

Tilburg

1. Background

Tilburg is a city located in the south of the Netherlands in the province of North Brabant. In 2021, it had 224,459 inhabitants, making Tilburg one of the seven largest cities in the Netherlands (CBS, 2022a). In 2021, Tilburg had 102,471 housing units, with equal numbers of owner-occupied homes (50%) and rental properties (50%). Housing associations owned 65% of residential rental properties, and private landlords owned the remaining 35% (CBS, 2022b). In terms of the age of the housing stock, 16.4% of the dwellings were built prior to 1945, and 16.2% – after 2005. In terms of housing type, 63.7% were single-family homes, with the remainder being multi-family homes (CBS, 2022c).

In 2021, 59% of homes in Tilburg had an individual natural gas boiler, 28% of homes were heated through district heating, 5% – block heating, 3% – electricity, and there is no data on the rest of the 5% of homes. The share of homes heated through district heating is much higher than the average share in the Netherlands (about 7% in 2021) (CBS, 2022d).

Homes heated through district heating are part of the Amernet heat network located in Central and West Brabant, one of the largest heat networks in the Netherlands. The network was built in the early 1980s by the municipalities of Tilburg and Breda, but in the 1990s the network was sold to a private company as part of the neoliberal reforms¹. A private company, Ennatuurlijk, currently owns the network and supplies heat to 51,000 households and 355 companies in Tilburg, Breda, Oosterhout, Geertruidenberg, Drimmelen and Made (Ennatuurlijk, n.d.). The network's sources of heat in 2021 included: the Amer power plant – 91%, natural gas – 7%, and biomass – 2%. The Amer power plant, owned by RWE, is located in the municipality of Geertruidenberg and uses biomass (80%) and coal (20%) to produce electricity (RWE, n.d.).

There has been significant activity by civil society groups in Tilburg focussed on increasing the share of sustainable energy and energy saving. There are five energy co-operatives in Tilburg, in which residents collaborate to speed up the energy transition in their community (Tilburg Municipality, n.d.-a). Through 2017-2020, five bottom-up initiatives in Tilburg participated in the Social Innovation Labs for a Zero Energy Housing Stock (SMILE) project supported by a grant from the European Union. The project used participatory approaches for area-based solutions to decarbonise homes (Hofman et al., 2021). There were different leading organisations in each Social Lab, including a homeowner association, a housing corporation, the municipality of Tilburg, and local energy co-operatives. The social labs adopted a 'double sustainability approach' aiming to procure sustainable energy and address social issues such as healthy living and poverty alleviation. An interviewee mentioned that the lessons on public participation and stakeholder collaboration learned in the SMILE project will be useful for planning and implementing heat transitions².

¹ Interview with a Tilburg city official.

² Interview with a researcher working on participation in the energy and heat transitions in Hart van Brabant.

2. Heat transition vision

2.1. Development of the heat transition vision

According to the Climate Agreement, each municipality in the Netherlands must develop a heat transition vision. To develop the vision, the municipality of Tilburg created a steering committee and working groups consisting of housing associations, tenant organisations, the electricity and gas network operator Enexis, the business community, Tilburg University, and the city councillor. The first draft of the vision was produced in April 2021.

In May-September 2021, the municipality solicited citizen feedback on the vision draft. Tilburg used a unique approach to citizen engagement in this process. First, the municipality set up a citizen assembly, or *Tilburger Tafel*, consisting of 20 representative Tilburg residents. Second, the municipality invited people to provide their feedback through a city-wide *Digital Dialogue* (about 1500 people participated). People were invited through online platforms, the city newspaper, and by talking to people in the street. The participants were provided with a set of questions, and all the answers were available to all the participants. The answers allowed the municipality to understand a general trend in resident opinions on the heat transition. The answers were also spatially mapped, and the municipality plans to use them to devise a tailored heat transition planning and implementation approach in a specific neighbourhood. The recommendations received through the *Tilburger Tafel* and the *Digital Dialogue* have been incorporated into the heat transition vision (Tilburg Municipality, n.d.-b).

The majority of Tilburg residents who participated in the citizen engagement activities supported the municipality's overall plans for heat transitions. The *Digital Dialogue* reported that 66.4% of the respondents supported a district-oriented approach to decarbonising heat. The survey also asked if the respondents supported the chosen plan for the zone, in which they resided (for more information on the zones, see Section 2.2.). On average, 68% of the respondents supported the plan, with some variation among the zones. Citizen feedback pointed out that the cost neutrality requirement might not be realistic and suggested emphasising property value increases as a result of heat decarbonisation in cost debates, as well as offering financial solutions and organising collective purchasing programmes. Residents called attention to focussing on the decarbonisation of older homes, pointed out the risks of private companies' monopolies, the importance of customisation, the availability of skilled personnel and independent experts, and encouraging resident initiatives (Tilburger Tafel, 2021).

In December 2021, the heat transition vision was adopted by the City Council. The vision is scheduled to be reviewed every two years to allow flexibility in the approach and avoid lock-ins. However, flexibility might come at the expense of the certainty that some stakeholders need. For example, an interviewee mentioned that network operators are not keen on having too much flexibility in the planning process³.

Policy officers and project leaders make up the municipality's in-house capability, but the municipality also relies on external energy experts and consultants. Consultants were responsible for developing the following parts of the heat transition vision: data modelling

³ Interview with a researcher working on participation in the energy and heat transitions in Hart van Brabant.

and scenarios prepared by CE Delft, and DWA; participation and communication approaches drawn up by P2; the financial approach developed by Finance Ideas. The Dutch Environmental Assessment Agency (*Planbureau voor de Leefomgeving*) assessed the technological feasibility and costs of different sustainable heating solutions for each district (neighbourhood) in the country. To make sense of the outputs of the modelling tool for the municipality of Tilburg, it had to hire an external consultant at CE Delft.

The municipality of Tilburg obtained data on CO₂ emissions from the Regional Climate Monitor (*Regionale Klimaatmonitor*) developed by the national government. The gas and electricity network operator Enexis shared data on energy consumption, the location of cables and pipelines, and maintenance activities (Enexis, 2022). The municipality also used data provided by the Dutch Central Bureau of Statistics (*Centraal Bureau voor de Statistiek*) and data tools developed by a non-profit organisation District Compass (*Wijkkompas*). According to the data privacy regulations, the data is anonymized. The absence of data on, for example, the gas grid connection of particular housing units can be problematic for the municipality's planning activities⁴.

2.2. Approach to heat decarbonisation and natural gas phase-out

Tilburg's goal is to decarbonise heat and phase out natural gas in the residential sector by 2045 (in accordance with its net-zero goal by 2045).

The heat transition vision broadly divided the municipality into four zones, without stipulating technological solutions for each district within the zones. The four zones identified in the heat transition vision differ from each other in terms of the age of the building stock and building density, as well as existing infrastructure.

- Homes in the northwest part of the municipality are connected to the Amer heat network. The goal in that area is to make the network more sustainable by reducing reliance on the Amer power plant as a heating source and replacing it with more sustainable sources (e.g., geothermal energy). Other approaches include lowering the temperature of the heat network and making the power plant's electricity sources more sustainable.
- In the areas with high building density (west, north, and south), the plan is to build or expand heat networks. The vision considers the development of smaller networks that tap into local heat sources (for example, aquathermal energy or local waste heat) and utilise storage solutions.
- A sustainable heating solution in the areas with low building density in the northeast will be determined after 2030, but home insulation will take place in the near term.
- The city centre area will rely on individual hybrid heat pumps in the near term to reduce the amount of natural gas used. In the south, the plan is to build 5th generation heat and cold networks as there is no existing district heating, but the building density is high (Tilburg Municipality, n.d.-b).

Within the four zones, the municipality will also develop a plan for each district (neighbourhood). The municipality has decided to start with districts where the heat transition is more likely to succeed in the short term (for example, districts located near existing heat networks that could be expanded) and with those neighbourhoods, in which there are plans for new construction or renovation. The vision aspires to reduce heating demand in all

⁴ Interview with a researcher working on participation in the energy and heat transitions in Hart van Brabant.

districts. The vision strives for cost neutrality, meaning that the costs for homeowners or rent increases could not be higher than the energy bill savings. A municipal employee discussed the benefits of collective heating solutions: *'Now we have to ring every door[bell] and ask, "Will you work with us for a new system?" If we go with individual systems and we think later on, "Oh no, this wasn't the best solution", then we have to ring [the doorbell] again. So we are trying to get collective solutions'*⁵.

Interviewees expressed the opinion that the municipal level is best equipped to coordinate and deliver heat transitions because it is closest to the household level and has the best knowledge of urban development, upcoming public projects, and local sources of heat⁶.

However, a municipal employee pointed out that the municipality does not always have the required powers and resources, *'We have to take control, but we don't have the instruments'*⁷. First, the municipality currently cannot obligate residents to connect to a heat network or adopt other sustainable heating solutions. Second, the municipality depends on the actions of the private company that owns the Amer heat network to make it more sustainable. Third, the municipality cannot directly make decisions regarding the electricity grid. The municipality can influence the decisions of the network operator because it is a shareholder of the network company, and it sits together with the network company at the multi-year public space programme's table that conducts long-term planning regarding interventions in public spaces (Tilburg Municipality, n.d.-c). In addition, the municipality of Tilburg has administrative consultations with the grid operator four times a year and is working with the grid operator on the Hart van Brabant regional energy strategy. However, the final decision over the electricity network lies with the network operator.

3. Heat transition pilots

3.1. Quirijnstok district (grant from Programma Aardgasvrije Wijken (PAW), or natural gas-free neighbourhoods programme)

A PAW grant (€3,806,516) was awarded to Tilburg municipality for the Quirijnstok district in 2018 (the first round of grants). The pilot neighbourhood consists of terraced houses built between 1965 and 1974 heated through the high-temperature heat network (90°C) using the Amer power plant as a heating source. The total number of residences in the district is 1987, among which 1091 are owner-occupied homes, and 896 are rental properties owned by housing associations and private landlords. The pilot has focussed on the implementation of insulation measures (PAW, n.d.). Since 2021, the Quirijnstok district has hired a sustainability broker who provides the homeowners with free tailored energy advice, information on available subsidies, contacts of neighbours willing to share their experiences implementing retrofit measures, and a list of reliable contractors (Tilburg Municipality, n.d.-d).

The municipality, in partnership with Tilburg University, worked with the residents on deciding on the approach to make the homes more sustainable. The pilot suggested that homeowners require advice on heat decarbonisation measures tailored to their homes and

⁵ Interview with a Tilburg city official.

⁶ Interviews with a Tilburg city official and a researcher working on participation in the energy and heat transitions in Hart van Brabant.

⁷ Interview with a Tilburg city official.

some assurance that measures would be compliant with future policy requirements and that the technology used would retain value. A municipal employee mentioned that the municipality took on an advisory role by providing the long-term vision and the framework for (external) advice, but it did not give any specific advice on technology. However, given the involvement, there was some expectation among residents that the municipality would provide some guarantees on the quality and costs of the retrofit measures⁸.

One of the lessons learned is that there is a need for additional financial instruments for residents who do not qualify for regular loans. Another lesson is that homeowner associations and housing associations are an important actor in the heat transitions, as they can communicate on behalf of the whole group of homeowners, reducing transaction costs. However, the Quirijnstok district's housing association had not planned any renovations for the next several years, so it has not become a leading actor in home decarbonisation in the district (PAW, 2020).

3.2. Fabriekskwartier (Factory Quarter)

According to a municipal employee, residents' trust in private actors and the government to deliver heat in a sustainable and affordable way has been low⁹. For example, Tilburg residents have been asking why heat network tariffs have been going up whilst these networks do not use natural gas. Some residents have been coordinating efforts to procure sustainable heating themselves, including through the development of small community-owned heat networks, and the municipality of Tilburg has been helping such initiatives with knowledge, expertise, and financial support.

One such example is the development of a small heat network using Piushaven canal water as the heat source. The heat network would provide heat for a new district *Fabriekskwartier* (about 400 homes). The municipality is working with the developer to pilot the use of aquathermal energy as a heating source and to test the business case and cost structure of the heat network. After completion, the heat network would be owned by a residents' co-operative.

Tilburg municipality, in partnership with a consultancy group Rebel, is engaged in assessing two business cases for the heat network by comparing two models: the traditional cash flow method vs a *cost price+ model*, in which the costs of the heat network are included in the price of newly built homes. The initial findings indicated that the latter business case would save households money on their heating bills. The *cost price+ model* can be transferred to other jurisdictions in the Netherlands (Energiewerkplaats Brabant, n.d.).

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⁸ Interview with a Tilburg city official.

⁹ Interview with a Tilburg city official.

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