

Introduction

OCAP, a joint venture between gas supplier Linde Gas Benelux and the VolkerWessels firm of contractors, supplies pure CO₂ to companies cultivating under glass. This CO₂ is released during the production of hydrogen at Shell in the Botlek and would otherwise be expelled into the atmosphere. OCAP supplies this CO₂ via an existing pipeline and a new distribution network. This enables horticulturists to save about 95 million cubic metres of natural gas per year. And it also reduces CO₂ emissions by about 170,000 tons per year. It is therefore a unique form of cooperation. For both the environment and greenhouse horticulture.



CO₂ in the horticultural greenhouse

Plants grow under the influence of light and use water and CO₂ as raw materials (photosynthesis). In the competitive horticultural market, the use of CO₂ in a greenhouse is considered to be a major instrument in increasing production. In the Netherlands the CO₂ requirement is primarily met by using CO₂ in the form of flue gasses from the heating system (boiler). Natural gas is therefore burnt on a large scale in the Netherlands in horticultural greenhouses during the summer. This technique, however, provides limited quality with respect to CO₂, is limited in capacity and is not always environmentally friendly. Horticulturists can use some of the heat that is released but in many cases the heat is lost (summer heating).

CO₂ in the Botlek

At the Shell refinery in the Botlek area, (almost) pure CO₂ is expelled into the atmosphere on a large scale. The CO₂ is released during the production of hydrogen, a crucial process in the refinery. Many kilotons of CO₂ are emitted each year. This CO₂ can be used directly in greenhouse horticulture.

The mission of OCAP

The idea of supplying the CO₂ that was emitted during the production of hydrogen to glasshouse horticulturists was conceived in 1994. In 2002, Syens Energy worked out this initiative of linking demand with supply and economics with the environment. Their mission was: 'to meet the requirement for CO₂ in greenhouse horticulture in an environmentally-friendly way through the distribution and delivery of the pure CO₂ which is released from the refinery'.

VolkerWessels and Linde Gas Benelux have undertaken this initiative which is unique in the world. They are supplying the CO₂ which is released during the production of hydrogen to greenhouse horticulturists. The CO₂ supply operation has been placed with a joint company called OCAP (*Organic Carbon dioxide for Assimilation of Plants*).

The OCAP solution

OCAP is solving two urgent problems:

- The horticulturist has high-quality CO₂ made available to him in large quantities for the maintenance of the best possible concentration of CO₂ in the greenhouse. The increase in production achieved by this increases the competitive position of the horticulturist. At the same time the burden on the environment (the natural gas consumption) is lessened per unit. This saves about 95 million m³ of natural gas on an annual basis.
- The CO₂ which is emitted by the Shell refinery is put to good use and this lowers CO₂ emissions. There is a total reduction of CO₂ emission by 170,000 tons per year. These reductions can make a considerable contribution to the targets in the field of CO₂ emission reduction which were set in the Kyoto protocol.



Delivery area

The company delivers c. 160,000 kg of CO₂ per hour to 500 greenhouse horticulture companies. Between them they have c. 1300 hectares of greenhouses between Rotterdam and The Hague.

Transport

The CO₂ that is supplied to the horticulturists is purchased from Shell. The CO₂ gas is pressurised using a compressor. Use is made for transport of the existing 85 km transport pipeline. This pipeline runs from the Rotterdam industrial area to the port area of Amsterdam. It runs alongside a number of major greenhouse horticultural areas. The use of this existing pipeline is vital for a profitable CO₂ supply operation.

Distribution and delivery

The delivery areas are connected to the existing transport pipeline. To do this OCAP has laid an extensive new pipeline network which connects each customer to the CO₂ network.

OCAP & Rotterdam Climate

Initiative

OCAP cooperates intensively with several parties to increase the use of pure CO₂ in Dutch horticulture.

OCAP has initiated a partnership with the Rotterdam Climate Initiative. This is an ambitious programme in which the city of Rotterdam, Havenbedrijf Rotterdam NV, DCMR Milieudienst Rijnmond and Deltalinqs cooperate to achieve a better Rotterdam climate in every respect. In 2025, the CO₂-emission on Rotterdam territory must have been reduced with 50% in comparison to 1990.

The OCAP-project corresponds seamlessly with the ambition of the RCI. Therefore it is one of the most important pillars within this initiative. OCAP and the RCI are working together to connect the horticulture in the Rotterdam region to the OCAP-network.

Facts and figures

Horticulture in the Netherlands

- Total area: 10,000 hectares.
- Total turnover: € 8.5 billion export value.
- Number of hectares that qualify for CO₂ from OCAP: approx. 5,000 hectares.

The distribution network

- NPM pipeline (NPM): 85 kilometres.
- Main pipeline (steel): 12 kilometres.
- Distribution pipeline (HDPE): 130 kilometres.
- Delivery stations situated at the horticulturists: 500.

The delivery

- Number of participating horticulturists: approx. 500.
- Total connected service area: approx. 1,300 hectares.
- Total supply capacity: approx. 160 tons per hour.
- Total delivery: approx. 300,000 tons per year.

Environmental benefit

- 95 million m³ natural gas saving on a yearly basis.
- 170,000 tons CO₂ emission reduction.

Linde Gas Benelux and VolkerWessels investment

- 100,000,000 euros.

Business details

OCAP CO₂ v.o.f.
Havenstraat 1
3115 HC Schiedam
T +31 (0) 10 246 1280
www.ocap.nl