

# Research Report

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**A just transition to the decarbonisation of heat  
in off gas areas: Phase 2**

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Changeworks  
36 Newhaven Road  
Edinburgh EH6 5PY

0131 555 4010  
[consultancy@changeworks.org.uk](mailto:consultancy@changeworks.org.uk)  
[changeworks.org.uk](http://changeworks.org.uk)

<b>Report</b>	<p>Research Report</p> <p>A just transition to the decarbonisation of heat in off gas areas: Phase 2</p>
<b>Main contact</b>	<p>Ting Zhang</p> <p>European Climate Foundation</p>
<b>Report authors</b>	<p>Freya Burns, Research Consultant</p> <p>Shane Donnellan, Senior Behaviour Change Specialist</p> <p>Hannah Dunne, Researcher</p>
<b>Issued by</b>	<p>Shane Donnellan</p> <p>Senior Behaviour Change Specialist</p> <p>E: <a href="mailto:sdonnellan@changeworks.org.uk">sdonnellan@changeworks.org.uk</a></p> <p>Changeworks Resources for Life Ltd</p> <p>Charity Registered in Scotland (SCO15144)</p> <p>Company Number (SC103904)</p> <p>VAT Registration Number (927106435)</p>
<b>Approved by</b>	<p>Ian Smith</p> <p>Head of Consultancy</p> <p>Changeworks</p> <p>E: <a href="mailto:ismith@changeworks.org.uk">ismith@changeworks.org.uk</a></p>

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## Executive Summary

Electrification is expected to play a significant role in the decarbonisation of heat within Scotland, particularly in the context of uncertainty as to the role of hydrogen and the gas networks in the future of heat supply. Rural and off-gas communities are considered to be 'no regrets' areas with regards to electrification of heat. However, these areas have historically been burdened with higher electricity costs, comparatively low efficiency housing and, in some remote rural locations, issues associated with under resourced supply chains.

As such, the concept of a 'just transition' aims to consider these factors at a fundamental level in order to mitigate any impacts to those likely to be disproportionately affected by decarbonisation of heat. The purpose of this research was to investigate options and obtain stakeholder support for the decarbonisation of off-gas communities, which did not unfairly affect those in off-gas areas, whilst maintaining the pace and scale of change needed to meet national targets.

This research was conducted in two phases: Phase 1 consisted of initial scoping and stakeholder engagement exercises to help inform the subsequent phase and ensure stakeholder buy-in. During phase 2, a desk-based review was conducted investigating existing schemes and projects to develop a series of four broad models for wide-scale electrification of heat which may be applicable within a Scottish context. Stakeholders from across the related sectors were consulted to determine areas of support and highlight any potential barriers for roll out. This research considers the technical, social, and financial aspects of heat decarbonisation, and outlines what support may be needed at a statutory level to ensure a fair and equitable transition.

Strengths, perceived and actual barriers and policy needs to roll out at scale were identified for all of the models. Tenure-based preferences were highlighted as well as the need for developing supply chain and energy markets. The findings have formed the backbone of a comprehensive dissemination campaign, which has been delivered to inform and influence Scottish Government decarbonisation policy.

## 1. Introduction

This research report details the research process undertaken as part of the project. Specific details of the models of decarbonisation identified are included in an accompanying Discussion Paper, used to guide stakeholder engagement. A further Stakeholder Voice document outlines the findings from the consultation exercise. Both of these documents are hosted on the Changeworks [website](#).

The aim of the project is to:

***identify and advocate for targeted investment in just heat decarbonisation approaches that are replicable, scalable and have broad stakeholder and community buy in.***

The objectives coming from this include:

- influence dialogue at a national level alongside policy and investment decisions to accelerate uptake by presenting models for heat decarbonisation
- Clearly articulate barriers to replication, scale up and acceptance for each model
- Ensure a voice given to the end user.

## 2. Context

Domestic heating is responsible for 13% of Scotland's carbon emissions and Scotland's pathway to meet its ambitious climate change target of net-zero by 2045 requires rapid and widespread heat decarbonisation in homes. While the approach in on gas grid areas is complicated by considerations over the future of the gas grid, heat decarbonisation of rural and off gas communities and properties are seen as 'no regrets'. Remote and rural areas in Scotland are also subject to higher electricity costs, have lower average efficiency housing stock and have higher rates/ risk of fuel poverty.

There are real and perceived concerns amongst some stakeholders that meeting climate targets could lead to higher energy costs (e.g. via environmental levies on bills and/or costs of installing and running low carbon heat). These concerns extend across stakeholder groups, government officials, political party leaders and individual households.

There is therefore a very real danger that levels of fuel poverty, already high in remote, rural and off gas areas may be exacerbated if the cost of the low carbon transition is not just, and the burden of costs are unfairly borne on vulnerable households, either at point of install or in the form of higher bills. There is also a risk that delay will mean off-gas grid households are left behind in the energy transition, reliant on high carbon fuels in a shrinking market and subject to volatile prices. The risk of a rising number of people in or at risk of fuel poverty is exacerbated by the Covid-19 crisis.

However, the crisis has also presented opportunity in the form of a Green Recovery agenda, bought into by political parties in Scotland. This project aligns with that

agenda, identifying models for the low carbon transition. The project was conducted at an opportune time to influence policy in Scotland during the development of the now published Heat in Buildings Strategy and Fuel Poverty Strategy.

## 2.1 Phase 1

Phase 1 of this project was an initial scoping and engagement exercise to secure buy-in from key stakeholders. During Phase 1 we engaged with stakeholders who represent many of the individuals and groups who will be most affected by any transition to decarbonisation.

The discussions and outputs from Phase 1 determined the scope of Phase 2, which included:

- Rural and remote off gas areas
- Socially rented, private rented and owner-occupied tenures
- Models for the low carbon heat transition characterised by the specific renewable heat technologies adopted, the energy system they sit within or the financial arrangement with the householder
- Compatibility with, and opportunities within, Scottish Government strategies and target setting including Energy Efficient Scotland and Local Heat and Energy Efficiency Strategies
- Active awareness of just transition characteristics, fuel poverty and costs to consumers

The exercise also helped us to determine some of the methods, parameters, priorities and ambitions of a just transition for Scotland. These included prioritising models that could be deployed at scale in the short term, identifying routes to Phase 2 stakeholder engagement and identifying aspects of the existing system in Scotland which compete or work against each other. For example, the current means by which energy performance of buildings is measured in the UK (RdSAP) can penalise buildings with low or zero carbon heating systems with less efficient energy ratings, which disincentivises the low carbon heat transition.

## 2.2 Phase 2

Phase 2 consisted of desk-based research to identify models and further determine the scope, a stakeholder consultation exercise and dissemination activities. Each of these stages is detailed in this report.

# 3. Methodology

## 3.1 Identifying models

We conducted desk-based research to identify potentially suitable models and examples of each (planned, underway, completed). The aim of this task was to develop a clear understanding of potentially viable models and present them in a way

that stakeholders can grasp their features, pros and cons and make informed decisions as to each model's appropriateness.

Based on the project scope, particularly the focus on a just transition, the models that were developed are all characterised by a sense of communality. While a model may entail the individual purchase and ownership of a heating system, we are looking at how this would be achieved or mobilised at scale.

From the desk-based research we identified 35 existing projects and schemes. These were a mixture of UK-based and international projects. Those based in the UK or with the highest relevance to the Scottish context were prioritised during the analysis. The examples were mapped in a matrix and categorised according to the financial model used, rather than the heating or building fabric technologies being rolled out. For each financial model we identified some potential risks and benefits, as well as the demographic and geographic suitability.

The models were distilled to four overarching models, each with a 'menu' of different options which incorporated most of the financial models identified in the matrix. The four models are distinguished by how the capital costs are paid, and who holds ownership of the asset (heating system or fabric upgrade). The models were not developed for specific heating technologies, and we envisage that all models could be used for the installation of any form of low carbon heating technology. All four models assume that a fabric first approach will be followed.

### **3.2 Defining a 'just and fair transition'**

The overarching theme of the project is ensuring a just and fair transition to low carbon heating. Therefore, a separate desk-based research task was undertaken simultaneously to the research into existing models. The potential replicability and scalability of any model is highly dependent on acceptance across stakeholder groups and wider stakeholders. Acceptance will stem partly from a sense of fairness and justice.

This research task identified numerous issues and some solutions broadly grouped under the headings of:

- technical
- dwelling and geographical location
- financial
- social.

One of the outputs from this task was a short list of 'tests or questions' which we could ask of any model as we determine whether it is aligned with a just or fair transition. This research also informed the development of the Discussion paper (see below).

### **3.3 Discussion paper**

This paper was produced as a resource for the consultation exercise and was designed to support understanding and prompt discussion from a wide range of

stakeholders with varying degrees of technical knowledge. The information in the paper is presented in direct clear language, and each of the four models is presented as an infographic. The paper can be found on the Changeworks website.

To ensure that the paper was accessible to users with no prior knowledge of heat decarbonisation the paper gave a brief overview of the low carbon heating technologies as well as some of the key issues to consider in order to achieve a just and fair transition. The paper also briefly outlined why there is a need for the proposed models, namely that the current journey to installing low carbon heating is fragmented and can be challenging to navigate as a consumer.

The description of each model includes case studies and vignettes to bring the models to life for the reader. The case studies of existing projects demonstrate how the models could be put into practice. The vignettes are fictional and aim to illustrate how different actors may benefit from each model.

Webinar slides were also developed to present the Discussion Paper in various online seminars and forums (see Section 3.6).

### **3.4 Stakeholder consultation**

A comprehensive consultation exercise was undertaken across housing tenures, as well as wider stakeholders. The consultation sought feedback on the four delivery models which were identified from the research. These delivery models were purposefully and largely 'technology-agnostic' given the diversity and complexity of the housing stock in rural Scotland.

The main stakeholder groups were identified by the tenure they are most associated with (Private rented, social housing, owner-occupied). However, not all stakeholders (e.g. supply chain, District Network Operators) could be categorised by tenure, and so a fourth category of 'Wider Stakeholders' was included.

68 individuals and organisations were invited to participate, 31 of whom directly engaged through interviews and group discussions. Through presenting at events and forums we engaged with, and collated feedback from an estimated 150 stakeholders. These events were:

- The Rural and Islands Housing Associations Forum (RIHAF)
- Scottish Parliament Cross Party Group on Renewable Energy & Energy Efficiency
- Highland Climate Conference
- Highlands & Islands Housing. Associations Affordable Warmth Group

The project has been and will be submitted to a number of additional conferences relating to decarbonisation, for which the speakers have not yet been decided.

The findings of this consultation exercise are presented within the Stakeholder Voice paper. This paper outlines the feedback from stakeholder groups on each of the four models, including both support and concerns raised. This paper also contains calls



on Scottish Government regarding national steer, statutory backing and support needed.

### 3.5 Comparative assessment of models

The secondary aim of the stakeholder consultation was to understand how the different models could be replicated in multiple locations and be implemented at scale. A Scalability and Replicability Analysis (SRA) was performed involving 4 domains chosen to underpin the consultation:

- Technical
- Regulatory
- Social Acceptance
- Economic

The consultation exercise was guided by these four themes, exploring the current state of play for different stakeholder groups, barriers, opportunities and recommendations. A series of interviews were conducted, based around these 4 themes and incorporating the following points:

- Policy context/ priorities
- Examples of good practice
- Attitudes/ acceptance/ resistance within sector
- Main barriers to any model
- Opportunities/ levers which could support the roll-out of a model
- Delivery and supply chain
- Area-specific considerations

The factors outlined within the SRA informed the development of a RAG (Red-Amber-Green) ranking for the different models by stakeholder groups. The focus is within group comparisons of models (i.e. RSL views of each model) rather than considering one model against the views of different stakeholder groups, and is supported by the outputs from the stakeholder consultation.

### 3.6 Dissemination

The purpose of dissemination is to drive a campaign to generate and capitalise on support from stakeholders, extend the conversation and reach and demonstrate the evidence base to Scottish Government.

As indicated previously, research findings have been culminated into two reports: A Discussion paper and Stakeholder Voice paper which has been published online on the Changeworks website<sup>1</sup>.

Research findings have also been presented and feedback sought through a series of webinars at local and national events. These included:

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<sup>1</sup> Changeworks (2021) [Stakeholder Voice Report - A just transition to low carbon heat](#)

- The Sutherland Fuel Poverty Summit
- The Highland Council Climate Conference
- Fuel Poverty Research Network -Making Decarbonisation Fair Conference.

A further presentation is due to be made at the 2022 All Energy Conference in Glasgow. Our partners the Existing Homes Alliance, who supported the project though an active role within the Steering Group, were responsible for driving the dissemination of the research outputs to influence wider policy. At the time of writing, the following activities have been completed.

1. Reference report in evidence to LGHP Committee inquiry on retrofit, and in our briefing for the retrofit debate, led by the committee. This was picked up in the committee's letter to the Minister following the inquiry and his reply. <https://www.parliament.scot/chamber-and-committees/committees/current-and-previous-committees/session-6-local-government-housing-and-planning/correspondence/2022/retrofitting-housing-for-net-zero-january-2022>
2. Send report to Head of the Heat in Buildings Team at Scottish Government for information and flag for the forthcoming Green heat finance task force.
3. Draft briefing on a 'rural transition package' – using the Stakeholder Voice report as a starting point, and obtaining commitment from the coalition government of SNP-Greens.
4. Contact steering group and seek their input/sign up to the briefing. This briefing would form the basis of a meeting with conservative MSPs and researchers who have particular concerns about rural properties.
5. Talk with steering group about media release of the briefing, and further dissemination, policy hooks (eg. resource spending review, Islands energy plan).

The report has been received with interest and widely circulated within Scottish Government. Changeworks have been invited to present to key policy and decision makers within Scottish Government.

## 4. Key Findings

### 4.1 Overview of identified models

The current journey to installing low carbon heating is fragmented and can be challenging to navigate as a consumer. The most common model is for an individual household to contract an installer to provide and fit a new heating system. The four potential models set out within the Discussion paper may serve to enable a more straightforward customer journey to roll-out low carbon heating systems at scale. Broadly, the four models defined were:

1. **Collective purchase** – The cost of heating and fabric upgrades is reduced through bulk purchasing.

2. **Payment plan** – Upfront costs for heating and fabric upgrades are spread over time and can be combined with energy billing.
3. **Community asset ownership** – Heating assets are collectively owned by users e.g., heat networks or shared ground arrays for heat pumps.
4. **Third-party ownership** – A utility company or an energy service company pays the upfront costs to develop the heating system and recoup their costs from users.

See the Discussion Paper for more detail on the four models.

## 4.2 Stakeholder consultation

As discussed previously, the four overarching models were scrutinised by a range of stakeholders within housing and retrofit sectors. The key findings from the stakeholder consultation are captured in the Stakeholder Voice document and include:

- Widespread acknowledgement from all stakeholder groups of the need to adopt new models to achieve necessary scale and pace of transition.
- Scale is key to attracting market actors, achieving efficiencies, and providing equitable access. The current voluntary and piecemeal approach will not deliver at scale or within the necessary timeframe for net zero targets.
- No model was ruled out by stakeholders, and there is an expectation that all models will be of value and will overlap.
- Unrestricted choice of products creates inertia and confusion, rather than enabling action.
- Political leadership and clear direction from local and national government is required to ensure that delivery is consistent, fair and at scale across the country.
- Some market regulation is needed to drive the transition and set standards, alongside financial incentives to reduce the risks for consumers, communities and housing providers (particularly for the third-party ownership model).
- An intermediary or third party may be required to deliver any model effectively, particularly to provide advice, procurement, and quality assurance. A one-stop-shop2 service was suggested by many. There was appetite for this to be provided at a local scale by not-for-profit organisations, but also recognition that the scale of the transition may require large-scale commercial actors to provide one-stop-shop services.
- While the payment plan, communal ownership and third-party ownership models are all viable, major legislative barriers around ownership and consumer protection exist. In addition, social acceptance of new legal arrangements may hinder the pace and scale of uptake until established and trusted.

More detail can be found within the Stakeholder Voice<sup>2</sup> document, alongside results of the SRA analysis.

## 5. Conclusion

The consultation revealed challenges across all four models for different stakeholder groups, suggesting there will be no 'one-size-fits-all' approach. Some, or all of the delivery models identified by this research will be fundamental to support wide-scale decarbonisation in a replicable, scalable and fair manner, and to meet the pace and scale of Scotland's climate change targets and timescales.

Local and area-based approaches were appealing to many stakeholders, but it was also clear that delivering decarbonisation at scale is key to attracting market actors, achieving efficiencies, and providing equitable access. To support this, Scottish Government will need to work with stakeholders to address barriers, providing both financial and political support throughout the transition.

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<sup>2</sup> Changeworks (2021) [Stakeholder Voice Report - A just transition to low carbon heat](#)