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5 - 6 December 2023
Excel London
The journey from niche to mainstream
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A short history of heating with heat pumps

1856 First operational (heating) heat pump: in response to a shortage of fuel for Austrian salt works.

1877 Improved version installed in Swiss salt works

1912 US patent for ground source heat pumps

WW2 Switzerland builds 37 heat pumps to combat fuel shortages

1948 First working Ground Source Heat Pump: USA

1975 International Energy Agency founded in response to oil embargo

1976 IEA collaboration programme on heat pumping technology formed

NOW “Heat pumps …..are the central technology in the global transition to secure and sustainable heating.” (IEA)

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The issue today is deployment

“Heat pumps, powered by low-emissions electricity, are the central technology in the global transition to secure and sustainable heating.” “[Heat pumps are] below the deployment level required to get on track with the Net Zero Emissions by 2050 Scenario.” IEA 2022

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A UK-led IEA Project

Retrofitting Heat Pump Systems in Large Non-domestic Buildings

- High-level initial guidance to building owners and managers
- Literature research showed that there is little existing guidance
  - AM17 is one of few documents on heat pumps in nondomestic buildings

Project led by UK Department of Energy Security and Net Zero, working with Austria, Canada, Ireland, Italy, Netherlands

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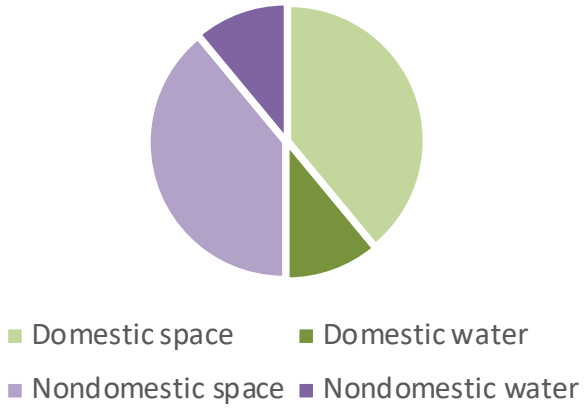
Domestic and Nondomestic heating



Discussion is mostly about dwellings BUT:

- Equal amounts of energy are used for space and water heating in domestic and nondomestic buildings.
- Sales of large heat pumps are growing rapidly

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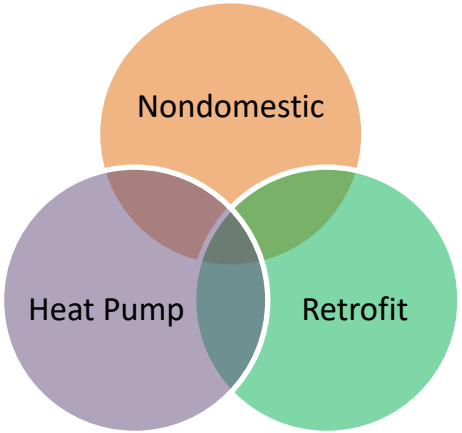
Nondomestic+Retrofit+Heat Pump is complex



Nondomestic: Many types and sizes of buildings and systems

Retrofit: Anything from boiler replacement to deep refurbishment

Heat pump: Heat source? Distribution system? Bivalent? …

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Who is this for?

"My boiler/heating system will soon need replacing, but policy is to ban new fossil-fueled heat generators in future: I probably ought to consider a heat pump system"

- "What sort of systems should I be thinking about?"
- "Where have they been used before?"
- "What are the pros and cons?"

(And also for anyone else thinking about a heat pump retrofit)

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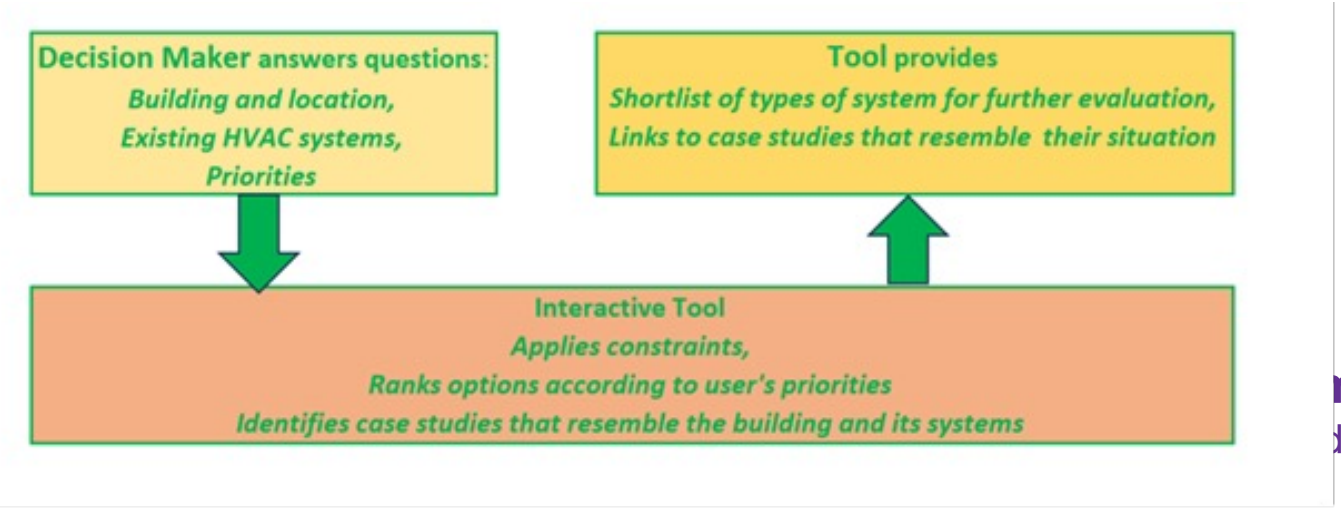
Guidance tool



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How will it work?

Input

- Existing building and its heating system(s)
- Constraints: availability of heat sources, plans to upgrade the fabric etc
- Motivations and concerns: satisfy regulations, capital cost, carbon saving etc

Output

- Short-list of system types that reflect inputs (for more detailed assessment), accompanied by.
- Links to summaries of relevant existing installations

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Current Status

About 30% through a three-year timescale

- Collecting information on example installations
- Questions to tool users have been defined
- Outline tool logic is defined

Still to do

- Clarify who the “decision-makers” are
- Expand information on comparative costs and efficiencies
- Code and test

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You can help

If you have participated in a retrofit: we would like **examples of successful retrofits** as case studies. (And – privately – information about less successful ones)

If you have **assessed alternative solutions for a particular building**: we would like to talk to you (privately) about what you found.

If you are **thinking about a retrofit**: we would like to talk to you about your motivations and concerns.

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If you would like to **keep in touch** with the project or be actively involved: please give us your contact details.

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Contacts

Project website: https://heatpumpingtechnologies.org/annex60/

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IEA Heat Pump activities: https://heatpumpingtechnologies.org/about/heat-pump-centre/