Programme Area: Smart Systems and Heat

Project: WP3 Business Model Development

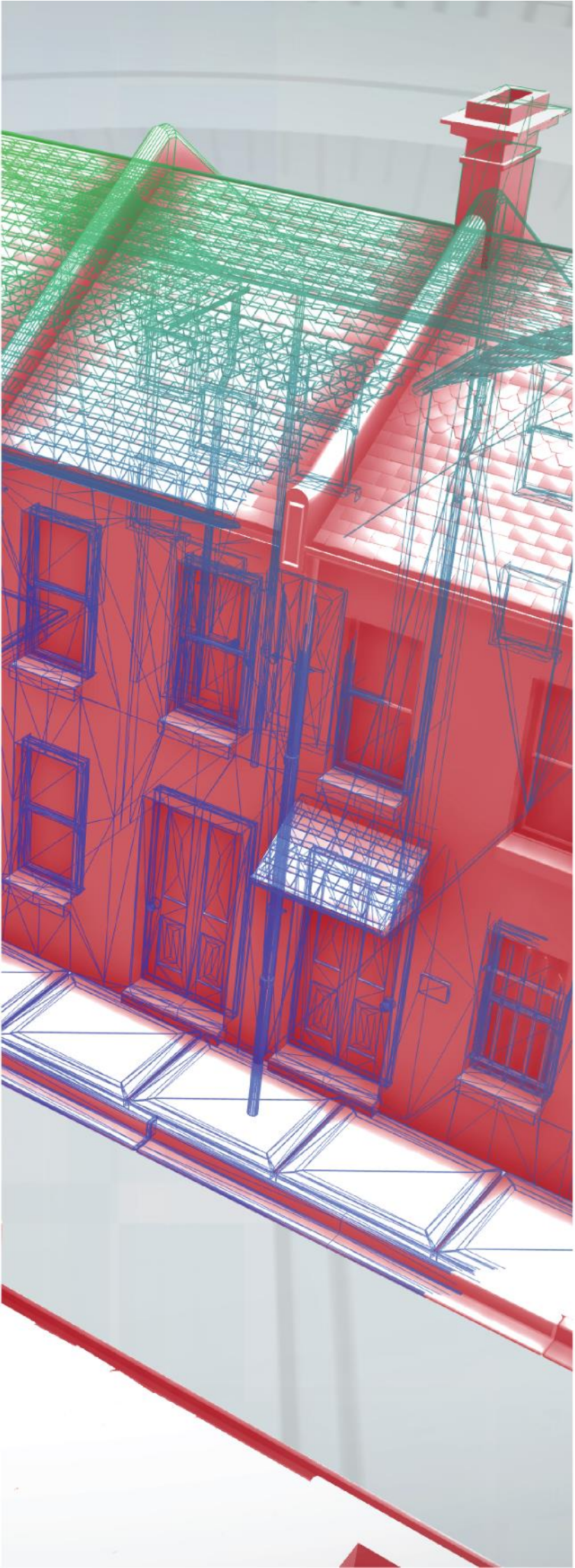
Title: Business Model Summary Report

Abstract:

The deliverables have been produced by the Energy Systems Catapult as part of the Smart Systems and Heat Phase 1 Business Model Development Project within Work Package 3 as Listed Deliverable WP3 – LD1. The Listed Deliverable package comprises a main and summary report (with supporting appendix) outlining five promising consumer business models to transform low carbon heating and well-being in the home in support of ETI Framework Agreement Outputs 3.1a and 3.1g. This aims to stimulate new thinking for business models to be introduced into the market from 2020 that are attractive to customers and investors, to test thinking about wider policy and market development and provide options for future demonstration projects within the Smart Systems and Heat Programme.

Context:

The case for heat decarbonisation is widely acknowledged, with studies showing that it is more cost effective to tackle CO2 emissions from buildings than cutting more deeply in other sectors. The real challenge is establishing new heating solutions that substantially remove natural gas use from homes whilst making the solutions financially viable and attractive to consumers. Around 20,000 homes each week will need new heating system installations between 2025 and 2050 to meet decarbonisation targets; a rate fifty times greater than achieved to date. The current market will not deliver at scale for residential low carbon heat transition given: unappealing consumer propositions, a fragmented industry structure, a lack economic drivers and need for holistic policy framework. The Energy Technology Institute commissioned the Energy Systems Catapult to deliver a business model development project to develop a number of specific business propositions that could stimulate new thinking for models to be introduced into the market from just before 2020 through to the late 2020's.



Business Model Development

Five promising consumer business models to transform low carbon heating and well-being in the home

Summary Report

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Introduction

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The Energy Technology Institute commissioned the Energy Systems Catapult to deliver a business model development project to develop a number of specific business propositions that could stimulate new thinking for models to be introduced into the market from just before 2020 through to the late 2020's.

Previous work identified the requirement to address a number of barriers across the design of markets, the characteristics of interventions and the fulfilment of consumer's needs. Harnessing the initiative of business was identified as crucial to overcome barriers to uptake, finding added value for consumers similar to many other markets, and dealing with the complexities of new low carbon installations potentially using new, innovative Home Energy Management Systems and new commercial roles and offerings.

New ways of positioning low carbon solutions to householders

Current business models have focused mostly on payback against energy savings and retained a technical sales approach of separate items linked to units of energy rather than outcomes. Financing of these expensive interventions is mostly via upfront cash payments and is unpredictable in quantum and in its timing. The need for and value of energy efficiency and low carbon heating are constant but the current sales approach is underdeveloped when compared with the marketing of other consumer products and services. As a result, there is limited interest in and uptake of low carbon heating solutions. Almost all successful consumer products and services are sold based on the value of outcomes and aspiration by trusted providers. Technology is usually a secondary issue and hardware and services are frequently packaged together. In addition, a range of financing options to ease purchase are readily available (e.g. pay-as-you-go and contract leasing in car & mobile phone sectors) thereby reducing the affordability barriers. Turnkey system offerings which bundle both the entire hardware package and associated services are common.

The industry requires a change in thinking with a move towards consumer orientated marketing approaches (non-technical) and outcomes, providing financing flexibility to make affordable for all and an optimised full home solution approach.

The value of well-being and comfort (Fig 1.) in a home goes far beyond the single vector of energy savings. There are many other issues and benefits that are influenced by the choice of heating technology, state of building insulation, approach to appliance servicing and method of selling and payment. These may have a greater bearing on perception of value and create more engagement than an uncertain forecast of savings in kWh and annual energy spend.

Fig 1. More value in well-being than kWhs

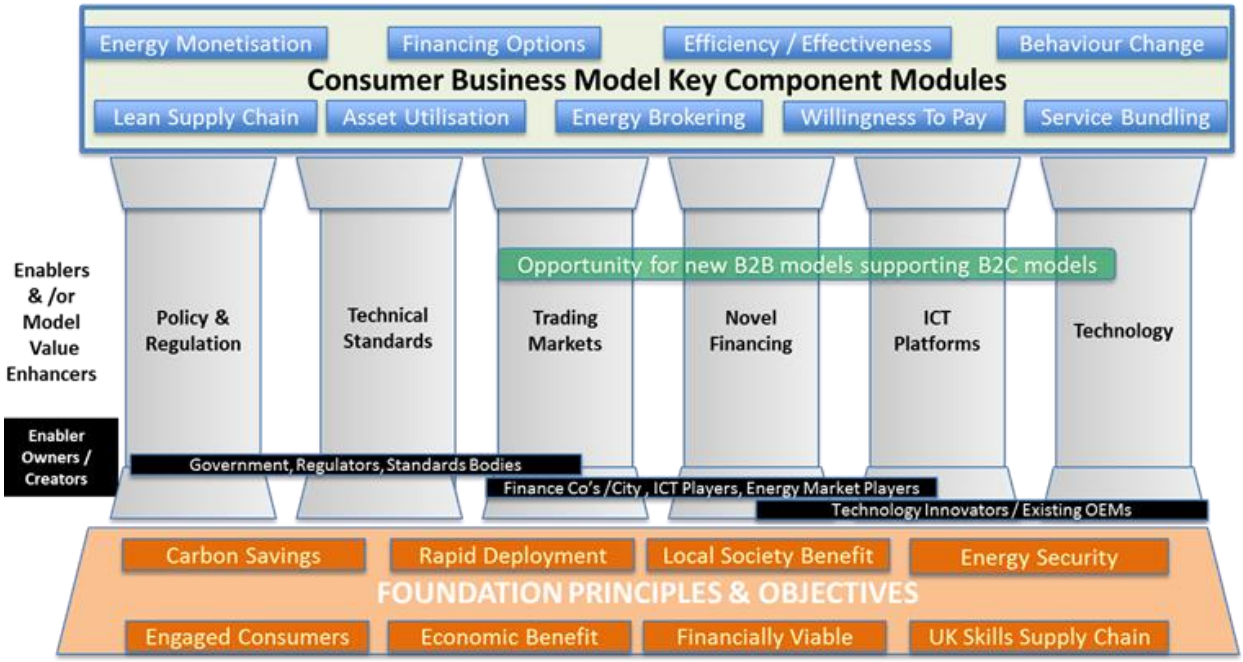
Marketing home insulation or new heating technologies against energy savings and payback alone, offers little chance of success. Payback periods are often over 10 years and frequently longer than the product lifetime. By harnessing all the sources of value and changing the way in which financial and benefits are presented and packaged to the consumer, there is an opportunity to demonstrate affordable and enhanced well-being linked to home and heating system upgrades.

Compared with predicted energy bill savings for home and heating upgrades of £10's to low £100's per annum, the value associated with improved health (e.g. reduced risk of asthma, better ventilation etc.), better control and comfort, peace of mind (e.g. no surprise bills or risk of costly repairs) and house value, could be much larger and perhaps more than offset the additional cost (after the impact of cost & policy enablers) of the low carbon upgrade (e.g. insulation, new heating and controls) when considered at the annualised cost or value basis.

Developing the new business models

A significant number of initial business model ideas were assessed and from these nine underlying **Key Components Modules** were identified (see Fig 2). For each Key Component Module, there were between 2 and 10 sub-module elements identified (e.g. Financing Options sub-modules included among others mortgage-based financing, allocation of FIT/RHI income, lease financing …) Dissection of all the original business model concepts revealed over 55 sub-module elements.

Fig. 2 The Business Model Architecture identified during the project



Six classes of market Enabler (shown as pillars in Fig 2.) were identified. These facilitate or may even be vital for the success of a Business Model or the applicability of a Business Model component.

To facilitate the development of new business model ideas and their optimisation, a toolkit in the form a card game was devised. Using a 'palette' of the sub-module elements new business models could be constructed with the ability to explore how elements could be combined or be phased over time or be added as optional extras within a business model.

Five complementary business models to stimulate new thinking

Addressing affordability & engagement in residential low carbon heating for all homes & consumers, including the fuel poor.

Home Service Company	Consolidation of utilities, local taxes & other home running costs into a single monthly fixed charge whilst optimising efficiency and convenience. Akin to serviced accommodation but applicable to homeowner, rented and social sectors.
Home Comfort Contract	Long term contract, with flexibility, whereby the supplier undertakes to guarantee and cover all necessary investments for an agreed comfort / temperature level for a fixed monthly price. Electricity retail offer combined.
Home Moderniser	An aspirational home upgrade & improved occupant well-being through major improvement of insulation, controls, low carbon heating system within a full system approach. Financed via the mortgage and/or cash contribution from the homeowner
Neighbourhood Heat & Electricity	A community-scale low carbon heating & power solution option with a strong local identity. Using distributed generation and storage assets run for the community providing heat via local networks supplemented, as necessary, by in-home heating technologies.
Urban Renewal	Accelerated regeneration of old, poor quality & lower density housing stock to provide more housing, urban renewal & near zero carbon homes, funded in part from the value created by higher dwelling density & home value / rental enhancements & more efficient use of land.

These models are not exclusive, can take effect with existing and other new business models – and can be combined (e.g. Home Comfort Contract with Home Service Company). Some households will have two or more business models that would sensibly apply.

Given that approximately three quarters of the UK housing stock will require lower levels of home insulation upgrade, with a focus on conversion to low carbon heating systems, Home Comfort Contract and Home Service Company are likely to be the dominant models. Urban Renewal is not consumer choice but will play a part to deal with the very worst housing stock during a long term local authority-led plan.

Enablers play an important role in the success of new business models

Analysis suggests that the most significant Enablers would be Policy, ICT and Standardisation. It is notable that none of the business models depends on new clean technology per se and that financing typical for other sectors could be sufficient to move the market forward. Trading of energy, whilst helpful, was after initial indicative quantitative analysis, deemed to have a minor impact in the value or cost of the home heating provision

Novel Financing	Using methods common in other sectors for smoothed long-term financing at competitive rates
Policy & Regulation	Permitting new providers to sell energy as a service and bundle utility offering, all with an obligation to reduce CO_2.
ICT Platforms	Home Energy Services Gateway: an 'open' platform for service providers to deliver new, bespoke and innovative products and services & empower customer.
Technical Standards	Standardising equipment specifications and installation to reduce cost and facilitate skills base.
Trading	The ability to monetise demand flexibility, storage & generation at individual household level
New Technology	For example, to reduce cost or increase capacity of energy storage

Policy has a vital or enhancing effect on almost all the business models. Aside from the assignment of CO_2 reduction obligations on new providers using the business models, Policy could enhance the financial case in favour of low carbon heating versus gas boilers.

New ICT such as Home Energy Services Gateway (including improved smart controls) would be vital for assured levels of comfort and provision of heating and power at the optimum cost. Transfer of ICT approaches used in the commercial sector could also enhance ability to trade demand shift at an aggregated level, provide condition monitoring of heating systems and offer machine learning to optimise control.

Consumer feedback and quantitative analysis

The models are at an early stage in their development and validation. Accordingly, the qualitative (consumer research) and quantitative analysis were conducted at a high level to understand the indicative viability of a model and any key sensitivities and concerns at a stage when models can be easily adapted.

Consumers generally responded positively to business model ideas when presented at a high level. Comfort outcomes, fixed bills, and one aggregated household bill were particularly well received being perceived as easier and reducing hassle. Neighbourhood Heat was felt to be more efficient, cheaper and safer than home gas boilers. Some participants suggested combining all 4 models. Participants highlighted that models must offer flexibility to the consumer and be supported by success stories to give confidence. A lack of trust in heating providers & installers arises from the complicated nature of heating systems and heating costs being opaque and difficult to control.

Whilst the quantitative analysis was conducted at very high level, with the assessment of the soft (willingness to pay) benefits in particular being quite subjective – and needing much more consumer insight work – the approach of annualising the cost of well-being demonstrated that the business models may create a viable value proposition for the householder versus the 2020 counterfactual.

Recommended Next Steps – taking to market

- There is still much to be done to engage the market on new thinking to help inform options for new business model selection in low carbon demonstrators and market trials in the near future.
- The models are at a concept stage and require additional validation and refinement before they are robust enough to warrant significant investment and commitment by stakeholders and commercial partners who may deliver them.
- Most importantly, perhaps, is the need to **determine, via consumers, the pricing and likely take-up level of the models.** Other next steps include **more extensive stakeholder consultation** to better understand the **challenges of practical deployment** and thinking to help **inform policy change.**

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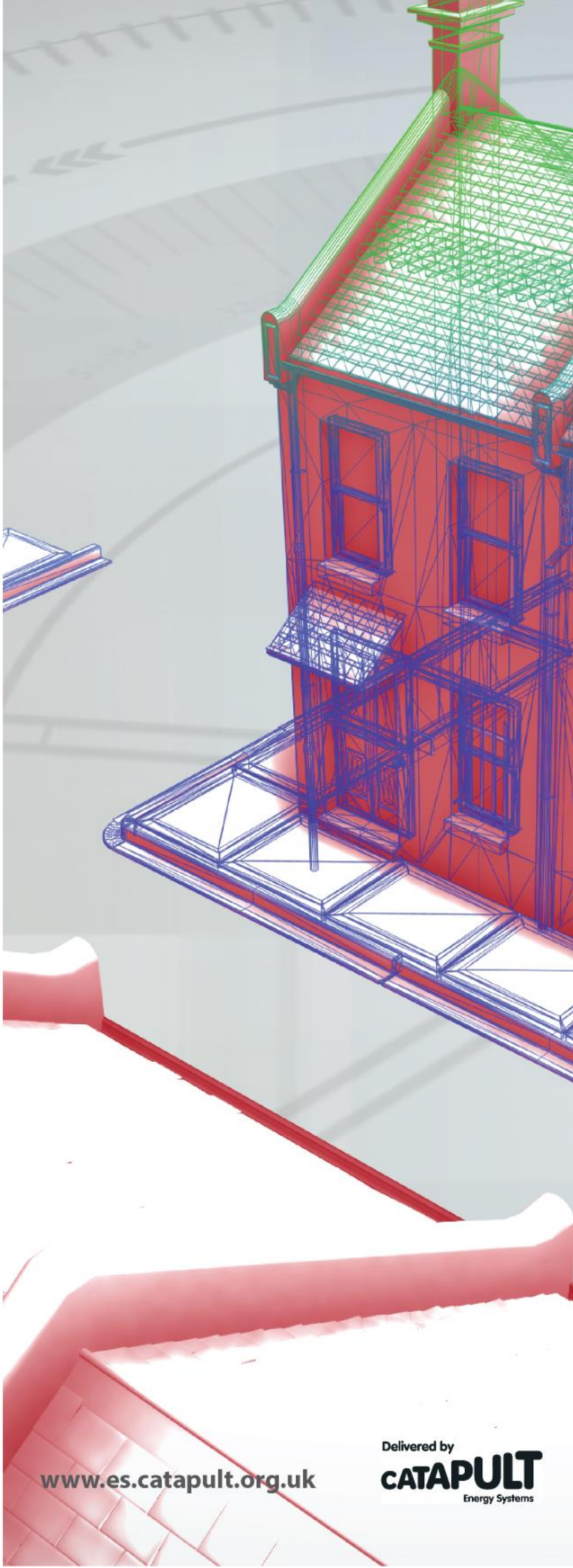

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