

Defining and identifying complex-to-decarbonise homes and retrofit solutions

Annex D – suggestions from the research



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Annex introduction

This annex accompanies the main report for ‘Defining and identifying complex-to-decarbonise homes and retrofit solutions’. This annex sets out suggestions for further research and development for complex-to-decarbonise homes and for the CTD Identification Framework, which was developed through this research. The annex also sets out the suggestions from the research for different critical actors for home decarbonisation – industry, policymakers, and consumer-based stakeholders. This annex is for readers who wish to understand the research suggestions in more detail and the potential opportunity areas for further research and development.

The annex uses the terminology complex-to-decarbonise (CTD) homes to describe homes which have been identified as those with one or a combination of certain physical, locational, occupant demographic, or behavioural attributes which may constrain the design and delivery of measures to improve energy efficiency, decarbonise heating, and realise occupant benefits (e.g., increased comfort and affordability of domestic heat and energy). These effects may be amplified by one or a combination of numerous system-level factors including financial (e.g., feasibility and affordability of measures), economic (e.g., supply chain and materials availability), and/or organisational capacity and capability (e.g., workforce skills).

This CTD terminology has been developed in this research and is informed by evidence which suggests several improvements on existing terminology such as ‘hard-to-treat’ and ‘hard-to-decarbonise’.

Suggestions for further CTD research and knowledge building

The research has signalled areas where more comprehensive understanding of CTD is needed, as summarised in the evidence gap analysis in Annex A. There could, for example, be additional evidence on the social factors through robust studies. The research has also identified areas where datasets are limited or not yet available through the CTD Identification Framework, detailed in Annex D.

The interviews and case studies have identified clear examples of innovation and lessons learned. Good practices and examples for CTD homes could continue to be shared with the wider sector, and a trusted source could gather and share such information (independent of product promotion) along with guidance to support a range of stakeholders. The CTD identification Framework has also raised use cases to support consumer groups and industry stakeholders with CTD knowledge.

To support the above suggestion, further monitoring and evaluation is suggested for CTD homes. This includes a) continued measuring and testing of work in CTD homes beyond the initial post-delivery period; and b) further in-depth monitoring and evaluation to cover wider impacts (such as socio-economic and place-based benefits or costs), to consistently check for unintended consequences (such as damp or higher running costs), and to utilise advanced techniques and monitoring devices (like those identified in the research for home performance testing, including smart and remote devices and thermal imaging) where possible.

There is an opportunity to revisit how CTD homes are 'valued' by considering the co-benefits from their retrofit when evaluating cost effectiveness and performance.

Suggestions for the CTD Identification Framework

The presented CTD Identification Framework could be further developed. This could be to further meet policymakers and asset owners' needs such as in mapping and analysis, or in expanding the use cases it meets, such as for industry and consumer actors. One suggestion is to develop an industry-facing product to support identification and decision-making, which aligns to PAS 2035. Another suggestion is to develop complementing guidance for use by organisations supporting and advising consumers.

This research's definition of CTD recognised that some attributes will be primary and fundamental to CTD, and others will be more secondary or 'amplifying' attributes. Users can use their judgment and expertise to prioritise (or weight) attributes in the framework according to the purpose of their analysis and its context. The framework is not prescriptive to when and the extent to which different attributes mean homes are CTD. The purpose of the research was to provide a foundational evidence base for understanding more complex stock, to provide clarity, and to inform solutions. However, the nature of attribute weights and interactions could be the subject of future research with users.

The data-agnostic and flexible nature of the framework also supports the integration of new and emerging datasets. This enables the framework to be usefully developed over time to continue to meet needs and reflect the latest understanding. Future research could therefore be undertaken to gather and utilise new datasets.

Another potential area for development of the framework is to undertake new research to map the CTD attributes to potential measures, which could in turn also map these to available cost information for the measures. This research would necessarily need to consider attribute and interacting impacts.

To further develop the framework and extend it to other use cases, deep user engagement research and product design development could expand on the current framework and meet the needs of industry and practitioners.

Suggestions for industry stakeholders

The main report presented findings on the challenges to retrofitting CTD homes and existing approaches to retrofit CTD homes. The ten case studies in Annex C provide detailed examples on how CTD homes can be addressed. These findings and case studies have informed the following suggestions for industry.

Industry stakeholders could further participate where possible in the sharing of knowledge and project learning, being transparent in where things have not worked well, open to try new approaches tested elsewhere, and open to collaborate with specialist partners. For example, partner with those who are experts in the local area and in effective, community-bespoke engagement methods.

Industry stakeholders could also look to further identify their own expertise and skills gaps for CTD homes, using the CTD attribute types and the CTD Identification Framework to guide where skills are needed for these homes (e.g., for physical, locational, occupant demographic, and behavioural attributes). The findings and case studies also identify the approaches that can be deployed, with sufficient understanding and expertise.

Industry stakeholders could utilise developments of the emerging CTD Identification Framework to further consider where a housing stock, or individual home, may have CTD attributes that need careful design and delivery, supported with relevant datasets and evidence of approaches. This includes the need to understand homes as early as possible in the retrofit project lifecycle, and to explore the wider set of attributes as covered in the CTD definition.

Industry stakeholders could also seek to further recognise opportunities to re-frame or add benefits to the retrofit offer to help shift attitudes and support uptake. Focusing on co-benefits such as affordability, health and wellbeing, home conditions, home and street environment could be particularly useful for retrofitting CTD homes with occupant demographic and behavioural attributes.

Suggestions for policymakers

The main report presented findings that considered the current policy, regulatory, and funding environment of CTD homes. These findings included:

- Finding 4, on the limitations on existing information and data, which the CTD Identification Framework can address by more comprehensively mapping CTD homes.
- Finding 5, that there is limited and dispersed expertise and skills availability for some aspects and types of CTD homes.
- Finding 6, that the policy environment can be inconsistent/challenging for CTD homes.
- Finding 10, that PAS 2035 has brought important improvements, but it could go further.
- Finding 14, that monitoring and evaluation is critical, and lessons learned for CTD can be better captured and disseminated.

These have informed the following suggestions for policymakers.

Policymakers could support further robust analysis of the impact of policies on CTD homes, potentially by redesigning existing frameworks or developing new ones that further enable the detailed analysis of the large CTD stock within the UK.

An identified opportunity for policymakers is to further utilise funding scheme monitoring and evaluation (M&E) to capture what works and does not work for retrofitting CTD homes, and continue to disseminate good practice and guidance.

Policymakers could shape the procurement and Social Value elements of tenders to further require that suppliers propose suitable approaches to deal with vulnerable residents, reduce disruption, and engage residents fairly, clearly, and effectively.

Policymakers could further consider where a focus or explicit addition of co-benefits is important for retrofitting CTD homes, as detailed above for industry stakeholders.

Policymakers could further consider the need for a long-term strategy for dealing with the challenges from CTD homes, within the context of the Heat and Buildings Strategy. The need to further consider the long-term challenges, and policy approaches in response, was also highlighted by research participants who recognised a need for more certainty and coordination to support an industry-shift towards longer-term investment in retrofitting CTD homes.

The research has also identified a need to further increase the availability of expertise and skills to understand and address CTD homes in effective and considered ways. Policymakers could utilise the CTD Identification Framework here, where one illustrative example reflects mapping to identify skills needs.

Suggestions for consumer-based stakeholders

The main report presented findings on the challenges to retrofitting CTD homes and for the evidence on existing approaches to retrofit CTD homes. The ten case studies in Annex C also provide detailed examples for how to effectively address CTD homes. These findings and case studies have highlighted the important role in resident-centred and bespoke engagement through the CTD homes' retrofit project lifecycle, from early engagement to design and post-intervention M&E, and the important role of dedicated people-based and social organisations. These findings have informed the following suggestions.

Consumer-based stakeholders could continue to pursue and request available and new evidence to support consumers with broad understanding of the benefits and approaches to retrofit, to navigate difficult terms, and to disseminate knowledge of consumer protection and what to look for from installers. This necessarily needs to be supported with clarity and potential developments of retrofit standards and protections for residents.

These communities and organisations also have a really important role to help disseminate further knowledge in good home maintenance practices and in home habits with new technology, ventilation practices, and low carbon heating systems. The research findings and case studies present good practices for doing this and are supported by the new CTD terminology. Consumer-based stakeholders could also further support dissemination of this terminology and the message that CTD homes need not be left behind.

These stakeholders could continue to help represent the voice of consumers, in their retrofit needs through the user journey and of good practice asks of contractors in the design and delivery of retrofit, especially where homes are CTD in one or more attributes. This could consider fairness, inclusive engagement, and the minimising of disruption, reflecting an aim to work with residents.

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