



Ministry of the Interior and  
Kingdom Relations

# The role of Low Temperature Heating for the energy transition of the built environment

Sabine Jansen

Senior policy advisor

[Sabine.jansen@minbzk.nl](mailto:Sabine.jansen@minbzk.nl)

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# PAW

Programma  
Aardgasvrije  
Wijken



# Dutch existing building stock: the challenge

- 7.9 million existing homes
- 0.57 million non-residential buildings (production halls, offices etc.)

Entire Building stock:  
Decarbonised by 2050

By means of:

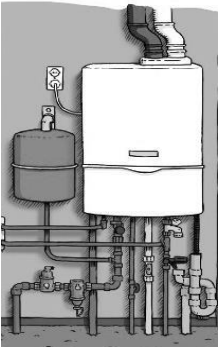
- Energy saving
- Alternatives for natural gas



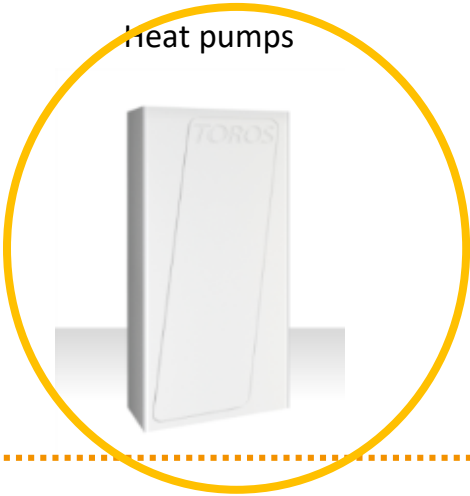
# Alternatives for natural gas heating

Individual solutions

Sustainable gas



Heat pumps



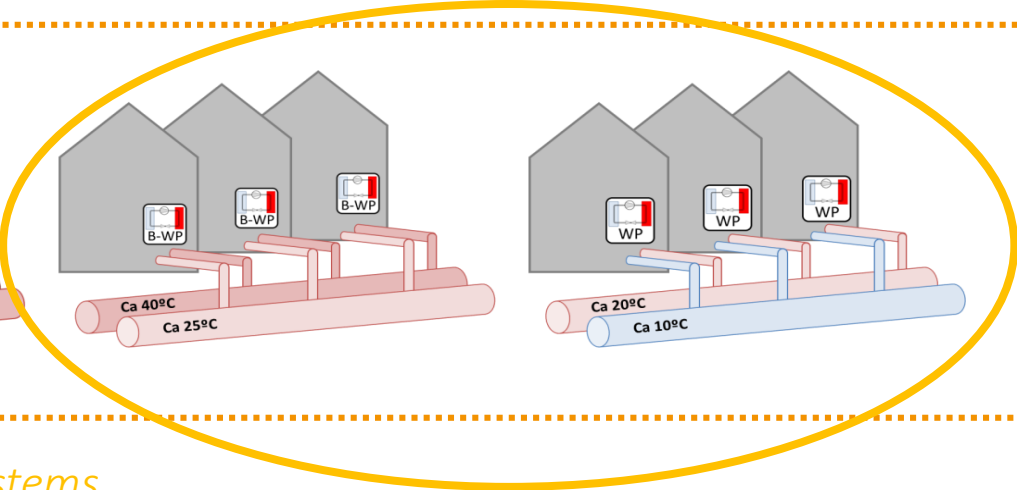
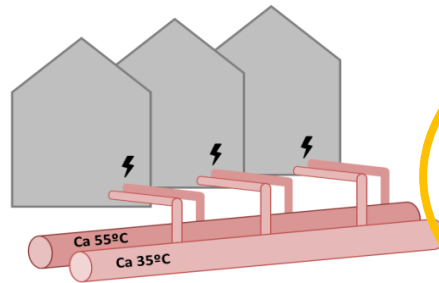
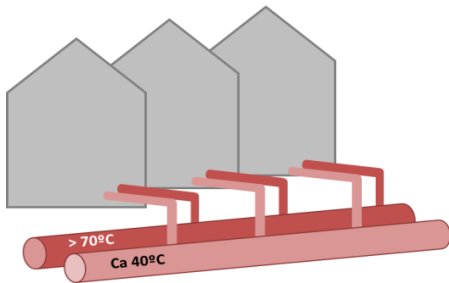
Electrical heating



Bio-based fuels



(local) District heating



*Some options require low temperature heating emission systems*

## Startanalyse – Heating strategies

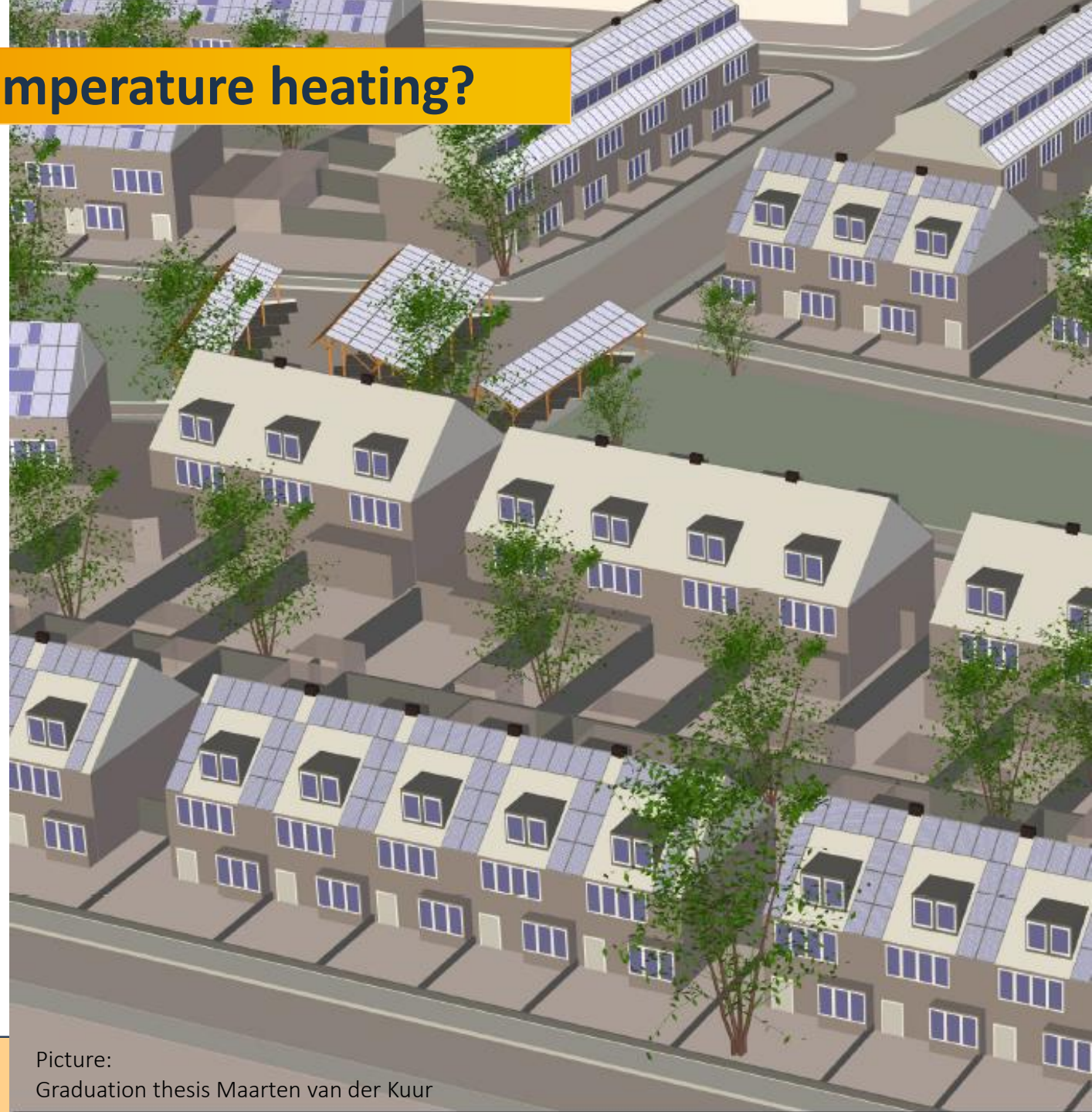
- S1: Individual heat pump
  - S2: District heating with medium&high temp heat source
  - S3: District heating with (ultra)low temp heat source
  - S4: green gas
  - S5: Hydrogen
- Possibly with hybrid heat pump



<https://www.expertisecentrumwarmte.nl/>

# Why low temperature heating?

- For a better performance of a heat pump
  - Individual heat pump
  - Collective – large scale heat pumps
- More efficient use of (ultra) low temperature heat sources
  - Environmental heat sources (air / water / uninsulated solar systems)
  - Datacenters
  - Low temperature industrial waste heat
- Lower need for electricity, sustainable gases and medium to high temperature heat sources



Picture:  
Graduation thesis Maarten van der Kuur

# 'Standaard voor woningisolatie'

- Norm for the maximum net heat demand of a dwelling after renovation: in kWh(th)/m<sup>2</sup>/year)
- Based on a balance between energy saving, practical possibilities within existing homes, costs and 'ready for a sustainable heat supply'
- → ready for low temperature heating

<https://www.rijksoverheid.nl/actueel/nieuws/2021/03/18/standaard-voor-woningisolatie>

< 1945

> 1945

Single-family



Multifamily



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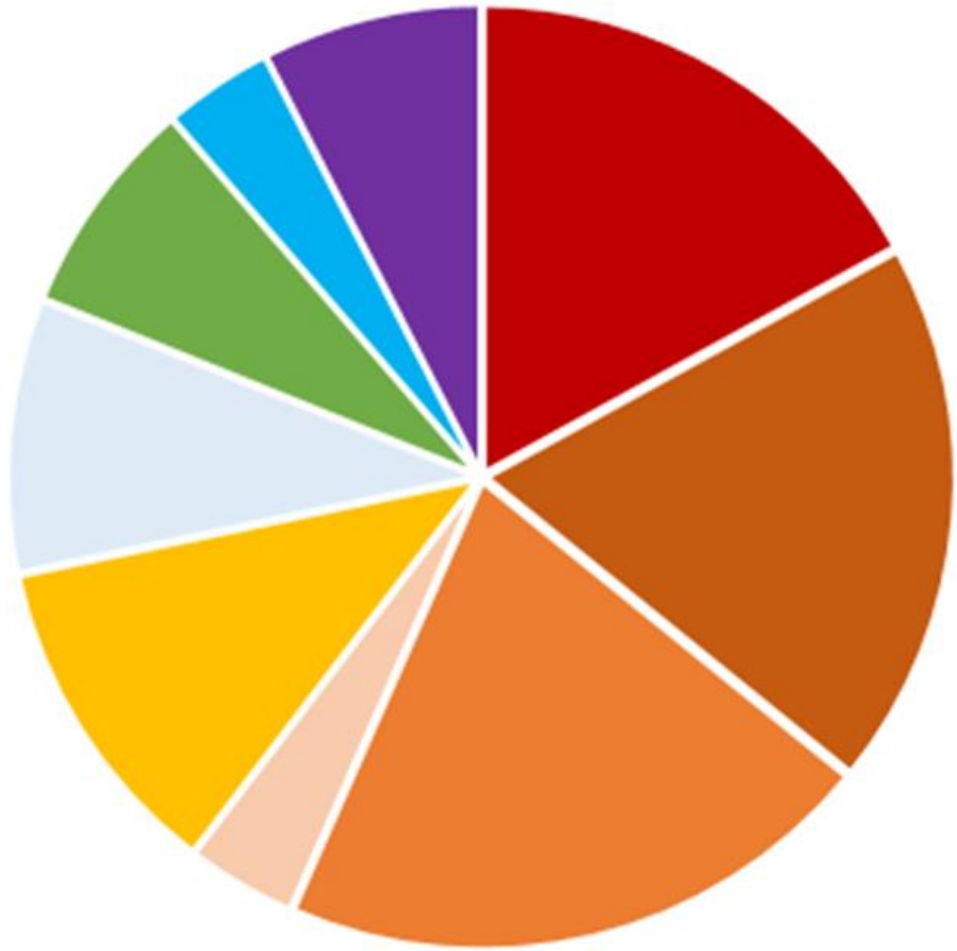


Interdepartmental programme:

- BZK,
- EZK & ECW
- Municipalities (VNG)

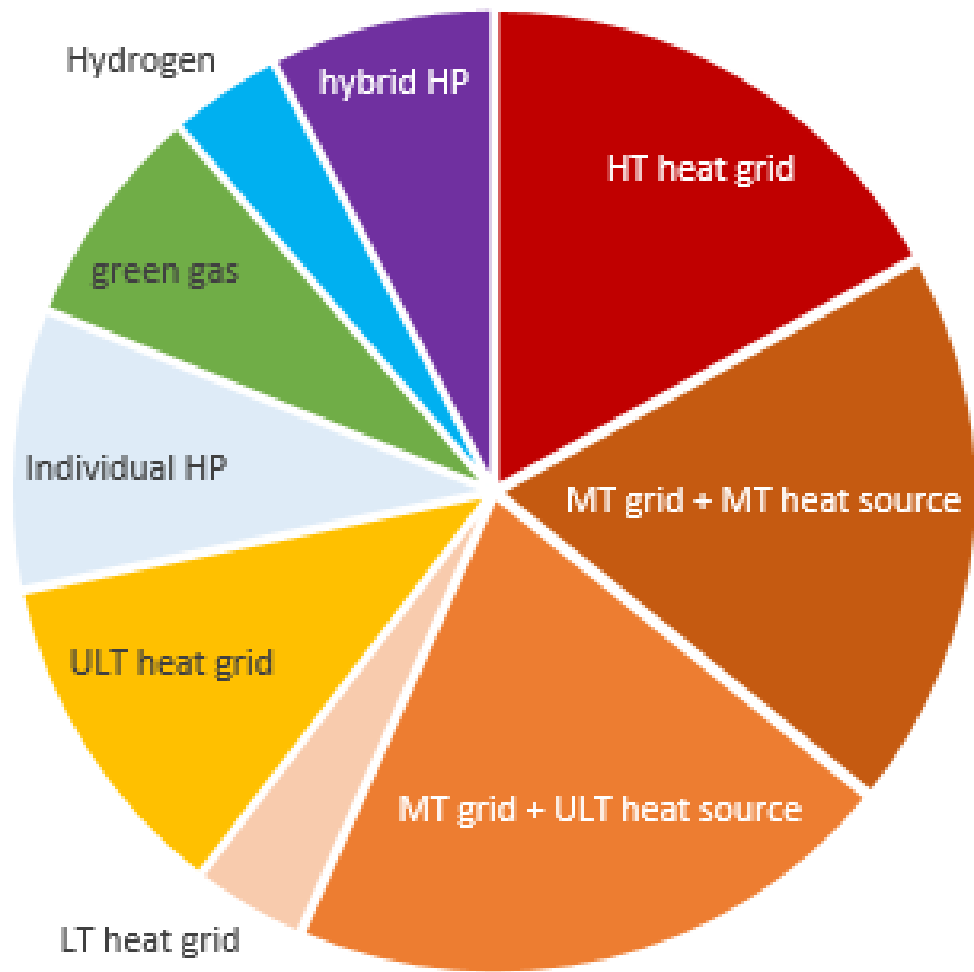
50 pilot neighbourhoods  
with different technologies





50 pilot neighbourhoods with different technologies

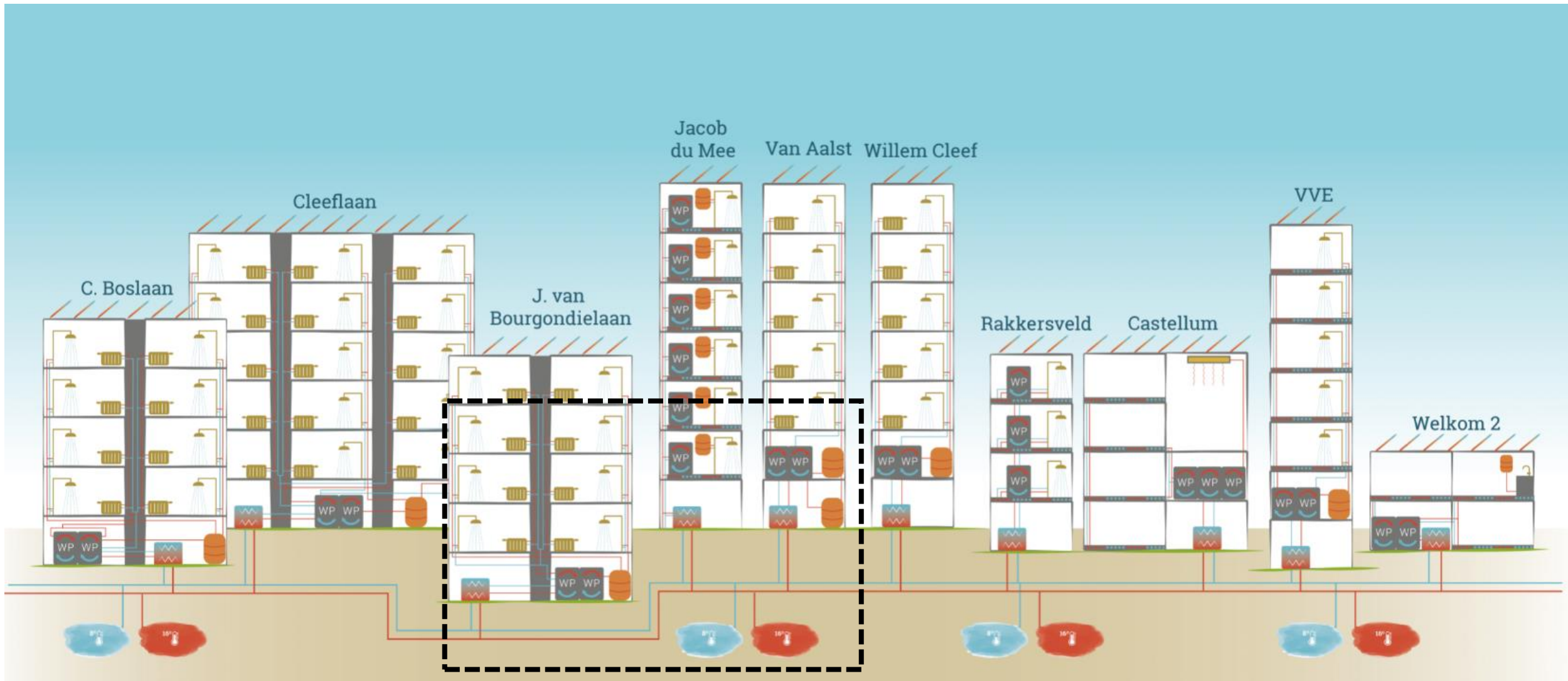




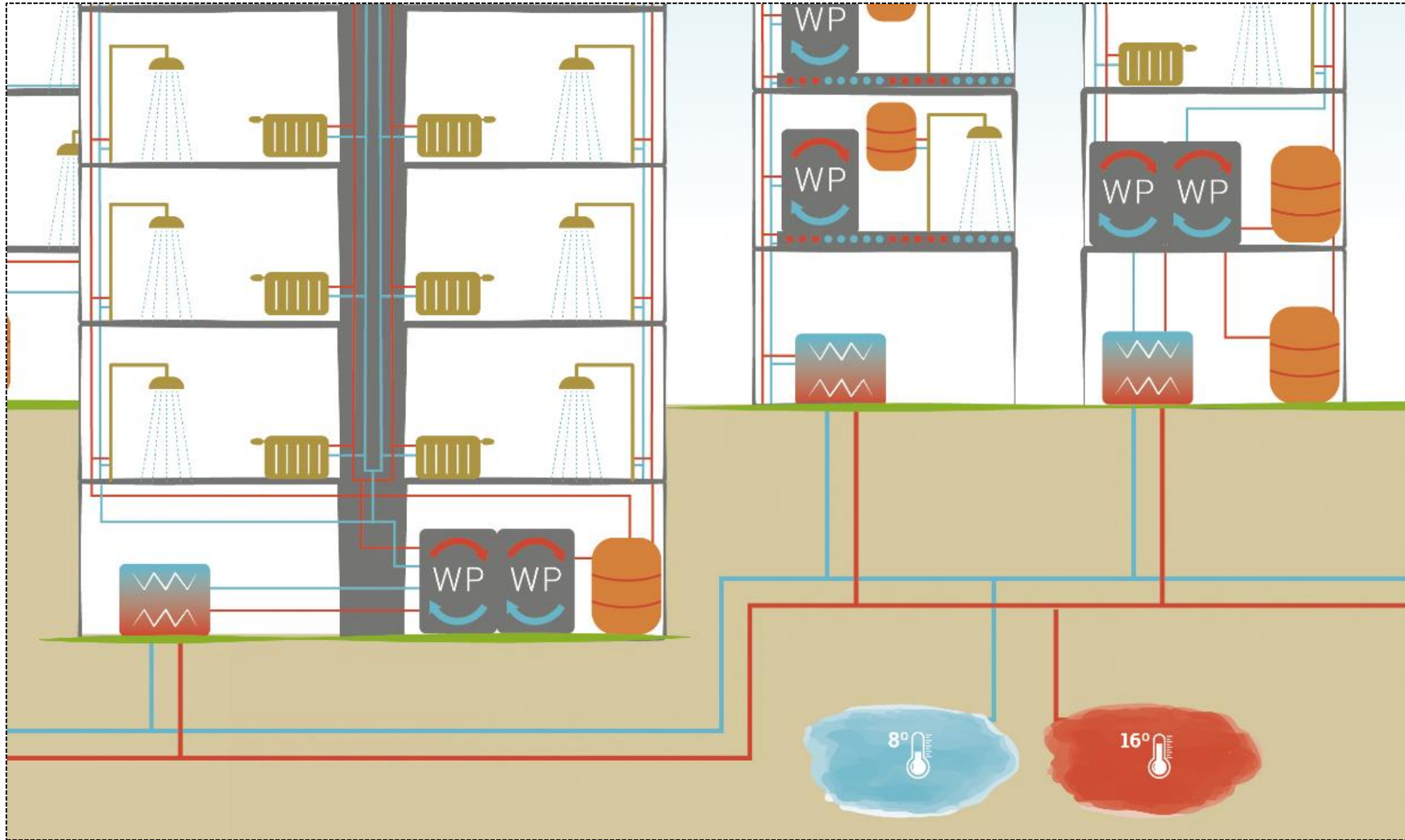
- HT heat grid
- MT grid + MT heat source
- MT grid + ULT heat source
- LT heat grid
- ULT heat grid
- Individual HP
- green gas
- Hydrogen
- hybrid HP

50 pilot neighbourhoods  
with different technologies

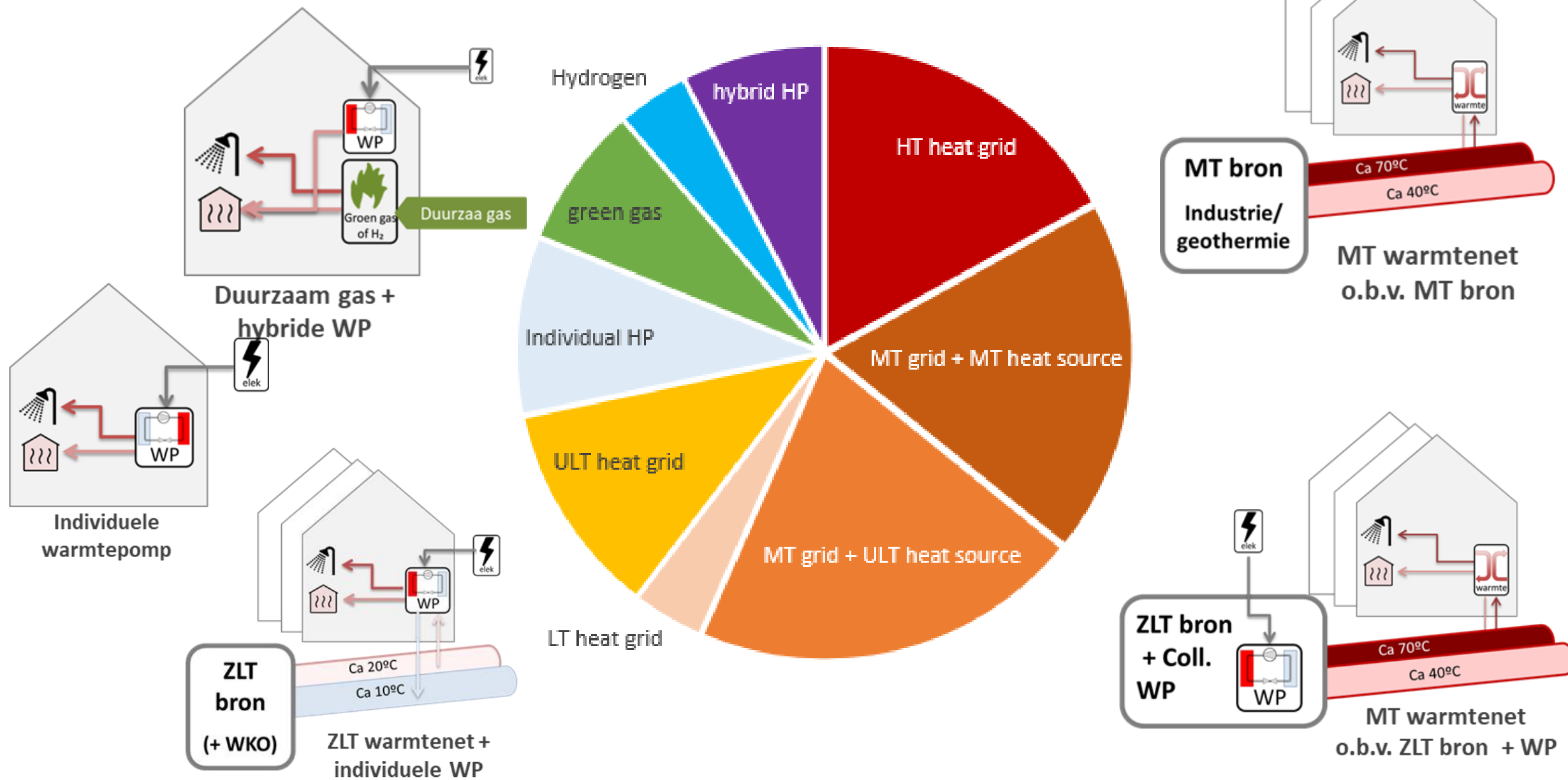
# Example: Zoetermeer



# Example: Zoetermeer



# Several efficient options require or benefit from LT heating systems



# Dutch existing building stock: the challenge

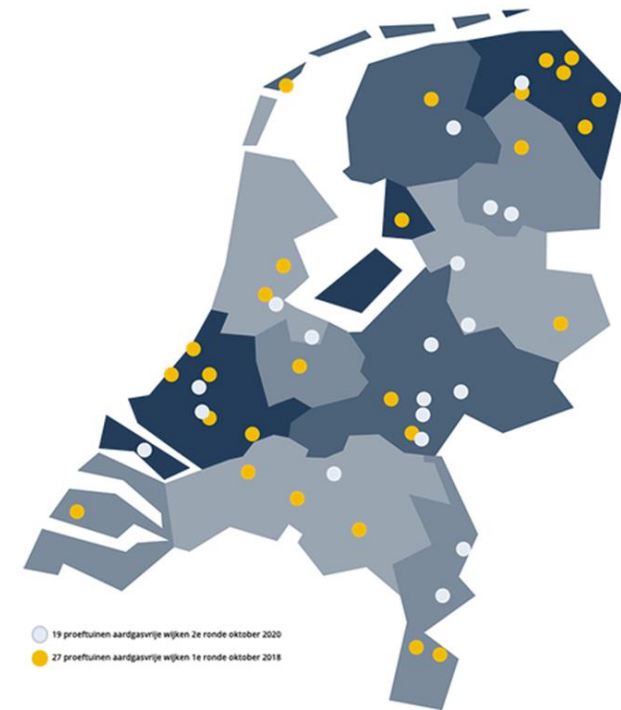
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Entire Building stock:  
Decarbonised by 2050

By means of:

- Energy saving
- Alternatives for natural gas

Low temperature solutions play an important role



# More information:

Programma Aardgasvrije Wijken

[www.aardgasvrijewijken.nl](http://www.aardgasvrijewijken.nl)



Centre of Expertise

[www.expertisecentrumwarmte.nl](http://www.expertisecentrumwarmte.nl)



PAW Webinar march 2021: technologies in the pilot neighbourhoods

<https://www.aardgasvrijewijken.nl/congres2021/themasessies+congres+aardgasvrije+wijken+2021/de+technieken+in+de+46+aardgasvrije+wijken+van+paw/default.aspx>