

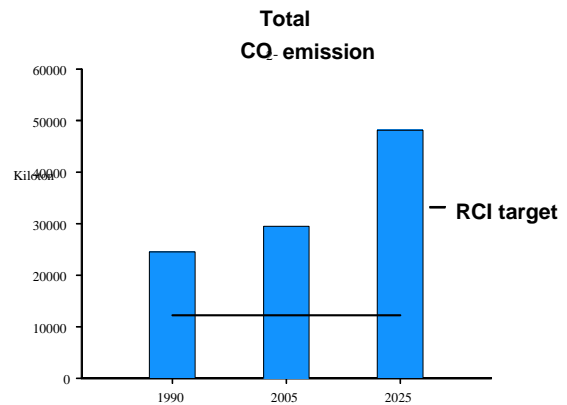


Baseline study Rotterdam Climate Initiative Environmental Protection Agency Rijnmond (DCMR), The Netherlands

Summary

This baseline study forms the numerical starting point for the Rotterdam Climate Initiative (RCI). The 1990 CO₂ emissions form the basis for the ambitious RCI target:

- a reduction of 50 % CO₂ emission in 2025 compared to the level in 1990. The situation in 2005 provides a complete and recent picture of the emission in Rotterdam, prior to the start of RCI. The situation in 2025 provides a good estimate of the emission according to autonomous development (existing policy without RCI application), as well as insights into the achievable reduction in CO₂ emissions. The 1990 emission level of approximately 24 Mton means that in 2025 the emission may not exceed 12 Mton. This is shown in Figure 1.



End-user area

- New buildings
- Refurbishment of buildings
- Transport and mobility
- Financial instruments
- Industry
- Legal initiatives (regulations, directives, etc)
- Planning issues
- Sustainable communities
- User behaviour
- Education
- Other

Target Audience

- Citizens
- Households
- Property owners
- Schools and universities
- Decision makers
- Local and regional authorities
- Transport companies
- Utilities
- ESCOs
- Architects and engineers
- Financial institutions
- Other

Technical

- Energy efficiency
- Heating
- Cooling
- Appliances
- Lighting
- CHP
- District Heating
- Solar energy
- Biomass
- Wind
- Geothermal
- Hydro power
- Other

Context

Rotterdam's aim is to become the 'World capital of CO₂ free energy'. The accompanying target reads:

A 50% reduction in CO₂ emission in 2025 compared to the level in 1990

This is both for the city and the port and must eventually lead to a more sustainable energy system. Concurrently, Rotterdam is an 'affiliate member' of the Clinton Climate Initiative. The approach required to achieve this target is described in the Rotterdam Climate Initiative (RCI). The initiative is shared between 4 parties: the City council/OBR (Rotterdam Development Corporation), the Port of Rotterdam Authority, Deltalinqs (port enterprise organisation) and the Environmental Protection Agency Rijnmond (DCMR). The DCMR was responsible to carry out this CO₂ baseline study.



Objectives

The aim of the baseline study is:

- The development of an unequivocal image of the CO₂ emissions in Rotterdam in the base year 1990, the present situation (2005), and in 2025, based on autonomous development.

The 1990 data are of vital importance for the baseline study, as it form the basis for the RCI target. However, in order to determine the CO₂ emissions for each of the sources defined, and the effect of regulations, covenants and instruments, it is the current situation (before the start of the RCI) and the situation based on autonomous development in 2025 that are relevant.

Process

In order to present the emission data, two approaches are possible:

- The 'area-approach', whereby the CO₂ emission levels are determined on the basis of what is emitted by Rotterdam.
- The 'user-approach', whereby the emissions levels are related to the actual use in Rotterdam. In this approach, the generation of electricity and the related CO₂ emission levels are assigned to the business or households that use the electricity.

The 'area-approach' has been selected for this baseline study. This approach is most commonly used, both nationally and internationally to measure CO₂ emission in a specific area.

Other basic requirements set for this baseline study are that it is objective, unambiguous, complete and transparent.

Objectively, this approach has resulted in the use of the following data:

- for 1990 and 2005: based on generally accepted public data regarding CO₂ emissions or data in which the emission has been calculated using, for example, the number of transport kilometres (road traffic) or gas use (homes);
- for 2025: based on accepted methods and assumptions for estimating future emission levels following autonomous development.

'Unambiguous and complete' means that the data must not overlap (for example the generation of CHP on industry sites) and that it must include all the non-natural sources of Rotterdam's CO₂ emissions.

Transparent means that it must be clear how the data have been obtained. This has been achieved by:

- employing clear definitions for all emission sources
- reporting all sources of information, so that the source data can always be retrieved
- showing how the calculations have been determined
- stating which assumptions have been used.

For presentation purposes, the emissions are divided over three main sectors: industry, transport and built environment. Information is also presented for how much each sector contributes to the total amount of emissions. See figures 2 and 3 respectively.

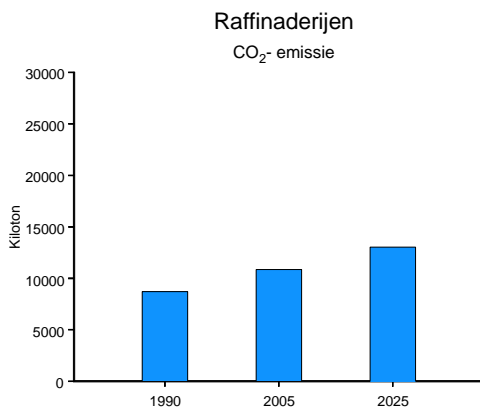


Figure 2: This graph shows the CO₂ emissions of the refineries in 1990, 2005 and 2025.

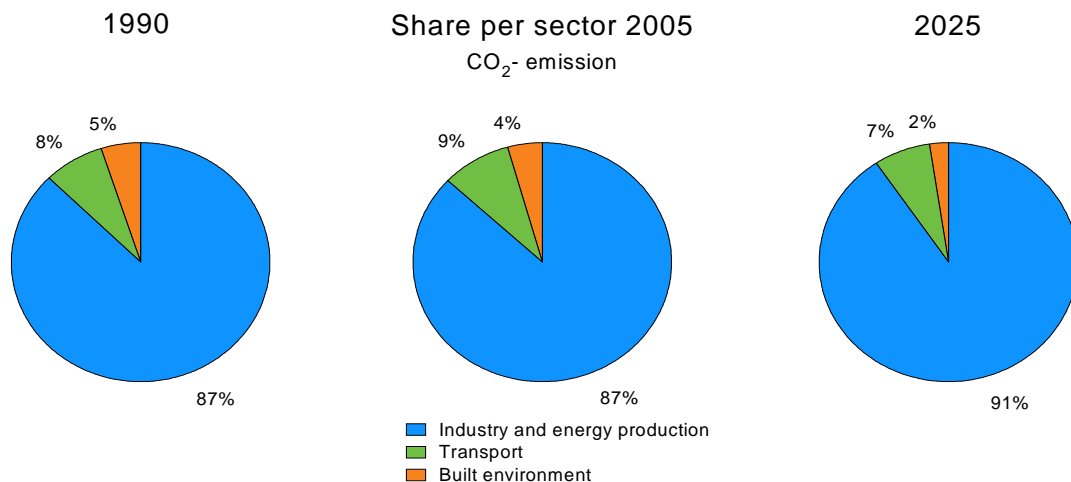


Figure 3: This figure shows the share of emissions for each category of the target years. It clearly demonstrates the large current share from the industry sector, and that this even will increase more in the future.

A validation of the baseline study has been carried out by The Energy Research Center of the Netherlands (ECN).

This baseline study forms the foundation for monitoring the RCI. Monitoring, however, is more than a representation of the annual CO₂ emission. The monitoring has to be emphatically linked to the RCI policy and approach as has been defined in the action programme: the monitoring will present insights into the progress and effects of the action programme.

Financial resources and partners

The costs of the baseline study are about 120 000 Euro and are paid by the RCI. Roughly half of the amount is used for data collection, archive and calculation and processing the data into CO₂ emission information. About 45 000 Euro is used for the editing of the (various) versions of the baseline study, including the description of the applied calculations. Finally, 15 000 Euro was needed for the validation.

Most of the work was carried out by the DCMR. Support was also given by 2 different (commercial) specialized engineering offices. The validation was done by ECN.



Results

The baseline study does not (directly) yield to any CO2 reduction. However, we feel that it definitely will help to improve the future RCI policy and gives direction to a better execution program. And thus indirectly lead to energy savings.

Lessons learned and repeatability

The data collection and archive requires a lot of 'energy'. In order to be useful in the future the description of the data (meta information) and of the applied calculations should be carried out thoroughly. Preferably, this is done during or directly after the project is finished.

Also, the validation is an attractive instrument. It requires extra work (and hence costs), but ensures that the approach will be strictly applied and that the baseline study is objective and transparent. Next to that, it avoids discussion between partners on the applied approach and executed calculations.

Supporting figures should not be adapted in each new version. It is most effective to produce these on the first complete concept version and after the final validation.

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Printed reports or other literature available:

Title: RCI Baseline study (will be soon available; now only available in Dutch). Costs: not applicable