

Synergy in Heat and CO₂



ECS bv



OSIRIS



OSIRIS:

- An ancient Egyptian God
- Fertility and agriculture

Project:

- Local initiative between 2 greenhouse clusters and a waste to energy plant
- Synergy in heat and CO₂

The Osiris partners



Greenhouses

- ECS: Energy Cluster Steenbergen
 - Greenhouse cluster of 9 companies
 - Vegetables & fruit
 - Total surface of 107 ha
- NP: Nieuw Prinsenland Dinteloord
 - Under development
 - Greenhouse cluster of
 - Vegetables, fruit & flowers
 - Total actual surface of 156 ha
- CHP based on natural gas
 - Production of electricity, heat and CO2



The Osiris partners



- Capacity:
Yearly treatment of 360.000 Ton of non recyclable municipal and commercial waste.
- Electricity production:
Yearly export of ca. 240.000 MWh of electricity of which is 52% is green.
- Heat delivery:
yearly delivery of 25.000 MWh heat @ 90°C to a nearby greenhouse
- Residual heat delivery:
Yearly delivery of ca. 1.000 MWh residual heat @ 42°C to the district heating system Stadsoevers in Roosendaal
- Residues:
all residues are recycled and used as secondary raw materials

SUEZ ReEnergy Roosendaal



Key figures of the project



1. SUEZ ReEnergy

- Heat connection of 70 MW @ 73 °C, 420.000 MWh/year, 90% residual heat
- CO2 capture plant of 18,5 Ton CO2/hr, 148.000 Ton CO2/year, of which:
 - 74.000 Ton CO2, gaseous to greenhouses
 - 74.000 Ton CO2, liquified to CCS or available for alternative application

2/3rd of our C is biogenic!

2. Transport

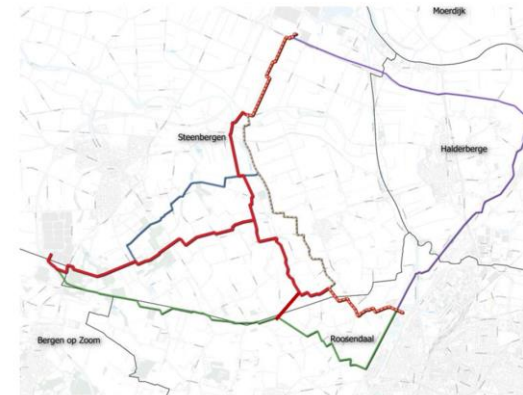
- Development of a Y-trace between the 3 partners.
- Total length of the transport system ca. 25 km.

3. Distribution system for heat and CO2 in both greenhouse clusters.

Actual status of the project



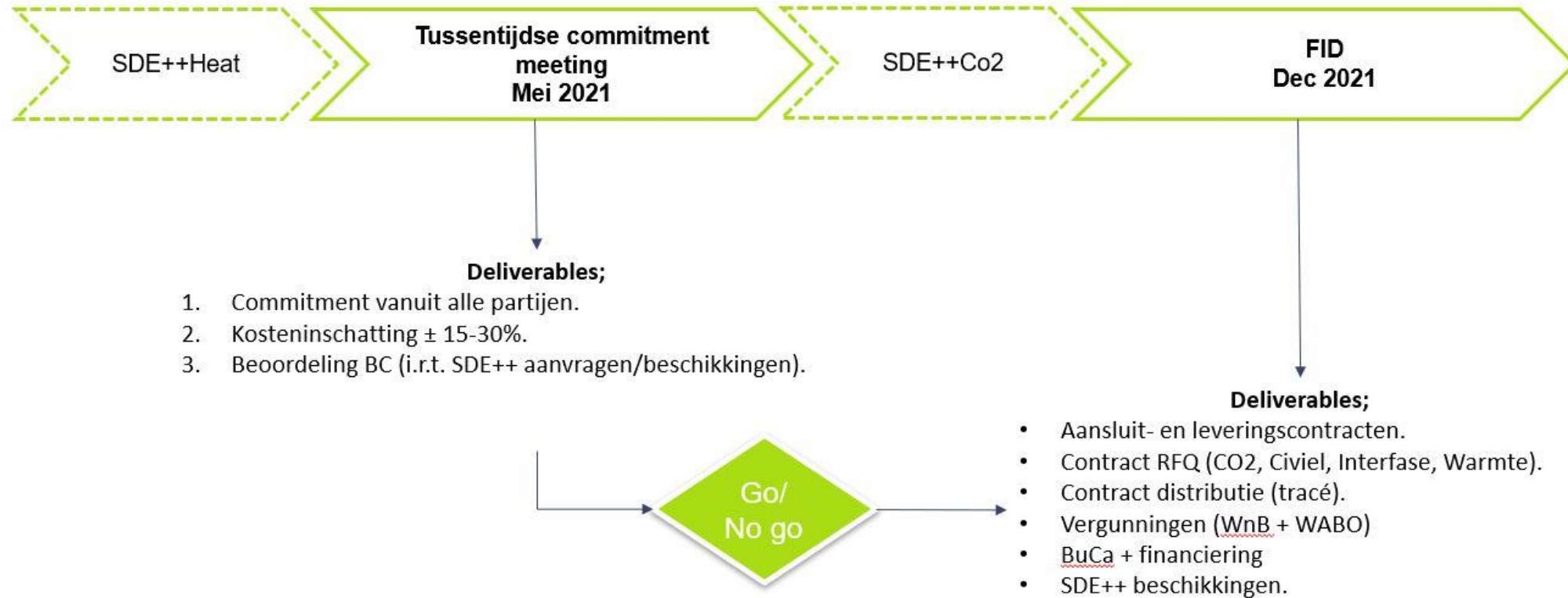
1. SUEZ ReEnergy
 - Environmental report (MER) & permit application for the CO2 capture plant to be launched end 2020.
 - Final RfQ for heat connection and CO2 capture plant ready in January 2021, resulting in binding offers by April 2021.
2. Transport
 - Development of a Y-trace between the 3 partners.
 - Total length of the transport system ca. 25 km of which.
 - Trace study to be finalized by April 2021.
3. Distribution system for heat and CO2 in both greenhouse clusters.
 - Information available at the growers from previous projects.



- Legenda
- Rood geoptimaliseerde Y
 - Groen + Paars U-tracé
 - Groen + Rood Y-tracé

Timing of the project

Milestone commitment meetings



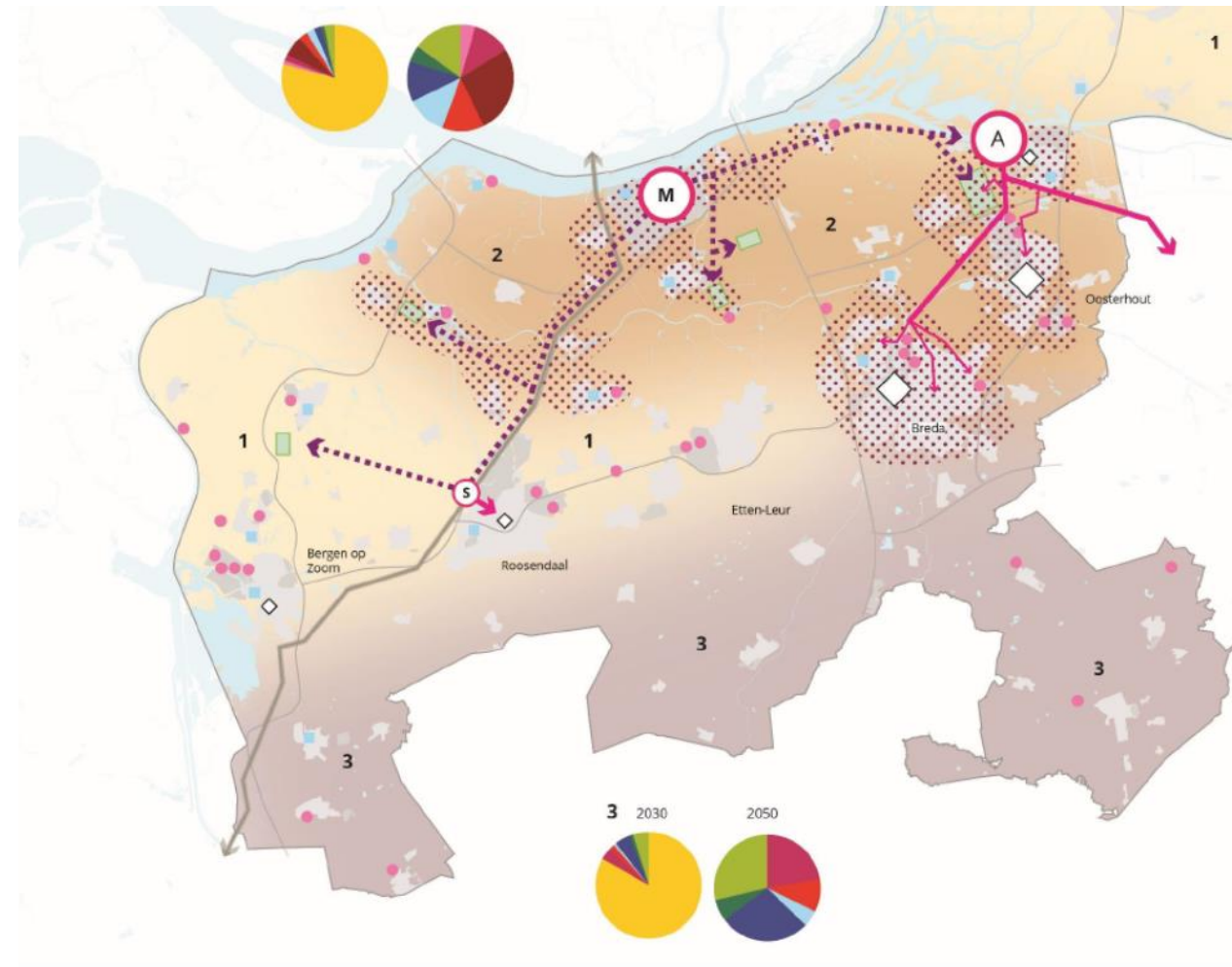
Added value of this project



1. Osiris offers a short-term solution in our fight with climate change.
 - According to the actual time schedule, the Osiris project could be operational by end of 2023.
2. The Osiris project will create an important environmental and climate impact for our region:
 - Reduction of the natural gas consumption of the greenhouses by ca. 100.000.000 m³ per year.
 - Reduction of the CO₂ emission of ca. 100.000 Ton per year
 - Reduction of the nitrogen emission of ca. 60.000 kg per year.
3. The Osiris project will create a big step for the sustainable development of greenhouse activity in our region.
4. The Osiris project should be integrated in the regional heat infrastructure as defined by the RES (Regionale Energie Strategie).

Routing

**Future integration in the
Regional Heat Infrastructure
for the Province of Noord
Brabant (RES)**



Why OSIRIS will succeed?



1. OSIRIS was developed by and for the partners.
2. On the supply side, the heat and CO2 sources are already available.
3. On the off-take side, the need for heat and CO2 already exists.
4. The project could operate at full scale as from the start.
5. OSIRIS is not a distant dream, it can be operational in 2023.
6. Due to the limited subsidy need in €/Ton avoided CO2, the project will have a competitive ranking for the SDE++ subsidy.