

Q&A Webinar Aquathermal Energy and 5th generation district heat and cold

June 1st 2023

Questions to Herman Eijdens	Answers
<i>Slide 9: If you talk about the cost reduction: is this on CAPEX or OPEX? Can you say something about what are the typical total costs for the system and the main cost elements?</i>	The Opex costs are rather low, about 1,5% of investment per year. The revenues are prescribed by Dutch Heat Law which was until yet based on “No more then else principles”; not more expensive than natural gas. The new law will be based on real costs and an excepted profit of Utility companies. The Capex depends a lot on local circumstances and also the market scale. The scale is still small, but many places offer low hanging fruit, meaning cheap sources and limited pipeline distances. We found an investment from k€20-k€ 25 per dwelling in the city of Heerlen. We expect it to come down by k€ 5 to k€ 10 on longer term, which actually now is supported by subsidies.
<i>Can you tell something about governance. Are all the participants also owner?</i>	The new heat law in the Netherlands intends to make these grids 51% public owned. It is very useful to have energy cooperations on board, but we also think you need professional partners to do the project development, it is serious business, with serious investments.
Vragen to Hugh Moore	Answers
<i>Is there being paid for the energy by the network? Specific for the waste energy of the WWTP.</i>	The supply costs are based on a nominal amount for passive heat from the treated effluent and related pumping costs for the ambient loop.
<i>How is the accounting done for delivering heat/cold to the grid, with some many large and small prosumers? Is there a fixed cost per unit of energy, or does it vary daily/hourly depending on the amount of renewable energy available.</i>	We apply a unit rate in the customer heat supply agreement. The variation in size and type of customers is fairly limited so their tariffs do not vary greatly. However it is correct that where further diversification is applied to energy prosumers, a more flexible range of tariffs would be applied but kept to more fixed costs to avoid cost uncertainties.
<i>What temperatures are you running the network?</i>	The wastewater temperature is between 9 to 12 degrees Celsius. The plan is to deliver 65 degrees Celsius to the buildings.
<i>How open is the local water company to the tapping the energy from wastewater, are there any limits to using the wastewater infrastructure?</i>	There are not limits, the plans are in line with the sustainability goals Scottish Water has. They have their own carbon and net zero targets and the use of the facilities is consistent with maximizing wastewater as a source of energy.
<i>Is there any environmental impact on the river by extracting energy from it? And how do you cope with it? And what legislation and/or boundary conditions are there?</i>	The impact is very limited and well within our environmental agency (SEPA) guidelines.
<i>Do you already add CO2-pricing to your models? To Capex and Opex (TCO)?</i>	We carry out counterfactual cases in relation to CO ₂ avoidance and this is reflected in our business case assumptions.

<i>Why it doesn't work with high temperature ranges?</i>	The efficiencies are generated through low exergy, using minimal lifts in temperatures to improve the COP. Higher temperatures can be generated more locally if required but impact the bottom line. Fabric first approaches are more seen as a counter to higher temperature requirements.
<i>If higher end-user temperatures are required, couldn't the end-user install "private" heat pumps with optimized/higher temperature levels?</i>	As per the answer above additional heat pumps could be used but is not considered a long terms improvement rather building improvements to mitigate the new for higher temperatures. Potentially electric boilers can be used to enhance peak requirements.