Zumikon utilizes the heat from wastewater to heat school buildings, town hall, swimming pool and other public buildings.

On June 11, 2018, the municipality of Zumikon has approved a project to utilize the heat from its waste water. Charrière Management has supported Zumikon in the development of the concept. Thomas Epprecht, the responsible council member, is pleased that the project will be realized after a long search for the best solution.

Bettina Charrière spoke with Thomas Epprecht

Mr. Epprecht, on June 11 the municipality of Zumikon has approved the realization of a plant to utilize the heat from wastewater. You have been in the driver seat for this project - congratulations to your success! You were relieved that the voters approved the plan. Why is this project so important for Zumikon?

Zumikon is operating a disctrict heating grid since almost 40 years. It supplies a dozen important public buildings with heat and warm water. Since the beginning, wastewater was the main heat source. We used the purified water directly at the exit of Zumikon's water treatment facility. Zumikon received a lot of praise for this pioneering achievement. Later on, it was decided to shut down Zumikon's water treatment facility and to treat all wastewater from the towns of Zumikon, Küsnacht and Erlenbach in a common facility in Küsnacht, called ARA KEZ. This raised the question about a new suitable heat source. In order to continue using the existing district heating grid, a central heat plant was imperative.

The project has a long history. Why did it take so long?

There are several reasons. The development of the new ARA KEZ in Küsnacht was delayed by various appeals. In the meantime, Küsnacht also decided to utilize the heat from Zumikon's wastewater. This required an agreement between the two municipalities. At the same time, the cantonal authorities declared that they would only release one single authorization to ARA KEZ. The two municipalities were supposed to enter into a sub-agreement. Küsnacht selected Energy 360° as contractor. Zumikon was also considering a suitable external operator. Finally the long underground tunnel in Küsnacht that was supposed to contain the pipe for Zumikon's wastewater, collapsed. Time passed and the complexity increased.

The project

The projected plant comprises:

- heat extraction from untreated wastewater
- heat pump (550 kW)
- buffer heat storage
- two back-up oil tanks

The heat pump covers 75% of the heat demand of approx. 3'200 MWh of the connected buildings:

- 2 school buildings
- swimming pool
- town hall
- community center and child care
- church

The project will be realized as an energy contracting under a 30-year contract with Energie 360°.

Which alternatives have been considered, and why was the utilization of heat from wastewater chosen?

The utilization of heat from wastewater was an obvious choice since the beginning: in the past, we used the purified water; in the future, it would be the untreated water. We took some detours because at the time when the closure of Zumikon's water treatment facility was decided, we didn't fully trust the new technology for heat exchangers with untreated water. Therefore, before my tenure, a heating plant fueled by wood chips was considered. Some citizens suggested equipping a large field with borehole heat exchangers to supply the district heating grid. Both ideas were not put to a public vote. Thanks to the delays in the construction of ARA KEZ and the technological progress that occurred in the meantime, we were able to reconsider the obvious solution.

Which essential elements lead to the approval of the project by the citizens of Zumikon?

We didn't conduct any opinion polling. However, the very clear voting result and the fact that the project was approved without any discussion – which in Zumikon is rather exceptional – indicates that the voters agreed with the arguments of the municipal council. Essential was presumably the fact that with the proposed solution, we can avoid high initial investments. The costs will be distributed over the years through the energy price. This may sound surprising, since Zumikon is perceived as a rich town. However, we have to decide very carefully on each investment. Out of each Swiss Franc of taxes that Zumikon collects, 85 cents go into the cantonal tax revenue sharing. Neither a relief of the tax revenue sharing nor an increase of the municipal tax rate are realistic these days. Another reason for the approval could be the fact that with the chosen contracting solution we are buying a "worry-free-package". We don't have to worry about the coordination of operation with Küsnacht, and we receive energy for 30 years at a pre-defined price.

Thomas Epprecht

Thomas Epprecht is municipal councillor of Zumikon since 2014 and responsible for the security and buildings departments. He studied biochemistry and holds a PhD of the University of Zurich.
During his professional career as a risk expert, he developed comprehensive expertise in the fields of environment, security, genetic engineering and nanotechnology. He was a member of the Executive Committee at Swiss Reinsurance Company.

He is married and father of two sons and one daughter. His personal interests are literature, wood crafts and architecture. He also likes to travel.

The municipalities of Zumikon and Küsnacht both want to use heat from the same wastewater channel. Is this even feasible?

Of course, why not? However, you need rules, if two parties are using the same resource. Zumikon is situated above Küsnacht. If we would extract all the heat that we require in Zumikon on cold days, Küsnacht wouldn't have much heat left. Therefore, we have agreed that Zumikon has the right to cool down the wastewater to 7-8°C, and Küsnacht has the right to extract the remaining heat down to 3-4°C. This implies that on very cold days both towns have to supplement heat from fossil energy sources. The minimum end temperature of 3-4°C is necessary to ensure that at the confluence of all wastewater streams in ARA KEZ the inlet temperature is at least 10°C. This corresponds to the requirements of AWEL, the competent cantonal authority, and is required for proper functioning of the water treatment facility. Choosing the same operator, Energie 360° AG, for both Zumikon and Küsnacht is also ideal for another reason: it allows for a flexible usage of the available heat depending on the heat demand in each of the district heating grids as well as price and availability of the back-up fossil fuels.

Zumikon has opted for a contracting solution, transferring construction and operation of the plant to the contractor Energie 360°. 30 years are a long time – many things may change. What do you need to consider to ensure that the solution is sustainable in the long run?
Yes, 30 years are definitely longer than my tenure and probably also of my successor's. Each decision that you can't correct yourself if necessary needs to be considered with particular care and foresight. In this case, I could draw upon my experience with the re-negotiation of building rights agreements with various companies in Zumikon – with durations of 60 years. Whether building rights agreement or contracting – a solution that is sustainable over a long time needs to be attractive to both parties over a long time. Both must have an advantage, you need to find a win-win-solution. Rights and obligations must be distributed in a balanced way. In case of problems, the burden and the obligation to furnish evidence should not rely on the shoulders of one party only in a one-sided manner.

The municipality has approved the project – what are the next steps? When will the new plant be operational?
We want to turn the switch in the spring of 2019. From this moment onwards, the wastewater of Zumikon will go directly and without treatment to Küsnacht, and we will shut down the old water treatment facility. In parallel to the dismantling, we will prepare the underground chamber for the new heat exchanger in the current digester. While Zumikon will build the underground chamber, all technical installations will be under the responsibility of Energie 360° AG. We expect to receive the first heat delivery in winter 2019/20.

Which advice would you give other municipalities pursuing similar projects?
Similar projects, which means several involved parties, tricky cantonal requirements and long-term contracts are mostly complex. You have to find a way to keep the overview and to respect the different objectives of all the stakeholders. My advice: engage skilled consultants, listen well to them, discuss discrepancies, ask about the long-term consequences and distill the essence of it all. This will produce better results and you will reach your goals faster. For the heat-contracting project, we had a team on board that comprised - next to you, Mrs. Charrière, as overall coordinator – also an experienced technician and a lawyer specialized in public tendering. This was ideal; particularly your background and your specific experience in the energy sector gave me the necessary assurance to support the solution with full strength in front of the voters.

Thank you for the interview! We wish you all the best for the completion of the project.