provincie Zuid-Holland

Development of geothermal energy in the province of South-Holland

Moving from horticulture to the built environment

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(seconded from Talent voor Transitie)
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provincie Zuid-Holland

Contents

- Heat and geothermal projects in South-Holland
- Heat value chain and the importance of infrastructure
- Current issues around demand development

Key insight

- Non heat-source related issues that should be addressed to accelerate geothermal energy

1. Province of South-Holland (geographical)

Most populated and most densly populated province in the NL

- Population: 3.7 million

Large urban municipalities (52 total)

- Rotterdam, The Hague, Delft, Leiden, Zoetermeer, Gouda, Dordrecht

Largest harbour in Europe (Rotterdam HIC)

- Biggest industrial cluster NL (source of excess heat)

Large greenhouse horticultural sector (clusters ‘Oostland’ and ‘Westland’)

- Huge heat demand (similar or larger than built environment)

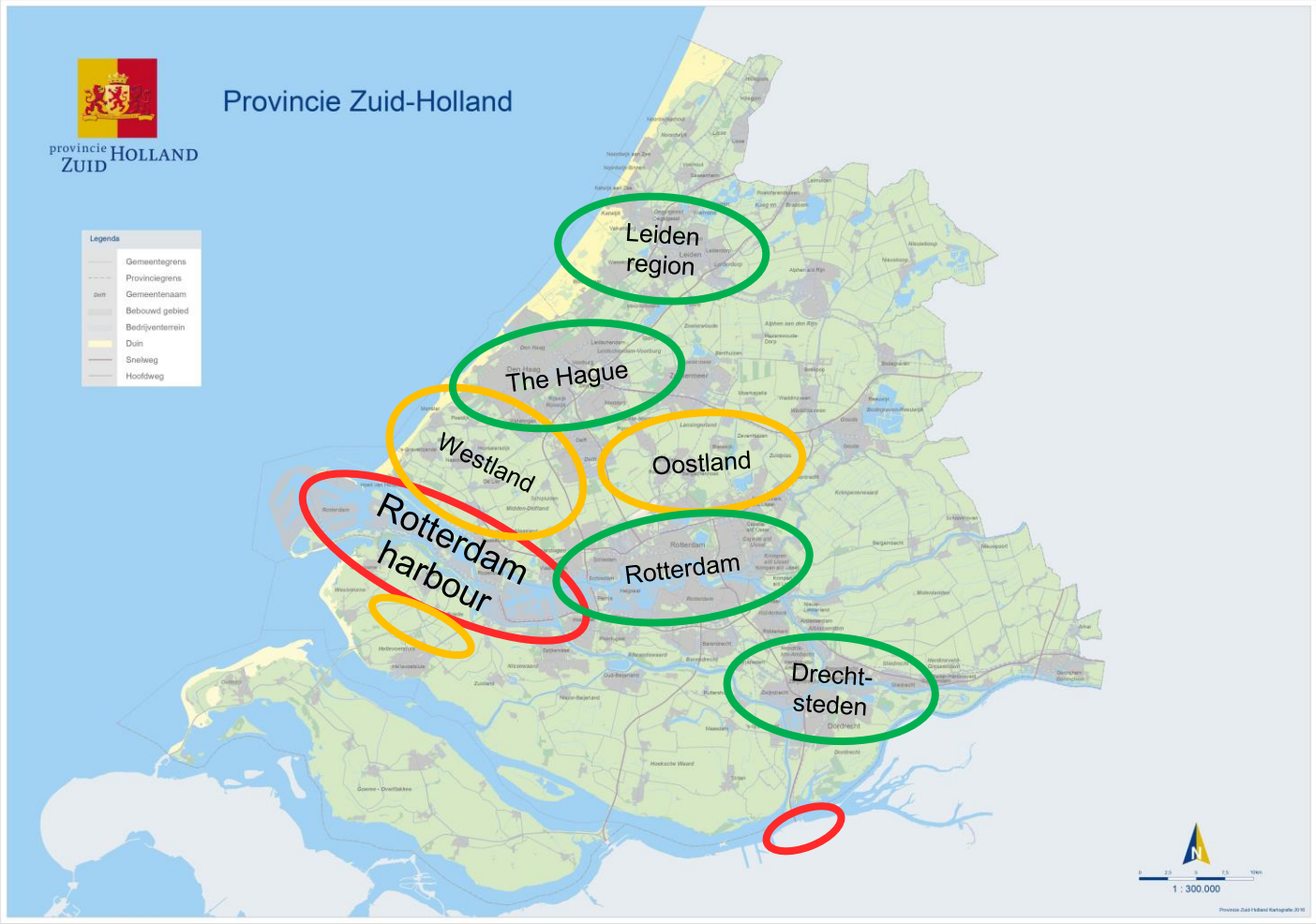
2. Province as an organisation

Policy program ‘Schone energie voor iedereen’ (Clean energy for everyone)

- Stimulating growth of clean energy sources
- Connection of local and regional goals
- Stimulation of main infrastructure projects (mainly industrial waste heat)
- Knowledge sharing and support for municipalities
- Attention to energy poverty and inclusion

Other governmental levels

- Municipalities: Decide on heat carriers and networks in their area
- National goverment: In charge of subsidies, most legislation

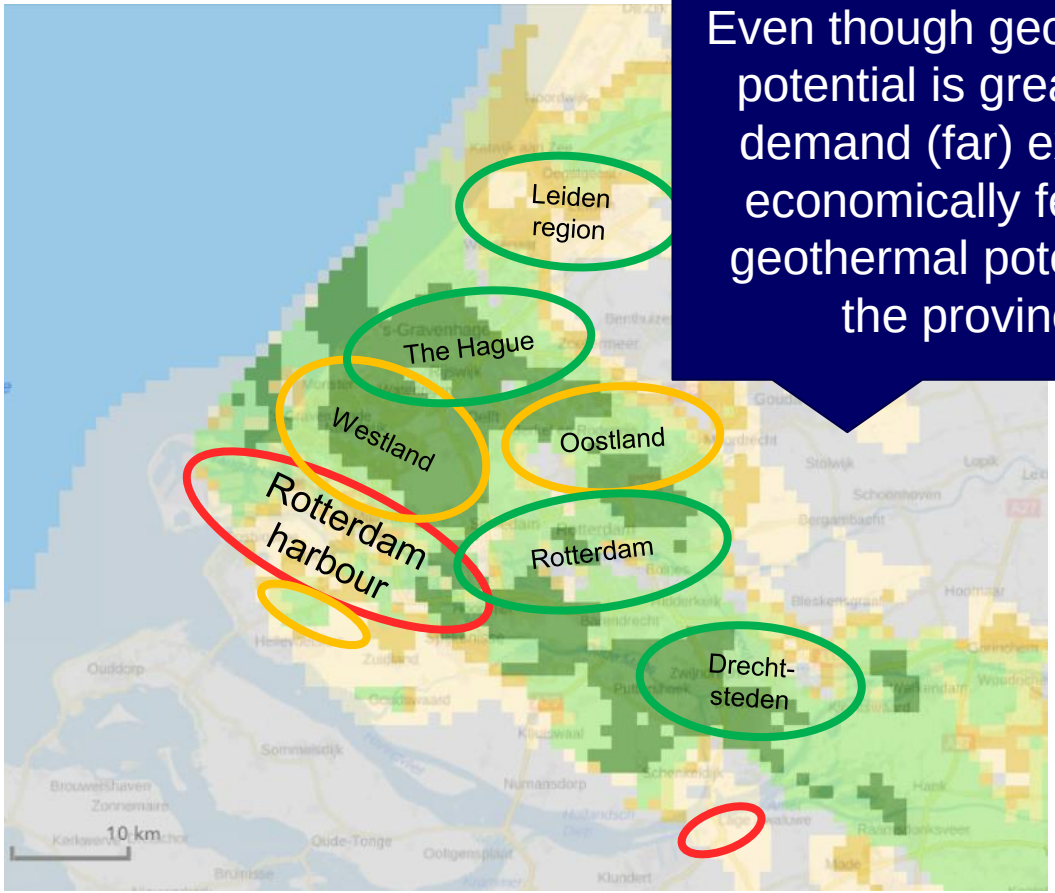


Legend

Urban centre (high heat demand)

Greenhouse horticultural region (high heat demand)

Harbour area (excess heat)



Even though geothermial potential is great, heat demand (far) exceeds economically feasible geothermal potential in the province

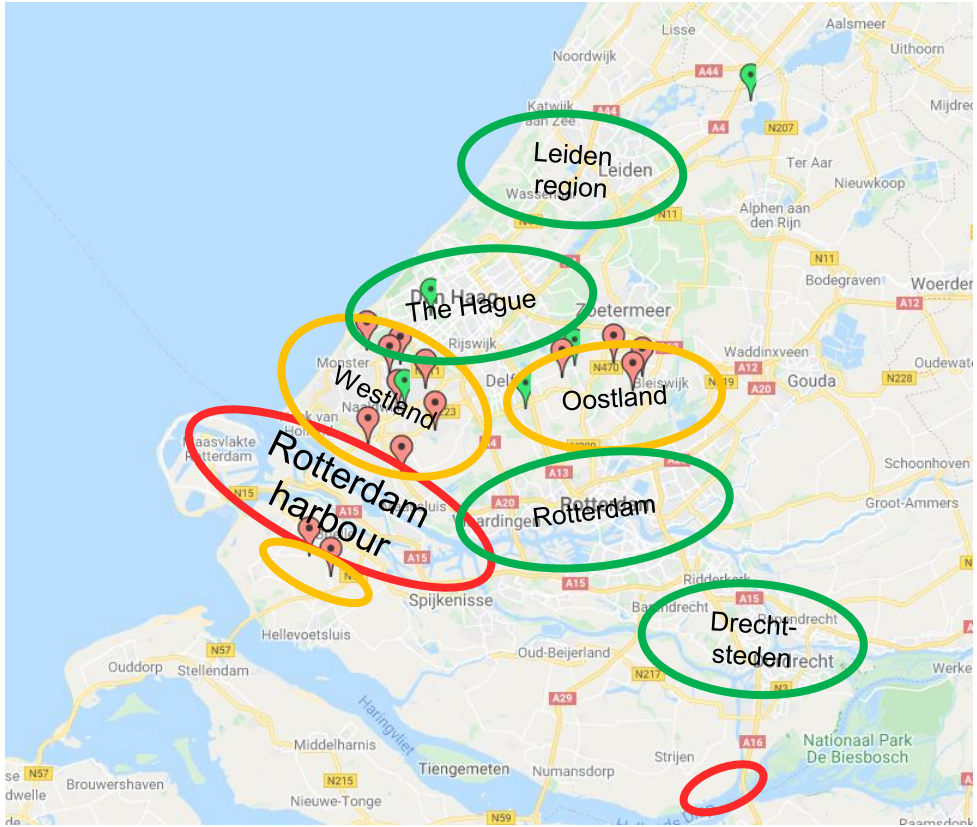
Legend

- Urban centre (high heat demand)
- Horticultural region (high heat demand)
- Harbour area (excess heat)

Geothermal potential

High potential — Low potential

Source: ThermoGIS



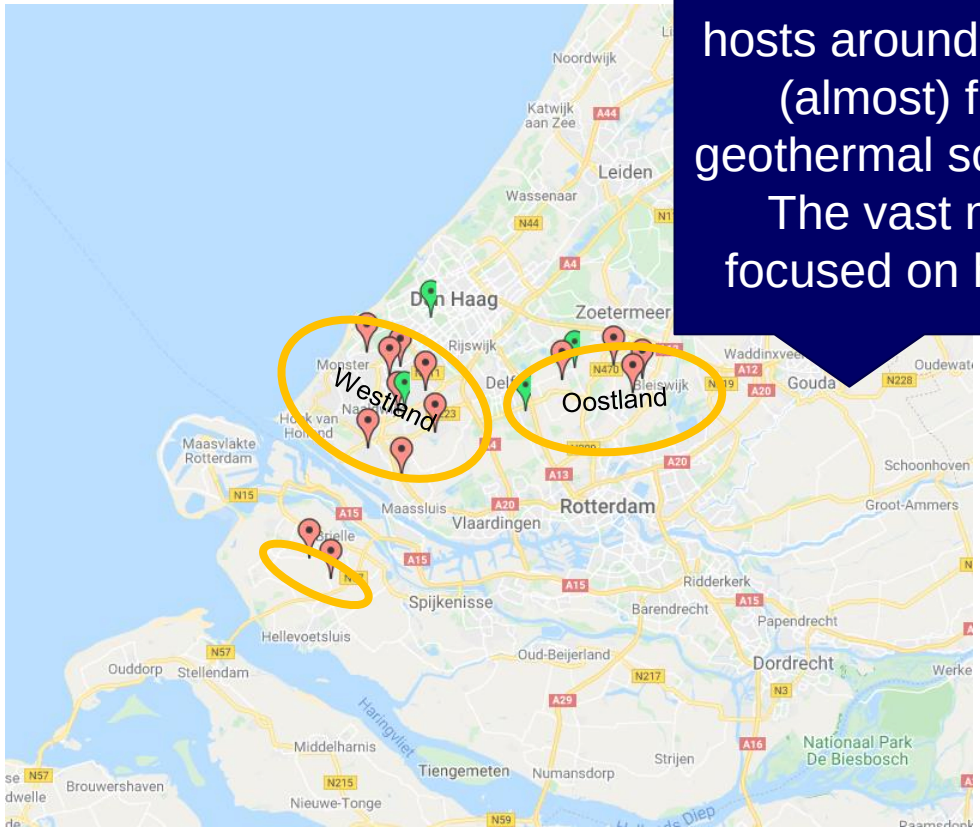
Source: Geothermie.nl

Legend

- Urban centre (high heat demand)
- Horticultural region (high heat demand)
- Harbour area (excess heat)

- Active geothermal source
- Source under development

Province of South-Holland hosts around 15/25 of the (almost) functional geothermal sources in NL. The vast majority is focused on horticulture.



Source: Geothermie.nl

Legend

- Urban centre (high heat demand)
- Horticultural region (high heat demand)
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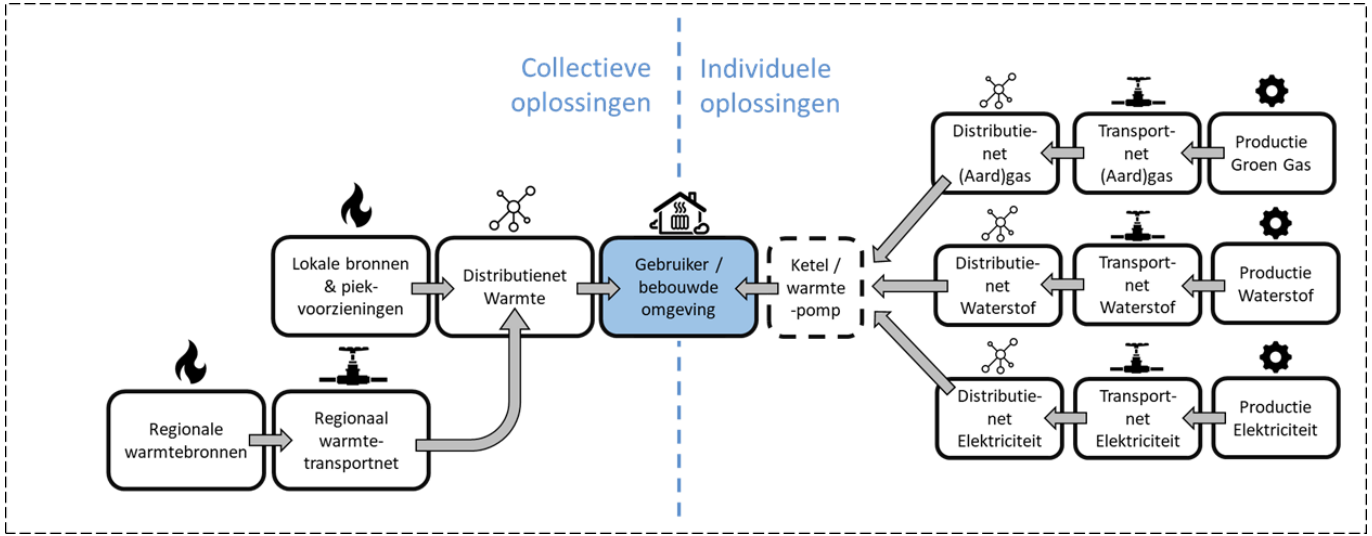
- Active geothermal source
- Source under development

3. Next step: Geothermal for Built Environment

- Progress in built environment has been slow
  - HAL project, The Hague
  - Connections within horticultural networks and built centres
  - (DAP)
- Large ambitions, but so far the acceleration we are hoping for is missing
- What barriers do we face?
  - Legislation, economic and subsidies, policy-development, public acceptable, technical, …
  - Largest current barriers we see are not related to geothermal energy as a source

4. Understanding the value-chain

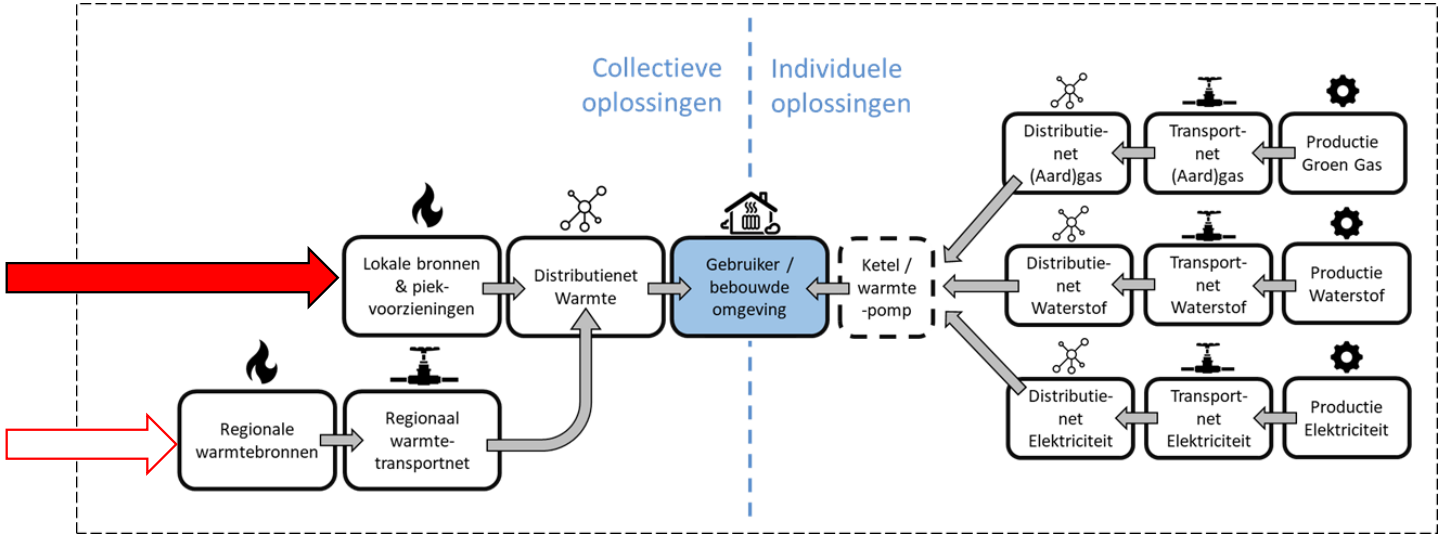
Municipalities need to make fast decisions in this complex field of solutions



Source: Integraal Ontwerp, WarmtelinQ (2021)

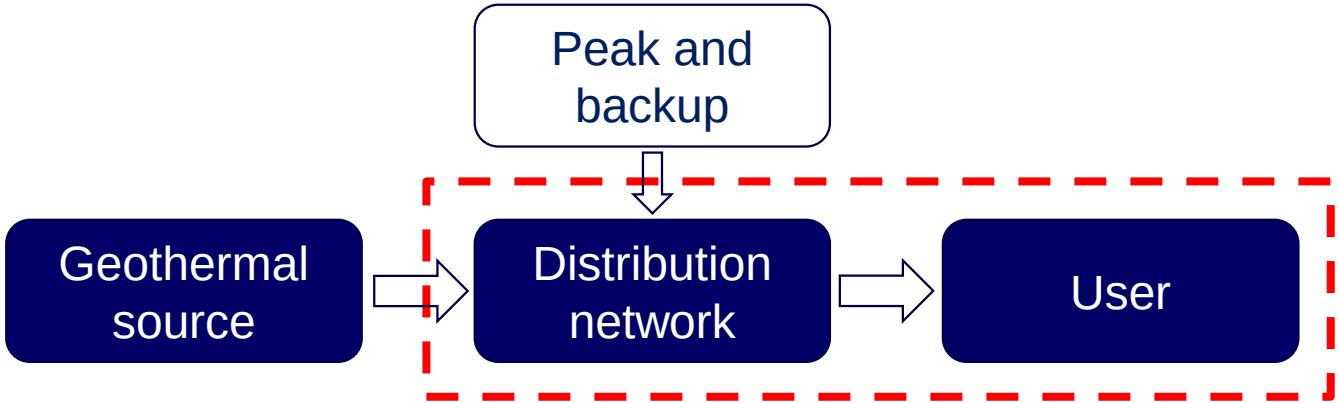
4. Understanding the value-chain

Geothermal energy fills a niche of a MT/HT source for collective local systems



Source: Integraal Ontwerp, WarmtelinQ (2021)

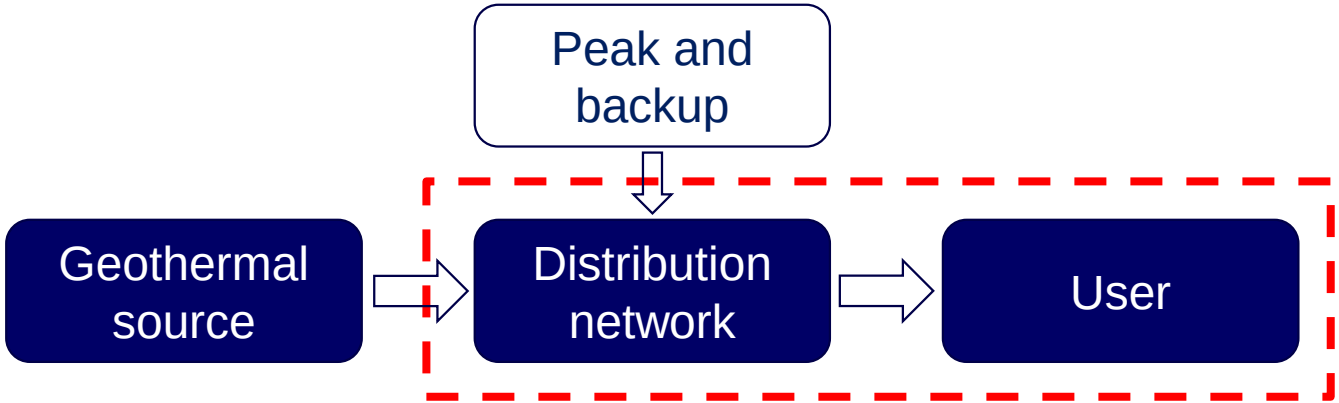
5. Restrictions in current value-chains



Geothermal sources *need* a distribution network to be (largely) finished at the start of their operation to be economically feasible

This constitutes a large part of the system's costs (estimate: 70% network, 30% geothermal source)

5. Restrictions in current value-chains



A large part of the horticultural sector's success is that this *demand development* is relatively easy
compared to the built environment

6. Issues around demand development

- Municipalities have to make difficult decisions on future heat systems
  - Policy trajectories: Transitievisie(s) Warmte (TVW) (in the making)
  - National legislation is missing/postponed: Warmtewet II, Mijnbouwwet
- Working business models for collective heat systems are rare
  - Almost nothing is cheaper than natural gas
  - Infrastructure development has high initial costs and risks
  - National financial incentives are currently largely insufficient

6. Further challenges

- Public support solutions
  - No legislative framework to ‘force’ people to switch to heat networks
    - Develop models to ‘seduce’ large groups of citizens to switch to collective heat solutions
    - This means a minimum of 5.000-10.000 of households per geothermal source that need to be convinced(!)
    - In practice: Initially working with housing associations
- Smart timing and allocation of sources
  - Geothermal energy is part of a larger field of solutions
  - When and where do you develop geothermal energy
    - How does geothermal energy fit in with other heating solutions? (choice between alternatives)
    - Where does geothermal energy add the most value? (prioritisation in allocation of resources)

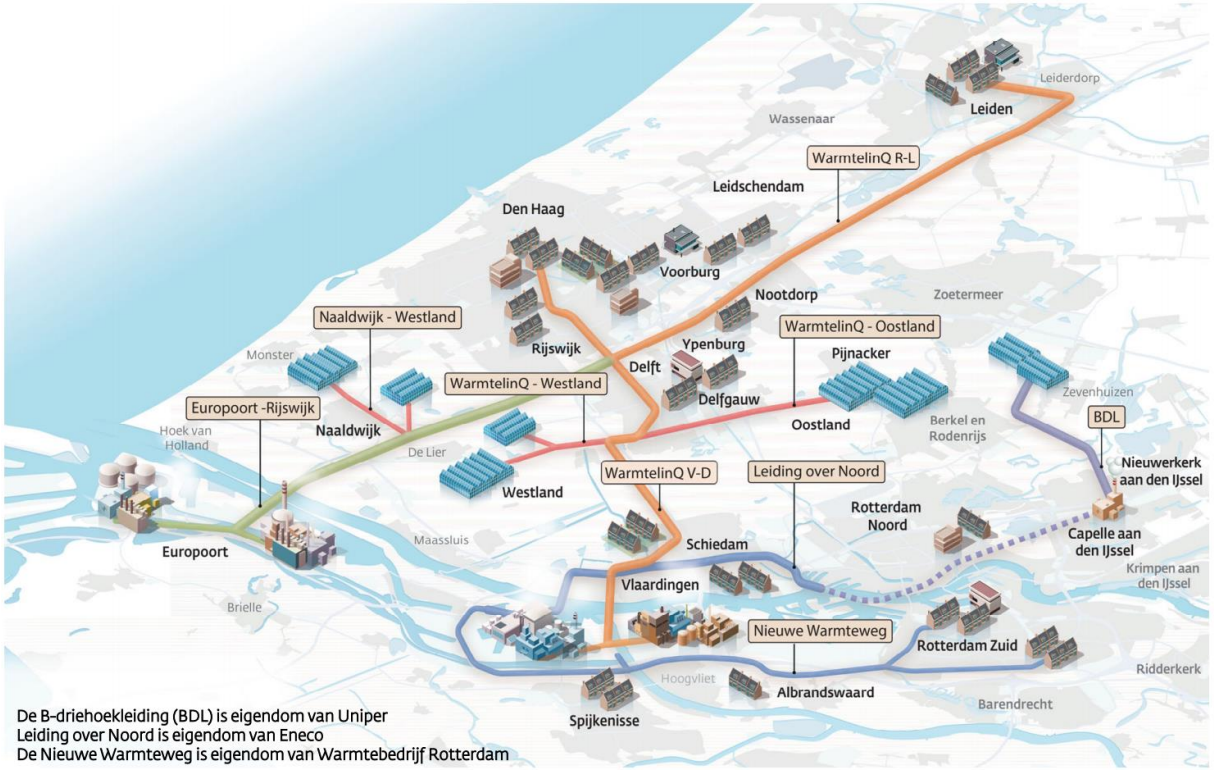
7. What do we need from the sector?

- Technical development driving down costs, improving (public perception of) safety
- Clear information on *how* and *when* geothermal energy fits in the development process of a heat network
  - How do you grow a (new) heat network to a point where it's large enough to connect to a geothermal source? What (sustainable) sources does it use before this? How does this growth path fit in the financial picture of the heat network? What other use-cases are viable for geothermal energy?
- Models on how people can participate in systems based on geothermal heat (or heat networks in general)

8. Questions?

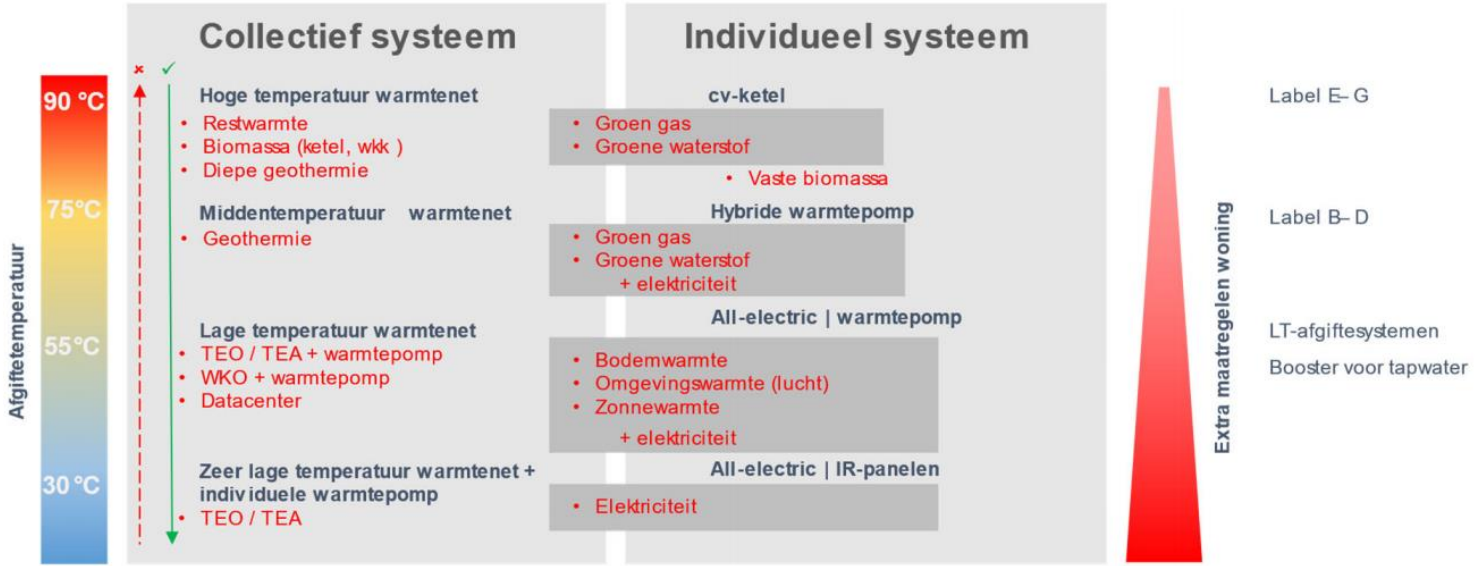
Feel free to get in touch at: yjj.nijsse@pzh.nl

Extra



Possibly planned regional heat networks
Source: WarmtelinQ – Integraal Ontwerp

Extra



Heat sources and their temperatures
Source: WarmtelinQ – Integraal Ontwerp