



**CHANGeworks**

Delivering positive low carbon living

**climateXchange**

Scotland's centre of expertise connecting  
climate change research and policy

---

# **The experiences of early adopters of zero direct emissions heating systems in Scotland**

**A ClimateXChange research project for the Scottish  
Government**

**Kurt Borth – Senior Behaviour Change Consultant – Changeworks**

# Research Aims

---

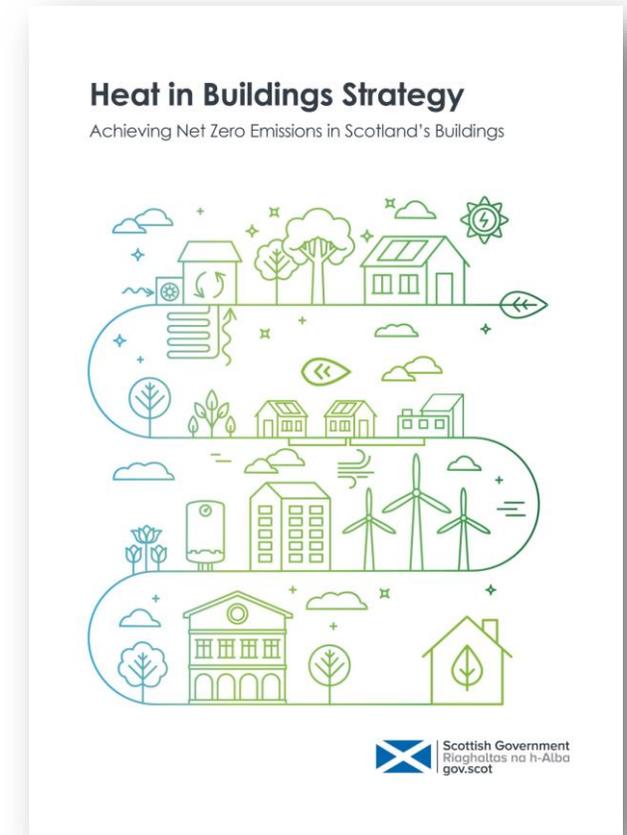
## Two key aims:

- (i) to better understand the experiences of early adopters of ZDEH systems and energy efficiency retrofit to inform the development of the upcoming Heat in Buildings Public Engagement Strategy; and
- (ii) to develop a series of detailed case studies / pen portraits that depict a range of different experiences of successful installation of ZDEH and energy efficiency measures that can be used as an engagement tool.

# Rationale for the research

Over one million homes will need to convert to zero direct emissions heating by 2030 (and the remainder by 2045) (HiBS).

HiBS Public Engagement Strategy  
(2023)



# Methodology

---

**Literature Review** to gather data on the lived experiences of early adopters (motivations, consumer journeys, barriers and enablers).

**Early Adopter Interviews** private tenure households who had recently installed ZDEH systems (focused on 2-3 years) were recruited for 45-minute qualitative interviews. Diversity in location (urban, rural, peri-urban), housing type and demographics was attempted.

**Pen Portrait Development** interviews were analysed and coded to create the thematic foundational basis for the pen portraits. These pen portraits offer a (semi) representational depiction of some early adopters of ZDEH technology.

# Recruitment

## Who did we interview?

### GENDER

We spoke to 11 men and 9 women



### OCCUPATION

13 interviewees are working adults, of which 8 work in the environmental area. The remaining 7 are retired.



### LOCATION

8 live in rural areas  
6 live in urban areas  
6 live in small towns



# Findings

---

## Motivations:

- Environmental (16)
- Renovations (6)
- Replacing an old heating system (5)
- Better heating regime (4)
- Future cost concerns (2)

## Barriers:

- HES loan process (10)
- Installers (9)
- Costs (6)
- Post-install failures (5)
- Supply chain delays (4)
- Upheaval (4)
- Planning permission (1)

# Findings

---

- **Advice to others**
- **Influencers- people and resources**
- **Initial concerns**
- **Post-install**

# Influencers – People and Resources

---

- Home Energy Scotland (15)
- Online research (e.g. HeatGeek) (9)
- Green Homes Network (3)
- Home building exhibition (2)
- Viewing neighbours/friends heat pump (2)

# Initial Concerns



*“For me I’m so frustrated with the bad press that people keep saying, about heat pumps not working. It looks to me as though I’m going to get a return on investment in 8 years. Having a technical background made me less sceptical. The bad press out there saying house is frozen and costs you a fortune, these people are not helping. A well-designed system to match the house will reap benefits. I’m convinced of that. More an inbuilt fear on what you were seeing in the press and tv. I have a vulnerable wife and I wondered if I was doing something wrong. But it never materialised. You only see complaints rather than compliments.”*

# Post-install

---

## Negative:

- Lack of understanding of the system and operation (13)
- Running costs information lacking (10)
- Noise and hot water availability (2)
- EPC conducted after install lower than previous (1)

## Positive:

- Increased thermal comfort (11)

# Advice to others

---

- Make sure to get a good installer
- Understand the controls and flow temperature
- Accept heating system is not a switch on/off like gas
- Focus on insulation
- Remember it's not cost-saving
- Do plenty of research
- Talk to someone who already has a heat pump

# Pen Portraits

## Heat Pump Early Installer: Unfamiliar but Undeterred



### About Catriona

Catriona is retired and lives in her rural Highlands bungalow with her dog Hamish. She's always used coal and LPG gas to heat her home, but it still felt cold. She's part of her local environmental group and wanted to switch to a ground source heat pump. After speaking with her neighbours, she had faith in the technology and was happy to leave the planning and details to the experts. The most important thing for Catriona was that she finally made the move away from fossil fuels after all these years.

#### Priorities

- Making the sustainable choice
- Staying warm

#### Initial concerns

- Not understanding the technical side
- Heating an older property

### Installation Journey

- Catriona knew switching her heating system was the right decision. She phoned Home Energy Scotland to get a home visit and plan her journey out.
- With an older house, she was recommended to get more loft insulation by her Home Energy Scotland advisor.
- Catriona used HES recommended installers to find someone to give her a quote. To simplify the process she chose a contractor who could do all the works in-house.
- She found the system confusing so she paid the installer to be able to control it remotely and change as needed.

### Outcome

Catriona's house feels much warmer. Her system still uses electricity but she's using less than before because it's more efficient. She's proud that she's moved away from fossil fuels.

### Challenges overcome

Catriona knew she wasn't an expert but finding an installer and advisor she could trust meant she didn't have to worry if she wasn't sure about her system set up. Although she doesn't understand it fully, she's still very happy with her warm home.

#### Trusted Sources

Home Energy Scotland specialist Advisor and home visit  
Speaking to neighbours with the same system

Created by ClimateXChange & Changeworks.

## Heat Pump Early Installer: Retired Researcher



I've become a grandfather recently and I feel like I have a responsibility to decarbonise. I'm very very happy with my set up and my brother is even saying what I've got.

### About Donald

Donald is a retired engineer, living in a 1980s bungalow with his wife. He's recently installed solar panels, a battery, and an air source heat pump to make his home more environmentally friendly. As he's retired, Donald has lots of time to do thorough research to make sure the system is right for his home and likes collecting data on the performance of his new systems. Donald's wife has dementia, and he wants his house to be warm and comfortable for her. It's important that the new system works for them and the installers understand their situation.

#### Priorities

- Making the low carbon choice for his family
- Keeping his home warm for a family member

#### Initial concerns

- Negative stories he'd heard in the news
- System wouldn't be as efficient as promised

### Installation Journey

- Donald did his own research of the technology then called Home Energy Scotland and spoke with a specialist.
- He looked at quotes from different installers and investigated the Renewable Heat Incentive with Home Energy Scotland.
- Donald needed an installer to work around his wife's needs. He found one through personal connections.
- Once installed he looked at the system with the installer and monitored its performance to get the most out of it.

### Outcome

Donald has a system that keeps his home comfortable for his wife and it's saving them money on their energy bills.

### Challenges overcome

Donald wasn't sure that the system would be as efficient as it promised. He found getting clued up on how his system worked and how he could keep it running optimally gave him the confidence that he was getting the most out of his new set up.

#### Trusted Sources

Home Energy Scotland advisor  
Heat Geek Website

Created by ClimateXChange & Changeworks.

## Heat Pump Early Installer: Unexpected Opportunists



We wanted a sustainable heating source because this is where we're settling down. There's a lot of potential to put solar or a battery in, too.

### About Marta

Marta recently moved into a converted steading with her partner and child. She always had a long term plan to make her home greener. But recently they found out their gas system was faulty and needed disconnecting immediately. Although not ideal timing, this was a good opportunity to move forward her green home plans. A heat pump was a good replacement option as they already had lots of insulation. At the time, Marta didn't have the time to get other works like radiators but she's planning to do so later.

#### Priorities

- Having a modern heating system
- Having an expert to guide her on the journey

#### Initial concerns

- Potential noise
- Install taking too long

### Installation Journey

- Marta didn't have time to research or have a home visit from Home Energy Scotland. So she relied on advice from family members who had heat pumps to guide her.
- She phoned around a lot of installers to find one who could work on such short notice. Luckily she found someone understanding of the situation who expediated things for her.
- Marta had to use different sources of funding to make sure she could bridge the gaps and pay installers on time.
- She was worried about a long and disruptive install but was surprised how quick and smoothly it went by instead.

### Outcome

Marta's heat pump was installed quickly so she wasn't left without heating. She's surprised how quiet it is, even right next to the nursery it doesn't bother her baby at all.

### Challenges overcome

Tight timelines made it challenging to find bank loans. She was fortunate enough to be able to rely on savings to bridge the gap until her Home Energy Scotland loan arrived. But if she were to do it again, she'd have planned ahead with other funding sources.

#### Trusted Sources

Home Energy Scotland advisor  
MCS accredited installers list  
Green Homes Network

Created by ClimateXChange & Changeworks.

## Heat Pump Early Installer: Clued Up Renovator



I wanted a heating system that would keep us warm without having to think about it.

### About Priya

Priya moved into a Victorian property in the city and the heating system needed a serious upgrade. She was getting work done anyway, so it was a good time to make the green choice of installing an air source heat pump to heat her home. Priya is confident doing a lot of research herself and shopping around for contractors. But she also appreciates a bit of expert know-how to make sure she's heading in the right direction with her choice of technology and the funding opportunities.

#### Priorities

- Staying warm in an older home
- Easy-to-use system once installed

#### Initial concerns

- Finding a contractor to work on an older home
- Not much technical support for her property

### Installation Journey

- After doing her own research Priya phoned Home Energy Scotland to check her plans and apply for her loan.
- She contacted installers but some did not want to work on an older home so she had to contact more.
- Priya hoped to install solid wall insulation but her rooms were too small for it. She installed underfloor heating instead.
- Using a loan meant she had to negotiate with the installer to make sure her loan and install date lined up.

### Outcome

Priya now has a modern heating system. Her home feels warmer and it isn't costing her any more than before.

### Challenges overcome

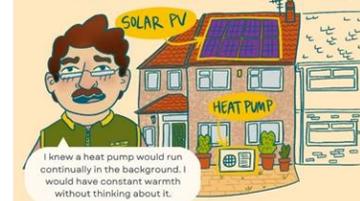
Some installers wouldn't work on an older property and a lot of online advice wasn't. It took Priya more time and research to find the right installer and relevant advice for her home, but she got there in the end.

#### Trusted Sources

Home Energy Scotland specialist advisor  
Contractor trade show  
Independent online research

Created by ClimateXChange & Changeworks.

## Heat Pump Early Installer: Settled and Hesitant



I knew a heat pump would run continually in the background. I would have constant warmth without thinking about it.

### About Rob

Rob lives in a semi-detached house in the suburbs with his wife and his two teenage daughters. Because of his job with a renewable technology company, he wanted to move to a greener heating system. He was unsure if a heat pump and solar panels were the right choices for his home in particular.

However, after speaking with Home Energy Scotland and other people who had installed the system, he was relieved to get the right system planned out and hear that it worked for others.

#### Priorities

- Making his home fossil fuel free
- A constant, comfortable temperature

#### Initial concerns

- Potential noise
- High costs

### Installation Journey

- Rob phoned Home Energy Scotland to get an expert to spec out a heat pump and solar panels.
- He used the Green Home Network to speak to someone who had installed a heat pump. Seeing the system work for their home put some of his fears to bed.
- Rob used the MCS certified installer list to find someone to get quotes from.
- Rob had to get some extra work done such as new radiators. This made the project quite large but it finished up quickly.

### Outcome

Rob's home isn't too hot or too cold - it's just right all the time. He notices it stays warmer for longer and, with the solar panels, they don't always need to buy electricity from the utility.

### Challenges overcome

Rob's biggest challenge was the unknowns; Would it be right? Be too noisy? How much would it cost? Speaking to others gave him the confidence to finally install and it worked out in the end.

#### Trusted Sources

Home Energy Scotland advisor  
MCS certified installer list  
Green Homes Network

Created by ClimateXChange & Changeworks.

# Heat Pump Early Installer: Clued Up Renovator



I wanted a heating system that would keep us warm without having to think about it.

## About Priya

Priya moved into a Victorian property in the city and the heating system needed a serious upgrade. She was getting work done anyway, so it was a good time to make the green choice of installing an air source heat pump to heat her home.

Priya is confident doing a lot of research herself and shopping around for contractors. But she also appreciates a bit of expert know-how to make sure she's heading in the right direction with her choice of technology and the funding opportunities.

### Priorities

-  Staying warm in an older home
-  Easy-to-use system once installed

### Initial concerns

-  Finding a contractor to work on an older home
-  Not much technical support for her property

## Installation Journey

After doing her own research Priya phoned Home Energy Scotland to check her plans and apply for their loan.

She contacted installers but some did not want to work on an older home so she had to contact more.

Priya hoped to install solid wall insulation but her rooms were too small for it. She installed underfloor heating instead.

Using a loan meant she had to negotiate with the installer to make sure her loan and install date lined up.

## Outcome

Priya now has a modern heating system. Her home feels warmer and it isn't costing her any more than before.

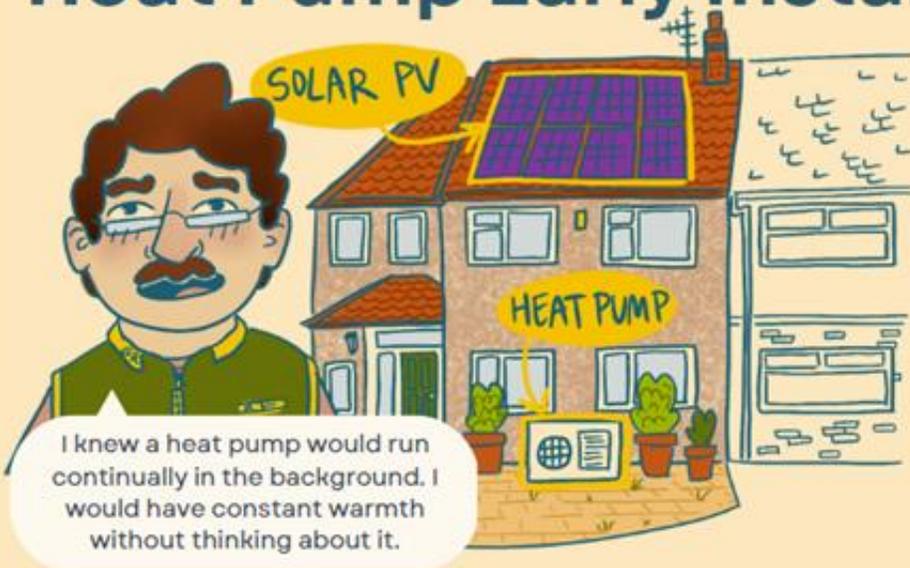
## Challenges overcome

Some installers wouldn't work on an older property and a lot of online advice wasn't. It took Priya more time and research to find the right installer and relevant advice for her home, but she got there in the end.

### Trusted Sources

Home Energy Scotland specialist advisor  
Contractor trade show  
Independent online research

# Heat Pump Early Installer: Settled and Hesitant



## About Rob

Rob lives in a semi-detached house in the suburbs with his wife and his two teenage daughters. Because of his job with a renewable technology company, he wanted to move to a greener heating system. He was unsure if a heat pump and solar panels were the right choices for his home in particular.

However, after speaking with Home Energy Scotland and other people who had installed the system, he was relieved to get the right system planned out and hear that it worked for others.

### Priorities



Making his home fossil fuel free



A constant, comfortable temperature

### Initial concerns



Potential noise



High costs

## Installation Journey

Rob phoned Home Energy Scotland to get an expert to spec out a heat pump and solar panels.

He used the Green Home Network to speak to someone who had installed a heat pump. Seeing the system work for their home put some of his fears to bed.

Rob used the MCS certified installer list to find someone to get quotes from.

Rob had to get some extra work done such as new radiators. This made the project quite large but it finished up quickly.

## Outcome

Rob's home isn't too hot or too cold - it's just right all the time. He notices it stays warmer for longer and, with the solar panels, they don't always need to buy electricity from the utility.

## Challenges overcome

Rob's biggest challenge was the unknowns; Would it be right? Be too noisy? How much would it cost? Speaking to others gave him the confidence to finally install and it worked out in the end.

### Trusted Sources

Home Energy Scotland advisor  
MCS certified installer list  
Green Homes Network

# Are you thinking about a heat pump?

## Did you know?

- Running costs will depend on how your heat pump is designed and operated. Savings on your energy bill will also depend on the system you are replacing and the levels of insulation and draught proofing in your home.
- You'll need some space outside for your heat pump, installers can often help identify the best location.
- Your existing radiators might be compatible with a heat pump. Depending on their size you might not have to opt for larger radiators, however it's often recommended to make sure you get the most out of your heat pump system.
- You might need to install a hot water tank if your property doesn't already have one.
- Loans and grant schemes can take time to arrive. It's best to plan ahead with any savings or other sources of funding to bridge any potential gaps until they arrive

## How does an air source heat pump work?

Put simply, an air source heat pump takes warmth from the air outdoors (even when it's cold outside), heats it up some more, and lets us use that heat indoors. The hot air from the heat pump is then used to heat up water. The water then passes through the pipes in your radiators. It can also heat a hot water tank to provide hot water for your kitchen and bathroom. Your heat pump will still comfortably heat your home even if it is -15 degrees outside.

## About semi-detached buildings

Air source heat pumps work better in homes that are less draughty. If you live in a semi-detached home you're already benefiting from sharing the attached wall with your neighbours. You may want to top up or install insulation in your loft or wall cavities, or install external or internal wall insulation. You should also ensure windows are double glazed, and draught proof to make your home more suitable for a heat pump. Installing solar PV would help supply the heat pump with electricity instead of buying from the grid.

## Next steps

Find information specific to this house type below:

- House Type - Check if a Heat Pump is Suitable for Your Home ([www.gov.uk/check-heat-pump](http://www.gov.uk/check-heat-pump))
- Guide to green renovation - Energy Saving Trust

To arrange a home visit or find out more about installing a heat pump, visit [Home Energy Scotland online](#) or call **0808 808 2282**

# Keep in touch

---



**Call** 0131 555 4010

**Visit** [changeworks.org.uk](http://changeworks.org.uk)

**Sign up** for updates and insights at  
[changeworks.org.uk/subscribe](http://changeworks.org.uk/subscribe)

**Changeworks ~ delivering positive low carbon living**

Follow us on

