Programme Area: Smart Systems and Heat

Project: Value Management

Title: Overcoming barriers to smarter heat solutions in UK homes - Annexe 3d: Elements of business model offerings

Abstract:

This document was prepared at the time to contribute to ETI internal thinking and planning only.

Context:

This project studied how value can be delivered across a smart energy value chain - in the context of the UK. It built a clear understanding of how smart energy systems can deliver combined consumer value alongside commercial value for market participants - producers, suppliers, distributors. The analysis will help to make the commercial deployment of smart energy systems more likely. This £600,000 project was delivered by Frontier Economics, a leading economic consultancy.

Overcoming barriers to smarter heat solutions in UK homes

Annexe 3d: Elements of business model offerings

PREPARED FOR THE ETI

March 2015

1 Introduction

In this work, we have considered how business models may be able to overcome barriers to the uptake of low-carbon heating interventions. Business model providers offering such interventions may be able to incorporate various additional elements (for example, contracts that reduce risks) to make the overall proposition more attractive for consumers. However, consumers may also be able to obtain these types of service alongside incumbent technologies such as gas boilers.

In this annexe, we explore the extent to which various business model elements can enable low-carbon interventions to be more competitive.

- First, we set out some simple examples to show how different business model elements may be able to make low-carbon interventions more attractive relative to incumbent options. Such business model elements must be *complementary* to the low-carbon technologies to have any impact.

- Next, we set out a number of different business model elements that could be offered alongside low-carbon heating interventions. We examine to what extent each element is complementary to the interventions, potentially increasing uptake. We consider in particular whether the element may be more or less applicable to specific groups of customers, drawing where possible on insights from BMET.

- The analysis described in the previous section indicates that different groups of customers may value different elements of business models. We therefore explore to what extent such "tailoring" of business models may be possible.

- Finally, we describe the implications this work may have for future quantitative modelling of uptake, such as that in BMET.

Overall, the analysis in this section suggests that many barriers to smart systems and heat intervention take-up can be mitigated through an "outcomes provider" business model, which combines elements such as risk reduction, access to finance, and access to information. These will tend to increase the attractiveness of low-carbon interventions relative to the alternative of keeping heating incumbent technologies and avoiding retrofits. Two business model elements in particular may improve the proposition provided by heat pumps compared to gas boilers.

- **Providing fixed-bill contracts**, as described in the illustrative example below. For customers that place a strong value on risk avoidance, a heat pump with a fixed price guarantee may be more attractive than a boiler

without such a guarantee. Such a business model may be less suited to gas boilers given the very high hedging costs that may be required in the future, given the higher running costs of gas boilers (especially if policies eventually lead to gas and electricity prices reflecting their carbon content). This business model element is complementary to a heat pump, as it leverages the high upfront cost / low running cost nature of the technology.

- **Using heat pumps and HEMS to provide DSR services** to entities such as suppliers, DNOs, and National Grid. By sharing the benefits of such contracts with consumers, the value of a heat pump is increased. Again, this business model element is complementary to a heat pump, utilising the way in which a heat pump (and not a gas boiler) is electrically powered and dispatchable.

However, it is far from certain how effective such business models would be. The costs and benefits of fixed-bill contracts are difficult to quantify (they depend on consumer behaviour in the presence of uncertainty, which as explained in annexe 3a, does not lend itself to bottom-up modelling). The gains from DSR to a household might be less than £50 per year,[1] which seems small in the context of the wider barriers to take-up. Finally, these contracts do not address the barriers to insulation take-up even though (as discussed in the main report), this is likely to be a significant problem for many households.

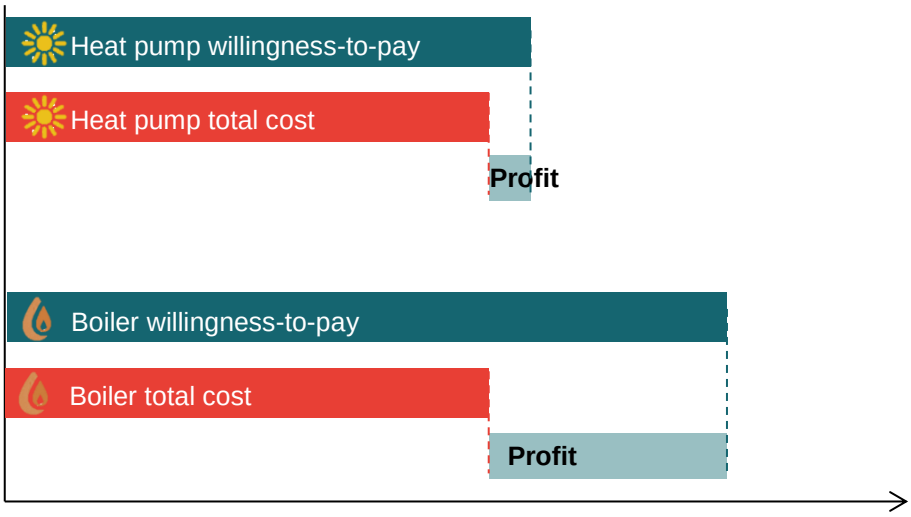
[1] Based on current payments to US customers on the Nest "Rush Hour Rewards" tariff. We note that the demand for DSR could increase in the future, leading to higher payments – although increased electrification of heat and transport could also increase the supply of DSR, having an offsetting effect.

2 Complementary business model elements

In this section, we use an illustrative example to show that some business model elements might complement low-carbon heating interventions, but that others may not.

Consider an energy supplier looking to sell a heating technology[2] at a time in the future when the total lifetime costs of heat pumps and boilers are equal. The business model provider can choose whether to include a gas boiler or a heat pump as part of the package. If customers are unsure about the efficiency of a heat pump (and their resulting bill payments), they may be willing to pay less for the package with the heat pump. In this case, competing against other businesses offering gas boilers,[3] the business model provider would do best to offer a gas boiler themselves. This is shown in **Figure 1**.

Figure 1. Heat pump compared to a gas boiler



Source: Frontier Economics

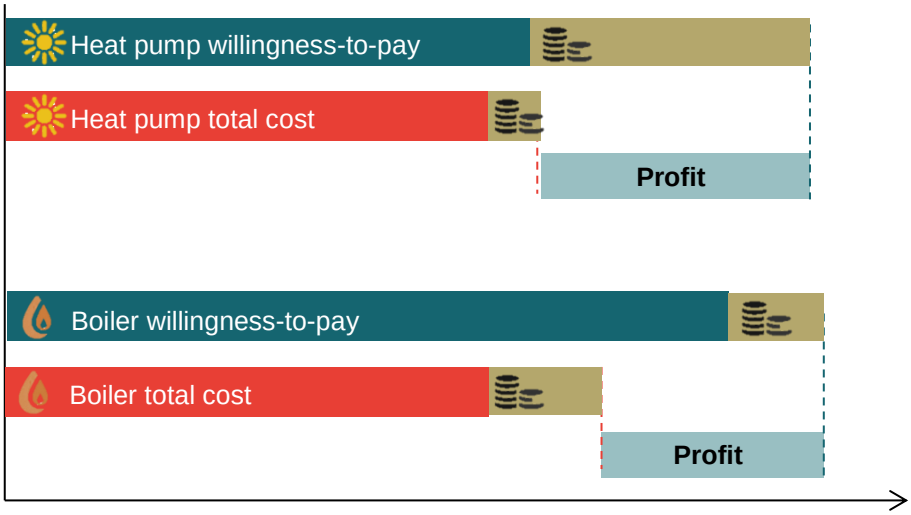
However the supplier may be able to do better by adding another element to the business model. For example, the supplier could promise to keep bills at a fixed monthly level. This would remove customers' risk, which might increase their willingness to pay. The supplier's costs would also increase as it would need to hedge its fuel purchases. But, if hedging costs are sufficiently low compared to

3 In BMET, we refer to the next-best alternative available to customers not taking up the business model as the counterfactual.

consumer risk-aversion, the resulting business model may be competitive compared with offering a boiler without the fixed bill.

Before concluding that offering a heat pump with such a contract was optimal, the supplier would also wish to consider whether it could do better by offering the new contract with a gas boiler. This may not be the case: if gas boilers have higher running costs than heat pumps, the hedging costs may be greater. If so, then the addition of the "fix bills" business model element could help increase heat pump uptake[4]. This is illustrated in **Figure 2**.

Figure 2. Heat pump compared to a gas boiler, both as part of a "fixed bill" package



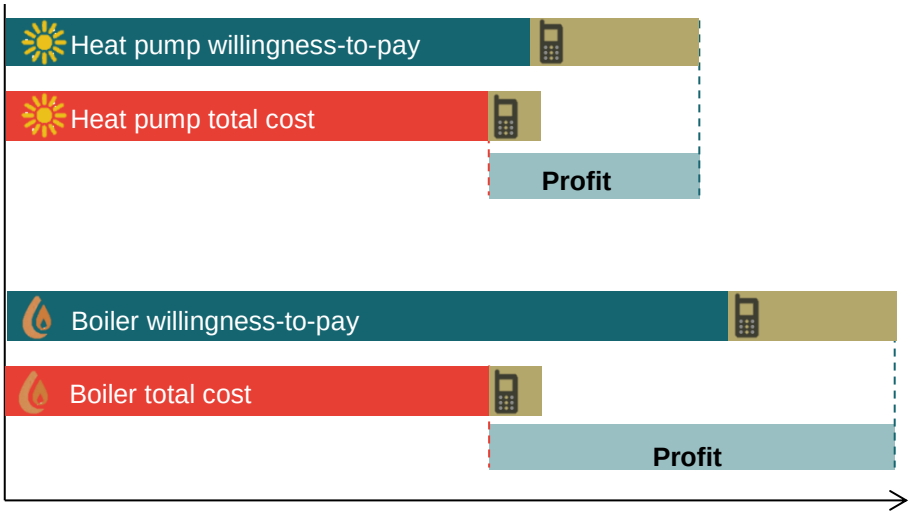
Source: Frontier Economics

Note that it is not enough to simply add any element onto a business model that increases customer willingness-to-pay more than it increases cost. For example, consider a business model that bundled in a mobile phone contract. Such a contract might make the heat pump package more attractive. However, it would have the same effect on the gas boiler package – there is nothing about a heat pump that makes a mobile phone cheaper to provide, or provide greater value to the user. A rationale business offering this business model would choose to bundle the phone with a gas boiler. This is illustrated in **Figure 3**.

4 This example is purely illustrative as many other factors would also influence the relative hedging costs such as the volatility of different fuel prices and the liquidity of traded markets for the length of contract being sought.

Complementary business model elements

Figure 3. Heat pump compared to a gas boiler, both as part of a "energy and telephony" package



Source: Frontier Economics

These purely illustrative examples have shown that adding additional elements to a business model can only help the take-up of low-carbon heating interventions if they are *complementary* to the interventions (and not to a higher-carbon alternative). In this context, "complementary" means that either the business model element:

- is more cost-effective to provide with the low-carbon intervention than without; or
- adds more value alongside the low-carbon intervention than without.

3 Elements of business models

When looking at what business models can do, their services can be broken down into a number of different elements including:

- reducing risks;
- spreading costs;
- reducing hassle;
- bypassing the need for awareness and interest;
- obtaining a service from consumers; and
- reducing costs.

We have considered each of these in turn, looking at the extent to which they reduce barriers to intervention uptake. Crucially, we have considered whether each element is particularly suited to low-carbon interventions (such as heat pumps), or would provide just as great a benefit to a business model that provided alternatives such as gas boilers. This is summarised in **Table 1**.

Table 1. Summary of business model element analysis

Business model element	Examples	Which groups is it relevant to?	Is it complementary to low carbon interventions?	Likely impact
Reducing risks	Fixed-price energy contracts Fixed interest mortgages Mobile contracts (fixed bill)	Groups which are averse to uncertain fuel bills (potentially those with high energy usage and low income – the fuel poor). Groups which have a high subjective uncertainty of technology performance.	Generally **yes** – customers may perceive greater performance risks with low carbon interventions. However, if uncertainty relates purely to fuel prices, this may not be the case.	Lessens the disadvantage associated with low-carbon technologies. Could lead to an overall increase in the value of heat pumps compared to gas boilers if consumers have a sufficient aversion to technology performance risk.
Spreading costs	Mobile contracts Boiler finance Mortgages	Groups which are credit-constrained (i.e. do not have access to large amounts of funds).	**Yes** – all interventions we have considered involve higher capital costs than the alternative.	May lessen disadvantages associated with low-carbon technologies, but cannot make them better than the alternatives.
Reducing hassle	Boiler provider bundles product, installation and maintenance	May apply to all consumer groups, although some individuals may have a greater propensity to pay for hassle avoidance.	**Yes** – most interventions we have considered are likely to involve greater during the installation process	May lessen disadvantages associated with low-carbon technologies, but cannot make them better than the alternatives.

			hassle than the alternatives.	
Bypassing the need for awareness and interest			**Yes** – customer awareness is typically lower for low-carbon interventions than alternatives.	May lessen disadvantages associated with low-carbon technologies, but cannot make them better than the alternatives.
Obtaining a service from customers	Rent-a-roof schemes Flow Energy boiler[5]	Applies to all consumers.	**Yes** for HEMS and heat pumps, which can offer DSR services Insulation and district heat are less likely to benefit from this business model element.	Improves the case for HEMS and heat pumps. However, the savings might be relatively low compared to the cost of a heat pump (as discussed below, this is based upon existing payments for similar services in the US).
Reducing costs	Any business model that obtains economies of scale	Applies to all consumers.	**Possibly**– factors such as economies of scale that drive down costs will make costly interventions more	Entirely dependent on the scale of any cost reductions that can be achieved.

5 Flow Energy is shortly due to launch a scheme with some similarities to rent-a-roof, where finance payments on a CHP boiler are paid off over five years of feed-in-tariff payments. See http://www.flowenergy.uk.com/deals-packages/pays-for-itself/

		attractive than the do-nothing alternative (or replacement boilers). However, cost reductions would need to be material, and produce a greater absolute decrease in the cost of a heat pump than a gas boiler.

Source: Frontier

3.1.1 Reducing risk

A wide variety of business models take risk away from the consumer. These include boiler maintenance and insurance contracts (transferring the risk of the appliance breaking), fixed price energy and mortgage contracts (transferring the risk of price changes), fixed fee telecoms bills (transferring both price and volume risk).

As explained in annexe 3a consumers are generally assumed to be averse to uncertain outcomes, and willing to pay more to ensure no risk of a bad outcome. The types of risk that could be relevant to installing interventions include:

- **Price risks** – for example the per-unit prices of gas and electricity, which will affect both total bills and the return from interventions.
- **Technological risks** – for example, whether a heat pump will work as well as advertised, given the unique nature of each home, and a lack of information on how the technology performs.
- **Financial risks** – for example how consumers' income will vary, which may affect their ability to service loan repayments.
- **Hassle-related risks** – for example, consumers may be unsure how long they may be without heat services during installation.

How does this provide value, and to which types of consumers?

Business model providers may be less risk-averse than consumers. Additionally, some (but not all) of these types of risk can be eliminated by a business model provider – either since they have greater knowledge of interventions and so have a lower *subjective* perception of risk, or can diversity away risks such as a heat pump happening to be less efficient in one property.[6] A business model is looking to take on such risks from consumers when it can do so at a cost that is lower than the benefit to the customers who dislike the risk.

It may be impossible to for the business model provider to remove other sources of risk. For example, a business model provider that sought to fix bills over a long period would likely purchase energy in advance on the futures market to avoid the eventuality that the market moves far against them. This hedging will come at a cost. Within BMET, we have assumed that purchasing energy up to five years in advance at a fixed price will incur a hedging premium of 10%. A business model that incorporated a fixed bill element would therefore only appeal to customers whose value of risk exceeds the cost of hedging. Customers with a lower value of risk would actively dislike this element of the business model.

---

6 Indeed, the capital asset pricing model suggests that firms should only consider risks that are entirely non diversifiable – i.e. those that are positively correlated with the market as a whole.

Is this business model element complementary to low-carbon technologies?

Fuel price risks may actually be lower under these technologies, since they typically trade higher up-front costs for lower running costs.[7] As such, business models which reduce fuel price risks may actually lessen what would otherwise be a unique selling point for low-carbon interventions.

However, customers' perceived uncertainties regarding factors including performance and hassle may be higher for low-carbon technologies such as heat pumps, district heat, HEMS and insulation than the alternatives (continuing to use a technology such as a gas boiler, without any other upgrades). Business models that can mitigate these types of risk may therefore increase the relative attractiveness of all these technologies.

What insights can we draw from BMET?

We used BMET to model a group ("Older Established") that would find a heat pump just cost-effective in 2040. This group would face heating energy bills of approximately £800 a year with a heat pump, and £1,900 a year with a gas boiler.[8] If the business model provider incurred a 10% premium in hedging fuel costs, they might be able to provide a fixed-bill contract for £110 less with the heat pump. If consumers perceived the heat pump to have greater price risks than the gas boiler (despite the gas boiler having higher running costs), it seems plausible that such a contract could make heat pumps more attractive compared to gas boilers. However, additional empirical research with customers would be required to find out if such gains could be realised, and whether they would be significant in the context of the high up-front costs of heat pumps.

3.1.2 Spreading costs

Business models may seek to smooth the high upfront capital costs of some interventions over a longer period. This can be seen in the various contracts that provide finance for a long-term investment such as a boiler, a phone, a car, or a house.

How does this provide value, and to which types of consumers?

As set out in annexe 3b, spreading of upfront costs can provide value to consumers in two ways.

---

7 The risks will also depend on the relative volatility of future gas and electgricity prices, which we have not modelled.

8 In both instances, we assumed that HEMS has also been installed. The gas boiler costs are sigifniciatnly higher than with the heat pump since it is assumed that the price of carbon is included in the cost of both gas and electricity, as a proxy for government policies aimed at decarbonisation.

First, **some consumers may be credit constrained** – realising that an intervention will provide value over the long-run, but unable to afford the initial capital payment. Business model providers that have greater access to credit may be able to avert such constraints for those customers who are able to access credit.

Second, **some consumers may place a greater value on short-run costs and benefits than business model providers**. By re-profiling costs to fall later, a business model provider can profitably encourage such consumers to take up interventions. As described in annexe 3b, this will only be feasible if the business model provider can expect to recover any sunk costs within the life of the contract.

Is this business model element complementary to low-carbon technologies?

The low-carbon technologies that we have considered have a higher capital cost than the alternative: Heat pumps cost more than gas boilers, while insulation retrofits and HEMS are capital expenditures that a consumer could avoid altogether. District heat is also associated with high setup costs, albeit at the community level rather than per individual household.

As a result, business models which spread payments are likely to increase the attractiveness of low-carbon interventions relative to the alternatives.

What insights can we draw from BMET?

Within BMET, the business model provider is assumed by default to spread intervention payments over five years. The profit that the business model provider makes on both interventions and fuel must be sufficient to cover their cost of capital (10%).

The analysis in annexe 3c on intervention take-up order compares intervention cost to the credit constraints in BMET, to consider what proportion of households may be able to afford each intervention. **Table 2** carries out a similar analysis.[9] This shows that, while the provision of finance may make relatively little difference to boiler uptake (most consumers are already assumed to be able to afford a boiler), it can have significant increases in the proportion of customers that may find a low-carbon heating intervention affordable.

---

[9] Unlike the analysis in annexe 3c, the gas boiler cost is shown separately, rather than being net of the heat pump cost. Note that due to the small number of BMET groups, this analysis is not granular: small changes in yearly costs will not lead to a change the groups where credit constraints are modelled as binding.

Table 2. Effect of spreading costs on the affordability of different interventions

Intervention	Upfront cost	Proportion of households that can afford	Yearly repayment over 5 years at 10%	Proportion of households that can afford
Internal wall insulation	£28,000	0%	£7,350	15%
External wall insulation	£10,000	15%	£2,690	70%
Heat pump	£10,000	15%	£2,690	70%
Cavity wall insulation	£1,000	70%	£250	100%
HEMS	£600	70%	£160	100%
Gas boiler	£2,500	70%	£660	70%

Source: Frontier Economics

3.1.3 Reducing hassle

A business model provider may reduce the hassle associated with intervention installation. For example, this could involve co-ordinating the various contractors required to install the intervention, or ensuring that multiple interventions are installed at the same time, minimising hassle.

How does this provide value, and to which types of consumers?

To the extent that all consumers dislike hassle, any business model which can avert it will provide them with benefits. Overall value from the interventions will be increased if the value the consumer places upon the reduced hassle exceeds the cost of implementing it.

Is this business model element complementary to low-carbon technologies?

Some low-carbon technologies are associated with greater initial hassle than the alternatives: Insulation and HEMS[10] are new interventions that would not otherwise be installed. Solid wall insulation can involve particular hassle to

[10] Once installed, HEMS can decrease hassle by managing temperatures effectively. However, this is an intrinsic benefit of the technology, not a business model element that can be packaged with it.

install, so any business model that can mitigate this would increase the relative attractiveness of this intervention. While the domestic heat exchanger unit for a district heat system is relatively small, there may be some hassle involved in connecting it to the network.

What insights can we draw from BMET?

BMET considers the hassle involved with intervention installation time. However, as this is assumed to be identical regardless of whether the business model provider or the consumer is installing the intervention, it does not drive uptake of the business model.

In practice, an integrated business model may help overcome other aspects of hassle. This is therefore an area where further quantification could be useful.

3.1.4 Bypassing the need for awareness and interest

A business model might directly increase customer awareness of interventions (for example through advertising campaigns). Alternatively, by bundling up various interventions in an all-encompassing "heat service", a business model may entirely remove the need for consumers to know about the intervention before it is installed.

How does this provide value, and to which types of consumers?

This business model element is likely to be most effective for those customer groups which are currently not highly engaged in the market.

Is this business model element complementary to low-carbon technologies?

Customer awareness of the various interventions is generally low – either since they are relatively new to the domestic sector (e.g. heat pumps and HEMS), or are currently not being rolled out at a large scale (e.g. solid wall insulation and district heat). By contrast, consumers will be familiar with their incumbent technology (generally a gas boiler).

It is therefore likely that business models providing additional information and awareness to consumers will increase the relative attractiveness of low-carbon interventions.

What insights can we draw from BMET?

BMET assumes that customers initially have a high inertia against installing unfamiliar interventions. This is reflected through a £1,000 "additional hassle factor" incurred when interventions are installed within the counterfactual. This hassle factor gradually decreases through time (halving every five years), as customers become more familiar with the interventions.

To determine the effect this has on intervention take-up within BMET, we examined customer counterfactual uptake without this "additional hassle factor". As a result, a large number of groups that would previously have taken up HEMS in 2020 or beyond are modelled as taking HEMS up in 2015. Take-up of other interventions does not change – either the interventions are cost-effective at such a late stage that the "additional hassle factor" is negligible, or they are so cost effective early on that this dwarfs the £1,000.

However, we acknowledge that the "additional hassle factor" is a highly simple approach that appears to contradict some ways in which consumers make intervention decisions. For example, HEMS products (Hive and Nest) are already being taken up by consumers. This is therefore an area where consumer trials may be particularly useful.

3.1.5 Obtaining a service from customers

Business models may be able to make use of a service that customers would otherwise not be capable of obtaining the value from. For example, Economy 7 tariffs make use of the flexibility of storage heaters, while "rent-a-roof" schemes use the owners' property to obtain FiT payments.

How does this provide value, and to which types of consumers?

Greatest value from this type of business model is obtained when the business can obtain a greater benefit from the service than consumers would be able to themselves. Storage heaters are a perfect example of this: running storage heaters at a different time of the night has no effect on consumers, but can produce benefits for electricity suppliers and network operators.

Is this business model element complementary to low-carbon technologies?

The roll-out of electric heating technologies with associated storage, together with HEMS to enable more sophisticated control, offers a resource for demand-side response. Business models providing these interventions may be able to offer payments for such services that customers would otherwise be unable to get (for example because they could not afford the cost of the upfront technology required to offer the service). Heat pump DSR could be aggregated and used by the following types of entity:

- the transmission system operator, to balance electricity demand and supply;
- network operators, to avert local constraints;[11] and

[11] Northern PowerGrid's *Consumer-Led Network Revolution* project recently trialled the use of heat pumps for this application.

- suppliers, to reduce wholesale and imbalance costs.

HEMS also offer the possibility for a business model provider to collect valuable data on household behaviour. However, as discussed in the mobile phone case study in annexe 1a, the extent to which consumers are willing to share their data depends on the extent to which they trust the provider, feel they are in control of their data, and receive benefits in return.

What insights can we draw from BMET?

BMET does not directly model the benefits from heat pump DSR for ancillary services (although it does consider the extent to which electricity bills can be reduced through load shifting in the presence of time-of-use tariffs). We have therefore carried out some simple calculations to determine what the value of heat pump DSR could be if used for short-term operating reserve (STOR).

National Grid currently procures approximately 4.3GW of STOR, at a cost of around £100m.[12] This implies a cost of around £20/kW. If applied to a 11kW heat pump, this would imply a potential payment of £220 per year. However, this is a significant overstatement of the available payments, since an individual heat pump will not always be available for DSR, and an aggregator will need to account for this.

Nest's Rush Hour Rewards provides payments to US households using DSR for air conditioning, and may be a more realistic estimate of the payments that households could expect to make from offering such services. This service pays between $20 and $60 a year[13] - approximately £13 to £40.

3.1.6 Reducing costs

A business model provider might be able to reduce the costs of an intervention (whether the capital costs or ongoing fuel costs) – for example, by buying in bulk, or by avoiding intermediaries in the supply chain.

How does this provide value, and to which types of consumers?

Such a cost reduction would be valuable to all consumers.

Is this business model element complementary to low-carbon technologies?

A business model which is able to reduce capital costs of interventions may make low-carbon interventions relatively more attractive, since they typically require higher upfront costs and lower running costs. Conversely, if business models are

---

12 Frontier Economics (2012), *A Framework for the Evaluation of Smart Grids*

13 https://nest.com/energy-partners/, accessed on 22/01/2015

able to reduce running costs, this might actually make low-carbon interventions (which already have lower running costs) relatively less attractive.

What insights can we draw from BMET?

The payback period annexe 3b provides further information on the extent to which lower up-front cost can drive intervention cost effectiveness. This shows that extremely high levels of cost savings would be required for interventions such as heat pumps and solid wall insulation to pay back within a short (under ten-year) period.

4 Tailoring of business models

Depending on the physical characteristics of a consumers' house, business models will need to offer a wide variety of interventions. For example,

- a poorly insulated off-grid rural home may require solid wall insulation, HEMS, and a heat pump;
- a well-insulated suburban home may just require HEMS and a heat pump; and
- houses in densely populated areas may benefit from district heat.

Further, as explained above, different types of consumers may value different aspects of a business model. For example some consumer types may:

- actively dislike elements of a business model (such as risk-sharing which is paid for through higher bills) that appeal to other types of consumers;
- already have access to finance and would prefer not to be tied into a long-term loan (others may require this); and
- be well informed and would prefer to have more control over their heating system, while others may want the business model provider to take care of everything.

Taken together, this suggests that a large number of business models may be required. To what extent can business models be tailored to match the preferences of individual customer types, without becoming unwieldy?

The existing business models described above typically offer a wide variety of options. For example, a consumer purchasing energy services through British Gas's website can choose from:

- energy tariffs that are either fixed at a guaranteed maximum or variable (both for Economy 7 and single-rate tariffs);
- optional add-ons for energy tariffs including a service to track usage online;
- a variety of boilers, provided with or without finance;
- insulation options including solid-wall, cavity and loft insulation, as part of their supplier obligations.

This suggests that a wide variety of services can be delivered under a single brand. However, there are limits to the complexity of business models. In this section, we briefly explore the implications of this.

4.1.1 Consumer decision-making

Having a large number of alternatives available can lead to consumers finding it difficult to engage with the market. In its Retail Market Review, Ofgem stated that the large number of energy tariffs could lead to consumers making fewer switching decisions, and making poor decisions when they did so.[14]

This may become a more significant issue as the proliferation of new technologies and business models leads to greater customer choice. There is a risk that many customers, faced with a bewildering range of choices, simply chose to go with their "default" option which is likely to involve keeping their incumbent technologies.

To some extent this can be overcome by limiting the choice available to consumers, as Ofgem have sought to do as a result of the RMR. For example, propositions offering heat pumps could be targeted at areas that do not have district heating networks. However any policy that substantially reduces customer choice is likely to prevent some consumers from accessing the services of most value to them.

Additionally, business models may be able to encapsulate the variety of services they offer in simpler propositions – for example, offering a "pay for comfort" service, and then installing interventions and purchasing energy as required. However, if these contracts are not standardised, they may still be difficult for consumers to compare although the increasing use of comparison websites could overcome these problems.

4.1.2 Business model profitability

If a business model provider tailors its value proposition to specific customer groups, it may expose itself to losses should other customer groups take it up. For example, a business model offering fixed bill payments may be profitable for low consumers of energy, but loss-making if taken up by high consumers.

The solution is to offer "incentive-compatible" contracts, that are only attractive to those customers that can be served profitably. One way of doing this may be acceptable use policies that limit the way customers can use services. However, enforcement may be difficult within the energy sector, where many consumers themselves will be unaware of how much energy they use. An alternative may be to use HEMS systems to monitor energy usage in the house for a period before the business model provider offers a contract.

14 Ofgem (2013), *The Retail Market Review – Final Domestic Proposals*

FRONTIER ECONOMICS EUROPE
BRUSSELS | COLOGNE | LONDON | MADRID

Frontier Economics Ltd 71 High Holborn London WC1V 6DA
Tel. +44 (0)20 7031 7000 Fax. +44 (0)20 7031 7001 www.frontier-economics.com