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# Air Source Heat Pumps at Thirteen Group

**Case study**

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# Introduction

Thirteen Group is a housing association serving over 100,000 people across the North East, Yorkshire, and Humber. With more than 36,000 properties, they focus on providing safe, secure homes and support services, aiming to improve lives and foster inclusive communities.

Wes McGeeny has worked at Thirteen Group and its precursors for over 20 years, beginning as a Partnering Officer to deliver the Decent Homes Programme. He then progressed into the role of Renewables Manager at Thirteen Group and currently acts as a Net Zero Technical Manager for Thirteen Group.

For this case study, we interviewed Wes about his experience of delivering air source heat pumps (ASHP) across Thirteen Group's portfolio of housing. We also asked him to consider how he might approach delivering them at scale.

This publication aims to share insights, good practices, and lessons learned from relevant retrofit, sustainability and warm homes projects. It is intended for informational purposes only and does not constitute recommendations or endorsements of specific suppliers, products, or services within the sector.

## Can you give us an overview of your heat pump installation experience?

Thirteen Group has installed approximately 500 ASHPs across various sites, ranging from individual houses to groups of bungalows. The installations feature two main types of heat pumps: Mitsubishi and Daikin. These brands were chosen due to their favourable 20-year whole life cost, ensuring long-term efficiency and reliability for clients.

Wes' journey with heat pump installations began in 2009/10, and since then, he has accumulated extensive experience in deploying these systems in diverse settings. Whether it's a single-family home or a cluster of bungalows, Wes and his team have consistently delivered high-quality installations tailored to meet the specific needs of each site.

Wes' process for heat pump installations involves several key steps:

- **Site survey:** Conduct a site survey to determine the occupancy type and archetype, which will help identify any energy efficiency measures needed alongside a heat pump to optimise its efficiency. This might include top-up loft insulation or cavity wall insulation. The site survey also is also an ideal time to suggest optimal locations for the heat pump and water cylinder. Wes will also provide some guidance to the resident at this moment, explaining that

the system maintains a constant temperature, similar to a refrigerator, and should not be turned off.

- **Scheme planning:** When a scheme for 40 properties is received, identify the archetypes of the properties to understand the requirements of where the heat pump and cylinder may go. The rest is then handled by the MCS approved installer.
- **Planning permission:** Check with the local planning office to find out if planning permission is needed. If it is, engage with officers to ensure you comply with any local requirements. However, you might find that they are considered permitted development: recent advancements in technology, which have allowed improvements such as noise reduction, mean the units fall under the same legislation as air conditioning units. This means they may be permitted development.
- **Aesthetic integration:** Wes' advocates 'wrapping' ASHPs in order to disguise them. Because they can be unsightly, it can be useful to design wrapping and covers that help them fit in the local environment (figure 1).
- **Performance specification:** Use a performance specification rather than a normal specification. The installer designs the system using a tool that models radiator sizes. Increasing the ASHP temperature can reduce radiator size but may add approximately £14 per year to the customer's bill.
- **Property types:** Installations are primarily in domestic settings, including houses, bungalows, and maisonettes, which differ significantly from commercial installations.



Figure 1 shows heat pumps before and after 'wrapping' so they complement the building and local area aesthetically. Source: Thirteen Group

## How successful have the installations been?

Thirteen Group view the installations as having been very successful. As hybrid ASHPs, which utilise gas fuel alongside electricity, were installed in homes in 2016, the Group have data and customer experience findings that demonstrate this. Thirteen Group has worked with residents that are happy to talk to others about their experiences, fostering a positive community approach towards ASHP acceptance. The approach of working with residents to demonstrate the benefits and ease of using ASHPs when transitioning from a traditional boiler has helped many more people benefit from the new technology.

The hybrids were installed alongside monitoring equipment, which provided 7-years' worth of data between 2016 and 2023. The data highlights improvements in the seasonal coefficient performance (SCoP), which compares energy output to input. The data shows that a ratio of 3:1 (3 units of energy output to every 1 unit of energy input) was achieved. Additionally, these systems are five times more efficient in hot water production compared to gas boilers. Both Daikin and Mitsubishi heat pumps have performance measures on various sites, clearly demonstrating the efficiency and effectiveness of the installations.

## Have you noted any trends that boost the effectiveness of heat pumps?

Yes, several trends have been noted that boost the effectiveness of heat pumps:

1. **Thermostat configuration:** Using both a master and a simplified thermostat can enhance efficiency. The master thermostat resets every 24 hours, while the simplified thermostat allows residents to control the system as needed. This allowed both residents and the building owner a level of control.
2. **Constant hot water setting:** Keeping the hot water on constantly at 55°C, with a reheat setting that ensures it never drops below 44°C, helps maintain efficiency and consistent performance.
3. **Correct cylinder sizing:** Properly sizing the cylinder is crucial. For example, a 150-litre cylinder is suitable for a 2-bedroom house, while a 210-litre cylinder is ideal for a 3-bedroom house. This ensures the system operates efficiently based on the property's needs.
4. **Occupancy considerations:** Following the PAS 2035 occupancy report guidelines, it's important to retrain new residents on how to work with the

ASHP when occupancy changes. This ensures they use the system effectively. He mentions that residents must keep all their radiators switched on in order to prevent the system from working harder to maintain a level of heat in a home. If a radiator is switched off, the remaining radiators must work harder to heat the home to the same level, causing inefficiencies.

## What advice would you give someone hoping to fit heat pumps at scale?

From Wes' experience, for anyone looking to fit heat pumps at scale, here are some key pieces of advice:

1. **Engage with the Distribution Network Operator (DNO) early:** It's crucial to speak to your DNO early in the planning process. This ensures that any necessary upgrades to the electricity supply can be identified and scheduled in a timely manner, preventing potential delays. Early engagement helps in understanding the capacity of the local grid and planning for any infrastructure adjustments needed to support the increased electrical load from heat pumps.
2. **Consult with planning authorities early:** Early discussions with planning authorities are essential to navigate any regulatory requirements smoothly. This includes understanding and addressing specific rules. Early consultation helps in securing the necessary permissions and avoiding last-minute complications.
3. **Engage with residents at an early stage.** Speak to residents early and, if possible, link them to other people that have had heat pumps installed. Testimonials from others can be a powerful tool!

By following this advice, you can ensure a smoother, more efficient installation process, minimizing delays and maximizing the effectiveness of your heat pump systems.