Heat pumps in the Netherlands

The Netherlands country report 2023
Marion Bakker, IEA HPT TCP delegate
Tom van Aalten, IEA HPT TCP alternate delegate

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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

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Market statistics

Total installed heat pumps

Source: Warmtepomp trendrapport 2023

⇒ https://www.duurzaamverwarmd.nl/trendrapport/

* Preliminary numbers based on CBS

** Forecast by DNE Research

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Market statistics

Total installed heat pumps in homes ordered by source

Source: Warmtepomp trendrapport 2023

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

* Preliminary numbers based on CBS

** Forecast by DNE Research

Total installed heat pumps per year ordered by source

(Green = ground to water / orange = air to water)
Policy - The Challenge

Based on results KEV'21

Heat delivered in PJ/year

Energy saving (e.g. insulation)

District heating (~70 °C)

Electrical heat pump

Renewable gas + (hybrid) heat pump

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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
- Vereniging Warmtepompen
- Techniek Nederland
- Netbeheer Nederland
- De Nederlandse Verwarmingsindustrie
- Natuur & Milieu
- Ministerie van Economische Zaken en Klimaat
- Rijksdienst voor Ondernemend Nederland

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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. optimalisation 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)  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
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


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
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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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


Policy program sustainability accelerator building environment

https://open.overheid.nl/repository/ronl-789924103b28f6a32678bddd3fc81e5d35b2a320a/1/pdf/beleidsprogramma-versnelling-verduurzaming-gebouwde-omgeving.pdf
NL main stakeholders

Ministries

- Ministerie van Economische Zaken en Klimaat
- Ministerie van Binnenlandse Zaken en Koninkrijksrelaties

RVO (Netherlands Enterprise Agency)

- Programs
- Subsidies

Research & Knowledge institutes

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

Others:

- Municipalities
- Building owners

Associations

- Vereniging Warmtepompen
- De Nederlandse Verwarmingsindustrie
- Techniek Nederland

Manufacturers/suppliers*

- itho daalderop
- ecoforest
- inventum
- daikin
- nibe
- LR remeha

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

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Contacts
HPT TCP, The Netherlands:

Ms. Marion Bakker
Executive Committee delegate & National Team contact
+31 88 042 2677
marion.bakker@rvo.nl

Mr. Tom van Aalten
Executive Committee alternate delegate
+31 88 042 3387
Tom.vanaalten@rvo.nl

NL OA/participants
Onno Kleefkens (46)
Peter Wagener/ Paul Friedel (55)
Charles Geelen (50, 60)
Henk Witte (52)
TNO (58)
Questions?