Do heating networks limit freedom of choice?

People who express their dissatisfaction with heating networks via social media and many meetings usually respond to the increasing rates charged by the heat suppliers. They express their dissatisfaction because they often have no good alternative. The only thing they can do is insulate their houses and thus reduce their use without reducing comfort. Or they have to make large investments to be disconnected and install an alternative (sustainable) heat source. Unfortunately, a "collective" approach to these actions also leads to higher tariffs because the heat suppliers are "forced" to increase their tariffs, in order to be able to cover the basic costs with reduced sales.

Of course, vendors may want to consider incorporating more connections into their existing network or expanding the network to nearby neighborhoods. However, possible candidates within the existing network area have usually already found another alternative to natural gas (e.g. a heat pump). Moreover, rising tariffs will certainly not provide the necessary motivation to switch to the heating network. The neighbouring areas will also look at the developments in the initial area with great suspicion and will be unwilling to take the step to a heating network by connecting to the existing network.

Investments for such an expansion are important for the profitability of the company. Without the certainty that the majority of residents will join, these investments are therefore risky for the heat suppliers. This is one reason why the large energy companies in the Netherlands have decided to suspend their activities around heat networks for the time being. In other words, it seems that the construction of heating networks as a solution for many homes to carry out the energy transition has come to a dead end.

In order to be able to continue the transition, the Dutch government has taken a number of initiatives to encourage investment in heat networks. In addition to providing subsidies and controlling rates, it encourages municipalities to take a majority stake in the heat company. These are certainly possibilities, but they do not change the economic reality and the restriction of freedom of choice that is implicitly imposed in the realisation of a traditional heat network.

A 5th Generation District Heating and Cooling (5GDHC) system is of course also to a certain extent a monopolistic system because the economic profitability is also partly driven by the number of connections. However, a good 5GDHC system is not developed around a "central heater". Its strength comes from using the different types of heat sources that already exist in the area. Think of surface water, geothermal energy, effluent heat, industrial residual heat, solar panels, and so on. In addition to the direct exchange of heat and cold, a 5GDHC system provides the possibility to store excess heat (but possibly also cold) in a buffer and/or a thermal energy storage system. Of course, this storage can also be used for any surplus green energy generated in the area. In other words, a 5GDHC system uses what already exists in the neighborhood and thus becomes a "neighborhood project" to which everyone can contribute and thus reduce costs.

A further advantage of a 5GDHC system is that it can be built up slowly and that there is basically no optimal (maximum) size that hinders further expansion. Of course, a minimum size is desired, but this only depends on the available sources, the possibilities for heat and/or cold storage and the possibilities to start exchanging heat and cold at an early stage. Connecting

nearby neighborhoods is fairly easy and as long as each neighborhood has the above elements, in fact all neighborhoods can operate largely independently. By linking them together, the security of supply for everyone in the total system increases, because each subsystem has reserve capacity outside the (winter) peak. The energy supply also gains in robustness through the use of multiple sources and buffers. The increase in intelligent communication and smart control systems will therefore make it increasingly possible to control and optimize energy flows in an urban area in the future.

Even if a 5GDHC system can be set up as a joint or collective project, there remains a need to have a central organization that has an economic incentive to operate the project efficiently. This incentive is best filled by an organization that has a profit motive and is not funded by the community in the form of increasing taxes (or rising rates). To ensure that this incentive does not lead to rising tariffs, it is necessary to lay down clear rules in advance with regard to tariff transparency.

XChains is of the opinion that such a set-up is more possible within a 5GDHC system because with a well-designed network, the operating costs are not or to a lesser extent dependent on external energy prices, as is certainly the case for most existing heat networks. Newer heat networks that use one "central stove" (e.g. a large central heat pump) also remain largely dependent on fossil fuel rates. The biggest cost item for a well-designed 5G network is only the annual depreciation of the investments made. This makes it possible to set a fixed rate for a longer period of time before realisation (taking into account an annual inflation correction).

The costs of upgrading the supplied water to the desired heating temperature are borne by the user via the use of his individual heat pumps. This gives the end user direct influence on his energy bill. They can naturally generate the required electricity themselves, just like with the current outdoor heat pump, with solar panels. The big difference with the air-to-water heat pump is that a water-to-water heat pump does not require an outdoor unit (no noise) and requires less energy than the traditional air-water heat pump. Moreover, unlike the outside air, the supplied water temperature is constant. This improves the efficiency of the heat pump.

In summary, one can conclude that a 5GDHC system also limits the freedom of choice in the first place, but the end user still has considerable influence on the costs for heating or cooling his home. Once the entire system is efficiently developed and operated, there is also greater certainty of future costs.