The Dutch approach to residential heat transition: Are there lessons for the UK?

Department for Energy Security & Net Zero
London, 2023

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1. *Going Dutch?* project

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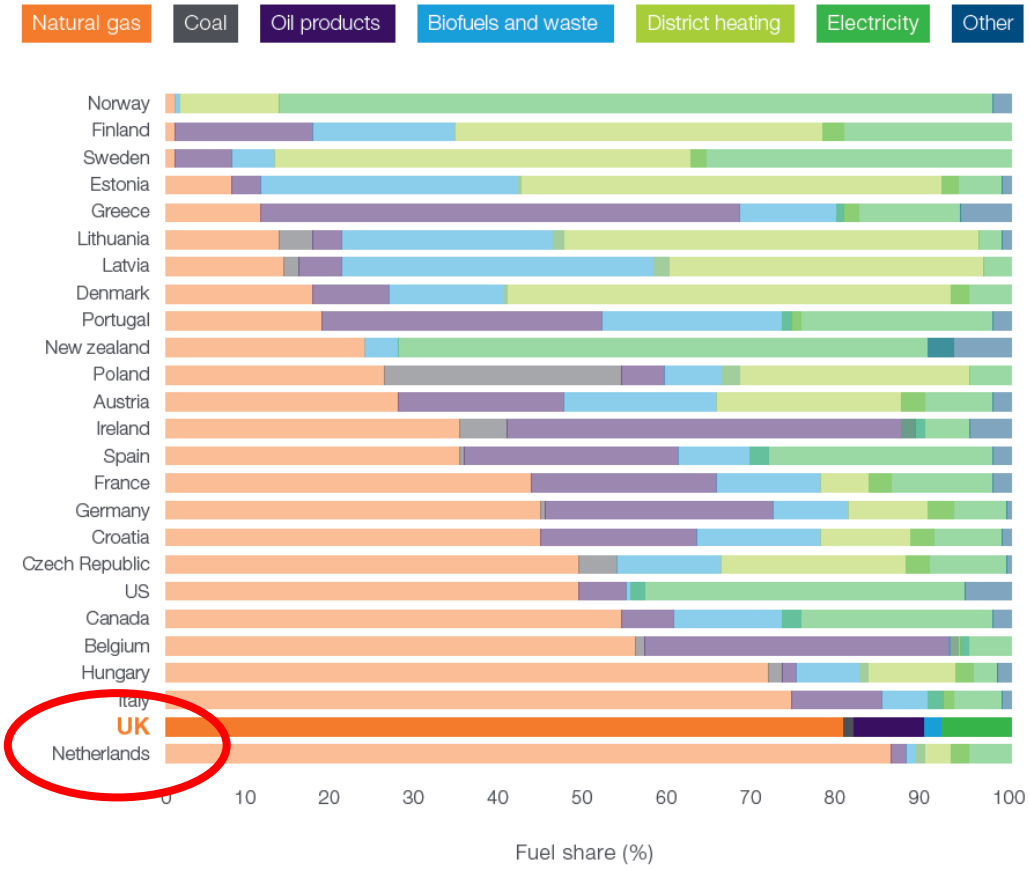
Going Dutch? project

- 18-month research project, led from the University of Sussex, funded by the UK Energy Research Centre
- Comparing governance arrangements for heat decarbonisation and natural gas phase-out in the UK and the Netherlands
- Investigating how these arrangements have been shaped by different political and institutional contexts
- Looking at possibilities of lesson-learning
- More at https://www.going-dutch.org/

Fuel share for heating demand (residential and commercial)



Source: BEIS, 2018

2. Context

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The residential housing picture

1. In 2021, the Netherlands had 7,966,331 housing units (CBS, 2022a).
2. In 2019, 92% of homes had access to the gas grid (CBS, 2021).
3. Home heating installations (2021): individual boiler – 82%, district heating – 7%, block heating – 5%, electric – 3%, unknown – 3% (CBS, 2022b).
4. Housing tenure: owner-occupied – 57%, rental properties – 43% (housing corporations owned 29% of all housing units) (CBS, 2022a).
5. Housing type: single-family homes – 64%, multi-family homes – 36% (CBS, 2022c).
6. In 2019, 550,000 households (7% of all households) experienced energy poverty: a combination of high energy costs, inadequate insulation and low income (Mulder et al., 2023).

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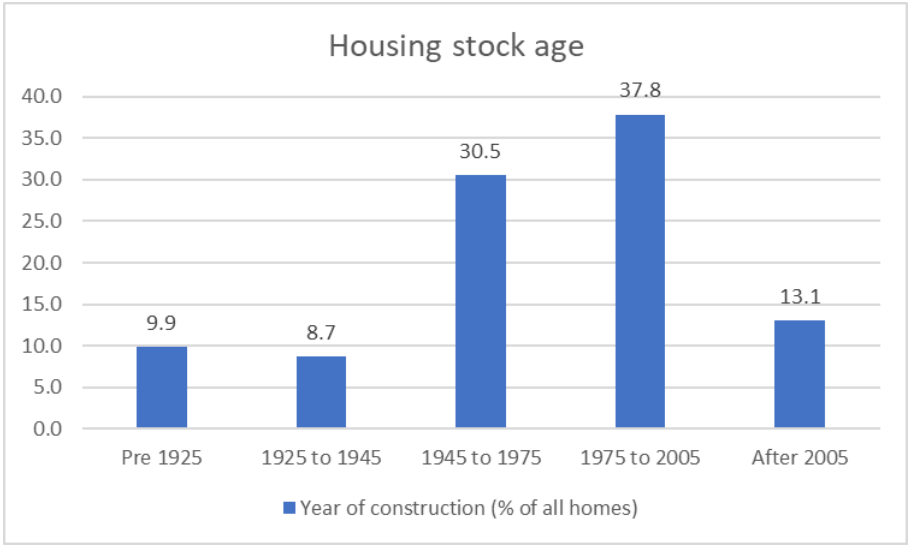
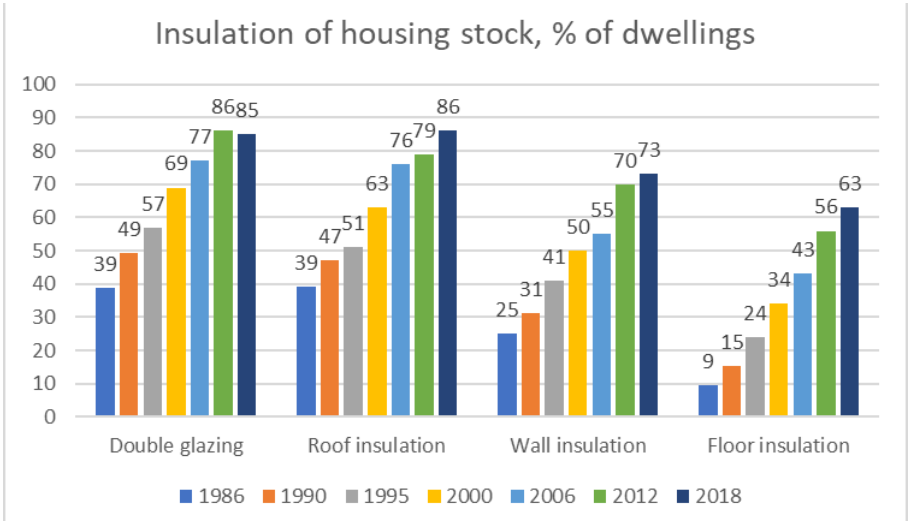


Source: CBS, 2022c



Source: Dutch Government, 2020

Heat targets and regulations

2019 Climate Agreement:

- 1.5 million homes (about 20% of the housing stock) should be made ‘more sustainable’ by 2030, 7 million homes (about 90% of the housing stock) that are currently heated by natural gas should be gas-free by 2050.

Building regulations:

- From 2018, no connection to the gas grid and an emission heat standard in new buildings (RVO, 2021a).
- From 2026, a requirement to install a hybrid heat pump, or adopt another low-carbon heating solution, when the gas boiler is replaced (Dutch Government, 2022a).
- From 2030, ban on rental properties with E, F or G labels (Dutch Government, 2022).
- From 2021, a requirement to report on an energy label property’s heat demand in kWh/m^2 to assess the level of insulation (RVO, 2021b).

Taxation:

- Tax increases on gas from €0.2524 per m^3 in 2017 to €0,4898 in 2023 (excluding 21% VAT) (Tax and Customs Administration, n.d.).

Incentive policy tools

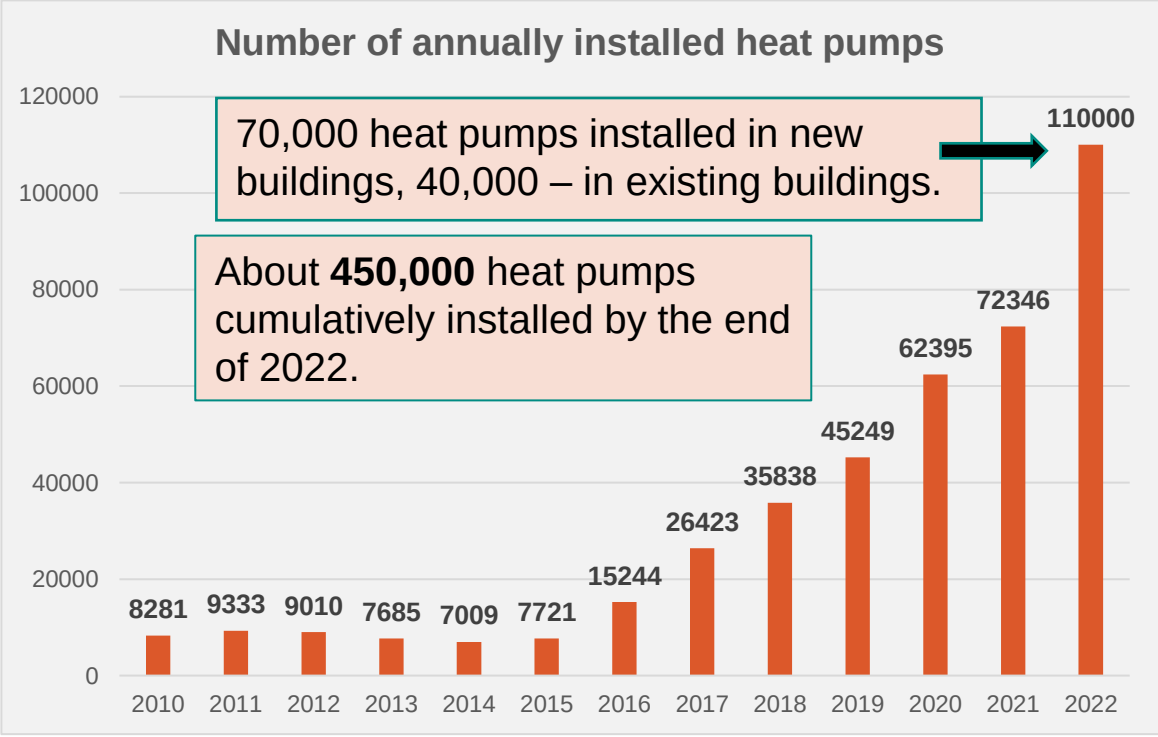
- **National Insulation Programme** allocating €4bn to insulate a total of 2.5 million homes (about 30% of all homes) by 2030, with a focus on homes with energy labels E, F, and G (Dutch Government, 2022b).
- **Stimulating Sustainable Energy Production and Climate Transition (SDE++)** subsidies (€13bn in 2022) for large-scale production of renewable energy and CO_2-reducing technologies (RVO, 2021c).
- **Investment Subsidy for Sustainable Energy and Energy Saving (ISDE)** for homeowners and businesses for insulation measures and low-carbon heating solutions, including heat pumps and heat network connections. €325m was available in 2022, €350m will be available in 2023. The scheme will run until 2030, budgets are specified annually (RVO, 2023).
- **Incentive scheme for natural gas-free rental properties (SAH)** to connect rental properties to a heat network. The total budget is €195.3m (2020-2023), with a maximum of €5,000 per home (RVO, 2020).
- **Landlord Levy Reduction Scheme**: housing corporations stop paying landlord levy from 2023 in exchange for insulating social housing units with an E, F or G label (Dutch Government, 2022c).

Supply-chain innovation support

- **Integral Knowledge and Innovation Agenda (IKIA)** with yearly budgets of around €130m. 13 Multi-year Mission-driven Innovation Programmes (MMIPs), four of which relate to the built environment (RVO, 2021c).
- **Construction and Technology Innovation Centre (BTIC) –** consortia of industry, government, and research institutions (TKI Bouw en Techniek, n.d.):
  - Develop scalable building renovation solutions to reduce costs (20–40%) and nuisance (renovations completed in up to 5 days),
  - Improve heat pump and heat storage technologies,
  - Improve policy, regulatory, and financial mechanisms for building decarbonisation.
- **Skills development:** the Netherlands is experiencing shortages of personnel with the skills necessary for heat transitions. The Climate Agreement introduced programmes for training through public-private partnerships and changes in the vocational education curriculum (Climate Agreement, 2019).

Progress so far

- **Public awareness:** in 2021, 89% of Dutch residents knew about the goal to phase out natural gas for domestic heating (RVO, 2021d).
- **Heat network:** 2019 – 6%, 2020 – 7%, 2021 – 7% (CBS, 2022b).
- **New buildings without a natural gas connection:** 2020 – 87%, 2021 – 90.6% (Netbeheer Nederland, 2022).
- **Heat pumps:** a 52% increase in 2022 compared to 2021 (Vereniging Warmtepompen, 2023).
- Due to a high volume of applications for **Sustainable Energy and Energy Saving subsidies**, a 43% budget increase in 2022 to €325m compared to initially planned €228m (RVO, 2023).



Source: Duurzaam Verwarmd, 2023; Vereniging Warmtepompen, 2023.

3. Assessing governance for heat transitions

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Framework for assessing governance for heat transitions

Our approach is based on Pierre and Peters (2021) and Frank et al. (2021)

Political governance

- vision development
- inclusivity
- consensus-building
- legitimacy
- coordination

Policy governance

- municipal responsibility
- capacity and resources
- learning and knowledge sharing
- responsiveness and accountability
- flexibility
- equity and affordability

4. Political governance

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Vision development, inclusivity and consensus-building

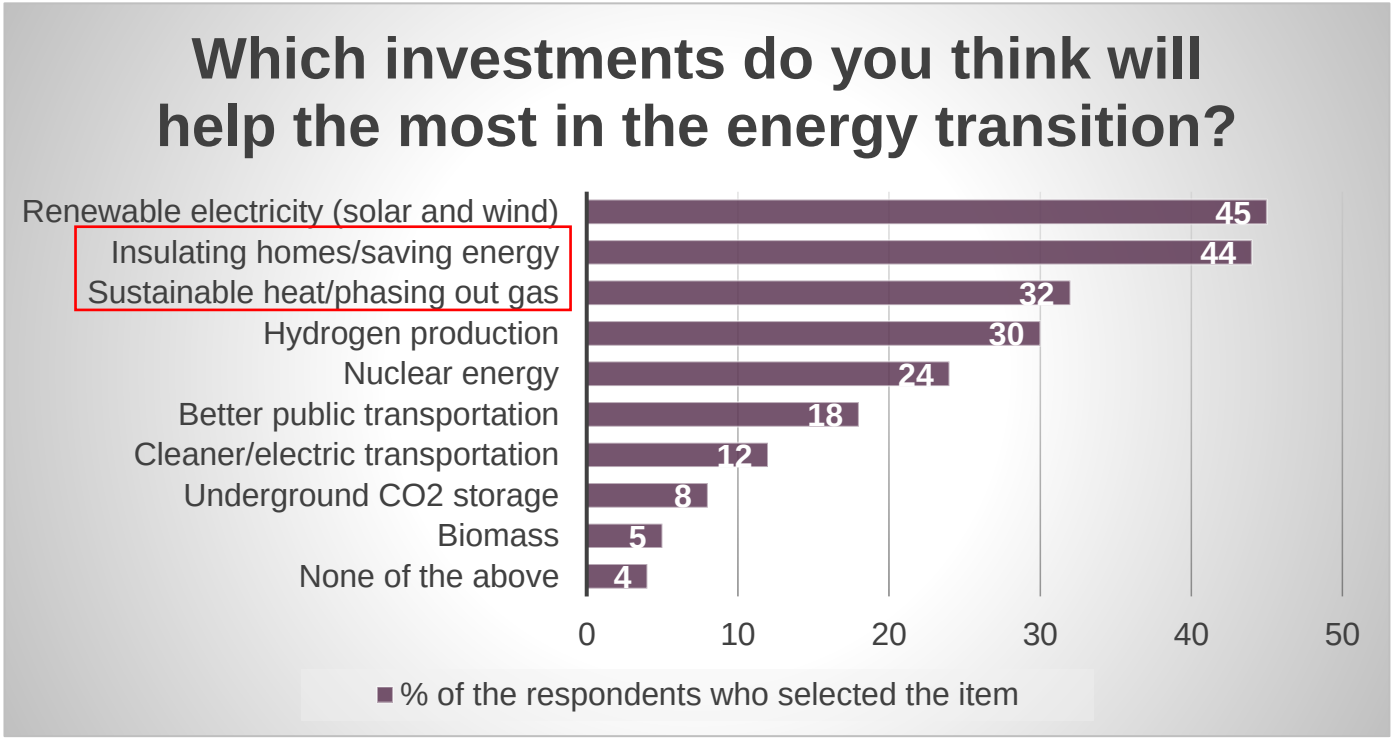
- Climate Agreement negotiated over a year by 150 business and civil society organisations, coalition of government and opposition parties, in a process organised by the Social and Economic Council
- Process inclusive of all major stakeholders, but deliberations were at the elite level. Citizens tend to be more involved in discussing decisions about how their own neighbourhood decarbonises heat.
- Process was consensus-based. Different aspects are thoroughly discussed, which could make implementation easier, but negotiations happen until there is no resistance and everyone is on board leading to final decisions being delayed or avoided:
- e.g., adoption of the Heat Act regulating heat networks delayed by several years, creating uncertainties

Energy shock: legitimacy of heat transitions and phasing out gas

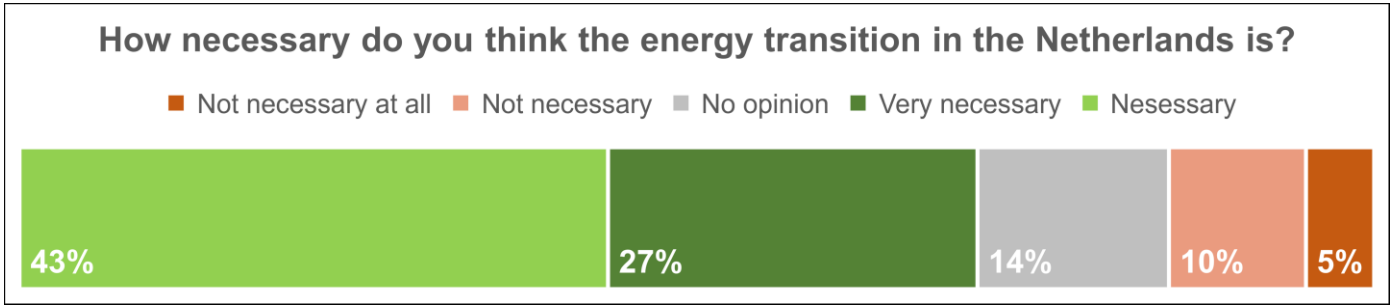
Opinion poll August 2022, a representative sample of Dutch residents (Motivaction, 2022)

Impact of Russia's invasion of Ukraine:

- 30% of the respondents became more in favour of the energy transition
- Increased support for insulation (44% in 2022 compared to 13% in 2021)
- The goal to move away from natural gas became one of the top three priorities

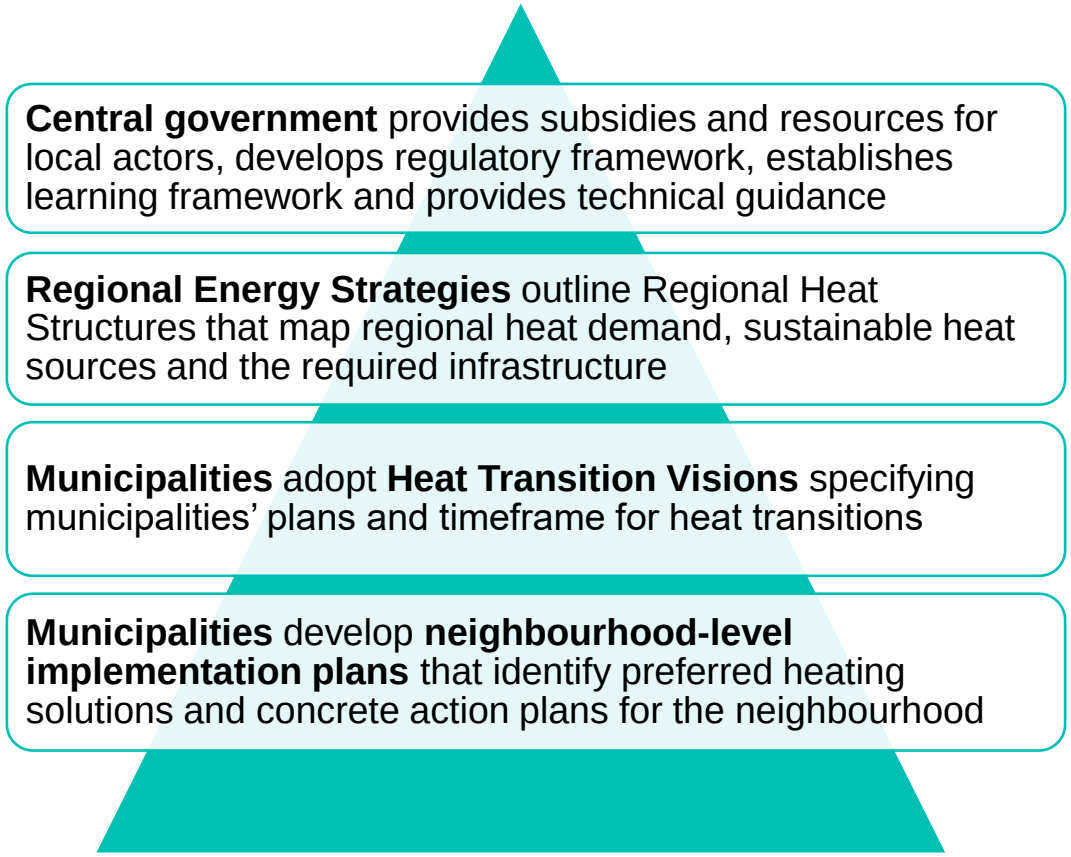


Division over gas extraction in Groningen:
against – 34%,
for – 35%



Coordination

Clear and explicit coordination framework



Network operators

- companies own and operate both electricity and gas networks
- shareholders are groups of municipalities and provinces
- regulated at the national level, through incentive regulation framework similar to UK
- participate in developing Regional Energy Strategies for sustainable electricity generation
- work with municipalities on Heat Transition Vision development

Key role for municipalities

- In the Climate Agreement, stakeholders agreed to give municipalities the key governance role for heat transition planning and implementation because they are closest to people and local actors, they also know local context better

…but…

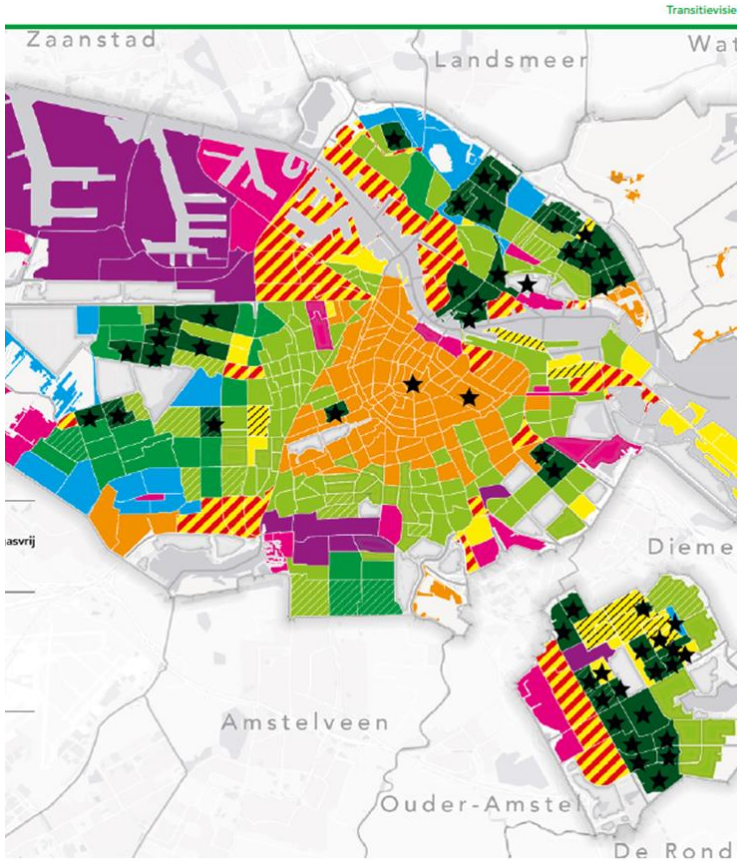
'It's about people… Heating grids or renovation projects will be organised locally, at district level. Case studies so far have shown that this is more successful, as local residents collaborate more with one another and with the relevant local government authority' (Climate Agreement, 2019, p16).

- Over the past decade, a trend of the central government delegating new tasks to municipalities (e.g., youth care, spatial planning) without increasing national funding or local taxation (Groenleer and Hendriks, 2020)
- Some municipalities (e.g., Amsterdam) welcome the challenge, but smaller municipalities struggle with the task
- Growth of new local parties and single-issue independents makes it more difficult for municipal governments to form and agree on programmes (Dutch academic, interview 24)

The central government 'dropped' the task of heat transitions on municipalities (Dutch academic, Interviewee 8).

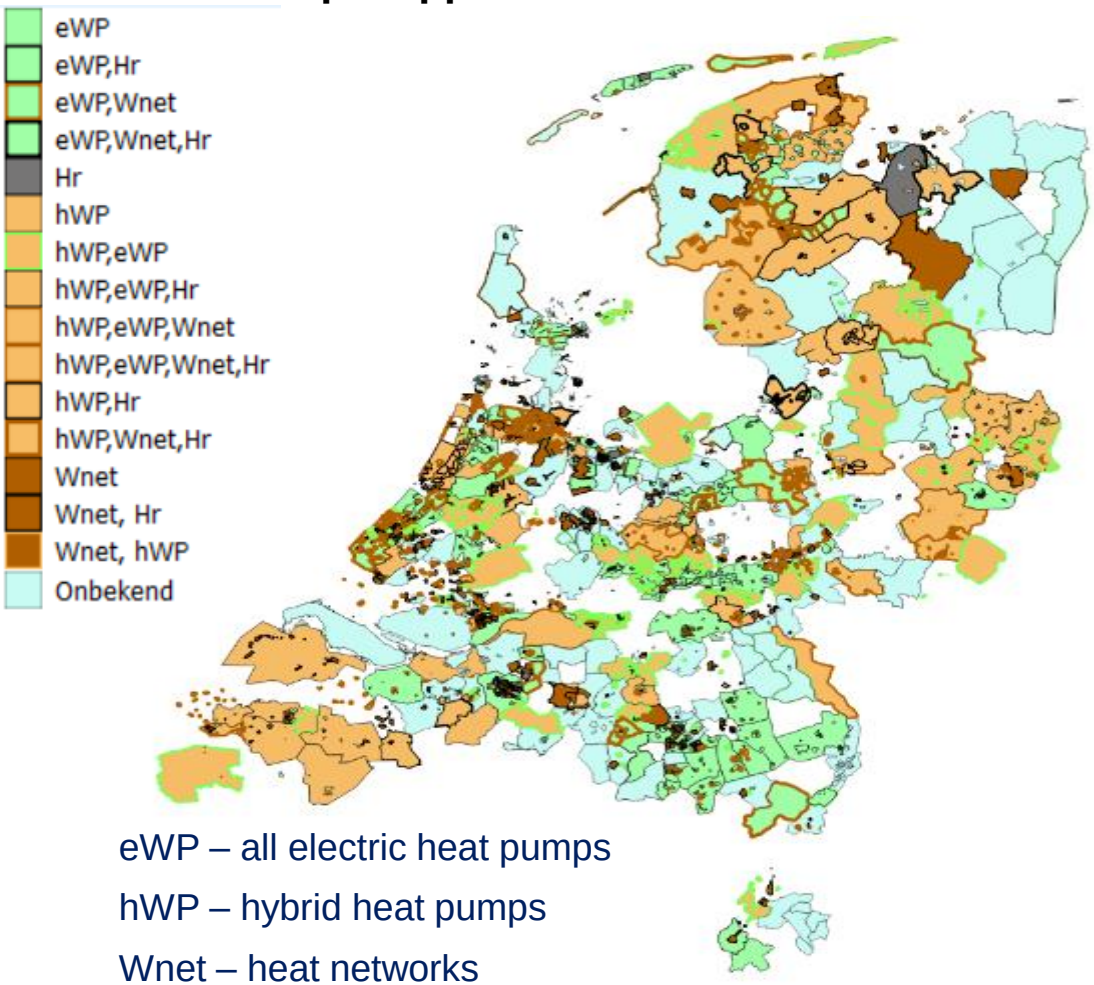
Municipality-led neighbourhood-based approach

Amsterdam's Heat Transition Vision



Source: Amsterdam Municipality, 2020

Municipal approaches to heat transitions



eWP – all electric heat pumps

hWP – hybrid heat pumps

Wnet – heat networks

Hr – hydrogen

Onbekend – unknown

Source: Heat Expertise Centre, 2022

Coordination challenges

1. Differences in municipal capacity to plan and implement heat transitions, smaller municipalities lack capacity.
2. Municipal governance capacity depends on central government as the latter retains significant powers and responsibilities (e.g. subsidies for low-carbon heating solutions, district heating regulations).
3. Regional coordination challenges: municipalities have the key governance role in heat transitions and might prioritise their own needs over the needs of the region.
4. Tension between municipal-led planning and national policies based on market instruments (e.g., subsidies for heat pumps).

5. Policy governance

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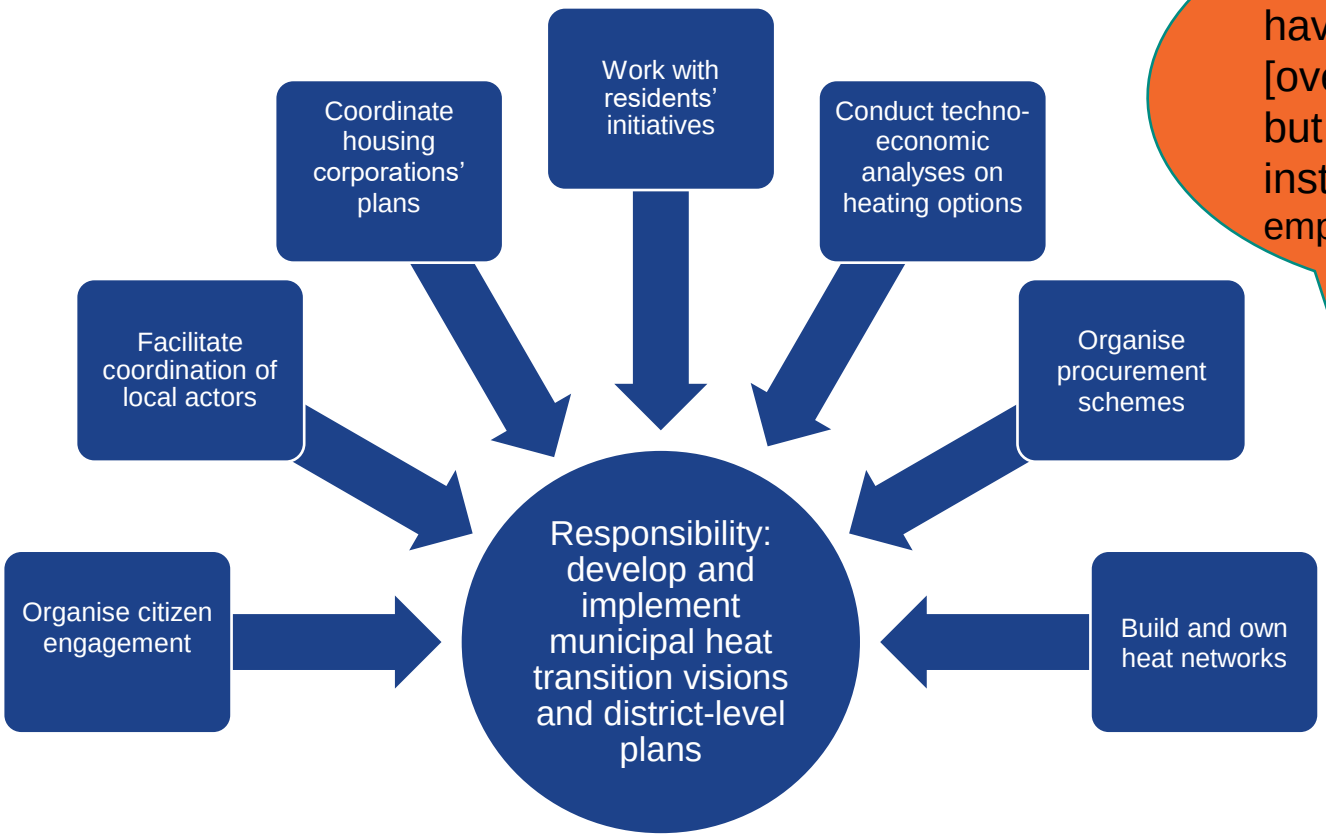
Municipal responsibilities and a range of available tools



'We [municipalities] have to take control [over heat transitions], but we don't have the instruments' (Municipal employee, Interview 9).

Municipal Instruments for the Heat Transition Act (under consultation): potential powers to remove existing gas grid connections

Municipal capacity and resources

- Low municipal planning and implementation capacity:
  - contracting out the development of heat transition visions;
  - more resources expected from the central government - €2.6bn in 2022-2026 for local authorities and other actors for planning and implementation activities across all climate sectors (Dutch Government, 2022b).

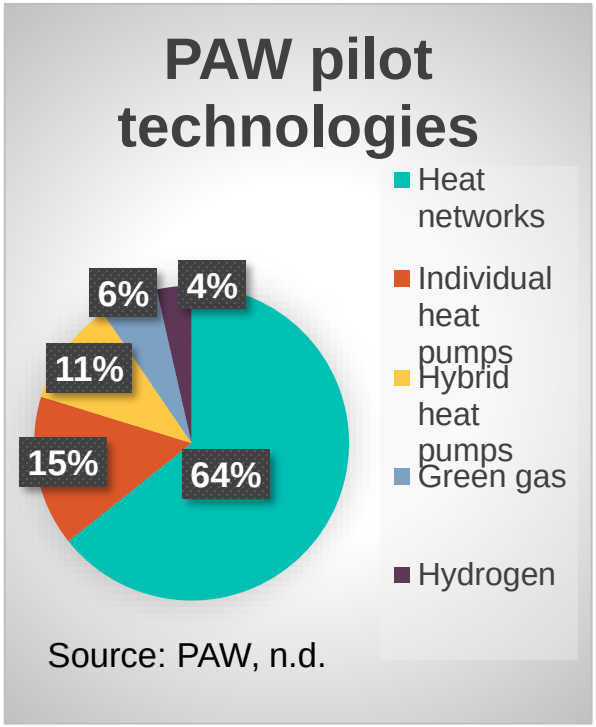
'We don't have the means for [heat transition planning and implementation]… We have consultants who are helping us. Not always in a good way, but we have to depend on them' (Municipal employee, Interview 33).

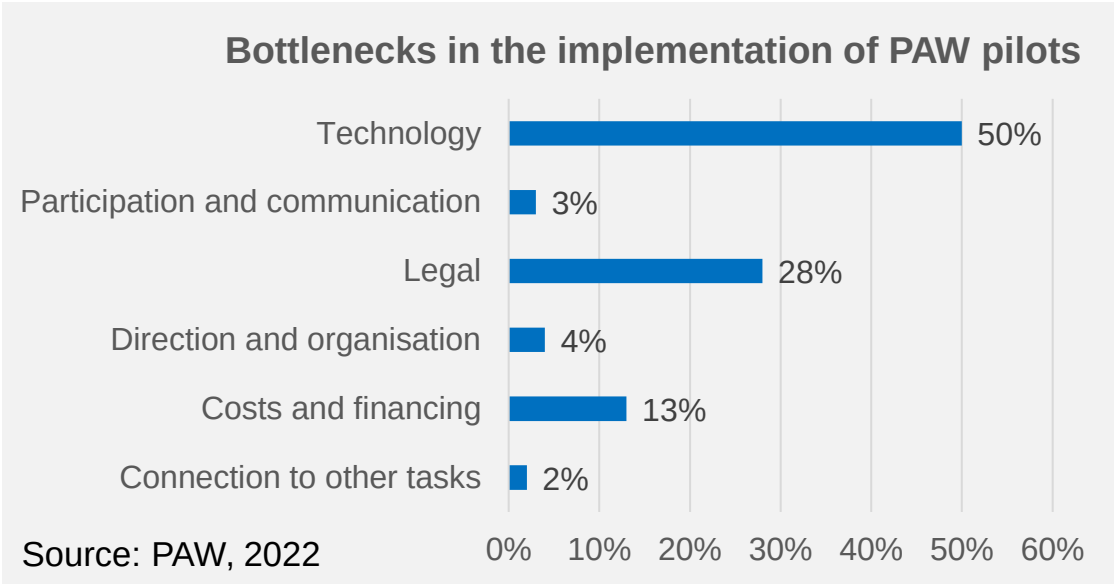
- Significant variation in and available resources for citizen engagement approaches
- Technical capacity building: Dutch Environmental Assessment Agency (PBL) developed an open-source spatial modelling tool (Vesta MAIS) to assess technical feasibility, costs and emission reductions of alternative heating technologies.
- Heating Expertise Centre: technical, financial, legal and managerial support for municipalities.

Piloting, learning and knowledge sharing

Learning-by-doing approach

- **Natural Gas-Free Neighbourhoods Programme (PAW) (€400m 2018-2022):** 64 municipal-led pilots of low-carbon heating and insulation technologies and approaches for effective citizen involvement.
- Formal learning and knowledge sharing framework through the PAW and the Heating Expertise Centre.
- In 2023 PAW and the Heating Expertise Centre merged to form the National Programme for Local Heat Transition to support all municipalities, not just the pilots.





- Two PAW monitor reports (2021 and 2022) identifying the bottlenecks in the municipal-led implementation of PAW pilots.
- PBL study discussing how to change existing laws and regulations to eliminate these bottlenecks (PBL, 2022).

Accountability and responsiveness

- Participation Coalition helped residents across the country to incorporate their initiatives into municipal heat transition visions.
- Case studies showed that no proper public engagement leads to pushback (e.g., Overvecht, Utrecht; Van der Pekbuurt, Amsterdam; Erflanden, Hoogeveen).
- Verifiability of how preferred heating solutions were chosen (clear selection criteria and methods) increased accountability.
- Independent energy advisors in the community help residents make decisions on heating alternatives.
- Energy ambassadors: members of the community share their experience on decarbonising heat in their homes.

Key challenge is managing tensions between giving residents room for choosing the preferred heating solution and steering them toward a solution identified in the economic-technical analyses

Flexibility

- Heterogeneity within a district/neighbourhood/building and differences in residents' circumstances required much more customisation than initially anticipated, which brought challenges to the district approach (PBL, 2021).
- Because of cost and technological uncertainties, municipal visions are expected to be frequently reviewed, and do not specify heating options for each district at this point in the heat transition process.

Key challenge is managing the tension between flexibility of municipal plans and network operators' long-term planning preferences.

'Most of the [municipal] plans are vague… And this is on purpose' (Municipal employee, Interview 14).

Flexibility and transparency

- Initial approach for making entire districts gas-free one-by-one has been too slow, leading to a shift in 2022 from policies for *phasing out gas* to policies *reducing gas consumption* through insulation and hybrid heat pumps (Warmte365, 2022).
- Hybrid heat pumps showed a 130% increase in 2022 compared to 2021 with 23,000 hybrid heat pumps installed in 2022 (Vereniging Warmtepompen, 2023)
- Risk of stranding or lock-in? Debate on hydrogen still on-going; policy focusing on hydrogen production and industrial use

Transparency issue:

- gas and boiler manufacturer lobby influence the decision-making process, not always in a clear way
- the hybrid heat pump policy was advocated by a coalition comprising the association of installation companies, the association of network operators, the heat pump association, the heating industry association, including boiler manufacturers, and the environmental organisation Natuur & Milieu

Equity and affordability

- Until energy price increases in 2021, the Netherlands did not have a national policy for evaluating and alleviating energy poverty.
- A principle of cost neutrality emphasised in the Climate Agreement meaning that people should not pay more for sustainable heating than they would otherwise pay for the existing heating solution:
  - Case studies and PAW monitor reports (Schilder and van der Staak, 2020; PBL, 2021) show that this is hard to achieve without offering subsidies.
- Low-income households who cannot invest in low-carbon heating can apply for national and municipal loans (offered by some municipalities):
  - However, demand for heat pumps is currently predominantly from wealthy residents (Vereniging Warmtepompen, 2023).

(Partial) successes

1. Building experience and awareness through piloting
2. Mechanisms for responsiveness and building legitimacy
3. Mechanism for coordination
4. Committing resources for technology deployment and actors
5. Knowledge-sharing frameworks

Challenges

1. How to accelerate heat transitions but maintain legitimacy and affordability
2. How to balance predictability with flexibility and adaptivity
3. How to coordinate market instruments with planning approaches
4. How to achieve consistency in planning approaches and their quality within a multi-actor, multi-level governance framework
5. How to match municipal responsibilities with powers and available resources
6. How to balance consensus-based decision-making with timely adoption of regulatory frameworks

6. Lessons for UK?

Lessons for UK (especially England)?

1. Mandate and resource mechanisms for local and regional ***coordination*** of actors (government, network companies, developers, suppliers) and functions (spatial planning, electricity/gas network planning, heat network planning, procurement, data and knowledge sharing)
2. Develop function in DESNZ to ***identify and resolve*** perverse interactions amongst and between incentives, regulation and policies at different levels
3. Develop and resource local mechanisms for building ***legitimacy and responsiveness*** in local area energy planning, especially in areas where heat networks may be extended to residential housing
4. ***Support community initiatives*** for heat and wider energy decarbonisation
5. Develop a common, open-source ***methodology*** for planning as a benchmark
6. Develop a source of dedicated technical, financial, legal and managerial ***expertise and support*** on heating or local energy system decarbonisation
7. Opportunity to learn from and build on LHEES in Scotland and LAEP approach in Wales for England

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