh for centuries.

While the first pipeline that branches off near Swansea to a decompression station serves southern Welsh gas needs, the larger pipeline from Swansea to Gloucestershire was exclusively planned to provide English gas needs. This led some newspaper correspondents to speculate (see below) that the pipeline represents an English colonial venture to supply itself with gas while merely risking lives and environments within Wales.

Although the pipeline runs through several local communities all over south Wales and small parts of Gloucestershire, protests were particularly concentrated in the villages of Trebanos and neighbouring Portardawe, and Cilfrew in the county borough of Neath Port Talbot and the market town of Brecon.

5. National Legal Context

The planning regime for major infrastructure projects has recently been updated with the introduction of the new Planning Act 2008.²³ The previous regime which applied to the pipeline in this case study was governed by several pieces of legislation summarised by the DTI (DECC 2001a), the then UK Government Department of Trade and Industry (which was replaced by the Department for Business, Enterprise and Regulatory Reform (BERR) in 2007 which in turn was replaced by the Department for Business Innovation and Skills (BIS) in 2009, with some of the DTI's relevant responsibilities given to the new Department for Energy and Climate Change (DECC) in 2008). Planning applications for gas pipelines of this nature had to be made directly to the Secretary of State for Trade and Industry under the pipelines Act 1962, with the DTI's guidance notes specifying that it was in the applicant's best interest to consult widely beforehand. The applicant also had to contact all landowners along the planned route before submission of the application. The DTI would then “write to the applicant with suggested forms of notices to be published and to be served together with lists both of those gazettes and newspapers where notices are to be published and of those persons or organisations on whom notices are to be served” (DECC 2001b, section B9) and detail other requirements the applicant would have to meet, such as making sure there are no serious objections from the local authorities along the route, before the planning permission is granted. Thus, “although the Secretary of State is in effect the planning authority for cross-country pipe-lines, an objection by a local authority [...] necessitates a public inquiry” (section B3) This planning permit did not cover above ground installations such as decompression facilities, which would have to obtain a regular planning permit from the local authority.

Under the new Planning Act 2008, major pipelines and LNG terminals are considered to be Nationally Significant Infrastructure Projects (abbreviated to NSIP, the precise meaning is defined in the Act), and are it required to be built in accordance to the act, which sets out many of the requirements for consultation. Despite the requirements outlined in the legislation, National Grid feels that they have been carrying out adequate consultation regardless (*David Mercer, interview*. See also the local government guidelines for the Act including guides for the public, Communities and Local Government 2009). The new planning act introduced the creation of the Infrastructure Planning Commission (IPC) which is designed to act as an independent body to make decisions on NSIPs. The IPC also helps developers in the consultations they have to make with Statutory Consultees as specified in the Act, which includes local authorities, public bodies and agencies (IPC 2009).

23 http://www.opsi.gov.uk/acts/acts2008/ukpga_20080029_en_1

6. Position of the Project Developer: National Grid Consultation Process

In an interview with National Grid's project manager for the pipeline, David Mercer, Mercer claimed that National Grid had applied most of the extra requirements introduced by the new planning regime as a matter of good practice. National Grid is obliged through their operating licence to provide connections for shippers bidding for access to the system. The Milford Haven LNG terminal projects did not fall under their jurisdiction, they simply were obliged to connect them to the rest of the UK gas grid. Milford Haven, although it is a natural choice because of the existing facilities in one of the largest harbours in the country, lies at the western extremity of Wales, and therefore far away from any possible entry routes to the grid. National Grid was obliged to connect the terminals with the rest of the UK infrastructure within three years, which for a project of that size proved to be quite a challenge.

To obtain planning permission, National Grid needed consent from the DTI. As part of that application process they needed to have determined the best route. A route was chosen to balance construction difficulties with the environmental impact. Having determined an optimum route, they carried out a detailed environmental survey over a period of 12 months to mitigate any potential environmental impact. Where possible, agreement was sought with other key stakeholders such as the Environment Agency and the Countryside Council for Wales. In addition, all local authorities were consulted, as well as the relevant Members of Parliament and Welsh Assembly members. Mercer stressed that the process was one of active engagement with the consultees:

the key thing there is to at a very early stage try and provide information on what we're doing and a structured way of engaging with them, so that you can come up with a best route based on their input, and then assess the environmental impact with their help, and then look at how that's best mitigated, *with their help.* (David Mercer, interview, original emphasis)

The local geography of south Wales provided National Grid with a particular set of problems. The direct and thus most obvious route would have taken the pipeline directly through the Brecon Beacons national park, so that was ruled out. South of the national park however is a landscape dominated by fairly deep valleys running north-south, which makes running a pipeline east-west almost impossible. To the south of the valleys there is the added difficulty of getting too close to some of Wales' major conurbations, including the capital Cardiff itself. To the north of the national park there was more mountainous terrain, as well as an extensive military training ground. The eventual route of the pipeline was to stay generally north of the national park, though at several points there was no choice but to go inside – it was the preference of the park itself that if the route had to go through at some point, it should be in the northern area rather than in the more sensitive southern area. That the route

had to go through the national park proved to be a major issue with the opposition groups to the pipeline, even though National Grid had consulted extensively with environmental agencies and the park itself.

With the limitations of possible routes set out as part of an agreement with the statutory consultees, National Grid identified several possible routes which they then took back to the consultees. Although it is always impossible to come up with a plan that pleases everyone, they eventually announced their preferred, one mile wide route corridor. They then went public with that corridor, by displaying it in village halls, advertising it in the local media outlets and holding public information evenings:

I guess if we draw a relatively arbitrary line between the lets call it statutory consultation and sort of below the line public consultation – public consultation geared towards parish councils, local representatives, representative groups, interest groups and then members of the public, community, so and then the familiar round of local exhibitions and what have you, given the very rural nature of south Wales for the most part an awful lot of individual meetings with everybody from – well we haven't touched on the landowners yet, but, landowners through to sort of individuals, residents. (*Ivan Stone, interview*)

They also needed the consent of every landowner along the way, which turned out to be a total of 835. If agreement with a landowner could not be reached for some reason, then National Grid had the option of applying to the High Court in London for a “compulsory purchase order” (CPO) which is normally considered only a measure of last resort. A CPO would have the potential to seriously delay the project: it could take three to six months to schedule a hearing, and another three to six months for a decision, potentially delaying the project by a year. This challenge was encountered on only two occasions, and both times it was commercial developers who owned the land and were holding out for a better deal in the compensation rather than private owners concerned for their safety.

Both interviewees have stressed that a good relationship with the landowners is absolutely crucial for such a project, because the pipeline will be there for 30 to 40 years, and therefore the building of it is merely the beginning of a lengthy relationship. They believe it is important that National Grid has a good reputation among landowners, and the wider local community which they believe they managed to attain through being transparent as much as reasonably possible, and through being consistent in their approach. Regular planning consent had to be sought on the parts of the pipeline that were above ground, as well as installations such as depressurisation stations, a process that led to two particular flashpoints with the county borough council of Neath Port Talbot, as outlined below.

7. Discussion of the Pipeline and its Construction in the British Media

A search on LexisNexis of the UK national press²⁴ for the words “pipeline”, “Wales” and “LNG” was carried out, between the dates 1.07.2002 and 14.10.2009, yielding a total of 41 articles. However, the controversy over the pipeline was not covered extensively. Of the 41 articles, a large majority (especially in the first few years of the search) were articles on the general state of the energy market or of UK gas supply politics, which mentioned in passing that a facility was being planned or is under construction in Milford Haven (24).

These articles were mainly featured in the business pages (19). The second largest group of articles were more specifically focussed on National Grid or LNG terminals and pipelines, which were again almost exclusively in the business pages and did not mention any opposition (8). Other articles focussed on safety fears of LNG tankers (3), or were otherwise unrelated to the pipeline (4). On a national level only two articles reported on the opposition to the pipeline, one fairly early article in 2005 reported on a request by campaigners to the Prince of Wales (who owns land on the proposed route) to block the development of the pipeline (Milmo 2005). A much longer feature article appeared in the (left-leaning) national broadsheet the Guardian, reporting on the local and national protest groups campaigning against the pipeline, mainly centred on the town of Brecon and the village of Trebanos (Harris 2007, see also below).

A search (for “pipeline” and “LNG”) on the Welsh local news aggregator Wales Online²⁵ however, uncovered quite substantial interest in the local protests around the pipeline. Although there also appeared the odd article about the UK’s (or Wales’) energy need (e.g. Shipton 2008) here as well, most focussed on protests against the development. One particular point of interest from the beginning was the safety worries over the LNG terminals in Milford Haven, and the tankers which were planned to supply them. Related to that were a couple of stories that focussed on accidents and workers’ strikes happening on the construction site.

There were however also many news reports on the protests on the pipeline itself, and these were mostly negative in tone – even in the few articles that were not primarily about the protests about the pipeline, such as the one announcing its formal opening, it was invariably termed the “controversial”

24. The papers covered were the broadsheets the Guardian, the Independent, the Times and the daily Telegraph (with their respective Sunday sister papers), the mid marked tabloids the Daily Mail with its Sunday sister paper and the Sunday Express, and the mass market tabloids the Sun, the Mirror and the Daily Star, also with their Sunday sisters. Notable omissions from the LexisNexis database are the Daily Express and the Financial Times.

25. <http://www.walesonline.co.uk/>

pipeline (e.g. Clark 2008). Apart from news items covering the protests at Trebanos, Cilfrew and Brecon (see below), there were also reports on a scandal involving a confidential map of the route being found for sale online (Wales Online 2007, unattributed), and a retired civil engineer voicing concerns over the safety of the project (Shipton 2007).

The most interesting items however were the readers' letters on the subject, almost all of which featured references to the fact that it is a project benefiting mostly English people being forced on the Welsh, and that Wales has no impact on decision making in London, a nationalist sentiment which was efficiently used by politicians and sympathisers of the Welsh national party Plaid Cymru to argue for more autonomy for Wales:

What the Tories did was to push out a whole community in order to flood our valley for water for Liverpool. All but one of the Welsh MPs of the day were against it as were many prominent Welsh figures from all walks of life. The ignorance of the "British" establishment at the time for Welsh democracy was appalling. However, even looking at our "democracy", when locals oppose the LNG pipeline or new nuclear power stations and dirty power stations, there is nothing that we in Wales can do as London are our masters. The sooner we get more powers for the Assembly the better; then we can oppose undemocratic plans like the Scottish Parliament can. (*Iago Ap Steffan, 25.9.09, Western Mail*)

This sentiment was carried to an extreme by a Green Party member, who compared Wales to the Niger delta, where energy infrastructure for the benefit of another country is imposed without regard or compensation on the local populace:

Here in Wales we are suffering the imposition of an LNG pipeline system through South Wales. And, like the Niger inhabitants, the people of Wales are getting absolutely nothing but destruction, injustice and neglect. (*Dave Howells, 18.10.06, Western Mail*)

A similar division between the local and national news content on the pipeline was evident in a search of the BBC's news website (for "Milford Haven" and "pipeline"), with the national news part of the website emphasising the UK's need for a secure gas supply, and Welsh local news concentrating on the protests.

8. Summary of Opposition to the Pipeline

One major and influential opposition movement which drove a lot of the discussion on the pipeline but which is not as such directly related to it, concerns the building of the LNG terminals in Milford Haven. Local campaigners set up the protest group “Safe Haven” to campaign against the building of the LNG terminals. The objections of the group are primarily on safety grounds, arguing that the LNG terminals as well as the ships supplying the terminals are endangering the local population. In this the recent memory of the sinking of the oil tanker “Sea Empress” near Milford Haven in 1996 has found resonance, as well as the explosion in 2005 of the Buncefield oil depot in Hertfordshire.

Safe Haven has been active in bringing their fears into the local news – as the news search carried out showed, most of the articles found in the local newspapers for the keywords “pipeline” and “LNG” focussed on the terminals and the associated protest movement. Although the protest movement was ultimately unsuccessful in stopping the developments, they did manage to give it a very high profile which ultimately rubbed off on the pipeline. Both David Mercer and Ivan Stone felt in the interview that this negatively coloured the impression people had of the pipeline, to the extent that people and media outlets consistently misrepresented the nature of the pipeline:

This business about the LNG terminals; we learned throughout the process that there were sections of the community convinced that this was a liquid natural gas pipeline. An LNG is a different scale in terms of what it is compared to vaporised natural gas, and the community was convinced that this was bringing LNG with all the potential risk from it through their communities, and trying to get this message across was... every time I did an interview I said natural gas, “what about that LNG pipeline?” It's not an LNG pipeline! (*David Mercer, interview*)

One particular action by the protest group, which demonstrates the strained relationship between the protesters and the port authority, related to a request under the Freedom of Information Act (which is part of the UK's response to its obligations under the Aarhus convention) to look at the risk assessments carried out for the terminals. The port authority refused a decision that was later overturned by the Information Commissioner (Richard Buxton (for Safe Haven) v. Milford Haven Port Authority, Buxton 2007a).

On the pipeline itself there were three particular flashpoints during the construction of the pipeline, near the villages Trebanos, Cilfrew and the market town Brecon – which shares its name with the Brecon Beacons national park. Protesters at this site were mostly anti-pipeline protesters from outside

the area, aligned with national environmental protest groups. Principal among these was the group “Rising Tide”,²⁶ which is organized on a bottom-up level similar to the larger and more famous “Camp for Climate Action” with which it is closely affiliated.²⁷

The protest against the South Wales pipeline in Brecon, as well as some of the protests in Trebanos should be considered in the context of national environmental campaigning against the exploitation of fossil fuels. Rising Tide’s objections to the pipeline are mainly based on objections to the use of natural gas in that it pervades reliance on fossil fuels. Even though gas is certainly a much cleaner fossil fuel than the alternatives, they argue that it is still a “bogus” solution which is a distraction from the urgently needed development of renewable energy. They are however also concerned about the impact the pipeline potentially has on the local wildlife, especially in the national park, and they highlight worries with respect to National Grid’s safety record, as well as safety fears of the LNG terminals in Milford Haven. Finally, they argue that building the pipeline in Wales is symbolic of the exploitation of the Welsh nation, noting earlier disasters inflicted on that nation:

Welsh lives and countryside have often been collateral damage in the hunt for power and profit. In Aberfan in 1966, 144 people, mostly children, died in a disaster caused by the National Coal Board’s shocking disregard for safety. (Rising Tide 2009)

This point was picked up prominently in local media coverage, as well as one of the rare national news items on the pipeline protests, a feature article in the Guardian (Harris 2007), and was summarized, by Rising Tide as well as by the Guardian with the slogan: “They wouldn’t put a pipeline like this through Surrey!”²⁸

26. <http://risingtide.org.uk/>; Accessed 30.10.09

27. Climate Camp is an amalgamation of protest groups that sprang up in 2006. It is characterized by its emphasis on democratic, communal decision making, and its consciously non-hierarchical organization (Doyle 2009, Camp for Climate Action 2009). Climate Camp and Rising Tide have regional groups – there is for example a “mid Wales” group for Rising Tide – however they have a distinctly national and international outlook. There is for example a close relationship between the Climate Camp in the UK and protesters at an Irish gas pipeline construction site in Rosspport, County Mayo (Struggle Archive 2009), and representatives from the Rosspport protests have presented both at the Climate Camp meetings in London and Wales this summer. However, as both Climate Camp and Rising Tide have a strict non-hierarchical nature, the Rosspport protesters are better seen as part of these groups themselves. This multi-level structure to the grassroots climate protesters in the UK and Ireland, results in many protests though being organized at a regional or even local level, to find supporters and participants from around the country.

28. Surrey is a county to the south west of London, containing many very wealthy commuter towns. It is consistently rated as one of the most expensive counties to live in and has a very high proportion of upper middle class residents. It is often used metaphorically to denote a typical highly privileged area, and as such is also referred to as London’s “stockbroker belt.” A particular irony here is, as Ivan Stone (*interview*) remarked, there was in fact a similar development happening in Surrey at the time.

The protests in Brecon consisted of a camp situated in the path of the planned pipeline from January 2007 onwards. The Guardian report on the camp characterized the protesters as a mix of seasoned environmental and global warming protesters and a larger number of “students and gap-yearers”. A similar observation was made by David Mercer, the project manager for the pipeline: “those weren’t local people, I don’t think there were many Welsh accents to be perfectly honest” (*interview*).

At the latter stages these protests involved protesters erecting tree-houses and chaining themselves to trees; protesters had to be forcibly evicted before the pipeline could be built. With these tactics the protests followed similar lines as other direct action campaigns organized by environmental protesters (such as those advocated by Climate Camp for Action). Compared to the developments in Rossport, where the protests are still ongoing, they were less eventful and ultimately of course not successful as the pipeline was built without major delays. However, as one of the protesters interviewed by the Guardian stated, the aim was not so much to stop this particular development, but to raise awareness of the issue and to make developers think twice before starting similar projects in the future.

In a remarkably similar way to the pipeline developers, the protesters realized that a good relationship with the local population is very crucial to their project, something which very obviously crystallized among anti-pipeline protesters involved with the Rossport camp (*interview*). It is also evident that Rising Tide’s emphasis on the safety hazards and Welsh national interests quoted above, that both concerns are not closely linked to combating climate change, which is the groups’ main concern. At least the Rossport group has claimed to have a very good and supportive relationship with the local community (*interview*). This however was disputed by Ivan Stone (the communications manager working with National Grid on the pipeline), speaking from his experience with this and with many other cases he’s been involved in:

I think that is a claim that is always made, but from my prejudiced position I have rarely seen it achieved. People will travel to the action, but they’re rarely locally recruited. (Ivan Stone, *interview*)

Thus both sides in this conflict realized the importance of communication with the local population and by using the appropriate rhetoric, were able to position themselves more or less on the side of the local community. National Grid was at least required to provide community relations for people who were able to speak Welsh, since it is an official language. However it is not clear whether employing local people for community relations was a matter of policy for National Grid or just a lucky accident arising from the Welsh language requirement. Regardless, this may have earned them greater credibility with the local population.

Two other flashpoints were the villages of Trebanos and Cilfrew in the county borough of Neath Port Talbot near Swansea. While Trebanos would later witness protests similar to those at Brecon, the events here have arisen mainly out of more local concerns. These two locations differed from other sections of the pipeline. Cilfrew was the location of the depressurisation facility at the end of the Milford Haven to the Aberdulais part of the pipeline. As an above ground installation it was required to go through the regular planning permission process with the local authority. During that process a number of concerns were raised by residents of Cilfrew which were largely centred on local safety issues.

The secretary of the Cilfrew Residents' Association, Linda Ware, became a prominent face of the opposition to the pipeline on a much larger, regional and even national scale, through her extensive letter writing campaign to local newspapers. She also conducted a battle at the High Court to challenge the construction to the pipeline, which was thrown out on appeal in June 2008. Sadly, as the Neath Guardian reported, this left Ms Ware facing bankruptcy (Nicholls 2009a).

In August 2006 the head of planning of Neath Port Talbot council, Geoff White, reported to the Planning and Control Committee meeting that a petition with 123 signatures was handed in, requesting that councillors were to be made aware of a series of objections from local residents to the facility, and that "the whole project is looked at in depth by the Welsh Assembly Government and not made the responsibility of Local Councillors"(Neath Port Talbot council planning committee document 200806-EN-GW-UA, p.7).²⁹ The complaints were:

- That National Grid did not let anyone from the Residents' Association or the Neath planning department look at comparable existing depressurisation stations, and that as this station will operate at a higher pressure than anywhere else in Europe, thus representing untested technology.
- That the proposed plans for traffic management to the facility will place too heavy a burden on local roads in Cilfrew.
- That the noise from the station will drive out local wildlife.
- That the residents' association was not party to the ground investigations carried out by National Grid.
- That the pipeline goes counter to the Welsh government's own literature extolling the virtue of green energy.
- That previous representations made by the association were not taken into account

29. http://www.npt.gov.uk/default.aspx?page=3530&file_name=PLANDEV-290806-EN-GW-UA&doc_id=7585&file_type=1&searchall=true

- An additional email claimed that councillors were deliberately misled “and that the DTI has pressurised the Planning Section in ‘speeding through’ the application”.

It was decided that final resolution of the planning application for the facility would be deferred to the outcome of a site visit by members of the committee and local councillors (290806-MIN, p.132).³⁰ In September, the results of the consultation were reported by the committee. The planning application was advertised in the local press as well as through letters to residents (*email from Geoff White*). Two hundred and fifty six replies were received, including complaints similar to those of the petition. A separate petition with 489 signatures was received complaining of the proximity of the installation to the village. Furthermore a letter was received from the Welsh Assembly member for Neath (Gwenda Thomas, Labour), objecting also to the proximity to the village (190906-MIN).³¹ The application was approved along with hazardous substance consent for the storage of gas.

The residents’ association however did not give up and pursued the matter by seeking a judicial review of the decision alleging that some councillors were pressurized into not voting. The High Court quashed the decisions by the council on the 30.03.07, forcing it to consider the applications again, this time submitted by the developers in amended form (see also *Neath Port Talbot CBC v. Linda Ware*, summarised by Buxton 2007b).

By the time of a second site visit on 15.05.07, the council had received a further 159 letters of objections, as well as a petition with 353 signatures in support of the Cilfrew Residents Association, and asking for an extra mile between the station and the village (150507-REP-EN-GW-UA).³² The new applications were then approved by the committee (150507-MIN).³³

These developments show that local opposition to the installation was very organized. With the support of regional politicians they were eventually successful in having the planning permission reviewed which resulted in the facility being built further away from the village. Though this was the end of the matter as far as the council was concerned, some local citizens such as Linda Ware continued their protest against the pipeline in general. Ms Ware's legal campaign against the

30 http://www.npt.gov.uk/default.aspx?page=3530&file_name=PLANDEV-290806-MIN&doc_id=7690&file_type=1&searchall=true

31 http://www.npt.gov.uk/default.aspx?page=3530&file_name=PLANDEV-190906-REP-EN-GW&doc_id=76224&file_type=1&searchall=true

32 http://www.npt.gov.uk/default.aspx?page=3530&file_name=PLANDEV-150507-REP-EN-GW-UA&doc_id=8567&file_type=1&searchall=true

33 http://www.npt.gov.uk/default.aspx?page=3530&file_name=PLANDEV-150507-MIN&doc_id=8704&file_type=1&searchall=true

depressurisation facility continues to be in the news. However, having lost her appeal against the council's planning permission, she now faces the legal costs, and Neath Port Talbot council is still pursuing her for the money even though she is a pensioner and has no appreciable wealth. The council's barrister is quoted by the Private Eye (a high profile national current affairs/satire magazine) as saying that they pursue it as "a matter of principle" and to not be seen as a soft touch (*Private Eye* 2009). The Neath Guardian reports that

At a court hearing in August, Mrs Ware will challenge the costs award against her, arguing that the Aarhus convention – meant to ensure access to justice without penalty for genuine campaigners – applies. Her solicitor, Richard Buxton, will argue that the court should not have ordered costs against that make litigation "prohibitively expensive", or more than "nominal". (Nicholls 2009b)

These struggles against the local council, and the appeal – whether ultimately successful or not – to the Aarhus convention have engendered a lot of sympathy for the cause, as is evidenced by the uptake of the story in the Private Eye in their regular "Rotten Boroughs" page, which aims to take an admittedly light hearted look at the wrong-doings of local councils. A smaller scale local protest seems still to be in place, with websites like "pipeline twitter",³⁴ although it is difficult to see how big the support still is.

A second planning application at roughly the same time had to be made at the nearby village of Trebanos in the valley of Cwmtawe on a section of the pipeline which the developers found needed blasting because they encountered an area of hard rock. In accordance to the Gas Transporter Pipeline (EIA) Regulations 1999, this required that a blasting management plan had to be agreed with the local authority. The location in Trebanos was also a rather unique point along the pipeline because developers had no option other than to locate the pipeline closer to habitations than usual. The proximity of the pipeline was compensated by having a heavier pipeline wall in that section, and the plans were finalized in consultation with the Health and Safety Executive (*David Mercer, interview*). However, the consultation by the council's planning committee received a similar amount of objections from local residents, where their concerns were as follows:

- Potential structural damage to properties from the blasting
- Concerns over the local ground conditions: the ground was an ancient dormant landslip area that the developer's survey had taken into account, but which the local population still felt represented a potential hazard. Also the area lies on a fault line which puts the pipeline at a

34 <http://www.pipelinetwitter.co.uk/>

potential risk from earthquakes.

- “Potential environmental damage”
- “Possible gas explosions”
- “Lack of information and consultation about the pipeline”
- “The very existence of the pipeline so close to residents” (180806-REP-EN-GW p.119)³⁵

The council also later received a petition with 144 signatures which argues some of the above points: although the developer’s survey has found the landslip to be dormant, they argue that it is in fact active. Also the potentially affected buildings are older and therefore more prone to damage from vibrations, which the developers did not seem to take into account. They also cast doubt on the blasting engineers who have been overheard to say they have no experience with the Welsh Pennant Stone found near Trebanos, and residents felt that they are extremely vague in their risk assessment:

In fact they have not provided any evidence as to the safety of this blasting other than vague statements such as “it is unlikely” and “not considered a risk” to property and people. (290806-EN-GW-UA p.5)³⁶

Following a hitch in the counting of the votes, the councillors’ votes were tied, and the chairman did not exercise his second casting vote. This caused some delay (as well as dismay and suspicion among the residents as the original vote was wrongly announced as rejecting the application), and a further 20 letters and emails of objection were received, in addition to a letter from the local Welsh Assembly member Gwenda Thomas expressing concern over the dismissive attitude shown by the developers towards the residents (190906-REP-EN-GW-UA p.3).³⁷

Finally, a resident submitted a further geological survey “which indicates that the land is within an area that has a high risk of ground instability”. They also include comments by the Saudi Geological Survey expressing concerns “about constructing the pipeline [...] in areas of potential subsidence and query why the pipeline staff do not know about shockwaves, and that in the Gulf there could be large hidden caverns and it is necessary to carry out gravity surveys” (190906-REP-EN-GW-A).³⁸ The

35 http://www.neath-porttalbot.gov.uk/default.aspx?page=3530&file_name=PLANDEV-080806-REP-EN-GW&doc_id=7502&file_type=1&searchall=true

36 http://www.neath-porttalbot.gov.uk/default.aspx?page=3530&file_name=PLANDEV-290806-EN-GW-UA&doc_id=7585&file_type=1&searchall=true

37 http://www.neath-porttalbot.gov.uk/default.aspx?page=3530&file_name=PLANDEV-190906-REP-EN-GW-UA&doc_id=7693&file_type=1&searchall=true

38 http://www.neath-porttalbot.gov.uk/default.aspx?page=3530&file_name=PLANDEV-190906-REP-EN-GW-A&doc_id=762&file_type=1&searchall=true

committee eventually resolved that the matter be referred to the DTI for consideration, on the 19 September 2006 (190906-MIN p.174).³⁹

The Guardian reported that this whole episode, considered alongside the legal challenge to the Cilfrew decision, was regarded as very bizarre and with a lot of suspicion by the local residents, who thought that the council did not handle the planning applications well at all:

At six o'clock that evening, I got a phone call from one of the protesters," says Huw Evans, a local Plaid Cymru councillor. "They said: 'You won't believe this: the result's been changed.' I was utterly amazed." At around this point, the Trebanos campaigners say they began to believe that the council's increasingly bizarre machinations were traceable to two things: pressure from Whitehall, exerted through the local Labour party (which, as in just about all of South Wales, is politically dominant) and fear of challenges to their decisions from National Grid. (*Harris, Guardian, 27.04.07*)

Councillor Evans went on to become part of the Cwmtawe residents' action group, which was then influential in setting up a protest group with activists from Rising Tide which lasted for 12 days, and drew the attention of the local media, and attracting protesters from other pipeline protest sites such as Rossport in Ireland (*Turner, Western Mail, 20.11.06, "Steady flow of support for pipeline protesters"*). The campaigners then continued to lobby and eventually persuade the local Member of Parliament, Peter Hain, who also happened to be the Secretary of State for Wales. Finally, by November 2007, the DTI announced that the route for the pipeline be prepared using a much slower technique, opting to "err on the side of caution" (*Secretary of State for Trade and Industry Alastair Darling, quoted by Harris, Guardian 27.04.07*).

The local opposition to the pipeline and depressurisation plant seemed to be predominantly about safety concerns in terms of having the facilities close to homes and on potentially unstable ground. Similar to the way the global warming protesters appropriated the safety concerns of the local residents into their protests, so have the local campaigners incorporated global concerns, and even invited the protesters to their parts of the planned pipeline route. However that alliance seems to have died, once the safety fears were eventually assuaged by re-siting the facility and ordering a different construction process.

39 http://www.neath-porttalbot.gov.uk/default.aspx?page=3530&file_name=PLANDEV-190906-MIN&doc_id=7910&file_type=1&searchall=true

Another recurring theme in the irritation of the local community was that they were left in the dark with respect to the consultation and the whole construction of the pipeline and that they did not feel empowered by the democratic processes. This perception was obviously affected by the council's planning committee mismanagement of decisions related to blasting management and to the High Court ruling quashing their earlier planning approval for the depressurisation facility. This development was followed by a fairly extensive political involvement on behalf of the residents: local politicians notably from the Welsh national party Plaid Cymru who voted against the blasting proposal and joined a residents' association; regional politicians in the form of the local Welsh Assembly member Gwenda Thomas; and eventual national level support from the Secretary of State for Wales himself.

From National Grid's perspective, the allegations that local residents were inadequately consulted were false given their hands-on consultation efforts with the local community:

From my point of view [the situation in Trebanos] is a really good example of where you have to be careful with a vociferous minority. There were individuals who spent a lot of time talking about how they were told nothing. From my point of view they were the same individuals who members of my team were spending virtually every day with to keep them informed. (*Ivan Stone, interview*)

Eventually this conflict of perspectives is not easily resolved without looking in more detail at how the local community really reacted to the proposals. While it seems clear that most of the noise came from a small group of highly motivated people such as Linda Ware and councillor Huw Evans, the amount of signatures from several petitions, and the number of letters of objection received by the councils seems fairly high for such relatively small communities.

A final point is raised by the episode of the blast management at Trebanos regarding the value of local expertise and knowledge, standing in direct contrast to the expertise offered by the developers (and their more regionally based consultees). People who live in the affected area have offered local knowledge about the constitution of the terrain which was not considered as part of the developer's report. One example is the constitution of old property found in an area which they argued was prone to vibrations. They also disputed the stability of the landslide on which the village was built, as well as the dormancy of the fault line which ran through the area - realities which are backed up by news reports and other collective memory. Frustrated that these concerns were not taken into account, and having been privy to conversations among contractors stating that they weren't very familiar with the local geology, residents even organised their own survey, as well as utilising the professional expertise of the Saudi Geological Survey.

It is probably fair to say that it was these concerns more than any of the other issues raised that ultimately swayed the DTI to “err on the side of caution. This is of course not to argue that the residents’ expertise was ultimately more valuable than that of experts consulted by the developers. The situation is very reminiscent of the famous case study reported by Brian Wynne on the local expertise of Cumbrian sheep farmers in the wake of the Chernobyl disaster (Wynne 1992), which is a classic study that helped overturn the now mainly abandoned concept of the “deficit model” in science communication studies. Wynne’s study recognised that there are situations where experts from the outside can be shown not to have a clear monopoly of knowledge in a situation and may at times need to defer to locally collected knowledge and concerns.

9. Main Features of the Consultation Process: Lessons Learned for CCS

This case, and the eventual protests it created seems to be influenced by a series of events specific to this pipeline and its location. This is supported by the fact that other comparable pipeline developments in the UK, such as the Isle of Grain to Shorne pipeline in Kent that was build at around the same time, did not make any noticeable impact in terms of local or national protests.

The LNG terminals at the start of the south Wales pipeline were new developments which already attracted a huge amount of opposition around Milford Haven. The issues raised in connection with them were in many ways similar to the concerns that were to be voiced later in connection with the pipeline. The biggest issues were safety worries around both the terminals themselves. At around the same time in December 2005, an oil depot in Bunceford, Hertfordshire exploded, only narrowly avoiding loss of life, while the community in Milford Haven is still very much aware of the nearby sinking of the oil tanker “Sea Empress” in 1996, which caused an oil spill and long lasting environmental damage to the Pembrokeshire coast. Both events featured in the news articles related to discussion of the pipeline by giving concrete examples of accidents that occur in the face of rhetoric from the relevant operators and developers. Another factor affecting trust in the operators is the fact that they (including National Grid) are privately owned, and that they are ultimately responsible to their shareholders and not to the local community. Thus the pipeline suffered from a series of associations with related developments, recent accidents and general mistrust of private companies. In terms of perceived risk, although the local population had no direct experience with pipelines thus making it difficult to further determine any potential benefits.

There are also telling differences in the nature of the two developments. One is that unlike the pipeline, the LNG terminals are localised – but that means also that protests against the terminals spilled over to the more easily targeted pipeline:

And to put it as crudely as possible, it's much easier to get at linear infrastructure than it is something you can put a fence around. And that does mean that you can find that you're the tail wagging the dog, even if you're not the big policy issue yourself, if you follow that. (David Mercer, interview)

The issues outlined above will apply to CCS as well. CCS will be perceived as a privately owned-privately run operation, which is not based on the enhancement of the public good.

Another factor that influenced the way the project was seen is the very location of the pipeline. This includes the unfortunate but ultimately unavoidable fact that it crossed through a national park, which generated some negative press. Another point that David Mercer emphasised was that the scale of the pipeline was much bigger than any of the other projects they had worked on before (David Mercer being responsible for all major National Grid projects). This means that both technical aspects of the project as well as with community relations they were treading on slightly unfamiliar grounds. But a predominant factor was Wales itself. As the letters to the local newspapers show quite clearly, the project suffered from the fact that it (at least the second section from Felindre to Tirley) was built predominantly to supply the national gas grid in England. Although the pipeline branched off near Swansea to provide south Wales with gas as well, it was not seen as being in the local interest given that this region did not traditionally rely on gas (*David Mercer, interview*).

The rhetoric that the pipeline was an English colonial development dumping safety risks on the Welsh without handing them the benefits was developed and fostered by local politicians as a way of opposing the pipeline, mainly by the Welsh national party Plaid Cymru, but also the Green party and even sections of the local Labour party. Wales' political landscape is fairly unique within the country in having an extra layer of regional government, and therefore an extra layer of politicians who had their say on the pipeline. Although the Welsh Assembly is less powerful than for example the Scottish Parliament, the local Welsh Assembly member, from the Labour party, came out in support of the protesters. The UK's electoral system may also have influenced the events. Because members of Parliament are also representatives of one particular constituency, the protesters had one direct link to a member of parliament they could lobby (and who therefore may have a legitimate worry over retaining his seat in the next election). The protesters at Cilfrew and Trebanos may have been helped by the fact that their local MP was also the Secretary of State for Wales, who held a much more influential position within the government than the average MP.

How these local contingencies translate to future CCS pipelines depends of course on their eventual locations. The Welsh nationalist discourse of the pipeline being forced on the native population won't

of course occur in precisely this form anywhere else. However there is a lot of regional pride in other areas of the UK, including of course Scotland, but also most of the north of England which sets itself apart from the South East and especially London, both of which are often popularly portrayed as not caring about injustices they are seen to inflict on the provinces. It is one of the reasons that the complaint “it wouldn't happen in Surrey” has singled out Surrey rather than any other area in England. I would imagine that this at least is a possible reaction to consider in pipelines in Yorkshire, which has a traditionally strong regional identity (though much smaller of course than Wales).

Finally, developments at least in Neath Port Talbot have not been helped by a series of unfortunate events in the council's planning office. These include miscounting of votes and irregularities that would later lead to a High Court ruling quashing the original planning approval. Although the council won on appeal, the council hardly conducted itself in a way to engender public support, and through its pursuit of a local campaigner and pensioner for the legal fees – as they seem to admit to set an example – they leave themselves open to a possible complaint under the Aarhus convention.

The exact way in which local politics and bureaucracies will be able to influence future projects of this type will be slightly different now that there is a new legislative regime in place. Especially issues surrounding planning permission seem to have been streamlined within the new regime, as well as giving a heavier emphasis on consultations and keeping the public informed. In summary, the project was pushed through in the end on the basis of national interests. In this case, it was a demand for energy dictated by national interests that overrode local concerns and resulted in the implementation of the project.

Figure 1: Map of the pipeline (from national Grid website)

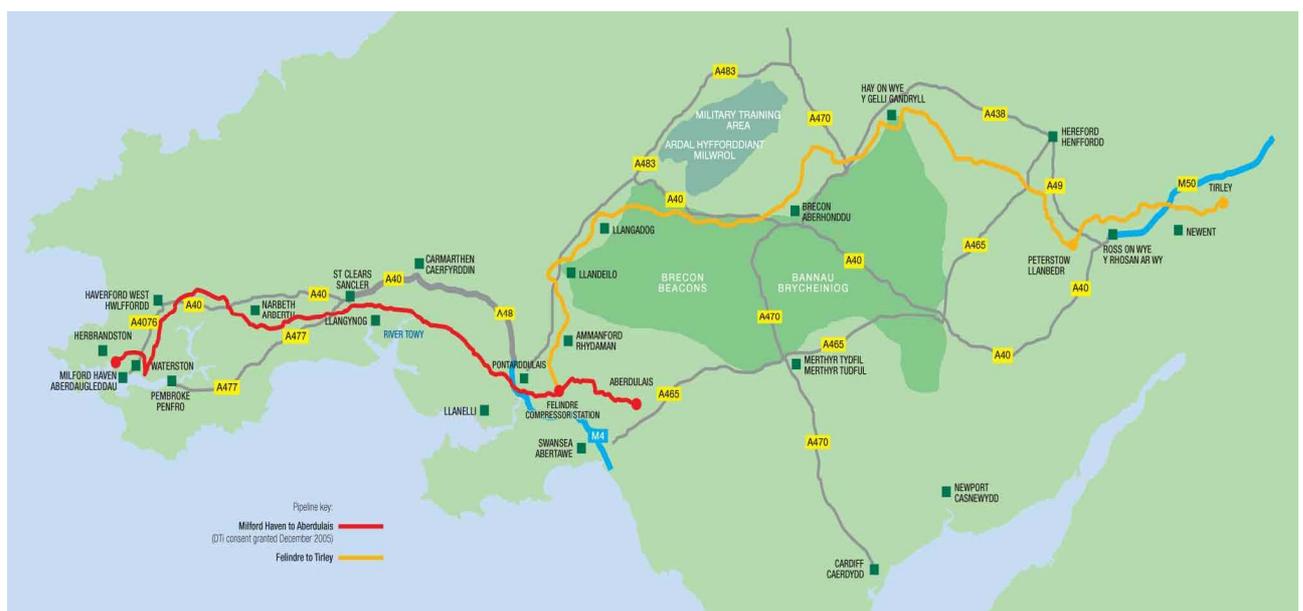


Figure 2: Cartoon from the protest website “Pipeline Twitter”



APPENDIX E: SPANISH CASE STUDY

NearCO₂ WP1.2

Public participation practices and onshore CCS: Learning From a Case Study in Spain - La Pereda Gas-fired Power Plant

Authors: Dr. Christian Oltra and Dr. Roser Sala

1. Introduction

On December 2006, the planning of a gas-fired power plant in the North of Spain (La Pereda, Mieres, Asturias) was announced by two Spanish energy companies (Endesa and the public company Hunosa, a company historically very active in the area). The two companies wanted to build a gas-fired power plant of 410MW next to a coal-fired power plant owned by Hunosa that operates since the 1990's. Project permits to build the new power plant were requested of the national environmental authorities in 2005. In 2006, a local movement including local environmental and local civic associations initiated an active opposition to the building of the new power plant.

In this report we analyse this event, in order to understand different issues such as the nature of the controversy, the interaction between the stakeholders, the public engagement practices developed in the planning process and the main concerns expressed by the different actors. We try to answer questions such as: why this controversy was motivated? What communication practices were developed by the promoter and how did they influence the local reaction against the project?

This case study is based on documentary analysis and interviews with key actors. Three interviews, one with one representative of the energy company, one with the president of the main residents' association against the project and one with a member of an opposition party were carried out. An online search was carried out to find information and relevant documents about the project. Different public documents have been analysed (environmental impact assessment documents, web pages from residents' and environmental associations and the promoters). Articles from the local newspapers covering the process have also been analysed in order to identify the main actors, their main views and the main events.

First, we analyse the national and local context of the project. Then, we turn to the controversy generated around the planning of the power plant, giving special attention to the actors and the

participatory practices involved. Finally, we conclude with the main characteristics of the process and its potential consequences on future CCS projects.

2. National and Local Project Context

Spain is significantly dependent on energy imports. More than 75% of the primary energy (mainly oil and gas) is imported. In terms of primary energy production, 50% of the production comes from nuclear and 28% from renewable (2004). Power generation and consumption has growth constantly in the last ten years. Availability of natural gas from Algeria has increased the participation of gas (through combined cycle power plants) in the power generation. Also renewable sources, mainly wind, have increased significantly their participation in electricity generation in Spain.

Table 1. The distribution of electricity generation in Spain

	2009
Gas	28%
Nuclear	21%
Coal	10%
Wind	14%
Hydro	10%
other	17%

Source: WWF. Observatorio de la Electricidad, 2009.

Natural gas plays a significant role in Spanish power generation. The first combined cycle natural gas turbine was built in Spain in 2002. Since this year, the number of planned and built plants has rapidly increased. But the role natural gas should play in electricity generation in Spain and the position of the government on this issue is not clear. Spanish government adopted in 2007 the Spanish Climate Change and Clean Energy Strategy – Horizon 2007- 2012- 2020. In this document, there is a clear support for renewable energy, energy efficiency and energy saving. Spain will need huge reductions in CO₂ emissions to achieve the Kyoto agreements, and the spread of gas-fired power plants will not contribute to that reduction.

However, gas-fired power plants seem the most appropriate way of rapidly increasing the Spanish power supply. Increasing imports of natural gas from Algeria, the relatively low impact on the environment (not taking into account CO₂ emissions), the decreasing importance of nuclear and coal in power generation, and the building of new gas infrastructures have given a significant importance to natural gas in power generation. On the other hand, opponents have indicated that the contribution

of gas-fired power plants to greenhouse gasses emissions and the fact that energy demand will not grow in Spain as fast as predicted, makes the building of new gas-fired power plants unnecessary. In fact, the building of new gas-fired power plants in Spain has faced, in some cases, the opposition of environmental and civic associations.

3. Project Features

The project of a gas-fired power plant was planned by the energy company Endesa in 2005. The plant, a combined cycle gas turbine plant of 410 MW, is expected to be operating in 2010. The plant is expected to provide important benefits for the companies and the region and to promote the use of environmentally friendly technologies while satisfying domestic electricity demands. The promoters consider this technology to be more efficient than other technologies, with costs of generation significantly lower than carbon-fired power plants, nuclear power plants and renewable energies, and less pollutant (less emission of NO_x, SO₂ and CO₂) than the existent coal-fired power plants.

The power plant is planned to be built next to a coal-fired power plant running from the 1990's. The area is located 4 km from the closest city, Mieres del Camino, a small city of 25.000 residents. The municipality of Mieres is an area located in Asturias, the north of Spain. The population is about 45.000 inhabitants. Mieres del Camino, the main city of the area, is a typical small industrial city, with a long tradition of mining industry (coal) and affected by a process of emigration and deindustrialization from the 1970's. Hunosa and Endesa selected the site due to the long experience of Hunosa in the area, the existence of industrial and electric infrastructures, the industrial and mining tradition of the area and the future presence of a regasification plant near the site.

The building of the plant will also require the construction of a gas pipeline of 1900 meters. In the same area, Hunosa is planning the construction of a pilot power plant of 1 MW incorporating carbon capture technologies. Hunosa is leading, with other public research centres, a CCS project. CO₂ will be stored in the same region, and potential storage sites are under study at present. But the project is still in an early phase. A significant issue in the area that affects the project is the fact that three more combined cycle power plants have been planned by other companies in an area of 30km and eight in an area of 100km.

4. Actors and Their Visions

When in 2006 the planned power plant was announced by Hunosa (2006) and the local media, some local civic associations initiated an organized opposition to the project. This first reaction was based on the perceived negative impacts of the project as well as on the perception of not being properly

informed by the local government and promoters about the proposed facility. Environmental associations in the region declared, at the same time, that a gas-fired power plant was an unnecessary project for the region. The mayor asked the local associations (integrated in two platforms: Plataforma Antitérmica La Pereda and Federación de Asociaciones de Vecinos de Mieres) to wait until more details about the project were known. A meeting with the promoters was proposed.

Promoters followed the process of public information, as obliged by environmental impact assessment law, but a comprehensive risk communication program was not planned. In December 2006, a press note announcing the collaboration of both promoters to build a gas-fired power plant was published. In this information, the promoters explained the main benefits of the project: low environmental impact, employment, economic development of the region. In the environmental impact assessment it is also stated that the gas-fired power plant will contribute to energy safety in Spain, while achieving high energy efficiency with low environmental impact. The two main statements held by the promoters in the meeting with local association were that the facility would generate more than 30 local jobs and it would not pollute the environment as only gas will be fired.

For promoters, opposition to the project has remained low and local. It is perceived that opposition is politically driven and not based on solid arguments. The site where the power plant will be built is considered a suitable industrial area. The promoters have made efforts to reduce the environmental impact of the project. In their perspective, the information process has been transparent and adapted to EIA regulation requirements.

Local opposition started very early. Local neighbourhood associations were, from the beginning, very actively opposed to the planned facility. Different factors seem to be behind this opposition: the existence of active residents' associations and local environmental associations in the area with a long history of coexistence with a coal-fired power plant; lack of trust in the way promoters and the local and regional government acted and their motives; perception of adverse consequences from the facility; perception of an unfair distribution of risks and benefits (the area is perceived as one of the most polluted areas in Spain). The main negative impacts perceived by the local associations were (Plataforma Antitérmica La Pereda, 2009):

- Impacts on human health (increases in cancer and other serious and mild illness; impacts on child and older populations)
- Environmental degradation of the area (already polluted)
- Impacts on quality of life (the planned site is considered to be at an extremely near distance to the local population)
- Negative impacts on other economic sectors (tourism)

Few benefits from the planned power plant are perceived by the local associations. The gas-fired power plant is compared with the existent coal-fired power plant, which has had some negative impacts (noise, pollution) in the view of the local residents. They perceive the new power plant as not having positive impacts on local employment, as unnecessary in terms of energy needs, and as the product of an old-fashioned economic sector. As one piece of graffiti collected in the local media said: “Besides unemployed, poisoned”. Local associations have also criticised the lack of dialogue between the promoter and the local residents and associations in the planning of the facility.

Local, regional and national environmental NGO's actively opposed to the power plant. Environmental associations have manifested a general opposition to combined cycle gas turbine plants. The main arguments behind this opposition to the technology are:

- Environmental impacts. Gas-fired power plants produce CO₂ emissions as well as NO_x, SO₂ emissions.
- Negative impacts of gas infrastructures.
- Safety concerns (risk of explosions and fires)
- Impacts on agriculture due to water consumption
- Dependence on gas imports from not stable countries
- Clear preference for other renewable technologies

Local and regional environmental associations, as well as opposition political parties, also based their position on other concerns:

- The region does not need more electricity production, as it exports electricity to other regions in Spain
- The facility will not have positive benefits to the economic development of the region.
- Impacts on local climate
- Noise impacts due to the proximity of the facility to populated areas
- Gas supply is not guaranteed
- Impacts of the connection to the grid
- The inexistence of alternative sites
- Lack of plans against potential leakages
- Impacts on the local river
- Lack of social acceptance

Table 2. Actors and Their Visions

Actor	Position towards the project
Hunosa and Endesa (promoters)	The new power plant will have significant economic and social benefits, while being environmentally friendly. The area has industrial and electric infrastructures as well as a long tradition on mining and energy industry
Local government	Not opposed to the building of the new power plant
Partido Popular Izquierda Unida (local opposition parties)	Opposition parties are against the building of the new power plant
Regional government	Supports the project
Plataforma Antitérmica de La Pereda Other neighbourhood associations	Actively opposed to the power plant in the proposed site. Main concerns: Impacts on health, the local environment, the quality of life, the social development and tourism.
Coordinadora Ecologista de Asturias Ecologistas en Acción (local and national environmental associations)	Opposition to gas-fired power plants and to the local site. Environmental and safety concerns.
Trade unions	In favour of the power plant due to potential benefits on employment in the energy and industrial sector in the area

Political parties have also played a role in the local opposition. The hosting of the facility has reinforced a political struggle between local parties. The two main opposition parties have opposed the construction of the power plant and collaborated with local associations. Their opposition is based, as explained by one of the actors from Izquierda Unida (opposition party) interviewed, on the lack of social interest of the project, the lack of a participation process (as required by the Aarhus convention), the environmental and health impacts and safety problems (As o considered). The Green

party even complained to the European Parliament about the impact assessment of the power plant. Political parties have emphasized the environmental and social impacts of the facility and the lack of economic and social benefits for the region. As a result, the city council, in a plenary session, voted against the planned power plant.

The major and the regional government have favoured the development of the project based on the potential economic, social and energy benefits. Also some of the trade unions in the area supported the building of the new plant based on the benefits on employment in the energy and industrial sector in the area.

5. Public Participation Process

In terms of public engagement we can identify two processes: a mandatory process of public information and consultation, as obliged by the Environmental Impact Assessment legislation, and a non regulated process. In 2006, a process of previous consultation before the Environmental Impact Assessment was carried out by the environmental body (MARM, 2009). More than 20 organizations, including public bodies, administrations (nine city councils in the area), three research centres and six environmental associations were consulted. Different neighbourhood associations and the regional green party (Los Verdes de Asturias) sent documents to the consultation. The consultation resulted in different concerns (location alternatives, associated infrastructures, air and noise pollution, refrigeration system, spills, and impacts on protected spaces) that were addressed by the promoters and that resulted in specific changes in the project.

In November 2007, the public information process started in order to obtain the Environmental Impact Certificate. As registered in the official document (MARM, 2009), statements against the impact assessment were presented by a regional environmental association, the Plataforma Antitérmica la Pereda, two city councils and private individuals. One of the concerns presented against the EIA by local associations, the use of diesel oil, was addressed by the promoter. Diesel oil, more pollutant than natural gas, was eliminated as a potential auxiliary fuel for the power plant. The promoter indicated that more general concerns, such as the existence of other power plants planned in the area or the visual and noise impacts, had been addressed in the EIA.

In terms of non regulated participation, the engagement process has been limited to one meeting with local representatives. In May 2006 a meeting was planned between Hunosa and Endesa technicians and representatives of “Plataforma cívica contra la central térmica de La Pereda” (the main association against the project) and representatives of “Foro Cívico de Medio Ambiente”, but it was finally cancelled. The objective of the meeting was to give information on the project to the local

associations. Two months later, in July 2006, a meeting was held in the council of Mieres between city representatives from the Council and the promoters. In this meeting, technicians from the companies explained the details of the project to the representatives.

Two local institutionalised mechanisms of public participation have also had a role in the discussion of the planned facility. These mechanisms were not constituted ad hoc for the discussion of the project, but are mechanism of local political participation in environmental and urban planning issues. The Foro Cívico de Medio Ambiente (Environmental Civic Forum), related to Agenda 21 actions and made up of local civic and environmental associations and political parties, voted against the project. The Consejo de Participación Ciudadana (Citizen Participation Council) is another general mechanism of participation to debate local problems where the planned facility was discussed.

In July 2009, the environmental body at the state level approved the environmental impact assessment presented by the promoters. Permissions still have to be granted by the Ministry of Industry and the regional body. The plan is likely to be approved in the coming months. The association Plataforma Antitérmica la Pereda, against the power plant, is considering initiating judicial procedures to contest the approval of the environmental impact assessment.

6. Media Coverage

The local media has actively covered the event. Some local associations became aware about the planned facility from the local media. Two regional newspapers have actively covered the local reactions to the project from its origins.

The amount of articles about the projected power plant in the local newspapers was significant in 2006, when the project was officially announced and the first signs of local protest started. In March 2006 the media covered the first complains of residents' associations about the project. The press release from the promoters about the project, the reaction of the major and the reaction of local associations was also covered by the local press. In 2007, six articles on the local protest appeared in the news. The struggle between the local government and the opposition parties, a local demonstration against the project, and a general description of the project were the main issues in the articles. In 2008, seven articles were published. Local opposition and political issues were the main topics. In 2009, four articles about the project have been published. Three of them refer to a likely delay in the construction of the plant due to the reduction in energy consumption in Spain. Another article refers to the desire of the Plataforma Antitérmica la Pereda to start a judicial process against the project (the approval of environmental impact assessment).

Media seems to have played a significant role in making visible the controversy about the project. No signs of risk amplification are found in the articles, as risk has not played a role in the narratives of the articles, more focused on politics (struggle between local political parties). The regional media has covered in depth the process, reflecting the views of all the actors involved. The view of associations has been more explicitly reflected in the articles, but in general terms, the way stakeholders' views are explained in the articles seems to be neutral.

7. Discussion and Translation to CCS

This case shows the problems that arise from the siting of industrial and hazardous facilities based on traditional technical and economic criteria in Spain. The engagement process can be characterized as a one-way communication process and limited to the requirements by law. A comprehensive risk communication program was not developed. Information flow was mainly one-way and there is no public involvement and feedback. Except for the meeting with public representatives, no other actions of public engagement have been carried out.

One main question is why local opposition was motivated. One main explanatory factor could be the fact that local associations were, from the beginning, very actively opposed to the planned facility. The existence of active residents' associations and local environmental associations in the area with a long history of coexistence with a coal-fired power plant is an important factor. Lack of trust in the promoters and the local and regional government, the perception of negative consequences from the facility; a lack of a clear perception of the benefits; a perception of an unfair distribution of risks and benefits (the area is perceived as one of the most polluted areas in Spain) or the existence of local politicians against the project are elements explaining the opposition. It is significant to note that familiarity seems to have had a negative effect on the local attitudes towards the project.

An important question is the adequacy of the stakeholder engagement process on this project. In relation to the legal framework, the promoters observed the regulation on Environmental Impact Assessment that applies to industrial activities. This regulation considers that public participation is gathered in the process of consultation to other authorities and the procedure of public information of environmental assessments. The regulation on impact assessment was modified under Law 27/2006, inspired by Aarhus Convention, to guarantee that participation is promoted by public administrations and that public information procedures are carried out. But there is no reference to the way in which the public may be informed and consulted in the Environmental Impact Assessment legislation.

In terms of stakeholders' perceptions, the process was clearly insufficient for the local associations and the opposition parties. In their view (interview with a member of the political party IU) the

process was characterized by a lack of dialogue, transparency and the irreversibility of the decision of siting the facility. In relation to the best international practices and the general ideas on stakeholder engagement, the process studied could be best defined as a limited one-way communication process. If we define public engagement as a group of procedures designed to consult, involve and inform the public in decision making, this project, as the majority of industrial projects in Spain did not emphasized the engagement of the public and other stakeholders.

Finally, although is difficult to predict whether this public participation process will be followed in future CCS projects, some lessons can be learned. Different factors such as the type of storage project (pilot, industrial), the type of promoter or the kind of potential site will influence the engagement strategy in CO₂ storage. A CO₂ storage project will be subjected to the information procedures stated in the EIA and SEA regulations, if they apply to the project. But as regulation does not establish any specific procedure about how the public may be informed and consulted it is not likely that a comprehensive engagement process will be developed. Trends in different areas (water planning, urban planning, Agenda 21, Aarhus Convention) might force the search for more participation, but CO₂ storage projects might also remain as industrial processes where public engagement is often considered unnecessary.

APPENDIX F: DUTCH WIND FARM CASE STUDY

NEARCO₂ WP 2.1 - Case Studies

Public participation practices and onshore CCS: Lessons from a Dutch wind energy case

Authors: S. Brunsting, PhD, T. Mikunda, MSc

Reviewers: Ruth Mourik, PhD, Sylvia Breukers, PhD. Ynke Feenstra, Msc, Marjolein de Best-Waldhober, PhD.

1. Summary

This case study concerns a wind farm in Burgervlotbrug, in the North-West of the Netherlands. The project started in 1993 and was completed in July 2009. Although it normally takes 5-10 years to complete a wind farm, this particular project took 16 years. Public protest has played an important role in the delay. The focus of this report is the development of public opinion resulting from interactions between local stakeholders and the local public. The study is based on reviews of publicly available project information and interviews with members of the key stakeholder groups involved. The report describes the target groups addressed, the concerns identified, the communication materials and approaches used, and an assessment of the extent to which public involvement has been a dialogue rather than a one-way information campaign.

The main conclusion was that, in line with previously found results on public participation in wind projects, public protest is only partly about feared negative consequences, such as visual impact and noise. The main reason for public protest seems to be the lack of information and the use of informal (i.e., not legally required but voluntary) forms of engagement in the early stages of project development. The main reasons for subsequent continuation, extension, and intensification of public protest seem to be related to perceived procedural injustice and perceived inequity in the distribution of costs and benefits. In the absence of informal public participation forms, public questions about the rationale for the project for example, remain unanswered.

For CCS projects, this implies that the public should be informed and involved as early as possible in the project. Involvement should not only take place through legally required reviewing processes, but also through informal opportunities for discussion. In the dialogue with the public, the following questions should be addressed. Firstly, why does this project have to take place? Secondly, why does

it have to take place at this location? Thirdly, what would constitute an acceptable way to carry out the project within the existing policy, legal, and technical requirements? And fourthly, how may the region and the local public benefit from the project? Answering these questions requires, amongst others, clear national and regional policies both on (sustainable) energy in general and on CCS specifically. Also, clear and consistent regulations and incentives (such as funding) need to be in place for the implementation of CCS projects

The structure of this document is as follows. Firstly, we provide an overview of the national and local energy policies, and the legal framework for public participation in infrastructure projects in the Netherlands. Secondly, we describe the data collection method. Thirdly, we discuss the features of the Burgervlotbrug wind project. Fourthly, we analyse the developments in public protest, communication and participation activities, media attention, and stakeholder relations. Finally, we draw conclusions from this project and provide implications for CCS projects.

2. National and Local Project Context

2.1 National Energy Policy Context

The Netherlands are a relatively large producer and exporter of natural gas, but 38.9% of energy supplies are imported. The country generates the majority of its electricity from gas and coal. In 2008, 7.5% of gross electricity consumption was provided by renewable energy sources (RES; EREC, 2009). As part of the European Union Directive on the promotion of the use of energy from renewable sources, the Netherlands has obligations to ensure that by 2020, 14% of the total energy consumption is provided by RES (European commission, 2009). Ambitiously in 2007, the Dutch environment Minister Jacqueline Cramer introduced the ‘New energy for the climate’ report, which stated that the share of the total energy provided by renewables should reach 20% by 2020 (VROM, 2007).

2.2 National and Local Wind Energy Policy

Despite a long history of using wind energy, when compared to its neighbouring countries of Germany and Denmark, the deployment of modern wind turbines in the Netherlands has made slow progress. The Dutch government has set a target of reaching an onshore installed capacity of 4GW by 2020 (VROM, 2008). Currently, the onshore capacity is 2.22GW (WSH, 2009). Dutch subsidies are less favourable when compared to countries such as Germany and Spain, and their provision has been irregular in recent years. Support for investment in renewable energy in the Netherlands has been provided by the ‘Stimulerend Duurzame Energieproductie’ (SDE) regulation, a feed-in premium to cover the additional costs above the wholesale energy price (SenterNovem, 2008). However, there have been doubts that this regulation provides sufficient incentives to reach the ambitious targets set

for 2020 (Elzenga and Van Dril, 2008). The SDE regulation covers energy produced through onshore wind, biomass, hydropower, and photovoltaics. The project described in this case study was supported by the predecessor of the SDE regulation called MEP (Milieukwaliteit Elektriciteits Productie), which existed until 2006 (EREC, 2009). In 2007 no funding was available, which allegedly has caused delays in wind project plans.

Even though the central Dutch government outlines a national wind energy policy, local authorities are responsible for planning practices in their province or municipality. The municipality of Zijpe, the location of the project in this case study, has an obligation stemming from national and provincial wind policies to create zoning suitable for the placement of onshore wind turbines. However, the municipality itself has no formal targets for increasing RES. Zijpe, in the province of Noord-Holland has been developing its own policy on wind power since 2001, devising hindrance zones where turbines may not be placed, and consequently isolating areas of land where turbine deployment is hypothetically acceptable. Amongst others, the policy stipulates that no turbines may be built inside a radial perimeter of 500 meters from residential areas or recreation areas, or 300 meters from nature conservation areas (CEA, 2007). Within the acceptable areas, the planning applications of turbines are further subjected to a set of nine principles, to determine whether the plan fits into the landscape. The principles encompass aspects including the configuration of turbines, avoidance of a combination of different types of turbines, and how the turbines blend into the visual direction of the landscape. How these principles are applied in practice is not clarified; many seem to be open to interpretation.

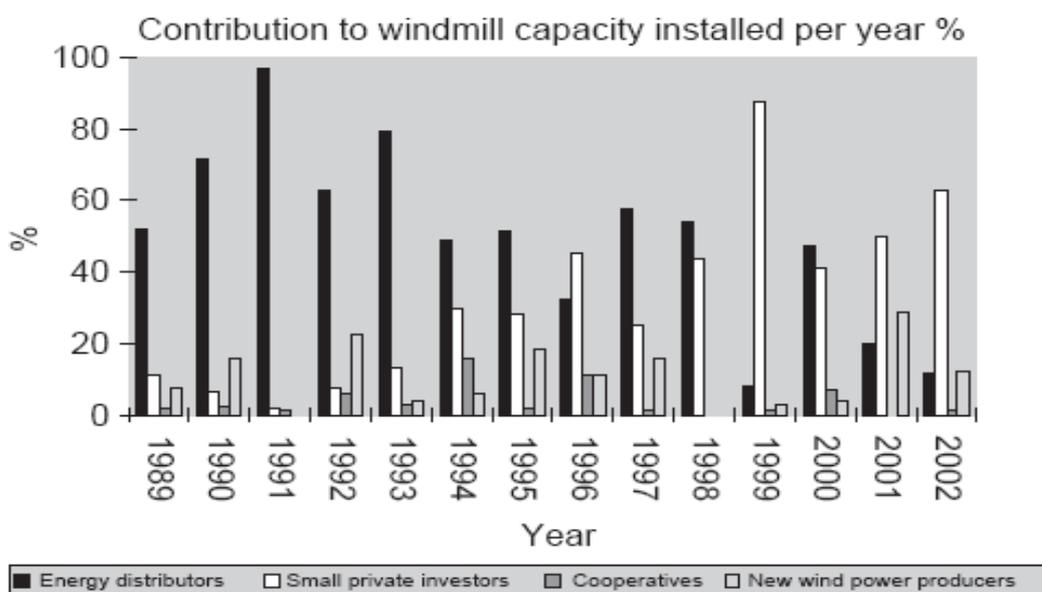
Zijpe started with wind policy development in 2001 in response to the growing number of requests for turbine installations, the largest of which was the plan for the wind farm Burgervlotbrug - the subject of the present case study. Neighbours of this project were asked to respond to the concept policy document, after which the project was approved. However, changes in the provincial wind policy of Noord-Holland required subsequent revision of the municipal wind policy. An attempt to update the policy was made in 2005. However, due to growing resistance against wind projects which had by then also led to a polarization in local politics, the 2005 version was rejected. A new concept was made in 2007, outlining the situation desired by the council for 2008 and beyond. The consultation period for this plan has been completed and the municipality has concluded that the document can be approved. However, actual approval is still pending. Both local government officials and municipal stakeholders believe that the approval will be delayed until the national elections in 2010.

2.3 Participation in Wind Projects: Dutch Wind Cooperatives

Within the Netherlands, Agterbosch et. al. (2004) identify four types of wind power entrepreneurs: small private investors, the electricity sector, wind cooperatives, and new independent wind power producers. This report will focus on the entrepreneurial group of wind cooperatives, because the wind farm in the present case study is owned by such a cooperative. Projects from wind cooperatives are normally small scale projects, and are not intended to accumulate huge profits from the generation of electricity. Moreover, as community initiatives, wind cooperatives often look upon wind turbines as devices to be used in the transition towards a more sustainable society. It should be noted though, that in many cases the ownership of projects is less transparent, and joint ventures by different actors are common.

As can be seen in Figure 1, wind cooperatives play a small role in the wind power industry, with annual contributions to the total installed windmill capacity normally below 10% between 1989 and 2002. The origin of the Dutch wind cooperatives is connected to the Dutch organisation for Renewable Energy (ODE), which was originally an antinuclear power movement. Working mostly with volunteers, cooperative wind projects strongly rely on local support and public participation (Agterbosch et. al., 2004). Most wind cooperatives do not have bank loans, but generate income through small investments by community members that can range from €50 to €15.000. Investors can then expect annual dividends based on the revenue generated from electricity generation.

Figure 1. Contribution to windmill capacity installed per year % (Agterbosch et. al., 2004).



2.4 Public perceptions of onshore wind energy

According to research on public attitudes towards wind power in Europe, the general view of the public on wind energy has been improving since the technology was first widely introduced in the 1980's (Wolsink, 2007). Nevertheless, gaining local support for wind projects remains difficult. Thus a clear distinction can be made between the public attitudes towards wind power in general, and the local public attitudes towards a specific wind farm. Stemming from this, the term 'not in my back yard' (NIMBY) is a well established policy belief. As a result of this belief, project proponents often call public protest 'emotional' or 'irrational' thereby implying that no valid arguments are used or that the opponents are acting selfishly. Policy makers do not always use these labels consciously to frame arguments as invalid. Rather, it appears that the NIMBYism belief is so widespread that it may implicitly influence the words chosen to describe public opposition.

Many scholars disagree with the idea that NIMBYism accounts entirely for the gap between positive public attitudes and negative behaviour towards specific projects (Devine-Wright, 2005; Ek, 2005; Wolsink, 2007). Research indicates that the visual impact of wind turbines is the dominant factor in explaining opposition against them, but also suggests that public animosity towards a wind farm is partly reinforced by the planning procedure itself (Breukers & Wolsink, 2007). Top-down, hierarchical, and technocratic approaches to decision making may lead to feelings of injustice and inequity within local communities. These reasons should not be confused with the notion of NIMBYism.

Care should be taken in any case when interpreting public concerns as NIMBYism. For example noise is regularly mentioned as a perceived disadvantage of wind turbines. A survey among 725 residents of rural areas living near wind turbines shows that although wind energy in itself is positively appreciated by the majority of the respondents, the sound from wind farms is seen as an important disadvantage of wind energy (Van den Berg, Pedersen, Bouma, & Bakker, 2008). People who claim to suffer from noise from wind turbines are often told that they cannot be bothered by the noise since acoustic reports have shown that noise levels remain within the legally required limits. Recently, however, these norms have been debated.

According to Van Den Berg et. al.(2008), the sound of wind turbines is perceived to be more annoying than equally loud air or road traffic. This may be caused by the swishing character of the sound or because at night it does not decrease in strength, in contrast to most other sources of noise such as traffic. The authors even found that noise from high wind turbines may actually increase at night, because then the wind speeds at hub height may differ from those at ground level (Van Den Berg, 2003). This conclusion was drawn from findings from a sound research in a German onshore

wind park near the Dutch border, which was carried out at the request of protesters against the park who claimed to suffer from the noise. Acoustic reports had shown that noise levels were within German as well as Dutch noise limits. However, Van Den Berg (2000) states that acoustic consultants tend to rely heavily on information from their customers (wind project developers), even when there is reason to be critical about that information. He therefore makes a plea for independent acoustic advisors.

Although Van Den Berg's conclusions are disputed, the specific character of noise from wind turbines has recently been taken into account in the new sound calculation method "Lden" (Level day-evening-night) that has been developed and prescribed by the European Union in the European Environmental Noise Directive in 2004. This new calculation method was adopted in the Netherlands in 2009 (Staatscourant, 2009). From the observation that noise calculations are a topic of debate follows that complaints about noise nuisance should not just be refuted by referring to these calculations. That said, the previously mentioned survey of Van Den Berg et. al. (2008) also showed that those participants (14%) who stood to benefit from a wind turbine (by owning a turbine or by having shares in a wind farm) did not think the sound of wind turbines was annoying. These people differed in several other respects from other participants: they lived closer to the wind turbines, but had a more positive view on wind energy and the impact on the landscape, and were relatively better educated, younger, and (hence) healthier. Thus, the relation between proximity to a wind farm and perceived noise nuisance may be mediated by a range of variables, which are not necessarily all related to NIMBYism.

Previous studies suggest that the timing of interaction between the local community and the developer is a key factor in shaping the public opinion of wind energy projects. For public participation to be effective, people must be involved in the process at early stage (Breukers & Wolsink, 2007). However, the most important aspects of a wind scheme proposal, such as exact location and number of turbines, have often already been decided on once they are revealed to the public. Often termed as 'decide-announce-defend' (DAD; Ducsik, 1987), such decision making methods are thought to increase conflict between planners and public. However, both public authorities and project developers still continue to use them (Wolsink, 1996). Another factor for success is the division of costs and benefits. In an international comparative study, Breukers and Wolsink (2007) argue that projects that have been developed by a local project developer and in local co-ownership have a better chance of succeeding. This is partly because local initiators are usually more sensitive to the local, social and political situation, and are better able to generate support. At the same time, co-ownership also ensures that a certain amount of project revenues will remain within the local community. In summary, local involvement, financially and in decision making, appears to enhance support for wind schemes locally.

2.5 Dutch Law on Project Planning and Public Participation

Infrastructural projects such as the present wind case have to fit in to the existing Municipal Development Plan. If a project does not fit in to this plan, either the project is rejected or the plan is adapted. This is a time-consuming process. There are ways however, to give a project the necessary permits first and adapt the Development Plan later. Until July 2008, the Dutch spatial planning law offered this opportunity. According to article 19 in the Spatial Planning Law, a municipal council may exempt projects from the existing development plan. Ways in which the municipality cooperates in the context of an exemption request depend on the type of exemption sought. For the project described in this case study, the province provided 'declaration of no objection' to the exemption given that the project exemplified 'good spatial motivation' meaning that it would be compatible with present and future local development.

In the Netherlands, the General Administrative Law Act ('Algemene wet bestuursrecht' or Awb) applies to both the making of administrative decisions and to the judicial review of these decisions in the courts. Based on the Awb, citizens can oppose a decision ('besluit') made by a public body ('bestuursorgaan') within the administration and apply for judicial review in courts if unsuccessful. The party that loses has to pay for the costs of the procedure. If a proposed development is likely to have 'significant' environmental impacts, it will require an EIA which, together with the planning application, must also be made available to the public. The project in the present case study did not require an EIA. Instead, the Environmental Management Act was applied. Public bodies are obliged to make decisions public and give people a 6 week period of time to respond, which they can do by submitting views ('zienswijzen'). Opposing a decision is only possible if one is found to personally suffer from the consequences of the decision. Although not legally required, the public body usually organizes a hearing for all prosecutors.

Applying for judicial review or appealing to court is only possible after having opposed a decision against the public body itself. When reviewing a decision, the Court will only look at the method used to arrive at the decision whereas the correctness of the decision itself will be under question as part of an appeal. Usually, an application to court must be made within 6 weeks after having received the final decision of the public body. Unlike France or Germany, the Netherlands have no special administrative courts of first instance. Instead, regular courts often have an administrative 'chamber' which specializes in administrative appeals. In administrative cases the courts of appeal are specialized depending on the case, but most administrative appeals end up in the judicial section of the Council of State ('Raad van State'). Usually, the court and the Council of State also organize a hearing.

Similar to the UK, the scope or content of the public's comments that are considered relevant is highly constrained. Of principal concern in the planning system is the degree to which the proposal is consistent with the Development Plan, which sets out higher level policies for the locality. Effects on neighbouring properties, on traffic and safety are also considered material. Ethical, policy and other issues that are not referred to in the Development Plan are not considered material, and in general there is a presumption in favour of development.

2.6 Data Collection Method

2.6.1 Desk Research

Background information was obtained through literature search. Detailed project information was found in abundance on the internet from the year 2000 onwards, amongst others on the project developers' websites. Because public protest arose after 2001, online information combined with details obtained through the interviews was in itself nearly sufficient to write this report. Part of the information, such as confidential information and copies of communication materials, were obtained with help of the stakeholders interviewed. We also used the MA thesis of Van den Oetelaar (2009), who briefly describes the process of public participation in wind farm Burgervlotbrug as part of a multiple-case study on participation in wind turbine projects in the Netherlands.

One drawback was encountered in mapping the interaction between members of a local association opposing wind projects. At present, the website of this association is temporarily offline. As a result our coverage of communication to members of this association may be somewhat less detailed than the coverage of communication from the project developers. Another drawback was encountered when attempting to find the exact dates at which particular events occurred. In some cases, we were only able to determine in which year a certain event took place, but were not able to pinpoint the exact date. For the purpose of this case study, however, both drawbacks are unlikely to severely alter any conclusions drawn.

Media coverage of public protest mainly took place in three media: The local newspapers NoordHollands dagblad and Schager Courant (both accessible through www.noordhollandsdagblad.nl), and the local radio station Schagen FM (www.schagenfm.nl). We used the online news archives of these media for our analyses of media attention and impact on the project.

2.6.2 Interviews

Interviews were conducted between September 14, 2009, and September 24, 2009. The selection of respondents for interviews was based on the individuals either being key figures involved in the realization of the project, or key figures in the public opposition to the project. In addition, an interview was conducted with the local owner of a solitary wind turbine who was able to characterize the local community. In total, six interviews were conducted with representatives from (1) the wind cooperative that initiated the project and is now a 50% shareholder, (2) the commercial project developer which became involved in 2006 and has a 50% share in the project, (3) the municipality, (4) a local association which was established in objection to the project plan, (5) a local owner of a wind turbine who lives close to the project site, and (6) a member of the cooperative who has shares in the project. Short descriptions of the organizations and people we interviewed are included in Appendix 1.

2.6.3 Analyses

The interviews and the other data sources each provided different perspectives on the process. We reconstructed the project history and drew our conclusions through a process called triangulation, in which information from one data source is used to validate information from another data source (Baxter & Jack, 2008). Information obtained from one source that could not be verified by at least one other source was not included in the report.

2.7 Project features

2.7.1 Location and project characteristics

Central to this report is a wind farm of a cooperative called Kennemerwind. This cooperative was established in 1988 and focuses on developing wind projects in the North-West of the Netherlands. Kennemerwind is mainly active in the municipalities of Zijpe and Heerhugowaard, near the city of Alkmaar. In 1989, Kennemerwind placed its first wind turbine in the small municipality of Zijpe. Through the 1990's Kennemerwind has increased its portfolio to a total of 10 turbines, all of which are located in Zijpe. This research focuses on the development of the cooperative's most recently completed project named 'Burgervlotbrug' which consists of nine 850kW turbines close to the village Burgervlotbrug. The following information in this section is intended to provide the reader with background information regarding the municipality of Zijpe, and specific details of the project relating to the technology, the location and the financial organisation.

Municipality Zijpe (see figure 2) is in the province of Noord-Holland, and covers an area of 116 km². Within the municipality, 11.500 inhabitants are spread over 10 small villages, hamlets, and farms. The main industry in the areas is agriculture and horticulture, with 14% of the workforce in the municipality employed in the sectors of ‘land, forestry and fisheries’, compared to the national average of just 1%. However due to the fact the majority (54%) of the workforce are employed in the ‘commercial services’ sector, it can be assumed that many inhabitants commute to the large nearby towns of Schagen, Den Helder and Alkmaar (CBS, 2008). The four villages closest to the project site hold approximately 1.270 people. The village of Brugervlotbrug has 175 residents, and the nearby villages of Burgerbrug and St Maartensvlotbrug have 475 and 298 residents respectively. The village of St. Maartensbrug has 322 residents (CBS, 2008).

Figure 2. Municipality Zijpe, province of Noord-Holland, the Netherlands (left; Zoekplaats, 2009). Municipality Zijpe in detail (right; Zijpermuseum, 2009).

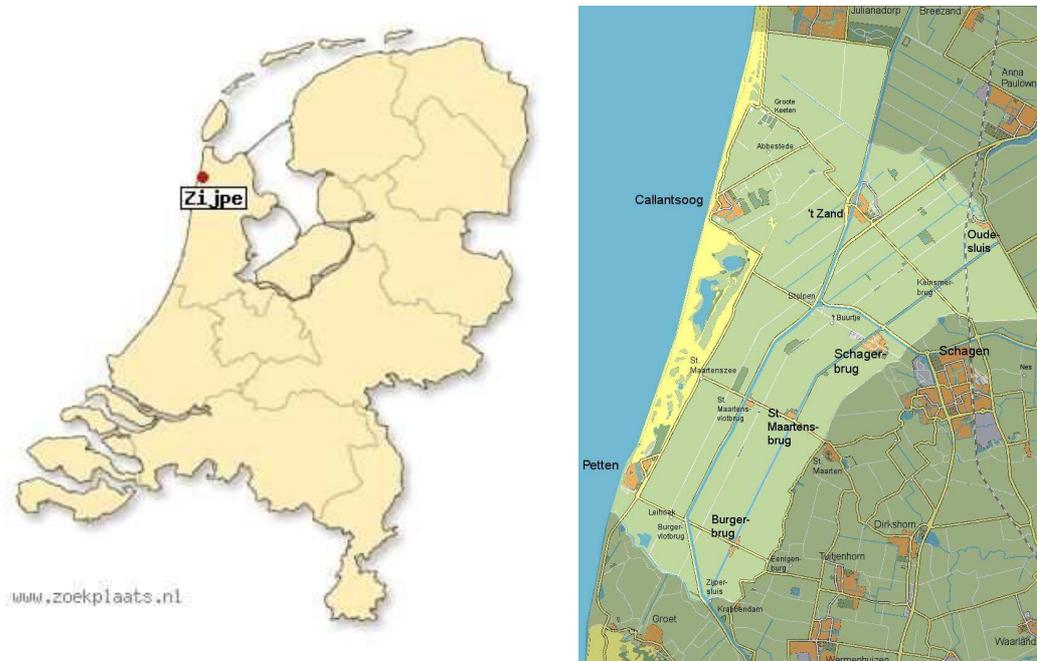


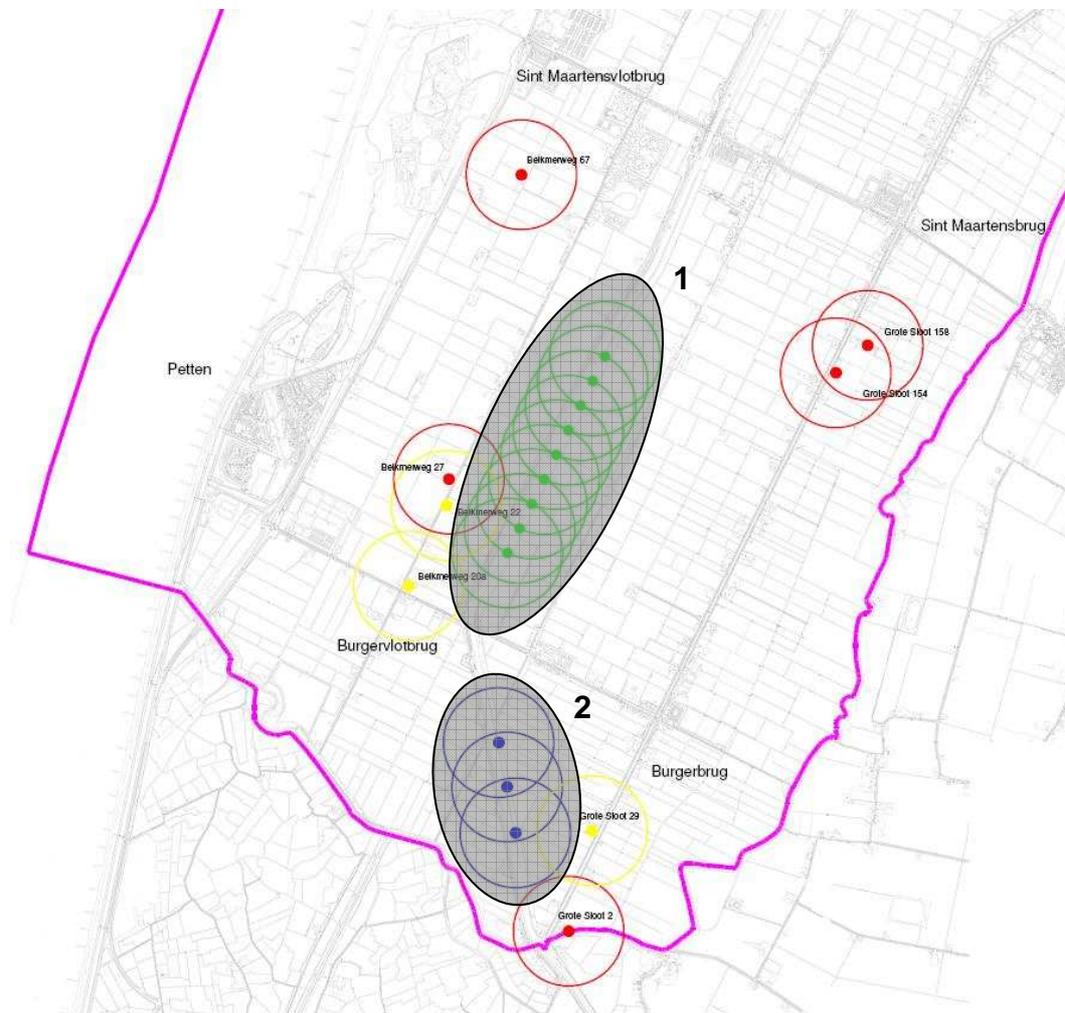
Figure 3 shows the southern part of the municipality Zijpe, marked by the thick line, and shows the locations of turbines in the areas of Burgervlotbrug and St. Maartensvlotbrug in 2008. The seven circles in oval nr. 1 represent the turbines of the new wind farm Burgervlotbrug. According to the project website (<http://www.ecowind.nl>) and documentation received from the project developers, the project consists of 9 Vestas V92 turbines placed in a line alongside the canal, 5 of which belong to Kennemerwind and 4 of which belong to another project developer. Each turbine has a capacity of 850 kW, axis height 65 meters, hub height of 70 meters and a rotor diameter of 52 meters. The five turbines owned by Kennemerwind have a combined power of 4.25 MW and are expected to generate 12.200.000 kWh annually, which is sufficient for over 3.500 households. In total, the wind farm

generates over 25 million kWh on an annual basis, enough for 7.200 households. Compared to conventional electricity production, the 9 turbines together reduce CO₂ emissions by 14.400 tons on an annual basis. In his review of ten Dutch wind projects, Van den Oetelaar (2009) mentions that projects such as Burgervlotbrug may take from eighteen months to ten years to implement.

The three circles in oval nr. 2 represent the most recent plan of Kennemerwind, which is to replace 9 small turbines for three larger ones. The small turbines are remains of a test park that originally contained 15 turbines, built in the 90s. It currently consists of three different types of Lagerwey turbines with a total capacity of 1.080 kW (3*75 en 6*80 kW). Kennemerwind has made a plan to increase the capacity of the park by replacing the 9 small turbines with three Enercon turbines of 2MW, with a hub height of 70 meters and a rotor diameter of 35 meters. This plan is called 'Jan van Kempen' after the former chair of Kennemerwind. The research stage for this plan has been finished and it is currently being discussed in the municipality, where it has met resistance from the local public.

The remaining circles represent private wind turbines owned by local farmers, of various types and sizes. As will be described later in this document, these solitary turbines play an important role in the general perception of wind in the municipality.

Figure 3. Southern part of municipality Zijpe, scale 1:25.000, 28 May 2008 (adapted from appendix to the wind policy of Municipality Zijpe, dept. of public construction).



2.7.2 Financial organization and stakeholders

Figure 4 describes the stakeholder relationships and financial flows in the wind project Burgervlotbrug. It also describes the formal process as it relates to public protest.

Cooperative Association Kennemerwind currently has 820 members, of which approximately 71% live in Noord-Holland, 27% in the rest of the Netherlands, and 2% abroad. Out of all members, 29 are live in close proximity to the wind farm Burgervlotbrug (3.5%). Initially, membership was offered for a 15-year period by making a donation of at least 100 guilders, later 50 Euros. These were actually loans to the association which would be paid back over 15 years with interest. Nowadays, the membership fee is 10 Euros for 15 years. Donations are also possible. Fees and donations no longer

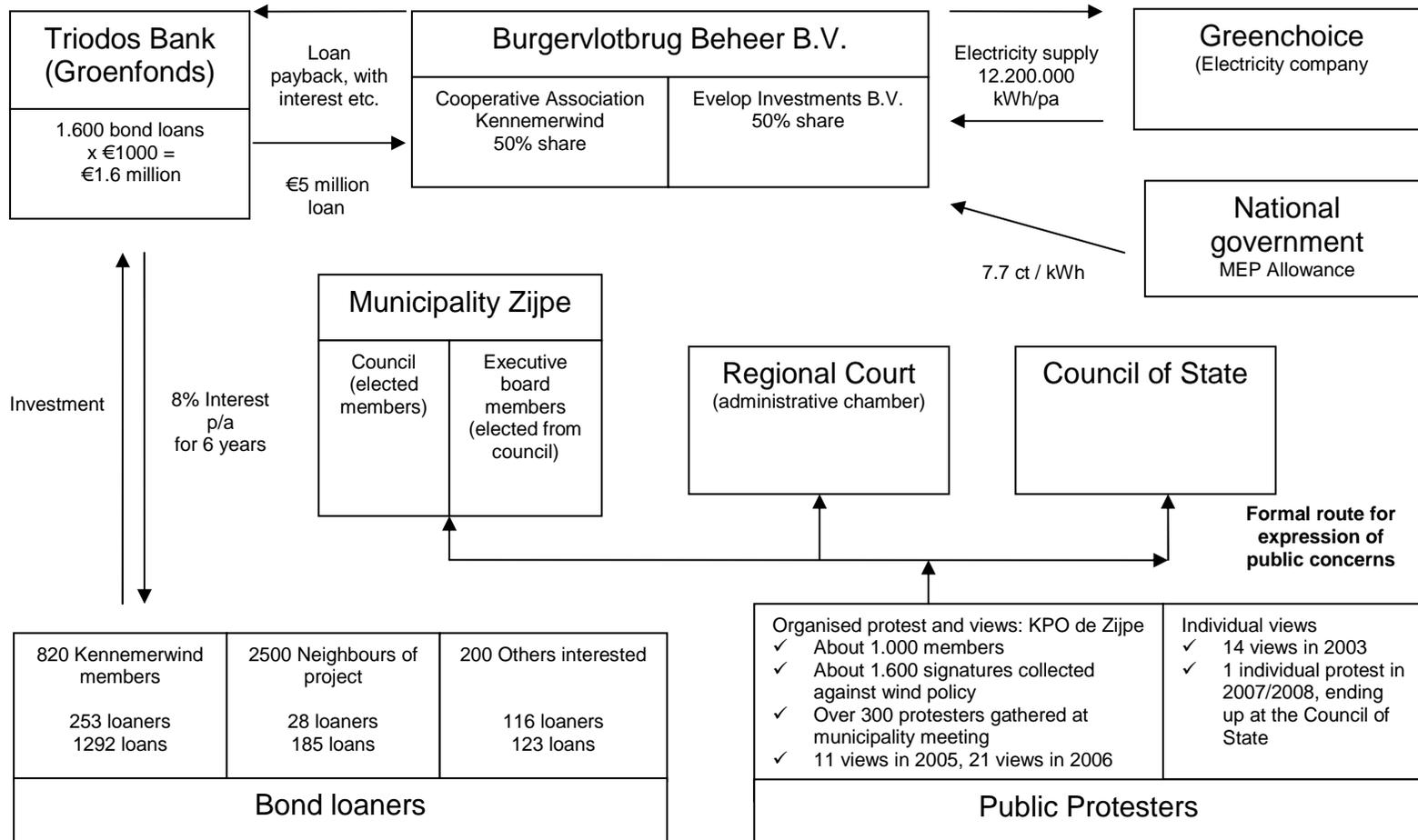
represent loans because the Dutch financial authorities did not approve of this fiscal instrument, which was the reason to switch to bond loans in the Burgervlotbrug project.

The bonds are distributed by the project management entity Burgervlotbrug Beheer BV, a joint venture between Kennemerwind and Evelop Investments B.V. each with an equal share in the project. Evelop develops, finances, and manages on- and offshore wind farms, and has previous experience with financial participation in other wind parks in the Netherlands. The initial shareholder, Evelop Projects, was part of E-concern. This company was declared insolvent in June 2009. The company's shares in the project were then acquired by Evelop Investments B.V., part of a large Dutch utility company Eneco. Triodos Bank (Groenfonds), which specializes in sustainable investments, and acts as the financial administration for the bonds. The electricity generated is distributed to the market by electricity company Greenchoice. The project was supported by the predecessor of the SDE regulation, called MEP (Milieukwaliteit Elektriciteits Productie), which existed until 2006 (EREC, 2009).

The total costs for the project were €6.6 million. Of these costs, €1.6 million consists of bond loans. 1.600 bonds of €1.000 were made available to the public during the period of 20th August until the 18th September 2009, with members of Kennemerwind and local residents (selected by postal code) given priority over 'interested others', a group consisting of people who had previously shown interest in having a share in other wind projects by Evelop. Over a six-year period, bond holders can expect an annual fixed rate of interest of 8%. All of the bonds were sold, and demand outstripped supply. To give as many people as possible the opportunity to participate, everybody who showed interested initially got one loan. What was left was divided among those who applied for more than one loan according to the first come, first served principle (with a maximum of 50 loans per person).

The formal process for the expression of public concerns is also indicated in figure 4. In Dutch municipalities decisions are made by the council, which consists of politicians elected by the public. Execution of decisions is the responsibility of the executive board, which consists of the mayor, a secretary, and two aldermen. These aldermen are selected from the two largest political parties in the council, but they are not part of the council themselves (thereby separating the executive and administrative powers, a system known as Dualism). Protest against the wind farm Burgervlotbrug was largely organized by the Critical Platform Development Zijpe (KPO de Zijpe), which was established in 2005. Before the establishment of KPO, a National Critical Platform Wind Energy (NKPW) had already existed for about 3 years. The KPO was installed as an independent platform but maintains connections and shares knowledge with NKPW. A detailed description of the development of public protest throughout this project will be given below.

Figure 4. Flowchart of stakeholders, relations, costs and benefits, public participation, and public protest.



2.7.3 Project chronology and public responses

This section gives an overview of developments and public responses to the project. A chronological overview of events is given in Appendix 2.

Starting in 1993, the development of the wind farm has had a long history. Before 2005, the project already suffered from an implementation delay due to lack of clarity in national wind energy policy, public authorities having a low interest in wind energy, ground ownership issues, and financial issues. One important development is that one of the private ground owners decided to develop a wind farm himself. Of the nine turbines eventually built, 5 belong to Kennemerwind and 4 belong to the private land owner. In the remainder of this document we will occasionally mention another project developer, meaning the private land owner.

Between 2001 and 2005, wind energy became more important to authorities. The municipality Zijpe developed its own wind policy mainly in response to the Burgervlotbrug plans. This initially caused further project delay as it turns out that the project plan for Burgervlotbrug was not entirely in line with the local wind policy. Issues got resolved in 2005, when the province Noord-Holland and the municipality of Zijpe reached an agreement about the wind policy and agreed with Kennemerwind on requirements for the wind farm. Meanwhile, however, neighbours of the project noticed the inconsistencies between the Burgervlotbrug project and the wind policy. In 2003, 14 views were submitted against the preparation decision to exempt the project from the existing Development Plan (ex. Article 19 WRO) and to give a building permit. There are no major events in relation to the project until 2005, when the municipality prepared the decision for the third time (due to the expiration of the previous decisions after one year).

Meanwhile, however, the project had already become complex from a development point of view. The wind cooperative Kennemerwind, which consists entirely of volunteers, not only had to write the spatial motivation but also had to deliver research reports on environment, cast shadow, noise, and birds to convince the municipality that the plan can be carried out without inconvenience. Although the cooperative benefits from some knowledgeable members, it was a time-consuming process. An extra complication was the regular changes in policies and legal requirements regarding wind projects, which had to be taken account in the research reports. As a result, these reports had to be updated regularly while the application for a building permit was still pending.

In 2005, Kennemerwind finished the spatial motivation that is required by the municipality to exempt the project from the existing Development Plan and, subsequently, to provide a building permit. Delighted that after so many years of work his project finally seemed about to get a permit, the chair of Kennemerwind gave an interview to the local newspaper 'Schager Courant' in May 2005. The chair stated that he was confident that the project, which had taken 12 years to develop, would finally proceed. He believed that delaying the project was still possible but that stopping it was out of the question at that point. This media event seems to give a large boost to public protest. A neighbour of the project wrote an angry response to the interview, stating that given the magnitude of opposition, it remains to be seen if the project will be realised. The resident started a petition throughout Zijpe against the wind policy in the municipality and subsequently used the collected signatures to submit views to both the spatial motivation and the municipal preparation decision, which were under review awaiting a final decision at the end of May 2005. In June 2005, the protest was formalized by the installation of the Critical Platform for Development Zijpe (KPO de Zijpe). By the end of 2005, all views were treated by the 'commission of objection and complaints' and most of them were declared unsuitable or ungrounded for procedural reasons. The commission advised the municipality to proceed as planned.

In 2006, the municipality received the required declaration of no objection from the province and gave both Kennemerwind and the other project developer a building permit. Kennemerwind started cooperating with a commercial project developer called Evelop, whose job was to find a suitable financial construction for financial participation. Furthermore, the project received funding from the national government (MEP) through Senternovem. Meanwhile however, KPO and several others decided to protest against the decision of the municipality. The municipality declared the protests ungrounded, upon which KPO appealed to the regional court. In 2007, the regional court declared the protests of KPO partly grounded, however this verdict had no legal consequences for the project. KPO therefore appealed to the State Council, which declared the appeal ungrounded in 2008. In the same period, other protest activities took place as well. In May 2007, around 300 residents gathered at the municipal building where a public meeting was held about the municipal wind policy. Most of the residents who showed up were against the plans. Furthermore, a resident from Petten also decided to object to the municipal decision to grant a building permit. Like KPO, this individual protest eventually ended up at the Council of State in 2008, where it was declared ungrounded. By the end of 2008, the project reached financial closure. The building of the wind farm started in February 2009 and the wind farm went into operation in July 2009.

2.7.4 Public concerns

Public concerns that emerged from official documents of the municipality seemed to focus on the following categories of issues. With regard to (1) the process of decision making, protesters noticed procedural errors and inconsistencies between the project plans and the democratically approved municipal wind policy. Concerns regarding (2) the wind farm were noise, negative visual impact on the unique, typically Dutch landscape, danger for birds flying through the area to a nearby nature reserve, cast shadow, and light reflections. With regard to (3) the distribution of costs and benefits, some people feared that having wind turbines so close to their homes would cause a decrease in real estate value. Also, it was mentioned that the project developers will hugely benefit from placing wind farms in the collective space whereas there would be little, if any, benefits for the local public. Finally, relating to (4) wind energy in general, some protesters questioned the effectiveness of wind energy altogether and mentioned that there may be better alternatives available such as offshore wind turbines, other types of RES such as solar or nuclear energy. They suggested that the municipality did not pay enough attention to these alternatives.

Additional information from the interviews indicates that concerns about the process of decision making were the first to emerge, and that the way these concerns were dealt with has largely determined the project outcome. To those who were involved in submitting views to the wind policy 2001 and the preparation decision regarding Burgervlotbrug in 2003, the ability to have a say in the project from the very beginning was most important. When possibilities for this, and in particular informal ways of participation, turned out to be very limited, public opinion rapidly shifted. This process is described in more detail in the next section.

2.8 Communication and participation

2.8.1 Development in public protest

Public concerns in relation to the Burgervlotbrug project were raised for the first time in 2003, when the public could respond to the municipal preparation decision to give a building permit for the Burgervlotbrug project. Among the 14 views that were submitted, the main arguments against the project were: procedural error, inconsistency between the wind policy as approved in 2001 and the present project, possible noise nuisance, cast shadow, light reflections, and possible decrease in property value.

Regarding the observed discrepancies between the wind policy and the Burgervlotbrug project, the main problem seemed to be that both the number and size of turbines turned out greater than expected. First, the 2001 wind policy mentioned that 7 turbines would be built instead of 9. Second, until publication of the project plan the neighbours had apparently assumed that the turbines would be similar to the 9 old turbines already in place near Burgervlotbrug. After the visit of the former chair of Kennemerwind in 1993 and the letter with information about the project in 2002, residents never received personal updates from Kennemerwind about any changes to the plans. For example, the building permit request had been extended with 2 more turbines and these turbines would be much larger than the old ones due to technological advancements. Furthermore, Placing 9 turbines instead of 7 would result in shorter distances to houses and nature reserves, which would subsequently no longer be in line with those from the 2001 wind policy. Also, the distance between the turbines would be smaller. Based on information they had found themselves, some people thought this would lead the turbines to reinforce each other's noise and reduce each other's effectiveness.

The second and largest wave of protest was in 2005. The website of the municipality reports to have received a total of 45 views against wind projects in this year. After the aforementioned newspaper interview with the chair of Kennemerwind in May 2005, several neighbours of the project who had already submitted views to the plan in 2003 decided that their opinion would have more impact if they organized themselves. The initiator of KPO figured that the best way to organize a large-scale protest would be to involve Zijpe in its entirety. He therefore started a petition about the wind policy in general. He distributed letters to 4.000 households, predominantly in the villages. In the letter he stated that was not against wind energy but that in Zijpe several entrepreneurs wanted to build around 38 wind turbines in a surface area of about 25km², which he found too intensive. (He also enclosed a map which showed where the turbines were planned.) He asked everyone who agreed to return a card with name, address, and signature. Eventually he received 1.400 signatures within one

year. Since it was clear that an association against wind projects had potential, KPO de Zijpe was officially established in June 2005.

Using the signatures previously collected KPO submitted views to challenge both the spatial motivation designation of Kennemerwind and the preparation decision of the municipality by the end of May 2005. On behalf of its members, KPO rejected the plan for five main reasons. Firstly, on procedural grounds: the municipality intended to give the project exemption from the existing Development Plan by applying article 19 in the Spatial Planning Law. As explained earlier in this document, this procedure is now outdated but used to be a device to speed up permitting procedures. KPO argued that the resistance to wind turbines is too great to take this 'shortcut', arguing that it would not allow sufficient opportunity for public participation. Secondly, KPO stated that the project was not in line with the 2001 wind policy as approved by the community, and was also not in line with provincial wind policy (which had been updated in 2003). As mentioned earlier in this report, it seems that the wind policy left ample room for interpretation. KPO perceived the information to be interpreted in favour of the project developers. Thirdly, the turbines were considered to destroy the unique Dutch 'polder' landscape. Moreover, together with the various types of solitary wind turbines owned by farmers that have already been built or that were in the planning stage, the 9 new turbines will look like part of a cluster rather than a straight line. This too was against the wind policy which stated that turbines must be placed in lines as much as possible to reduce negative visual impact. Fourthly, the project may cause cast shadow, noise, light reflections, and danger, in particular to birds. And fifthly, the project may cause a decrease in property value. With regard to financial matters the view also states that the project relies too heavily on public funding.

The municipality organized a hearing for all those who submitted views in response to the spatial motivation and the preparation decision. Since the views submitted in response to these two decisions are very similar, we will only discuss the views submitted to the preparation decision which we were declared unsuitable on procedural grounds. Firstly, KPO had handed in copies of the collected signatures instead of the originals. Secondly, the signatures signalled protest against the wind policy in general and not against Burgervlotbrug in particular. The view of KPO itself was declared unsuitable because an association is not a legal entity and thus has no stake in the project. Moreover, at the time that views could be submitted against the decision, KPO did not yet exist (it was officially registered by the end of June). The 10 views submitted by other individuals were declared unsuitable as well, because these were not protests against the preparation decision but against the actual exemption from the spatial plan, which was not yet the topic of discussion.

In the subsequent appeal to the regional council and the State Council against the municipal executive board, KPO had the following arguments. Firstly, the provincial wind policy 2003 says turbines should have a power of 1MW or more, whereas the building permit for Burgervlotbrug was for turbines of 850 kW. Defendants mentioned that at the time the plan was approved, this was the best type of turbine available. Therefore, the State Council decided that the KPO's argument was invalid. The second argument was that the plan was not in line with municipal wind policy regarding, for example, distances between different wind farms. And the third argument was that the ecological research carried out for the project did not convincingly show that birds would not be bothered by the turbines. The responses to these arguments are somewhat confusing to the authors of this case study, who have no legal background. Therefore, conclusions from the following interpretation of the verdict of the State Council should be treated with caution.

The State Council provided numerous explanations in disputing KPO's claims. The notion that the wind farm would form a cluster with existing solitary turbines was rejected because the wind policy exempted the type of turbines being considered. However, whenever KPO used information from the wind policy to make an argument, the Council stated that the argument was invalid given many statements in the wind policy are suggested guidelines rather than requirements. For example, the wind policy states that houses should not be within 500m from turbines the size of those planned in Burgervlotbrug. However, the policy also states that this zoning is only a suggestions and that in practice the suitability of a location for wind turbines depends on other factors as well, such as background noise.

Furthermore, all the additional evidence that KPO provided the Council to sustain its arguments, including a reference to the German wind farm case study report of Van Den Berg (2003), was deemed insufficient or inapplicable. In contrast, the defensive argumentation of the municipal executive board is deemed sufficient because 'it has not been shown incorrect.' The Council concluded that the wind policy does not stand in the way of the project. This was perhaps to be expected since the requirements in the wind policy are apparently rather subjective. Nevertheless, it appears that statements in the wind policy are interpreted in favour of the municipality and project developers rather than the project opponents. Closer scrutiny of the wind policy and the verdict of both the Council of State and the local council would be needed to determine if this conclusion is correct. However, previous research (Van den Biesen, 2002) has shown that a bias towards project proponents is not uncommon in The Netherlands.

In addition to the appeal of KPO, an individual resident of the village Petten also submitted a view to the municipal executive board in which he protested against the decision to give building permits for the Burgervlotbrug project. His main argument was that the view from his house was already spoilt by existing turbines and that the Burgervlotbrug project would make this much worse. His living room only had one window through which all the turbines would be visible. The municipal executive board declared his objections ungrounded, upon which the resident appealed to the regional council and State Council successively. However, both courts find his arguments invalid.

2.8.2 Analysis of Communication

A chronological overview of communications activities around the project by the two owners and the opposing party KPO is given in Appendix 3.

Members of Kennemerwind were well-informed throughout the project. They received a magazine three times a year which contains, amongst others, an overview of the turbine revenues and developments in new projects. Kennemerwind also has an extensive website with a news archive dating back as far as 2001. Because a cooperative needs approval of a majority of its members for important decisions, annual meetings were held. Throughout project development, members also received several letters about the upcoming possibility to buy shares in wind farm Burgervlotbrug. Evelop, the commercial project developer, took care of the communication regarding shareholding possibilities as of August 2009.

In contrast, neighbours of the planned project only received information in 1993 by a visit from the former chair of Kennemerwind and in 2002 through a letter about the project plans. Afterwards, they did not receive any personal information until the distribution of the bond loans started on August 18, 2009. This was announced in a personal letter to all households in postal code areas surrounding the project and through an announcement in a local newspaper. Throughout the project Kennemerwind mentioned the possibility of participating as often as possible when the project was under discussion at meetings or in local newspapers, but because the details of the financial construction were yet unknown nothing specific could be said in these public announcements. Moreover, information meetings were mostly visited by opponents to the plans who interpreted the invitation to participate as bribery. Thus, upon receiving the letter with the details, the local public only had one month to decide about an investment of at least 1,000 Euros. Apart from the fact that for many people this will be too short a time period to decide, this offer to participate in the project through investment came at a time when most people had already turned against the project. However, this cannot be

derived from the communication materials from the project developers. No reference at all is made to public concerns raised; all materials only mention the participation possibility and its assumed benefits.

KPO kept people who had signed the petition in June 2005 informed by newsletters. KPO also has a website, which is now temporarily offline. Information about KPO can partly be found on the national website of the aforementioned organization NKPW. Some information was retrieved from the chair of KPO as well. Nevertheless, it cannot be guaranteed that all key communication activities of KPO have been reported in Appendix 3. This does not prevent us, however, from the conclusion that the only information sources available to the general local public were the formal documents from the municipality and media attention in local newspapers, which we discuss in the next section.

2.8.3 Analysis of local media attention

A chronological overview of local media attention is given in Appendix 4. The media coverage analysed begins in 2003. This is partly due to the limitations of the online newspaper archives, but does not constitute a real problem for the analyses since the project was most extensively covered between 2005, when the building permit was discussed, and 2009 when the project was finished. We identified four topics in media coverage that we believe have together shaped the public opinion about the wind farm Burgervlotbrug. Firstly, the Burgervlotbrug project itself. Secondly, wind projects in the Zijpe municipality in general. Thirdly, a solitary turbine owned by a local farmer, described as the solitary turbine at Grote Sloot 158. Fourthly, information about another project Kennemerwind is working on and that we have mentioned earlier in this document, called the Jan van Kempen project. Below we explain how these events have contributed to public opinion.

The institutionalisation of the protest, through the establishment of the Critical Platform for the Development of Zijpe (KPO), has shaped media coverage throughout the period 2005-2009. The actions of KPO are all aimed at wind projects in Zijpe. However, according to the chair of KPO, the main reason to start organizing the protest against wind energy in Zijpe was in response to an interview with the chair of Kennemerwind in May 2005 that appeared in the local newspaper Schager Courant. In this interview, the chair of Kennemerwind stated that the project could be delayed, but not stopped by opponents. The tone of voice and wording of the interview gave the chair of KPO, who is one of the closest neighbours of the project site, the impression that the substantial public protest against wind energy throughout the municipality was neglected. He therefore wrote a letter to the newspaper in response to the interview

declaring that he would organize the protest in Zijpe against the wind policy in general, including the Burgervlotbrug project. What happened next has already been described in the previous section. The overview of media messages show that he collected 1,100 signatures within 9 months, indicating a rapid growth in support.

Another sign of protest was the public meeting at the municipality in May 2007 (see Figure 5), which about 300 people attended. This was not only fed by resistance against the wind farm Burgervlotbrug, but also by complaints about a solitary turbine located at the address 'Grote Sloot 158'. Discussions around this turbine seem to have had a significant negative effect on the general perceptions of wind turbines and the wind policy in Zijpe. From August 2006, the media have reported regularly on a conflict between the turbine owner and municipality, caused by protests of neighbours against the turbine about the noise. The conflict remains unresolved to date. Meanwhile the turbine remains in operation, because the Council of State declared that shutting down the turbine would cause too much damage to the owner. Within the community, the incident sharpened the division between farmers who benefit from wind energy through turbine ownership and others who do not benefit from the turbines. Because solitary wind turbines are usually owned by local farmers, community members who are opposed to wind energy use the designation 'wind farmer' as a term of abuse. This example also illustrates that local ownership is not always a guarantee of public acceptance.

Figure 5. Public protest in front of municipality building Zijpe, May 23rd 2007.



The media overview also shows how the municipality responded to the growing protest. The municipality has organized several public meetings to discuss the wind policy, including the plans for the Burgervlotbrug project. Furthermore, by the end of 2008, the municipality started a broad discussion about renewable energy. Kennemerwind also seemed to become more responsive from 2008 onwards as shown in a message related to its other wind project, Jan van Kempen. This project has been in the news since 2006. In April 2008, a public meeting was organized to discuss the project. A message from Kennemerwind in November 2008, announcing that the wind turbines will be placed closer together, gave the impression that this time public concerns were being taken more seriously.

This impression was strengthened by the fact that in June 2009, on behalf of Kennemerwind, an energy advice agency conducted interviews with 23 residents near the Jan van Kempen project to listen to their concerns. Among the respondents were two local village council members who were opponents of wind projects and who publicly voiced their opinion in the local media. The research report, which contained answers to all concerns raised by the respondents, was sent to all neighbours of the proposed wind project and to members of the council. The report also contained an invitation to a brainstorming session and a visit to the wind farm Burgervlotbrug on August 12, 2009, to discuss conditions under which the new project would be acceptable to the neighbours.

Concerns raised in the Jan van Kempen survey were similar to the ones raised in relation to the Burgervlotbrug project. The main concern was the noise the turbines would make, which is likely to have been fed by the negative experiences with the turbine at Grote Sloot 158 that violated the noise limits but remains in business anyway. Given that turbines, once placed, will stay there for decades, people want assurance that they will not suffer from the noise. The second concern was about the visual impact given the size and shape of the turbines. Thirdly, people wanted to know why it was necessary to place the new turbines closer to their houses than the 9 small turbines standing alongside the canal. Further concerns were: about cast shadows; why the turbines had to be placed locally and not at sea for example; why the municipality chose wind and not other renewables such as solar; possible loss in property value; and how the neighbours of the project would benefit.

It remains to be seen, however, if the more proactive approach of both the municipality and Kennemerwind will be viewed as such by project opponents and the public in general. Although recently both parties seem to have taken more effort to involve the public in both the general municipal wind policy and in the Jan van Kempen project, the present situation

strongly reflects that of 2005. The most recent messages in the media overview show that whereas the wind policy is still under discussion, the municipality has announced an exception for the Jan van Kempen project. This is a similar situation as for the Burgervlotbrug project, and the response of the local opposition is the same as well. Furthermore, throughout the past 16 years, stakeholder relations and stakeholder views of the project process has altered significantly. Kennemerwind and the municipality have become low-trusted parties to the local public, which is likely to complicate an open dialogue at this stage. At present, KPO assists several small protest groups in organizing their protests against particular wind projects in their neighbourhood, amongst others against the project Jan van Kempen. We describe stakeholder views and relations in detail in the next section.

2.8.4 Stakeholder views and relations

In this section we describe stakeholder perceptions of the process, the project outcome, and of each other. The present situation is a deadlock. On the side of the project developers, there seems to be doubt that the local opponents to wind farms can be reasoned with. On the side of the opponents, there seems to be doubt if decision making is truly democratic or if parties involved have hidden agendas. Below we describe how this situation emerged.

Earlier in this report, it was mentioned that the tendency of proponents of infrastructural projects to view any public remonstrance as NIMBYism, has the potential to mask 'valid' concerns or uncertainties from within the local community. Two examples illustrate how perceptions of NIMBYism can be strengthened in the course of a project. The first example is a discussion at a council meeting, where opponents were asked if they would still object to the turbines if they were completely silent. The opponents answered that they would still object, because the turbines also have a negative visual impact. The chair of Kennemerwind, who was present that evening, understood from this discussion that people just do not want turbines and will use noise as an argument for not wanting them. A second example is the responses of opponents to a local newspaper announcement of Kennemerwind in November 2008. Kennemerwind reported that in response to local concerns, the three turbines in the planned Jan van Kempen project be placed closer together. This could be perceived as a gesture to the local public but it was not perceived as such by KPO, who stated it was no real solution. To Kennemerwind it appeared that there is no point in trying to satisfy the opposition, because this will never be achieved.

Such experiences are likely to have contributed to the cooperatives' focus on providing good arguments to the municipality officials who have the authority to make the final decision, and

to put less effort in having a dialogue with the general public through discussion with opponents and informing the public through local media.

As perceived by Kennemerwind, the features of the Burgervlotbrug wind farm such as noise and visual impact do not seem to have been the primary cause of public protest. Instead, the main cause lies in the decision making process. One likely cause is that proponents and opponents differ considerably in their perception of what constitutes a good, democratic decision making process. Kennemerwind thinks that as long as the project lives up to its legal requirements, the protest of several individuals should be ignored on behalf of the society as a whole. Indeed, this could be said to be rational, democratic decision-making. The council, having been elected by the people, should represent and defend the opinion of the majority. However, KPO argues that even though the opposition is substantial, the council does not listen to its arguments. According to the chair of KPO, the wind farm itself was not his main concern. Of biggest importance to him is that projects like this are carried out after careful deliberation, that questions and concerns of citizens are heard, and that stakeholders attempt to take these into account. We may conclude from this that the opponents felt the need to organize themselves because they did not perceive their opinion to be defended by any of the parties involved in the project, in particular the municipality council.

The formal route of protest, which opponents saw themselves forced to resort to, does not allow for a real dialogue between project opponents and proponents. Legal authorities only check if all procedures have been followed correctly. The chair of KPO resents having to hear time and again that protests are declared unsuitable, or that arguments are declared irrelevant with regard to the decision in question. For example, from a legal point of view, the municipal executive board correctly decided that a petition against wind policy in general cannot be used as a valid argument in a protest against one wind farm in particular. However, it seems fair to expect that when facing public protest of this size, stakeholders (in this case, the municipality) put more effort in having a dialogue with the local public about conditions under which the project would be acceptable to them. The entire procedure has led to anger and frustration within KPO, as well as suspicions that the process of decision making is not fair and democratic at all but that parties involved have hidden agendas.

The long trench war through legal procedures, which was frustrating for all parties involved, might have been avoided if the municipality had effectively created trust with the neighbours of the Burgervlotbrug project in the municipality to defend their interests. One complicating factor, however, is that the polarization between project opponents and proponents also affected local politics. Whereas at first both the council and executive board were in favour of

wind projects, this gradually changed in response to the developments in public protest. In 2006, these changes led to a political crisis when two political leaders who were both strongly opposed to wind projects entered the executive board. This resulted in the executive board being against wind energy whereas the council was still largely in favour, making any further decision making that represent everybody's interests a very troublesome process.

One reason for the initial unresponsiveness of both the municipality and Kennemerwind to protests around wind farm Burgervlotbrug may be that resistance against wind parks, especially from small cooperatives such as Kennemerwind, did not come into being until around 2000. By then, the project had already been underway for 7 years. Having not foreseen this change in general support for wind projects may explain, at least partly, why both Kennemerwind and the municipality have not responded quickly enough to public protests in the Burgervlotbrug project. It may also explain why the project has not been preceded by a more general discussion about the role of renewable energy in the municipality and the choice for wind energy from all options available. The desirability of such discussions is much clearer in hindsight. Analyses of case study materials have shown that both the municipality and Kennemerwind have recently adopted a more proactive approach. By now, however, a dialogue has become much more difficult due to the negative perceptions the project proponents and opponents now have of each other's motives and interests.

Although dialogue is clearly important, effective public involvement also requires clear and consistent policies and regulations. The project owners both stated that getting any wind farm realized is already difficult enough without involving the public in decisions about, for example, the placement, formation and type of turbines. Both shareholders assess the difficulties of ongoing changes in wind policy, legislation, and funding. A persisting problem is that at the start of building, the project had to meet requirements that were in place at that time. This meant that research conducted in conformity with older requirements had to be revised. Some decisions, however, could not be adapted. For example, upon completion of the wind farm, the turbines that are now part of Burgervlotbrug were already technologically outdated. Nowadays, Evelop would never build turbines of this type on such a suitable location. However, the type of turbine described in the building permit is the one that has to be built. When options for shaping the project are restricted by rules that change so frequently, this will hinder public participation in the decision making process.

With regard to financial project matters, we may conclude that the general public is largely unaware of the problems that project developers are facing and the risks they are taking. Although 50% of the Burgervlotbrug wind farm is owned by a wind cooperative consisting of

volunteers, a recurring theme in public protest is the idea that the owner of the wind farm makes huge profits from his project at the expense of the neighbouring residents. They perceive this as unfair and feel no sympathy for such a party. In the present case study, this perception may be due at least partly to Kennemerwind not having a strong basis in the local community, with only 3.5% of its members living in one of the villages nearby the project and the chair of Kennemerwind living outside the community. Another likely factor is the difficulties the project developers faced in finding a suitable, low-risk construction for financial participation. For a long time, it was unclear to what extent and in which form local co-ownership would be possible. Thus for a long time, the general public remained unaware of the plans for co-ownership as the project developers felt they had no clear story to tell. This, again, calls for clarity in regulations and also in possibilities for project developers to create co-ownership and acquire funding for their project.

2.9 Discussion

2.9.1 Conclusions from this project

This report describes experiences with public participation in the wind energy project Burgervlotbrug, which raised a high level of public objection against both the project and the entire municipal wind energy policy. The development of public opinion throughout the Burgervlotbrug project can be summarized as follows.

The initial communication around the Burgervlotbrug project falls in line with the so called 'decide-announce-defend' (DAD) method (Ducsik, 1987). Neighbours of the wind farm Burgervlotbrug were not personally addressed by Kennemerwind throughout the project until one month before the official opening of the wind farm, apart from one informal visit the former chair paid to the neighbours in 1993 and a letter about the project in 2002. When the project was announced through the municipality, the application had already been applied for and many of the important details had already been drawn up. There was no informal discussion about the project and no alternative scenarios were provided. Initially, however, the municipality was trusted to defend the public interest based on the developed wind policy that had been approved by the local community. But when a group of neighbours to the planned wind farm raised concerns about the project not being in line with the wind policy, the municipality disappointed them by dealing with these concerns only through legally required procedures. When the project seemed about to be approved, one local community member took the lead in organizing public protest. Subsequently, a long and tiresome process of arguing and counter arguing through formal procedures led to further polarization between proponents and opponents. Although the Burgervlotbrug project was eventually realized

according to the plan of the project developer, it remains to be seen how the project procedure will affect future wind projects in the area.

This case study shows that in practice, it may be difficult to determine to what extent public protest is rooted in dissatisfaction with the planning procedure or in envisaged impacts of the wind turbines. Initially, people turned against the project plans for procedural reasons. Subsequently, however, they used other arguments to stop the project. Those arguments, such as noise and visual impact, are often perceived by project developers and other project proponents as unfounded. In line with the literature, the primary explanation for public opposition to wind in municipality Zijpe seems to be the way in which project Burgervlotbrug was implemented rather than particular characteristics of the turbines themselves, such as noise or visual impact. That is not to say that these arguments played no role at all. For a significant number of people, visual impact, noise or threat to birds may be real concerns. However, the manner in which the municipality and project developers listen to and act upon such concerns determines the development of public protest.

With regard to the public perception of procedural justice, KPO states that the public bodies have only looked at procedural correctness and have not taken into account the arguments. Kennemerwind, on the other hand, states that the public bodies did respond to all arguments. When studying the publicly available minutes from the public bodies involved we can conclude that on the one hand, all arguments have indeed been discussed and replied to. On the other hand, one does get the impression that it hardly seems possible for a citizen to make an argument that will actually change, let alone stop a plan. KPO's perception of public bodies taking sides with the project beneficiaries is therefore understandable.

With regard to the public perception of the division of costs and benefits, research has shown that projects that have been developed by a local project developer and in local co-ownership have a greater chance to succeed. In the present case study, the chair of Kennemerwind was not part of the local community and only relatively few Kennemerwind members came from the community. Offers to allow neighbours of the project to participate only emerged in the final stages. Although understandable from the viewpoint of developers, who faced, amongst others, vagueness in financial rules and delays in the project, this is likely to have contributed to the perception that the costs and benefits are unequally distributed.

One question that remains to be answered is the exact size and location of public opposition. Although there seems to be quite a lot of public protest in Zijpe, one problem is that opponents to a project are usually more effective in drawing attention than proponents. Thus,

analyses of media attention and formal public protest will say something about the size of the opposition in absolute terms, but will hardly give any information about the number and background of people who may be in favour of the project. For determining the strength and also the causes of public opposition we not only need to know the number of protesters, but also their location. For example, 1,600 signatures against wind policy from the entire population of Zijpe (11.500) represent only 0.14% of the population. However, this conclusion could be different if the majority of these signatures included those from inhabitants of the four closest villages (1.270 inhabitants). Unfortunately, we were unable to retrieve the addresses of the people who have signed the petition against the wind policy.

2.9.2 Implications for CCS projects

There are obviously major differences between the technologies of CCS and those of wind turbines, as well as different impacts on the natural landscape, and different potential risks and drawbacks. Furthermore, wind energy technology is more familiar to the Dutch public than CCS. Despite these differences, general lessons can be learnt from the present case that are likely to apply to CCS projects, not only with regard to the process of public involvement but also with regard to legal and policy requirements.

The first lesson is that people should be informed about the project as early as possible, preferably by both the project developer, local authorities, and local interest groups (if any). In the Burgervlotbrug project, people did not receive information about the initial plan or any changes to it. They only obtained information through the municipality once the planning application was on the table and a decision had to be made.

The second lesson is that having a dialogue with the public requires stakeholders to create informal opportunities for public participation. The legally required forms of public participation do enable people to submit their view, but they do not allow for discussion about the project. Furthermore, the complexity of the formal route of public protest and the high likelihood for public views to be declared non-suit or ungrounded is likely to create perceptions of procedural injustice and the sense of being powerless against authorities and industrial developers. Therefore, opportunities should be created for people to voice any questions and concerns they have in a non-scripted way. Subsequently, rather than addressing all questions and concerns using a top-down approach, project developers and decision makers should seek to resolve these concerns together with the public.

The third lesson relates to questions that need to be discussed in the dialogue with the public. Based on the present case, we identified four issues that seem generally relevant to projects related to energy and climate, including CCS.

Firstly, the reason for implementation of the project should be provided. This requires stakeholders to explain which solutions to climate change are available, and why the present solution is chosen here and now. This can only be done, however, if there is a general plan at both national and regional level with regard to both energy solutions in general and the specific type of project at hand.

From this follows the second recommendation, which is to have a developed view on energy solutions in general and CCS in particular. The municipality Zijpe is now placing the wind policy in a broader discussion about renewable energy. In hindsight, it may have been more beneficial to the Burgervlotbrug project if this discussion had already started in 2001, together with the development of the first version of the wind policy.

Thirdly, clear national and local regulation need to be in place for the specific technology that is to be implemented. Kennemerwind faced many difficulties in project development as a result of the unclear and regularly changing national goals, rules, and funding. Not only did this delay the project, it had also a negative effect on the public participation process and the willingness of Kennemerwind to be cooperative in this respect. The planning application was on the table for three subsequent years. Each time, formal public objections could be made. Due to changes in regulations and policy, the discussion about whether the project did or did not fulfil current rules became a tiresome process for all of those involved. As the Dutch minister of spatial planning said when opening the Burgervlotbrug wind farm, more clarity in the national wind policy was needed to enable people to defend their rights. However, having more clarity would also be beneficial to project developers and would enable them to develop strategies for public participation.

Fourthly, project developers need to pay attention to the perceived equity of costs and benefits. In the Burgervlotbrug project, it was apparently unclear to many people that the wind cooperative that owns the project does not make a sizeable profit at all. Existing perceptions about stakeholder motives, whether true or false, will also affect perceptions of credibility and trustworthiness. Stakeholders should therefore be transparent about costs and benefits from the very beginning, as this question is strongly tied to stakeholder motives.

Appendix 1. Stakeholder overview

Stakeholder – interviewee role	Interviewee Description
Cooperative Association Kennemerwind – Chair	The interviewee is chair of Kennemerwind. He became a member of Kennemerwind in 1991, board member in 1995, and chair in 1996. From 2003-2008 he was also chair of ODE, a cooperative promoting renewable energy. He is not a resident of gemeente Zijpe but does live in the province Noord-Holland, in the city Heerhugowaard.
Cooperative Association Kennemerwind – Bond Loaner	The interviewee became a member of Kennemerwind in 2002. He was attracted to membership because he is interested in sustainable energy and because of the low membership fee. He applied to become a bond loaner in the Burgervlotbrug wind farm. He does not live close to this wind farm himself, but he does have a view of another set of turbines from his house.
Evelop - Commercial project developer	The interviewee has been involved in the Burgervlotbrug project from 2006 onwards as a project developer. Around 2006, the building permit had been given and the turbines had been ordered, although an appeal from opponents of the park against the municipality was still underway. The interviewee started working on financial closure and selecting an attractive product for financial participation.
Municipality Zijpe - Civil servant in spatial planning	The interviewee has been involved in the project for about 2.5 years. Most of the work had been done when he started working on the case. He has 14 years of experience with spatial planning in various organizations. He lives in a rural area in the north of the Netherlands and has a strong affinity with renewable energy.
Local Community - Local community member	The interviewee is a resident of the community and a neighbour of Burgervlotbrug wind park. He owns a horticulture company and owns a solitary wind turbine himself. He is in favour of wind projects and thinks the municipality should have a clear wind policy. He makes a plea for this through his membership with one of the local political parties.
Critical Platform for the Development of Zijpe (KPO)	The interviewee is a resident of the community and a neighbour of the Burgervlotbrug wind park. He turned against the project when he found out the plans were not in line with the local wind policy which had been approved by neighbours of the wind park. He was critical of the fact that the municipality neglected this, thereby neglecting democratic principles. He and his neighbours subsequently established an association criticizing development plans throughout the municipality, in particular wind project plans.

Appendix 2. Overview of project events and formal protest

2009	
September 18	All bond loans have been distributed. There was greater demand than offer.
August 20	The distribution of bond loans starts.
August 19	Official opening of wind farm Burgervlotbrug by the minister of spatial planning.
August 12	As part of the communication and participation activities around the new Kennemerwind project "Jan van Kempen", Kennemerwind organizes a walk to the wind farm Burgervlotbrug followed by a brainstorm about conditions under which the new project would be acceptable to the neighbours. The announcement of this meeting was preceded by a survey among neighbours of the project (23 interviews), amongst others with two declared opponents of the project who are also members of village councils.
July	The Burgervlotbrug wind farm goes into action.
June	E-concern, owner of Evelop, goes bankrupt. An uncertain period follows after which Evelop is taken over by the energy company Eneco. The project continues.
February	The construction of the Burgervlotbrug wind farm starts.

2008	
September	Financial closure is reached and preparations for construction are made.
August 6	The Council of State declares the individual appeal of the resident of Petten ungrounded.
July 15	Hearing at the Council of State with representatives of the individual protester, Kennemerwind, and the municipal executive board.
May 21	The Council of State declares the appeal of KPO ungrounded. KPO has to pay the costs of the process.
April 4	The resident of Petten appeals to higher court against the decision of the regional court.
April 3	Hearing at the Council of State with representatives of KPO, Kennemerwind, and the project developer of the other 4 turbines.
March 6	The resident of Petten appeals to the regional court against the municipal executive board, but the regional court declares his objections ungrounded.
Date unknown	Completion of extra research on birds on behalf of project Burgervlotbrug in preparation of the defense of the project at the Council of State.

2007	
November 23	KPO lodges an appeal against the decision of the regional court at the Council of State.
October 12	The regional court partly destroys the decision of the executive board of October 19, 2006, to declare all objections of KPO ungrounded. Instead, the regional court decides that some objections of KPO are grounded. However, the court also states that the legal consequences of previously taken decisions remain effective, which means that the municipality may still exempt the project from the development plan. The municipality has to pay the costs of the process.

Date unknown	Evelop has started working on a financial construction suitable for individual participation in the Burgervlotbrug project. Earlier plans of Kennemerwind in this respect, about which members had already been informed, have turned out impossible due to some changes in regulation in the course of the project.
July 23	A resident of the village Petten submits a view to the municipal executive board in which he protests against the municipal decision to give building permits for the Burgervlotbrug project. The municipal executive board declares his objections ungrounded.
May 23	Around 300 residents of Zijpe gather at a public meeting in front of the municipality to voice their opinion about the Burgervlotbrug project and other wind projects as planned in the wind policy of 2007. Most of them are against the plans. Never before have locals in Zijpe shown up in such large numbers to speak out.
April	Completion of extra research on noise, cast shadow, and birds on behalf of project Burgervlotbrug in preparation of the defense of the project at the regional council.

2006

Date unknown	In 2006, Kennemerwind starts working together with the project developer Evelop. The Dutch funding organization Senternovem grants Kennemerwind a funding (MEP) of 7.7 eurocent/kWh, over a period of 10 years, with a maximum of 18.000 hours. It is expected that this maximum will be reached within six years of operation.
October 19	The executive board of municipality zijpe declares the protests of KPO and others ungrounded.
August 14	The municipality (college of objection and appeal) organizes a hearing to give people who expressed their view against the decision the opportunity to clarify this view.
May 16	The municipality gives Kennemerwind a building permit for 5 turbines and at the same time gives the private ground owner a permit for 4 turbines. Neighbours of the project are given a 4-week period to submit their views against this decision. KPO de Zijpe and several others use this opportunity to object to the decision of the municipality. A total of 21 views is submitted.
January	The province gives a "declaration of no objection" against the municipal decision to give the Burgervlotbrug project exemption from the development plan.

2005

October 18	The commission that treats incoming views (called the "commission of objection and complaints") advises the municipality to continue the procedure and to ask the province (again) for a declaration of "no objection" against the decision to give exemption from the development plan.
October 1	The municipality organizes hearing for everyone who has submitted their view to the decision to give exemption from the development plan and subsequently give a building permit to Kennemerwind. The 520 views of KPO members are declared non-suit on procedural grounds.
August 1	The municipality organizes hearing for everyone who has submitted their view to the spatial motivation. All views are declared suit, but are eventually declared ungrounded.
June	Installation of the Critical Platform Development Zijpe (KPO de Zijpe).

- May 31 Preparation decisions only remain valid for one year. So for the third time, the municipality prepares a decision to give the Burgervlotbrug project exemption from the existing development plan and subsequently a building permit. Neighbours of the project can respond to this so-called "preparation decision" by submitting a view to the municipality within 4 weeks after publication of the decision. On behalf of 520 members, KPO objects against the decision. Furthermore, KPO objects on behalf of itself. Finally, 10 individuals also submit their view through the KPO.
- May 26 Again, the spatial motivation for the Burgervlotbrug project is submitted to the municipality for approval, after which the municipality may give exemption from the development plan and give a building permit. Neighbours of the project are given a 4-week period to submit their views to the spatial motivation. On behalf of 380 members, KPO submits a view on the spatial plan. Furthermore, 7 individuals submit views.

2004

- Date unknown Preparation decisions only remain valid for one year. So in 2004, the municipality for the second time prepares a decision to give the Burgervlotbrug project exemption from the existing development plan and subsequently a building permit. Neighbours of the project can respond to both the "spatial motivation" and the so-called "preparation decision" by submitting a view to the municipality within 4 weeks after publication of the decision. We were unable to retrieve information about the number of views submitted, but it seems that with regard to wind energy issues 2004 was a quiet year. At this stage, delays in the project are not predominantly being caused by public protest but rather by aforementioned factors such as ground ownership and funding problems. Furthermore, in 2004, Kennemerwind receives a warning from the Dutch National Bank about the way in which the cooperations finances her activities with loans of her members.

2003

- November 4 The municipality accepts a revised version of the spatial motivation and prepares a decision to give the Burgervlotbrug project exemption from the existing development plan and subsequently a building permit. Neighbours of the project can respond to both the "spatial motivation" and the so-called "preparation decision" by submitting a view to the municipality within 4 weeks after publication of the decision. This results in 14 views being submitted. Although not obligatory, it is custom for municipality Zijpe to organize a hearing at which those who submitted their view can clarify their opinion. After this has been done, the municipality answers to all questions and concerns raised by postal mail and decides that the procedure can be continued.

2002

- Date unknown By the end of 2002, Kennemerwind informed the neighbours of the project by sending them a letter explaining the project plans.
- December 20 The wind project Burgervlotbrug does not fit into the existing development plan. However, the spatial planning law offers the municipality the opportunity to give exemption from the existing development plan. To start this procedure, Kennemerwind must hand in a spatial motivation which states how the project fits in present and future local developments. This motivation is completed and submitted in 2002. It then turns out that the plan deviates in some respects from the wind policy 2001 document. To resolve this issue, the municipality asks Kennemerwind to make some adaptations to the spatial motivation.

2001 and before

- July 2001 Taking into account the views of the local public, the municipality council approves wind policy 2001. Regarding the project Burgervlotbrug, the policy document mentions that 7 turbines will be built. Approval of the wind policy was preceded by a participation procedure in which neighbours of the planned wind farm Burgervlotbrug were explicitly invited to submit their view. The municipality also organized a hearing at which participants could clarify their opinion. The neighbours were satisfied with the outcome of the participation exercise.
- 1997-2001 Towards the end of the 90s national and local governments start to attach more importance to wind energy, resulting in a more proactive and cooperative attitude towards wind farm Burgervlotbrug. In response to the plans of Kennemerwind, the municipality begins to develop a general wind policy for municipality Zijpe. However, ground ownership issues persist. The wind farm is planned on ground that is now partly owned by the province and partly privately-owned. Agreements with some of the tenants of the provincially owned ground turn invalid, amongst others due to changes in ground tenancy. Meanwhile, the private ground owner had decided to develop a wind farm himself. Eventually it is agreed that the private ground-owner will have 4 turbines built, in line with 5 turbines of Kennemerwind. However, one new ground tenant decides to object against the plan. Eventually he loses, but he causes further delay to the plans. In the end, it will take until 2006 to resolve the ground ownership issues completely.
- 1993-1997 Further development of the plan involving two project owners, the national government, the province Noord-Holland, and several ground tenants. In 1993, the chair of Kennemerwind (Jan van Kempen) personally visits the houses that are close to the project. He asks the neighbours if they would object if Kennemerwind would place 9 turbines between their houses and the canal. The size and shape of the turbines is not yet specified, leading the neighbours to assume that the turbines will be similar to the nine turbines Kennemerwind already owned near Burgervlotbrug. However residents will receive no further information until 2002, because the project gets into trouble and is almost cancelled. First, the project suffers from delay. The main causes are changes in ground ownership from government to province, and wind energy not being high on the national political agenda. Subsequently, the project also gets into financial trouble due to an expired allowance. Meanwhile Kennemerwind has started working on a plan to replace her 9 old turbines and considers cancelling the other project.
- 1993 The chair of Kennemerwind, Jan van Kempen, starts making plans for a wind farm in Burgervlotbrug. He first gets a permit for three small turbines within a year. Later, this permit is extended to five turbines.
- 1988 - 2002 Kennemerwind grows to approximately 600 members who together loan over fl. 800.000 to the corporation. With this money, Kennemerwind builds 10 turbines. Nine of these are close to the future Burgervlotbrug project, between Burgervlotbrug and Zijpersluis. The profit is used to pay back the loans and a yearly interest over these loans.
- 1988 Two existing corporations merge to form a new, larger corporation called Kennemerwind.

Appendix 3. Overview of communication materials

Date	Source	Message	Target group	Objective	Content
August 18 2009	Evelop	Letter, subscription form, and brochure	Interested others (200, Evelop database)	Announce bond distribution	Announcement of possibility to become bondloaner in wind farm Burgervlotbrug, for reasons of having shown interest previously. Possibility to sign up from August 20 to September 18, 2009. The accompanying brochure is the same one the Kennemerwind members received.
August 18 2009	Evelop	Letter, subscription form, and brochure	About 2.500 Neighbours of the wind farm (identified by postal code)	Inform and involve neighbors of the wind farm	Invitation to invest in windpark Burgervlotbrug. Possibility to sign up from August 20 to September 18, 2009. Reasons given for investment: Contribute to sustainable energy (electricity for 4,000 households), safe investment in turbines already in business, high return of investment. The accompanying brochure is the same one the Kennemerwind members received.
August 18 2009	Evelop	Letter, subscription form, and brochure	Kennemerwind members (about 820, Kennemerwind database)	Announce bond distribution	Announcement of possibility to become bondloaner in wind farm Burgervlotbrug, mentioning that members have priority in participation. Possibility to sign up from August 20 to September 18, 2009. The accompanying brochure mentions the expected project returns (total capacity 4.25 MW, expected to generate enough for 4.000 households) and mentions the following reasons for participation: personal benefit and environmental gain go together, invest in renewable energy, high return of investment, low risk, and project carried out by trusted, experienced parties.
August 6 2009	Evelop	Letter	Kennemerwind members	Announce that bond distribution starts on August 20	Reference to letter sent in October 2008. Apologies for not having sent any news since last year, "due to "circumstances" Explanation that one of the shareholders has gone bankrupt but that a new shareholder has taken over. Details on the bond loans. Announcement of letter, brochure, and subscription form to be received on August 20, 2009.
December 2008	KPO	Newsletter	KPO members	Get donations	KPO members are asked for donations. The appeal to the Council of State left them with a debt of about 5.000 euros.
May 2007	KPO	Newsletter and protest flyer	KPO members	Call to action against wind policy in municipality	Call to members to visit the public meeting of May 23rd, 2007 at the municipality at which the wind policy 2007 will be discussed, to protest against the plans by showing the protest flyer. The call also gets local media attention and is published on the KPO website.

March 29 2007	Venture Wind Park Burgervlotbrug	Letter	Kennemerwind members	Gauging interest in participation	Announcement that wind farm will be built and operated by Venture Windpark Burgervlotbrug. Details on participation that will be distributed: A total of 600 representing a value of 2.500 each, expected interest 8-10%. Request to return application form stating interest to participate and an indication of the number of participations wanted.
Date	Source	Message	Target group	Objective	Content
June 2005 - present	KPO	Website with general information	Everybody	Explain the platform's objectives	Website of the KPO. Is currently offline but the chair has explained that this is only temporarily. The national KP site is still online and contains several messages about activities of KPO.
June 2005 - present	KPO	Newsletter	KPO members	Update members on developments	KPO regularly informs her members about developments in Zijpe related to wind and wind policy.
June 2005	KPO	Petition letter	Residents of Zijpe	Getting people to sign petition against wind plans in Zijpe	The initiator of KPO personally delivers petition letters to most residents in Zijpe. In the letter he states that he is not against wind energy but that in de Zijpe several entrepreneurs want to build around 38 wind turbines in the area at about 25km ² , which he finds too much. He asks everyone who agrees to return a card with name, address, and signature. Enclosed is also a map which shows where the turbines are planned.
1999 - present	Kennemerwind	Online brochure (pdf download)	Kennemerwind website visitors, potential members	Explain the association's objectives and possibilities to become member	Explains the advantages of wind energy, a.o. contribution to climate effort, and advantages of participation (high interest). Refutes arguments against wind energy commonly used by opponents, such as noise and bird kills.
1998 - present	Kennemerwind	Annual meeting	Kennemerwind members	Vote on decisions to be made	Annual meeting of members with the board. The board renders account to the members of decisions made during the year. The annual report, financial overview and next year's budget are discussed as these have to be approved by the members. Important decisions have to be approved by members as well. Board members are chosen for a period of 3 years.
1988 - present	Kennemerwind	Newsletter	Kennemerwind members	Update members on developments	three-annual newsletter called "Westerwind" (West wind) with project updates, venues, developments in wind energy in the Netherlands and abroad, minutes of the yearly meeting, interviews with people from Zijpe or with experts, etc.

2002	Kennemerwind	Letter	Neighbours of project Burgervlotbrg	Update neighbours on developments	Letter with information about the project and the exemption ex article 19 from the Spatial Planning Law procedure.
Before 2002	Kennemerwind	Letter, brochure, regulations	New Kennemerwind members	Inform new members	Letter welcoming the new member and explaining his or her donation is a loan which will be paid back after 15 years whereas the interest will be paid yearly (aimed interest is 7%). Brochure explaining why Kennemerwind believes it is good to invest in wind projects.

Appendix 4. Overview of media attention

Date	Topic	Headline	Summary
28-10-2009	Jan van Kempen project	Citizens disapprove of 'special wind policy' Zijpe	Residents of Burgerbrug denounce the policy of municipality Zijpe to give a special treatment to the megaturbine project Jan van Kempen, which is about building three wind turbines south of Burgerbrug. The new wind policy will be finalized in spring 2010, but apart from this Zijpe already wants to discuss the plan Jan van kempen. the local action group 'polder F' is strongly opposed and tried to voice its opinion at the most recently held council meeting, but was not allowed because the wind policy was not on the agenda for that meeting. The action group was annoyed because in an earlier meeting it had been possible to discuss the project while it was not on the council agenda.
11-10-1009	Wind projects in municipality Zijpe	Zijpe postpones discussion wind policy	Zijpe has decided to postpone a decision about the wind policy, meaning that decisions about upscaling existing turbines and building new ones are postponed as well. Zijpe first wants to have a complete overview of the outcomes of the broad discussion about renewable energy policy. Two discussion meetings have been organized with citizens of Zijpe, which showed that people fear that new, large turbines will be built. At the same time, however, they acknowledged that something should be done with regard to renewable energy in the municipality.
19-8-2009	Burgervlotbrug project	Minister opens wind farm with considerable delay	The Dutch minister of Spatial Planning, Cramer, opens wind farm Burgervlotbrug 16 years after the project was started. The police are present because protest actions are expected, but these do not occur. The minister states that future projects need not take that long because the ministry will issue clearer rules for noise and safety of wind turbines. She also mentions lack of local support as cause of the delay and states that clearer rules with regard to wind projects will also help citizens defend their rights. According to the minister, decisions should be honest and just.
18-8-2009	Burgervlotbrug project	Opening turbine park no reason for party	A representative of the village council Burgerbrug describes the opening of the wind park as arrogant and frustrating. Neighbours of the wind turbines have complaints about the noise, but feel that these are not being taken seriously. The invitation to the opening of the park announced "an informal party to toast to the wonderful result" which citizens of Burgerbrug feel is an underestimation of public objections.
13-8-2009	Burgervlotbrug project	Participating in wind turbines	Announcement of participation possibility in Burgervlotbrug project through bond loans.
16-6-2009	Jan van Kempen project	Information evening does not continue	Announcement that an information meeting about the new kennemerwind project "Jan van Kempen" will be postponed until after summer because the municipality is insufficiently prepared
15-6-2009	Jan van Kempen project	Fear of noise nuisance by megaturbines persists	Kennemerwind plans to replace 9 old turbines (remaining from a farm that originally consisted of 15 turbines) by 3 megaturbines. Kennemerwind has surveyed the neighbours of the project site to hear their opinion. The chair of Kennemerwind concludes that fortunately, most people have a balanced opinion and only few people are fiercely opposed to the project.

6-2-2009	Solitary turbine at Grote Sloot 158	Environment Agency: Turbine Grote Sloot falls in error	The provincial Environmental Agency has found that the turbine at Grote Sloot 158 is in breach of the initial planning consent once again. If the problem persists the owner will have to pay a non-compliance penalty every time the planning consent is violated.
21-1-2009	Jan van Kempen project	delay decision Jan van Kempen: college promises new research	The debate on April 16, 2008, about the Kennemerwind plan "Jan van Kempen" had resulted in the decision that more research is required with regard to noise, cast shadow, and planning damage. After the debate in January 2009, again, the municipality was unable to reach a decision. One of the political parties stated that the assumptions underlying the noise research were erroneous and it was decided that still more research is needed. The chair of Kennemerwind was dissatisfied.
Date 2008	Topic	Headline	Summary
30-12-2008	Wind projects in municipality Zijpe	First discussion, then perhaps wind turbines	The chair of the Critical Platform for the Development of Zijpe (KPO) is frustrated. The municipality Zijpe is still working on her wind policy and is organizing a broad discussion about renewable energy, but at the same time already takes decisions in favor of current wind projects. The chair of KPO finds this premature. "First communicate with the residents. Then the politicians have heard us, then they can discuss and decide. That is democracy, that is what we strive for"
25-11-2008	Wind projects in municipality Zijpe	Critical platform asks critical questions	KPO, which now has 1.600 members, has asked critical questions about wind policy 2007 and additions made to this policy in 2008. KPO finds that the municipality does not pay enough attention to other types of renewables.
21-11-2008	Jan van Kempen project	Turbines closer to Noord-hollands Kanaal	In response to concerns raised by neighbours, Kennemerwind announces to place the three new megaturbines closer to the canal and thus further away from their houses than originally planned.
6-8-2008	Wind projects in municipality Zijpe	Zijpe restrains building of wind turbines	Announcement of debate between the municipality council and executive board about the wind policy and a complementary report, which state that the building of large new turbines will be restricted. Exceptions will only be made in some cases to replace or scale up existing turbines, and to align them where possible. Noise will be a point of special concern, as silence in the area is essential. Yet there are some loose ends in the policy about which the council has to decide.
3-7-2008	Wind projects in municipality Zijpe	Zijpe in consultation with citizens about wind projects	The municipality Zijpe announces a public council meeting at August 18 to initiate a debate with citizens about renewable energy in the municipality, to discuss all options. Also the municipality announces not to built more turbines than mentioned in the wind policy .

25-5-2008	Burgervlotbrug project	Green light for turbines in Burgervlotbrug	The appeal of KPO de Zijpe against municipality Zijpe about the Burgervlotbrug project results in the decision of the Council of State that the municipality Zijpe may give permission to Kennemerwind to built the Burgervlotbrug wind farm.
28-3-2008	Jan van Kempen project	wind turbines in committee Zijpe	Announcement of political debate on April 16, 2008, about the request of Kennemerwind to replace 15 small turbines with 3 large ones of 2 MW each, 170m high, axis height 70m, hub height 105m.
17-3-2008	Wind projects in municipality Zijpe	Increasing resistance against wind policy Zijpe	KPO mentions to have a growing number of members who disagree with the wind policy in Zijpe, which allows for megaturbines.
Date	Topic	Headline	Summary
2007			
11-12-2007	Burgervlotbrug project	Appeal against wind farm	After Kennemerwind and KPO met in court in the summer of 2008, KPO has decided to appeal against the decision to give consent to the project. The chairman of KPO says the the unique polder landscape will be changed by the turbines.
31-5-2007	Solitary turbine at Grote Sloot 158	Turbine Schuijt back in business	The Council of State decides that the wind turbine at Grote Sloot 158 may remain in business for the time being, as shutting it down would cause the owner too much financial damage.
24-5-2007	Wind projects in municipality Zijpe	Massive protest Zijpe against wind turbines	About 300 inhabitants of Zijpe, the majority opposed to the wind policy of Zijpe, gathered yesterday at the municipality hall at a public meeting to discuss the wind policy 2007. This is the first time so many people gather at the municipality, even more than during the debates about the nuclear reactor in Petten. However, the great majority of the municipality council is in favor of the wind policy. Besides opponents of the wind policy, there are also some public speakers who are in favor of wind energy.
22-5-2007	Solitary turbine at Grote Sloot 158	Bruggers' in action against wind turbine	Residents of Burgerbrug call residents of nearby village St Maarten to action to object against a plan of the municipality Zijpe to move the turbine at Grote Sloot 158 to another location, closer to St. Maarten.
16-5-2007	Solitary turbine at Grote Sloot 158	Schuijt has to shut down megaturbine	The provincial Environmental Agency has found that the turbine at Grote Sloot 158 is in breach of the initial planning consent. The turbine is put in the wrong place, is of the wrong type and makes too much noise. If the owner does not shut it down his turbine before May 30, the provincial Environmental Agency will do so at his expense.
24-4-2007	Wind project Burgervlotbrug	Still room for wind turbines	The municipality Zijpe again announces her intention to permit the building of the nine turbines of wind farm Burgervlotbrug. The chair of Kennemerwind thought the approval would be merely a formality, as everything has been planned carefully. However, neighbours have objected against the decision.

4-5-2007	Wind projects in municipality Zijpe	Call for group protest	The Critical Platform for the Development of Zijpe (KPO) has called residents of the municipality of Zijpe to group together in protest against the placement of wind turbines in the area. On the 23rd of May 2007 there will be a municipality meeting regarding the development of a new wind policy. The call to action is also aimed at a solitary wind turbine at "Grote Sloot 158" about which are a lot of complaints.
Date	Topic	Headline	Summary
2006			
19-12-2006	Solitary turbine at Grote Sloot 158	Neighbour fights against wind turbine	A neighbour who is still bothered by the noise of the turbine at Grote Sloot 158 objects to the municipality, stating that the turbine does not have the necessary permits with regard to noise, distance, and safety. She holds the municipality responsible for any damage.
19-10-2006	Solitary turbine at Grote Sloot 158	Optimization of wind turbine in progress	Neighbours of the turbine at Grote Sloot 158 have complained about its noise, in response to which improvements to the turbine are made.
6-9-2006	Jan van Kempen project	Wind project staggers after MEP	The replacement of 15 small turbines alongside the Noordhollands Kanaal, south of Burgervlotbrug, staggers. Culprit is minister Wijn of Economic Affairs, who recently discarded the MEP funding entirely unexpected. And without funding, the project is financially not feasible.
10-8-2006	Solitary turbine at Grote Sloot 158	Turbine Schuijt reaches height of almost 100 meters	A local farmer named Mr. Schuijt has a solitary wind turbine placed next to his farm, with a hub height of 60m and a rotor diameter of 70m.
27-5-2006	Burgervlotbrug project	Green light for turbines alongside the canal	Municipality Zijpe gives building permit to Kennemerwind and partners for the 9 turbines in Burgervlotbrug
April-May 2006 (several news items)	Wind projects in municipality Zijpe	Action group: Threatening letter is awful	A threatening letter with a bullet enclosed has been sent to the Mayor of Zijpe by an anonymous opponent to the wind energy policy. The chair of the Critical Platform for the Development of Zijpe (KPO) has been quick to distance the group from these kind of actions, and has reiterated calls for a democratic process. The police tries to localize the sender of the letter. The Mayor says she will not allow the letter to spoil the debate around wind policy. The chair of Kennemerwind criticizes opponents to wind energy for scaring people with myths about wind energy and having created a climate for threatening letters.
9-3-2006	Burgervlotbrug project	1.100 responses Platform Zijpe	The Critical Platform for the Development of Zijpe (KPO) received 1.100 responses in support for the protest against the plans for the Kennemerwind project.

1-2-2006	Burgervlotbrug project	Zijpe makes room for wind turbines	The municipality council in Zijpe reports to have taken a preparation decision for the third time to give a building permit to Kennemerwind for building wind park Burgervlotbrug, despite public opposition.
Date 2005	Topic	Headline	Summary
12-12-2005	Wind projects in municipality Zijpe	Critical platform debunks wind policy Zijpe	KPO warns against large-scale investments and proliferation in megaturbines in the municipality. They point out that the landscape will be spoiled by the large turbines. They also mention that wind turbines are largely subsidized and that the municipality may hurry the permitting procedures because the national government will decrease funding opportunities in 2006. Furthermore, they mention that a growing number of scientists state that investments in onshore wind energy are an expensive mistake and that an increasing number of onshore projects fail to meet criteria and are therefore abandoned.
9-5-2005	Burgervlotbrug project	The Burger-vlotbrug wind turbines may still be delayed	The planning application and the preparations are complete, which has taken in total 12 years so far. Kennemerwind proponents say they now have a solid belief that the plan will be realised, although this belief is not shared by others in the municipality.
Date 2003	Topic	Headline	Summary
16-10-2003	Burgervlotbrug project	Wind turbines alongside canal	Announcement of plan to built wind farm Burgervlotbrug and the start of a participation procedure
4-3-2003	Burgervlotbrug project	Wind turbines in Burgervlotbrug	Announcement of plan to built wind farm Burgervlotbrug. The province has declared not to have objections to the plan, which is said to "largely fulfill the requirements stated in the wind policy Zijpe"

APPENDIX G: DUTCH CCS CASE STUDY

***NearCo₂* WP 2.1 - Case Studies**

Public participation practices and onshore CCS: Lessons from a Dutch CCS Case

Authors: S. Brunsting, PhD, T. Mikunda, MSc

Reviewers: Ruth Mourik, PhD

1. Summary

Early in 2006 Shell started preparations for a capture and storage demonstration project in the southwest of the Netherlands, in two empty gas fields. These gas fields are primarily located under Barendrecht, with part of the total area located under the adjacent city of Albrandswaard. In November 2008, the Dutch Ministry of Housing, Spatial Planning and Environment announced that the project will be eligible for a €30 million government grant. During informational meetings in February and April 2008, it became clear that the citizens of Barendrecht had many questions about the advantages and disadvantages of CCS. In June 2009, after the completion of an environmental impact assessment, the municipality of Barendrecht voted against the plan. The Provincial Council of Zuid-Holland followed in November 2009. However, due to a change in legislation for this type of project that was passed in March 2009, the Dutch national government is able to overrule the decision of the local governments. As a result, on November 18, 2009, the Ministers of Economic Affairs and of Housing, Spatial Planning, and Environment decided to proceed with the project. Meanwhile Shell estimates that the project will be delayed by at least two years, with injection starting by the end of 2012 earliest.

2. National and Local Project Context

Dutch CO₂ emissions have increased steadily from 161 MT CO₂ in 1990, to 176 MT CO₂ in 2005 (VROM, 2007). Carbon capture and storage (CCS) became a seriously considered CO₂ abatement option in Dutch climate and energy policies in 2007, as part of the 'Clean and Efficient' ('Schoon and Zuinig') policy package (VROM, 2007). This action plan for energy and climate calls for annual energy efficiency improvements of 2% by 2020, a 30% reduction in greenhouse gas emissions by 2020 (compared to 1990) and 20% renewable energy in the energy mix by 2020.

In 2008, another set of policy recommendations called the 'Energy Report' (Energierapport; EZ, 2008) was adopted by parliament. This report contained descriptions of a joint 'CCS project' between the Ministries of Spatial Planning and Economic Affairs. As part of the project, the Taskforce CCS was established in March 2008. This public-private partnership is responsible for the realisation of a commercial CCS infrastructure. This requires a market-ready technology, organization of the infrastructure, policy and juridical facilitation, financial arrangements, and societal endorsement. The Taskforce has eight members including the chairman of Shell, the director of the Netherlands Foundation for Nature and Environment (SNM), and the chairman of the Rotterdam Climate Initiative and former Dutch prime-Minister Ruud Lubbers. The Taskforce is chaired by Stan Dessens, former DG energy of the Ministry of Economic Affairs. He also chairs the steering committee of CATO, the Dutch CCS research program. The Taskforce aims to speed up CCS projects in the Netherlands, amongst others by contributing to a positive image of CCS. Social acceptance is identified by the Task Force as a major issue that is difficult to manage.

The CCS project represents a strategy for moving towards large-scale implementation of CCS. The Dutch government has provided a budget for several research projects, including: the implementation of four capture and two storage projects by 2012; the building of two large demonstration projects from 2012-2015 (with a storage component integrated from 2015-2020) and from 2020 onwards large-scale industrial implementation of CO₂ storage. From 2020 onwards, CCS is expected to be commercially viable without the need for government support. On November 27, 2008 the government decided to allocate €60 million for two CO₂ storage demonstration projects. These projects are located in Barendrecht, the subject of this case study, and in Geleen, in the south-west of the Netherlands.

The Dutch government sees CCS as a third strategy in Dutch energy and climate policy, after energy efficiency and renewable energy. The Dutch government regards CCS as a necessary intermediate step in the transition towards a sustainable energy system and to help realize the policy objective of a 30% reduction in CO₂ emissions by 2020. The Dutch government hopes that the Netherlands can become a frontrunner in CCS projects and can also contribute to CO₂ reduction internationally.

i. Local Policy Context of CCS

In the Rotterdam area, the Rotterdam Climate Initiative (RCI) was set up in 2007 by four partners: the Port of Rotterdam, the municipality of Rotterdam, Deltalinqs (a branch organisation representing the industrial and logistical companies in Rijnmond) and the Environmental Protection Agency of Rijnmond (DCMR). The chair of the RCI is former Prime Minister Lubbers, who is also member of the Taskforce CCS.

The RCI is aiming to become ‘the world capital of CO₂-free energy’, and is one of 40 cities affiliated with the Large Cities Climate Leadership Group (C40). The RCI states that, despite maximum efforts to increase energy savings and the use of renewable energy, CCS will be necessary. In terms of CO₂ emission reductions, the target is a reduction by 2025 to 50% of measured CO₂ levels in 1990 (24MT), far exceeding national and European objectives. CCS plays the lead role in reducing CO₂ emissions from industry. To meet the challenging target, planned activities include advancements in energy conservation (7MT), sustainable energy (7MT) and CCS (20MT; Vergragt, 2009).

According to the Rotterdam Climate Initiative (RCI), the Netherlands are in an excellent position to become a frontrunner in CCS technology development. There are plans to develop the Rotterdam Port area (‘Rijnmond’) into a major hub for CCS (Van den Heuvel, 2008). Around Rotterdam there is a high concentration of CO₂ point sources, the proximity of storage sites both on-shore and off-shore, and there is existing CO₂ infrastructure that could connect to the Antwerpen harbour in Belgium and the German Ruhrgebiet.

ii. Legal Context for CCS and Public Participation

By March 1, 2009, an important change took effect in the electricity, gas, and mining law, made by the Minister of Economic Affairs. The so-called ‘national coordination regulation’ (rijkscoördinatieregeling or RCR) applies to a broad array of energy-infrastructure projects, such as Wind Energy projects over 100MW, other renewable electricity production from 50 MW, underground storage and mining in vulnerable areas. For projects above a certain magnitude, decision making takes place at the national level. Instead of local development plans, the national integration plan as determined by the Ministries of Economic Affairs and Spatial Planning will be used as a basis for development. Furthermore, the Ministry of Economic Affairs will coordinate the permitting procedures.

The idea behind this legislation is to make procedures shorter and more effective, thereby increasing the speed with which projects are realized. Amongst others, the law permits procedures for the national integration plan and permitting procedures to take place simultaneously. Submitting views in response to each of these decisions remains possible but must be done simultaneously, leading to increased efficiency in decision making. Furthermore, the Minister of Economic Affairs may overrule a local authority if it takes a decision it disagrees with, or if the local authority refuses to cooperate with the granting of an environmental permit (within the boundaries of the Environmental Act).

iii. Public Perceptions of CCS

The general discussion about CCS among stakeholders in the Netherlands can be categorized as follows. Those in favour of CCS, including the government, industry, and some NGOs, point out that CCS is needed because alternatives are not yet ready. They argue that CCS technology is ready, already in use and proven safe. Furthermore, proponents state that the government should invest in CCS so that it becomes economically viable as soon as possible. After that, the polluter will pay. Proponents find CCS acceptable as a transition technology, provided that the safety is guaranteed. Energy saving and sustainable energy are regarded as more important. However, proponents of CCS expect that after 40-50 years, sustainable energy will be affordable and will gradually take over whereas the market for coal disappears. Finally, those in favour of CCS point out that coal will remain an important source of energy in years to come and that therefore, new coal plants will be built whether we develop CCS or not.

Those opposing CCS, amongst others Greenpeace and local politicians in Barendrecht, point out that CCS can only exist with large investments from the government, meaning that society pays for it. This is against the 'polluter must pay' principle – it is the industry that must carry the costs. They further argue that safety is not guaranteed, and that monitoring will be needed forever to be sure the CO₂ stays underground. If it does not, this is dangerous to public health. Moreover, it would also mean that CCS is not a real solution to the climate problem after all. Also, opponents point out that CCS is expensive and that the money could be better invested in other types of renewable energy and energy saving. Investing in coal plants and CCS now means that renewable energy cannot compete in 40-50 years, as coal remains the cheapest and most widely available source of energy.

Finally, those against CCS state that CCS is just an excuse to continue the use of coal and to continue building new coal plants. It will be years before the technology is ready; meanwhile

all emissions from newly built coal plants will not be captured and not stored for at least another 20 years from now.

3. Data Collection Methodology

i. Desk Research

Background information was obtained through a literature search. Detailed project information was widely available on the internet. Below is a selection of the websites we used.

General information on CCS in the Netherlands was available at the Dutch CCS information base financed by the national government www.co2afvangenopslag.nl, and the website of the Ministry of Environment and Spatial Planning VROM www.vrom.nl/co2opslag. Project information was available on the project developer's website www.shell.nl/co2opslag, on the website of the municipality Barendrecht www.barendrecht.nl, and on the Environmental Protection Agency of Rijnmond www.dcmr.nl. Information on CCS in the Rijnmond region was available at the website of the Rotterdam Climate Initiative (RCI), www.rotterdamclimateinitiative.nl. Stakeholder views on the project and references to media coverage could be found on stakeholder websites, for example the websites of the local political parties CDA www.cdabarendrecht.nl/co2 and GroenLinks www.groenlinksbarendrecht.nl.

Local media coverage of public protest mainly took place in three media: The local newspapers De Schakel (www.deschakelbarendrecht.nl) and De Weekkrant/Het Zuiden (www.deweekkrant.nl/het_zuiden_barendrecht), and the local radio and television station RTV Rijnmond (www.rijnmond.nl). We used the online news archives of these media to form an impression of media coverage of the project. Additional information and news items were found, amongst others, on websites of national newspapers and websites of organizations that are generally concerned with energy such as the Energy Council www.algemene-energieraad.nl.

Part of the information, such as confidential information and copies of communication materials, were obtained with help of the stakeholders interviewed. For example, we collected the hard-copy information that is publicly available in the CCS information centre in Barendrecht and we received visitor statistics and weekly reports from employees of the information centre.

ii. Interviews

Interviews were conducted between October 5, 2009, and November 23, 2009. Respondents were selected on the basis of their involvement in the project, or as a result of opposition to it. Nine interviews were conducted in total with representatives from: (1) The taskforce CCS (responsible for the general CCS communication strategy for the Netherlands); (2,3) DCMR, the Environmental Protection Agency of Rijnmond which is the local research, consulting, and permitting authority for the region including the province Zuid-Holland and the municipality Barendrecht; (4) the Municipality of Barendrecht; (5,6) Two local political parties who were among the first to oppose to the planned project; (7) The national NGO Greenpeace, (8) The project developer NAM, and (9) the project owner Shell.

In addition, the first author paid two visits to the information centre in Barendrecht and had informal conversations with its employees. Since they daily give information to visitors and answer questions about the project, they have a good view on the type of questions and concerns of residents in Barendrecht in general. The first author also participated in one of the excursions that were organized in May 2009 by the information centre together with the project developer Shell/NAM to one of the planned injection sites. The second author visited a public meeting in Barendrecht early in December 2009, where the Ministers of Spatial Planning and Economic Affairs explained their decision to continue with the project to the public.

iii. Data Analysis

The interviews and the other data sources each provided different perspectives on the process. We reconstructed the project history and drew our conclusions through a process called triangulation, in which information from one data source is used to validate information from another data source (Baxter & Jack, 2008). Information obtained from one source that could not be verified by at least one other source was not included in the report.

4. Project Features

i. Location and Characteristics

Barendrecht is located in the West of the Netherlands (see figure 1), and has a population of approximately 44.000 people (Gemeente Barendrecht, 2009). The town is just south of the River Maas, is part of the conurbation of Rotterdam and close to the heavily industrialized 'Rijnmond' district. The Rijnmond industrial area is home to a number of large oil refineries

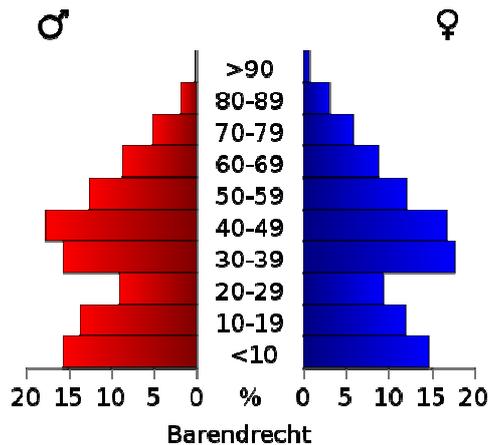
operated by amongst others Shell, Kuwait and BP, as well as chemical manufacturing plants such as Dow Chemicals, ICI/Akzo Nobel and ExxonMobil. This area is responsible for the bulk of chemical and fuel manufacture, storage and transport for large parts of central Europe. The area contributes significantly to the Dutch economy, but is also given precedence in Dutch policy given its high rate of energy consumption and is a target of GHG mitigation efforts.

Figure 1. Location of Barendrecht in the Netherlands (www.zoekplaats.nl)



As shown in figure 2, the bulk of the population is made up of citizens between the ages of 30 and 50, as well as a high proportion of children below the age of 10. The demographic distribution is not particularly unusual for the Netherlands, but the higher proportion of middle-aged citizens and children indicates that many families live in the area. Approximately 30% of the total population is over the age of 60.

Figure 2. Population pyramid of Barendrecht (data source CBS, 2009)



In Pernis (see figure 3), at the heart of the Rijnmond district and roughly 20 kilometers from Barendrecht, Royal Dutch Shell operates a hydrogen gasification plant. Shell had already managed to mitigate part of the plant's 1 million almost pure CO₂/year emissions through the provision of carbon dioxide to the soft drink industry (150.000 CO₂/year), and to greenhouses in the summer months (380,000 CO₂/year). Mainly because of the lower demand in the winter, around 400.000 tonnes per year is still available for storage. Shell hopes to be able to inject this amount into two almost expended gas fields that sit 2-3 kilometers under the town of Barendrecht (Herber, 2008). If granted consent, Shell would receive a €30 million government subsidy for the small scale demonstration project, and would also benefit from emission savings given a raise in the price of European Union Allowances (EUA) under the European Union's Emissions Trading Scheme.

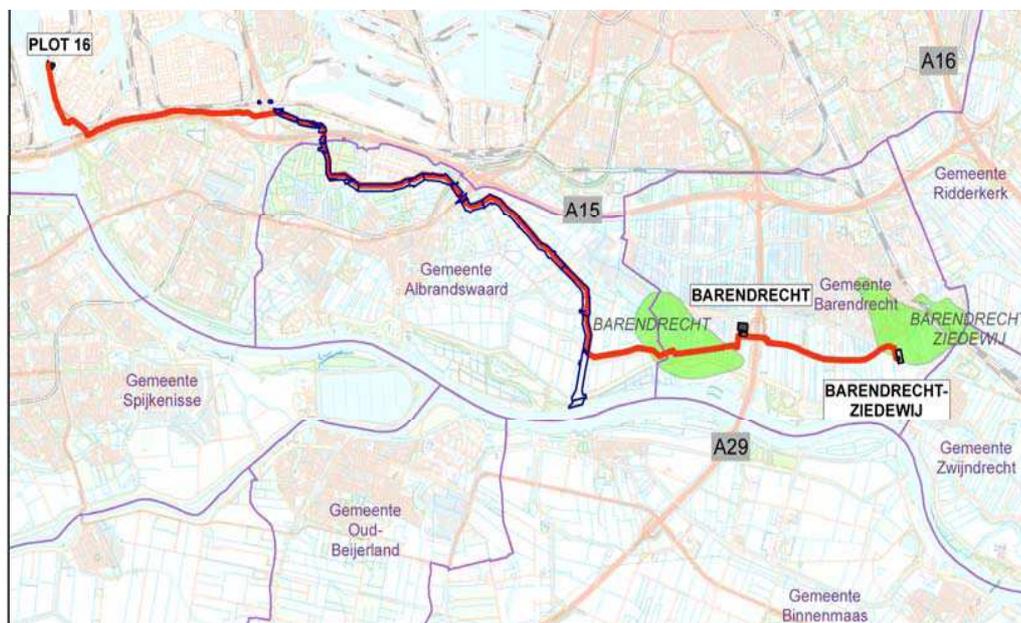
Barendrecht lies some 17 kilometres from Pernis. The distance is bridged by an existing pipeline. Starting in 2011, two depleted gas fields will be used to receive the CO₂ for a period of around 25 years. The smaller of the two fields (Barendrecht) can store about 0.8 million tonnes at a depth of 1.700 metres. The larger (Barendrecht-Ziedewij) can store about 9.5 million tonnes at a depth of 2.700 metres. The reservoir in both fields is sandstone, but from a different geological age. In both fields the cap rock is a thick layer of clay stone. The CO₂ will be compressed to a pressure of 40 bar before entering the pipeline. A second compressor at the point of injection will gradually increase the pressure up until the end of the injection period. Each field will have one injection well. In Barendrecht one monitoring well is available and Barendrecht-Ziedewij has two potential monitoring wells.

The storage site at Barendrecht is particularly suited to the project for a number of reasons (Herber, 2008). Firstly, it is close to the sources of CO₂ emissions in Pernis. Secondly, the gas fields will be fully expended in 2010 and 2013. Thirdly, the first gas field is relatively small;

therefore implementation of the entire project cycle can be completed within a three year timeframe. And fourthly, an existing pipeline can be utilised to transport the CO₂. Shell has agreed to take ownership of the gas fields and injection site from Nederlandse Aardolie Maatschappij BV (NAM). According to the national government and the project developers, no major new technology is needed for this project. These parties state that the main learning objectives are in the areas of public acceptance, legal procedures and regulations, monitoring and verification, and obtaining CO₂ credits in the EU Emission Trading Scheme.

If successful, the Shell project at Barendrecht could lay the foundation for the replication of fully integrated CCS systems both in Rotterdam and the rest of the Netherlands. The Dutch government is also optimistic that the project contributes to the development and innovation of CCS technologies in the country, placing the Netherlands in a favourable position for the international trade of equipment and expertise. If the endeavour is abandoned for whatever reason, this will negatively affect the probability that the RCI will reach its aspirations (Herber, 2008), and will perhaps warrant a government re-think of the deployment strategy for further CCS projects.

Figure3. The location of Pernis (plot 16), with the pipeline in red and the gas fields shaded green (Herber, 2008).



ii. Stakeholders

The project developers are a consortium consisting of Shell, NAM, and OCAP. Shell is the project owner and NAM is the project executive. They are united in Shell CO₂ Storage Company BV, which will handle storage and monitoring. OCAP will be responsible for the transport and the compression. Several research organizations are involved in the project, including the Dutch research organization TNO, which has a strong knowledge base of underground technology.

From the national government, two Ministries are involved: the Ministry of Economic Affairs (EZ), represented by Minister Maria van der Hoeven, and the Ministry of Environment and Spatial Planning (VROM), represented by Minister Jacqueline Cramer. Furthermore, the CCS project Directorate and the Taskforce CCS are involved. These were set up by the Ministry of Economic Affairs to support both Ministries.

From the local government, the following parties are involved: the Provincial Executive, represented by deputy Erik van Heijningen, which plays a role in the permitting procedure; the Provincial Council, as an observer to project proceedings; the Municipalities of Barendrecht. and Albrandswaard; and DCMR, the Environmental Protection Agency of Rijnmond. DCMR has had three roles in this project. Firstly, DCMR is one of the founders of the aforementioned Rotterdam Climate Initiative (RCI) which actively promotes CCS in the Rijnmond region. Secondly, DCMR works as a consultant and permitting authority for several parties in the region, including Provincial Government Zuid-Holland and the municipality of Barendrecht. Thirdly, upon the request of the national CCS project, DCMR has acted as a mediator for communication between various parties involved in the Barendrecht project.

The municipality of Barendrecht consists of an executive board, the head of which is the Alderman Simon Zuurbier, and a council, including leaders and members of all political parties. The official position of all local political parties is that they are opposed to CCS. They keep the local public updated on their actions, mainly through the party websites. Only the local green/left party has actively mobilized the public through petitions and a protest march. One liberal/right party is known to have a more neutral or even favourable opinion towards CCS, but this view is not publicly expressed because of the agreement between the municipality council and executive board to speak with one voice.

National NGOs such as Greenpeace and SNM (Stichting Natuur en Milieu) have been remarkably silent in the debate around Barendrecht. Upon requests from several stakeholders involved in Barendrecht to voice their opinion, they stated that they do have a general viewpoint on CCS but that they only voice their opinion at the national level. Greenpeace is against CCS, arguing that choosing for CCS means choosing coal and vice versa. This technical 'lock-in' will prevent renewable energy sources from competing on the energy market in years to come (Greenpeace, 2007). SNM regards implementation of the technology as necessary intermediary step towards clean energy but states that the polluter must pay and hence objects to public funding of CCS demonstration projects. Yet SNM is a member of the national CCS taskforce, which promotes CCS in the Netherlands.

iii. Project Chronology

In early 2007, the Dutch government informally announced a tender procedure to grant 60 million euros to two CCS demonstration projects. At the same time, Shell started working on a CCS project plan to submit for this tender. Amongst others, Shell contacted the Municipality of Barendrecht to discuss the project plans. The executive board was initially positive about the plans. Meanwhile, the government had officially announced the tender procedure and the intention to assign the grants by the end of 2007. In December, Shell published a notification of intent to perform an Environmental Impact Assessment for her project.

Meanwhile, in July 2007 the AMESCO report had been published ('Algemene Milieu Effecten Studie CO₂ opslag'), which was initiated by NAM and was written by various national and local governments and industrial parties. This report, which has been reviewed by the EIA committee, aims to provide a basis for future EIA reports on CCS. The concluding chapter of the report contains a sentence suggesting that CO₂ storage better not be allowed in densely populated areas. Although subsequent sentences make clear that this is not a conclusion from the report, the sentence has been regularly referred to as such by project opponents throughout the course of the project.

In 2008, Shell presented its plans to members of the municipality Council on invitation from the executive board. The majority of the Council was not enthusiastic. Nevertheless, the municipality agreed with Shell's intention to start informing the public. In February 2008, Shell organized the first of two information meetings for the general public in Barendrecht to explain its plans for CO₂ storage. At both meetings, an independent discussion leader was in charge of guiding the interaction with the public. Both information meetings had the approval

of the municipality, but members of the municipality did not wish to be involved themselves given that a decision either for or against the project was still pending. Sixty people attended the meeting; half of them were professionals and the other half of them local citizens a large number of whom were known to be active in local politics.

At the meeting, Shell and TNO presented the technical details of the project. Shell also announced the availability of a project website, e-mail form and telephone line to obtain more information about the project. The director of the national 'CCS project' installed by Economic Affairs was there as well, to explain why CCS is needed to meet national climate goals. Shell presented information about the EIA procedure, the preceding AMESCO report, characteristics of CO₂, and technical and geological project details. Shell stated that the project would be totally safe. This claim was supported by references to existing natural CO₂ fields, existing pipelines and storage projects, existing gas storage technology which will be used for CO₂ storage as well, and the fact that the gas that was previously located in the fields under Barendrecht had remained there for millions of years. According to several ECN contacts who attended this meeting, some concerns were raised but the meeting did not spark significant debate.

One week later, the municipal council was updated on the project plan in a meeting. Local political parties had started discussing the project plans. One local party leader, who attended the first information meeting, had read the AMESCO report and was not convinced that the project had been well thought through. She was particularly worried about the monitoring given that the CO₂ is permanently stored underground. In her opinion, Shell's information was too simplistic and downplayed the risks. She asked Shell to give her all reports they used in their application to the Environmental Impact Assessment committee. It would take Shell some time to fulfil this request, amongst others because of confidentiality of the reports. The opposition, however, framed the delay as evidence of Shell's unwillingness to provide information. Almost a year later, when the party leader appeared on a national television program on February 8, 2009 she stated that Shell had still not given her the information she asked for. Eventually, however, she received everything. Apart from that, Shell had frequently informed all local party leaders in meetings.

On February 16, 2008, an article appeared in a national newspaper (De Volkskrant) entitled 'No CO₂ storage under my back yard'. Residents were concerned about the safety of transport and storage, despite the safety claims of NAM, because 'people make mistakes'. They were also concerned about the location of the project, claiming: 'So many young families live here, there is only one way in and out, when something happens we are trapped.' The leader of the

local green/left party GroenLinks was fiercely against the project and stated; 'It's like NAM and Shell say, just jump into the water and we'll see who reaches the other side alive'.

In March 2008, the public-private Taskforce CCS was founded by the Ministry of Economic Affairs and the Ministry of Environment and Spatial Planning. Meanwhile, no decision had yet been made about the assignment of the grants in the tender procedure. In the same month, Shell visited the municipality for a meeting with the council. In April, Shell organized a second information meeting for the general public at the request of the municipality. Since the first meeting raised many technical and safety questions, a second meeting would create the opportunity to answer these questions and inform a larger group of citizens. The meeting attracted about 180 visitors. In contrast to the first meeting, there was much more debate with about 10-12 people asking many critical questions. Some people claimed they were not invited and wanted to know why (according to other sources, these people did receive an invitation). Shell attempted to answer all questions and concerns raised. There were so many questions that they could not all be answered that evening, but they were all written down and answered in the publicly available minutes of the meeting. However, local political parties and the local public were not convinced about the safety of the project and did not understand why Barendrecht was chosen as the project site. An interesting note is that members of the general public, when asked how they wished to be involved in the process, answered that the council of Barendrecht would represent their view thus negating the need for their direct involvement.

The second meeting differed from the first meeting in many ways. Firstly, this time nobody was present from the national government because the representative that had been invited cancelled shortly before the meeting. This means that Shell, NAM and the research organization TNO were the only parties presenting information about the project. Secondly, the presentation was slightly adjusted. The most prominent change was in one of the diagrams showing a cross section of the local geology with the location of the empty gas field, in which the trees on the surface were 50 times bigger than they would be when properly scaled. This remark was added to the slide next to the diagram, to stress that the field is located two to three kilometres underground.

Before the summer of 2008, the Ministers of Spatial Planning and Economic Affairs had a meeting with the Provincial Executive deputy of Zuid-Holland and the Aldermen of the municipalities of Barendrecht and Albrandswaard. The parties decided to put in place an administrative discussion platform, which they called BCO₂. The deputy (Erik van Heijningen) chaired the discussion. In addition, two working groups were created. First, a procedural

workgroup that would be concerned with, amongst others, the EIA procedure. Being a central player in the permitting process, DCMR was asked to guide the discussion process within this workgroup. Second, a communication workgroup was created. This team consisted of communication professionals of all stakeholders, including Shell.

The task of the communication workgroup was not to come up with a unified project communication strategy, but to synchronize stakeholders' communication activities. Parties discussed the idea of putting up a general website about the project. The municipality suggested that all information be put on the municipality website, but other parties disagreed, as they felt that this would not guarantee objectivity. Eventually it was decided that all parties would host their own websites and that these websites would be linked to each other. Furthermore, it was decided that Shell would refrain from public communication activities in Barendrecht for the time being, to prevent further growth in public unrest. Shell largely kept this promise, but did respond several times to misperceptions and factual errors in local media coverage of the project.

In June 2008, the municipal council proposed a motion to the executive board to act and speak as one in the debate about the CCS project. The motion was accepted. They agreed with the position that more research was needed before the project could be either accepted or rejected. A consultation structure ('klankbordgroep') was implemented in which the local party leaders discussed questions and concerns with regard to the CCS project with the Alderman. The green/left political party ceased to support the motion for several weeks. Going against the official position that more research would be completed before taking a stand either for or against the project, the party started mobilizing the public by organizing petitions and a demonstration walk entitled 'walk along against CCS'. The petition resulted in around 900 signatures and the protest march was attended by around 300-400 people. According to the leader of the party, participation in these events was considerable given the generally low interest of the people in Barendrecht in political actions and the limited publicity that had preceded the activities.

In July 2008, the Rotterdam Climate Initiative (RCI) published a report entitled 'CO₂ capture, transport and storage in Rotterdam' about the potential for CCS in the Rotterdam area. The main conclusion was that Rotterdam could start capturing, transporting and storing 5 million tonnes of CO₂ underground by 2015. By 2025, it would be possible to capture and store 20 million tonnes of CO₂ annually. The report was presented with an accompanying letter to the Dutch Prime Minister Balkenende. In the report, RCI stated that these goals would require considerable effort and decisiveness from regional and national government as well as the

EU, both in terms of providing financial resources and in developing clear legal conditions. With regard to Barendrecht, RCI mentioned that the procedure would have to be carried out very carefully and that DCMR had been appointed to mediate between parties and guide the process. Furthermore, the national government would have to be clear about responsibilities for monitoring the stored CO₂, given permanent storage.

In October 2008, an information meeting was organized for people in Albrandswaard, the municipality bordering Barendrecht under which a small part of one of the injections fields is located. Despite their involvement, neither the municipality nor the citizens of Albrandswaard have raised their voice in the debate. The municipality of Albrandswaard supports Barendrecht's point of view, but information meetings for the public have not been well-attended.

In November 2008, about 1.5 years later than originally planned, the national government decided to allocate €30 million to Shell for the CO₂ storage demonstration projects in Barendrecht. The other €30 million went to DSM for a storage project in Geleen. On December 11, 2008, Shell submitted the EIA and request for permits to the Province Zuid-Holland (which has to give environmental permit) and to the Ministry of Economic affairs (which has to give amongst others the permit related to mining law). Meanwhile, the municipality council and executive board have agreed upon a list of questions to be answered by the EIA committee. This so-called 'question checklist' was finalized on December 15, and was used to submit the municipal view on the decision to approve the EIA to the Provincial Executive and Economic Affairs in February 2009 (see below). The official stand of the municipality was that answers to the questions must be provided before a decision could be made, based 'not on emotions but on facts and figures'.

During the period January – March 2009, the administrative discussion group BCO₂ organized four meetings with independent experts to reflect on the research done for the EIA and to answer the questions in the 'question checklist' of the municipality. Results of this so-called knowledge roundtable ('kennistafel') were summarized in a report that became available in April 2009. The executive board of the municipality stated that based on satisfactory consideration of all questions, and clarification of the permitting procedure, municipal opposition to the project could be dropped. Meanwhile, however, local political parties continued to develop their own activities which received regular media attention.

The two most active parties, the Christian-democrate party CDA and the party Groenlinks ('Green Left'), both used different strategies. Whereas GroenLinks organized public protest

activities and public debates, the CDA discussed matters with other party leaders and members at national, provincial, and municipal levels. Although the CDA did not organize public protests, it kept the public informed of all activities through its website. Communication activities with other party branches included contact with the CDA in Geleen, where DSM was preparing the other subsidized CCS storage project. According to the CDA party leader however, the municipality in Geleen did not make an issue of the forthcoming project. Furthermore, in January 2009, the party sent a letter with questions to the Dutch Parliament and Senate. The party sought clarification on which decisions the municipality could make that would not be overruled by the national government after implementation of the new law national coordination regulation (see below). With regard to the legal requirements for the project, the main concern was the permanence of CO₂ storage and the issue of government liability.

On February 5, 2009, a news item appeared in the largest national newspaper in the Netherlands, De Telegraaf. The item also appeared in another national newspaper, De Volkskrant. Hydrology professor Cees van den Akker, who is one of the independent experts consulted by the municipality of Barendrecht as part of their 'question checklist', stated that there are still many uncertainties about CCS. He referred to the AMESCO report which stated that CCS demonstration projects should not be carried out in a densely populated area. He also stated that the safety of the project is not guaranteed. Although Shell claims that the technology is proven the professor pointed out that many things are still uncertain particularly with respect to impacts on the underground. The article also included the response of the municipality of Barendrecht which shared van den Akker's opinion. On February 8, 2009, the national television programme Buitenhof broadcasted a discussion between the chair of the Taskforce CCS and the leader of the local conservative/Christian party CDA in Barendrecht.

In the second week of February 2009, the decision of the Provincial Executive and the Ministry of Economic Affairs to approve the EIA was published both nationally and locally, after which an opportunity to submit views was given (a 6-week period from February 9, 2008 – March 23, 2008). Eventually 1.570 views would be submitted, including a form signed by over 900 concerned citizens of Barendrecht. This form had been provided by the green/left party. The party had announced the possibility to submit views in the local newspaper and asked everybody who wanted to object to the plan to do so, providing the form for convenience.

On the morning of February 18, 2009, the national newspaper Algemeen Dagblad published an article about ducks that died as a consequence of leakage in a pipeline of OCAP, which

transports CO₂ to the greenhouses for the growth of vegetables. The newspaper mentioned that the leakage, which ‘remained undiscovered for a long time’, is salient in light of Shell’s plans in Barendrecht. Shell and Ocap stated that this situation is incomparable to the project in Barendrecht. Firstly, the structure of the leaking pipeline is entirely different from the one that will be used for CO₂ transport in Barendrecht. Secondly, the leakage occurred under a bridge where the ducks were sleeping, causing them to be exposed to the CO₂ long enough to be killed.

The same evening, the municipality hosted a public meeting and an information kiosk for the people in Barendrecht which was visited by over 1,000 people. All citizens of Barendrecht had been personally invited by a letter. To the disappointment of all organizers (the communication workgroup from BCO₂), no national NGOs were present at the information kiosk. Greenpeace sent a set of brochures that explained their general view on CCS in relation to coal plants. According to a report describing the meeting, Shell claimed that the project was not profitable. This remark was heavily debated afterwards. Shell also claimed they would take into account public opposition, although this was not widely believed by the general public.

On March 1, 2009, the so-called ‘national coordination regulation’ (rijkscoördinatiereregeling or RCR) took effect (see above). The municipality in Barendrecht perceived the RCR as a means of forcing them to accept the CCS project. On March 13, 2009, the Dutch environmental education organization MilieuCentraal launched the website www.co2afvangenopslag.nl. This website contained neutral, reliable information about climate change, CO₂ emissions, and CO₂ storage that has been written and approved by an independent editorial board with partners from government, industry, science, and NGOs. The website was built upon request of the national government. Although this joint stakeholder initiative was meant to represent a broad range of views thus guaranteeing a degree of impartiality, due to the occurrence of several other events in the same period the website was not positively received and was considered to be pro-CCS propaganda from Shell.

On March 18, the information centre CO₂ storage was opened in a shopping mall in Barendrecht near one of the CO₂ injection sites. The centre was funded by the Ministries of Economic Affairs and Spatial Planning, with contributions from Shell. Its aim was to inform the general public about all aspects of the project and opinions about CCS in Barendrecht. The centre offers information about CO₂ transport and the various aspects of storage, such as geological aspects, risks, and safety issues. Furthermore, the information centre offers information about the procedure and possibilities for participation in the decision making

process. Visitors can walk in and ask employees any questions. Employees of the information centre are hired through an employment agency. They have no background in communication. Occasionally, an employee of Shell or DCMR staffs the information centre. In the first weeks of its existence, a Shell employee was present one day a week.

Between March 18 and October 14 (seven months), the centre attracted 889 visitors representing an average of almost 32 a week and 7 a day. The centre attracts most of its visitors when an event takes place, such as a visit of a Minister. Visitors also include members of the press who attend such an event. Typical days in the information centre can be very quiet. In the first 2.5 months of its existence, there were 546 hits on the information centre's website with an average of 7-8 hits a day. The centre undertook various efforts to increase the number of visitors by approaching a broad array of local organizations such as schools, youth and elderly associations, churches, and other volunteer organizations. In general, however, these organizations showed little interest in being informed by the information centre.

We asked the information centre employees what type of information visitors are most interested in and which questions they ask. Visitors wanted to know whether their house is on top of a storage site, whether the project is dangerous, whether their house will decrease in value, and why this project has to take place in Barendrecht. When the information centre first opened, most visitors simply wanted to demonstrate their distrust of authorities involved and express their feelings of powerlessness in the face of yet another industrial project in their area. Referring to a diagram similar to figure 3 in this report, most visitors are keen to determine if their house is on top of an injection area.

Although many visitors lose interest in the project once they discover their house is located outside the injection area, many are keen to learn more about the risks – particularly the long-term consequences of underground storage. The following information sources at the centre are also consulted: the EIA summary, the panel featuring local newspaper articles, and only limited interest in the representation of the formal decision procedure. People also questioned the objectivity of the information given the favourable attitude towards CCS of all parties involved. At first, many people thought the information centre was owned by Shell given the prominence of three Shell information panels located opposite the entrance and the regular presence of a Shell employee.

The parties involved in the information centre – The Ministries of Spatial Planning and Economic Affairs, Shell, TNO, OCAP, DCMR, and the Province Zuid-Holland took various

efforts to position the information centre as a source of objective information about the project and on the opinions of various stakeholders on CCS. The logo, templates for information displays, and the interior were especially designed for the information centre. The information that can be obtained in the centre includes a brochure with opinions on CCS from Greenpeace, SNM, the leader of the local conservative/Christian party CDA, and the director of the Taskforce CCS.

Despite these efforts, not all residents view the information centre as an objective information source. Given the prominence of the Shell displays, and their location near the centre entrance, the employees are regularly asked if they work for Shell and if the information centre is owned by Shell. Interestingly, the prominence of the Shell displays seems to be coincidental. Although initially corporate logos were not displayed, visitors to the centre mistook this for mutual endorsement of information by all partners with displays in the centre. In order to distinguish between the presentation of information from different stakeholders, corporate logos were later added to the display panels. Together with the absence of information from NGOs (who refused to provide information), this may have caused some visitors to doubt the objectivity of the information presented.

According to its website, the municipality of Barendrecht took part in the information centre as well. However, the municipality and local political parties did not actively use the information centre as a communication channel instead choosing to display information in the lobby of their office building. The municipality was not initially in favour of the information centre, and even questioned whether it was legally possible to refuse granting a permit for its location in the local shopping mall. One of the reasons for rejection of the information centre was that at the time the information centre was opened, the municipality did not yet know if it was going to approve the project. Opposition to the project however, interpreted the establishment of the information centre as an indication of project approval.

In March 2009, the cover of the popular science magazine *Nature and Technology* ('Natuur en Techniek') showed a fictitious picture of a CO₂ explosion in Barendrecht. The article in the magazine mentioned that CO₂ storage is less safe than it appears based on the applicable science. According to the magazine, the models on which the safety of CO₂ storage is calculated are inaccurate. These models overlook the impact of the lack of CO₂ dispersion in the event of a leak for example, claiming that it is possible for CO₂ leaks to remain behind buildings or dykes. It also points out that the local fire department in Barendrecht is located close to one of the injection wells, making it extremely vulnerable to leaks. In a response to the article, Shell revealed its frustration with the presentation of extremely misleading

science. According to Shell, this article will only ‘strengthen the emotions already present in Barendrecht’.

On April 24 2009, the EIA committee published its account of all stakeholder views and the issues raised as part of the ‘knowledge roundtable’ held in the presence of appointed experts. The information centre reported that few visitors were aware of the EIA publication and that very few questions were asked. In the weeks that followed, information centre employees did not notice any significant increase in the number of visitors or in the type of questions asked since the publication of the EIA report. Despite low levels of interest, questions that were asked became more technical in nature.

In May 2009, representatives of Shell gave lectures at the local Rotary and Lions clubs. The information centre and NAM organized two excursions for the local public to one of the CO₂ injection wells, where a gas installation of Shell/NAM is located. The excursion dates were announced in the local newspapers and on the website of the information centre. The excursions were preceded by an explanation about the project at the centre itself by its employees, who preferred to use the information panels of Shell for this explanation given their clarity. The first excursion on Saturday May 9 attracted 19 visitors, among who was a journalist who wrote a report about the excursion for the local newspaper De Schakel. The headline of this article was ‘Information centre tells the half truth about CCS’, suggesting that the excursions were industry propaganda.

The second excursion on May 30 was preceded by a visit of the Provincial Executive deputy Erik van Heijningen to the centre. This event received more publicity than the previous excursion, and the press was also invited. Despite these efforts, only 17 people were present including the first author of this report. Furthermore, only three of the attendees were citizens who were not officially involved in the process through their job or through political activities. They asked critical technical questions for example, about the pressure and amount of energy needed for injection. Both the first author of this report and employees of the information centre questioned general public interest in the project given that only 3 out of 17 visitors involved in the second site visit were not directly connected to the project.

In May 2009, the information centre became part of the communication workgroup and was informed of ongoing developments. In a meeting on May 27, 2009, the municipal executive board took a principal decision to say no to the CCS project given that a number of questions as written down in their checklist had remained unanswered. Unaware of the national coordination regulation (RCR) and its consequences, visitors to the information centre were

surprised to learn that the future of the project would be based on a decision from the national government separate from any municipal decision. Questions at the centre were increasingly related to developments in real estate value and to the actual financing of the information centre.

On June 2, 2009, the local green/left party organized a debate about alternatives to CCS to curb climate change although it did not attract many visitors. On June 20, 2009, both the Ministers of Spatial planning and of Economic Affairs paid a visit to Barendrecht to talk with the local authorities and with the residents of the area. Minister Cramer also visited the information centre. Speaking to a group of around 40 citizens for an hour and a half, the Minister answered questions from both the public and the media. She stated that the procedure had been started incorrectly and that it will be reviewed with promises to inform citizens about the procedure upon further request. Both the public and the media were satisfied about the direct and open way in which the Minister spoke with them.

On June 8, 2009, the decision of the executive board was discussed in a meeting with the municipal council. On June 29, the municipal council reconfirmed its decision to refuse development of the CCS project. The Ministers of Spatial Planning and Economic Affairs sent a letter to the municipality of Barendrecht, stating that they would treat decisions around the project carefully and after discussion with the municipality, and that they understood that the municipality must have felt overwhelmed by the rapid developments. In the information centre, the employees noticed that visitors are generally unfamiliar with the objections of the municipality to the project. The number of visitors that expressed their objections declined, while the number of visitors simply interested in obtaining information increased.

During the summer and fall, employees of the information centre noticed a shift in the type of questions from the public which started focussing more on the decision making process than on risks. They also perceive an increase in demand for printed information. Some people were under the impression that the project would not continue, but did not indicate why they thought so. Some visitors notice the lack of municipal information provided at the centre. Students have started approaching the centre for school projects.

In September 2009, having not yet formed an opinion on CCS, the Provincial Council discussed the results of the municipal CCS question checklist. In October 2009, a government press release revealed that TNO completed additional research on suitable locations for CCS in the Netherlands. The results were confirmed by the independent verifier DNV (Det Norske Veritas). The municipality responded in turn through a press release and a press conference,

declaring their satisfaction with the existence of other injection sites. In the weeks before the TNO research results were made known, local Barendrecht citizens publicized the formation of a local activist group called 'CO₂ is no' through the local newspaper De Schakel. The mascot of the group is a guinea pig named 'Cootje'.

Despite opposition from both provincial and municipal governments due to safety concerns, the Ministers officially announced their decision to approve the project on November 18, 2009, stating that the project is safe and that it is necessary to buy time in order to secure other sustainable energy solutions. They also stated, however, that the injection of CO₂ in the larger of the two empty gas fields below Barendrecht will only continue if injection in the smaller gas is demonstrably safe. In a media response, the municipality stated that 'Shell has taken the government hostage.'

In December 2009, both Ministers visited Barendrecht to explain their decision in a public meeting at the local theatre in the presence of 600 people. Another group of citizens of an unknown size watched the meeting at the town hall, where it was broadcasted live. According to the second author who attended the meeting at the town hall, the entire audience was strongly opposed and had come to voice their opinion to the Ministers. The discussion leader attempted to make the public take turns in asking questions to the Ministers, but to no avail. The Ministers were continuously interrupted by boos, whistles, and cries of disapproval. The Public response consisted mostly of speeches from audience members stating that the process of decision making had been undemocratic and that they would never allow the project to continue. These speeches were continuously followed by rounds of applause.

This meeting made clear that the final stage of the development in stakeholder relations had been achieved. The relations between the most important stakeholders – the national government, local authorities, the project owner, and now also the general public – had become completely polarized, lacking any mutual understanding, trust, or respect, thus disabling any type of effective dialogue. At the time of finishing this report it was unclear which steps would be taken next, and by whom. The municipality has however, already announced its continued opposition to the project through all possible legal means which will probably result in the stakeholders going to court and eventually the Council of State.

iv. Municipal and Public Concerns

With regard to the decision making process, the municipality thinks that first a SEA ('planmer') should have been performed in the initial stages of project planning in order to study a number of different locations. To the municipality, it is not evident why the first onshore CCS demonstration project has to take place in a densely populated area such as Barendrecht. The municipality has pointed out that Barendrecht has faced many infrastructural projects in recent years, causing inconvenience to the local community. Furthermore, the municipality points out that Barendrecht is in some respects not a suitable location according to the AMESCO study.

With regard to the legal requirements for the project, the main concern is the monitoring of the stored CO₂. Although the CCS EU directive states that the project developer has to look after it for the first 30 years and that after this period responsibilities will be taken over by the national government, a number of questions were raised about how this would be organized in practice. It was unclear whether Shell would devote enough resources for monitoring throughout the 30-year period, and who would claim responsibility after the 30 year period ended.

Concerns directly related to the project were mainly about safety. The municipality disagreed with the conclusion in the EIA that 'existing technology' was being used, referring to questions raised in the AMESCO study which are not all addressed in the EIA report. As a result, Shell's statement that population density is an irrelevant parameter is disagreed with as well. The issues discussed were: the risk of leakages at the injection well; the high pressure needed to inject the CO₂ underground; the permanence of CO₂ storage and the increased likelihood of long term risk. Safety calculations were criticized for being based on models and not on real-life experience. One of the independent experts that were hired to advise the municipality pointed out in the media that there are actually many uncertainties concerning the geological consequences of CCS. Little is known, for example, about seismic activity and its consequences. The municipality considers the safety to be insufficiently guaranteed. Furthermore, the municipality states that the risk analysis made in the EIA is incomplete as it does not consider morbidity issues such as illness and psychosomatic effects of the project on public health.

The local politicians we interviewed questioned whether the scientific research concerning CO₂ storage in Barendrecht was objective and unbiased, due to the lack of research carried

out by independent institutes (that is, institutes which are not somehow related to Shell, or have been related to Shell in the past). One of the party leaders said that this was not a matter of distrust in the parties who had carried out the research, but rather a fear of the emergence of ‘groupthink’ among the parties currently involved in the research. She pointed out that since TNO employees are in some cases ex-employees of Shell, and the EIA commission contains ex-employees of both Shell and TNO, all researchers involved work from the same frame of reference, which may blind them to certain results and influence their interpretation of model outcomes. She therefore insisted that independent research be carried out by third parties. The other party leader was against the project in spite of any additional research, stating that CCS is not a real solution to the climate problem. With regard to the independency of research, she suspects that project developers will overcome any unwelcome results given the perceived importance of CCS.

With regard to the distribution of costs and benefits, the municipality pointed out that the region has already faced many infrastructural projects and that people are tired of them. They think that Barendrecht has done enough for the country already. Furthermore, the public fears a decrease in real estate value. Finally, the municipality thinks that not enough attention had been paid to the research related to the possible occurrence of diseases and possible psychosomatic effects on the citizens resulting from the project. At the same time, project developers will hugely benefit from the project in multiple ways by obtaining government funding to pollute. This is perceived as unfair, as it deviates from the ‘the polluter pays’ principle.

Relating to CCS in general, some protesters question the effectiveness of this technology altogether and mention that there may be better alternatives available particularly renewables. Greenpeace, for example, states that CCS development is just an excuse for continued use of coal and the building of new coal plants. According to Greenpeace, CCS is unnecessary if we put the money that is now allocated to CCS development into renewables. Another argument is related to so-called climate scepticism: Some protesters question the anthropogenic nature of climate change and hence, see no need for CCS at all. Although proponents of CCS are quick to label these protesters as climate sceptics, thereby implying that these people must not be taken too seriously, we have noticed that in the present discussion, arguments related to climate scepticism were among the last arguments mentioned. To the researchers, this indicates that displays of doubt in the anthropogenic nature of climate change are a ‘last resort’ in the discussion with proponents rather than a reliable representation of someone’s opinion.

After reviewing the process, however, our conclusion is that the municipal opposition was not based primarily on fears related to technology risk or doubts about the objectivity of the research performed. Although questions about safety were among the first to emerge, the municipality stated that its decision was not driven by fear of the risks. Rather the issue seemed to be about the procedure followed and how the municipality perceives its position versus the other stakeholders. With regard to the procedure, the municipality questioned what it perceived to be a 'false start' in the information provision process. Clearly, the municipality felt overwhelmed by the speed with which CCS was put on the national policy agenda and the prominence of Shell's proposed CCS demonstration project in Barendrecht as part of this discourse. With regard to the independence of the research, independent research has been performed in order to seek a second opinion, but did not end up influencing the municipal decision. Therefore, the reason behind the demand for independent research may be more interesting than the research itself. The municipality faces strong and powerful stakeholders who are in favour of the project, most notably the national government and Shell. Compared to the government the municipality has little decision making power, especially after the installation of the national coordination regulation (RCR). In all likelihood, this regulation has strengthened local politicians' perception of not only being overwhelmed, but also overruled. Discussing safety issues and the independence of the research may have seemed the best options for having a say in the project.

5. Communication and Participation

i. Main Topics in Media

The Barendrecht project has received international media attention, including an article in the Washington Post, and a story for the British Broadcasting Corporation. In the Netherlands, the following topics received regular media attention:

- ✓ References to previous accidents involving CO₂: lake Nyos in Cameroon in 1986 (1.700 people and thousands of animals died); lake Monoun in Cameroon in 1984 (300 deaths); a leak in a CO₂ tank of a fire extinguishing installation in Mönchengladbach in Germany in 2008 (100 people treated for respiratory problems), and CO₂ leakage from the Sleipner-field in Norway (no casualties reported – opponents regularly referred to this story although there is no evidence that there has actually been a leak in Sleipner); incident involving dead ducks due to a leakage in CO₂ pipe under a bridge in the Netherlands.
- ✓ Reference to experts who doubt the safety of CCS: Professor van den Akker, a Dutch Hydrologist hired by independent research organisation Det Norske Veritas (DNV) to

advise the municipality of Barendrecht; Peter Haugan, Norwegian geologist who was at first a proponent of CCS but recently changed his mind.

- ✓ References to features of CO₂. Above a certain concentration, CO₂ in the air is lethal. This is illustrated by stories about CO₂ being used in the meat industry to kill pigs and chicks. Also historical reference to canaries being used in the mining industry as warning signals.
- ✓ References to the consequences of underground storage. Who knows how the underground will behave and how can we be sure the CO₂ remains underground forever? References to decrease in underground productivity in the north of the Netherlands (Slochteren, the Netherlands) as a result of gas recovery; reference to waste that was supposed to stay underground permanently but came up again and/or caused underground pollution (Lekkerkerk, the Netherlands).

Regarding media impact on the project development, we conclude that the media in general mirror and reinforce developments in public concerns and stakeholder relations rather than shape them. This is also the view of most stakeholders we interviewed, although to a lesser extent for local media which at times have shown a bias towards the project opponents.

iii. Summary of Stakeholder Views and Relations

Throughout the project, all stakeholders have communicated extensively with each other. From 2007 onwards, the municipality of Barendrecht got regular visits from various stakeholders from governments and industry in favour of CCS. For example, in September 2008, shortly after the municipal motion was accepted, Ruud Lubbers, chair of the RCI, visited the municipality of Barendrecht to discuss the CCS project. In October 2008, Minister Cramer of Spatial Planning visited the municipality. She paid a second visit in June 2009, shortly after the municipality made its final decision against the project. Each of the Ministers has visited Barendrecht regularly throughout the project planning procedure to listen to the public concerns, and also entered the dialogue with members of the general public by paying visits to the information centre and to people's homes. The municipality also received regular visits from the Provincial Executive deputy Erik van Heijningen and several other local and national politicians.

A structure for regular meetings was in place as well in the aforementioned BCO₂ meeting and two workgroups: a procedural workgroup for discussing the EIA procedure and a communication workgroup. To answer all questions raised by the municipality about the project, four roundtable sessions were held with independent experts. The EIA committee also answered a part of the questions. Furthermore, additional research was carried out by

independent parties on alternative project locations, psychosomatic consequences of the CCS project in Barendrecht, real estate value, and legal issues. Clearly, all stakeholders have put serious effort into solving the issues raised by the municipality. To stakeholders in favour of CCS, it is therefore unclear why despite all these efforts, the view of the municipality has not changed.

As we suggested before, the persistence of the municipality in voting against the project even after every request for additional research had been fulfilled, indicates that the availability and validity of research about project safety and other aspects may not be the key issue. Rather, the problem seems to be how stakeholders perceive each other and how they view their own role in the process. The municipality, having to face strong proponents such as the national government and Shell, may have felt isolated and powerless. Indeed, the new regulation RCR caused the municipality to lose an important part of its formal influence on the project outcome. Thus, the municipality was forced to take a defensive stand and remained against the project, amongst others referring to a lack of acceptance among the general public.

As a result, representatives from Shell and the Dutch government perceive the municipality to have pushed the entire community into a 'no' position by preventing the public from forming an opinion based on balanced information. They state that the municipality is to blame for the current public opposition to the project, and was negative about Shell and the project from the very beginning on irrational and opportunistic grounds. With the 2010 municipal elections in sight, project opponents are suspected of having used the project as political leverage. Those in favour of the project point out that, in fact, the alderman of the executive board in Barendrecht was initially in favour of the project. Later he changed his view, presumably under pressure of the municipal council. Similarly, the Provincial Executive deputy was in favour of the project at first. However being a representative for the Provincial Council as well, his support for the project gradually became less outspoken as well. Both Shell and the taskforce CCS question the notion that opponents to the project have used facts and figures in stating their position.

Following from our conclusion that the present situation is more likely to result from dissatisfaction with the procedure than with project safety, we think the procedure should be reviewed if one desires to draw conclusions about what happened. For example, the role of DCMR as mediator in BCO₂ may have better be played by an independent mediator. Who is carefully selected and agreed upon by all involved. According to DCMR, who acknowledges that its position is difficult, they suggested to the municipality that an external mediator should have guided the process. For unknown reasons, the municipality found this

unnecessary. However, it is also clear that the Municipality views DCMR more as a governmental organization than as an objective mediator. In hindsight, having an independent mediator would have had advantages. Amongst others, such a person or organization would have been able to distinguish between stakeholder agendas and any perceptions stakeholders may have of each other, and having stakeholders resolve these matters before they would get in the way of effective communication.

Another factor that would have facilitated the procedure is if the Dutch government would have communicated its vision on CCS in general and the Barendrecht project in particular more explicitly and proactively from the start of the tender procedure, or even before. Indeed, government representatives acknowledge that in hindsight, they could have better discussed the necessity and the benefits of CCS. It should have been more clearly explained to people why CCS was necessary as part of a suite of options. However, according to several employees who were involved with CCS in general or specifically in Barendrecht, nobody had foreseen that this would become such a big issue in terms of public perception. Another reason may be that the government has been unable to keep up herself with the rapid growth of interest in CCS. Amidst all regulatory, legal, and financial issues that have to be arranged, timely allocation of sufficient resources (budget, time, expertise) to public communication activities may have been problematic.

Summary of Public Communication and Participation activities

As mentioned in the previous section, a leading role of the national government in public communication on CCS from the very start might have facilitated more constructive interaction between stakeholders about the project. Furthermore, it would have facilitated the creation of a unified local communication strategy endorsed by all stakeholders, instead of the separate communication channels that were in place now.

The information centre could have played a central role in objective communication, but failed amongst others because the municipality and NGOs refused to participate. As a result, citizens have doubted the objectivity of the information centre. This could have been solved in part by stronger references to other unbiased and balanced sources of information. For example, the information centre's website refers to the objective website www.co2afvangenopslag.nl, but no reference to this information source is given in the centre itself. Furthermore, the objective and balanced expert information on CCS options that has been created for research purposes in the national research program CATO could have been of use to the information centre as well.

The current approach used in the context of public communication is strongly focused on telling people facts, figures, and socially desirable reasons for carrying out this project (we do this to prevent climate change). This approach is based on the belief among project proponents that if convincing scientific evidence of the project's safety can be demonstrated to the public, and if the public understands this information, the technology will be accepted. In Barendrecht, Shell made a serious effort to explain all project details in an understandable way in order to assure the public that the project is safe. Shell has also visibly worked on improving its communication strategy throughout the course of the project. For example, in its project diagrams Shell has started using proper scaling of objects that are familiar to people, such as trees and buildings.

When public protest persisted, Shell attributed this predominantly to people's inability to understand the technical project details. According to Shell, every rationally thinking person should be able to conclude from the factual information that the demonstration project is safe, and also sensible given climate change. However, less attention was paid to other questions, such as why Shell and the government want to do this, why it has to take place in Barendrecht, to what extent this really contributes to the climate effort, and which other reasons may exist to do it. Proponents of CCS only show limited awareness of the extent to which issues of stakeholder trust and credibility mediate information processing. Communication about project costs and benefits is only successful if the public trusts the communicator to give objective and balanced information.

As a result, several claims in Shell's communication strategy seem to have backfired. First, the strong safety claim. Shell has stated several times that the label 'demonstration project' refers to lessons to be learned in areas such as legal procedures, regulations, and monitoring, but not to technological lessons because the technology has been proven. However, their EIA report does state that the project will provide technical lessons since there are still uncertainties, be it predominantly with regard to integration. Although the technology has been tested, for example as part of gas storage or enhanced oil recovery, the Barendrecht project will be different: this will be the first onshore integration of the entire CCS chain with the aim of injecting CO₂ into an empty gas field. Therefore, admitting that research on CCS chain integration is still in progress may have been a more effective strategy in public communication. Another claim that may have backfired is that Shell will not make money from this demonstration project. Even though it is true that in years to come Shell's investments will largely outweigh expected benefits, this is of course a strategic investment.

This is nothing a commercial project developer has to be ashamed of. But instead Shell has promoted its contribution to the climate effort, which the public finds hard to believe.

Arguments used by opponents, whether about risks or personal disadvantages such as decreased property value, are often perceived by project developers and other project proponents as unfounded or invalid. However, in agreement with previous research, the primary explanation for public opposition to CCS in Barendrecht seems to be the way in which decisions about the project were taken rather than particular characteristics of the project itself. That is not to say that these arguments played no role at all. CCS is a new, unknown technology. Unknown generally means unloved. A significant number of people may really fear leakage or be worried about the permanence of storage and the accuracy of monitoring. However, the way in which project developers answer to such concerns largely determines the development of public protest. Therefore, effective communication requires all stakeholders involved to make an effort to understand and acknowledge the reasons for each other's actions. Amongst others, this means that if stakeholders consider particular public concerns nonsensical they must still pay serious attention to them and ask themselves why these concerns would be raised. Only if this is known, can an adequate response to the concern can be given.

6. Conclusions

The general dynamics of the CCS project in Barendrecht can be summarized as follows. As is common in similar industrial projects, the project developers have started to inform the people in Barendrecht about their plans. However, project developers have a stake in the project by definition and are therefore not highly trusted sources when it comes to issues of safety or costs and benefits. Because the plan had not yet received funding, it was not yet publicly endorsed by the Dutch government. As a result, the project rationale and benefits remained implicit and the public perceived Shell to be the only beneficiary. The public, mostly members of the Council, raised concerns about the project which Shell was unable to answer by itself. Shell's expectation that the facts and figures would convince the public led them to label the persisting questions and concerns about safety as 'emotional' and 'irrational'. As a result, opponents felt that they were not taken seriously. Next, several members of local political parties took the lead in organizing both formal and informal (public) protest activities, while the media started reporting on the project as well. Mainly following developments, the media reinforced stakeholders in their perceptions of each other – the view proponents have of opponents as emotional, and the view of opponents of proponents as dishonest. A process of arguing and counter-arguing followed, leading to

further polarization between proponents and opponents. At the current time, stakeholders are deeply entrenched and effective dialogue has become nearly impossible due to the way they perceive each other.

With regard to communication and participation in future CCS projects, the following recommendations can be given. The first recommendation is that people should be informed about and involved in the project as early as possible, preferably by a consortium of stakeholders including the project developer, national and local authorities, and local interest groups. This requires that these parties first inform each other and reach agreement about the project requirements and the communication strategy, before any of them starts communicating.

The second recommendation is that a dialogue with the public should be based in mutual understanding of each other's knowledge and viewpoints. Mediation may be needed to help avoid common pitfalls between project proponents and opponents in discussions. For example, those in favour of a project deem the opposition 'emotional', 'irrational', or being rooted in NIMBYism or climate scepticism. Several stakeholders have stated that non-technical people are more often opposed to the project than those with a technical education, thereby suggesting that lack of understanding is a main cause of protest. However, people should not be downplayed because their arguments are perceived to stem from a lack of technical knowledge, thereby implying that their concerns are invalid. Even if their concerns are indeed invalid, they will affect their view on the project. As the Thomas Theorem goes: 'If men define situations as real, they are real in their consequences.' But perhaps more importantly, the way in which project developers deal with questions and concerns will largely determine their image. Shell's perceived arrogance may stem at least partly from their struggle to understand why people are still worried despite all scientific evidence that the project is safe.

The third lesson relates to the key issues needed for effective dialogue with the public. Based on the present case, we identified four issues that seem generally relevant to CCS projects and also to energy and climate in general.

First, in public communication it should be explained why the project is necessary. This requires stakeholders, led by the national government, to explain which solutions to climate change are available and why the present solution is chosen here and now. This can only be done, however, in the presence of a general vision and strategy at both national and regional

level with regard to energy solutions in general as well as the specific type of solution at hand (in this case, CCS).

From this follows the second recommendation: the national government should take the lead in developing a clear and strong view on energy solutions in general and CCS in particular. Subsequently, in communication about the Barendrecht CCS project, the project can and should be placed in a broader discussion context about energy solutions. At the regional level, clarity should be given about the place of the project in the general strategy to reduce CO₂ emissions in the Rijnmond area.

Third, clear national and local regulation needs to be in place for CCS. Shell faced many difficulties in project development as a result of inconsistencies and delays in national goals, rules, and funding. Not only did this delay the project, but lack of clarity from the national government about what the project is meant to accomplish also negatively affected the process of local political decision making and the public participation process. The discussion that followed apparently revolved around safety and health issues, but actually resulted from dissatisfaction with the decision making process. In the end, the discussion did not resolve anything and became a tiresome process for all of those involved.

Fourth, attention should be paid to equity in costs and benefits. Existing perceptions about stakeholder motives, whether true or false, will affect perceptions of credibility and trustworthiness. Stakeholders should therefore be transparent about costs and benefits from the very beginning, as this question is strongly tied to perceived stakeholder motives. Shell may not benefit from the particular demonstration project in Barendrecht, but hopes that her know-how of CCS will pay off in the long run. There is nothing wrong with a commercial entity in admitting to a profit-making motive, and that climate change is not the only motivating factor behind project implementation.

That said, a general recommendation with regard to effective communication strategies is that as part of public communication, one may consider the need to motivate the development of CCS projects by not exclusively referring to climate change. To a large part of the general public, the story of climate change is either too difficult to understand, or just not seen as relevant to them personally. Up to now, project proponents have unsuccessfully attempted to marginalize the so-called climate sceptics in the discussion. Therefore we recommend that stakeholders explore other arguments for CCS that may have a more direct relevance to the public, such as economic gain for their region and country (long-term economic prospects of the Rotterdam harbour) or technological achievements (Rotterdam harbour being a clean

technology leader, combining CCS with biomass in the Rotterdam area in the longer term) which may result in international influence and prestige.

Questions remain to be answered about the size and location of public opposition. A recurring statement in communication from the municipality and in media coverage of the Ministerial decision is that ‘all residents in Barendrecht’ are afraid or worried. However, after studying the case materials, our conclusion is that none of the stakeholders involved actually knows how many residents, in terms of numbers or percentages, are either in favour, against, or indifferent to the project. All we know is that up to now, the protest against the project has been led by local politicians. Only recently, a public action group has been formed. Although one may conclude from the relatively large and still growing numbers of people who sign up to the action group, attend public meetings, sign petitions, and participate in other actions, that the project is apparently a concern to a larger number of people than previous projects in the region, it is also known that people who are either in favour of or indifferent to the project largely remain invisible. We therefore recommend that future CCS project communication plans are preceded by research which both aims to identify key groups and individuals to involve them in the decision making process, as well as identifying the main concerns these stakeholders may have.

BIBLIOGRAPHY

Agterbosch, S.J., Vermeulen, W., & Glasbergen, P. (2004). Implementation of wind energy in the Netherlands: The importance of the social–institutional setting. Energy Policy 32, 2049-2066.

Jason Anderson; Heleen de Coninck; Paul Curnow; Todd Flach; David Reiner; Peter Richardson; Simon Shackley; Paul Upham; Gudmundur Sigurthorsson. “Summary of the Main Findings and Key Recommendations: Final Report from ACCSEPT”, December, 2007, 6th Framework Programme.

Ashworth, P., Pisarski, A., Littleboy, A., (2006). Understanding and incorporating stakeholder perspectives to low emission technologies in Queensland. Final Report for the Centre for Low Emission Technology.

Augustiniak, H. (2006): Knoblauch – Die Geschichte eines vergessenen Dorfes. Ketzin: Heimatverein Ketzin.

Baxter, Pamela; Jack, Susan; “Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers”, The Qualitative Report, Volume 13, no. 4, December, 2008.

Bell, D., T. Gray, Haggett C., (2005). "The "Social Gap" in Wind Farm Siting Decisions: Explanations and Policy Responses." Environmental Politics 14(4): 460 - 477.

Bonaiuto, M., G. M. Breakwell, Cano I., (1996). "Identity processes and environmental threat: The effects of nationalism and local identity upon perception of beach pollution." Journal of Community & Applied Social Psychology (6): 157-175.

Bradbury, J., Ray, I., Peterson, T., Wade, S., Wong-Parodi, G., & Feldpausch, A. (2009). The Role of Social Factors in Shaping Public Perceptions of CCS: Results of Multi-State Focus Group Interviews in the U.S. Energy Procedia, 1(1), 4665-4672

Breukers, S., & Wolsink, M. (2007). Wind power implementation in changing institutional landscapes: An international comparison. Energy Policy 35, 2737-2750.

Brown, B. and D. D. Perkins (1992). Disruptions in place attachment. Place Attachment. I. Altman and S. Low. New York, Plenum,.

Burgess, J., C. Harrison, et al. (1998). "Environmental communication and the cultural politics of environmental citizenship." Environment and Planning A **30**: 1445-1460.

Burningham, K. (2000). "Using the language of NIMBY: a topic for research not an activity for researchers." Local Environment **5**(1): 55-67.

Buxton, R (2007a): Richard Buxton (for Safe Haven) v. Milford Haven Port Authority, Website <http://www.richardbuxton.co.uk/v3.0/?q=node/62>, accessed 30.10.09

Buxton, R (2007b): Neath Port Talbot v. Linda Ware, Website <http://www.richardbuxton.co.uk/v3.0/?q=node/102>, accessed 30.10.09

Camp for Climate Action (2009): website <http://www.climatecamp.org.uk/> accessed 30.10.09

CBS (008). Gemeente op maat 2006: Zijpe. Centraal Bureau voor de Statistiek. Voorburg/Heerlen, 2008.

CBS, 2009. Population, sex, age, citizen state and region. Available online 6/11/2009: - <http://statline.cbs.nl>

CEA, Bureau voor implementatie van beleid B.V. (2007). Windbeleid Zijpe 2007: Herziene visie van de gemeente op de ontwikkeling van windenergie. Delft/Schagerbrug, maart 2007.

Centre for Sustainable Energy (2005). Community Benefits from Wind Power. A study of UK practice and comparison with leading European countries, CSE. <http://www.cse.org.uk/pdf/pub1049.pdf>.

Chawla, L. (1999). "Life paths into effective environmental action." Journal of Environmental Education **31**(1): 15-26.

Clark, R (2008) "LNG pipeline project wins sustainable award" Western Mail, 8.6.08

Communities and Local Government (2009): Planning Act 2008 – Planning, building and the environment. Website

<http://www.communities.gov.uk/planningandbuilding/planning/planningpolicyimplementation/reformplanningsystem/planningbill/> accessed 30.10.09

De Best-Waldhober, M., and Daamen, D., 2006. Public perceptions and preferences regarding large scale implementation of six CO₂ capture and storage technologies. Centre for Energy and Environment Studies, Leiden University.

De Best-Waldhober, M., Daamen, D., Hendriks, C., de Visser, E., Ramírez, A., Faaij, A., 2008. How the Dutch evaluate CCS options in comparison with other CO₂ mitigation options Results of a nationwide Information-Choice Questionnaire survey. Report of the CATO Project.

de Figueiredo, M. A., 2003. The Hawaii Carbon Dioxide Ocean Sequestration Field Experiment: A Case Study in Public Perceptions and Institutional Effectiveness. Massachusetts Institute of Technology Master's Thesis.

Denkstelle Hamburg (Mai, 2009): Haltungen zu CCS. Ergebnisse der quantitativen Studie.

Department of Energy and Climate Change (2001a): DTI: Oil and gas Directorate – Regulation: Guidance Notes. Part A Legislation. Website https://www.og.decc.gov.uk/regulation/guidance/pipeline_act62/parta.htm accessed 30.10.09

Department of Energy and Climate Change (2001b): DTI: Oil and gas Directorate – Regulation: Guidance Notes. Part B Applications for a pipe-line construction authorisation. Website https://www.og.decc.gov.uk/regulation/guidance/pipeline_act62/partb.htm, accessed 30.10.09

Devine-Wright, P. (2005). "Beyond NIMBYism: towards an integrated framework for understanding public perceptions of wind energy." *Wind Energy* **8**(2): 125-139.

Devine-Wright, P. (2005). "Local aspects of renewable energy development in the UK: public beliefs and policy implications." *Local Environment* **10**(1): 57-69.

Devine-Wright, P. (2009). "Rethinking NIMBYism: The Role of Place Attachment and Place Identity in Explaining Place-protective Action." *J. Community Appl. Soc. Psychol.* **19**(6):

426-441.

Devine-Wright, P. (2009). "Rethinking NIMBYism: towards an integrated framework for understanding public perceptions of wind energy." Journal of Community and Applied Social Psychology available online.

Devine-Wright, P. (forthcoming). Fencing in the bay? Place attachment, social representations of energy technologies and the protection of restorative environments. Urban diversities, biosphere and well being: Designing and managing our common environment. M. Bonaiuto, M. Bonnes, A. M. Nenci and G. Carrus. Cambridge, USA, Hogrefe & Huber.

Doyle, J (2009): "Climate Action and Environmental Activism" in Boyce, T and Lewis, J (eds) Climate Change and the Media, New York: Peter Lang pp. 103 – 116

Ducsik, D. (1987). Citizen participation in power plant siting: Aladdin's lamp or Pandora's box? in Lake, R (ed.), Locational Conflict Rutgers Center for Urban Policy Research, New Brunswick.

EIA, 2009. Netherlands Energy Profile. Energy Information Administration. Available online (6/11/2009): -
http://tonto.eia.doe.gov/country/country_energy_data.cfm?fips=NL

Eiser, J. R., R. Spears, et al. (1988). "Local residents' attitudes to oil and nuclear developments." Social Behaviour 3: 237-253.

Ek, K. (2005). Public and private attitudes towards 'green' electricity: the case of Swedish wind power. Energy Policy 33, 1677–1689.

Various articles, El Comercio Digital.

Elzenga, H.E., & Dril, A. W. N. van (2008). Tussenstand van een aantal onderdelen uit het werkprogramma Schoon and Zuinig. Planbureau voor de leefomgeving (PBL) en Energieonderzoek Centrum Nederland (ECN), Bilthoven, November 2008.

EREC (2009). Renewable energy policy review – The Netherlands. European Renewable Energy Council, 2009.

Etkin, D. and E. Ho (2007). "Climate change: Perceptions and discourse of risk." Journal of Risk Research Vol 10(5), Jul 2007, 623-641.

Eurobarometer (2007). Energy technologies: knowledge, perceptions, measures. Special Eurobarometer 262. Brussels, European Commission

European Renewable Energy Council (2004) Renewable Energy Scenario to 2040. Available at:http://www.erec.org/fileadmin/erec_docs/Documents/Publications/EREC_Scenario_2040.pdf]

European Commission (2009). Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. European Commission, Brussels.

EZ, 2008. Energierapport 2008. Ministerie van Economische Zaken, Den Haag, Juni 2008. Available online: - <http://www.ez.nl/publicaties>

Fazio, R. H. and M. P. Zanna (1981). Direct experience and attitude-behavior consistency. Advances in Experimental Social Psychology, 14. L. Berkowitz. New York, Academic Press: 161-202.

Fishedick et al. (2008): Sozioökonomische Begleitforschung zur gesellschaftlichen akzeptanz von Carbon Capture and Storage (CCS) auf nationaler und internationaler Ebene. Endbericht.

http://www.wupperinst.org/projekte/proj/index.html?projekt_id=150&bid=155)

Fishedick et al. (2008): Sozioökonomische Begleitforschung zur gesellschaftlichen Akzeptanz von Carbon Capture and Storage (CCS) auf nationaler und internationaler Ebene. Endbericht. (http://www.wupperinst.org/projekte/proj/index.html?projekt_id=150&bid=155)

Franke, G., Wallert, H.-J. (2009): Gasanstalt Ketzin 1899-1965. Ketzin-Kyritz: erschienen im Eigenverlag.

Fischhoff, B. (1995). "Risk perception and communication unplugged: Twenty years of process." Risk analysis **15** (2):, 137-145.

Gabriel, S. (2008, September): Monatsbericht. www.sigmargabriel.de (retrieved 19/10/2009).

Gemeente Barendrecht, 2009. Facts and figures. Available online: - <http://www.barendrecht.nl/content.jsp?objectid=980>

Gieryn, T. F. (2000). "A Space for Place in Sociology." Annual Review of Sociology **26**(1):, 463-496.

Giuliani, M. V. (2002). Place attachment". Psychological Theories for Environmental Issues. M. Bonnes, T. Lee and M. Bonaiuto. Aldershot, Ashgate.

Greenpeace International & EREC, European Renewable Energy Council (2007) Energy [R]evolution – a Sustainable World Energy Outlook. Available at: [http://www.energyblueprint.info/fileadmin/media/documents/energy_revolution.pdf]

Greenpeace (2007). CO₂ dumpen: Waarom niet! [Dumping CO₂: Why not!]. Stichting Greenpeace Nederland, mei 2007.

Gruber, E. (2009): Professional and public acceptance for carbon capture and storage activities. Report under the DYNAMIS project framework. Karlsruhe: ISI Working Paper.

Ha-Duong, M., Nadaï, A., Campos, A., (2009). A survey on the public perception of CCS in France. International Journal of Greenhouse Gas Control **3, 5**, 633-640.

Harris, J (2007): "How green was my valley" Guardian, 27.04.07

Herber, R., (2008). Barendrecht CO₂ storage project. VP Shell Exploration Europe. Presentation at World Ports Climate Conference, Rotterdam, July 2008. Available online: - www.wpcrotterdam.com/.../Rien%20Herber%20-%20special%20topic%202.pdf

Hinchliffe, S. (1996). "Helping the earth begins at home." Global Environmental Change 6(1): 53-62.

<http://www.termicalaperedano.com/>

<http://www.coordinadoraecoloxista.org/>

<http://www.asturiasverde.com/>

<http://www.nodo50.org/tortuga/Critica-de-las-centrales-de-gas-de>

Huijts, N.M.A., Midden, C.J.H., Meijnders, A.L. (2007): Social acceptance of carbon dioxide storage. Energy Policy 35, 2780-2789.

Hunosa. 2006. Endesa y Hunosa suscriben acuerdos de colaboración. Press Release, December 14th, 2006.

IEA, International Energy Agency (2008) World Energy Outlook. Available at:
[<http://www.worldenergyoutlook.org/2008.asp>]

Inalhan, G. and E. Finch (2004). "Place attachment and sense of belonging." Facilities (22): 120-128.

Infrastructure Planning Commission (2009): Working with statutory consultees. Website
http://infrastructure.independent.gov.uk/?page_id=24 accessed 30.10.09

Itaoka, K., Saito, A., & Akai, M., (2006). A path analysis for public survey data on social acceptance of CO₂ capture and storage technology. *Paper presented at 8th International Conference on Greenhouse Gas Control Technologies*, June 19-22, Trondheim, Norway.

Kaatsch, P. et al.: Epidemiologische Studie zu Kinderkrebs in der Umgebung von Kernkraftwerken (KiKK-Studie). http://www.bfs.de/de/bfs/druck/Ufoplan/4334_KiKK.html (retrieved 19/10/09)

Kempton, W., J. Firestone, Lilley J., Rouleau, T., Whitaker, P., (2005). "The Offshore Wind Power Debate: Views from Cape Cod." Coastal Management **33**(2): 119 - 149.

Kunreuther, H., Slovic, P., MacGregor, D., 1996. Risk Perception and Trust: Challenges for Facility Siting. Risk: Health, Safety and the Environment, **7**, 109-118

Numerous articles, La Voz de Asturias.

Lofstedt, Ragner E., "Evaluation of Siting Strategies: The Case of Two UK Waste Tire Incinerators", 8 Risk: Health, Safety and Environment **63** [Winter, 1997].

Luukkanen, J., Vehmas, J., Mustonen, S., Allievi, F., Karjalainen, A., Värttö, M. and Ahoniemi, M. (2009) Finnish energy industries – Energy Scenarios and visions for the future. Background Report, Finland Futures Research Centre, Turku School of Economics. Available at: [http://www.tse.fi/FI/yksikot/erillislaitokset/tutu/Documents/publications/eBook_2009-10.pdf]

Market Observatory for Energy (2008) *Europe's energy position: present and future*. Luxembourg: Office for Official Publications of the European Communities.

MARM (Ministerio de Medio Ambiente y Medio Rural y Marino). 2009. Environmental Impact Assessment Resolution. (July 2009) <http://www.boe.es/boe/dias/2009/07/06/>

McGuire, W.J. (2001). Input and output variables currently promising for constructing persuasive communications. In R.E. Rice, & C.K. Atkin (Eds.), *Public communication campaigns* (3rd ed., pp. 22-48). Newbury Park, CA: Sage.

McLachlan, C. (2009). Symbolism, knowledge claims and consultation: stakeholder responses to wave energy and bio energy. Manchester Business School. Manchester, University of Manchester. **PhD thesis**.

McLachlan, C. (Forthcoming). Technologies in place: symbolic interpretations of renewable energy. Society and Nature. R. Carter and N. Charles.

Milmo, C (2005): "Calls for Prince Charles to halt pipeline" The Times, 4.10.05

Ministerio de Industria, Turismo y Comercio. 2008. La Energía en España 2007. Report from the Ministerio de Industria, Turismo y Comercio. Madrid.

Nicholls, M (2009a): "The top Guardian stories of 2008", Neath Guardian, 1.1.2009

Nicholls, M (2009b) "Neath council claim against pensioner to be settled in court" Neath Guardian 11.06.2009

ODPM (2004). Planning for Renewable Energy: A Companion Guide to PPS 22, The Stationery Office.

Oltra, Christian, "Lay Perceptions of Carbon Capture and Storage Technology", Elsevier Editorial System for International Journal of Greenhouse Gas Control, 2009.

Palmgren, C., Morgan, M.G., Bruin, W.B., Keith, D., (2004). Initial public perceptions of deep geological and oceanic disposal of CO₂. Environmental Science and Technology 38, 6441–6450.

Plataforma Antitérmica la Pereda. 2009. La salud no está en venta. Press Release, June 28, 2009. <http://ecoloxista.blogspot.com/2009/06/28/plataforma-anti-termica/>

Private Eye (2009) "Neath Contempt", 16.10.09

Proshansky, H. M., A. K. Fabian, Kaminoff R., (1996) "Place-identity: Physical world socialization of the self." Journal of Environmental Psychology 3(1): 57-83.

Ramírez, A., Hoogwijk, M., Hendriks, C., Faaij, A., 2008. Using a participatory approach to develop a sustainability framework for carbon capture and storage systems in the Netherlands. International Journal of Greenhouse Gas Control 2, 136-154.

Rayner, S. and L. W. Rickert (1988). Perception of risk: the social context of public concern over non-ionizing radiation. Proceedings of the International Non-Ionizing Radiation Workshop, London, IRPA Publications.

Reiner, D.M., Curry, T.E., De Figueiredo, M.A., Herzog, H.J., Ansolabehere, S.D., Itaoka, K., Johnsson, F., Odenberger, M., 2006. American Exceptionalism? Similarities and Differences in National Attitudes Toward Energy Policy and Global Warming. Environmental science &

technology 40, 7.

RCI, 2008. CO₂ Capture, Transport and Storage in Rotterdam Report 2008, English Summary. Rotterdam Climate Initiative. Available online (6/11/2009): - http://www.rotterdamclimateinitiative.nl/documents/Documenten/RCI-English-CCS-Report_Summary.pdf

Renn, O., Carius, R., Kastenholz, H., Schulze, M. Hertel, R. F., Henseler, G. (eds.), 2007. RiK – Development of a multi-stage risk communication process. Berlin: Federal Institute for Risk Assessment.

Renn, O., Kastenholz, H., 2000. State of the art. Report on Risk Communication. Risk Communication for Chemical Product Risks. OCDE Background Paper.

Rising Tide (2009) “What's in the pipeline?” Website <http://risingtide.org.uk/bristol/pipeline> accessed 30.10.09

Rogers, J., E. A. Simmons, et al. (2008). "Public perceptions of opportunities for community based renewable energy projects." *Energy Policy* **36**: 4217-4226.

Seager, T.P., Lambert, J.H. y Gardner, K. H., 2007. Fostering Innovation in Contaminated Sediments Management Through Multicriteria Technology Assessment and Public Participation. *Risk Analysis* **27**, 4.

SenterNovem (2008). Stimuleren Duurzame Energieproductie. The Ministry of Economic Affairs. Available online 28/09/09:
[http://www.registratieplatform.nl/UserFiles/File/Dumont\(1\).pdf](http://www.registratieplatform.nl/UserFiles/File/Dumont(1).pdf)

Shackley, S., McLachlan, C., Gough, C., 2005. The public perception of carbon dioxide capture and storage in the UK: results from focus groups and a survey. *Climate Policy* **4**, (4), 377–398.

Shell International B.V. (2008) Shell Energy Scenarios to 2050. Available at:
[http://www.shell.com/home/content/aboutshell/our_strategy/shell_global_scenarios/shell_energy_scenarios_2050/shell_energy_scenarios_02042008.html]

Falk Schulze / Andreas Hermann / Regine Barth (2008): Rechtliche Rahmenbedingungen für

die Ablagerung von CO₂ in tiefen geologischen Schichten: Vorschläge zur Ausgestaltung des Rechtsrahmens. DVBL, November 2008, 1417-1427.

Shipton, M (2007): "Retired engineer claims LNG pipeline's dangerous" *Western Mail*, 14.12.07

Shipton, M (2008): "Electricity price shock for Welsh users" *Western Mail*, 5.22.08

Slovic, P. (1986). "Informing and educating the public about risk." *Risk Analysis* **6**: 403-415.

Slovic, P. (2000). *The Perception of Risk*. London, Earthscan.

Slovic, P., B. Fischhoff, et al. (1978). "Accident probabilities and seat belt usage: A psychological perspective." *Accident Analysis and Prevention* **10**: 281-285.

Slovic, P., B. Fischhoff, et al. (1979). "Rating the risks." *Environment* **21**: 14-39.

Solà, R., Oltra, C., Sala, R., Gamero, N. Cambio climático y opinión pública en España: percepción del problema y política energética. *Sistema* **205**, 93-106, 2008.

STAATSCOURANT Nr. 12902, 31 Augustus 2009. Official announcements of the Dutch government. Available at <http://www.staatscourant.nl>

Stedman, R. (2002). "Toward a social psychology of place: Predicting behaviour from place based cognitions, attitude, and identity." *Environment and Behaviour* **34**: 561-581.

Struggle Archive (2009): Rosspport Solidarity Camp – supporting Shell to Sea in resisting the Corrib gas pipeline and refinery. Website <http://flag.blackened.net/revolt/rsc/> accessed 30.10.09

Szabo, E., Brodbeck, F.C., Den Hartog, D.N., Reber, G., Weibler, J., Wunderer, R. (2002): The Germanic Europe cluster: where employees have a voice. *Journal of World Business*, **37** (1), 55-68.

Ter Mors, E. (2009). Dealing with information about complex issues : the role of source perceptions (doctoral dissertation). Department of Social and Organisational Psychology,

Faculty of Social and Behavioural Sciences, Leiden University.
<http://hdl.handle.net/1887/13832>

“The Case Study as a Research Method”,
www.ischool.utexas.edu/~ssoy/usesusers/1391d1b.htm

Tokushige, K., Akimoto, K., Tomoda, T., (2007). Public perceptions on the acceptance of geological storage of carbon dioxide and information influencing the acceptance. International Journal of Greenhouse Gas Control, 1(1), 101-112.

Total (2008) World Energy Prospects According to Total. Available at:
[<http://www.yearofplanetearth.org/content/GLE/ThierryDesmarest.pdf>]

UN, United Nations (2008) Global Environmental Outlook: Environment for Development (GEO4), 2008, United Nations Environment Programme. Available at:
[<http://www.unep.org/geo/geo4/media/>]

Upham, P., L. Whitmarsh, et al. (2009). Public Attitudes to Environmental Change -a selective review of theory and practice, report for ESRC/LWEC. Manchester.

Van Alphen, K., van Voorst, tot Voorst, Q., Hekkert, M., Smits, R., (2007). Societal acceptance of carbon capture and storage technologies. Energy Policy 35, 4368–4380

Van den Berg, F., Pedersen, E., Bouma, J., & Bakker, R. (2008). Project WINDFARM perception: Visual and acoustic impact of wind turbine farms on residents. Final report, June 3, 2008. FP6-2005-Science-and-Society-20, Specific Support Action Project, no. 044628.

Van den Berg, F. (2000). Wiens brood men eet Een pleidooi voor onafhankelijke geluidsadviseurs. Geluid, juli 2000, pp. 103-105.

Van den Berg, F. (2003). Wind turbines at night: acoustical practice and sound research. Science Shop for Physics, University of Groningen, the Netherlands.

Van den Biesen (2002). Measures on access to justice in environmental matters (Article 9(3)): Country report for the Netherlands. Milieu Ltd, Belgium.

van der Horst, D. (2007). "NIMBY or not? Exploring the relevance of location and the

politics of voiced opinions in renewable energy siting controversies." Energy Policy **35(5)**: 2705-2714.

Van den Oetelaar, P.W.A (2009). Public participation and wind turbine projects in the Netherlands: A multiple case study. M.A. thesis, Radboud University Nijmegen, Faculty of Management Sciences, Department of Spatial Planning.

Vergragt, P., 2009. CCS: The next technological lock-in? A case study from the Netherlands. Paper for the GIN Conference 'Joint Action on Climate Change', Aalborg. Available online (6/11/2009): -
<http://gin.confex.com/gin/2009/webprogram/Manuscript/Paper2702/Vergragt%20JACC%2009%20CCS.pdf>

VROM, 2007. New energy for climate policy. VROM, Report 7486. December, 2007.

VROM (2007). Nieuwe energie voor het klimaat: Werkprogramma Schoon en Zuinig VROM, Report 7486. December, 2007. Available online at
<http://www.vrom.nl/pagina.html?id=2706&sp=2&dn=7421>

VROM (2008). Nationaal plan van aanpak Windenergie. VROM, Report 8093. February, 2008.

Wales Online (2007): "Anger over the sale of map showing LNG pipeline route" 29.12.07. Website <http://www.walesonline.co.uk/news/wales-news/2007/12/29/anger-over-the-sale-of-map-showing-lng-pipeline-route-91466-20295695/#at> accessed 26.10.09

Walker, G. (2007). Community Energy Initiatives: Embedding Sustainable Technology at a Local Level: Full Research Report. Swindon, ESRC End of Award Report, RES-338-25 0010-A.

- Walker, G., S. Hunter, et al. (2007). "Harnessing Community Energies: Explaining and Evaluating Community-Based Localism in Renewable Energy Policy in the UK." Global Environmental Politics **7**(2): 64-82.
- Wallquist, L., Visschers, V., Siegrist, M. (2009). Lay concepts on CCS deployment in Switzerland based on qualitative interviews. International Journal of Greenhouse Gas Control, **3**, 652-657
- Weber, E. U. (2006). "Experience-based and description-based perceptions of long-term risk: Why global warming does not scare us (yet)." Climatic Change **77**(1-2): 103-120.
- WEC (World Energy Council) (2007) Deciding the Future: Energy Policy Scenarios to 2050. Available at: [http://www.worldenergy.org/documents/scenarios_study_online.pdf]
- Wolsink, M. (1994). "Entanglement of interests and motives. Assumptions behind the NIMBY theory on facility siting." Urban Studies **31**: 851-866.
- Wolsink, M. (2006). "Invalid theory impedes our understanding: a critique on the persistence of the language of NIMBY." Transactions of the Institute of British Geographers **31**(1): 85-91.
- Wolsink, M. (1996). Dutch wind power policy: Stagnating implementation of renewables. Energy Policy **24**, 1079-88.
- Wolsink, M. (2007). Wind power implementation: the nature of public attitudes: equity and fairness instead of 'backyard motives'. Renewable and Sustainable Energy Reviews **11**, 1188-1207.
- Worcester, R. M. (2001). Science and society: what scientists and the public can learn from each other. Proceedings of the Royal Institution, 71, Oxford, OUP.
- World Wildlife Foundation. 2009. Observatorio de la Electricidad 2009. http://assets.wwf.es/downloads/oe_agosto_2009.pdf
- WSH (2009). Wind Energy Statistics – World Wide. Wind Service Holland. Available online at <http://home.kpn.nl/windsh/stats.html>

Wüstenhagen, R., Wolsink, M., Bürer, M.J., 2007. Social acceptance of renewable energy innovation: An introduction to the concept. *Energy Policy* 35, 2683-2691.

Wynne, B (199):. "Misunderstood Misunderstanding: Social Identities and Public Uptake of Science." *Public Understanding of Science* 1(281-304).

Zijpermuseum, 2009. Available online at <http://www.zijpermuseum.nl>

Zoekplaats, 2009. Zijpe. Available online at <http://www.zoekplaats.nl/index.cgi?actie=plaats&zoek=zijpe>