Pilot project Generalenbuurt - Eindhoven

We spoke about the Generalenbuurt pilot project with Roozbeh Nikdel. He has been working for the municipality of Eindhoven since 2018, currently as Theme Leader Sustainable Living. The Generalenbuurt Pilot project is the second PAW pilot project in the municipality of Eindhoven. Pilot project 't Ven-Lievendaal was previously honoured, in the first tranche.

Eindhoven context
Roozbeh Nikdel says of the Eindhoven context, "Renewable energy sources are scarce in the municipality of Eindhoven. There is thermal energy from surface water and waste heat, but the most important sustainable heat source for Eindhoven - and for the Generalenbuurt - is the heat in the effluent of a sewage treatment plant. This has the potential to heat 8,000 homes. The Generalenbuurt was selected as a testing ground because of the mix of building typologies, and because many homes in this neighborhood were in need of maintenance."

"We will soon go into the neighborhood with a VLT backbone. The “cluster heat center” will then use electric heat pumps to upgrade the temperature to a maximum of 50°C. This design offers a lot of flexibility because new homes, or other projects in other neighborhoods, can also be connected to the VLT backbone this way. The dwellings in the Generalenbuurt owned by the housing association are already currently being renovated towards the so-called ‘standard’ (energy label A/B) and will also receive solar panels. For private homeowners, there is a special advisory process for making their apartment more sustainable, that runs through the owners' associations. This concerns three-story porch flats. One porch apartment has now been adapted to 50°C."

Questionnaire
1. Is there a cooling demand? If so, is it linked to heat demand?
No, not in the PAW area, if at all. This neighborhood has mostly renovated existing housing – ground based houses owned by a housing association - with no cooling demand. The porch apartments are owned by owners' associations. Partly they are heated collectively and partly with individual gas fired boilers. There is also some non-residential building: one building that is already natural gas-free, one car showroom that has been repurposed, one small supermarket and a strip of stores.

It is true that the municipality is noticing that cooling demand is becoming increasingly important. The temperature of the backbone from the sewage treatment plant offers opportunities for cooling from there: directly usable or with a small temperature step via a heat pump, with the resulting heat being injected back into the VLT grid.

2. Will a large number of heat pumps be used? If so, is some form of peakshaving being done to reduce the load on the power grid?
Yes, in the so-called ‘cluster heat center’.

- heat pumps extracting their source heat from the VLT backbone: via heat pump to 50-55°C, temporarily max. 60°C if 50°C would be too little in winter anyway;

- heat pump extracting source heat from outside air.

Within the framework of UDI (Urban Development Initiative, TUe, municipalities of Eindhoven, Tilburg and Helmond), studies are also being conducted on balancing electricity supply and demand citywide and at neighbourhood or district level.

3. Will local energy sources be used?
Heat extracted from the sewage treatment plant and outdoor air is local energy. The electricity for

the heat pumps and e-boiler is "gray" (linked to the generation mix of the national grid). The homes will have solar panels, but this energy is not intended for the cluster heat plant. There is no vision yet for the local and sustainable generation of the needed electricity. For now, the land area of the municipality of Eindhoven seems too small to be able to sustainably generate all the energy needed there.

4. Will low-grade energy sources be used for low-grade demand?
To a large extent, yes. However, heat pumps use electricity with a relatively favorable efficiency.

5. Is the system demand-driven?
The district heating will need to be maintained at a certain temperature to always meet heat demand. Therefore, heat will always be circulating.

6. To what extent is fossil energy still needed?
With the addition of solar panels in the renovation of the homes, a good portion of the electricity demand of the dwelling will be reduced. Regarding heating, fossil energy is still needed to generate part of the electricity required for this in the heat pumps: this is equivalent to the share of fossil energy in the national electricity mix. For the time being there is no plan to generate all electricity locally, the possibilities in the city have been investigated and appear to be limited.

7. To what extent will homes be made suitable for LT?
The homes will be made suitable for a supply temperature of max. 55°C, for the time being retaining the delivery systems, because the estimate is that these will suffice (see also the Warming Up study in Dutch). If the heat emitting systems turn out to be inadequate, they will be upgraded where necessary.