

The Paris Agreement makes it very clear that we need to take significant steps towards decarbonisation of our economy by 2050. The Wuppertal Institute for Climate, Environment and Energy has formulated three possible decarbonisation pathways as well as one business as usual pathway for the Port of Rotterdam.

The pathways cover different levels of ambition and different technologies. No single pathway is an accurate prediction of the future, the future will most likely be shaped by a combination of them.

PATHWAYS TO A DECARBONISED PORT

CLOSED CARBON CYCLE

The energy system is fully decarbonised by a radical shift to renewables. Carbon from fossil feedstock is kept in a circular system of production and recycling. Both lead to a radical overhaul of the port-industrial cluster.

BIOMASS AND CCS

A drastic shift towards 100% renewable energy production and large scale CCS help virtually eliminate CO₂ emissions. Fuel production shifts from fossil to renewable feedstock (both electric and biobased).

TECHNOLOGICAL PROGRESS

Both rapid implementation of best available technologies and large scale CCS for power plants and parts of refineries help decrease CO₂ emissions.

98%

CO₂ REDUCTION
2050 vs. 2015

98%

CO₂ REDUCTION
2050 vs. 2015

75%

CO₂ REDUCTION
2050 vs. 2015

WATER ELECTROLYSIS
(H₂ PRODUCTION)



SYNTHETIC CHEMICALS
PRODUCTION BASED ON CARBON
FROM WASTE STREAMS



LARGE SCALE AVAILABILITY
OF 100% RENEWABLE
ELECTRICITY PRODUCTION



HEAT GRID EXTENSION



POWER TO HEAT
& GEOTHERMAL HEAT



SYNTHETIC FUEL
& BIOBASED PRODUCTION



POWER TO HEAT



WATER ELECTROLYSIS
(H₂ PRODUCTION)



100% BIOMASS / WASTE-FIRED
POWER PLANTS (+ CCS)



HEAT GRID EXTENSION



LARGE SCALE
AVAILABILITY OF
SUSTAINABLE BIOMASS



REINVESTMENTS IN REFINERIES
AND PETROCHEMICAL PLANTS



CARBON CAPTURE AND STORAGE



RAPID ADOPTION OF BEST AVAILABLE
TECHNOLOGIES (ENERGY EFFICIENCY)



WIDESCALE IMPLEMENTATION
OF PARIS AGREEMENT



INCREASED SHARE OF RENEWABLE
ELECTRICITY (WIND / SOLAR)



(SLOW) ADOPTION OF
BEST AVAILABLE TECHNOLOGIES



REINVESTMENTS IN REFINERIES
AND PETROCHEMICAL PLANTS



WATER ELECTROLYSIS
(H₂ PRODUCTION)



POWER TO HEAT
(SMALL SCALE)



BUSINESS AS USUAL

Optimisation of existing activities and a decrease in refinery activities, due to diminishing demand, lead to a gradual but limited decrease of CO₂ emissions. The goals stipulated by the Paris agreement are not achieved.

30%

CO₂ REDUCTION
2050 vs. 2015

- **GREENFIELD INVESTMENT**
New process that is currently not in use or in construction.
- **RETROFIT**
Process currently in use which will have to be retrofitted.
- **CHALLENGE**
Pathway specific challenge that would need to be overcome.

! This infographic is highly simplified for clarity reasons. For a full understanding, please refer to the report "Decarbonization pathways for the industrial cluster of the Port of Rotterdam".

**RIGHT HERE
RIGHT NOW
MAKE IT HAPPEN.**

Current activities in the port such as fuel and power production, are major contributors to CO₂ emissions and require drastic rethinking. The transition towards a decarbonised economy offers many new business opportunities such as offshore wind, biobased chemistry, demand-side-management and energy storage,

CO₂ transport and storage and synthetic fuel production. The Port of Rotterdam is in a unique position to be frontrunner in this transition, because of its scale, its location, its excellent infrastructure, the companies already present, the combined available know-how and ambitions. **Will you join us?**