15 April 2025

Global Heat Pump Policy Toolkit

Heat pumps as pillars of a resilient energy future webinar, April 2025

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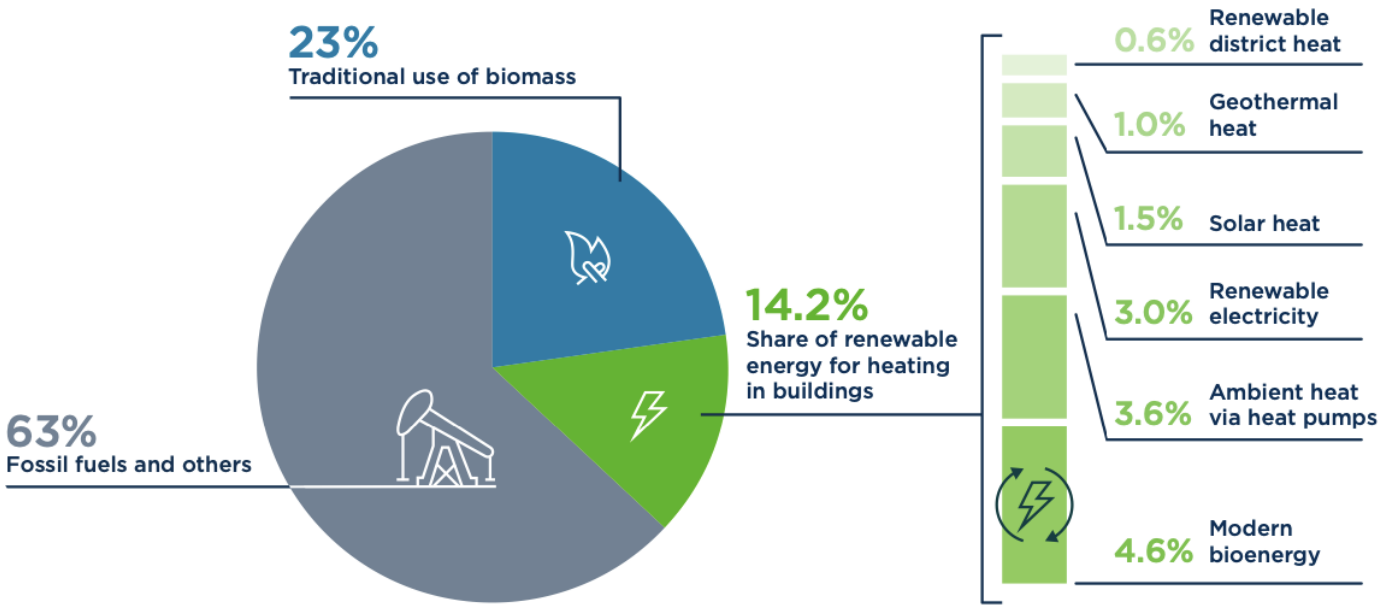
RAP

Why Heat Pumps? The global heating challenge

- Heating: **~50% of global final energy demand**
- **~63% of heating still relies on fossil fuels**
- Heat pumps are the **key clean technology** to replace fossil fuels:
  - Heat pumps are **highly efficient.**
  - Heat pumps produce heat and other products (like hot water) from a **renewable energy source**: air, water or ground
  - Heat pumps are **a flexible technology** used in individual buildings or as part of district systems

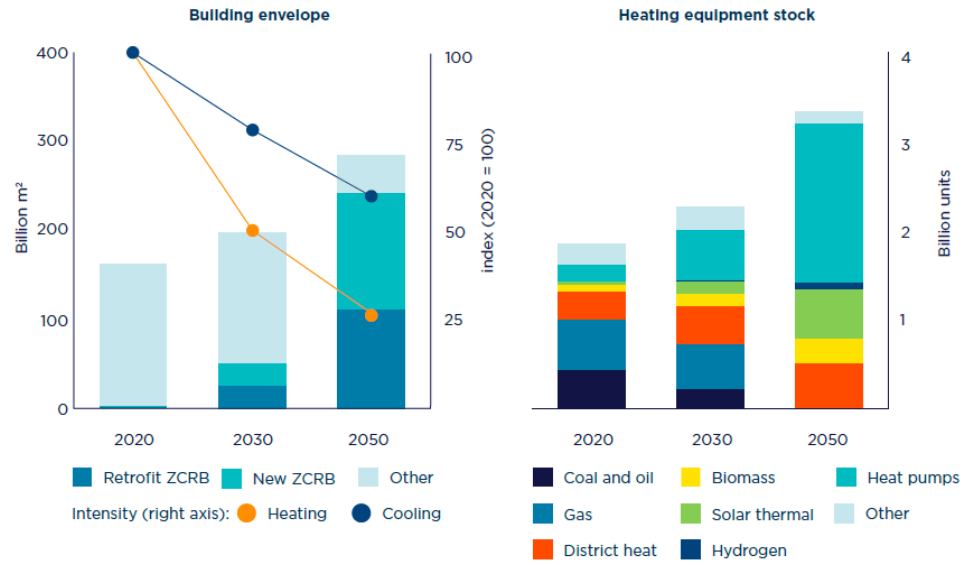
Figure 3. Energy consumption for heating in buildings, by source, 2021



Source: REN21. (2023). *Renewables 2023 Global Status Report: Buildings in Focus.*

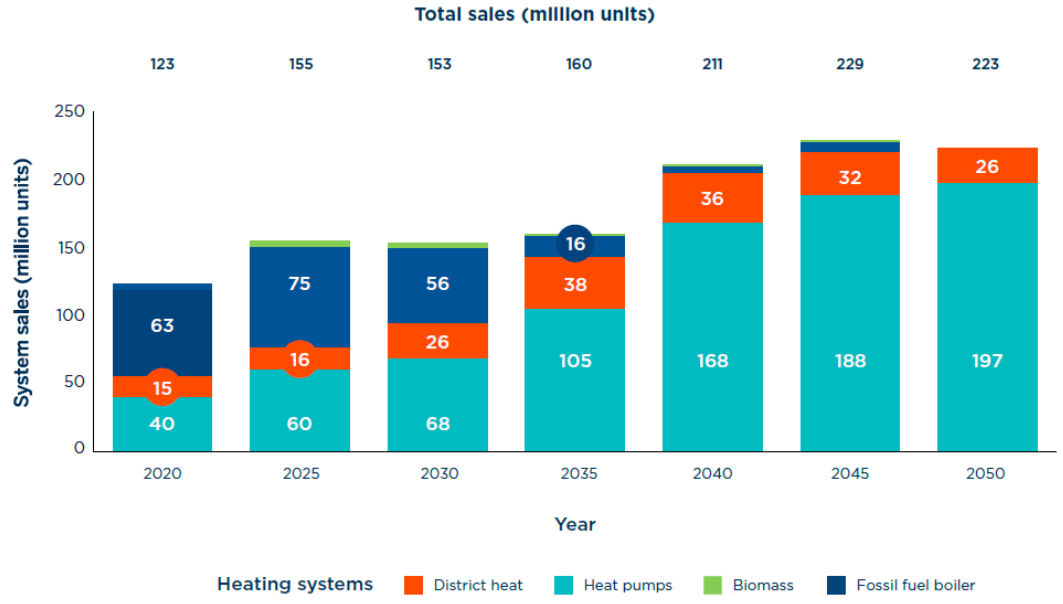
Why Heat Pumps? The Urgency of Clean Heating

Figure 5. Global building and heating equipment stock by type; and useful space-heating and cooling-demand intensity changes in the NZE report



Source: IEA. (2021, May). *Net Zero by 2050: A Roadmap for the Global Energy Sector.* Note: 'ZCRB' is zero carbon ready buildings; some district heating will be based around large heat pumps.

Figure 6. Global heating system sales under net-zero transition scenario



Source: McKinsey Global Institute. (2022, January). *The net-zero transition: What it would cost, what it could bring.*
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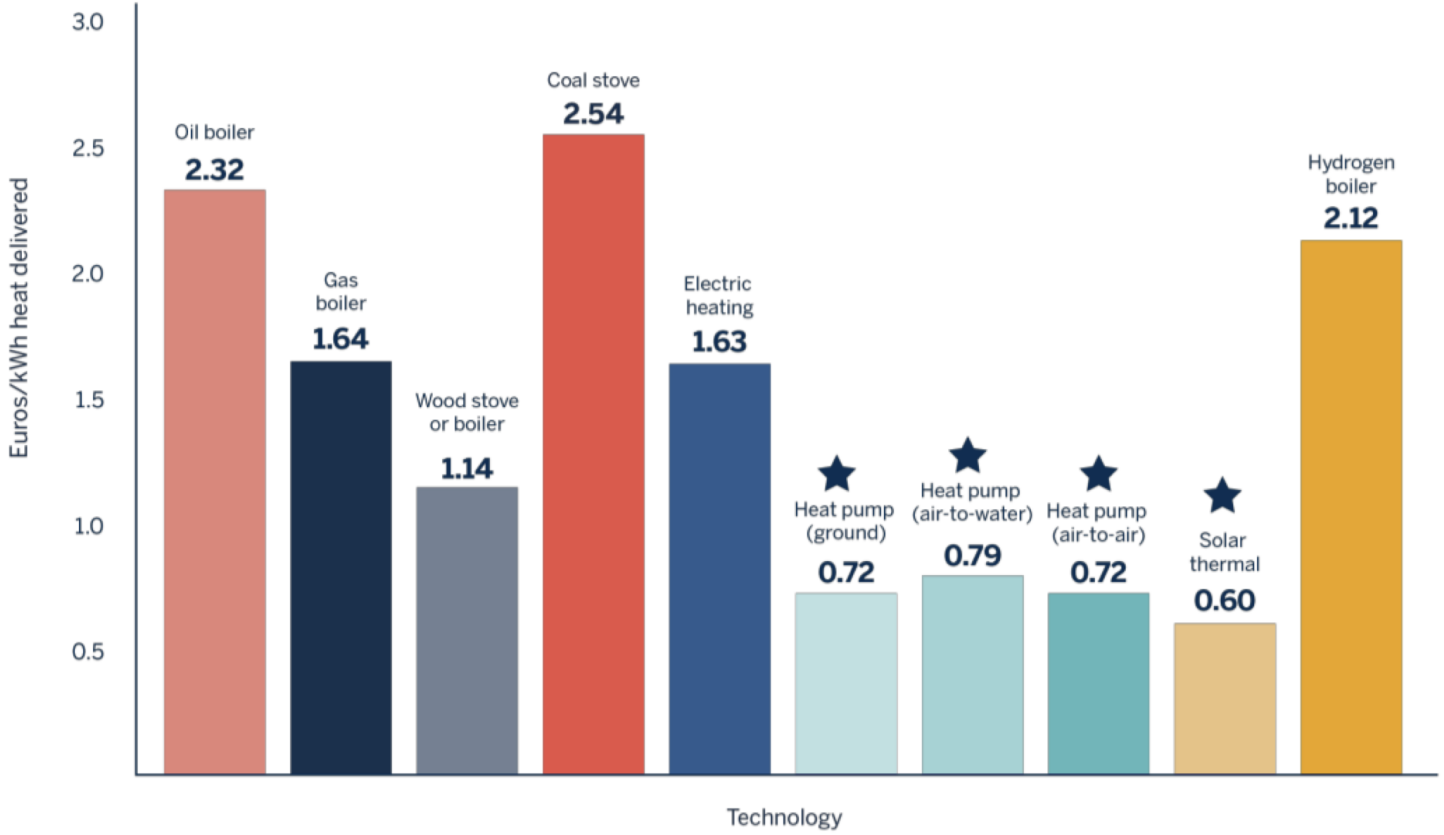
Essential for decarbonising heating in buildings

Reduce carbon emissions, air pollution, and energy costs

Why heat pumps? Cost effective solution

Figure 2. Total cost of owning and running different heating technologies, 2030-2040

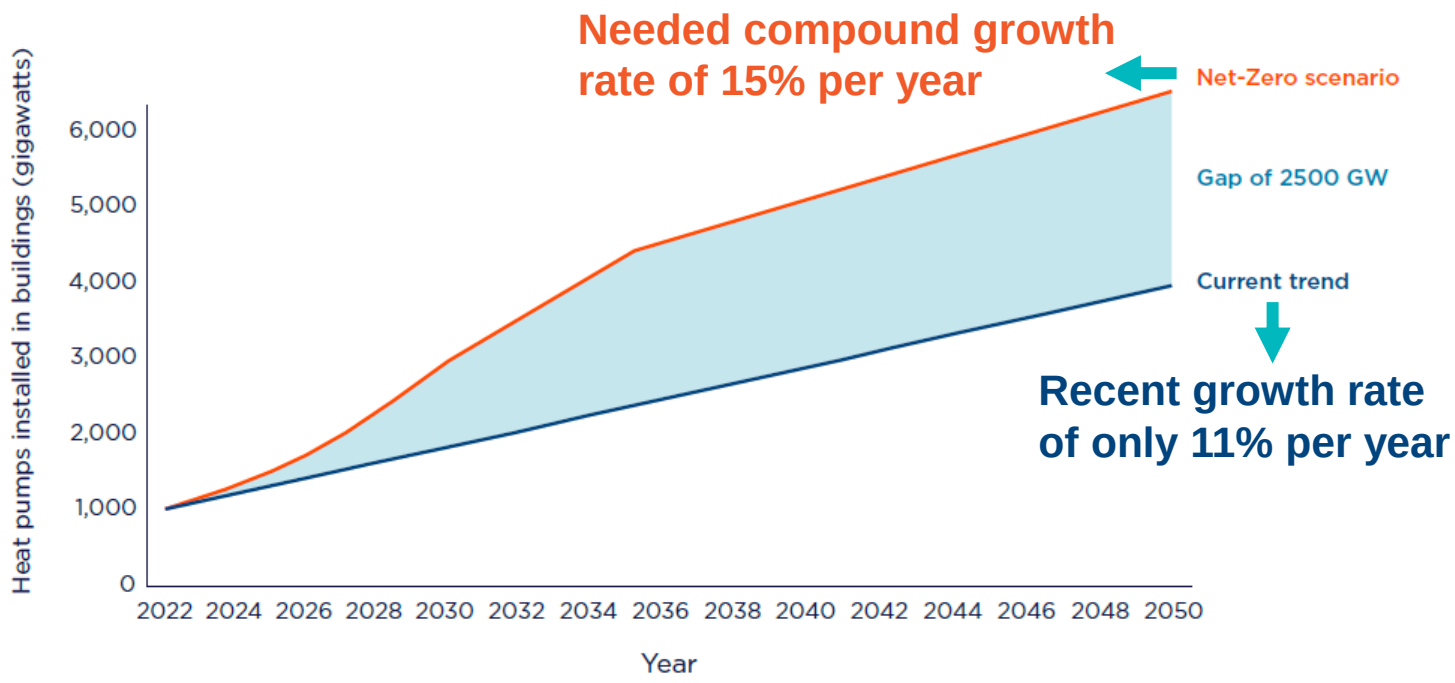


Source: European Climate Foundation and the European Alliance to Save Energy, 2022.

Technology certainty that we didn't have 10, 15 or 20 years ago.

Policy Attention Needed

Figure 4. Heat pumps are expected to be a vital clean-heating technology around the world, but a deployment gap remains



Source: IEA. (2023, September). *Space heating. Net Zero Roadmap.*

The story of one heat pump

- ? Installer
- ? Siting
- ? Manufacturer capacity
- ? Gas meter removal
- ? Upfront costs
- ? Running cost

Heat Pump Policy Toolkit

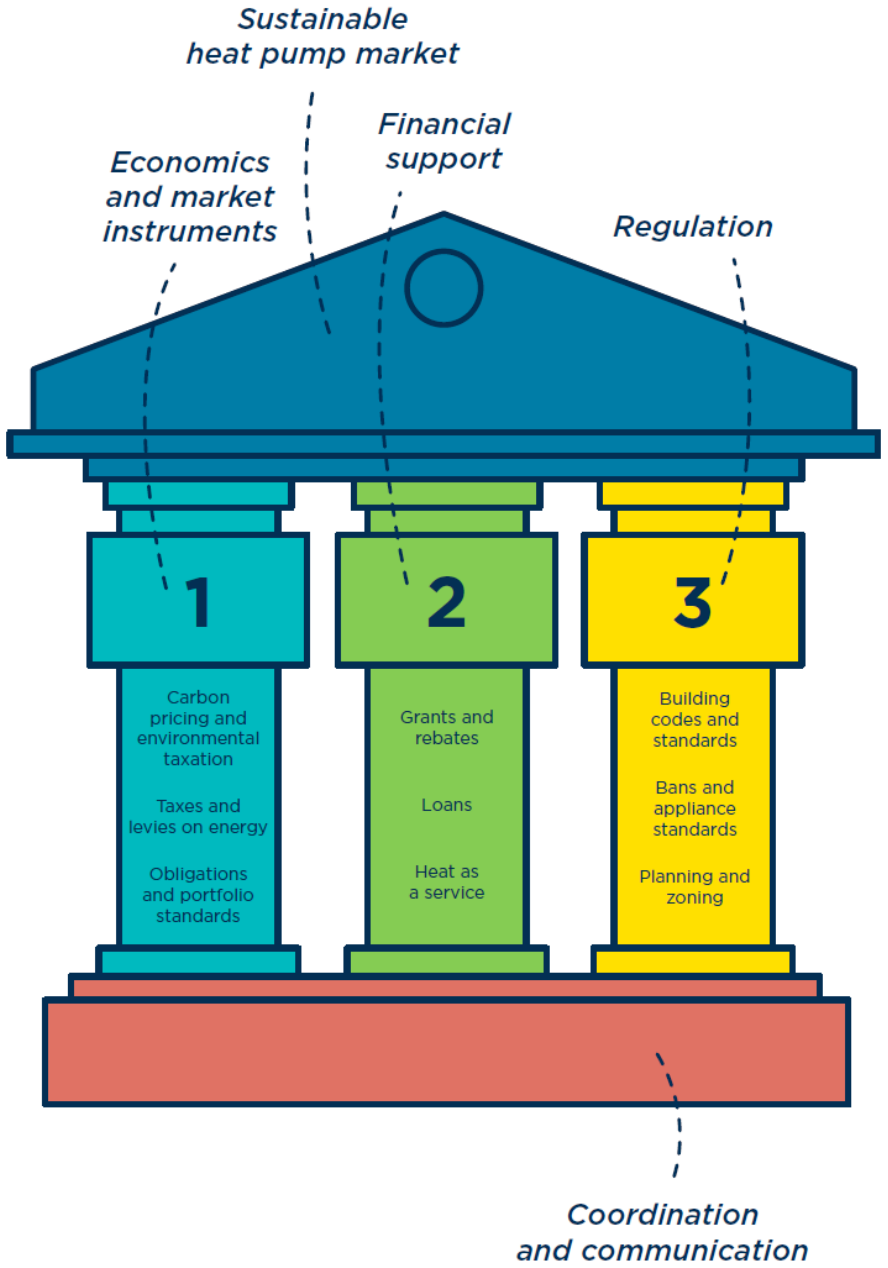
- Versatile and efficient technology that utilises environmental heat to provide useful heat
- Absolutely vital/central for decarbonisation
- Version 2 of our highly successful collaboration
- The result of years of global research and collaboration
- A guide for policy makers around the world on how to drive heat pump uptake

Accompanied by informative video series:
https://www.raponline.org/toolkit/heat-pump-toolkit/

Coordinated policy packages are a must

- **Foundations:** Coordination & Communication
- **Pillar 1:** Economic & Market Instruments
- **Pillar 2:** Financial Support
- **Pillar 3:** Regulatory Policies

All elements must work together to ensure successful deployment



Common Fundamental Policy Requirements

Foundations- Coordination & Communication

- Public awareness campaigns for consumer trust
- Installer training & certification to ensure quality
- Utility integration to optimise grid impact

Pillar 1 – Economic & Market Instruments

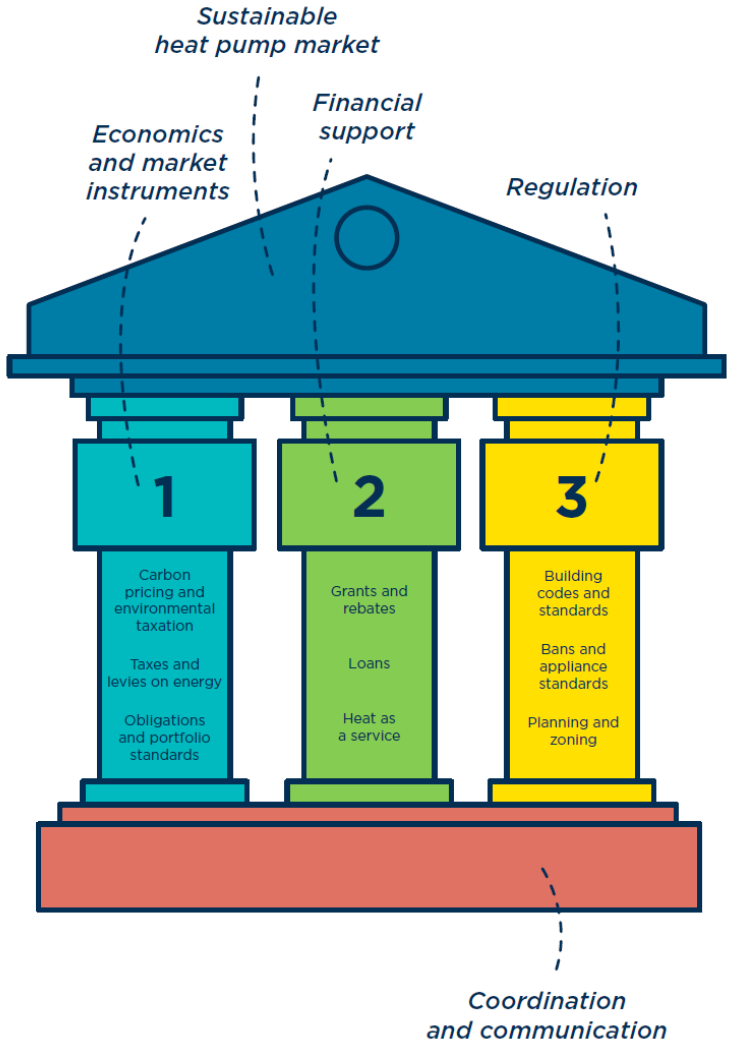
- Energy pricing reform: Align electricity and fossil fuel prices with climate goals
- Carbon pricing & taxation: Ensuring clean heating is cost-competitive
- Utility incentives & obligations: Encouraging demand-side flexibility

Pillar 2 – Financial Support

- Grants & rebates: Reducing upfront costs for consumers
- Loans & financing options: Ensuring affordability across income levels
- Heat-as-a-Service models: Making clean heating accessible

Pillar 3 – Regulatory Policies

- Building codes & efficiency standards: Ensuring heat pump-ready buildings
- Fossil fuel heating phase-outs: A structured transition plan
- Zoning & urban planning: Integrating heat pumps into energy systems



Successful Case Studies

Nordic Countries (Norway, Sweden, Finland): Comprehensive Policy Packages

- Policy Measures:
  - Financial support (grants and tax breaks) to reduce upfront costs.
  - Strong regulatory measures, including standards for heating appliances.
  - Promotional campaigns and consumer confidence-building initiatives
- Impact:
  - Highest penetration ratees of heat pumps globally.
  - Shows the importance of integrated policy packages rather than single measures.

Ireland: Energy Efficiency-Linked Grants

- Policy Measures:
  - Heat pump grants tied to minimum efficiency standards for buildings.
  - Comprehensive support for home retrofits alongside heat pump adoption
- Impact:
  - Improves affordability and ensures optimal performance of heat pump systems

Beijing (China): Electrification Through Heat Pumps

- Policy Measures:
  - Large-scale electrification programs incentivising replacement of coal-based heating with heat pumps.
  - Financial subsidies covering up to 70-80% of installation costs for residential households.
  - Policies supporting heat pump deployment in residential and public buildings
- Impact:
  - Air quality improvement
  - Reduction of reliance on coal for heating
  - Acceleration of heat pump adoption through government incentives

Source: Lowes, R., Gibb, D., Rosenow, J., Sunderland, L., Thomas, S., Graf, A., Verheyen, S., Kelpsaite, L., Malinowski, M., Ross, A., Graham, P., Kabare, R. and Njendu, M. (2024, November). A policy toolkit for global mass heat pump deployment — Version 2.0. Regulatory Assistance Project, Agora Energiewende, CLASP, Global Buildings Performance Network. https://www.raponline.org/toolkit/heat-pump-toolkit/

Deep dives on details of heat pump policy support

Air-blown or wet distribution systems

The heat from heat pumps is typically distributed around buildings by either hot water through pipes and then emitted via radiators and underfloor heating (wet systems), or is distributed by hot refrigerant through pipes and then warms the air directly with warm air being blown around a building (air-blown or forced air). Underfloor heating is not a requirement for any form of heat pumps.

In air-blown systems the air may be warmed centrally with warm air then ducted around the house, or the air may be warmed in a single room. Different types of heat pumps, for example ground or air source, can use either type of distribution system.

The presence of wet or air-blown systems varies geographically, and is often due to cultural and historical rather than technical reasons. In the United Kingdom and most of northern continental Europe, wet systems are widely used. In the United States, newer homes typically have air-blown systems rather than wet.[5] In most Nordic countries, air-blown systems are the most typical.[6]

A radiator and associated pipework in a wet central heating system. Image from Shutterstock.

5 U.S. Department of Energy. (n.d). *Heat Distribution Systems*. https://www.energy.gov/energysaver/heat-distribution-systems

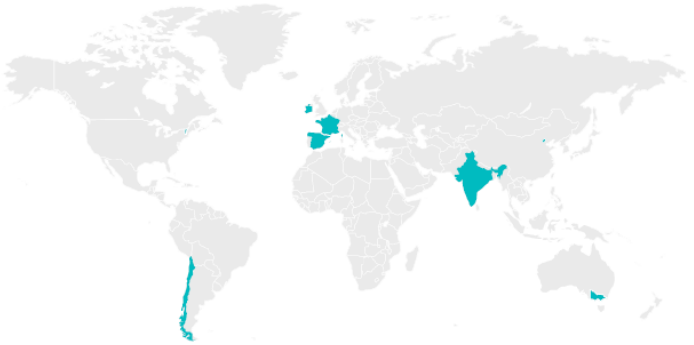
6 Rosenow, J. (2023, 2 October). How heat pumps became a Nordic success story. *Carbon Brief*. https://www.carbonbrief.org/guest-post-how-heat-pumps-became-a-nordic-success-story/

Across the Atlantic, Alex Sloan is Vice President for Business Operations and Development at Electrify My Home, a heat pump installation business in California which also offers wider electrification services. The company of 17 staff first started fitting heat pumps because the gas furnaces on the market were oversized for any home which had received an efficiency retrofit — only heat pumps made sense. But heat pumps are increasingly well recognized for their clean energy value. The company also offers workforce training 'on our business model and how properly to install heat pumps and heat pump hot water heaters'.

'In addition to electrification, we focus on high performance,' says Sloan, noting the warm climate of California which can give great heat pump running costs and performance. One of the biggest drivers for heat pumps is 'the ultra-low NOX mandate in certain areas requiring special furnaces and water heaters riddled with warranty issues,' as well as the TECH Clean California Initiative which funds much of their training.

'In general the State stays away from particularly noting heat pumps in their policy,' but the executive order from California's governor with the goal of installing 6 million heat pumps, accelerated in some areas, is a strong market driver despite the challenges it brings. 'While rebates and incentives are helpful for encouraging heat pump uptake, contractors are challenged by the start/stop nature of programmes and the bulky administration required to participate,' Sloan adds.

Figure 22. Traffic light classification of the heat pump policy mixes of chosen jurisdictions

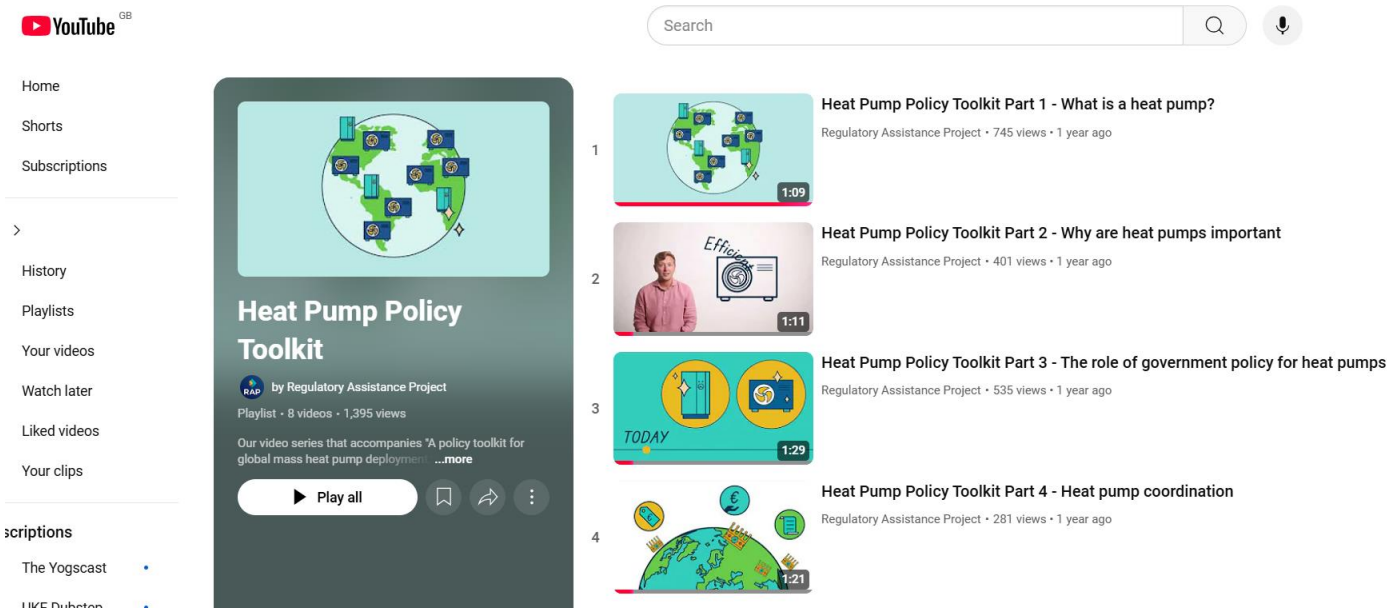


		Victoria, Australia	Chile	Spain	France	India	Ireland	Vermont, USA
Regulation	Heat planning and zoning	🟡	🟡	🔴	🟡	🔴	🟡	🟢
	Building codes, appliance standards	🟢	🟢	🟡	🟡	🟡	🟡	🔴
Economic and market instruments	Carbon taxation	🔴	🔴	🔴	🟢	🔴	🟢	🔴
	Taxes and levies (pricing)	🟡	🟡	🟡	🟡	🟡	🟡	🟡
	Obligations and portfolio standards	🟡	🟡	🟢	🟡	🔴	🟡	🟢
Financial Support	Grant and tax rebates	🟡	🔴	🟢	🟢	🔴	🟡	🟢
	Loans	🟡	🔴	🔴	🟢	🟡	🟢	🟢
	Heat as a service	🔴	🔴	🔴	🔴	🔴	🔴	🔴
Communications and coordination	Communication	🟡	🟡	🔴	🟢	🔴	🔴	🟢
	Installer training and certification	🟡	🟡	🔴	🟡	🔴	🟡	🟡
Broad equity support	Low-income support	🟡	🟢	🔴	🟢	🔴	🔴	🟡

🟢 Sufficient
🟡 Attention needed
🔴 Significant gap

Country	Coordination	Communications	Training	Economic and market	Financial support	Regulations
China[42,43]	Inter-agency collaboration and intergov-ernmental collaboration	Public recognition of need by central government		Trials of heat pumps and a flexible resource for demand response	Subsidies	Minimum energy performance standard (MEPS)
Switzerland[44]	Conferences	Exhibitions	Installer training, driller quality label	CO2 tax on heating fuels	Subsidies	Non-renewabl e standard, labelling
Sweden[45,46]	Expert groups	Public demonstrations, information, and advice	Training of installers	Increased tax on oil, high carbon tax	Subsidies and loans	Labelling
Denmark[47]	Promotion	Advice from central government	Quality assurance for installers	Reduced taxation of electricity used for heating and a carbon tax	Subsidies	Electric resistance and oil ban
Finland[48,49]	Wide ranging recognition and support	Messaging boards to improve consumer confidence		Increased fossil fuel taxation	Subsidies, tax deductions	Building codes account for carbon intensity of heat

The toolkit and associated video series can be accessed here:



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About RAP

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