CCS Barendrecht – case study

Introduction

This case study provides the Dutch National Council of R&Dialogue evidence based input on the role of dialogue in energy implementation projects. Not only the CCS (Carbon Capture and Storage) project in Barendrecht is investigated; five other case studies are developed, namely:
1) wind offshore near Noordwijk, 2) shale gas in Boxtel, 3) gas storage in Bergermeer, 4) gas production in Groningen and 5) local energy cooperation's and their developments.

This case study presents the dialogue and process in the developments of the pilot project of CCS in Barendrecht. CO_2-emissions play an important factor in global warming. Therefore, CO_2-reduction is one of the main pillars of European and Dutch national energy and climate policy – 20% reduction by 2020 and 80-95% by 2050 compared with the 1990 baseline. [1]

A general overview on CO_2-emissions and technological developments worldwide and in the Netherlands is given. This is followed by an introduction in the pilot project of CCS in Barendrecht focussing on the impact of dialogue on the implementation process. Due to the controversial nature of the CCS project in Barendrecht, both societal and political, a lot has been published. This case study research is based on research reports together with stakeholder interviews, analysis of relevant documentation and reports, laws and procedures. [2] [3] The aim of this case study research is to investigate the role of dialogue and public support in the implementation process of a low-carbon technology – CCS. This case study wants to provide an insight in and recommendations on the dialogue and implementation process.

CO_2 and CCS

Carbon dioxide is a naturally occurring chemical compound. This gas is produced by combustion of coals, hydrocarbons, fermentation of sugars and it is exhaled by humans and animals and absorbed by plants for photosynthesis. As such CO_2 is essential for human life. CO_2 is produced, amongst others, during the generation of electricity in coal and gas power plants. In the Netherlands, approximately 60% of the total inland coal consumption is used for power generation. A way to reduce CO_2-emissions in the atmosphere is by capturing CO_2 emissions from power plants and industrial plants and storing the CO_2 underground. For example in (depleted) gas wells onshore and offshore. This is called CCS (CO_2 Capture and Storage). CCS is applied in e.g. Canada, Australia, Norway and Africa in different projects. Some projects are operational, even more in planning and some projects are in pilot phase. CO_2 is also used to make wells - both gas and oil - more profitable, called enhanced oil or gas recovery. CCS is considered a new but proven and safe technology. Large-scale alternatives for CO_2-reduction are not available or proven. [4] [5] [6]

[1] http://ec.europa.eu/clima/policies/package/index_en.htm
[2] ECN 2010, Public participation practices and onshore CCS: Lessons from a Dutch CCS case.
[3] ECN and GCCSI 2010, "What Happened in Barendrecht?"
[4] http://www.globalccsinstitute.com/projects/browse
[5] http://www.sccs.org.uk/storage/globalsitesmap.html
[6] https://sequestration.mit.edu/tools/projects/in_salah.html

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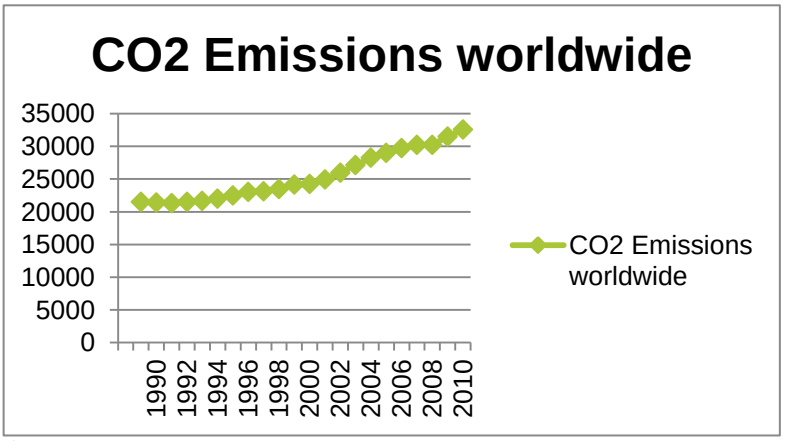
The CO_2 emissions in the Netherlands per sector:

	1990	2000	2005	2010	2012	2012 compared to 1990
Total CO_2 in million kg	**167.700**	**179.710**	**188.210**	**197.980**	**184.400**	**109.95%**
Households	21.050	20.490	19.600	22.390	19.560	92.92%
Chemical and pharmaceutics industry	20.960	15.470	15.590	17.110	15.570	74.28%
Industry (excluding energy sector)	40.050	33.620	33.730	34.330	31.820	79.45%
Energy sector	52.770	62.950	69.540	68.560	61.580	116.69%
Oil industry	11.040	12.120	12.310	10.620	10.490	95.01%
Mobile sources	32.980	39.170	40.850	40.990	41.070	124.53%
Transport	29.390	35.220	37.290	37.830	37.950	129.12%

Source: CBS 2014

Other emissions measured, like NMOS CH_4, SO_2, N_2O, CO, NO_x, NH_3, PM_{10}, all decreased in the past few years in the Dutch atmosphere. [7]

The total amount of CO_2 emissions from consumptions in the atmosphere worldwide has increased over the past twenty years, as the following figure shows: [8]

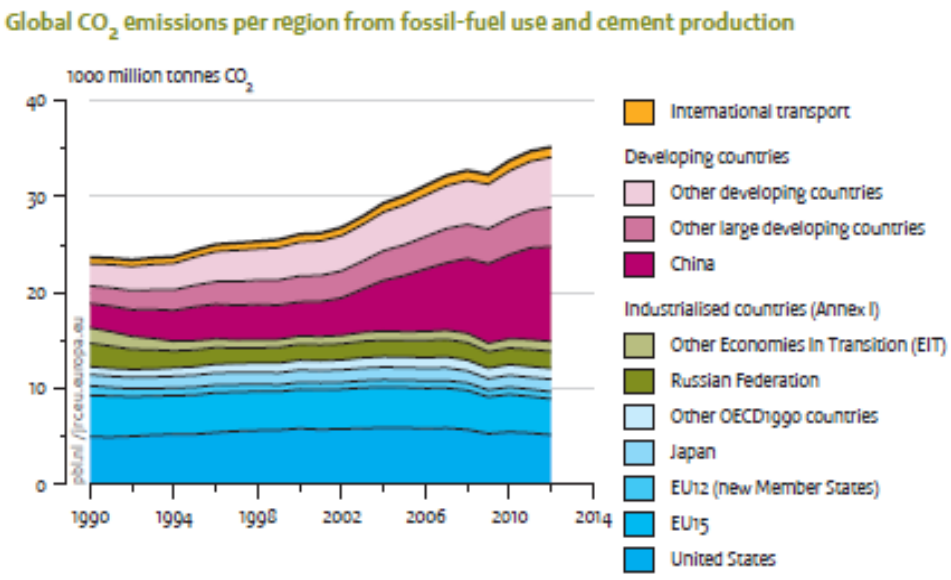


Source: EIA

[7] http://statline.cbs.nl/StatWeb/publication/default.aspx?DM=SLNL&PA=37221&D1=a&D2=a&D3=0%2c2%2c7%2c12-14&HDR=T%2cG2&STB=G1&CHARTTYPE=1&P=T&VW=T

[8] http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm?tid=90&pid=44&aid=8&cid=ww,&syid=1990&eyid=2011&unit=MMTCD

The economic developments in Asia, mainly China, increased the percentage of CO_2 emissions in the atmosphere the past ten years as the following figure shows [9]:



Source: EDGAR 4.2FT2010 (JRC/PBL, 2012); BP, 2013; NBS China, 2013; USGS, 2013; WSA, 2013; NOAA, 2012

The capture and storage of CO_2 reduces the level of CO_2 in the atmosphere simply because previously emitted CO_2 is stored underground. CCS is applied in Canada, North and South America, one project in Africa and two projects in Europe: Sleipner offshore in the North Sea and Snøhvit **offshore in the Barents Sea both in Norwegian waters.** [10]

In the Netherlands, new to build power plants are obliged to investigate the possibilities for CCS and be equipped for the possibility to separate CO_2 from the rest of the process – they need to be capture ready. [11] CO_2 can also be used as product in other sectors (e.g. in greenhouses to increase the efficiency of the growing process of crops and flowers or in the food processing sector and also in the fertilizer industry. This is called CCU – CO_2 capture and utilization.

CCS in the Netherlands

The ministry of Economic Affairs is the tendering party and authorised to appoint the executing party. In the beginning CCS was considered a part of the storage of waste legislation. Therefore, the ministry of Economic Affairs and Province Zuid-Holland are the competent authorities. Provincial government and the ministry have the authority over environmental management (*Wet Milieubeheer*). From 2009 the *Rijkscoördinatieregeling* is applicable to CCS. National government coordinates decision making processes of spatial planning and infrastructural projects when national interests are involved.[12]

[9] PBL (2013) Trends in global CO2 emissions http://www.pbl.nl/sites/default/files/cms/publicaties/pbl-2013-trends-in-global-co2-emissions-2013-report-1148.pdf
[10] http://www.globalccsinstitute.com/projects/browse
[11] Activiteitenbesluit milieubeheer, Mijnbouwet
[12] http://www.rvo.nl/subsidies-regelingen/de-rijksco%C3%B6rdinatieregeling

Since the CCS project in Barendrecht onshore storage of CO_2 is not a realistic part of a public debate anymore. Still, government and research and development organisations are investigating the matter. Dutch research and development organisations conduct research on e.g. capture technologies, which formations are suitable for storage; both onshore and offshore e.g. gas and oil fields and aquifers.[13] Dutch government considers CCS an inescapable tool to reduce CO_2 on the long-term, as stated in the policy direction of 2011 and in the SER Energy Agreement. [14] [15] Alternative usage of CO_2 like CCU in greenhouses, industry, for enhanced gas and oil recovery is a part of the solution, but not sufficient enough to reach the set targets. [16] Dutch governments want to maintain its leading position on CCS worldwide, since research and development organisations and industries have been involved in previous CCS projects. Government wants to develop and stimulate a pilot project for CCS offshore [17]; CCS offshore is considered sufficient enough to reach mid-term targets, CCS onshore is considered not a necessary tool to reach the 2020 CO_2-reduction target. [18]

Current developments

In the SER Energy Agreement CCS is considered a long-term solution to reach CO_2-reduction. CO_2-reduction can also be achieved by means of energy-savings in the built environment, in the industry and in the transport sector. The latter has committed itself to reach a 60% CO_2 reduction in 2050 compared to the 1990 baseline. Other tools are the development of renewable energy production e.g. by means of subsidizing 6000 MW offshore wind power and 4000 MW onshore wind power and the use of biomass in coal power plants.

The European policy incentive, Emission Trading System (ETS) is an allowance or market mechanism on emissions in the EU. The policy or trading system tries to stimulate companies to cost-efficiently reduce their CO_2 emissions by regulating their CO_2 output with a cap or limit on the total amount of emitted greenhouse gases. Companies buy or receive emission allowances and can trade them with other companies when needed. Over time, both the number of allowances and the cap is reduced so the total emissions fall. [19] [20] The price for CO_2 is round the €5,- per tonne [21]. Another European incentive is the NER300 programme, a financing instrument subsidising installations of innovative energy technologies and CCS. [22] Subsequently the Dutch government has also funded the CCS demonstration project ROAD on top of the NER300 funding. [23]

CCS projects

150 km northwest of Amsterdam in the North Sea is a CCS project named K12-B which is the first offshore well in the world where CO_2 is injected in the same reservoir from which it was produced. The CO_2 is injected and stored in a natural gas field still producing natural gas today. Since 1987, the reservoir has produced natural gas with a relatively high CO_2 content (13%). The CO_2 is separated from the natural gas and since 2004 injected in the reservoir - a total of 0,06 megaton. The activities are monitored and funded by GDF Suez E&P Nederland B.V. and TNO. The purpose of this project is to

[13] www.tno.nl, www.co2-cato.nl
[14] Energy Report 2011
[15] http://www.ser.nl/~/media/files/internet/publicaties/overige/2010_2019/2013/energieakkoord-duurzame-groei/energieakkoord-duurzame-groei.ashx
[16] Based on interviews with several stakeholders
[17] http://road2020.nl/en/
[18] Kamerbrief 14 februari 2011 – CCS-projecten in Nederland
[19] http://www.ser.nl/~/media/files/internet/publicaties/overige/2010_2019/2013/energieakkoord-duurzame-groei/energieakkoord-duurzame-groei.ashx
[20] http://ec.europa.eu/clima/policies/ets/index_en.htm
[21] Market prices
[22] http://www.ner300.com/
[23] http://road2020.nl/en/

increase gas recovery and production, investigate CO_2 storage in a pilot project and prevent CO_2 emissions to get in the atmosphere. [24]

The NUON power plant in Buggenum tested with pre-combustion CO_2 capture but NUON decided to close down the power plant in April 2013 due to the low electricity prices and high operating costs.

Rotterdam Capture and Storage Demonstration Project (ROAD) is an example of a CCS offshore demonstration project. E.ON Benelux and GDF SUEZ Energie Nederland want to store captured CO_2 in a depleted gas reservoir under the North Sea – good for 1.1. million tonnes of CO_2 per year. The CO_2 will be captured at the power plant of E.ON at the Maasvlakte and be transported to the gas reservoir. The investment decision on implementation of the ROAD project depends on the availability of subsidies and funding outside the Netherlands. If the funding is reached, the project will start. [25] [26]

The project - CCS Barendrecht and its process

The following discusses the motivation for a CCS project onshore and describes the process and dialogue as it happened. This section gives a brief overview on what happened in the dialogue and implementation process of CCS in Barendrecht and explains the reasoning behind an onshore CCS project.

To meet the goals set for CO_2-reduction, the CATO-2 research project (successor of CATO programme 2004-2009), including many research and industry partners, began to gain knowledge on CCS and develop technologies as a starting point for CCS research. In 2007, CCS was considered an important option for CO_2-reduction in Dutch energy and climate policies like *Schoon en Zuinig* promoting 'clean fossil' with the application of CCS leading to new markets. National government starts the tender procedure for demonstration projects for CCS. Rathenau Institute held focus group sessions with citizens on CCS n 2008. Outcomes were, amongst others, that citizens do not see a direct link between CCS and solving the climate problems, questions the effectivity of CCS and its effects on the environment, and information is critically received or distrusted. According to this research, the NIMBY [27] effects are minor. Furthermore, it is perceived that risks are more likely when a demonstration project is implemented compared to a proven state of the art technology. [28]

The ministry of Economic Affairs presents its Energy Report in 2008 containing policy descriptions for a joint CCS (demonstration) project and the establishment of a CCS Taskforce with public and private partners. CCS can accelerate new business and innovation, promotes reuse of suitable storage reservoirs (mainly former gas fields). When large industrial CO_2 emitting sources are located at a short distance of storage location, the initial costs of CCS decline in comparison to other sites. Later that year, government allocates € 60 million for two CO_2 storage demonstration projects, one in Barendrecht and one in Geleen, both close to large industrial CO_2 emitting sources. [29] [30] [31] [32] Local developments like the Rotterdam Climate Initiative, an initiative set up by the port of Rotterdam, the city of Rotterdam, Deltalinqs and DCMR (Environmental Protection Agency Rijnmond), aims at becoming the world capital

[24] https://www.tno.nl/content.cfm?context=thema&content=prop_case&laag1=895&laag2=911&laag3=98&item_id=1513&Taal=2

[25] https://www.tno.nl/content.cfm?context=thema&content=prop_case&laag1=895&laag2=911&laag3=98&item_id=1513

[26] http://road2020.nl/en/

[27] NIMBY: Not In My BackYard

[28] Rathenau Instituut 2008, Schoon fossiel of vuilstort? Resultaten focusgroepen met burgers over CO_2-opslag in lege aardgasvelden.

[29] http://www.co2-cato.nl/

[30] Nieuwe energie voor het klimaat – werkprogramma Schoon en Zuinig – September 2007

[31] http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2008/06/18/energierapport-2008.html

[32] ECN & GCCSI 2010 – What happened in Barendrecht?

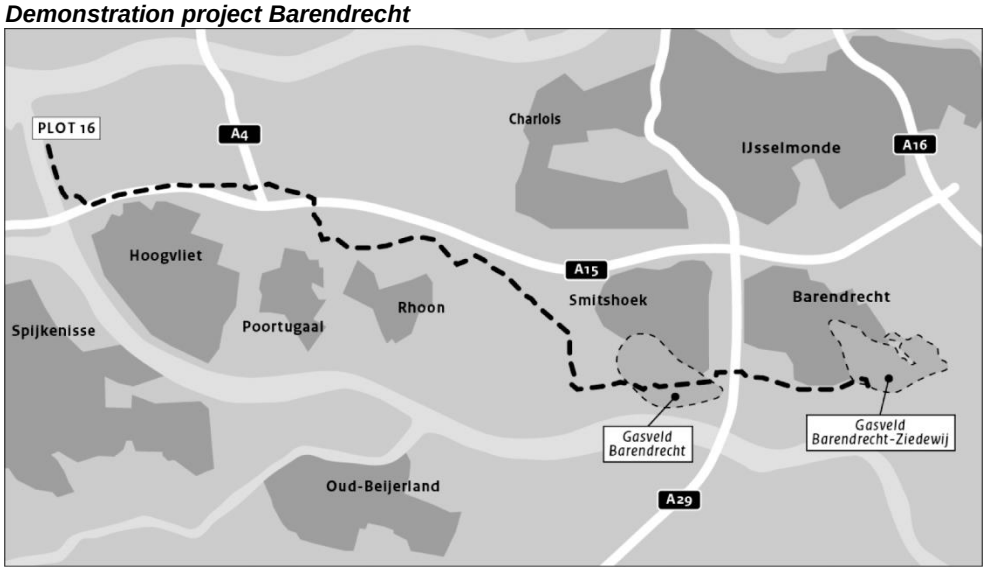
of CO_2 free energy and considers CCS as a tool to achieve this by means of 50 % CO_2-reduction in 2025. [33]

The demonstration project in Barendrecht has the following qualifications: [34] [35]

- A field with a storage capacity of 0.8 million tonnes at a depth of 1,700 meters with a storage capacity filled within 3 years;
- A field with a storage capacity of 9.5 million tonnes at a depth of 2,700 meters with a storage capacity filled within 25 years;
- Fields that are close to Pernis – refinery district of Rijnmond;
- The CO_2 comes from a gasification hydrogen plant of Shell nearby and is a pure stream of CO_2;
- Government provides € 30 million subsidy for the implementation.

NAM (Nederlandse Aardolie Maatschappij – Dutch exploration and production company of oil and gas) is the concessionaire of the Barendrecht fields and of many other fields in the Netherlands e.g. Slochteren field. [36]

Demonstration project Barendrecht



Source: Staatscourant augustus 2010

The process [37]

Proposed project site

In December 2007, Shell proposes a storage project in Barendrecht and starts communicating their proposal to the concerned municipalities. Local political parties claim to be divided and want to be provided with more information. While the tender procedure is ongoing, Shell conducts an Environmental Impacts Assessment (EIA - Milieu Effectenrapportage / Plan-MER) in 2008 and presents further plans to

[33] http://www.rotterdamclimateinitiative.nl/
[34] Nieuwe energie voor het klimaat – werkprogramma Schoon en Zuinig – September 2007
[35] ECN & GCCSI 2010 – What happened in Barendrecht?
[36] www.nam.nl
[37] Interviews with RVO, Barend van Engelenburg, CATO-2 programme

the City Council. Subsequently, Shell organises information gatherings whereof the first meeting attracted 60 and the second meeting 180 people. During the information gatherings, the communication was no always clear. An interviewee mentions that questions are not always answered and requests for additional information not sent.

Local unrest

The CCS demonstration project attracts local resistance formed by local authority blaming national government not being present (enough). Due to this resistance, the City Council adopts, via a motion / point of order, an investigation into CCS and requests a compensation fund. [38] The Executive Board agrees to an investigation and installs a focus group with an Alderman as chair. In the meantime, political parties are expressing their doubt and resistance in a petition and a protest walk. The Executive Board and Council of Barendrecht establish knowledge tables [39] with experts in order to create an assessment frame. Based on the outcomes of the knowledge table the board and council ought to take decisions. In the meantime, Shell is being accused of a non-transparent process in conducting the EIA.

At the end of 2008, national government establishes a group named BCO_2 with the intention to provide administrative consultancy and communication. In November 2008, the tender is granted to Shell. In February 2009, the Environmental Impact Statement (EIS – Milieu Effectenrapportage final) and the project plan is consulted and published. The responsible authorities (Tender Advisory Committee, EIA Committee, regional health and safety advisory) judged that the impact of the project was acceptable. Local residents had other viewpoints and therefore, in total 1570 appeals were handed in with 900 open notifications. In the meantime, the knowledge tables discussed their research with the public and the municipality organised an information meeting on the matter. In March 2009, an information desk with information on CCS opened. Furthermore, the CCS project became a part of the *Rijkscoördinatieregeling* leaving the coordination of the project at national level, with the minister of Economic Affairs. The municipality of Barendrecht officially expressed its objection against the project and sends a letter to the responsible minister with a request to abandonment of the formal procedures and questions whether Barendrecht is the best location and if CCS is a state of the art technology. [40] In that same year, a group of citizens set up a foundation against the project called CO_2 = Nee. In April 2009, outcomes of the knowledge tables are being evaluated by the national government and approved. The ministers decide to postpone the final decision on the project to the end of 2009. The ministers made this decision based on the local unrests and requests for further investigation, mentioning the possibility to investigate alternative sites. In May and June that year, visits to the injection sites are planned, some guided by the responsible Minister.

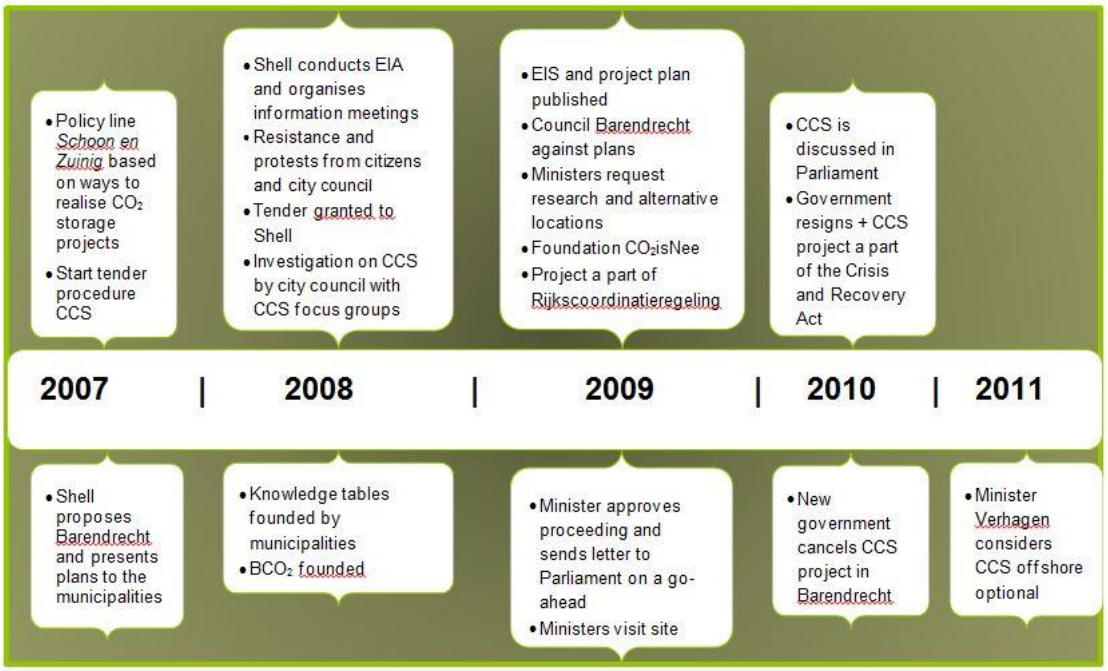
Additional research and a go-ahead

In October 2009, the Minister approves the proceeding of the CCS project and decides upon further investigation by (1) TNO and BCO_2 on the ideal location, (2) RIVM on the psychosomatic effects and (3) DCMR on project safety. The Provincial Council organises a hearing on the project and on CCS specifically. The environmental committee of the Province announced that it will not support the project. The Minister visits the location again and informs the inhabitants during an information meeting on which they expressed their resistance. In November 2009, the Ministers Cramer and Van der Hoeven send a letter to House of Representatives writing that CCS is a necessary technology for the transition towards reaching these goals. With this letter the Ministers gave a go-ahead for a pilot project in Barendrecht. In the meantime, environmental organisation Greenpeace openly opposes CCS. [41] [42]

[38] http://www.ad.nl/ad/nl/1038/Rotterdam/article/detail/2149987/2008/12/11/lsquo-Noodplan-voor-huizen-na-CO2-opslag-rsquo.dhtml
[39] Kennistafel: knowledge exchange amongst experts in the field.
[40] http://www.cdabarendrecht.nl/college-verzoekt-minister-co2-project-te-stoppen/
[41] http://www.rijksoverheid.nl/nieuws/2009/11/18/groen-licht-voor-beperkte-co2-opslag-barendrecht.html
[42] http://www.greenpeace.nl/news/co2-dumping-barendrecht-is-eno/

In January 2010, the House of Representatives discusses the matter due to high resistance of the citizens of Barendrecht. In February 2010, national government coalition resigns and the project becomes part of the Crisis and Recovery Act (Crisis en Herstelwet). This Act, stimulates and helps sustainable and innovative infrastructural and spatial projects, in times of economic crisis, to be implemented. [43] [44] However, it also means that local government cannot take legal action against decisions taken, individuals can still take legal steps.

In November 2010, government decides to cancel the CCS project and puts all CCS projects on a hold. In February 2011, Minister Verhagen announces that CCS onshore is cancelled until further notice, offshore CCS is optional. [45] [46]



The dialogue

When looking at CCS developments in the Netherlands, we notice that some topics are of main importance for the role of dialogue and the implementation process. The different levels of dialogue can be identified (macro and micro level dialogue), the level of responsibility and communications.

Macro versus micro level dialogue

In the beginning of this case study it is mentioned that CCS is a tool to decrease the amount of CO_2 emitted into the atmosphere. Decreasing emissions in the atmosphere is seen inevitable and irrefutable

[43] http://www.rijksoverheid.nl/onderwerpen/omgevingswet/crisis-en-herstelwet
[44] http://wetten.overheid.nl/BWBR0027431/geldigheidsdatum_10-07-2014
[45] http://www.rijksoverheid.nl/onderwerpen/co2-opslag/documenten-en-publicaties/kamerstukken/2011/02/14/ccs-projecten-in-nederland.html
[46] ECN & GCCSI 2010 – What happened in Barendrecht?

when combating global warming. At macro level, politicians from European and national governments have agreed to use CCS as a tool to reduce CO_2-emissions in Europe. In the Netherlands, this means that national government, Ministers and parliamentarians were in favour of this policy line. Though, it has to be noticed that the political consensus is fragile and the energy policy concerning CCS not always as clear or politically supported. The parties directly involved at this level are e.g. the Ministry of Economic Affairs and Infrastructure and Environment, NAM, EBN (Dutch organisation in exploration and production of natural gas and oil), port of Rotterdam and DCMR. They have had a dialogue on the policy implementation of CCS and started the dialogue right away. The dialogue is focussed on technology and installation procedures, subsidy and financing and policy and regulations even before the tender is officially granted. Due to policy rules and regulations the responsible authorities are positioned at macro level.

At micro level we look at the local environment; citizens, action groups and local authorities. In first instance, these parties were not involved in the macro perspective of combating global warming with CCS. These parties are involved in the process from the moment the executive parties starts the implementation process and seeks media attention. Due to the set rules and regulations, their level of influence is minor – on e.g. installation procedure, appointed location. The dialogue at micro level is oriented on the reasoning behind the project, its location and potential consequences. Due to the *Rijkscoördinatieregeling* and *Crisis en Herstelwet* local authorities are involved in a later stadium of the project. This late communication resulted in a lack of trust in the responsible parties and increased public hostility both at local authorities and communities.

After political unrest in the city council, local communities protested against CCS. The most resistance from the inhabitants of Barendrecht was based on the NIMBY effect (Not In My BackYard) due to the perceived risks and dangers of the CCS project. According to the research study “What happened at Barendrecht”, inhabitants of Albrandswaard are less resistant to the CCS project because they do not live above or near the injection area.

Responsibilities

National energy projects follow procedural steps for implementation. In the case of CCS, the parties legally involved in the development and implementation follow the rules and regulations available – in first instance waste storage regulations and later specified regulation on CCS. When looking at financing and investments, subsidies, communication and dialogue, the responsibilities lie mainly at national government and executive parties. The dialogue with stakeholders started before the tender was granted. The political decision making process took a long time and was perceived fragile. This left room to dispute the responsibilities of the involved parties, creating unrest and distrust.

The level of responsibility is differently perceived by different people. In several research reports it is argued that the project developer always felt very responsible for the work they were planning to conduct. This is perceived differently by some local inhabitants. The perception that the project developer would do anything in the direct environment that is unsafe or would harm the local environment is misunderstood by the project developer. The project developer has an image and status to defend and will not jeopardise that. As a response, the project developer tries to explain the project and their line of work over and over again. Which subsequently, is not perceived as an extra explanation and causes a lack of trust.

Local communities felt left behind because they had the feeling having no say in what was about to change in their direct environment. Due to the lack of responsibilities and involvement of lower authorities the level of influence and dialogue is minor. This was shown in protests.

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Communication
According to several research reports, the communication during the whole project lacks room for discussion and dialogue. The communication between and among public authorities, from public authorities to the public, civil society organisations and industries was not optimal. This gave room for factual and fictional information on CCS – not knowing which party communicated the accurate information causing distrust.

There has been a lack of discussion between public, politics and stakeholders involved. The *Rijkscoördinatieregeling* and *Crisis en Herstelwet*, gives national government full responsibility in the decision-making process, decreased the room for discussion and open dialogue with other involved ones. The lack of room for dialogue and lack of communication resulted in a lack of trust and an increase in public hostility. Once this situation is reached, communication means or ways are inferior to the set goals since it is fairly difficult to change a given image and can be considered little too late.

Conclusions

According to several research reports drawn on this topic, certain issues could and should be dealt differently in order to be more successful in the future. Especially, the political process and communication in this project is under discussion and leaves room for improvement. When focussing on dialogue, this case study can conclude and recommend the following:

- The decision-making process (e.g. energy policy and CCS) lies in the hands of national government;
- The implementation of CCS follows rules and regulations applied to the gas and mining business;
- National consensus on CCS as a policy line is fragile and at local level CCS is relatively unknown;
- The project implementation process and preparation process of by national government and the project developer is weak and improper due to lack of consensus and support for the policy line.
- Parties applying for tenders have to follow the rules and regulations with the involved stakeholders, and therefore do not focus on communication with local communities and lower authorities;
- Public and local communities are informed when the party applying for the tender submits the application licence – causing questions and protests from local communities;
- The party applying for the tender is the appointed party to create support;
- This requires good communication and negotiations, and trust in the sending party;
- It also requires an open and active attitude towards conducted research, being willing and open to learn lessons from it;
- Responsible parties intending to implement a certain policy line experience protests (from local communities and lower authorities) and lack of trust in their work or organisation;
- The points above create a lack of trust in government, executive parties and communication tools / messages;
- Finally resulting in cancelling the project and CCS onshore as future policy line.

Recommendations

- Government should establish a reliable, effective and understandable energy policy and execution of the policy that is backed politically, by all layers of government;
- Government should communicate national policy lines and business approaches more often and early in the project stage with local authorities, preferably face-to-face;
- Government, tendering and executive parties should involve local communities and involved parties (e.g. local authorities, local communities) in plans beforehand and explain the vision and reasoning behind the plans (moreover the responsibility of government), technical details as

appointed location, safety regulations (moreover the responsibility of executive parties), together create a codecision procedure: informing and listening to each other;

- Government, tendering and executive parties should improve communications on the process itself (vision and goals, implementation process, participation, codecision procedure), from the beginning of the process – depending on the level of responsibility at macro or micro level - towards the involved parties. The improvement of communication involves the choice of the communicator, timing of communication, medium used and targeting. Communication should be tuned to the message and goals;
- Government, tendering parties and executive parties should communicate the reasoning behind the implementation – express a clear vision on energy policy and the specific embodiment, leaving no or minor room for fictive information;
- National government should give choices / scenarios on where to implement CCS; giving local authorities and companies options where to implement a project thereby creating local engagement and provide situations whereby local benefits are given priority.
- The decision-making process should be improved by including stakeholders (direct involved parties) in the policy creation process, as early as possible, being able to draft together a successful implementation process;
- The implementation process should be open and flexible for feedback from a broad range of stakeholders (including citizens), creating the option for a codecision procedure wherein policy-makers and involved stakeholders, from every level, can codecide on aspects of the implementation process (e.g. location, forms of compensation etc.). During this process, the vision and goals behind the actual implementation should be communicated early in the process, transparently, and clearly.