

# LCA of full-scale ozonation plant for wastewater treatment

## Case study in the Netherlands

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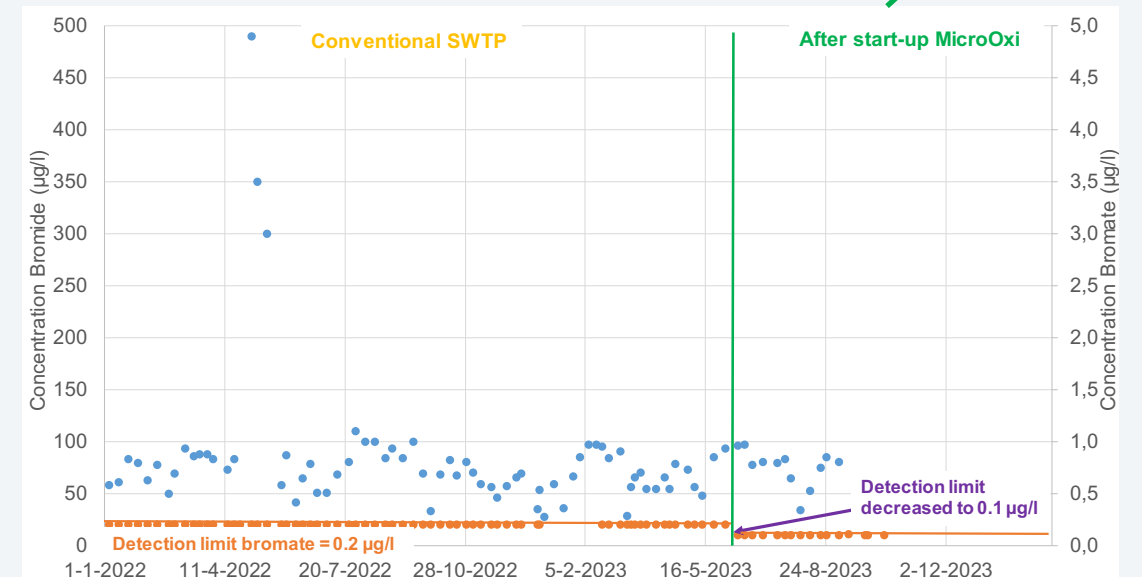
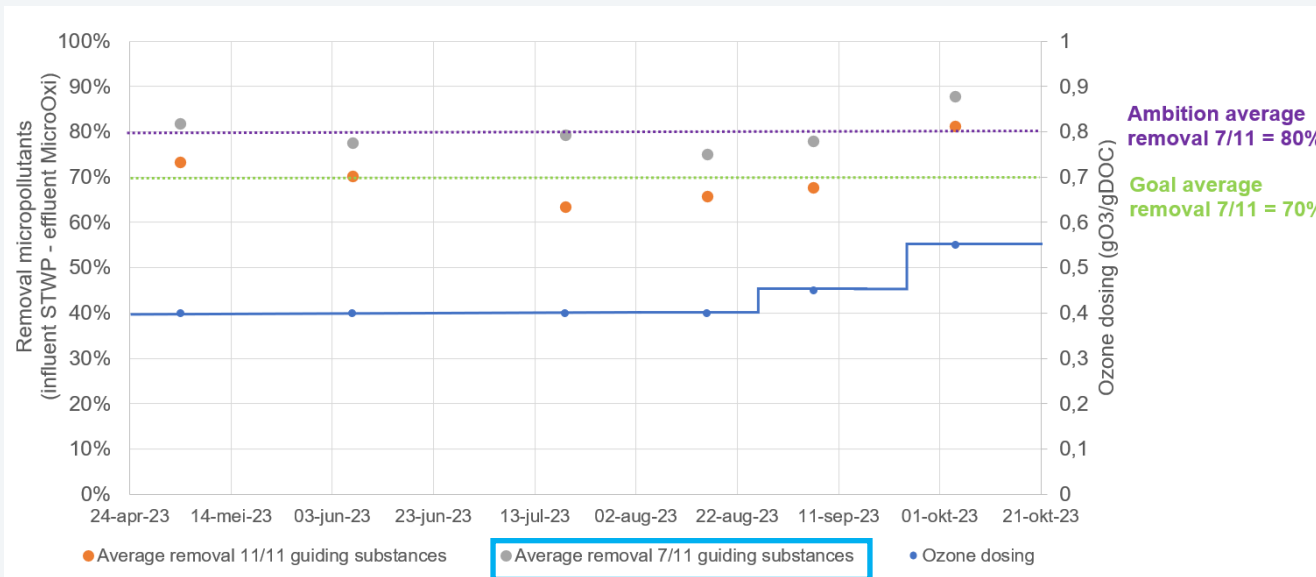
# STWP Houten – The Netherlands

## Installation Facts:

- **Industry:** Municipal wastewater
- **Size SWTP:** 91,000 PE
- **Design Flow:** 870 m<sup>3</sup>/h
- **Application:** 70% removal of 7/11 guiding substance
- **Technology:** MicroOxi
  - **Dosing range Ozone:** 0.2 – 1.0 gO<sub>3</sub>/gDOC
  - **Capacity Ozone:** 9.1 kg O<sub>3</sub>/h
- **Realisation:** Feb 2022



# Removal micropollutants by MicroOxi



## Environmental Life Cycle Assessment of construction, operation and end of life of Houten

Focusing on the climate change contribution

### Sensitivity Analysis:

- DOC variation
- Oxygen generation in situ: PSA vs. LOX



### HOTSPOT ANALYSIS

Identification of the areas with greater impact  
LCC

### Scenario Analysis

- Use of Green Electricity
- Alternative use of concrete
- Alternatives end of life



## LCA modelling

### ASSUMPTIONS AND CONSIDERATIONS



#### ENERGY AND MATERIAL RECOVERY

Considered in the **disposal treatment** and end of life of the plant



#### LIFE SPAN OF THE PLANT

**30 Years\***  
\*Substitution/renewal of parts considered



#### TRANSPORT

Of **chemicals** and **materials** supply and waste **disposal**.



#### CHEMICAL PERFORMANCE OF OZONE

Taken into account for the calculations of the **emissions**.

# Environmental Life Cycle Assessment of Houten

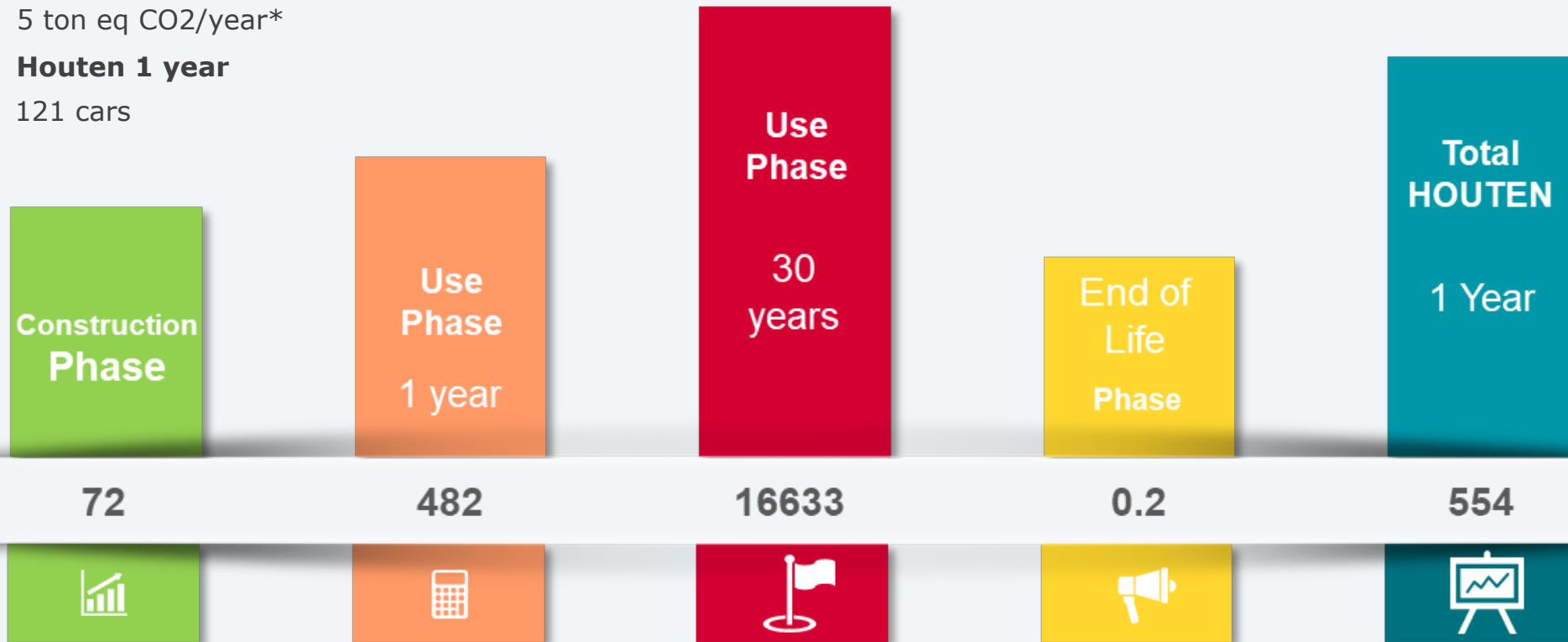


1 Average passenger car

5 ton eq CO<sub>2</sub>/year\*

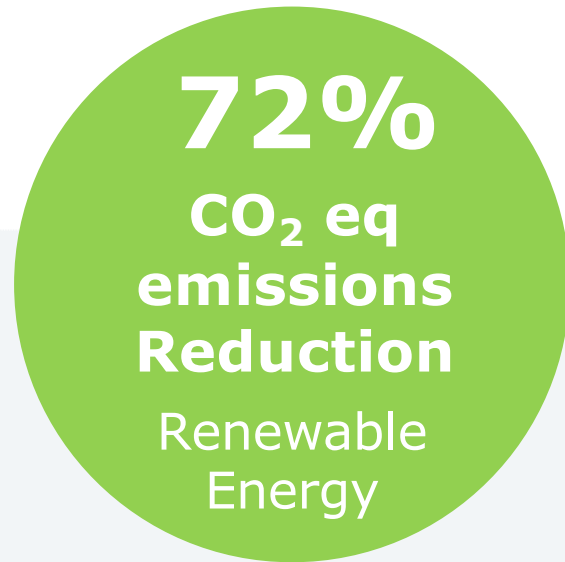
Houten 1 year

121 cars



Tons CO<sub>2</sub> equivalent comparison

New alternatives for use/end of life of concrete would help reducing the environmental burdens of the plant

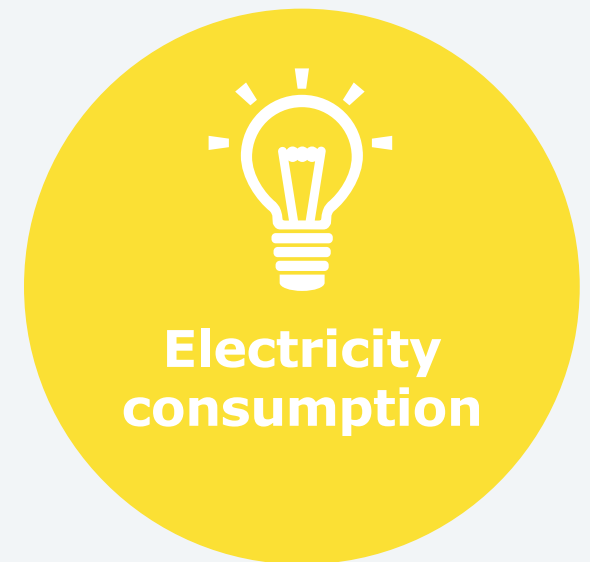


The main contributor to the environmental impact of the operational phase is the ozone generator due to electricity consumption.



# Take Home Lessons

From the LCA study of Houten ozonation wastewater treatment plant



part of  
  
saur  
mission  
water



#missionwater

### HOTSPOT ANALYSIS CONSTRUCTION

