

# Evaluation of HES Homecare pilot

Dr. Faye Wade, Prof. Janette Webb, David McCrone  
Heat and the City team, University of Edinburgh

James Wakelin  
Energy Saving Trust

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## Executive Summary

This report presents an evaluation of the HES Homecare pilot, which aimed to test the Energycarer approach to tackling rural fuel poverty in two rural areas: Anandale & Eskdale (South West Scotland) and Moray East (North East Scotland). The Energycarer approach seeks to provide support in accessing energy retrofitting opportunities and funding for vulnerable rural fuel poor households who may require multiple points of contact and face-to-face visits, rather than single phone calls offered through traditional services. This evaluation has been conducted by the University of Edinburgh; an additional Live Learning document which includes lessons on the delivery of the pilot has been completed by the HES Homecare team.

The HES Homecare pilot has been evaluated through a social survey and internal temperature monitoring with households receiving the service and a control group receiving a standard HES Community Liaison Officer service. The evaluation also included interviews with the HES Homecare team, a series of case studies and a live learning document compiled by the HES Homecare team. The social survey and internal temperature monitoring did not reach the number of participants required for statistical analysis, which means that the findings from this aspect of the evaluation do not form a robust basis for policy development. However, the pilot indicates that a more systematic strategy, including support for public health and social care services operating in liaison with neighbourhood and community organisations is needed. The findings contribute to a series of lessons learned for tackling rural fuel poverty in the future:

Lessons for delivering a service to tackle rural fuel poverty:

- Longer timeframes are required to establish the organisational structure and relationships with partner organisations in schemes of this type.
- An area-based approach to identifying vulnerable people and subsequent upgrade of buildings and heating is likely to be required. Use and resource local community organisations and networks to identify vulnerable people. Individual Energycarers juggling this work alongside delivering the service may have had an impact on its overall reach.
- A single finance mechanism which incorporates a range of physical measures (including heating, insulation and glazing) alongside remedial works (to tackle damp, condensation and mould) is required.
- The individual case approach applied through HES Homecare is resource intensive; work needs to be done in order to develop a stronger area-based approach and utilise existing local networks and services more efficiently for the coordination of an area-based strategy.

Lessons for future evaluation of pilot schemes:

- Social evaluation tools need to be developed further. For the vulnerable group in this pilot, this includes a more straightforward and shorter survey, along with trained interviewers to support with data collection.
- Opportunities should be explored for internal temperature monitoring equipment that does not require repeated visits to collect information, particularly when working with vulnerable groups. Smart metering might support with this type of monitoring in the future.

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## 1. The purpose of this report

A 2016 report of the Scottish Rural Fuel Poverty Task Force (SRFPTF)<sup>1</sup> recommended that an additional form of support should be provided to help those living in rural areas out of fuel poverty. The suggestion was that this should be based on intensive, client-centred and in-home support and tailored measures. This report evaluates a pilot designed to explore how this approach might be delivered through the Home Energy Scotland (HES) network.

Section 2 provides further details on the HES Homecare pilot, Section 3 details the methods that have been used to evaluate the pilot and Section 4 presents the results. Section 5 concludes the report and offers a series of recommendations for taking forward a scheme of this type.

## 2. The HES Homecare pilot

The aim of the pilot was to **test the Energycarer approach to tackling rural fuel poverty.**

The pilot was originally due to run for one year and deliver the HES Homecare service in two rural areas: Annandale and Eskdale, Dumfries and Galloway (South West Scotland); and Moray East (North East Scotland). The selection of these delivery areas was based on their rural population and high incidence of fuel poverty, along with effective links to local networks, and the presence of local Care and Repair teams. A small number of households with a health need located in other areas received support at the request of Scottish Government. The service was originally due to run for one year from March 2017 to March 2018, and reach 220 households. The pilot was extended to the 30<sup>th</sup> June 2018, and again to the 31<sup>st</sup> March 2019. By November 2018 approximately 150 households had been engaged through the service – see Table 1 for the pilot and referral timeline. The pilot is being delivered by Home Energy Scotland. All of the organisations involved in the delivery of the HES Homecare pilot are detailed in Appendix 1. The label ‘HES Homecare’ was chosen for the pilot in order to build on the HES network’s well-known identity and brand values of impartiality and trust<sup>2</sup>.

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<sup>1</sup> Delivering affordable warmth in rural Scotland: action plan. 24<sup>th</sup> October 2016. Available at: <https://www.gov.scot/publications/action-plan-deliver-affordable-warmth-rural-scotland-proposed-scottish-rural/>

<sup>2</sup> Taken from initial application documents for the HES Homecare trial.

Date	Pilot activity	Households visited	Measures installed using HES Homecare intervention fund
March 2017	Pilot commenced		
June 2017	First clients visited; primarily identified by HES from previous contacts		
September 2017	Commissioning of heating and insulation works commenced		
March 2018	Original pilot end date	117 households received one or more visits	18 jobs completed or cancelled; 12 further jobs committed but not completed.
October 2018			3 jobs referred in 2017 still to be completed
March 2019	Revised project end date		

*Table 1: Timeline of pilot activity, households visited and measures installed.*

The HES Homecare service is delivered by a team of three: one central coordinator, and two Energycarer staff roles within the HES teams that cover the selected areas. The Energycarer roles were filled by existing HES staff who were conducting outreach work, for example as Home Renewables Advisors or Community Liaison Officers (CLOs). The CLO service is an existing scheme run by HES, which supports people in fuel poverty. The CLO service usually comprises an initial phone call followed by a home visit. During the home visit the householder's needs are assessed, advice is provided, and referrals are made to relevant organisations for financial or retrofitting support. For the HES Homecare pilot, the two Energycarer staff members acted as case workers providing individually tailored solutions to clients with the aim of delivering affordable warmth. The Energycarer service was informed by an existing project in Highlands and Islands, and the Energycarers working on the HES Homecare pilot were trained through shadowing those involved in an existing project. The Energycarer approach is targeted at acutely vulnerable householders who are likely to require more than one face-to-face visit in order to pursue additional funds or energy saving improvements.

Recipients of the service were identified through the HES team making internal referrals to the Energycarer specialists from within their network of customers, alongside the promotion of the new service among local partners including the NHS, social services, local housing networks, and advice providers. The HES portal was used and a postage-paid referral card was developed to allow referrals to be made and passed to HES Homecare for support. Training was provided for potential referrers (including HES and NHS staff) to support the Energycarers in identifying those who may be at risk of fuel poverty.

When a householder is identified for HES Homecare support they will be contacted by a member of the HES Homecare team, and an initial visit will be arranged. Typically, clients received three or four visits from the Energycarers, but the highest number of recorded visits at the time of this report was 12. The HES Homecare team clarified that during the initial visit the Energycarers “*assess [client's] needs, their home, looks for insulation measures or heating improvements that could be installed, assesses the*

householder's ability to pay for measures...see whether they qualify for Warmer Homes Scotland"<sup>3</sup>. If eligible for Warmer Homes Scotland then the HES Homecare client will get referred for support. If they don't qualify or already receive support through Warmer Homes Scotland, or appropriate improvements aren't available through this scheme, then for physical works, they will be referred to Warmworks, Care and Repair Moray, or Care and Repair Dumfries and Galloway depending on which is most appropriate. These organisations are contracted through the HES Homecare Intervention Fund budget, which was initially set at approximately £140,000. Following review in November 2017, the Intervention Fund budget was reduced to £105,000; by January 2018 this revised budget had been surpassed – demonstrating challenges with predicting and allocating spend for projects of this nature. The amount of intervention funding used for the pilot is detailed in Table 2. ***An Advisory Group End Year 1 review of guidelines for this Intervention Fund allocation concluded that:***

- ***The guidelines work well.***
- ***A small enabling fund of up to £500, combined with hand-holding, can make the difference between a Warmer Homes Scotland customer cancelling and installing heating.***
- ***A small repair grant of £500 - £2000, combined with hand-holding, can put right a leak or fault that has huge impact.***
- ***£5,500 pays for central heating or insulation.***
- ***£10,000 was exceeded only where solid wall insulation or extensive repairs were required. £10,000 could be exceeded by a combination of heating and repairs.***<sup>4</sup>

Installer/ managing agent	Average cost	Number of homes
Warmworks – excluding any Warmer Homes Scotland enabling works	£5,458	16 homes 3 homes > £10k
Warmworks – Warmer Homes Scotland enabling works	£480	6 homes, plus one at £2k
Care and Repair Moray	£1,733	8 homes
Care and Repair Dumfries and Galloway	£823	9 homes

***Table 2: The amount of Intervention fund used; figures correct at May 2018. Table replicated from HES Homecare Live Learning document***

Details of Warmer Homes Scotland, Warmworks and Care and Repair are all provided in Appendix 1. The support provided through HES Homecare is on-going and can result in a long duration of client engagement. At interview, a member of the HES Homecare team noted that they've "got householders who became a HES Homecare client in August, September 2017, whose cases are just about wrapping up now in October, November, 2018". Energycarer's time would also be spent travelling between clients, and managing casework and installations.

<sup>3</sup> Italicised quotes are taken from interviews with HES Homecare team – discussed in Section 3.3.

<sup>4</sup> ***Bold italic*** text indicates that the material has been sourced from the Live Learning document prepared by the HES Homecare team.

### **3. Methods for evaluating the HES Homecare pilot**

To evaluate the pilot outcomes against the aims laid out above, this report draws on evaluation materials collected throughout the HES Homecare pilot. Evaluation activities included: technical monitoring to assess changes in internal temperature before and after the service and a social survey with service recipients to monitor shifts in comfort and behaviours in the home. Both the technical monitoring and social survey were carried out in homes receiving the HES Homecare and the standard CLO service, for comparative purposes. In-depth interviews with those involved in delivering the HES Homecare service, a series of case studies, and a live learning document compiled by the HES Homecare team have also contributed to the evaluation.

The initial ambitions for the evaluation of the pilot were to include a statistically representative sample of residents receiving the Homecare service, and collect data from a matched control group of residents receiving the standard CLO service. Based on initially forecast numbers, it was anticipated that 69 households<sup>5</sup> would be selected from an anticipated 220 households receiving the service. These households would take part in a social survey and have Tinytag monitors installed in order to measure internal temperature both before and after any interventions took place (this included advice and/ or the installation of physical measures). However, the timing of the pilot limited the pool of householders from which evaluation participants could be drawn. Only those that had come into contact with the pilot service by October 2017 were to be included in the evaluation, to allow a sufficient monitoring period before the original end-date of the trial; 45 households had been engaged by October 2017. The control group would be identified from vulnerable rural households across Scotland (excluding the areas included in the trial) receiving the CLO service, whilst the intervention sample would be selected from within those areas receiving the HES Homecare service. The realities of delivering the pilot meant that these numbers were not reached for inclusion in the evaluation. Details of the samples achieved for each different activity are provided in turn below, along with information about the way that this data has been used for the evaluation.

#### **3.1. Technical monitoring**

Tinytag monitors were installed by the Energycarers in 14 of the domestic properties; 11 of these received the HES Homecare service, 3 were CLO clients. These monitored internal temperatures and sought to gather information on where the HES Homecare service had an impact on internal temperature. The number of properties monitored is much smaller than the 69 anticipated; through interviews (discussed in Section 3.3) the HES Homecare team highlighted that some participants did not feel comfortable having the tags installed, and the rural nature of the pilot meant that it could be time consuming to install and collect the Tinytags. The recruitment process and required monitoring period limited the number of participants eligible to take part in this aspect of the evaluation. Case Study 6 highlights that changing circumstances through the course of a pilot of this type can also make it difficult to retrieve data gathering equipment of this type.

The properties monitored for the evaluation had a series of intervention points throughout the

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<sup>5</sup> This information was provided by the HES Homecare team at interview.

monitoring period; 30 instances of advice were given across the 14 properties which mostly took place before any measures were installed. The types of physical measures installed across the 14 properties is detailed in Table 3.

<b>Installed Measures</b>	<b>No. of Measures</b>
Boiler Replacement	5
Energy Efficient Glazing/Doors	4
Electric Heating Upgrade	2
Draught Proofing	2
Hot Water Cylinder	2
Loft Insulation	1
Electric Shower	1
Extractor Fan*	1
Repairs*	2
Smoke/CO Alarms*	2
<b>Total</b>	<b>22</b>

*Table 3: Measures installed across the 11 Homecare and 3 CLO properties with Tinytag monitoring (\* = non-heat related measures)*

The provision of advice in conjunction with physical measures makes it difficult to determine whether any impact seen in the analysis would be from the physical measure or behaviour change following advice given; however, the social surveys detailed below can contribute to understanding of this. Of the 14 properties monitored, 11 were from the Homecare project and the remaining 3 were part of the Community Liaison Officer (CLO) programme.

Only three datasets have been considered for analysis; these were all part of the Homecare trial. The remaining data was invalid because there was either too little pre-installation data, or no heat measures (e.g. boilers, insulation or draught proofing) were installed in the properties monitored (see Table 4). Only temperature sensors were installed, so only internal temperature analysis could be undertaken. Without a full set of heating season data before and after the physical measure is installed it is not possible to accurately assess the impact of an intervention.

<b>Analysis Status</b>	<b>No. of Properties</b>
Analysis Completed	3
Not Analysed (No Pre-installation Data)	7
Not Analysed (No Heat Measure Installed)	2
Not Analysed (Not Enough Data)	1
Not Analysed (No Installation Dates)	1
<b>Total</b>	<b>14</b>

*Table 4: Analysis status for the 14 properties monitored using Tinytags.*



### 3.2. Social surveys

The social survey was developed by the University of Edinburgh's evaluation team. Many of the questions in the survey instrument have been developed in other research locales, including: the Wyndford estate in Glasgow<sup>6</sup>, and in diverse local authorities across Scotland<sup>7</sup>. The survey was adapted to include energy advice for this pilot evaluation in collaboration with those delivering the HES Homecare service. There are two versions of the survey, the first is intended to be completed before they receive the service or intervention (Time 1) and the second is to be completed after (Time 2). The surveys were designed to be completed by householders with the support of an interviewer – in this case the Energycarers.

Social surveys were completed with 17 households ahead of receiving the HES Homecare service (Time 1); 13 of this group also completed surveys after any intervention (Time 2). Fewer surveys than anticipated were returned for the evaluation. During interviews with the HES Homecare team, it was clarified that only participants deemed to be most willing or able to complete the surveys were asked to take part. The HES Homecare team discussed how some of the vulnerable people in the HES Homecare trial struggled to complete the survey:

*“one was, ‘On a sliding scale of one to five, how do you feel about this?’ and people would kind of sit there and think about it and be like, ‘I’m not really sure.’ And also, like, they would then go off on a tangent and start speaking about something. So the surveys that were only designed to take half an hour ended up taking at least an hour”*

Case Study 3 further highlights the vulnerability of some of the HES Homecare clients and the distressing effect that something like a survey might have on them. This means that the survey sample is unlikely to be representative of all of those that have received the HES Homecare service. Indeed, when analysing the surveys, it was noted that some of the responses were very positive (compared to typical responses observed in surveys of this type), this may be explained by which individuals took part in the exercise, the risk of interviewers' interpreting the meaning of an uncertain response to a survey question, and participants reflecting positive experiences of the pilot.

Further, the above quote highlights that the surveys could take longer than originally anticipated to complete. During interviews with the HES Homecare team, it was suggested that these took between 1 hour and 1.5 hours. A related challenge for the HES Homecare team was that some of the questions in the survey would be asked anyway through the HES interactions, this could be beneficial, but also problematic:

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<sup>6</sup> See: McCrone, D., Hawkey, D., Tingey, M., & Webb, J. (2014). Findings from a Survey of Wyndford Households and Experiences of New District Heating. Edinburgh: University of Edinburgh. Retrieved from <https://heatandthecity.org.uk/resources/>

<sup>7</sup> See: Bush, R., Webb, J., Wakelin, J. Flynn, F., 2017. Interim report: Scotland's Energy Efficiency Programme pilot evaluation. Available at: <https://www2.gov.scot/Resource/0051/00518361.pdf>

Bush, R., McCrone, D., Webb, J., Wakeline, J., Usmani, L., Sagar, D., 2018. Energy Efficient Scotland – Phase 1 pilots evaluation final report. Available at: <https://heatandthecity.org.uk/wp-content/uploads/2018/11/EES-Pilot-Evaluation-Phase-1-Final-Report1.pdf>

*“...there’s two ways of looking at that. One is that we were asking those questions anyway so it wasn’t too much of an extra ask. And the other was, “Well we’re already asking those questions and now you want us to ask them again in a slightly different context.” So that’s challenging. We tried to square the two”*

The Homecare team commented on successive iterations of the draft survey and could restructure questions to suit the sample of people likely to be involved, although this was limited by the requirement for consistency with projects beyond this pilot that the survey was being used for. The questions were mostly adapted from similar surveys and had therefore been pre-tested with low income, elderly and vulnerable households.

		North-east	South-west	Highlands	Orkney	Total
INTERVENTION: Homecare	Time 1	7	10	0	0	17
	Time 2	7	7	0	0	14
CONTROL: Standard CLO	Time 1	1	0	5	1	7
	Time 2	0	0	3	1	4

*Table 5: Time 1 and Time 2 social surveys according to intervention and control groups and region.*

Seven households in receipt of the standard CLO service took part in Time 1 surveys, and 4 of these went on to complete Time 2 surveys (see Table 5). One of these 5 completed Time 2 survey as a HES Homecare client because they were initially offered CLO support and subsequently supported through HES Homecare after the pilot area was extended. In both the Homecare and CLO groups, there is a reduction in the number of participants between Time 1 and Time 2 due to natural attrition in a service of this nature, for example, people dropping out, being unable to continue with the programme for health reasons, and becoming uncontactable. The intervention samples were in the regions where the HES Homecare pilot was being trialled and the control group included participants in the Highlands and Orkney (see Table 5). The different groups surveys have some quite different characteristics in terms of age, tenure, household, and property type (see Appendix 2). It is recognised that these characteristics are determined by the individuals in receipt of the HES Homecare and Standard CLO services, but the differences in the sample make it difficult to draw direct comparisons between the intervention and control groups. This means that the objective of a matched sample of treatment and control households was not achieved, so it is not possible to conduct a systematic evaluation of the survey data. Instead the data presented in Section 4.3 are necessarily impressionistic and tentative.

### **3.3. In-depth interviews**

Semi-structured interviews were conducted with those involved in the HES Homecare pilot. This included the HES Homecare coordinator and the two Energycarers delivering the service in South West and North East Scotland. The interviews were conducted in person or over the phone, and were between 45 minutes and 2 hours in length. The interviews discussed the processes of delivering the HES Homecare service and the successes and challenges of working on this pilot; a full interview schedule is included in Appendix 3. The interviews were audio recorded and transcribed verbatim.

### 3.4. Case studies & live learning document

The HES Homecare team compiled a series of case studies to capture specific details of the customer journeys that people went on through the service. These provide additional detail on the health and domestic circumstances of those targeted through the HES Homecare service, the types of recommendation that were made by the Energycarers, and the subsequent interventions that people received. A selection of case studies have been used in this evaluation to supplement the temperature monitoring, social survey, and interview data and build a fuller picture of the service. The individual case studies referred to in this report are included in Appendix 4. A live learning document was also maintained by the HES Homecare team, this sought to capture lessons from their experience of the pilot and was shared with the evaluation team for use in this report.

In the next section, data collected through each of these evaluation activities is treated together to explore the delivery and impacts of the HES Homecare pilot. The results are presented in relation to: delivering the service; changes to internal temperature; changes to comfort in the home; and wider impacts of the service

## 4. Results

### 4.1. Delivering the service

#### *Establishing partnerships*

A critical part of the Energycarers' role was to establish partnerships with community and healthcare organisations in the region, with a view to those organisations then being able to identify and refer people to the HES Homecare service. These organisations included NHS, social services, and local housing associations. The relationship between the Health & Social Care providers in Moray took time to develop; the HES Homecare team reported that this delayed referrals. Well connected individuals can be important for establishing and maintaining partnerships:

*“Early on in the process we met somebody fantastic in Dumfries and Galloway who is very well integrated with lots of different organisations in the health and social care sphere was able to facilitate access for us to communication channels for them.... She was able to put HES Homecare information on the front page of their internal staff intranet.... She was able to offer slots in newsletters. And – this is quite crucial – she was able to offer us a speaking slot at a health and social care locality celebration in the first few months of the project, and then again towards the end of the first year”*

By including the HES Homecare pilot on the front page of the NHS internal staff intranet, in newsletters, and at events, this individual helped to provide a constant reminder of the service, which resulted in a good number of referrals.

*The following elements were found to be most useful for communications:*

- o Elevator pitch – to explain what the project offers briefly.*
- o Image/s for use in advertorial, referral tools, presentations.*
- o Project summary newsletter content and image.*
- o Direct mail letter from third party endorsing the project (e.g. Council, Care and Repair).*
- o Email from third party endorsing the project (e.g. Council, Care and Repair).*
- o Text addressed to potential referrers.*
- o Text addressed to potential service users.*
- o Text addressed to relatives/carers of potential service users.*
- o Map of area/s covered, showing towns and villages included.*
- o Postcode list.*
- o Poster for display in GP practices, community venues, advice agencies.*

Despite this, the majority of referrals received still came through Home Energy Scotland's existing database of clients, for example, those who had previously contacted the service, but not been eligible for or able to pursue support at that time. At interview, the HES Homecare team noted that the limited timeframe of the pilot that was then extended may have led to dwindling numbers of referrals later in the pilot delivery:

*“we were still telling them in March 2018 that it's running until March 2018. So I'm not sure whether we ran out of momentum because of, having said that, whether there might be people thinking, 'Oh, that scheme doesn't exist anymore.' I'm not sure that we've been able to get back to all of them to let them know, 'we're still here, you can still make referrals.'”*

Thus, it could be difficult to maintain partnerships with the variety of organisations that could potentially help in making referrals. At interview, the HES Homecare team reported that it could be challenging to maintain these partnerships whilst also managing customer journeys. In particular, initial contact with partners could yield a high number of referrals, but these would dwindle over time. The HES Homecare team reminded partners about the service, but regular, repeated contact was difficult to maintain and this could be time-consuming work:

*“the challenging part of trying to keep up with all your different partners with all the different casework going on while then trying to go and speak to the partners again for a second time.... there's only been a few different people that there's been a continuous stream of speaking to them”*

The interviews highlighted that it was helpful for the Energycarers to be maintaining partnerships because they could provide case study details to demonstrate the value of the service. However, it could also be difficult for Energycarers to juggle these different responsibilities.

### ***Everyday work of delivery***

The HES Homecare scheme was intended to take a 'person-centred' approach, with each case receiving a specific focus. This process was summarised by a member of the HES Homecare team at interview:

*“Normally when offered the home visit they would then accept that and say, “OK, come down and see me then.” I would then on the first visit speak to them about their concerns and what their feelings about the house [are], you know, because... I mean, I’m fairly qualified to walk into a house and see that there’s a boiler on the wall... But these people actually live there and have probably lived there for a decade or so. So to actually have a conversation with them about the house is always useful. And then they tell you what they would see as the problems and then you can try and see what they see as the problems, maybe something you’d noted as being something that you could help out with and then you can put them on a journey that resolves both their problems and maybe something they’ve observed as well.”*

Thus, technical knowledge sat alongside social understandings in the delivery of HES Homecare’s ‘person-centred approach’. This could mean that client interactions could be time intense. For example, Case Study 3 details that 10 visits were made to the household. Case Study 5 provides an indication of the challenges of navigating different routes to support for clients, particularly where only partial funding is made available for the remedial works required for the property. This meant that the Energycarer role needed to be filled by individuals with some technical expertise in terms of retrofitting and energy consumption, and a personable approach to understanding individual’s experiences. Factoring in the time spent with different clients, the Energy Saving Trust have estimated that each Energycarer could manage approximately 50 cases per year using this model, depending on the needs of clients.

## 4.2. Changes to internal temperature

Tinytag data from the three properties that were analysed did not show any significant difference in internal temperature over the period studied. Table 6 shows the results from the internal temperature analysis; it is important to note that that sample sizes that were compared are very small due to the limited amount of data available, therefore any impact derived from these results should be used with caution, as the data does not capture the full breadth of heating behaviour from the occupants nor the annual seasonal changes in temperature and therefore heating demand. Property A had a new gas boiler installed, Property B had draught proofing vents installed on its external walls and Property C has new electric storage heaters installed.

Internal Temperature Analysis Results								
Project	Measure	Property ID	Sample Size	T.Test	Temperature			Standard Deviation
			Weeks Before and After Measure	95% Significance	Before Installation (°C)	After Installation (°C)	Change (%)	Change (%)
Homecare	Gas Boiler	A	7	No	12.8	12.7	1%	78%
Homecare	Draughtproofing	B	3	No	13.9	14.0	-1%	-66%
Homecare	Electric Storage Heaters	C	6	No	19.4	19.3	1%	133%

*Table 6: Internal temperature analysis results.*

For these three households, the T-TEST on the internal temperature before and after the measure was found not to be significant, this is because the duration of monitoring is over such a short amount of time. The percentage change indicates that there was only a 1% difference which can be assumed to be within the margins of error. The standard deviation in internal temperature (otherwise known as the change in variability of internal temperature) shows a very large change both increasing in variability in

properties A and C; and a large reduction in variability in property B. However, given the sample size is very small, is over different parts of the same heating season, and does not include a whole heating season before and after installation of the measure, the change in variation is more likely to be due to normal variation in behaviour which has been over represented due to the short monitoring duration.

However, where collected beyond these three properties, the Tinytag data has been helpful for building a picture of what happens in particular properties following the provision of advice and technical intervention. Although not statistically significant or comparative of replacement heating systems, this information can help to understand the impacts of the HES Homecare service on an individual basis. For example, the data included in Case Study 1 indicates a change in heating pattern following Energycarer advice to use the programmer and alter the temperature when the residents were away from the home. Tinytag data was also used to supplement Case Study 2. In this case, the occupant did not have a working central heating system and they were not able to heat four rooms of their property. The temperature data indicates that between February and April the living room temperature rarely exceeded 10°C and that the lowest temperature was around 2°C. These extremely low internal temperatures were corroborated by the Energycarers at interview. They reported their own thermal discomfort at being in those spaces (for example, noting that it was “Absolutely Baltic” in one resident’s home); residents sleeping in the main living space because it was the only room heated; being dressed in many layers; and using duvets in living spaces to keep warm. The Energycarers also noted that, in some cases, they were able to notice a physical difference in the temperature of the property.

During interview, the HES Homecare team reported that some Tinytags are still in place and they have permissions to collect data for another winter. Consequently, there may be some longer-term data available for analysis in due course.

#### **4.3. Changes in comfort and occupant satisfaction**

The following analysis focuses on the data collected through the social surveys to assess changes in comfort and occupant satisfaction through the HES Homecare trial. This analysis seeks to gauge (a) the extent to which significant change had occurred between Time 1 and Time 2, that is, pre-and post-intervention; and (b) whether changes were greater among the experimental compared with the control group.

##### ***Thermal comfort during the winter months***

Figure 1 illustrates the change in respondents perceived thermal comfort during the winter months at Time 1 and Time 2 of the survey. Generally, it shows that those receiving both the HES Homecare and standard CLO services perceive themselves to be cool or much too cool in their homes. Figure 1 also indicates some shift towards feeling warmer, with some respondents answering that they are ‘comfortably warm’ at Time 2. For the participants in Dumfries & Galloway between the Time 1 and Time 2 surveys, four showed no change in overall thermal comfort level, two improved substantially and one showed a minor improvement. Of those in the Moray area, three showed no change, two showed a minor improvement and one showed a deterioration between Time 1 and Time 2. Amongst those receiving the standard CLO service, two showed no change, two showed a deterioration and one showed a minor improvement. With such small numbers and mixed results, it is not possible from this data to

identify whether the HES Homecare service yields a greater improvement in thermal comfort than the standard CLO service. Indeed, half of respondents indicated no change in thermal comfort had taken place, this includes those in the HES Homecare trial groups.

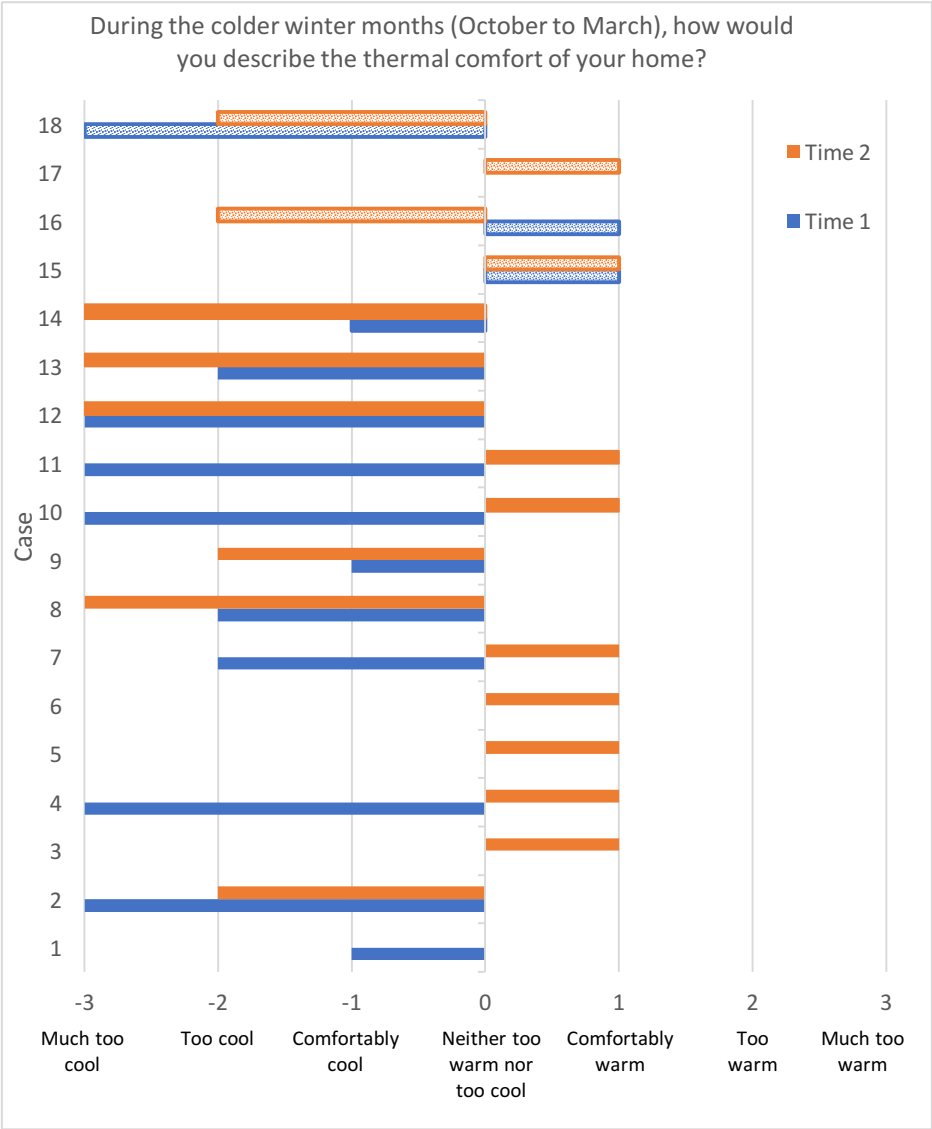


Figure 1: Change in thermal comfort during winter months between Time 1 (blue bars) and Time 2 (orange bars) survey. Case 1-14 (solid bars) received the HES Homecare service; cases 15-18 (hatched bars) received the standard CLO service.

Questions asking about behavioural change, for example: ‘Thinking back to last winter, how frequently did you do the following to prevent yourself being too cold at home?’, showed some modest changes in peoples’ actions. For example, in the Dumfries and Galloway group, some respondents answered that they use extra clothing and outdoor clothing less at Time 2 than Time 1, suggesting higher levels of thermal comfort. The Moray group also showed modest improvements (for example, instead of wearing additional clothes indoors ‘very often’ at Time 1 they did this ‘often’ at Time 2). However, in both cases there was no overall change and no statistical evidence to support these being patterns across the sample.

### ***Home satisfaction and house conditions***

Figure 2 presents a summary of responses about general satisfaction with the home. It shows some shift towards greater levels of satisfaction for recipients of both the HES Homecare and standard CLO services. For the question: *On the whole, how satisfied or dissatisfied are you with your home at the moment?*, the group in Dumfries and Galloway had a mean score of +0.86 (approximating to 'fairly satisfied') at Time 1, and +1.43 at Time 2 (between 'fairly' and 'very satisfied'). This is an increase of +0.57 through the course of the trial. Surveys from Moray householders showed low levels of home satisfaction at Time 1 with an average of -1.5 (between 'fairly' and 'very' dissatisfied), which increased to +0.33 at Time 2 (between 'no opinion' and 'fairly satisfied'). This is an increase of +1.8 in the mean score over time. For those receiving the standard CLO services, the scores cluster around 'no opinion' (0) to 'fairly satisfied' (+1) at both Time 1 (mean of +0.8) and Time 2 (mean of +1.0), and little evidence of change over time. However, two of these respondents are not same people at Time 1 and Time 2, making it difficult to draw firm comparisons.



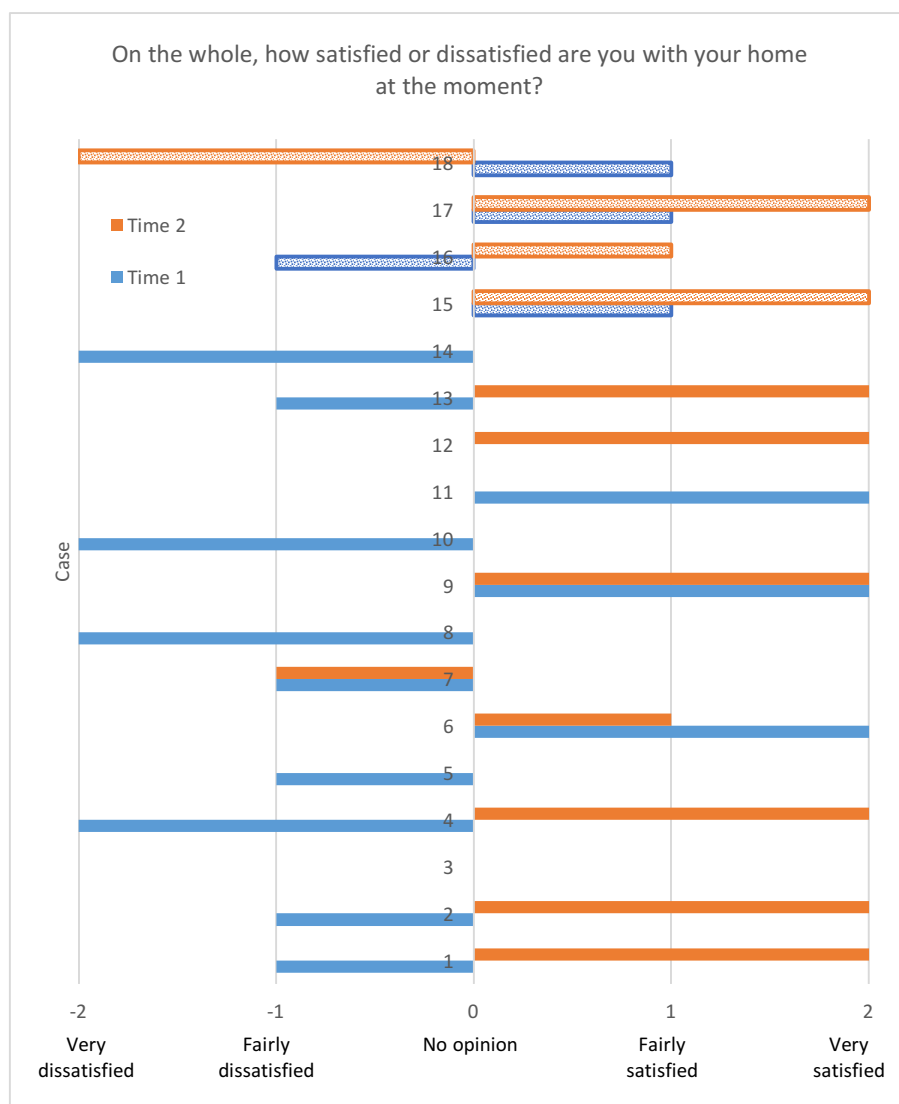


Figure 2: Change in general satisfaction with home between Time 1 (blue bars) and Time 2 (orange bars) survey. Case 1-14 (solid bars) received the HES Homecare service; cases 15-18 (hatched bars) received the standard CLO service.

With respect to house conditions, few survey respondents recorded instances of damp walls, mould, draughts or condensation. Where these conditions were reported, some respondents noted a marginal improvement in levels of draught (reporting that ‘more than half’ of rooms were draughty at Time 1, and ‘less than half’ were draughty at Time 2).

### Health and wellbeing

Figure 3 summaries respondents’ perceptions of their health and wellbeing before and after any interventions from the HES Homecare and CLO services, for the 18 households that completed both T1 and T2 surveys. For the HES Homecare recipients in Dumfries and Galloway, the Time 1 mean score was -0.86 (marginally less than ‘fair’), this rose modestly to +1.0 (‘fair’) at Time 2, with three respondents indicating no change; two recorded a slight deterioration, and two a modest improvement between T1 and T2. No-one scores their health and well-being ‘excellent’ and only one person ‘very good’. For those receiving the HES Homecare service in Moray, at Time 1, the mean score was -1.33 (‘Fair’ to ‘Poor’),

improving to -0.83 at Time 2 (just about 'Fair'). Four respondents record 'no change' over time, and two a slight improvement in health and wellbeing (e.g. 'poor' to 'fair'). For the recipients of the standard CLO service, two cases have been discounted on the grounds that respondents were different members of household at T1 and T2, and hence responses are not valid. There is no change over the time period in the remaining three cases (recorded as Poor, Fair and Very Good).

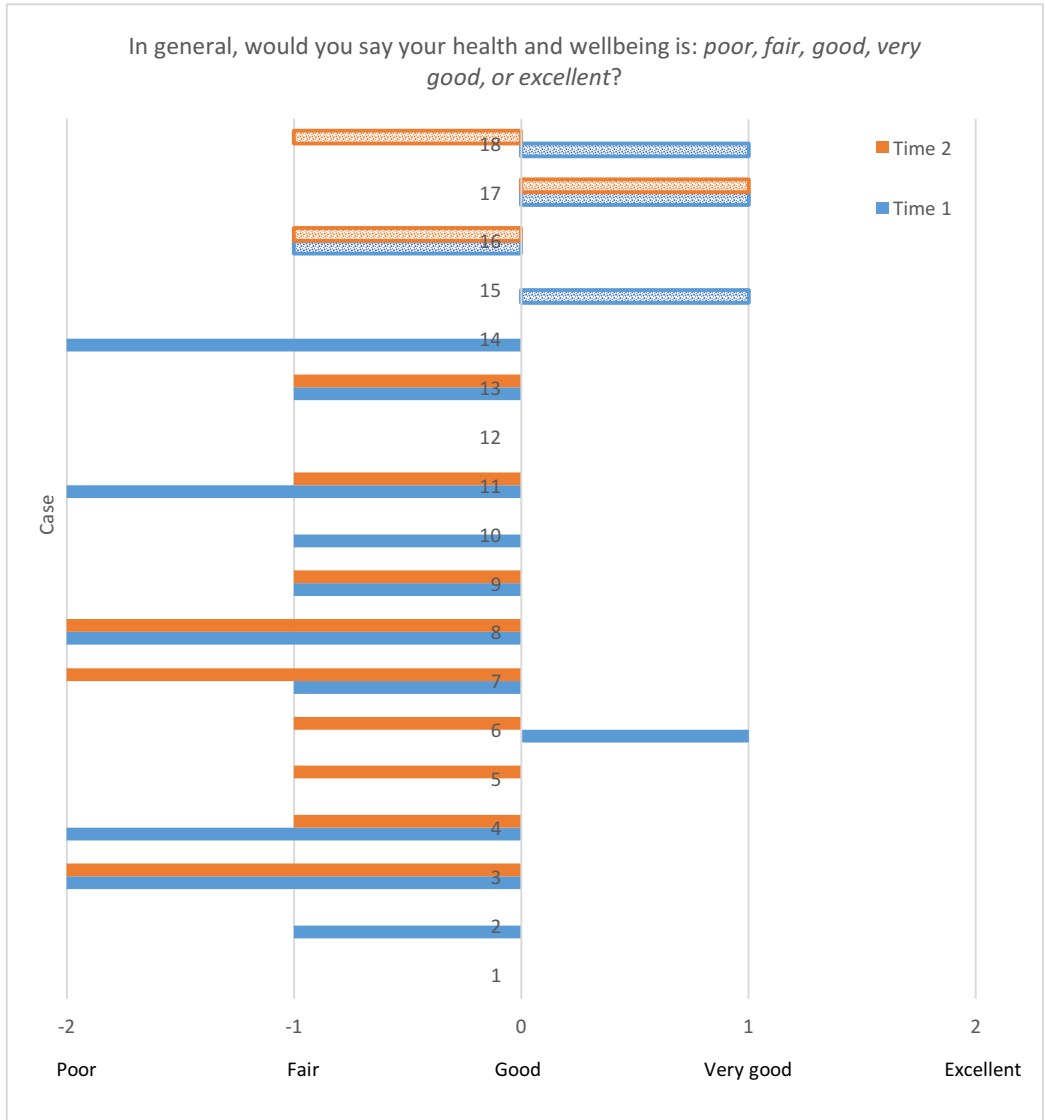


Figure 3: Change in perceived health and wellbeing between Time 1 (blue bars) and Time 2 (orange bars) survey. Case 1-14 (solid bars) received the HES Homecare service; cases 15-18 (hatched bars) received the standard CLO service.

Together, these results suggest that, while there have been modest reported improvements over time with regard to thermal comfort, behavioural change, house conditions, home satisfaction and health and well-being, there is insufficient variation, notably between the experimental groups and the control group, to conclude that the intervention has made a significant difference. There are not major differences between the 'experimental' groups (those receiving the HES Homecare service in Dumfries & Galloway and Moray) and the 'control' group (those receiving the standard CLO service in the Highlands/Orkney). Further, the results presented are not statistically significant and they are from a

small sample which makes it inappropriate to draw firm conclusions.

#### 4.4. Wider impacts of the service

The people in receipt of the HES Homecare service were often acutely vulnerable. Many of the recipients were older people, they were also people with health concerns that affected their mobility or ability to work. For example, the health concerns listed in the attached case studies include: a heart condition (Case Study 2), cancer (Case Study 5), and chronic obstructive pulmonary disease (COPD) (Case Study 6). In both Case Studies 3 and 6, one of the residents passed away during the course of receiving the HES Homecare service. For this vulnerable client group, HES Homecare offered benefits beyond energy saving alone.

Through HES Homecare, the residents received additional support through the processes of applying for funds and receiving interventions in the home. One of the HES Homecare team noted that *“the freedom to spend time with the householder, to establish that relationship of trust and to support them every step of the way”* was one of the main benefits of the scheme. For example, one of the residents in Case Study 3 struggled to keep up with the standard services available via telephone support. The repeated visits (10 in total) were particularly important for guiding this person through the installation of a gas central heating system, especially when their partner passed away. This type of service was also highlighted as particularly important for a resident with chronic fatigue who made progress in receiving additional benefits with the help of regular reminders and Energycarer support. Having a consistent and personable level of support was identified by the HES Homecare team as a critical aspect of this service. For example, one of the team members highlighted that a client *“was dreading”* the visit because they were concerned about how they would be treated. They noted that *“the last thing”* that these vulnerable residents would want was an *“Energycarer sitting there with a clipboard”*. The Energycarer role is thus important for providing *“one point of contact, people feel really supported. They know who they’re speaking to. Who’s going to be chasing things up for them”*.

In addition, the support included energy saving advice such as how to set heating programmers, which was reported by the Energycarers to have been heeded by clients. Although not all of the measures identified through the HES Homecare service (repairing broken windows, repairing roof leaks) will have a significant impact on energy consumption, they could be important for health and the occupant’s quality of life. These cases highlight the importance of remedial works for these residents, but also the challenges that can arise in funding these works. In Case Study 5, the visits undertaken as part of the HES Homecare service provided an opportunity to identify myriad problems in the home that would not necessarily have been apparent through phone intervention. These experiences led one member of the HES Homecare team to suggest that existing schemes like Warmer Homes Scotland might be re-considered to support with the treatment of mould and damp, for example.

In relation to this, another wider benefit of the HES Homecare scheme was its ability to identify people who are not supported through other means. For example, some of the recipients of the service were privately renting from family members or friends. These individuals are exempt from landlord registration requirements, so the properties in their care may *“slip through the gaps”* for receiving home improvements. Case Study 2 provides an example of how people in this situation can subsequently be discounted for receiving additional support. Case Study 4 details the extent to which an Energycarer can

help to encourage retrofitting activity in a privately rented home. Unfortunately, in this case the negotiations were eventually unsuccessful, due to additional costs which were not anticipated early in the process. However, the personal contact of the Energycarer was useful for liaising between landlord and tenant, and may be a model to carry forward in some way for wider engagement with the private rented sector.

## 5. Conclusion & lessons learned

This report has presented an evaluation of the HES Homecare pilot, which was set up following a recommendation to provide additional support to those living in rural fuel poverty from the Scottish Rural Fuel Poverty Task Force (SRFPTF). The HES Homecare pilot aimed to test the Energycarer approach to tackling rural fuel poverty in two rural areas: Anandale & Eskdale (South West Scotland) and Moray East (North East Scotland). The Energycarer approach seeks to provide support in accessing energy retrofitting opportunities and funding for vulnerable households who may require multiple points of contact and face-to-face visits, rather than single phone calls offered through traditional services. The pilot sought to reach 220 households in the year from March 2017 – March 2018; this was extended to March 2019. By November 2018 approximately 150 households had been engaged.

Evaluation of this pilot has included data collected through a social survey and internal temperature monitoring with households receiving the service and a control group receiving a standard HES Community Liaison Officer service. The evaluation also included interviews with the HES Homecare team, a series of case studies and a live learning document compiled by the team. In part because of the vulnerability of the client group, the social survey and internal temperature monitoring did not reach the number of participants required for statistical analysis, which means that the findings from this aspect of the evaluation do not form a robust basis for policy development. Further, the HES Homecare pilot was so intrinsically connected to an existing complex network of support for vulnerable households that it is difficult to evaluate the distinctive contribution that the pilot activities made.

There are many people in need of more help for energy efficient retrofitting; however, this evaluation has not provided evidence that the HES Homecare model is the most appropriate to tackle this. Thermal monitoring and accounts from the Energycarers identified that recipients of the service were extremely cold in their homes and living in inappropriate conditions. The pilot struggled to reach the numbers targeted, demonstrating the nature of these challenges for identifying and supporting vulnerable groups in rural areas with a high index of multiple deprivation. The pilot suggests that a more systematic strategy, including support for public health and social care services operating in liaison with neighbourhood and community organisations is very important. Identifying the differing criteria for eligibility, and subsequently supporting recipients to gain benefits and services proved to be slow, and overall transaction costs were high. Thus, future approaches will need to be delivered in conjunction with the review and simplification of existing funding streams. This is in line with the Fuel Poverty Forum's recommendation to collaborate with existing local social and community networks because these groups know their localities and can tailor support accordingly. The pilot has also demonstrated that a higher level of support is valuable in encouraging reluctant groups to take up energy efficiency measures in the home. A fundamental point here is that telephone services can be inadequate for guiding people through the patchwork of advice and funding that can be utilised for different aspects of upgrade work. These findings indicate a series of lessons for tackling rural fuel poverty in the future:

Lessons for delivering a service to tackle rural fuel poverty:

- Longer timeframes are required to establish the organisational structure and relationships with partner organisations in schemes of this type.
- An area-based approach to identifying vulnerable people and subsequent upgrade of buildings and heating is likely to be required. Use and resource local community organisations and networks to

identify vulnerable people. Individual Energy carers juggling this work alongside delivering the service may have had an impact on its overall reach.

- A single finance mechanism which incorporates a range of physical measures (including heating, insulation and glazing) alongside remedial works (to tackle damp, condensation and mould) is required.
- The individual case approach applied through HES Homecare is resource intensive; work needs to be done in order to develop a stronger area-based approach and utilise existing local networks and services more efficiently for the coordination of an area-based strategy.

Lessons for future evaluation of pilot schemes:

- The nature of the pilot – with a pre-determined and short timeframe – affected the ability to collect evaluation data. This especially impacted the internal temperature monitoring, which requires data to be collected over long timeframes and multiple heating seasons for valid comparisons.
- Social evaluation tools need to be developed further. For the vulnerable group in this pilot, this includes a more straightforward and shorter survey, along with trained interviewers to support with data collection.
- Opportunities should be explored for internal temperature monitoring equipment that does not require repeated visits to collect information, particularly when working with vulnerable groups. Smart metering might support with this type of monitoring in the future.

## 6. Appendices

### Appendix 1: organisations involved in the HES Homecare pilot

Organisation/ scheme	Details
Energy Saving Trust (EST)	Funded by Scottish Government. Manages Home Energy Scotland, a direct advice service. Home Energy Scotland (HES) runs a network of local advice centres covering all of Scotland. HES offer free, impartial advice on energy saving, keeping warm at home, renewable energy, and sustainable lifestyles. It is funded by the Scottish Government and managed by the Energy Saving Trust.
Warmer Homes Scotland	A scheme designed to help vulnerable people make their homes warmer and more comfortable by installing energy saving measures. Warmworks is the managing agent of this scheme, contracted by Scottish Government. Home Energy Scotland (the advice network managed by EST) is the Referral Administrator for the scheme.
Warmworks	Warmworks was formed to deliver the Scottish Government's national fuel poverty scheme, Warmer Homes Scotland. Warmworks manage applications to the Warmer Homes Scotland scheme from Home Energy Scotland. Warmworks is a partnership between the Energy Saving Trust, Everwarm, and Changeworks.
Care and Repair	Care and Repair offers independent advice and assistance to help elderly and disabled homeowners repair, improve or adapt their homes so they can live in comfort and safety in their community. The service operates throughout Scotland and building works are funded through local authority grants, benefits, equity release, home loans and charitable funds.

The HES network was identified as suitable for trialling the service in line with the following criteria:

- Be a natural delivery organisation for the region and have evident local support.
- Have the infrastructure to deliver services equally by geography anywhere in the proposed area of interest.
- Have expert staff that can be seconded to the project or experience at recruiting expert staff that match the requirement.
- Be the most appropriate body with the skills, experience, mind-set and abilities to offer expertise and significant in-kind support
- Have established and close links with local NHS, Social care and Housing Services.
- Have experience of local procurement and delivery, or have in-house skills and resources to deliver at market competitive prices.
- Be innovative, flexible and open minded to secure effective service delivery.
- Be at ease with the provision of remote rural support.

## Appendix 2: Characteristics of social survey participants

*For survey participants that provided both Time 1 and Time 2 survey.*

Case	Age	Sex	Tenure	Household size	Bedrooms	House type	Property age	Work carried out - survey reported	Work carried out - HES Homecare team notes
South-west (Homecare)									
1	87	F	owner	1	2	terrace	1950-64	Electric panels*	electric panel heaters had already been installed before survey time 1
2	84	F	owner	1	2	terrace	Pre-1919	Central heating - gas	GCH 16/10/2017
3	78	F	owner	2	3	terrace	Pre-1919	Oil combi; thermostatic radiator valves	Oil boiler 20/10/2017, humidistat extractor fans 02/18
4	55	F	Private rent	1	2	terrace	Pre-1919	External wall insulation	Internal wall insulation installed to one/two exterior wall/s 20/04/2018 EWI is yet to be installed to another external wall.
5	70	F	owner	1	2	terrace	1930-49	New storage heaters	Electric storage heaters 16/01/2018
6	64	F	owner	2	3	semi	1965-75	LPG combi boiler	LPG boiler, energy efficient doors and glazing, 30/08/2017 leak repair, gutter repairs 02/2018. Survey 2 completed 18/04/18.
7	82	F	owner	1	2	semi	Pre-1919	Loft insulation	Loft Insulation
North-east (Homecare)									
8	39	M	Private rent	1	1	flat	Pre-1919	Energy advice	None at Survey Time 2 - secondary glazing to be installed 14/05/2018



									gas central heating to be installed 22/05/2018
9	55	M	owner	1	4	detached	Pre-1919	Tariff advice	None as yet
10	37	F	Private rent	3	2	detached	Pre-1919	Storage heaters	Replaced electric meters, unknown date, 14/02/2018 Replaced storage heaters with Quantum, installed electric shower (off-peak) and new hot water tank
11	68	F	owner	1	2	terrace	1950-64	Loft floored*	25/01/2017 Meter install 20/12/2017 CO Detector, Gas boiler, Room Thermostats, Radiators, Smoke Alarms, hot water tank jacket,
12	83	M	owner	1	2	semi	1930-49	Draught proofing	Feb 2018 Draft proof vents onto external wall vented bricks
13	55	F	owner	1	<a href="#">6</a>	semi	Pre-1919	New gas central heating	23/02/2018 Gas boiler, radiators, 28/03/2018 smoke alarms, hot water cylinder, CO detector, energy efficient glazing/doors, enabling measure
17	79	F	owner	1	2	caravan	N/A	New heating system	07/02/2018 Gas central heating replacement, boiler, radiators and heating controls
Highlands & Orkney (CLO)									
14	88	F	owner	1	3	semi	Pre-1919	WHS boiler & radiators	26/09/2017 New gas central heating system installed under Warmer Homes Scotland: CO detector, condensing gas boiler, room thermostat, radiators, hot water tank jacket, smoke alarm

15	74	F	owner	2	3	detached	1965-75	Advice given	none
16	73	M	owner	2	4	detached	1965-75	Draught proofing	tariff check draughtproofing (date unknown)
18	62	M	owner	3	2	semi	1950-64	Advice given	benefits check with DWP tariff check with energy supplier supplier switching advice new oil boiler (date not given)

\*Initiated independently by respondent prior to pilot commencing

### Appendix 3: interview schedule

*Schedule used for semi-structured interviews. Questions in italics were asked to HES Homecare coordinator only. These were removed for Energycarer interviews due to time considerations.*

#### HES Homecare interview schedule 24.10.2018

##### Briefing

Why?

- Trying to understand the HES Homecare pilot, and provide report to Scottish Government
- Would like to include perspectives of those that have been involved in delivering it

The interview

- Approx. 1.5 hours
- Informal conversation – question sheet as guide
- Recorded; confidential, securely stored; anonymised outputs

Any questions?

##### Introductions and initiating the pilot

Could you introduce yourself and explain your role?

*How did the HES Homecare pilot first come about?*

*When was this?*

*How does this fit with other work that HES are involved in?*

*How was the budget agreed and organised?*

*What were the initial ambitions of the pilot?*

*What service would people receive?*

*How many people would receive it?*

*How would it be delivered? How long would it run for?*

##### Delivering the pilot

*How was the pilot delivered?*

*Management, Advisory Group*

*Recruitment of Energycarers*

What partnerships/ collaborative working took place? How did these partnerships/ collaborations work?

Health, Housing and Social Care sectors

Care and Repair

Who received the HES Homecare service?

Could you describe the types of people?

How did you select these people?

Referrals

## In-home survey

How many people received the service?

What support did these people receive?

Referral/ survey/ in-home advice/ tariff switching?

How was appropriate type/ level of support identified?

How have you found delivering the pilot?

What has worked well?

What has been challenging?

## Evaluating the pilot

What evaluation activities have been carried out?

Who took part in the evaluation activities? (surveys, monitoring, case studies)

What were the reasons for selecting these people?

How were treatment and control groups established?

Did the people receiving HES Homecare advice change the things that they were doing in the home?

Use of heating

Interacting differently with clothing, blankets etc.

Cooking practices

What changes in the physical condition of the property were reported/ measured/ monitored?

Temperature of the property & duration of that temperature

Relative humidity

Levels of fuel debt reduction

Changes in metered fuel consumption

Affordable expenditure levels

What do you think have been the main strengths of the pilot?

Have participants reported being warmer?

Reductions in medical/ care costs? Access to heating and insulation programmes?

Feasible to monitor these things within the pilot?

What do you think have been the main challenges of the pilot?

## *The benefits of the pilot*

*What are the benefits of a scheme like HES Homecare?*

*Have participants talked about benefits to being part of the scheme?*

## Next steps and wider thoughts

*What would you would have done differently if the funding/ pilot timeframe had allowed?*

*Why?*

From your perspective, what are the next steps for HES Homecare?  
What would you like to see happen?

*What changes might Scottish Government make for the success of a programme like this?*

Do you have anything you would like to add, or any questions or comments for me?

## **Appendix 4: selected case studies**

### **CASE STUDY 1**

MC and EC

Visits: 14/07/2017, 17/08/2017, 10/10/2017, 18/04/2018

HES Homecare visited after M phoned Home Energy Scotland about her broken back-boiler. A HES Homecare visit was arranged because M was not able to complete the phone call. M and her husband were assessed for Warmer Homes Scotland on the first visit and were found to be eligible. Their main bedroom has dampness in the roof and the corner, this may be due to faulty guttering outside (photos below). They say that this has only happened since their neighbour built a room in their loft space. Further testing may be necessary.

The second visit was conducted on the same day as the Warmer Homes Scotland survey. Warmworks found the house to be eligible and offered a new boiler, new radiators and new doors to M's delight. As this in itself may not cure the dampness, a referral to Care and Repair was made to investigate the cause of the dampness. The first evaluation survey was completed and Tiny Tags put in place to monitor temperature and relative humidity. The Energycarer kept in regular contact with M and her husband as they had a lot of preparatory work to do to enable the heating to be installed. New LPG central heating and doors were installed in August 2017.

In October the Energycarer visited M to advise her on making best use of the new heating controls, accompanied by someone from Care and Repair who was there to investigate the damp area. A contractor was allocated to repair a small section of gutter and this was completed in January 2018.

M got in touch with the Energycarer because her carbon monoxide alarm kept going off. He helped M get in touch with Everwarm - the contractor that had installed it and the alarm was quickly replaced without any further problems. A fourth visit was arranged to complete the second evaluation survey and collect the Tiny Tags. M said on this visit that the house was now much warmer and heating up much more quickly. M estimates that they spent a third less on their LPG this winter compared to last winter despite the weather being colder. M and E were also very pleased with their new doors as there is no longer a draught.

#### **Occupants**

- Owner occupier.
- 2 adults aged 66 and 63.
- Both suffer from mobility issues and one has asthma.

#### **Property**

- Semi-detached one storey, three bedroom, one living room, kitchen and bathroom.
- Cavity filled walls.
- Broken LPG back-boiler, very draughty doors.
- No thermostatic radiator valves or room thermostat.
- Dampness in main bedroom.
- Projected cost to heat home to standard heating pattern £1,425 which is 14.2% of the household income. Household is in fuel poverty.

**Measures recommended**

- New LPG central heating system and controls.
- New doors.
- Gutter repair.

**Advice Given**

- Advised on home heating and expectations of new system. Customer was under the impression that it is best for a boiler to be on 'all the time' on a low setting rather than programmed for intervals. Will arrange a visit after boiler has been installed to make sure the customer understands their new heating system.
- Advised on Warmer Homes Scotland process.
- Is currently happy with their electricity and LPG supplier.

**Outcomes**

- New central heating system installed (Warmer Homes Scotland)
- New doors installed (under Warmer Homes Scotland)
- Gutter repair to solve penetrative damp (HES Homecare)
- Annual saving of £161.

**Affordable Warmth**

M and E currently estimate their joint annual income to be around £10,000. After Warmer Homes Scotland intervention their fuel cost is projected at £1,264 per annum which equates to 12.6% of their annual income so they are still in fuel poverty.

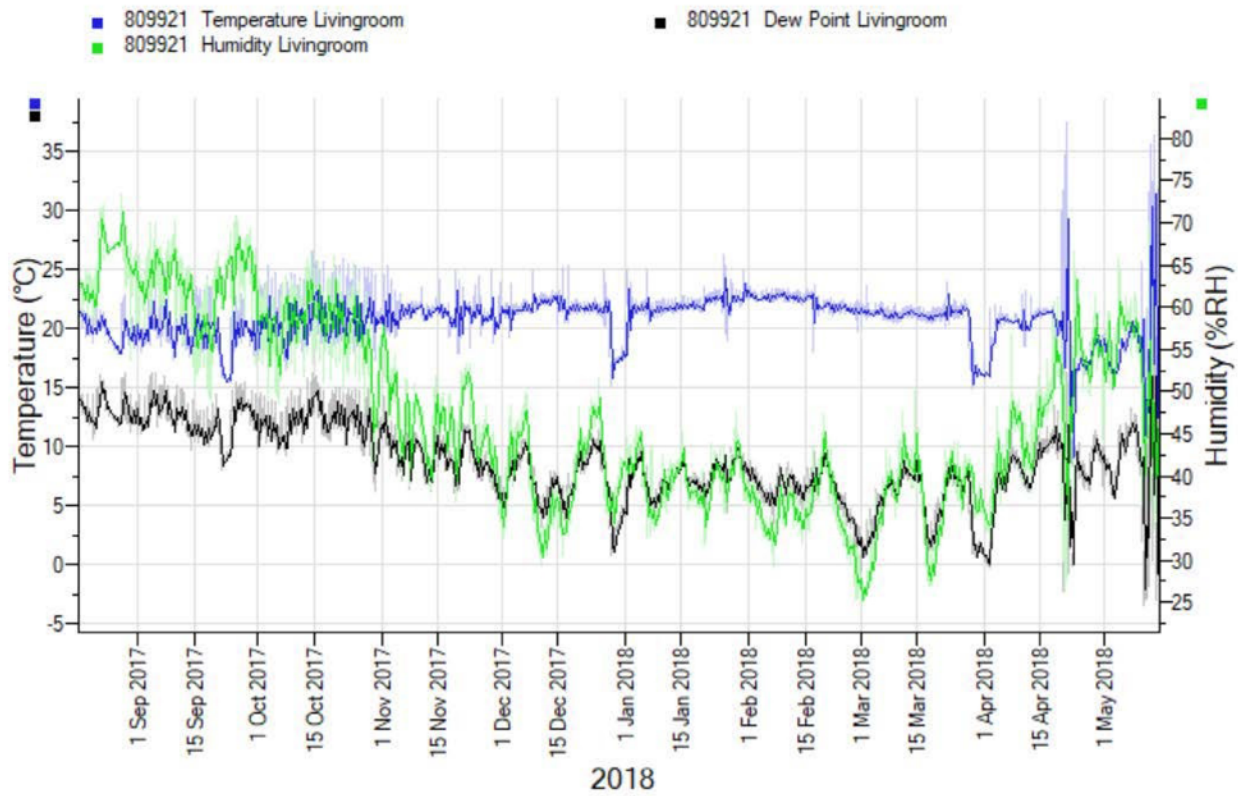
M and E are delighted that their fuel bills have dropped considerably because their back boiler was broken when they first contacted Home Energy Scotland. They were reliant on the electric immersion heater for hot water for months and this was putting a strain on the household income. They are very happy with the new radiators and heating controls which allow them to control the temperature of each room to their liking. M is due to receive her full state pension at the end of 2018 which will increase the household income.

**Tiny Tags**

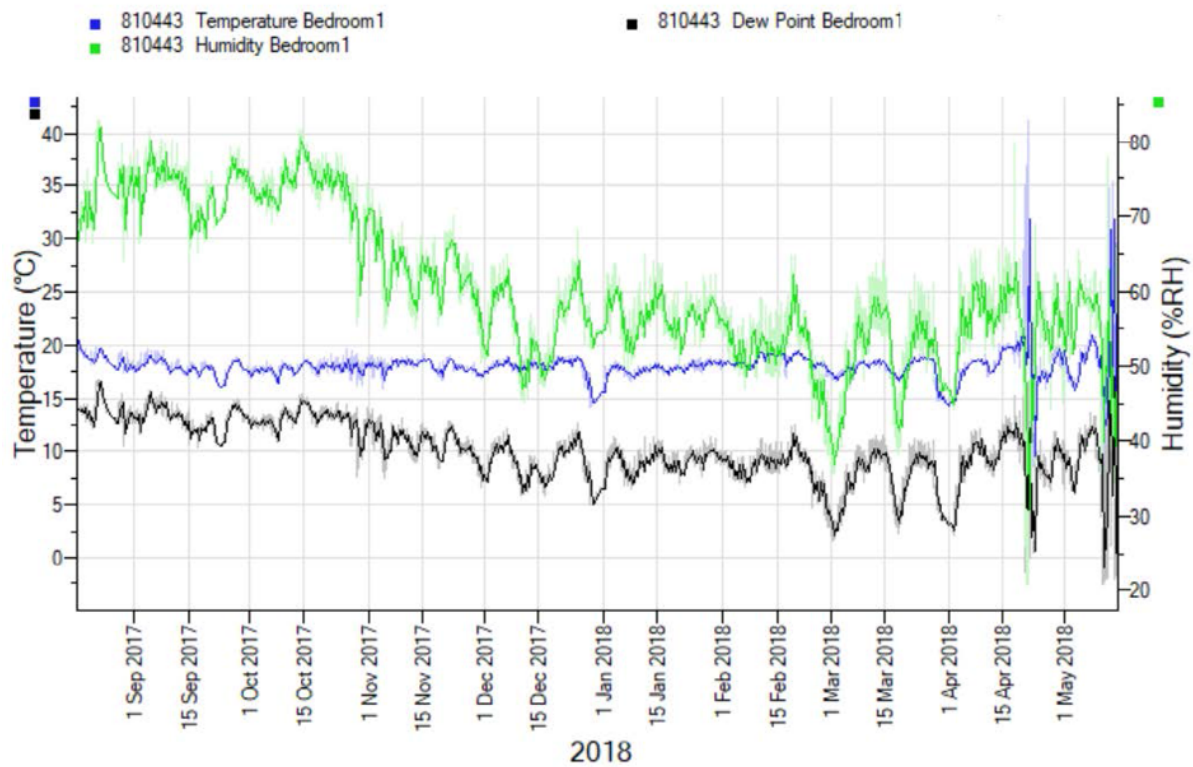
We do not have sufficient data from before the new heating was installed at the end of August to compare the temperature and relative humidity before and after the new heating. Tiny Tag monitors were in place between 17/08/2017 and 18/04/2018. The main observation from the graphs below is that the relative humidity of the home is comfortably within the recommended 40-60%RH during the heating months. This is vital to prevent condensation within the home.

The Tiny Tag graph shows that after the Energy Carer visited in October to advise on the heating controls, the temperature is more consistent. The dips in temperature around the end of December and March are because M and E were away and followed advice to turn down the thermostat.

## Livingroom



## Bedroom1





## Photos



Photo 1: Plant pot holding guttering together at living-room corner



Photo 2: Broken guttering and cracked masonry at bedroom corner

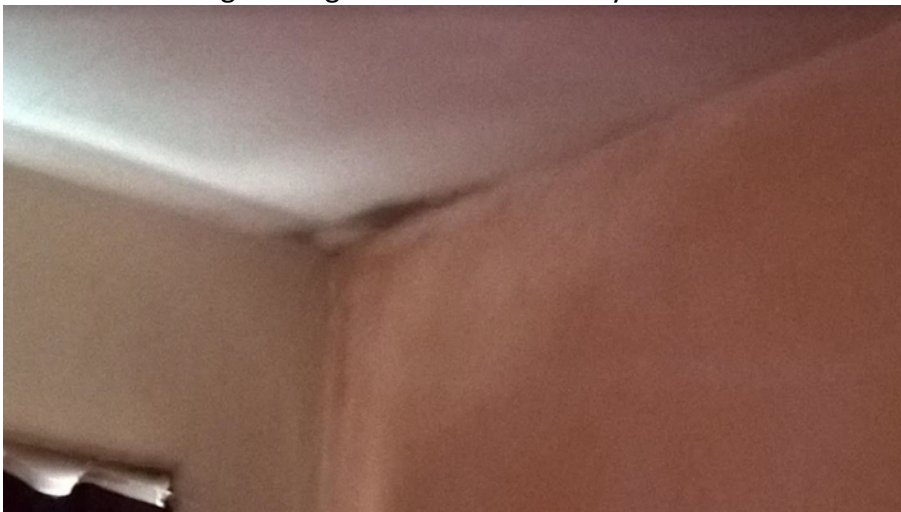


Photo 3: Damp patch in corner of bedroom near broken gutter

## **CASE STUDY 2**

D

Visits: 25/01/2018, 13/02/2018, 26/04/2018

D heard about Home Energy Scotland from a friend. He lives alone and takes medication for a heart condition which means he feels the cold. The home is around a hundred years old and is built of solid brick with no wall insulation. The oil boiler is broken so there is no central heating. D is on a low income but does not qualify for Warmer Homes Scotland.

The home is very cold with just open fires for warmth in the living room and bedroom and no heating to the other four rooms, so D goes to work or out to avoid being cold at home - he told us he is dreading next winter. Tiny Tag temperature and humidity monitors have been in place since 15 February and show the temperature to August in the living room and bedroom averaging 13 degrees Celsius: between 15 February and 15 April the temperature rarely exceeded 10 degrees Celsius. The temperature in the living room did not consistently reach 18 degrees until late June. On a few occasions the lowest temperature in the living room and bedroom was around 2 degrees Celsius (see graph below).

### **Occupants**

- One adult 56.
- Heart condition requiring medication.
- D's father owns the property but does not live there. D is responsible for the upkeep of the property. We are advised by The Moray Council that the property is exempt from Landlord Registration requirements because the tenant is a family member.
- Low income £16,570 /annum, in work. Awarded Universal Credit in July as a result of benefits check.
- Does not qualify for Warmer Homes Scotland.

### **Property**

- Detached house with room in roof, three bedrooms (two of the bedrooms could be partially heated because they are not in use), one living room, kitchen and bathroom.
- Uninsulated solid brick walls.
- Two open fires, one with a back boiler that provides hot water.
- Oil central heating boiler is very old and has been broken for eight years (this was second hand when it was installed to the property and is now obsolete).
- Single glazed windows.
- Doors are poor fitting and draughty. The back door is an internal door not suitable to keep the weather out.

### **Measures recommended**

After discussion, the Energycarer and D agreed that a suitable provision of heat for D's needs would be reliable central heating and controls to heat the main living area - living room, kitchen and bathroom. Four rooms would be partially heated. The aim is to reduce the household energy cost to below £2000 per year while providing a level of heat that is comfortable for D to spend time at home. Switching electricity supplier and tariff could result in a significant saving which would be used toward the cost of heating. Ideally the external doors would be replaced and secondary glazing fitted, however D does not have any savings or income to afford these improvements. Warm curtains would cost less and help to keep the heat in.

Replacing the broken oil boiler with new heating would be vital to providing a comfortable and healthy living environment.

- Assess the existing heating system to see if it can be repaired or requires replacement – priority.
- Assess impact of secondary glazing or thermal curtains potentially funded by HES Homecare.
- Assess impact and cost of new doors potentially funded by HES Homecare.

#### **Advice Given**

- Advised on Warmer Homes Scotland eligibility.
- Advised on and referred for benefits check. Awarded Universal Credit as a result in July 2018 – no effect on eligibility for Warmer Homes Scotland. Letter received October 2018 informing that he is now not eligible for Universal Credit.
- Tariff and fuel billing - because the home is connected to other buildings on the farm and has multiple meters and high electricity usage, HES Homecare referred D to local advice agency REAP - Rural Environmental Action Project for fuel billing support.

#### **Continuing support**

- Tiny Tags installed to monitor temperature and relative humidity and base follow-up advice on this information (see graph below).
- Support provided by REAP to understand fuel bills and potentially change tariff and supplier.
- HES Homecare assessment for intervention funding to assess oil central heating system. If required, a new system at cost of approximately £7,000 (plus smoke alarms, fees and vat). We do not know if enabling work would be required e.g. a new oil tank – a technical survey will provide guidance.
- Signposted to RSABI (Royal Scottish Agricultural Benevolent Institution) for possible financial grant funding.

#### **Affordable warmth assessment**

Item	Amount	Notes
Income - before Universal Credit application	£16,570 /annum	
Unavoidable living costs	£11,570	
Disposable income	£3,120	
Estimated energy cost using two open coal fires (actual heating). No supplier/tariff switch. This is based on actual cost of coal and electricity last winter.	£1,927	No heating in four rooms.

D is spending around 11% of his income on energy and is not able to be comfortably warm in his home. Our aim is that using an efficient controllable central heating system he could spend around the same amount and benefit from more heat in the rooms he uses most. HES Homecare recommends that D's broken oil central heating is assessed to see if the boiler can be repaired or needs to be replaced with a new boiler or heating system.

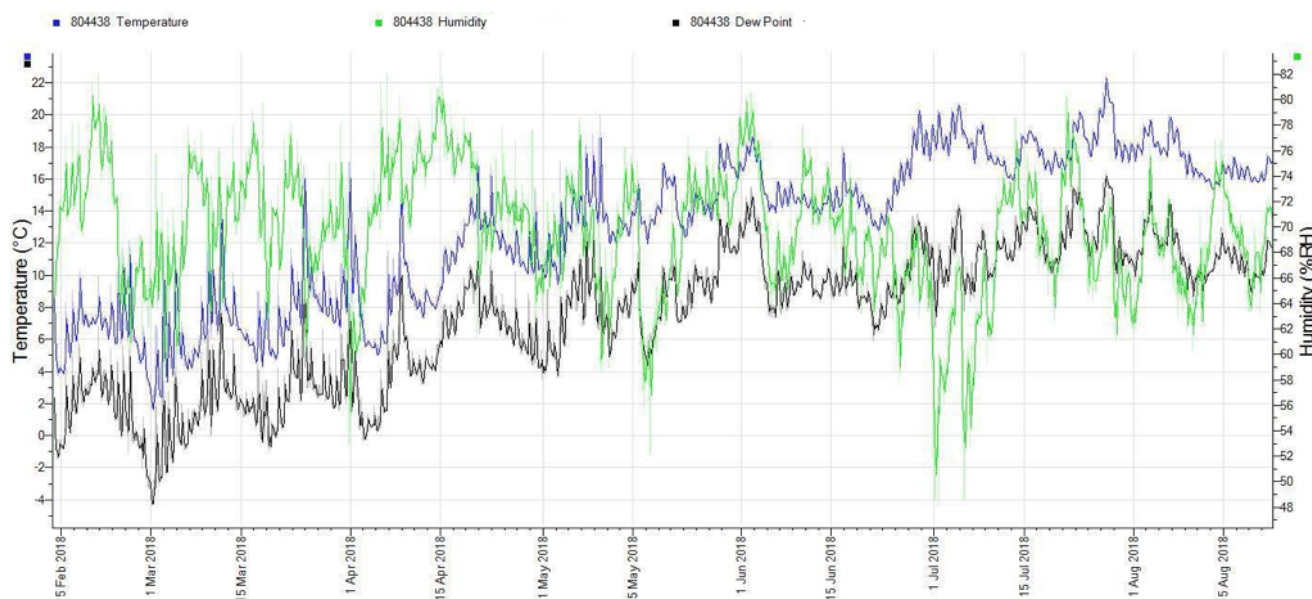
#### **Electricity tariff**

The Energycarer is going to support D to switch from his current non-domestic rate of 15.74p/kWh to a

more affordable domestic rate which could result in a saving of around £210 per year. The standing charge has recently increased to 42.42p from 23.98p meaning savings could be around £280 per year. S will also support D to reduce the electricity consumption.

Usage / year	Tariff up to 19/07/2018	Current tariff from 20/07/2018	Suggested tariff cost
	15.74p/kWh (current)	15.74p/kWh (current)	12.5p/kWh (estimate)
5936kWh (estimate)	£934/annum	£934/annum	£742/annum
Standing charge	£87.5	£154.8	£70/annum (estimate)
<b>Total / year</b>	<b>£1,021.50</b>	<b>£1088.80</b>	<b>£812</b>

### Temperature and relative humidity



Graph showing temperature, relative humidity and dew point, 15 February to 15 August 2018

### Outcomes

HES Homecare asked Scottish Government to review this case with regard to funding a potential boiler replacement or new central heating system as an exceptional case via Warmer Homes Scotland. The decision was that the client does not meet the eligibility criteria and given there are many other households in similar situations Scottish Government would not consider this as an exception. Scottish Government also directed that it would not be supportive of using HES Homecare intervention to fund this. Whilst the client is demonstrably in fuel poverty, he is in employment and the owner of the cottage has an obligation to provide adequate heating provision. The client should be directed to the landlord to address the heating situation and encouraged to get a tenancy agreement in place to protect his rights as a rent payer.

HES Homecare is advised by The Moray Council that the property is exempt from Landlord Registration requirements because the tenant is a family member.

S spoke with D again on 17/10/2018 for an update:

- D contacted RSABI but was not successful with any financial grant.
- D has received a letter from DWP to say he is now not eligible for Universal Credit.



Photo 2: Loft space with some insulation



Photo 3: Single glazed window

### **CASE STUDY 3**

F & A

10 visits: 15/08/2017, 08/11/2017, 15/11/2017, 29/11/2017, 24/01/2018, 07/02/2018, 20/02/2018, 15/03/2018, 22/03/2018, 16/04/2018.

F lives in a park home in Elgin. F's husband, A, initially made contact with Home Energy Scotland but passed away during the course of the support from HES Homecare. He had called Home Energy Scotland advice centre and a Community Liaison Officer visit was arranged as both were elderly, in poor health and struggled to keep up with conversation over the phone. At that time Elgin was not within the HES Homecare area however the Energycarer was asked to carry out the visit as he was visiting HES Homecare clients in nearby Moray East.

On the visit the Energycarer found the gas combi boiler was old and repeatedly losing pressure leaving the couple without heat or hot water. A had been in contact with an organisation which he thought was The Moray Council to install a boiler on what seemed to be a financial repayment scheme. A was unable to provide any details as he was so confused with whom he had spoken to but suggested it was Moray Council as he had visited the Council offices in Elgin. The Energycarer checked with The Moray Council and confirmed that it does not offer any financial help with replacement heating systems and most likely had advised A to contact Home Energy Scotland. F and A struggled to provide information on energy costs as electricity is paid to the Park owners within the land lease and they were unable to show any gas bills. The main concern was if the boiler broke down there would be no help as the couple are not in receipt of any benefits. The Energycarer made a referral for a benefits check visit from the Department for Work and Pensions to see if that would enable F and A to gain access to Warm Homes Scotland and offered to return at a later date to check on progress.

#### **Occupants**

- Owner occupier, land rented from caravan park.
- Two adults aged 82 and 80.
- Both suffered from mobility issues, A had diabetes and died of undiagnosed cancer.

#### **Property**

- Park home pre 2005.
- Gas central heating boiler broken beyond repair.

#### **Measures recommended**

- Replacement boiler, heating controls and radiators.

#### **Advice Given**

- Advised on home heating and expectations of new system.
- Advised on installation process.
- Revisited to advise on heating controls

#### **Continuing support**

- Referred for a benefits check home visit from DWP.

- Followed up with a call to DWP to request a self-assessment pack.
- Closely managed install of replacement gas central heating system.

When HES Homecare was extended to include all of The Moray Council area, the Energycarer returned to visit F and A with colleague Diane, a very experienced Community Liaison Officer. As far as they could tell, there had been no benefits check visit in the meantime and the household income was from basic pensions. They organised for a self-assessment pack to be sent by the Department for Work and Pensions to apply for a benefit, but on a later visit, the Energycarer was told this had never arrived.

With the difficulty in communication, the HES Homecare group determined that having made a referral for a benefits check rather than delay we would focus on making sure there was a reliable heating system installed to replace the old boiler through HES Homecare intervention fund rather than Warmer Homes Scotland as no other measures were required and further surveys could confuse the situation.

The installation of the replacement central heating system was postponed from December to 11 January because A was in hospital. When the installer contacted F on 10 January they found that A had passed away over the holiday period. The installer postponed the installation until such time as F was ready to have replacement heating installed. A week later, Home Energy Scotland received a call from F to inform us that A had passed away. The Energycarer visited F again to explain what is happening, and to get her written consent to replace her central heating free of charge, which previously had been in A's name. This is not something that HES Homecare intended to trouble her with, however because it seemed that she was forgetting what had been agreed from one visit to the next, this would be a safeguard in case she did not recall having agreed to accept the offer.

On 24 January, the Energycarer returned to visit F with a Community Liaison Officer after receiving a call from the installer who had tried to visit F to rearrange the boiler replacement. F had not answered the door on that occasion as she was not sure of who the installer was. When the Energycarer visited, F recognised him from previous visits and understood that this was connected to the boiler. On this visit F's friend who also lives on the caravan park came over which allowed the Energycarer to explain the many visits and some paper work which had been discovered when trying to sort through A's accounts. This friend became a valuable asset in making sure the installation could take place. F was happy to sign a new survey agreement as well as confirmation that she was happy for the install to go ahead on 7 February. The Energycarer was present at the caravan site when the installer arrived to ensure the install went as planned and F was able to visit with her neighbour in the park while the work was carried out.

Due to their circumstances – difficulty in communication, and this being a barrier to a benefits check – this household would not have been able to gain access to government assistance without HES Homecare support.

Securing a benefits check has proved to be a problem as two referrals for a DWP home visit have been made however DWP is not able to share the outcome with Home Energy Scotland due to data protection restrictions – it confirmed that appropriate action has been taken. F's income may be above the threshold to receive assistance.

## **Affordable Warmth**



It was not possible to calculate whether affordable warmth has been achieved here as the clients' accounts and details were not available. The main objective of HES Homecare intervention was to ensure a safe and reliable heating system to replace the existing boiler.

It is difficult to determine the energy performance of the home because the DEHRA tool does not have the functionality to assess park homes. Park homes are classed as inefficient within Warmer Homes Scotland qualifying criteria and a new boiler will more efficient and reliable.

This case demonstrates the challenge of supporting extremely vulnerable elderly householders.

- Two-person visits, signed offer letters, and inclusion of a third party contact were used to provide reassurance to F, and to minimise the risk of a dispute over what had been agreed on visits.
- HES Homecare attempted to use the evaluation survey with this household. This was of very limited use and distressing to the householder given that communication was difficult in general.



## **CASE STUDY 4**

S

Visits: 27/11/2017, 07/02/2018, 16/03/2018, 17/05/2018

S attended an event organised by Home Energy Scotland South West to advise people on how to stay warm during the winter. A Private Sector Landlord specialist advisor arranged a joint visit with the Energycarer to see how HES Homecare and the specialist service could work together to advise and support S.

### **Occupants**

- One adult 53.
- In receipt of PIP and ESA.
- Private tenant.

### **Property**

- End terrace with room-in-roof, three bedrooms, living room, bathroom and kitchen.
- Electric panel heaters using standard domestic tariff, open fire.
- Single immersion heater using standard domestic electricity tariff.
- Cavity wall insulation not possible because of severely cracked render on gable end...
- Single glazed windows.
- Doors poorly fitting and draughty.
- Electricity cost of 12.45p/kWh, declined referral to Citrus.
- SAP 12 band G.

### **Measures recommended**

- LPG central heating system and controls.
- Energy efficient doors and glazing.
- Estimated annual saving of £554.
- If measures above were installed SAP 31 band F.

The heating in the house was an open fire and some wall-mounted panel heaters. Both the panel heaters and the single immersion hot water heater were using through a standard domestic single rate electricity meter. The Energycarer referred S to Warmer Homes Scotland and arranged to be present for the survey to support her.

During the survey S was offered energy efficient doors and glazing. The Energycarer questioned why S was not offered a heating upgrade. Warmworks normally do not offer heating upgrades to private sector tenants unless there is no heating 'system' in the property. The Warmworks surveyor contacted their manager and explained that S only had 'secondary' heating in her house. After this call her offer was amended to include a full LPG central heating system and controls for free under Warmer Homes Scotland.

S's landlord was not willing to consent to any heating until they were satisfied that the technical survey specification met their approval. Without the landlord consent, the technical survey cannot be commissioned by Warmworks. Similar to another HES Homecare client case study, HES Homecare arranged with Warmworks for the technical survey to be conducted. with HES Homecare committing to

pay for the survey if it did not progress to install.

The landlord rejected the offer of LPG heating on the basis of high running costs for their tenants and stated a preference for oil central heating. New oil central heating is not offered under Warmer Homes Scotland. The Energycarer asked the landlord if they were planning to install oil central heating to benefit the tenant and was told this was out of the question. The Energycarer explained that S's current heating of electric panel heaters and an open fire was much more expensive to heat the home than LPG central heating and that at current prices there is very little difference in running cost between oil and LPG central heating. The landlord still rejected these measures.

The Energycarer consulted with the PSL specialist advisor and informed the landlord that new legislation had been announced for energy efficiency of properties with the privately rented sector. It states:

- All privately rented properties must reach a minimum rating of band E if a new tenant moves into a property after the 1st of April 2020.
- If the same tenant continues to live in a property from before the 1st of April 2020 then the property must be a band E by 1st of April 2022.

S's home has EPC 12 Band G so the landlord has a limited time to increase the SAP rating before they are no longer legally able to rent the property. The measures offered under Warmer Homes Scotland would increase the EPC rating of the property to SAP 31 band F, 6 points away from the new legal minimum. This finally convinced the landlord and they approved the measures.

The Energycarer assisted S to choose an LPG supplier and arranged for Calor Gas to come out and survey for an LPG tank. The Energycarer attended the survey and was told that the only way a tank could be fitted into the garden was if it was submerged and a one metre fire wall built between S's garden and her neighbour. Calor Gas charge £1,500 to submerge the tank but are unable to facilitate building a fire wall. The Energycarer contacted the landlord to inform them of this cost and they rejected contributing to the cost of the tank. The Energycarer again discussed the cost benefit to S of the new heating being installed and explained that for this relatively low cost, they are receiving a huge improvement to their property. Unfortunately the landlord rejected the measures and so S's Warmer Homes Scotland journey was cancelled.

### **Affordable Warmth**

S is not sure what her income is but estimates it to be in the region of £12,000. Estimated cost to heat home to standard heating pattern £2,669 per annum which is to 22% of total household income. S is in fuel poverty. If the measures offered under Warmer Homes Scotland were installed S could expect to spend £2,115 a year on energy which is 17.6% of her total income. S would still be in fuel poverty but would have reduced her fuel bills by over 20%.

### **Outcomes**

- Attempted negotiation with landlord failed after initial success.
- Warmer Homes Scotland journey cancelled.
- No improvements were installed.
- S is still in fuel poverty, spending 22% of her income on fuel.

## **CASE STUDY 5**

L

Visits: 30/08/2018, 21/9/2018

L was referred to HES Homecare by Moray Care and Repair because her roof needs some repairs and there is damp in the upstairs bedroom. L has a very low income and is receiving treatment for cancer. The Energycarer advised to do a benefits check but L declined because she had a negative experience which left her in dire straits when she had to repay over-paid benefit after pointing out to DWP that she should not be receiving the funds. L is not fit enough to work full time and has a part time job earning around £300 a month. She has released her pension early to try to make ends meet.

### **Occupants**

- Owner occupier.
- One adult aged 60 (not pensionable age).
- Receiving treatment for cancer.
- Low income £3,600 from part time job plus £6000 released from pension.
- Does not qualify for Warmer Homes Scotland because she is not in receipt of a qualifying benefit.

### **Property**

- Mid terraced house with room-in-roof, two bedrooms, one living room, kitchen and bathroom.
- Gas central heating.
- SAP 42 band E.
- Windows double glazed uPVC other than one Velux that is wooden framed.
- Kitchen window latch/mechanism is broken, window held shut with a plank of wood (see photos below).
- Uninsulated solid stone walls with brick kitchen and bathroom extension.
- Damp on walls of the front of the property (stone part of the property), this may be from leaking gutters that have been fixed or from the door plate not stopping sitting water seeping in to the hall.
- Damp on the slope of the upstairs bedroom which could be from the damage to the roof.
- Doors are poorly fitting, rotten and draughty. The back door is an internal door not suitable to keep the weather out.

### **Advice Given**

- Advised on Warmer Homes Scotland eligibility.
- Advised on benefits check.
- L pays for energy using prepayment meters which she easier to budget and is happy with her electricity and gas supplier,

### **Measures recommended**

- Repair or replace kitchen window.
- Repairs to roof to prevent further water leak.
- Ideally the external doors and frames would be replaced however L does not have any savings or sufficient income to afford these improvements.

### Affordable warmth assessment

L is spending around 10% of her £9,600 annual income on her energy bills and is not comfortably warm in her home: she said she only puts the heating on for the minimum time and wraps up to keep the bills down. If she were to heat the home adequately the projected cost would be £1147 which is 12% of her total income and 42% of her disposable income after unavoidable living costs. She is in fuel poverty.

Item	Amount	Notes
Income / annum	£9600	
Unavoidable living costs	£6900	
Disposable income	£2700	
Estimated energy cost from payments made	£960	Suggests the home is under-heated
Projected cost to heat the home to standard heating pattern (from DEHRA)	£1147	

Tinytag temperature and relative humidity monitors were installed 21/09/2018.

### Continuing support

- Application for Warm Homes Discount submitted. L is eligible without benefits through her supplier.
- Monitor temperature and humidity
- Explore cost of repairs through Care and Repair.

Care and Repair has offered a housing repair grant of 75% of the cost of the repairs to roof, window and doors. At the Advisory Group meeting in September 2018 Care and Repair asked for clarification as to whether HES Homecare intervention fund could be used to provide the remaining 25% of the funding required. There was no objection from the advisory group.

HES Homecare sought advice from Care and Repair Scotland and from Scotland's Housing Network who responded:

"If I understand correctly, you want to combine two grant sources to cover the full costs of repairs in this case. One of these is the local authority's housing repair grant and the other is from a fuel poverty fund, also administered by the local authority. I have spoken to colleagues in fuel poverty policy and their view is that the use of the fuel poverty fund is at the discretion of the fund holder. As far as the repair grant is concerned, ultimately this is discretionary fundings (sic) from the capital grant to the local authority. In both cases, this is at the discretion of the local authority, so provided the use complies with local priorities, we would not see any objection to using the funding in the way proposed."

Based on this advice, HES Homecare intends to offer to fund 25% of the cost of repairs to L's home carried out through Care and Repair to address the disrepair and prevent further dampness and heat loss. We are awaiting quotes for this.



Photo 1: Rotten door frame



Photo 2: interior door used for exterior door



Photo 4: Damp on upstairs bedroom ceiling



Photo 5: Damaged kitchen window

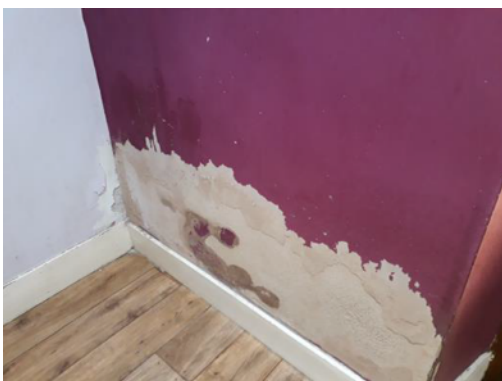


Photo 5: Damp on the hall wall

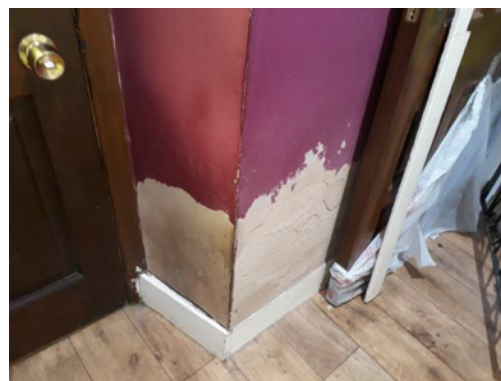


Photo 6: Damp on the hall wall

## **CASE STUDY 6**

T & I

Initial visit date: 04/07/2017, second visit: 29/08/2017

T met a Home Energy Scotland Community Liaison Officer at an outreach event at the Ecclefechan Day Centre. T has chronic obstructive pulmonary disease and her husband I has mobility issues. T had recently had a benefits check and was not eligible for Warmer Homes Scotland but was finding the home cold.

The Energycarer visited the couple and found that there is an extension to the rear of property that contains the bathroom and the kitchen. The extension has a flat roof and the walls are either a very narrow, unfilled cavity or solid brick. Neither room had fixed ventilation and mould was widespread in both rooms indicating condensation dampness. The join between the pitched roof and the wall of the extension appeared to be wet as there was green algae growth which may indicate a leak (see photo 2 below).

The Energycarer visited again to complete the evaluation Survey 1 and install Tiny Tag temperature and humidity monitors to help investigate the cause of the dampness. The Energycarer referred T and I to Care and Repair to arrange a contractor for dampness investigation. The contractor found that there was no water leak from outside and confirmed the Energycarer's assessment that the dampness in the extension was condensation due to lack of ventilation and insulation and was commissioned to insulate the ceiling and install humidistat extractor fans to each room. Work was completed in December 2017.

Unfortunately since then T passed away. The Energycarer attempted to make contact with I several times and wrote to I urging him to get back in touch if he wishes to have further support. Tiny Tag devices have not been collected and Survey 2 was not completed.

### **Occupants**

- Owner occupier.
- 2 adults aged 79 and 85.
- Chronic obstructive pulmonary disease (COPD), mobility issues.
- Personal circumstances (benefits) do not meet Warmer Homes Scotland criteria.

### **Property**

- Semi-detached, 1 storey, 1 bedroom, 1 living room, 1 toilet and 1 kitchen.
- Solid stone walls. Later extension to rear - unclear if solid brick or a very narrow cavity, it measures around 300mm thick.
- Condensation dampness in extension - kitchen and bathroom: mould photographed.
- Insufficient ventilation to kitchen and bathroom – small trickle vent in window, no extractor fans. Cooker hood is unvented.
- Energy rating SAP 62 – meets criteria for Warmer Homes Scotland despite recent boiler replacement.

### **Measures recommended**

- Flat roof insulation to extension.
- Ventilation to bathroom and kitchen – humidistat extractor fans.

- Cavity fill or internal wall insulation to extension once dampness issue is resolved (subject to survey).

### **Advice given**

- Advised on heating controls for new boiler.
- Advised at time of visit that at this stage we are unsure of what measures can be offered as part of HES Homecare.
- Advice to address condensation – ventilation, heat, minimise steam.
- Tiny Tags installed to monitor temperature and humidity in kitchen compared to living room and bedroom.
- Recently entered a 12 months fixed term electricity tariff, so Citrus Energy support was not offered.

### **Outcomes**

- Measures put in place to solve dampness issues – humidistat extractor fans.
- Flat roof insulation estimated to save £53 per annum.

### **Affordable Warmth**

In September 2017 T and I had a joint income of £300-400 per week or £15,600-20,800 per annum. The energy cost to heat the home to the standard heating pattern was estimated at £1,094 which is 5.2-7.0% of the household income. The household was not in fuel poverty.

As a person-centred service HES Homecare made the decision that because of T's respiratory condition the health benefits of removing the mould and addressing the cause of the mould justified use of the HES Homecare intervention fund. The household had very limited savings and the improvements would not otherwise be made. Intervention fund was used to install humidistat extractor fans and ceiling insulation to the kitchen and bathroom.

### **Tiny Tags temperature and humidity monitoring**

Tiny Tag monitors were installed to monitor the temperature and relative humidity in the home however it has not been possible to retrieve them as I has not responded to attempts to contact him by phone and letter.

### **Photos**



Photo 1: Mould on kitchen ceiling under flat roof





Photo 2: Flat roof to extension, join of pitched roof to extension (kitchen door)



Photo 3: Extension wall construction showing thickness of wall. Condensation is visible on inside of kitchen window.