Aquafin pioneers wastewater heat recovery at its own site

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Aquafin will soon be using wastewater as a source for sustainable heat generation. This is the most striking element in the conversion of the labs and workshop of its Aalst wastewater treatment plant (WWTP) into a zero-energy building.

Image: Impression of the design (Evolta)

At its Spuimeersenweg site Aquafin collects all the wastewaster from the wider Aalst area, where it is purified and then pumped back into the waterways. In addition to a workshop, a two-storey building also houses the labs where samples from WWTPs throughout Belgium are examined. This building, dating from the 1980s, was in need of a major upgrade, in terms of both energy sourcing and functional layout.

The building will be stripped down to the concrete structure. By demolishing as little as possible, rearranging functions more logically and adding a warehouse of just 200 m2, the building remains compact, with a total surface area of about 2,000 m2. The envelope is being made thoroughly airtight and insulated, with materials that can be easily recycled at the end of the building's lifespan. The façade is finished with wood, also an eminently circular raw material. The architectural study, including the design of the building envelope and the choice of materials, is by **Evolta**.

The building will be heated and cooled by a wastewater heat recovery system. The wastewater arriving at the site has a temperature of at least 9 to 10 °C in winter and, of course, a lot higher in summer. In the main sewer – with a diameter of 2 meters! – a heat exchanger is installed that extracts the heat from the wastewater and sends it to the heat pump. This heats the water to heat the building (40 to 50 degrees). The principle also works the other way around: the heat pump can also extract heat from the building – partly to cool the labs – and release it into the wastewater.

The choice of a 4-pipe heat pump has an additional advantage: in periods of lower heat demand, the heat pump can extract heat from rooms that need to be cooled, and use it immediately to heat other rooms. In this case no use is made of the heat from the wastewater. This ensures a much higher efficiency of the heat pump, because the electricity used to drive it simultaneously provides heating and cooling, while otherwise the same amount of electricity only produces heat.

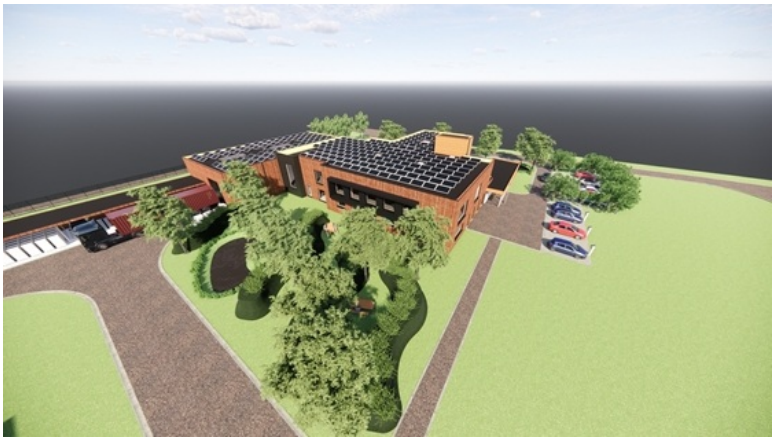
While geothermal energy is already widely accepted, wastewater is innovative as an energy source for heating buildings. With wastewater treatment as its core business, this is therefore a model project for Aquafin, which also wants to investigate whether it can use this principle to link heat from the wastewater network to heat pumps at customer premises.

Aquafin is of course aware of the problem of water scarcity in our country. Economical water consumption is therefore an important focus of this project. Rainwater will be reused for flushing toilets, while infiltration basins will permit maximum flow of surplus rainwater back into the soil. The design of the water infiltration is also by **Evolta**.

Photovoltaic panels installed on the building and elsewhere on the site will cover a large part of the electricity consumption on the site, including the energy needed to heat and cool the lab building. In this way, the Aalst WWTP will become a fossil-free site.

Like Ingenium, Aquafin is also opting to make its vehicle fleet more sustainable. 6 charging stations with 12 charging points for electric cars are therefore provided in the plans.

Image below: Impression of the design (Evolta)



For more information about sustainable heating and cooling via wastewater heat recovery, please contact Matthias Zuliani on 050 40 45 30 or matthias.zuliani@ingenium.be.