

An aerial photograph of a large industrial facility, identified as a Veolia energy plant. The main building is white with a flat roof and several large green doors. To the right, there are smaller red-roofed buildings and a tall metal lattice tower. The surrounding area consists of fields and trees under a dramatic, cloudy sky with a low sun. A prominent red banner with white text is overlaid on the upper left portion of the image.

# Szlachęcín: towards decarbonisation

Veolia Energia Poznań SA

COGEN Europe, May 26th, 2023

# Location Poland

AQUANET

Sewage treatment plant



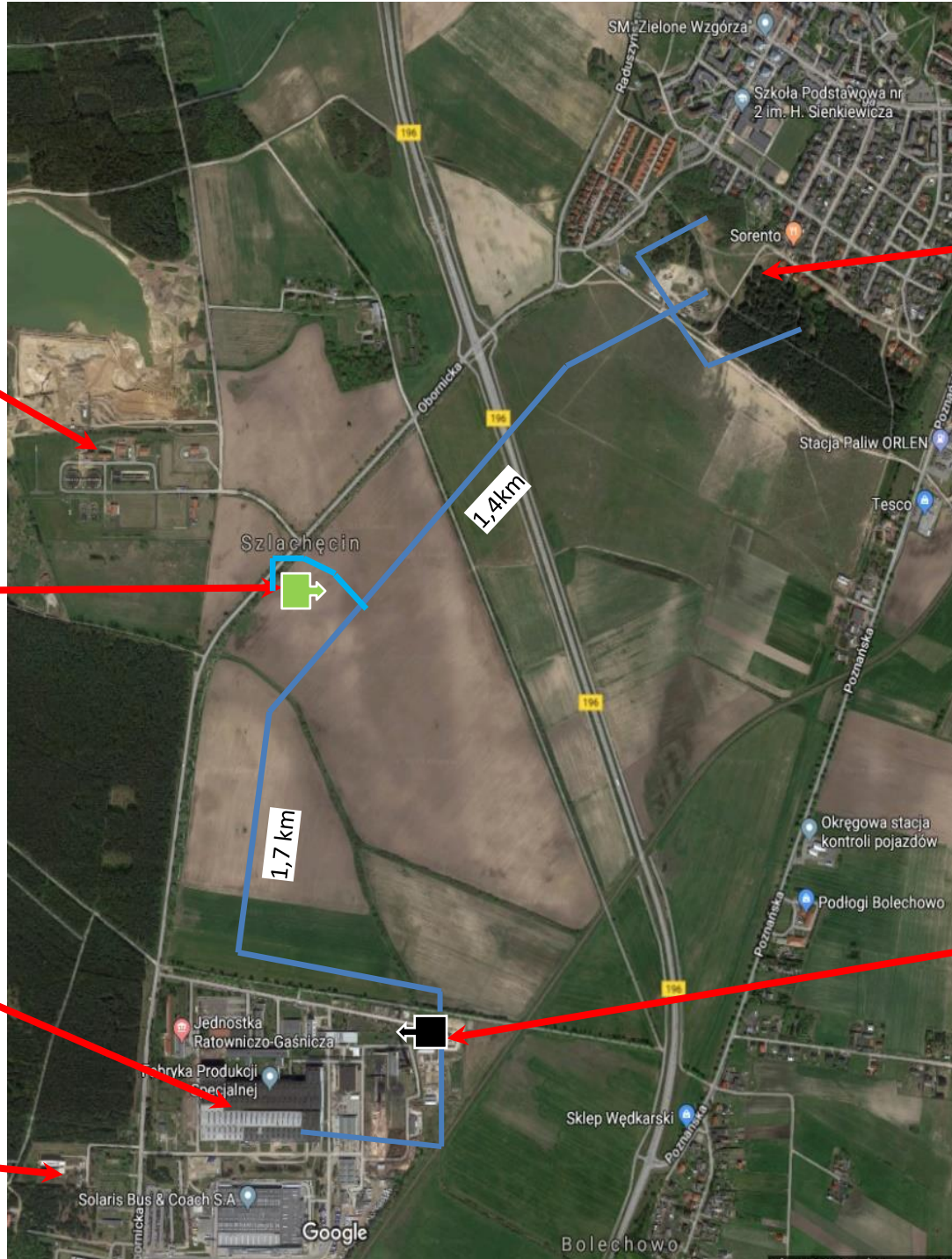
Szlachęcín plant



Main factory

SOLARIS

New investment



City of Murowana Goślina



Coal heating plant



# Key figures

## Sewage heat recovery with gas cogeneration



| **12.2020**  
starting of production

| **3 400 tons**  
coal reduction

| **2 000 tons**  
CO<sub>2</sub> reduction

| **100%**  
heat consumption between may-september

| **5 000 people**  
sewage heating

| **1 100 [kW]**  
heat consumption - summer

| **9 500 [kW]**  
heat consumption - winter

| **2 950 [kW]**  
total production

### WORK PARAMETERS

min. sewage temp. 8 [C]  
sewage daily flow rate 50-350 [m3/h]  
nominal for installation 180 [m3/h]

### Heating pump COP 2,71 - 3,5 (summer)

- I step 2x 663 [kW] 36/42 [°C]
- II step 6x 273 [kW] 55/65 [°C]

### CHP (gas)

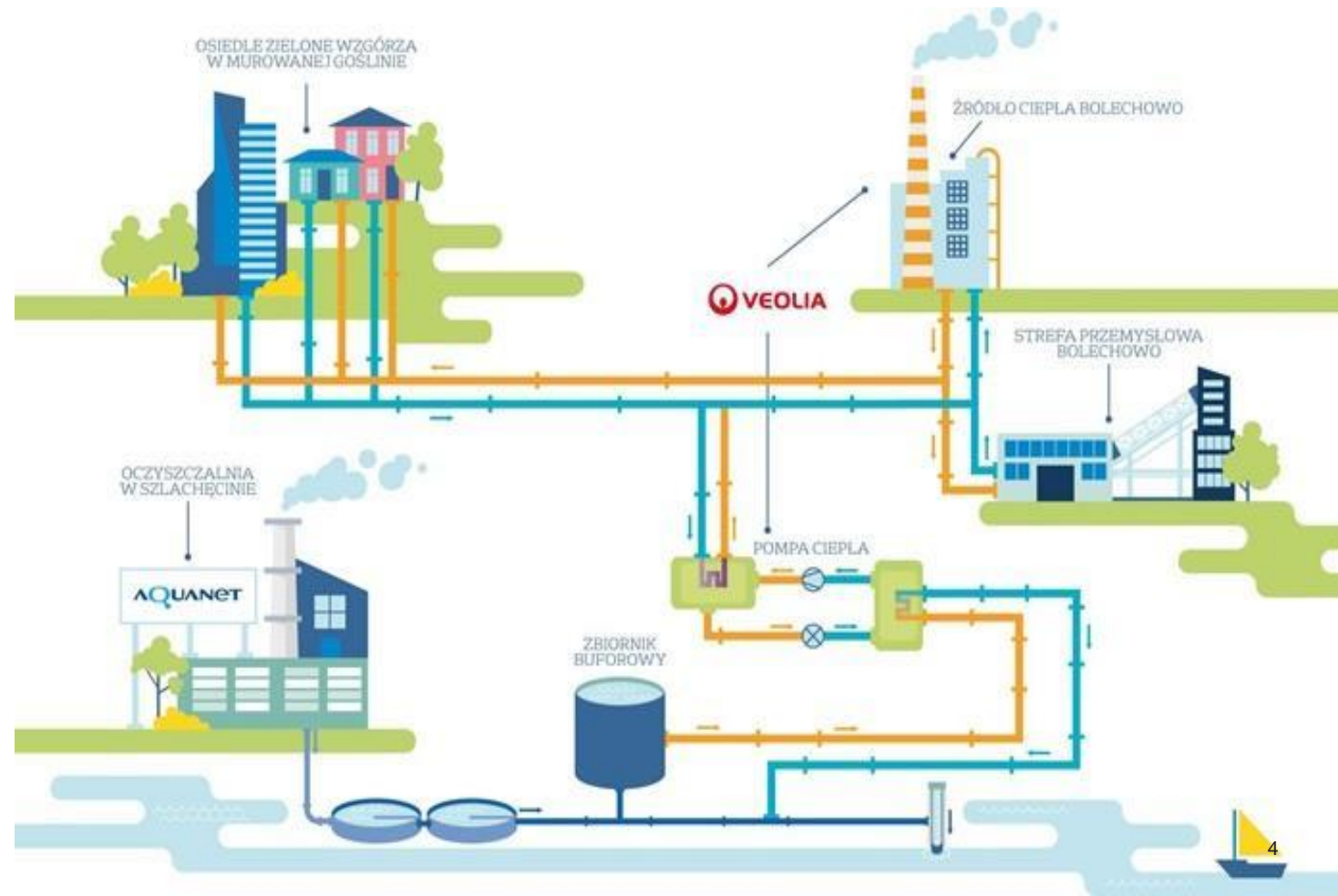
- 1002 [kWe] (605 [kW] heating pumps)
- 1200 [kWe] (107 [°C])

# Innovation

## What's new here

- The combination of known solutions in an **unobvious way** gave a new quality
- The **installation is zero-emission**
- Maintenance-**free installation**
- **Practical application** of circular economy
- It is very likely that it will become a **replicable project**, duplicated in many locations
- Work is **already underway on a similar solution**, on a larger scale, in Poznań or Warsaw

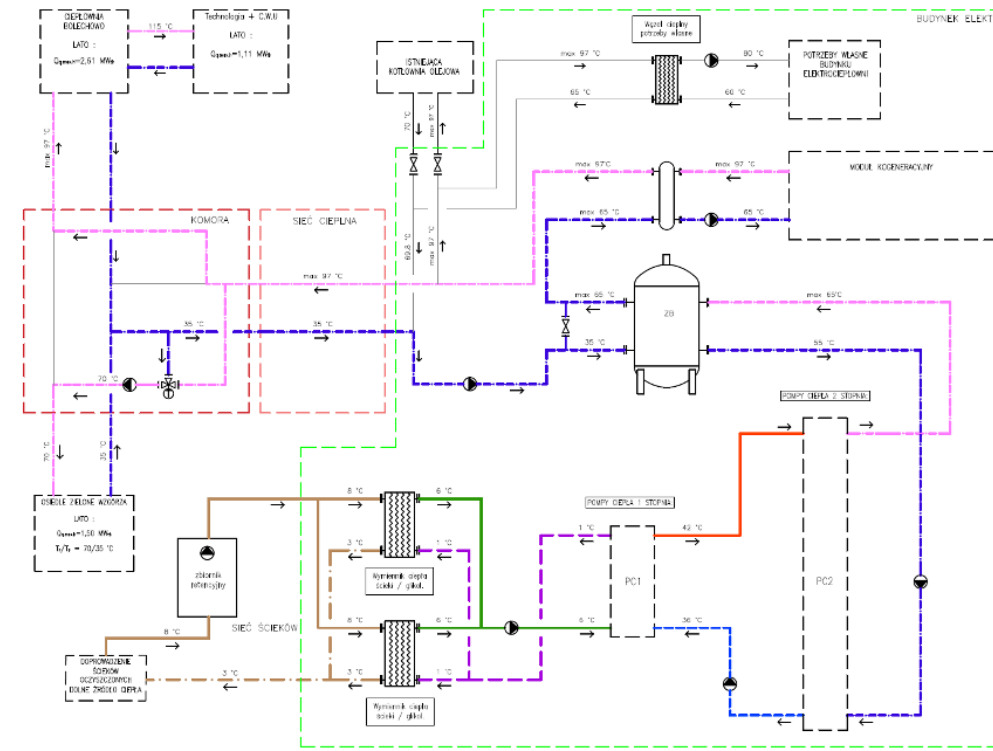
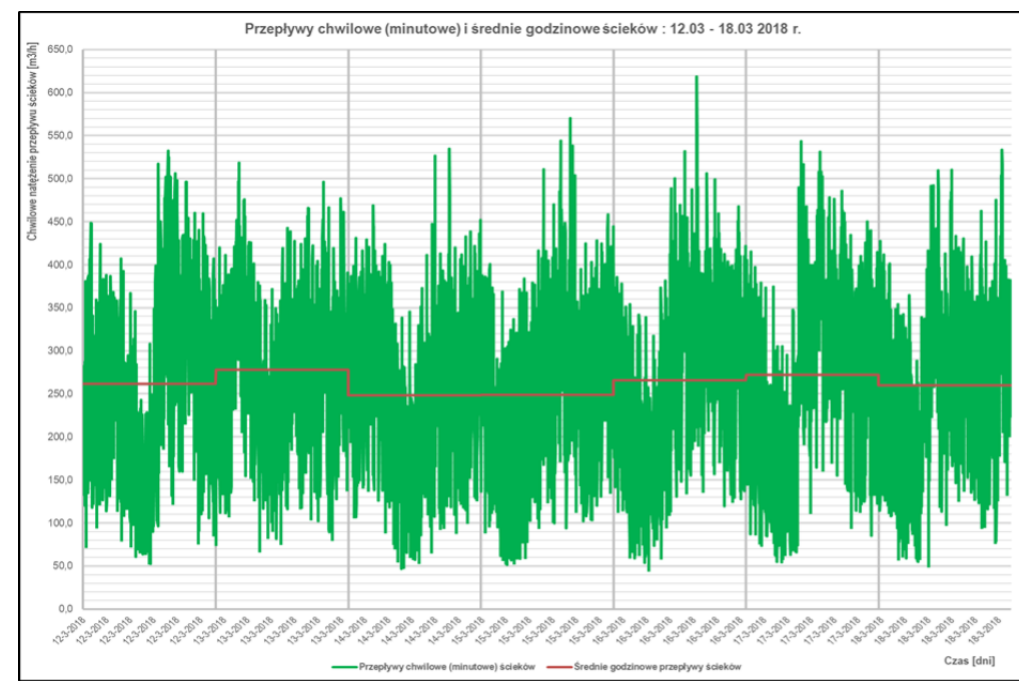
Combining gas cogeneration technology and a heat pump with a bottom source of treated sewage into one coherent and centrally controlled technological system.



# Design assumptions

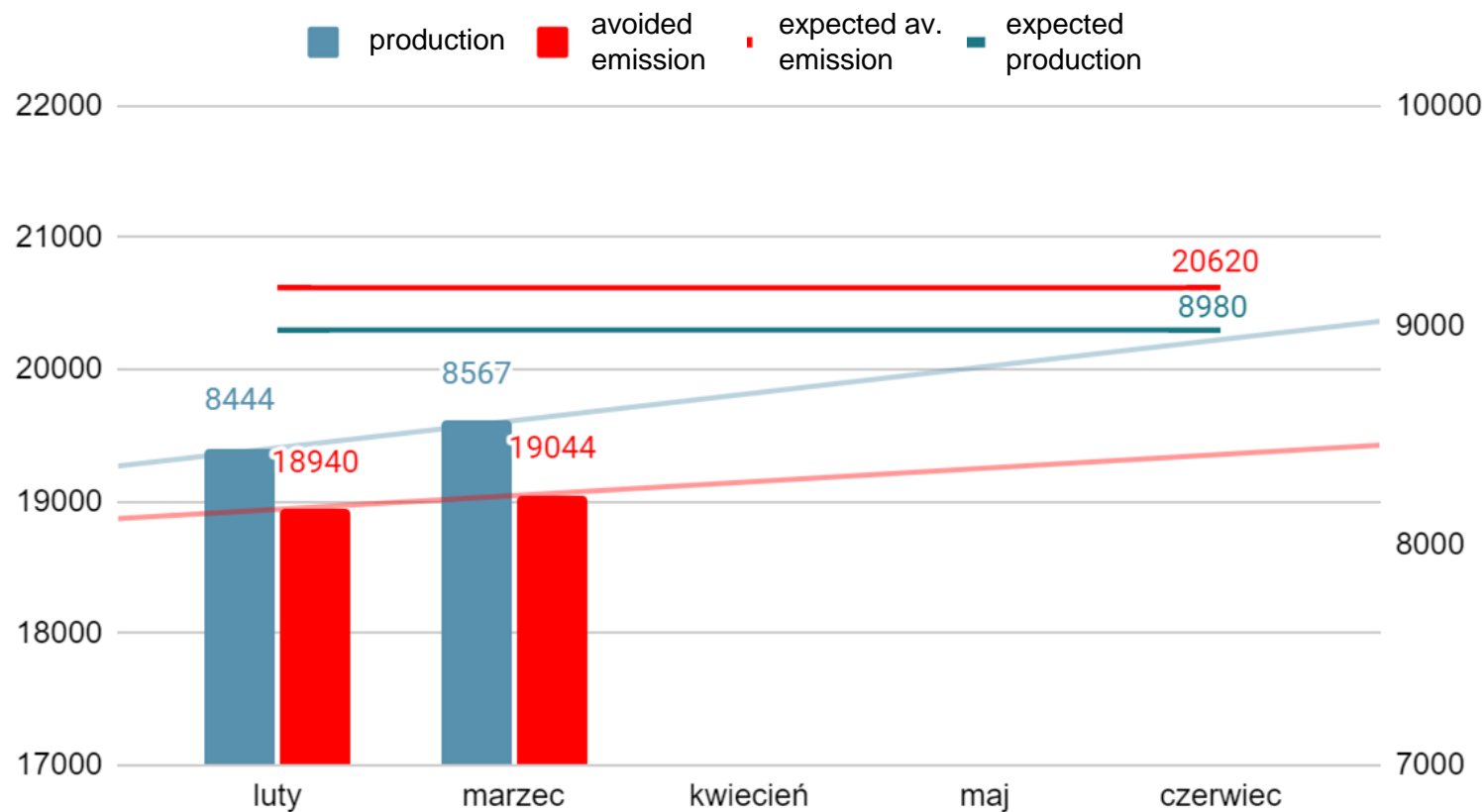
## Critical parameters

- **flow** of the sewage
- **temperature** of the sewage
- sewage **quality**
- **heat consumption** (in summer)



# Effect & KPI

## Learning by doing



production between 07.2022-03.2023 and forecast until July 2023

**TOTAL PRODUCTION**  
01.2021-03.2023

**15 276** MWhel CHP COGEN engine

**70 105** GJ CHP COGEN engine

**30 213** GJ from Heating Pumps

# New power facility Summary

The combination of cogeneration and a heat pump recovering heat from wastewater is a **step towards the implementation of the idea of a green deal and climate neutrality.**

The **system allows to maximize heat production** with the lowest possible consumption of natural gas.



It is not only a combination of technologies, but also a **combination and cooperation of the water, sewage and heating industries.**

In addition to the implemented ideas of decarbonization and waste heat recovery, the **investment provides ecological benefits:**

Annual **reduction in CO2 emissions: 2,000 t**  
Annual **reduction in coal consumption: 3,400 t**



**We are a leader of ecological transformation**