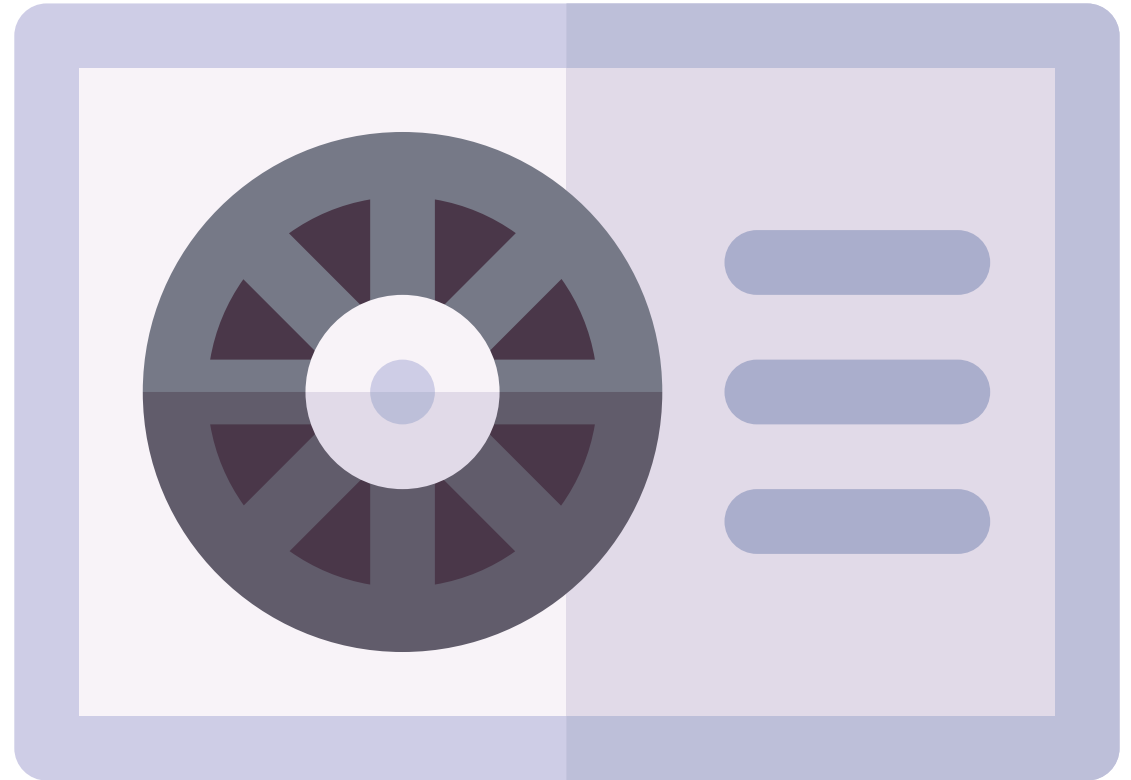


# Making heat pumps work for fuel-poor households

Common challenges and top tips for overcoming them



*Action for Warm Homes*

# Making heat pumps work for fuel-poor households

## Common challenges and top tips for overcoming them

*National Energy Action (NEA) is the national fuel poverty charity working across England, Wales, and Northern Ireland. Our singular vision is that everyone should be able to afford to keep their homes warm and safe.*

Over the past decade, NEA has undertaken several research, evaluation, and technical monitoring projects involving heat pump installations, often in collaboration with national and devolved governments, local authorities, housing associations, manufacturers and installers, and the energy industry. Through this work, we have learned about some of the unique challenges that fuel poor households experience when having a heat pump installed, and – much more importantly – the ways of meeting and addressing these challenges that tend to work well.

In the Heat and Buildings Strategy, published in October 2021, the UK Government restated its target of reaching 600,000 domestic heat pump installations per annum by 2028. A significant number of these installations will be undertaken in the homes of people living in fuel poverty. The UK Government is continuing the delivery of schemes that support the installation of heat pumps in fuel poor homes, especially the Green Homes Grant (Local Authority Delivery), the Social Housing Decarbonisation Fund (SHDF), the Home Upgrade Grant (HUG), and the Energy Company Obligation (ECO). As of May 2022, the new Boiler Upgrade Scheme (BUS), designed to support property owners to install heat pumps and other low carbon heating systems, is also open for grant applications and payments.

Through these schemes, thousands of fuel poor homes will have heat pumps installed in the coming years. “It is critical that these installations are managed and undertaken in a way that works for people and helps them to live affordably

in a warm and safe home. Done well, this will not only tackle fuel poverty, but contribute significantly to broader social, economic, and climate objectives. Done badly, we risk damaging the drive to net zero, compromising residents’ ability to heat their home at an affordable cost, and failing to maximise the benefits of the electrification of heat for fuel poor households.

This document is intended to be used as a guide by local authorities, housing associations, manufacturers and installers, and other organisations involved in the delivery of heat pumps in fuel poor homes. It identifies some of the main challenges that fuel poor households might experience during their heat pump installation journey, and puts forward the solutions that we have seen implemented successfully. We do not recommend sharing the guide with households themselves, but rather using it internally to be aware of some of the challenges they might face when you are working with them to prepare and undertake their installations.

The document is structured in three sections:

- Key things you need to know before installing a heat pump in a fuel poor home.
- Technical and financial aspects of the installation.
- Advice and support that fuel poor households require during their installation journey.

The document does not cover all of the challenges associated with heat pump installations, but rather identifies those that are most relevant to fuel poor households. The document is a continual work in progress, which NEA will seek to update at regular intervals as we undertake more research into the decarbonisation of domestic heat.

# Key things you need to know

## Technical and financial aspects of the installation

## The additional advice and support that fuel poor households need



Make sure the home is suitably insulated before you start, and that you can access funding for improving the energy efficiency of the home before installing a heat pump.

Ensure that you have provision to adequately support fuel poor households in understanding the use and operation of a heat pump system – this should happen before, during, and after the installation itself takes place.



Ensure that the installation and any associated works (e.g. rewires, consumer unit changes, or upgraded connections to the electricity network) do not require a financial contribution from the household to take place.

Include provision within your project to support households with further energy-related advice and support if they require it (e.g. income maximisation services, smart meter installation, tariff switching), either directly or through third-party partners (e.g. Age UK).



Include provision for 'making good' the home once the installation is completed (e.g. for plastering, flooring, or boxing in pipework on walls) – the household should not need to fix this after their installation.

If the home is connected to the gas grid, liaise with the household and the relevant GDN and supplier to ensure that, if the householder wishes it, they can have their gas meter removed and supply capped.



Ensure that you take appropriate steps to limit potential noise pollution from heat pump units (e.g. by ensuring a noise assessment is made under MCS-020 or installing anti-vibration mountings on the external unit).

Include the householder in the decision making process regarding unit, pipework, and radiator placement, balancing their needs and preferences with the technical requirements of the heat pump system where possible.



Ensure that installers are sufficiently experienced and qualified to install heat pump systems by requiring evidence of previous installations, stipulating that room by room heat loss calculations are carried out, and asking for evidence of additional accreditation beyond that mandated by the scheme you are delivering (e.g. Renewable Energy Consumer Code involvement).



Ensure that suitable monitoring platforms (e.g. phone applications) are available and that provision is included within the project to train households and project officers to periodically check outputs to identify any potential degradation of performance.

# Technical and financial aspects of the installation

Challenge	Solutions
<p>The insulation standard of some homes means that a heat pump system may not be suitably effective at keeping the home comfortably warm in winter or when it is cold outside, or may unnecessarily increase the costs of doing so beyond what is affordable for the household.</p>	<p>Ensure that you have access to ECO funding; HUG funding in England, NEST in Wales, Warmer Homes Scotland in Scotland; or the Affordable Warmth Scheme in Northern Ireland, or alternative internal funding sources, to install suitable insulation prior to the installation of the heat pump if it is required.</p> <p>Ensure that all doors and windows in the property are of a high insulation standard and that the interior is sufficiently draughtproofed to prevent heat escaping from living areas. Include provision in your project to fit these measures if they are not present in the property prior to the heat pump installation.</p> <p>More widely, ensure that a trained and qualified Retrofit Assessor and Retrofit Coordinator are commissioned to undertake a survey and condition report, and to make recommendations on the necessary measures required for each household you are working with, including the order in which measures should be installed. It is essential that the needs and perspectives/preferences of the household are considered at each stage of this process, especially if they are very vulnerable or may require additional support to manage significant changes to their home.</p>
<p>Fuel poor households typically cannot provide financial contributions to cover gaps in installation costs, meaning that planned installations sometimes cannot proceed.</p>	<p>Ensure that your project has access to suitable match or gap funding to cover the full cost of all planned works so that household financial contributions are not required in order for the works to go ahead (especially when ECO is used). This should include, where appropriate, insulation, glazing, draughtproofing, household electrical improvements, radiator and pipework upgrades, and any charges requested by the DNO for amp or connection upgrades.</p>
<p>Noise from a heat pump unit and system may disrupt sleep and, on very rare occasions, contribute to mental ill-health.</p>	<p>Specify in your delivery contracts with installers that heat pump units must not exceed a maximum DB level.</p> <p>Ensure that a noise assessment is made as part of the heat pump system design, following the procedure in MCS-020.</p> <p>Work with households (and, if appropriate, landlords) at survey and pre-installation to ensure that heat pump units are not placed directly outside bedroom windows. If you are installing an indoor heat pump model, likewise agree the location of the unit with the household so that it is not placed near noise-sensitive rooms (e.g. bedrooms).</p> <p>Include sufficient provision within your project for the installation of anti-vibration mountings on external units to avoid sound transmission through building structures.</p> <p>Provide suitable advice and assistance to households to set up timings for the hot water cycle so that it does not conflict with the heating or their sleeping hours. Also considering including provision within your project to soundproof internal water pumping unit cupboards if required.</p>

## Challenge

## Solutions

Where a heat pump system is installed with a monitoring platform, degrading performance is sometimes not identified due to a lack of logons or alerts that enables the household/third party to identify an issue is developing.

Ensure that suitable monitoring platforms (e.g. phone applications) are available and that provision is included within the project to support beneficiary households with training and access.

Include provision in your project for a trained, legitimate, and trustworthy officer (e.g. a project officer, tenant liaison officer, or installation partner) to periodically check outputs and readings from the monitoring platform to ensure degradation of performance is not occurring. Ideally, the monitoring platform should automatically alert the member of staff to any issues so that they can be rectified in a timely manner.

Ensure heat pumps are serviced annually, as all heating systems should be, and that the service includes a performance check.

The need to install new pipework, radiators, and other elements of household heating infrastructure may lead to remedial work being required to return the home to its former state (e.g. plastering, wallpaper, floorboards/flooring), or additional work to cover unsightly pipework runs (e.g. boxing in pipework on walls).

Include provision through internal gap funding to perform redecoration or reflooring, and to resolve any other remedial issues that may arise over the course of installation process.

Include provision in your project for a rigorous process of quality assurance and spot checks, including post-installation follow up with the household to ensure they are happy with the quality of the installation works and obtaining "signoff and acceptance" from the householder.

Include items relating to remedial disruption in subcontractor tenders/contracts, specifically asking subcontractors to set out their experience, training, and ethos regarding installation practices, and consider including this as a minor factor in your tender scoring processes (e.g. a small proportion of the overall score).

Some households may require internal electrical works e.g. a rewire, a consumer unit change, or the fitting of a mains isolator switch, before a heat pump installation can safely take place, a cost which cannot be met by fuel poor households.

Include provision through internal gap funding to pay for a small number of rewires in beneficiary households when required.

Develop partnerships and relationships with Home Improvement Agencies who have provision to fund and undertake rewires, whether wholly or partly.

## Challenge

Subcontractors may not be sufficiently experienced with heat pump technology and survey (e.g. heat loss calculation methodologies) to optimally size and install system, sometimes leading to sub-optimal heat pump performance in extremely cold temperatures, mis-sizing of radiators, and/or the installation of controls and products that are not compatible with the chosen heat pump unit.

## Solutions

Ask for evidence of previous satisfactory installations, especially in fuel poor households, and based on customer satisfaction as well as quality assurance, accreditation, and spot checks.

Ensure that correct specifications of radiator size/type (e.g. larger double-fin radiators) are written into subcontractor contracts and that unsuitable radiators are not installed as alternatives if the subcontractor cannot easily source those that are specified.

Ask for evidence of additional accreditation beyond that stipulated by the scheme you are delivering (e.g. Renewable Energy Consumer Code involvement) in addition to MCS/Trustmark certification and adherence to PAS 2030/2035 processes.

Ensure that a room by room heat loss calculation is carried out, following a suitable methodology.

Ensure that the control regime follows the chosen heat pump manufacturer's guidelines. In addition, if you consider that 3rd party controls are necessary to meet the heating needs, requirements, and preferences of the householder, ensure that this does not compromise thermal comfort, efficiency or the lifespan of the heat pump unit itself.

Some households may require an upgraded connection (e.g. from one phase to three phase) or to the electricity network or upgraded supply (e.g. to 100A) before a heat pump can be installed, the cost of which is sometimes high and unable to be met by the household.

Consider developing a relationship with the relevant DNO and including them within project design and delivery, especially so that any upgrades can be undertaken in such a way that household contributions are not required (especially when three phase connections are necessary).

# The additional advice and support that fuel-poor households need

Challenge	Solutions
<p>The nature and operation of low-temperature heat pump systems may be at odds with the way that fuel poor households are used to heating their homes (e.g. in short bursts with gas boilers or secondary heating appliances), and can result in e.g. heat pump systems being switched off or not used optimally by the household. This can ultimately increase fuel costs and decrease the thermal comfort of the home.</p>	<p>In promotional activities for heat pump projects (e.g. marketing materials, community meetings, heat pump demonstrations), ensure that you provide fair, factual, and balanced information about how heat pumps work, their running costs, and how they may (or may not) converge with pre-existing lifestyles and heating regimes.</p> <p>Prior to a formally recruiting a household into your project, take time to work with them to ensure that a heat pump system will not conflict with their pre-existing lifestyle and heating regime to result in higher heating costs. This will require detailed, tailored, and repeated explanations and demonstrations regarding the operation of heat pump systems and associated costs, especially compared to heating systems that they are used to.</p> <p>If a household is insistent that they cannot change their heating practices to accommodate a low-temperature heat pump, a less efficient high temperature system may need to be considered and installed to meet their subjective needs and requirements.</p>
<p>Heat pump installations may not lift all households out of fuel poverty due to low household incomes.</p>	<p>Include provision within your project to support beneficiary households with income maximisation, supplier switching (when appropriate), Warm Home Discount applications, and similar financial gains. This could be through partnerships and referral relationships with third parties (e.g. Age UK, Income Max), dedicated housing association support, or existing provision within a local authority (e.g. through a single point of contact health and housing service).</p> <p>Provide advice and assistance for beneficiary households to get a smart meter and In Home Display (IHD), including a linked app if appropriate, so that householders can have clear visibility of electricity and cost for budgeting. Ensure that missing IHDs are replaced with an alternative device from the supplier or (if necessary) through provision of a third party monitor.</p>
<p>Households might not receive suitable advice and instruction, pre-, during and post-installation on how to use and operate their heat pump in the optimal way.</p>	<p>Consider training and upskilling relevant project officers to enable them to provide appropriate, accurate, and tailored ongoing advice to households regarding use and operation of new heating systems, especially in the homes of particularly vulnerable people or those who may be digitally excluded. Trained officers should be the first point of contact for any households experiencing issues with their heat pump.</p> <p>Include provision for a project officer or tenant liaison officer to attend survey to provide pre-installation advice and answer any queries the household might have, in tandem with the contractor/engineer. Include provision for a project officer or tenant liaison officer to attend on the day of installation or immediately afterwards to provide advice and instruction on use of new heating system, and to provide an information leaflet with appropriate contact information (e.g. a telephone number) for future queries.</p> <p>In social rented properties, ensure that new tenants are provided with immediate advice and instruction regarding how to use and operate a heat pump system. This is particularly important for tenants who are especially vulnerable to the cold due to ill-health and/or do not know what a heat pump system is or how it works.</p>

## Challenge

## Solutions

Households may struggle to access adequate support post-installation if they have questions or require further support to use their system optimally (e.g. if they accidentally alter the settings and do not know how to reset them).

Include provision for regular follow-ups post-installation (e.g. 1 week, 4 weeks, 12 weeks) to ensure the household is using the heating system optimally and to give the household an opportunity to ask any questions they may have.

Ensure that provision is included within the project for ongoing support during the first winter heating season. At least one follow-up visit post-installation should be undertaken at the beginning of the first heating season to ensure the heat pump is working correctly immediately before the coldest time of the year.

For a site-specific or area-based project (e.g. in flats or tenements), consider identifying and training a 'resident champion' who knows how to use their system well, so they can explain to other residents and provide ad-hoc assistance to them if it is required. This is especially important in situations where residents may not fully trust outside experts, but are more likely to accept the help of another resident who is making the system work well.

Households in debt to their energy supplier may be restricted from switching, and may therefore be prevented from accessing the most suitable tariffs, such as ToU tariffs, for their heat pump, and/or from switching away from Economy 7 tariffs where storage and immersion heaters have been replaced.

Include suitable queries, questions, and prompts within eligibility triage processes and scripts, as well as during additional contact points project officers or tenant liaison officers have with the household throughout the installation process, to ascertain whether the household may be in debt to their energy supplier.

Include provision for supporting households in fuel debt through partnerships and referral relationships with third parties (e.g. Age UK, Income Max), dedicated housing association support, or existing provision within a local authority (e.g. through a single point of contact health and housing service).

Develop internal funding sources for debt clearance, or potential access to debt write-off (e.g. through supplier trust funds, WHD Industry Initiatives) via partnerships and referral relationships with third parties (e.g. Age UK, Income Max), dedicated housing association support, or existing provision within a local authority (e.g. through a single point of contact health and housing service).

Include provision within your project to support households with complex issues that may arise relating to metering (e.g. radio tele switch removal), especially in situations where suppliers, landlords, and DNOs are not engaged.

If fuel poor households are connected to the gas grid and the installation of a heat pump replaces or makes unnecessary any remaining gas appliances in their home, they can sometimes be asked to pay significant fees to have their gas supply capped and their gas meter removed. This can result in households continuing to pay a standing charge for a gas supply they cannot use.

Support the household to assess their cooking and other gas use, as well as the financial implications of replacing gas cooking and secondary heating appliances with electrical alternatives. If necessary, consider funding replacements for gas cookers and/or secondary heating appliances (e.g. gas fires), which can be facilitated through a scrappage scheme.

Include provision within your project for project officers and tenant liaison officers to liaise with the relevant GDN and energy supplier on behalf of the household to ensure that the relevant fixes can be undertaken at no cost to the household. If a solution cannot be found in this way, the household may require support to switch their energy tariff to one of the (many) suppliers who will remove a gas meter for free.



## Challenge

Surveyors may not include the household in decision making processes concerning the placement of radiators, pipework runs, hot water tanks, and other internal infrastructure, sometimes resulting in (e.g.) some rooms having over- or under-sized radiators or unsightly pipework in conspicuous places relative to the needs and preferences of the household.

## Solutions

Specify in subcontractor guidance/communications that you expect householder perspectives/preferences on (e.g.) radiator placement to be incorporated into survey processes where possible.

If working with a household in the private rented sector, ensure that perspectives/preferences of both landlord and tenant are taken into consideration during survey processes.

Ask for evidence of subcontractor experience working on fuel poverty schemes, including evidence of customer satisfaction and good practice, and include adequate provision of this within subcontractor tenders.

Ensure that a relevant project officer has contact with the household (and, if applicable, landlord) before the installation but after the survey has taken place to ensure they are happy with the installation specification and plan.



*Action for Warm Homes*

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