The Key to Successful Carbon Capture and Storage

Engaging the Public

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The Key to CCS

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Engaging the Public

Unlocking the potential of CCS

Increasingly higher concentrations of CO_2 in the atmosphere will result in a global rise of temperature and a consequent negative impact on the environment. Global CO_2 emissions must be reduced before the situation becomes irreversible. Fossil fuels currently supply almost 88% of the world's energy demand and will continue to be the main energy source for the foreseeable future

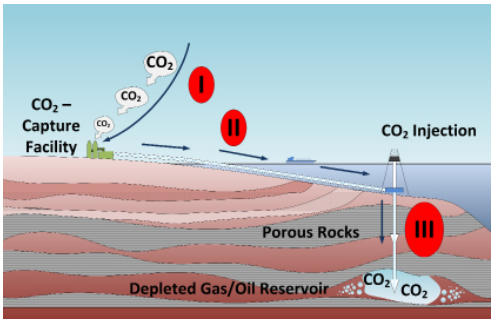

Figure 1. "Green Town" CCS concept

Carbon Capture and Storage (CCS)

CCS is introduced to ensure a continuous supply of world energy and at the same time reduce CO_2 emissions to the atmosphere. CCS is a technique that captures CO_2 directly from emitting sources such as coal and fossil fuel power plants. The captured CO_2 will then be transported by pipeline or ship to a suitable site for permanent storage in a geological formation (e.g.storage in depleted oil or gas fields or unminable coal beds). To date, only small scale CCS projects (less than 2 million tonnes CO_2/yr) have been implemented as a means to demonstrate CCS.

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Implementation is a Major Problem

CCS technology has been developed for almost two decades and has reached maturity level. However, large scale fully integrated CCS projects have not yet been implemented. Many reports have shown that negative public perception about CCS is the main obstacle in implementing the CCS projects. Public objections have actually led to the cancellation of trial projects such as Shell's Barendrecht CCS project in Holland and Vattenfall's Brandenburg CCS project in Germany. Public support and early engagement is therefore crucial for the successful implementation of CCS at large scale.

A Solution to the Problem: "Green Town" Concept

The "Green Town" idea is to gently introduce the idea of CCS to the people. This "Green Town" should ideally be a net zero producer of CO_2. The zero-anthropogenic CO_2 emission to the atmosphere is achieved by using air capture facilities installed in the community (see Fig.1). The air capturing technology (see Fig. 2) developed by Carbon Engineering Ltd. has the capability to draw in air and remove most of the CO_2 (see label I in Fig. 1). The captured CO_2 will then be transported by pipelines (see label II in Fig. 1) and stored in geological formations (see label III in Fig. 1).

The "Green Town" concept engages the public in the early stage of CCS with the aim of enhancing the public understanding on CO_2 emissions mitigation via CCS techniques. A meter displaying the captured CO_2 by the scrubbing facility could also be installed in the public view to inspire and interest the community. Public acceptance of the "Green Town" idea could also remove their scepticism towards direct CO_2 capture from emitting sources such as coal power plants. Hence, the "Green Town" idea is meant to be a 'door opener' for the future implementation of a fully integrated CCS.

“Fear always springs from ignorance”

Ralph Waldo Emerson

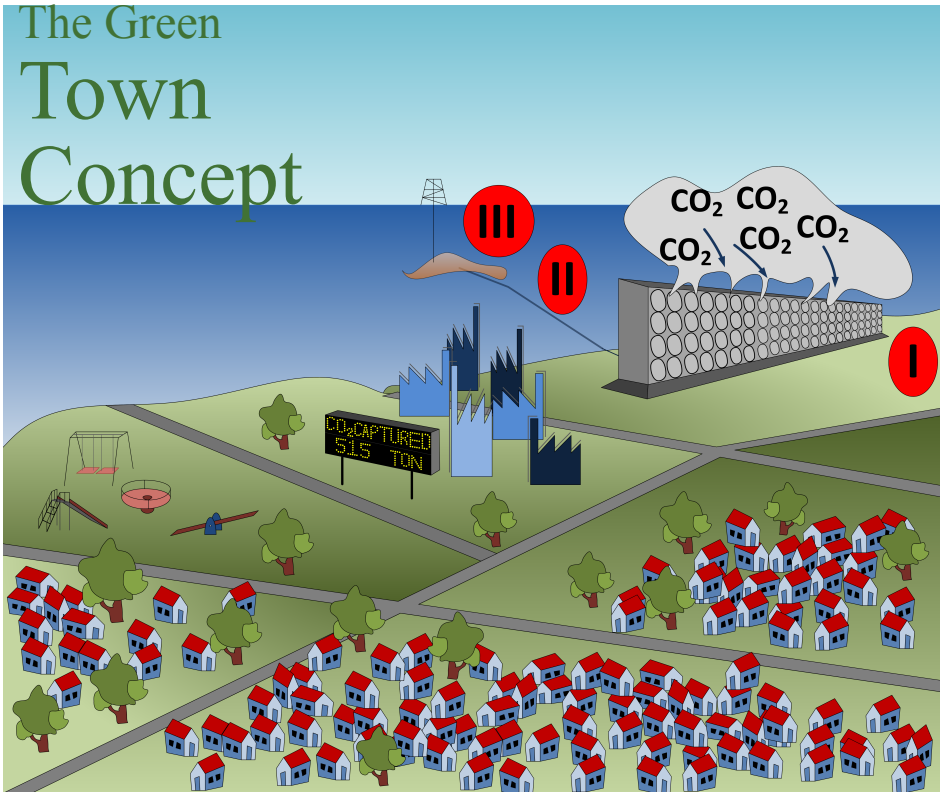


Figure 2. The “Green Town”

Validation

To measure the public perception and whether “Green Town” can improve their opinion on CCS a questionaire survey was conducted. People’s acceptance of CCS is connected with their understanding of climate change, therefore the survey was performed in a city with green minded people: Hamburg.

Purpose of the Survey

A survey was conducted in order to

- investigate the effectiveness of the“Green Town” concept towards realising a fully integrated CCS project
- investigate the effective methods to promote CCS to the public
- explore the public perception towards the “Green Town” idea and CCS

Survey Findings

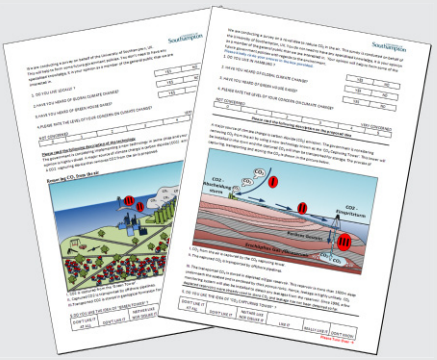
Major findings from 366 people surveyed in Hamburg:

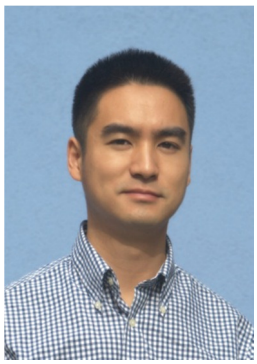
- Most of the public are environmentally conscious
- The majority of the public generally like the “Green Town” idea and would like to have the air capturing facility in their town.
- People who like the “Green Town” idea generally like the idea of CCS.
- Information regarding the “Green Town” idea or CCS could be effectively. delivered in schools and universities or through internet and newpapers.
- Government support and involvement in the project is also found to be an essential element in realising a successful “Green Town” project.

In summary, the survey shows that the idea of engaging the public through the “Green Town” concept could play an improtant role in laying a strong foundation for public interest in CCS projects.

Highlights

Early engagement and transparency in implementation are vital to gain public support and key to successful CCS project. National government involvement is recommended since the impact of CCS in environmental and financial terms is huge. The novel “Green Town” idea that is able to involve the public in the early stages of CCS projects was proposed to enhance the public understanding of CO_2 emissions mitigation by CCS technology. The empirical data from questionnaire surveys proves the suitability and feasibility of the “Green Town” idea.





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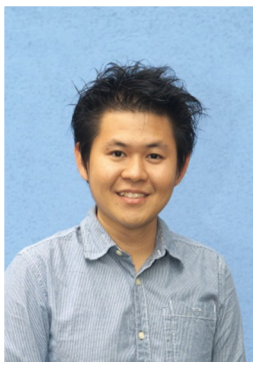
Dr. Michael Johnson is a Senior Project Engineer at Lloyd's Register where he continues a career in ship hydrodynamics R&D. With a first degree in Physics and a PhD in Ship Science, he has experience in tank testing, computational techniques and full scale trials. The oldest participant in the LRET Collegium, he has enjoyed the challenge of applying his experience in this environment and seized the opportunity of a period of high intensity 'lifelong learning' with respect to global climate issues.



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