

Heat pumps in the Netherlands

The Netherlands country report 2023

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Agenda

- Market statistics
- Policy
- Funding and finance
- Innovations
- Monitoring
- Questions



The Netherlands

- 41,865 km²
- 17.8 mio inhabitants (2023*)
- 8.1 mio households (2022*)
- 8 mio homes (2021*)
- 7.2 mio gas boilers (2021)
- 438,000 district heating (2021*)
- 449,500 heat pumps (2022**)
- Average temperature (2022***)
 - January 5,3°C
 - July 18,6 °C

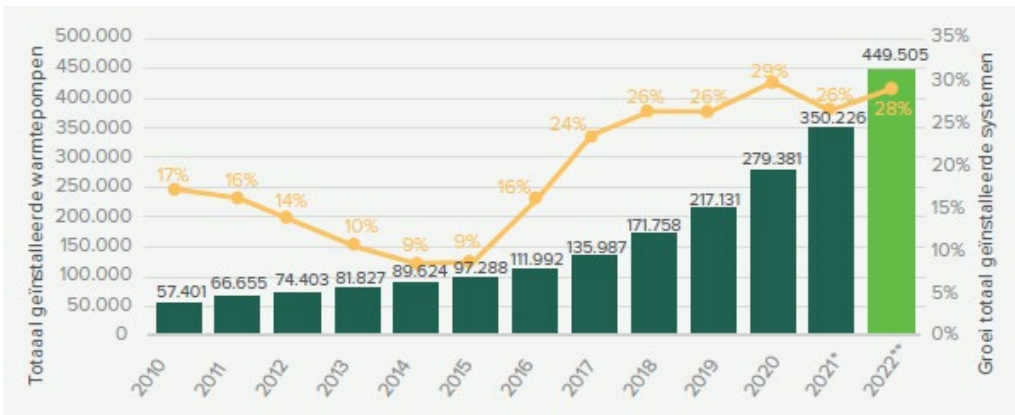


* Source: CBS

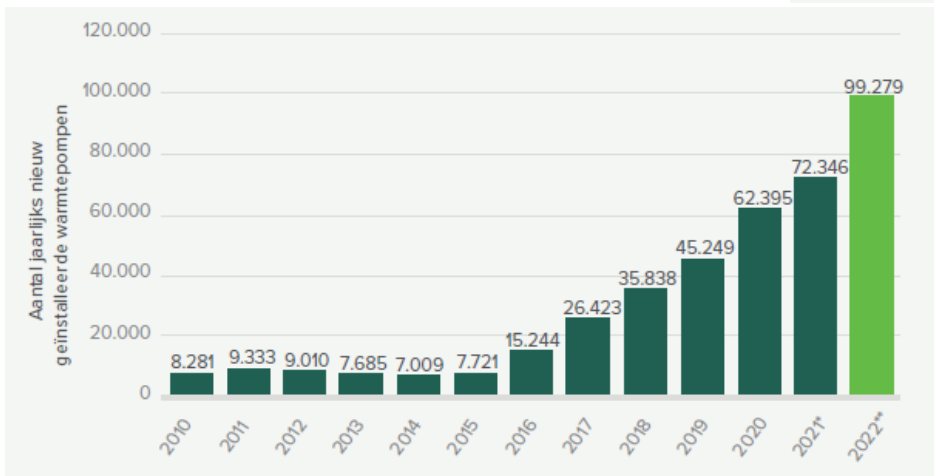
** Source: Warmtepomp trendrapport 2023

*** Source: KNMI

Market statistics



Total installed heat pumps



Total installed heat pumps

Source: *Warmtepomp trendrapport 2023*

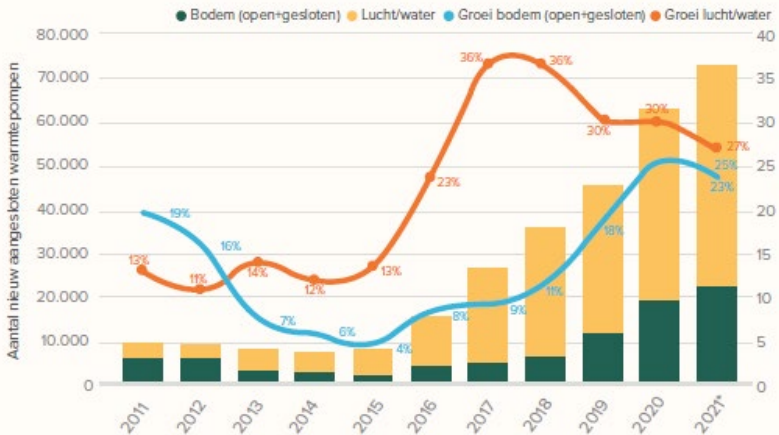
→ <https://www.duurzaamverwarmd.nl/trendrapport/>

* Preliminary numbers based on CBS

** Forecast by DNE Research

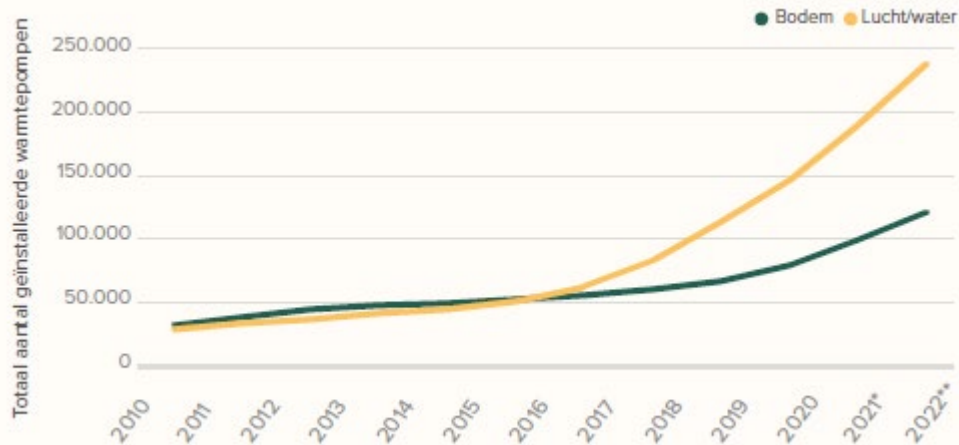


Market statistics



Total installed heat pumps per year ordered by source

(Green = ground to water / orange = air to water)



Total installed heat pumps in homes ordered by source

Source: Warmtepomp trendrapport 2023

→ <https://www.duurzaamverwarmd.nl/trendrapport/>

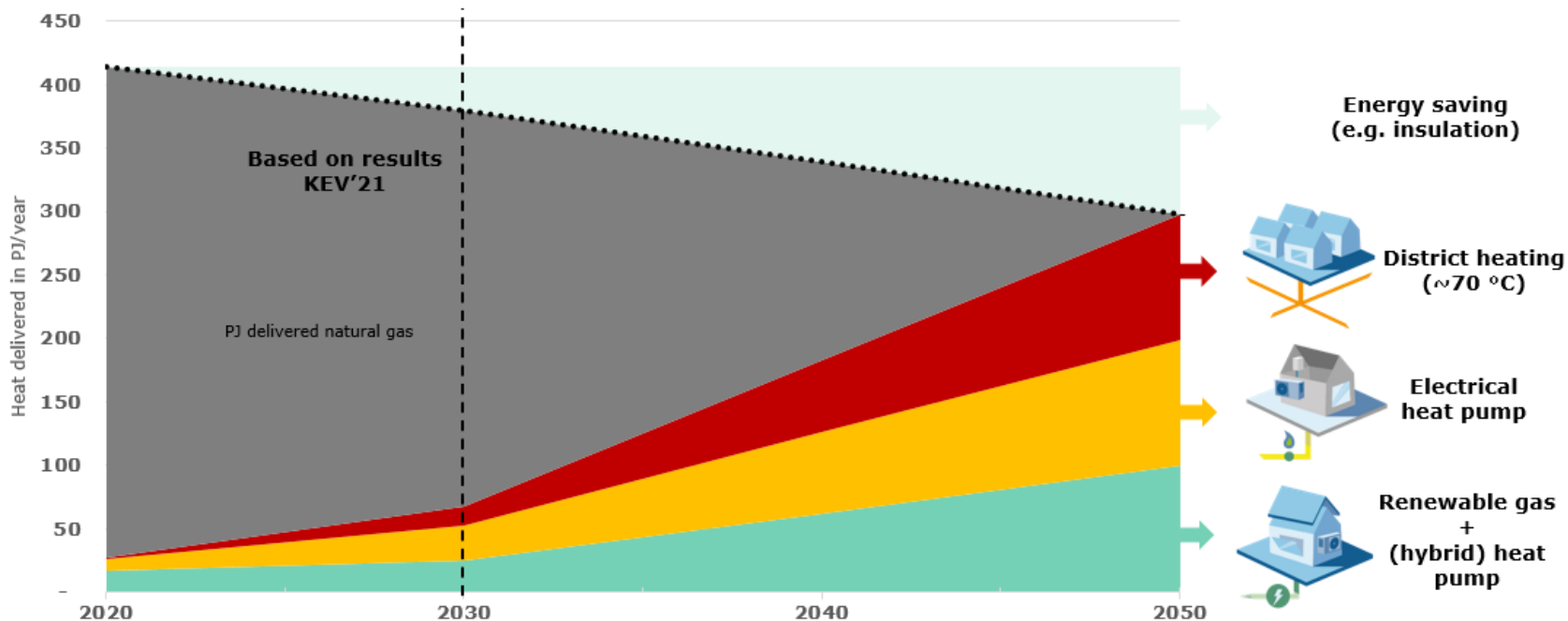
* Preliminary numbers based on CBS

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Policy - The Challenge



Policy: Strategy

- Municipalities have the lead in the heat transition
 - Municipalities made a heat transition vision (end 2021)
 - Municipalities are supposed to plan on the lowest national costs
 - Municipalities start implementing heat transition vision
- [Nation Program Local Heat transition](#)
- Program acceleration build environment ([PVGO](#))
 - [National Insulation plan](#)
 - [Hybrid heat pump action plan](#)
- [Starter motor are the housing corporations](#)
- New buildings are gas-free
- [National program regional energy strategy](#): room for 35 TWh renewable energy
- Pilot program for gas-free neighbourhoods
- Financial support from 25 billion climate fund
- New legal instruments

Hybrid heat pump (HHP) action plan – goals and actions

Main goal

- Remove existing barriers for further increase of HHP
- 1 mio hybrid heat pumps in 2030 (and + 125.000 between 2022-2024)

Main Actions

- Facilitate more supply by scaling up production
- Training of more qualified professionals
- Reduce costs for production and installation of heat pumps
- Communication (3 year public campaign)
- Monitoring
- Collect, validate and share knowledge
- The impact on the energy grid (monitoring and smart application)
- **Regulation: 2026:** more efficient heating installation obligatory at moments of replacement (phase out of mono gas boiler)

Partners



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Funding and finance – investment subsidy

- **Investment subsidy**
- For small-scale renewable energy systems and energy savings (ISDE)
 - *Aimed at house owners and companies*
 - *House owners can apply for: insulation, heat pumps, solar water heaters, connections to district heating and electric cooking facilities.*
 - *Companies can apply for: heat pumps and solar water heaters*
 - *Simple, Lumpsum subsidy amount, for heat pumps based on the thermal capacity*
 - *For **heat pumps** (<400 kwth), average subsidy is 30% of the costs*
 - *Devices list with approved products , Long-term (budget till 2030)*
- For Building owners associations (SVVE)
- For social real estate (DUMAVA)

Funding and finance – others

- **Other instruments**
- Heating fund / loans for energy savings for house owners
- Tax incentive:
 - gas up, electricity down
 - Energy investment reduction EIA
- Investment Subsidy for heating grids (Groeifonds, WIS)
- Exploitation subsidy for sustainable heat sources >500 kwth (aquathermal, solar thermal, (industrial) heat pumps etc) (SDE++)
- Innovation tenders stimulating **consortia** to develop integrated energy systems for different types of houses, buildings, communities, industry. (MOOI, DEI+, VEKI)



MOOI Innovation tender 2022

Reduction costs on performance and implementation by innovation

- **Natural refrigerants** upscaling propane hps, propane/isobutane 250 KW units; Next generation HT hps e.g. air compressed based tarnoc turbine boiler; 6 KW thermo acoustic unit.
- Easy installation by miniaturization of components and total system size; plug& play integrated units; **shorten installation time.**
- New applications : dual source heat pump systems (e.g. optimisation borehole/PVT); compact drilling machines; heat recovery showers.
- Application of heat pumps for **flexibility** : (open) standard communication protocol; heat pump/storage integrated systems (CCB); power to heat (upscale of district heating systems)
- Circularity

MOOI 2022 tender appr. 40 million euro (Buildings)

[Ruim € 80 miljoen innovatiesubsidie voor behalen klimaatdoelen \(rvo.nl\)](https://www.rvo.nl/nl/innovatie/innovatiesubsidie) www.heatpumpingtechnologies.org



Flexibility: MOOI Project DACS-HW

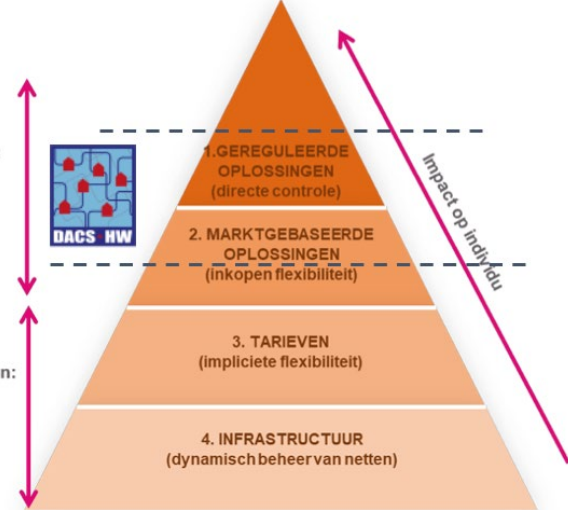
JAN 2023 – DEC 2025

Adoption of small scale hybrid heat pumps in districts Congestion management

1. Open standard communication protocol heat pump (brand and type independent)
2. Interface between houseowner (app) and installation (firmware)
3. GOPACS algoritm, flexcapacity on low voltage network level

Reactieve maatregelen:
 toepasbaar als ergens
 capaciteitschaarste
 wordt verwacht

Preventieve maatregelen:
 toepasbaar in het hele
 verzorgingsgebied ter
 voorkoming van
 capaciteitschaarste



Uitvoerende projectpartners



Supporters project



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Installation: MOOI project TDI500 Towards 500 installations per day

JAN 2023 – DEC 2026;

Consortium of 9 installation companies (#2M) aim to 500 (hybrid) heat pump installations a day.

1. *Intakeproces.* Data driven tool to automate the intake and work preparation proces
2. *Installatieproces.* Redesign of installation proces, prefabricage, supply chain contracting, automatic commision
3. *Datastore.* Shared datastore for predictive maintenance and interface for house owners.
4. *New installation concepts.* Pilots (focus on multi family houses).
5. *Chain approach.* Chain approach e.g. functional requirements on components, asset registration, circularity.

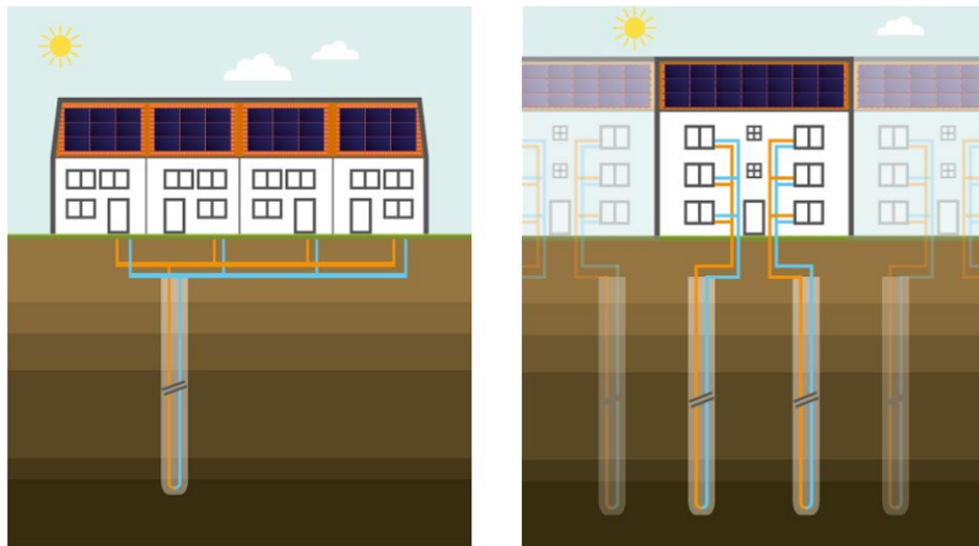
TDI500 consortium: Bonarius, Breman, Comfort Partners, Econic, Eneco, Essent, Feenstra, HeatTransformers, Mampaey,

Mensen maken de transitie, Stichting Team Duurzaam Installeren, TNO

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MOOI project: Small scale optimized heating & cooling grid



Optimized for 4 – 12 dwellings
Boreholes (400–800 meter)

1. Safe and sustainable drilling method
2. Higher efficiency
3. Smart control

Natural refrigerants: MOOI ready to market products



Collective A/W HT heat pump

Pre-fab modulair 250 KW unit

Refrigerant **Propane isobutane**

Multifamily houses, district heat
natuurlijkgasloos.nl

Compact A/W hp

Without outdoor unit

Hybrid or All electric

Refrigerant **Propane**

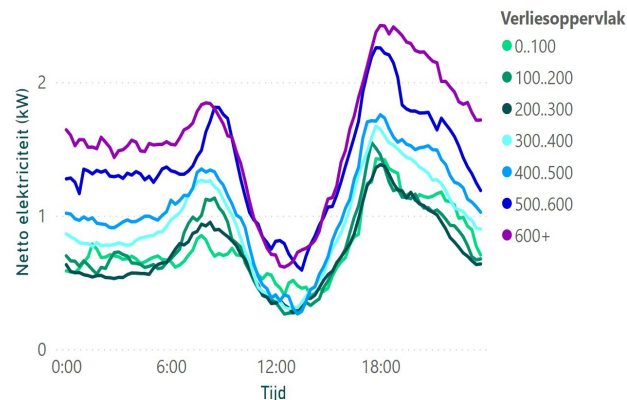
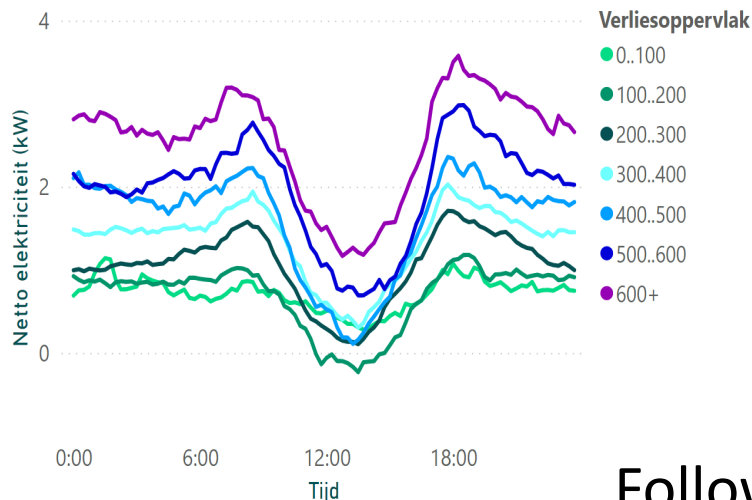
www.ontmoetvincent.nl



Monitoring campaign – installatiemonitor 1.0

All-electric heat pumps winter 2021

Hybrid heat pumps winter 2021



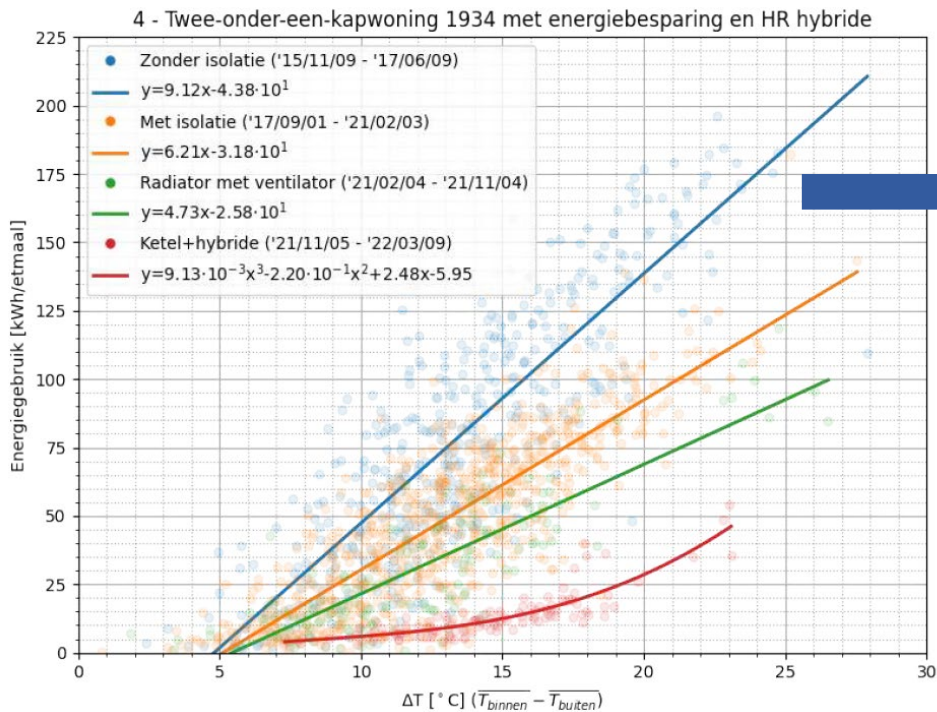
Follow up installatiemonitor 3.0

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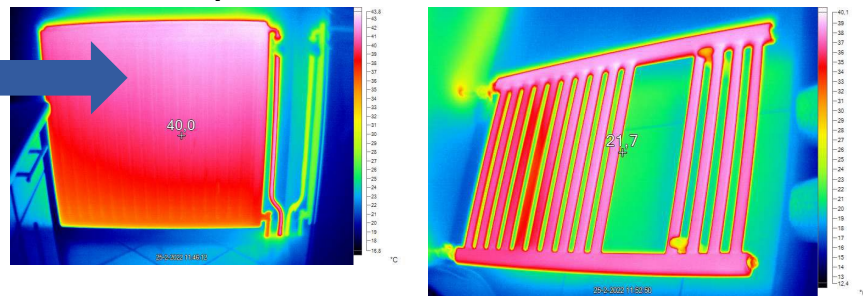
<https://www.installatiemonitor.nl/>



Monitoring campaign – demoproject hybride



- 3 simple modifications
- Cavity wall insulation, radiator fans



- Hydraulic commission!
- Monitoring results in better understanding performance!

Key messages

- *Gas-free* policy stimulates all-electric and sustainable heat options.
- Policy aimed at existing building stock, supported by hybrid heat pump action plan and upscaling subsidy schemes.
- The Dutch heat pump market is growing, 57% more heat pumps installed in new and existing buildings compared to 2021.
- Upcoming regulations to ban on mono used gas boilers in heating systems
- Municipalities and neighborhoods go “off the natural gas”. Strong coalitions between municipalities, building owners, grid operators, builders, installers, manufacturers and end users to develop and scale up *Off the Gas* affordable solutions.
- Heat pumps need to be more affordable and acceptable in existing building stock -> subsidy support schemes for small renewable heating options, R&D funding programs.
- Public-private cooperation on training centers for installers, awareness campaigns, monitoring and data, and more.
- Innovation programs are mission-driven



More information

Climate agreement

<https://www.klimaatakkoord.nl/documenten/publicaties/2019/06/28/national-climate-agreement-the-netherlands>



Policy program sustainability accelerator building environment

<https://open.overheid.nl/repository/ronl-789924103b28f6a32678bdd3fc81e5d35b2a320a/1/pdf/beleidsprogramma-versnelling-verduurzaming-gebouwde-omgeving.pdf>

NL main stakeholders

Ministries



RVO (Netherlands Enterprise Agency)

- ✓ Programs
- ✓ Subsidies



Others:

- ✓ Municipalities
- ✓ Building owners

Associations



Manufacturers/suppliers*



* Most important players for private owners in existing building stock 2021

Research & Knowledge institutes

- ✓ TNO
- ✓ TUDs Delft, Eindhoven, Enschede
- ✓ Applied Sciences Nijmegen, Groningen



Topsector Energy



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Questions?

