



## Factsheet

# Carbon Capture and Storage in Rotterdam

**Improving the climate for the benefit of people, the environment, and the economy; that is the challenge confronted by the collective initiators of the Rotterdam Climate Initiative (RCI); Port of Rotterdam, the City of Rotterdam, Deltalinqs (umbrella organisation for the industrial and port sector in Rotterdam) and DCMR Environmental Protection Agency Rijnmond. RCI has two objectives:**

- **50% reduction of CO<sub>2</sub> emissions by 2025 as compared with 1990;**
- **100% climate proof by 2025;**

**In combination with strengthening of the Rotterdam economy.**

Rotterdam offers a favourable location for a CCS network due to the concentration of industrial emissions in the Port of Rotterdam area and the Port's proximity to (significant volumes of) storage capacity, primarily offshore (on the Dutch continental shelf).

Carbon Capture and Storage (CCS) is an essential part of RCI's strategy to reduce Rotterdam's CO<sub>2</sub> emissions by 50% in 2025 as compared with 1990 levels. RCI invests in energy efficiency, sustainable energy, and large-scale implementation of CCS. Compared to a business as usual scenario Rotterdam has to decrease its CO<sub>2</sub> emission in 2025 by 34 Mton/a, whereas 20 Mton/a is expected to be achieved by implementing CCS.

This factsheet describes the current state of affairs concerning CCS in Rotterdam in June 2010.

The status of several CCS projects now indicates that CCS has entered the realisation phase in demonstration projects:

- The already existing network for transporting CO<sub>2</sub> from the Shell refinery to greenhouses, OCAP, continues to grow and more CO<sub>2</sub> is delivered to the greenhouses. An additional source, Abengoa (production of bio-ethanol), will be linked up to the network in 2010/2011.
- E.ON and Electrabel were jointly granted subsidy from the EPR package and the Dutch government, consisting of a 180 million euro grant from the European Union and a 150 million euro grant from the Dutch government. The project is designed to capture approximately 1 Mton of CO<sub>2</sub> annually at the new E.ON power plant with subsequent storage in depleted gas fields under the North Sea. Start of operation is scheduled by 2015.
- Shell is working on its project to store CO<sub>2</sub> from the refinery in the depleted gas fields near Barendrecht. The next cabinet (national government) will decide whether to proceed or not.
- The Port of Rotterdam Authority, together with a consortium of business partners (Gaz de France Suez, EBN, TAQA, Gasunie, OCAP, Wintershall and Stedin), developed a business case for a transport and storage network based on the common carrier principle for the Port of Rotterdam area. This network might grow from 2 Mton annually in 2013 to 20 Mton by 2025.



- Anthony Veder, together with Gasunie, Gaz de France Suez and VOPAK, developed a "CO<sub>2</sub> Liquid Logistics Shipping concept". These parties together with Air Liquide signed a consortium agreement for the further development of the Liquid Logistics Business case
- Nine companies have signed Letters of Cooperation with RCI. These companies delivered data for possible capture projects. These data were externally validated by Foster Wheeler.
- Climate Change Capital assisted RCI on the 'Deployment of a CCS network in Rotterdam', which involved a comprehensive financial analysis of the complete CCS-chain in Rotterdam.
- Based on the work mentioned above, applications are prepared for NER funding both in energy as well as the industrial sector, as the EU has set aside 300 million euros in allowances from the new entrants' reserve (NER) in order to accelerate the demonstration of CCS and innovative renewable energy.

These projects will serve as stepping stones towards full-scale implementation of CCS in the greater Rotterdam area. By accommodating multiple capture projects that connect to a common transport and storage infrastructure, experience will be gained on the development of clusters. For industrialised regions, developing CCS-clusters offers significant cost advantages in implementing CCS compared to single source, single sink solutions.

Current activities employed by the Rotterdam Climate Initiative to strengthen the Rotterdam effort include:

- Formation of alliances with industries and further development of proposals for financial support. Alliances will include all activities over the CCS-chain. Cooperation with possible storage operators is intensified to develop (multiple) storage options on time. In this respect the suitability of various storage locations is investigated.
- Cooperation and discussion with national and EU officials on developments in policy, subsidy schemes and regulations. It is particularly important to have adequate legislation in place on time to secure possible storage options.
- Cooperation and discussion with government (both national and international) on ensuring CCS, preferably by strict CO<sub>2</sub> caps for emissions trading and/or mandatory CCS once the technology is mature.

A detailed description of RCI's CCS approach is laid down in 'CO<sub>2</sub> capture, transport and storage in Rotterdam: report 2009'. This report and a summary of the report are available on our website:

[www.rotterdamclimateinitiative.nl/top/pers/publicaties](http://www.rotterdamclimateinitiative.nl/top/pers/publicaties).

Published by:  
Rotterdam Climate Initiative  
[www.rotterdamclimateinitiative.nl](http://www.rotterdamclimateinitiative.nl)  
[info@rotterdamclimateinitiative.nl](mailto:info@rotterdamclimateinitiative.nl)  
Date: June 2010

### CO<sub>2</sub> cluster approach for the Port of Rotterdam area – four-phase model

