



HOW ACCESSIBLE ARE FUTURE ENERGY SUPPLY BUSINESS MODELS? A REPORT FOR CITIZENS ADVICE

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CONTACT:

Jennifer Arran: Jennifer.Arran@delta-ee.com
Rici Marshall Cross: Erica.MarshallCross@delta-ee.com

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Executive Summary

Executive Summary

Introduction

The domestic energy supply market is rapidly changing, primarily driven by three factors:

- Digitalisation (e.g. smart meters)
- Demand side technological development (e.g. electrification of heat and transport, smart appliances, battery storage, micro-generation etc.)
- Reforms to industry systems and processes (e.g. supplier switching and settlement)

These changes will **enable new products and services to be offered to domestic consumers.**

Therefore, it is likely that the **retail market arrangement** (known as the ‘supplier hub model’) will be **modified to address these changes.** These modifications could fundamentally change how consumers interact with the supply market.

Given these changes, it is possible that **the customer accessibility of the market could be affected** and new rules may be required to ensure that all consumers have fair access to the market.

Ofgem considers that the current regulatory arrangements ‘are not going to be fit for purpose for energy consumers over the longer term’²⁵

Citizens Advice’s key aim is:

To understand **how accessible future energy supply models** will be for different types of customer, and how measures can be introduced to **ensure that all customers can benefit from future energy markets.**

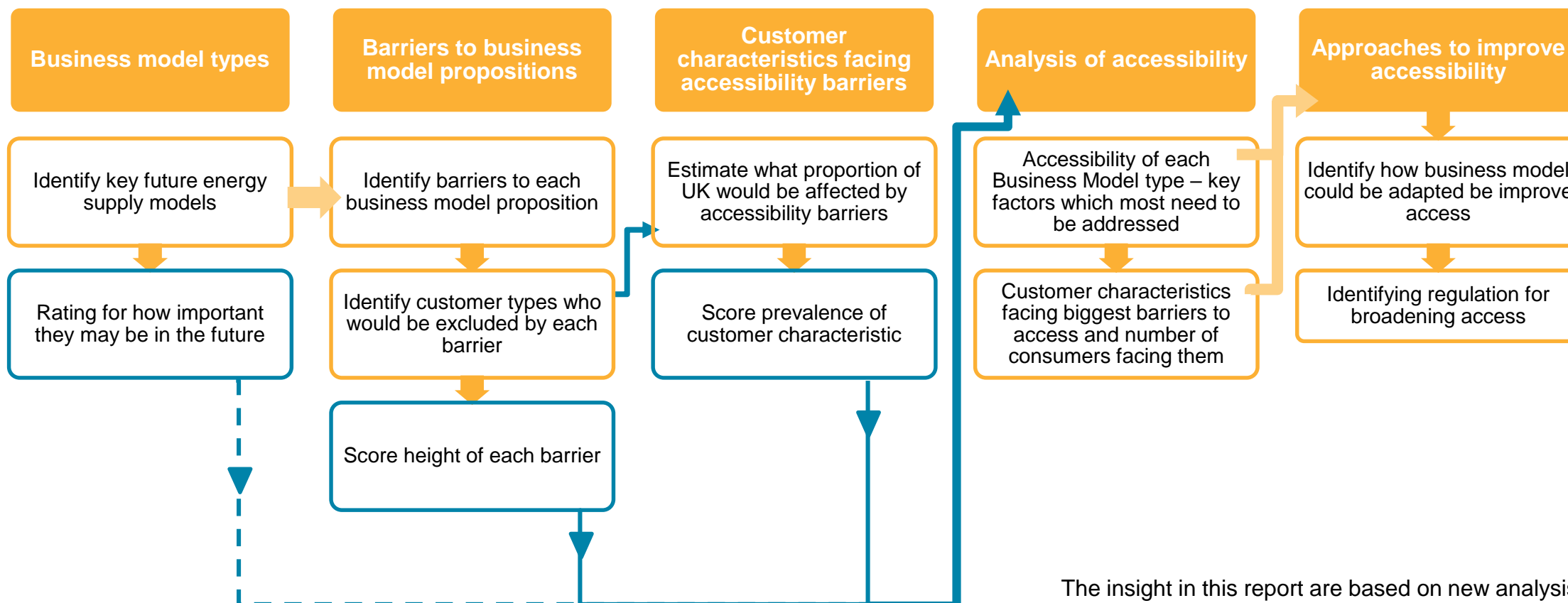
Research questions

- What types of new supply models exist and what characteristics do these have which may impact domestic customer accessibility?
- How accessible are these models to residential consumers and how many customers are likely to be affected by this accessibility?
- Are there any trends which will impact on accessibility?
- How can models be made more accessible?

Executive Summary

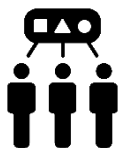
Research framework

The research framework begins with identifying types of future business models and potential barriers to accessing these business models. We then identify characteristics that would make domestic consumers susceptible to the barriers, and identify ways to reduce access challenges.

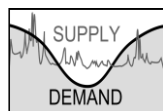


The insight in this report are based on new analysis and knowledge from within Delta-ee's subscription services.

Key findings



Through this research we have identified 5 key groups of characteristics that could impact how accessible new energy supply models are to domestic consumers. These are related to 1) the attitudes of the individual 2) their financial situation 3) attributes of the house they live in 4) their personal situation and 5) their understanding and comprehension of technology or energy market issues. Financial situation, and attitudes are the most difficult of these to address and impact the largest number of consumers.



We have identified a core group of energy supply models we expect to be taken up in the future as the energy supply market transforms. These are Energy as a Service offerings, Time of Use Optimisation, Trading Platforms, Efficient Consumption and Lifestyle Products. We identify Time of Use Optimisation as the most important future supply model and therefore most likely to impact on the mass market.



We have found that there are bigger barriers to models which require consumers to make more changes to how they engage with their energy use. For example Time of Use has a higher number of barriers impacting a wider range of consumers, than some of the other business models where barriers can be more easily, or universally overcome.



We have identified what types of consumers are most susceptible to exclusion / accessibility barriers. This includes those who lack the skills to use apps or websites (as many new business models rely on being online), are not motivated to engage, and critically lack trust in energy companies or other delivery bodies.



We have identified a clear role for different energy stakeholders, including the business model provider, in overcoming these barriers in the way finance or contracts are provided. We recognise that there is a requirement for policymakers to provide the relevant protections and regulations, and for an independent advice-giver to fill the knowledge gap for consumers.

Executive Summary

Business model types

Based on Delta-ee’s existing ‘New Energy’ Business Model framework we have identified the types of energy business models domestic consumers will have access to in the future:

- **Time of Use optimisation:** Business models which leverage value from energy-use flexibility (i.e. electricity demand shifting) through cost of energy usage varying throughout the day.
- **Lifestyle Products:** Focused on improving a customer’s quality of life or experience, these models primarily concern in-home devices and apps.
- **Trading Platforms:** These models transform the way in which stakeholders are connected and transactions occur, developing a market place for peer-to-peer trading.
- **Energy as a Service:** Business models develop ongoing relationship with customers by:
 - 1) providing the use of a product as a continued service offering, rather than a one-off purchase.
 - 2) focussing on managing the household’s existing equipment to improve the delivery of an outcome – selling comfort rather than kWh.
- **Efficient Consumption:** These models aim to improve energy efficiency by monetising a reduction in energy usage. We focus on business models that aim to:
 - 1) make a household’s behavior efficient
 - 2) make the house and equipment in it more efficient.

Bundling: We have not considered bundling as part of this analysis as it cuts across the other business model types, and the barriers will relate to the services or products within the bundle.

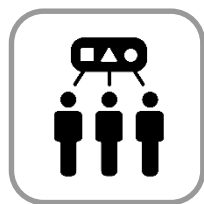
More detail on each business model type, including emerging examples of companies offering these propositions is given in the [Appendix](#).

Executive Summary

The 5 types of customer characteristics which could obstruct accessibility

Through this research we have recognised 26 customer characteristics that could impact how accessible new energy supply models are to domestic consumers.

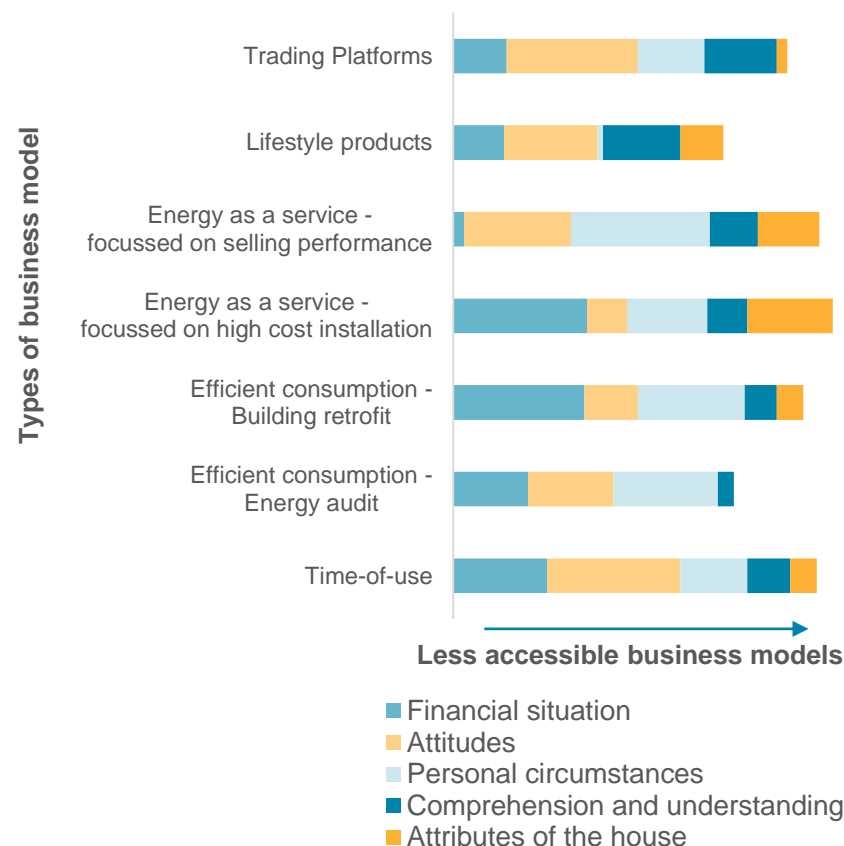
Key Finding



The consumer characteristics can be clustered into the following 5 types of characteristics:

- **Financial situation:** related to a household's access to savings, level of income or predictability of income.
- **Attitudes:** related to how motivated the household is to engage in the energy system, who they trust and how much they feel a need to be in control.
- **Personal circumstances:** a wide range of aspects related to the demographics of the family, whether they do shift work or rent their home.
- **Comprehension and understanding:** relating to how easily a household can understand new business model propositions or learn to use new technology.
- **Attributes of the house:** relating to the house that the members of the household live in.

The types of consumers facing the greatest barriers to accessing future business model types varies for each business model type as shown in the figure opposite.



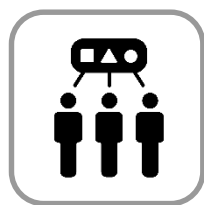
Indicative graph to show how the new energy supply business models compare against each other for accessibility, with coloured bars showing the level of accessibility barriers for the consumer characteristics.

Executive Summary

Customer characteristics which could most obstruct accessibility

The analysis also revealed that there is a cluster of financial and attitudinal barriers which are going to be critical to address for business models to succeed.

Key Finding



By combining our qualitative scoring to assess the **height of the barriers to each business model** with an estimate of the **proportion of domestic consumers affected by each barrier** we have produced this indicative chart.

It highlights that there is a cluster of barriers which may be both more challenging to overcome, and more likely to impact a higher number of consumers than other barriers. These are:

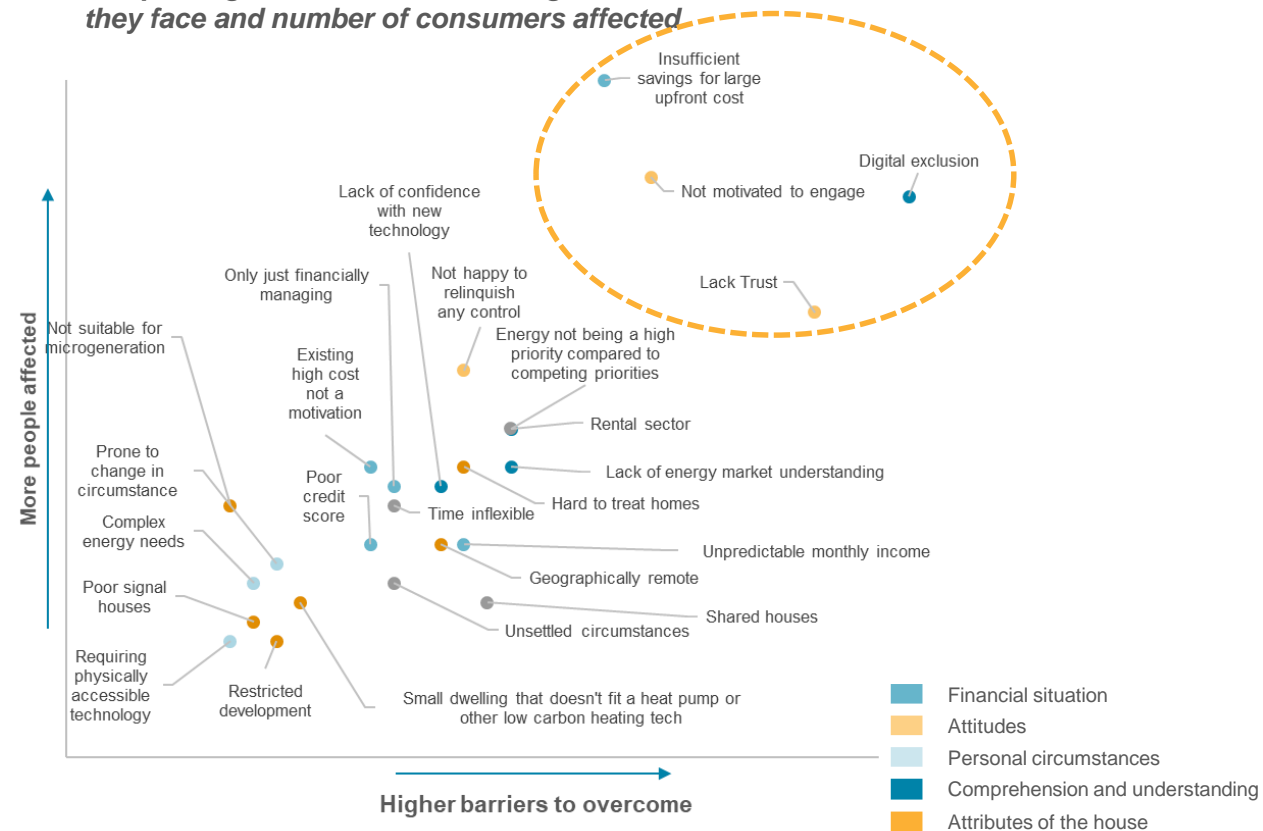
- Insufficient savings for large upfront cost,
- Digital exclusion,
- Lack of motivation to engage,
- Lack of trust.

Height of the barrier (score /5) is a qualitative guide to how difficult the barrier is to overcome by either the customer or company (based on internal discussion within the research team).

Number of consumers affected (score /5) based on the % of UK who are estimated to be affected (5/5 for over 50%) (based on research of [available data](#)).

More detail on the individual consumer characteristics which could obstruct accessibility is given in the [Appendix](#).

Indicative graph to show how consumer characteristics compare against each other on height of barrier they face and number of consumers affected



Executive Summary

Some consumer types are at higher risk of exclusion

Consumer accessibility will be strongly influenced by their financial situation, their attitude and their own personal circumstances

Key finding



Through our analysis, we see that there are particular customer types who face a greater risk of exclusion from some of the most important business models which we see emerging.

These are consumers who are:

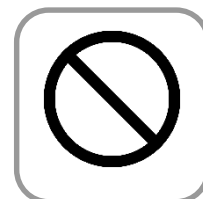
- **Financially struggling / or ‘only just managing’ / prone to change in circumstances:** these consumers are not able to pay for any technology required up-front and committing to a monthly fixed payment is difficult.
- **Have a skills or knowledge gap:** particularly around digital exclusion as many models will require consumers to engage with online platforms or apps.
- **Are unmotivated and disengaged:** trust, motivation and willingness to engage are critical success factors and energy supply at the moment is easy and affordable for most so there are limited reasons to change.
- **Have personal circumstances that could limit access:** renters for example have a high risk of exclusion from a number of the business models.
- **Have an unsuitable home:** particularly ‘hard-to-treat’ homes (homes with poor energy efficiency rating which cannot be cost-effectively improved) could be excluded from certain business models.

Executive Summary

Time of Use tariffs face the highest number of barriers

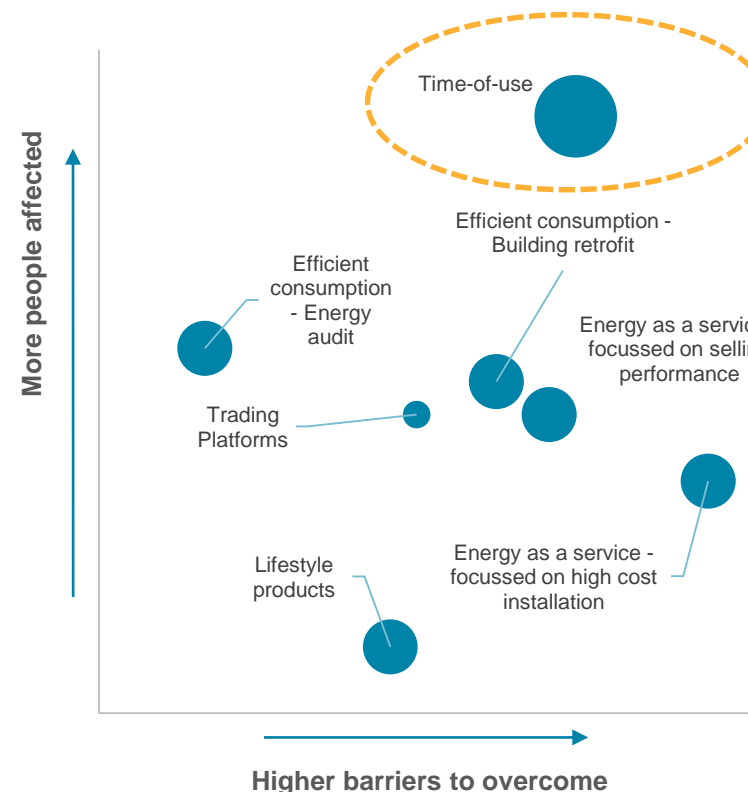
We predict that Time of Use will be the most important type of domestic energy business model in the future – but its success will depend on addressing the barriers it poses.

Key Finding:



There are bigger barriers to models which challenge the existing supply model most:

- Overall business models which require a greater adaptation in how consumers engage with energy today also face the highest number of barriers to uptake.
- While Time of Use may still involve customers consuming energy by the kWh, it also requires a step change in how they engage with their supplier. The biggest barriers it creates are around trust, motivation and control.
- These barriers are also identified as particularly challenging to overcome as they impact a wide range of consumers.
- Energy as a Service business models also scored highly here. This is because they require a fundamental shift in supply model, but also, face significant financial barriers to uptake.



Indicative graph to show how the new energy supply business models compare against each other on height of barrier they pose and number of consumers affected

The size of the bubble represents our prediction of the future importance of that business model

Conclusions and recommendations (1/3)

Education and awareness raising are critical for accessibility, and a mixture of information aimed at different consumers will be required to motivate, educate and inform them. This can be provided through a mixture of channels, but a clear gap exists for a “trusted advisor”.

Key finding:



Education and awareness raising actions start now:

Consumers have limited awareness today of both emerging energy technologies and the associated services or tariffs available to them. This will only get more complex into the future, so there is a real need for a ‘trusted advisor’ to step into the market to inform consumers. This ‘advisor’ could also be involved in raising awareness of energy supply models and the associated technologies, via education.

This role could encompass a number of market players: energy suppliers, technology manufacturers and installers will have a role, but an independent body (such as Citizens Advice) could be well trusted by consumers.

Examples of potential engagement activities

include: Online information portal, help-line or more general awareness raising over energy and climate to indirectly boost engagement. It could also involve more active engagement. e.g. linking customers to appropriately qualified installers.

There are different roles for different market players in awareness raising:

Energy Supplier



Energy suppliers are well trusted by consumers as suppliers of new technology as they are viewed as offering the best guarantees and on-going support. However they are not trusted when it comes to energy prices, so are unlikely to be viewed as a neutral source of information here.

Manufacturer



The manufacturer role will largely be around upskilling and engaging installers – who in turn can promote the right services and offerings to consumers. They may not be a trusted advisor to all consumers, as their brand here is not strong.

Other market player



Players entering the energy market from outside (e.g. retail and tech giants / telcos) will have more established customer brands and may be more trusted. However, information will likely be linked to products and services they sell, so may not be engaging for all consumers.

Independent advisor



Citizens Advice and other consumer organisations could be an effective “trusted advisor”. They could provide information tailored for different types of audience, and not tied to a particular business model or proposition.

Conclusions and recommendations (2/3)

Regulation by policymakers is going to be important for accessibility as the market develops. Regulations on building standards or technology will drive innovation of a range of business models for different types of consumer, while regulation around consumer protection will give consumers the confidence to engage.

Key finding:



Regulation will be required to open up the market:

Regulation by policymakers is likely to be a more important lever than financial incentives for prompting market innovation because it typically leads to faster change. While the financial incentives work for engaged consumers and will remain important for some poorer consumers, it is regulation that will force the issue with installers and the industry to bring these new business models to mass-market. The resultant increased demand for technology could help push costs down, support investment in installer training, and drive further business model development, all of which will ensure wider accessibility of the energy supply models that emerge. **Policymakers need to take action to ensure the right policy levers are being activated.**

For example, consumers would benefit from new innovative technologies to access some of the emerging business models, such as domestic battery storage to help consumers on Time of Use tariffs, and better insulated homes can help to enable Energy as a Service offerings. Policymakers can strengthen building regulations to increase the penetration of technologies, initially in new build, but later in retrofit.

Complex business models will require suitable consumer protection around them:

There is a high risk that consumers will not engage with complex business models or energy supply contracts. This is particularly likely in the near term where it is expected that consumers will associate a lot of risk with both the technologies, or the way they engage with energy suppliers or other business model providers. The complexity of some of the arrangements could also lead to a risk of mis-selling, and it is important that the risk of tying customers into unsuitable or poorly explained contracts is addressed.

There is a role for consumer protection or consumer advice. This can be in part filled by a formal regulator – that can ensure companies spell out the conditions of their contracts clearly, or have to adapt their models for consumers in vulnerable circumstances. It could also be a third party organisation that can support consumers via advice, or clear routes for redress if consumers feel they have been misled.

Conclusions and recommendations (3/3)

Overall it is clear that there is likely to be no one size fits all approach to accessibility of future business models and supply contracts. Bundling of offers and services will be a key way in which accessibility could be improved, offering options to tailor solutions to specific consumer types.

Key finding:



A combination of business models will be critical to maximise accessibility.

A combination of business models will be critical for a shift in how consumers engage with energy. Business models can influence the technologies in consumers' homes, how consumers communicate with their supplier and the type of long term supply contracts they engage with, but it is clear there will be no one size fits all approach so propositions need to ensure optionality for consumers. They also need to be available to consumers with a range of characteristics, although it is likely different offers will appeal to different consumers.

Role for business model providers (e.g. energy industry) primarily to carefully consider how to bundle their products and services in a way that has broad appeal.

Examples include: different contract lengths for different bundles, affordable early exit fees, transferable contracts that do not tie the customer in for a long period of time.

Bundling business models could provide the best solutions and will likely extend beyond energy in the future:

Bundling is a cross-cutting business model that can be an effective way of overcoming accessibility barriers. By packaging products and services together in a single offering, accessibility for consumers can be improved via:

- **Convenience & simplification** of ever-growing choices, both within energy, but also with other household services (e.g. via multi-service offerings)
- **Improved peace of mind & long term satisfaction** via tailored offers, fixed price contracts or flexible contracts depending on consumer circumstances.
- **Provision of exciting, novel and useful technologies** which consumers might not otherwise engage with, which is required for access.

Specific regulation may be needed to protect consumers from the risks of bundling where contracts across multiple sectors may confuse who has ultimate responsibility for explaining product offerings and providing protection.

Introduction

Customer accessibility to the energy supply market could be impacted by the rapid changes occurring in the market

The domestic energy supply market is rapidly changing, primarily driven by three factors:

- Digitalisation (e.g. smart meters)
- Demand side technological development (e.g. electrification of heat and transport, smart appliances, battery storage, micro-generation etc.)
- Reforms to industry systems and processes (e.g. supplier switching and settlement).

These changes will **enable new products and services to be offered to domestic consumers**. Therefore, it is likely that the **market arrangement** (known as the ‘supplier hub model’) will be **modified to address these changes**. These modifications could fundamentally change how consumers interact with the supply market.

Given these changes, it is likely that **the accessibility of the market for domestic consumers will be affected** and new rules may be required to ensure that all consumers have fair access to the market.

Ofgem considers that the current regulatory arrangements ‘are not going to be fit for purpose for energy consumers over the longer term’²⁵

Citizens Advice’s key aim is:

To understand **how accessible future energy supply models** will be for different types of consumers, and what measures can be introduced to **ensure that all customers can benefit from future energy markets**.

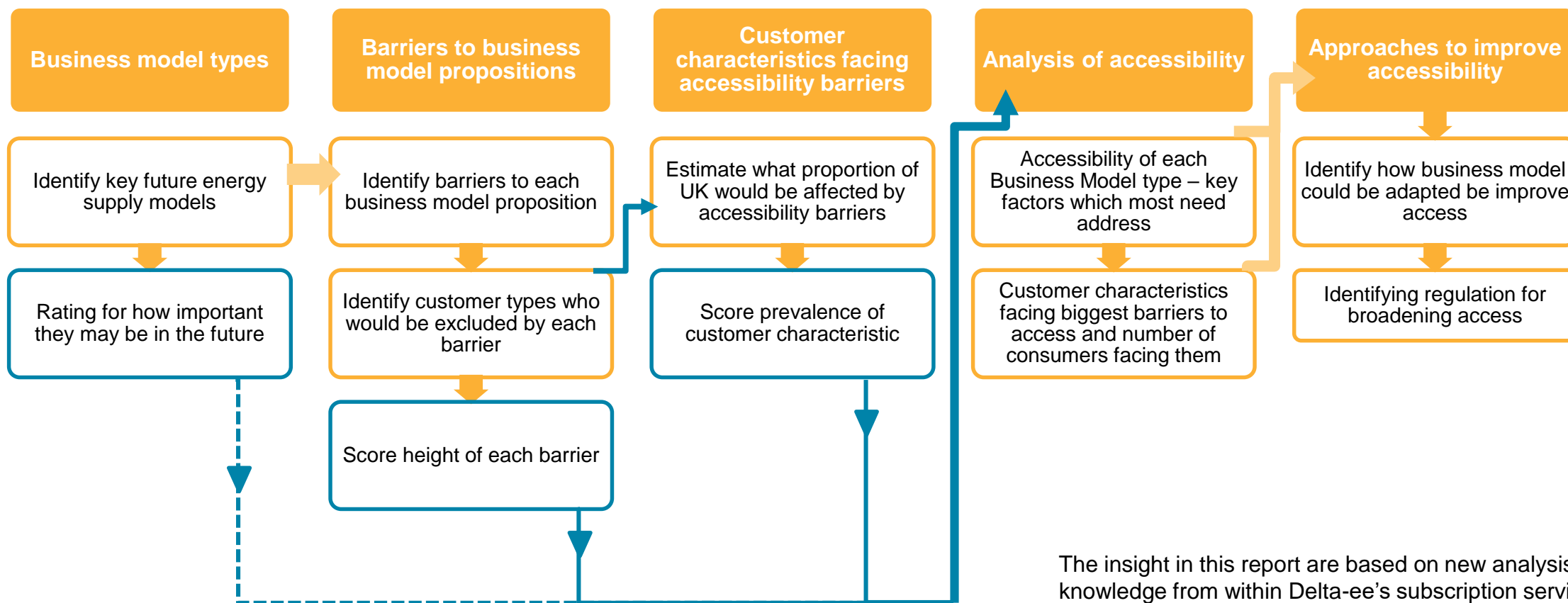
Research questions

- What types of new domestic supply models exist and what characteristics do these have which may impact domestic consumer accessibility?
- How accessible are these models to residential consumers and how many consumers are likely to be affected by this accessibility?
- Are there any trends which will impact on accessibility?
- How can business models be made more accessible?

Research framework

Project methodology

The research framework begins with identifying types of future domestic energy supply business models and potential barriers to accessing these business models. We then identify characteristics that would make consumers susceptible to the barriers, and identify ways to improve access challenges.



Future Energy Supply Business Models

- > Introduction to Business Model types
- > Future importance of business models

Business model types

Overview of Delta-ee existing ‘New Energy’ Business Model framework

Delta-ee’s expertise and understanding of business models is built on the analysis of 100s of customer propositions, spanning Europe. Through this work, we have identified six key types of business model that are shaping the future of ‘New Energy’. This forms the basis of the framework for this report, with some adjustments as shown on the next page to focus more closely on domestic customers.

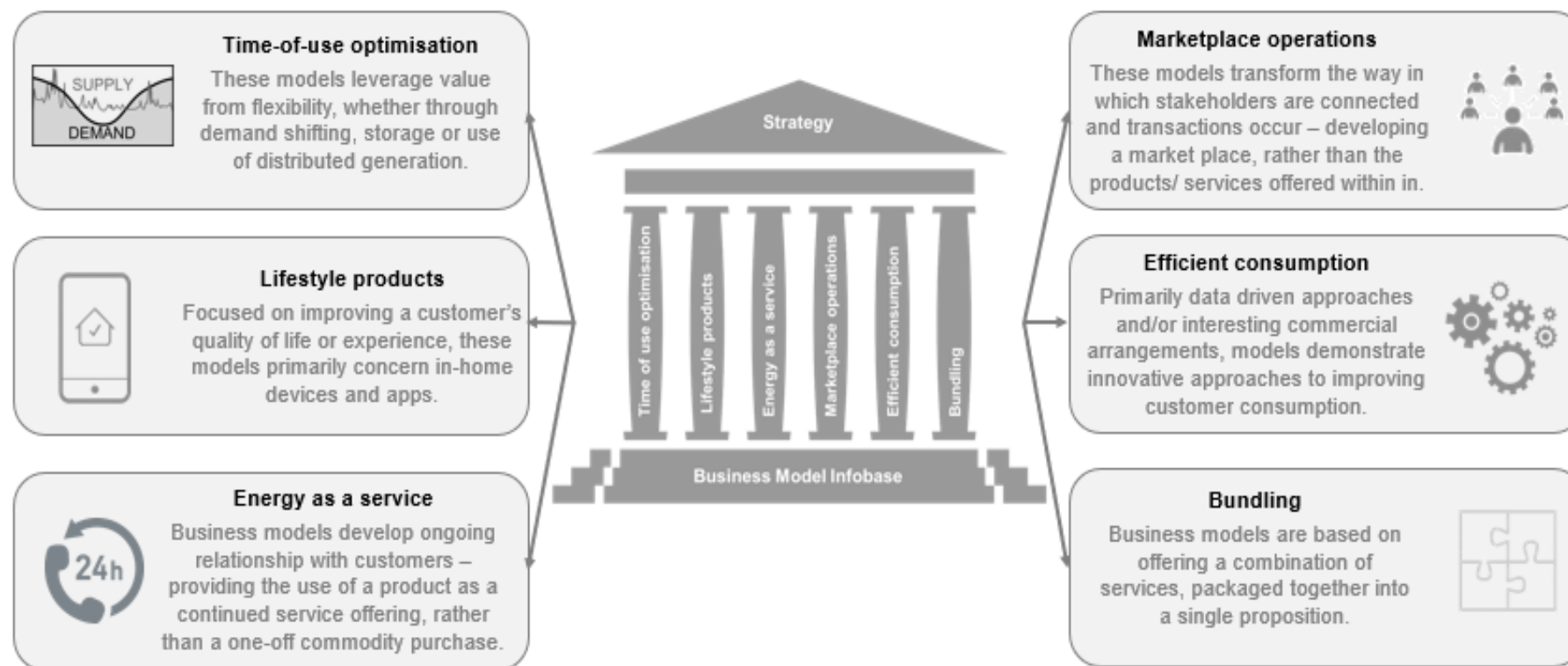


Image: Delta-ee’s ‘New Energy’ Business Model framework

Business model types

Our defined business model types for this project

Building upon our existing framework, we have refined the list of business model types for this project to focus around what the future of the energy supply market may look like for domestic customers. The business model types we focus on in this project are:

- **Time of Use optimisation:** Business models which leverage value from energy-use flexibility (i.e. electricity demand shifting) through cost of energy usage varying throughout the day.
- **Lifestyle Products:** Focused on improving a customer’s quality of life or experience, these models primarily concern in-home devices and apps.
- **Trading Platforms:** Trading Platforms transform the way in which stakeholders are connected and transactions occur, developing a market place for peer-to-peer trading. *These models are a specific type of business model within Marketplace Operations pillar, and will be the focus for this report.*
- **Energy as a Service:** Business models develop ongoing relationship with customers by:
 - 1) providing the use of a product as a continued service offering, rather than a one-off purchase.
 - 2) focussing on managing the household’s existing equipment to improve the delivery of an outcome – selling comfort rather than kWh.
- **Efficient Consumption:** These models aim to improve energy efficiency by monetising a reduction in energy usage. We focus on business models that aim to:
 - 1) make a household’s behaviour efficient
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Bundling: We have not considered bundling as part of this analysis as it cuts across the other business model types, and the barriers will relate to the services or products within the bundle rather than to bundling itself.

More detail on each business model type, including emerging examples of companies offering these propositions is given in the [Appendix](#).

Future business model importance

Assessment of which business models will have most significant impact on the market

To judge the level to which we predict that each business model type will be important in the future, we considered the benefits it could have to 3 groups:

Consumers



We see that priority for consumers in future will be an energy supply that is affordable, which improves their comfort and for some consumers, greater control or convenience will be important.

Energy networks



For energy networks (at distribution and transmission level), we see that their biggest priority is to minimise the need for future network upgrade and reinforcement work, by minimising peak demand for gas and electricity.

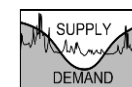
Policymakers



We identify the main priority for policymakers is meeting UK wide decarbonisation targets.

Each business model was rated from low to high importance for each of the three groups, and these were combined to give an overall rating of importance based upon our industry expertise.

How the business models are rated:



Most important for the future

- Time of Use tariffs



Mid importance



- Energy as a Service
- Efficient Consumption
- Lifestyle Products



Least important in the future

- Trading Platforms

Further detail on the scoring is given for each business model in the [Appendix](#).

Barriers to accessing future energy supply business models

Business model barriers

Approach

For each business model, the barriers to accessing it have been identified. The height of each barrier to each business model has been scored on a scale from high to low

Barriers to access of each business model are listed in the [appendix](#).

We identified 81 barriers overall with an even spread across each business model type. Some barriers are specific to certain business models, whereas others are common across many.

Defining the height of the barrier:

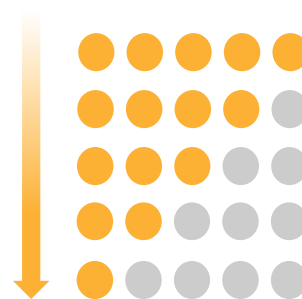
The barriers were scored qualitatively based on our business model expertise. It was a judgement based upon two factors:

- 1) **how possible it would be for a customer to get around the barrier themselves**
- 2) **how possible it would be for the company to address the barrier without the business model changing.**

Guide to scoring barrier height

- 5: High** We see no clear easy way to get around the barrier for company or consumer
- 4: Medium / high** Barriers exist and are likely to need specific actions to remove them, otherwise they will stop access to business model or cause problems for consumers who do access them
- 3: Medium** Barrier exists but there are clear ways for consumers to be helped to get over barriers
- 2: Low / medium** We can see barrier existing but there are likely to be easy ways for the company to overcome these by the time the business model is mass-market
- 1: Low** Barrier is unlikely to greatly affect accessibility of business model

High: no easy way to get around the barrier



Low: barrier is unlikely to greatly affect accessibility of business model

Business model barriers

Overview of Barriers to accessibility by individual business model

The highest rated barriers for each business model type are shown below (all score 5/5 for barrier height). All of the business models have at least one barrier with this highest rating. The business model types which face the most high rated barriers are those which we think pose the biggest changes to consumers compared to the current 'supplier hub' business model.



Energy as a Service focussed on high cost installation

- Lack of trust in companies
- Upfront cost
- Not owning a house
- Requirement for credit arrangement for a loan
- Long-term commitment
- Financial lock-in
- Suitability of house to new technology



Energy as a Service focussed on selling performance

- Lack of trust in companies
- Suitability of house to new technology
- Perceived loss of control
- Not owning the house



Trading Platforms

- Energy not being a high priority compared to competing priorities
- Lack of energy literacy to use the technology or software
- Not having control over energy demand

Overall that lack of trust will be a critical barrier to overcome as it is an issue for nearly all of the models proposed.

This is because the trust barrier cannot be overcome by supply companies individually, and collective action is required.



Time of Use

- Lack of trust in companies
- Ability for householders to change behaviour due to in-flexible lifestyle
- A consumer feeling they don't have control over energy demand in the home due to sharing the home with other high energy users



Lifestyle Products

- Lack of trust in companies
- Financial lock-in / fixed monthly payment



Efficient Consumption

- Energy not being a high priority compared to competing priorities
- Upfront cost

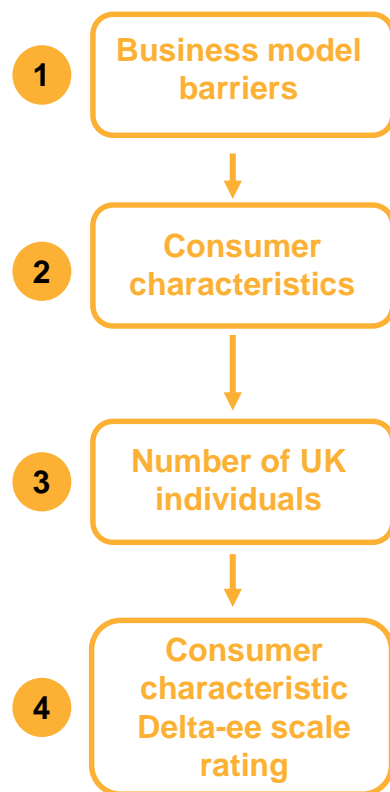
Further detail on the barriers for each business model can be found in the [Appendix](#).

Customer characteristics associated with barriers

Customer characteristics associated with barriers

Approach

A four step process was used to identify and rate the consumer characteristics. For each barrier to each business model, we identified what customer characteristics would make someone susceptible to that barrier. Once identified it was then possible to collect data to indicate at a high level how many consumers could be impacted.



Methodology overview



Consumer characteristics were identified from the barriers associated with business model.



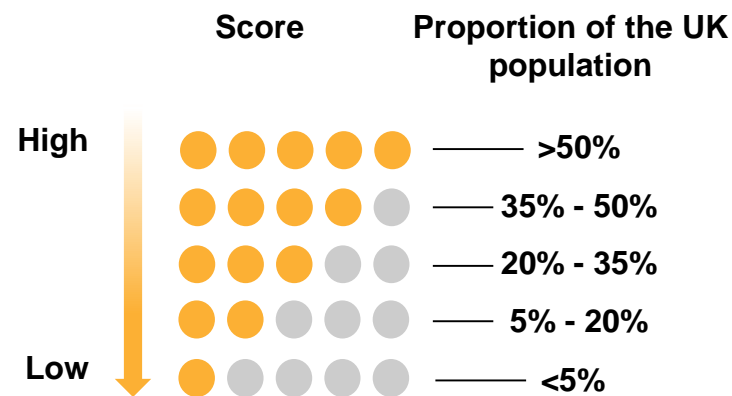
The proportion of the UK population which fit each of the consumer characteristics (i.e. number of UK individuals which have that characteristic) was obtained via desktop research.



Each consumer characteristic was given a Delta-ee scale rating based on the proportion of the UK population which fit that consumer characteristic.

Consumer Characteristic Prevalence score

The figure below details how the each consumer characteristic was rated based on our estimation of the proportion of the UK who hold the characteristic



NOTE: Consumer characteristics are NOT mutually exclusive. Where data could not be found, we made an assumption based on our knowledge of the energy market and consumers.

Customer characteristics associated with barriers

Overview of findings

Consumer's financial situation and attitudes are the two most important consumer groupings. Insufficient savings, valuing control, a lack of motivation to engage and the relatively low cost of energy resulting in low motivation and low prioritisation are the key consumer characteristics

Consumer groups

The consumer characteristics can be clustered into the following 5 groupings:

- **Financial situation:** related to a household's access to savings, level of income or predictability of income,
- **Attitudes:** related to how motivated the household are to engage in the energy system, who they trust and how much they feel a need to be in control,
- **Personal circumstances:** a wide range of aspects related to the demographics of the family, whether they do shift work or rent their home,
- **Comprehension and understanding:** relating to how easily a household can understand new business model propositions or learn to use new technology,
- **Attributes of the house:** relating to the house that the household live in.

Key consumer characteristics

The following 5 consumer characteristics impacted the greatest proportion of the UK population:

- Insufficient savings for large upfront costs
- Existing high cost not a motivation to engage
- } **Consumer group:**
Financial situation

- Value their control
- Not motivated to engage
- } **Consumer group:**
Attitudes

- Energy not being a high priority compared to competing priorities
- } **Consumer group:**
Personal circumstances

A more detailed explanation of the individual customer characteristics and the customer characteristic prevalence scores can be found in the [Appendix](#).

Overall analysis of business model accessibility

Explanation of scoring methodology

Analysis of business model accessibility

In order to undertake this research we have combined the barriers consumers will face for each business model types and which consumers will be most affected by the barriers.

To gain an understanding of the accessibility of future business models, we've combined:

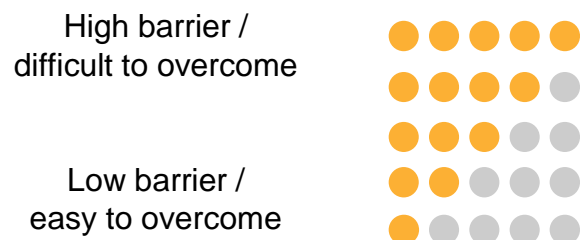
- how significant are the barriers to each future energy supply business model, and
- how prevalent in the UK are the customer characteristics associated with each barrier.

From this analysis we identify:

- Which future business models face the biggest barriers in the future, and therefore need action to improve the accessibility,
- Which customer types are likely to face barriers more, or higher, barriers to future business models, and therefore need support.

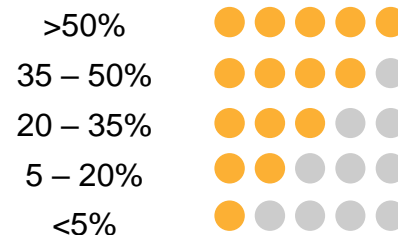
Barrier height

How significant is the barrier to the business model?



Customer characteristic prevalence

What proportion of the UK have the customer characteristics that mean they will face each barrier?



An example of how the combined scoring is calculated for the following graphs is shown in the [Appendix](#).

Customer characteristics facing greatest barriers

Analysis of business model accessibility

How graph axis are calculated

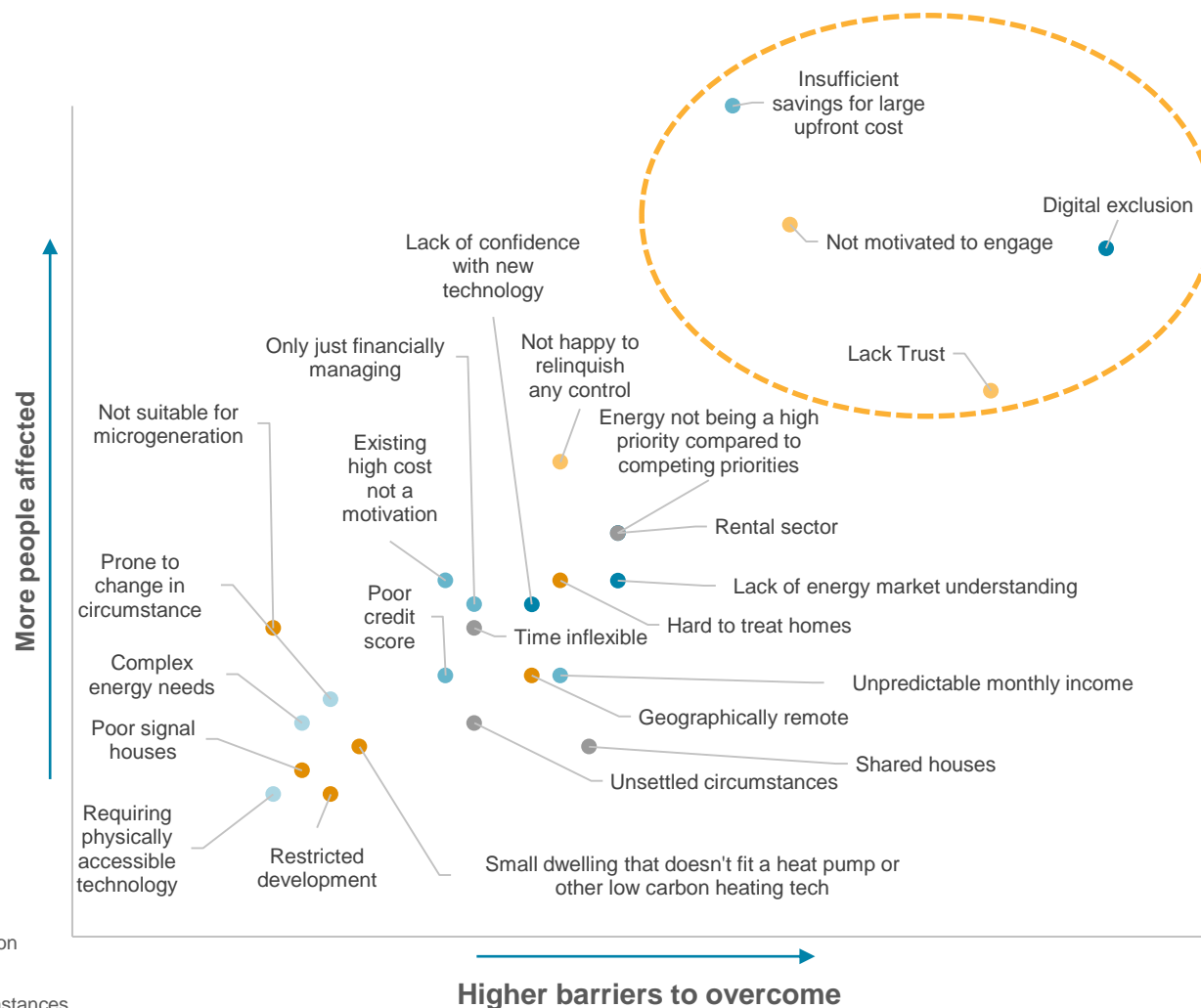
Indicator of height of barrier:

- Sum of the barrier height score for all barriers for that customer characteristic

Indicator of number of people affected:

- Sum of the customer characteristic prevalence score for all barriers for that customer characteristic

- Financial situation
- Attitudes
- Personal circumstances
- Comprehension and understanding
- Attributes of the house



Consumers are most susceptible to barriers to accessing future energy supply models if they:

- Have insufficient savings for large upfront cost of technologies
- Lack the skills or confidence to use apps or websites (digital exclusion)
- Are not motivated to engage in energy
- Lack trust in energy companies or other delivery bodies.

Of the remaining customer characteristics

Consumers face the highest barriers if they:

- Have competing priorities which mean they don't have time to engage in energy
- Rent their home
- Lack understanding of the energy market
- Have unpredictable monthly income.

Most consumers are likely to be excluded from accessing future energy supply models if they:

- Don't want to relinquish control
- Have competing priorities which mean they don't have time to engage in energy
- Rent their home.

Business models facing greatest barriers

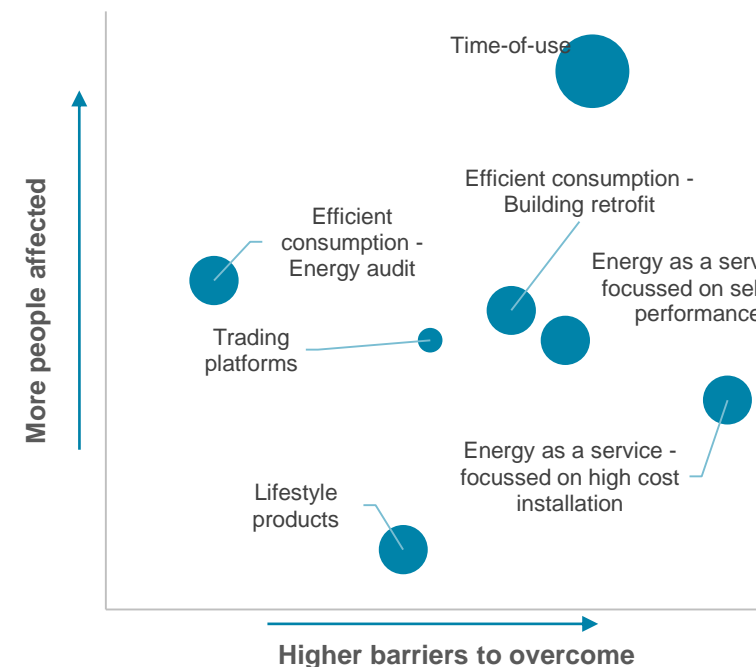
Analysis of business model accessibility

The **Time of Use business model** stands out as having barriers will affect the largest number of consumers compared to other future energy supply models, and the combined size of these barriers is one of the highest compared to other future energy supply models. It is also identified as the business model most likely to be important in the future.

Of the remaining future energy supply business models:

- The business model type that presents the highest barriers to access is Energy as a Service business models focussed on the installation of high cost heating equipment leasing.
- The business model with barriers which are likely to prevent the most consumers from access is Efficient Consumption type business models which focus on undertaking energy audits and attempting to change people's behaviour such that they use less energy.
- Lifestyle products are lowest as they are relatively low cost, have fewer access barriers as they are distributed by companies who already have high levels of trust, and do not always require long contract commitment.

A break down of what types of people face barriers to accessing each business model is shown on the next page



The size of the bubble represents our view on the future importance of that business model

How graph axes are calculated

Indicator of height of barrier:

- Sum of the barrier height score for all barriers for that business model

Indicator of number of people affected:

- Sum of the customer characteristic prevalence score for all barriers for that business model

Analysis of business model accessibility

Combined inaccessibility score

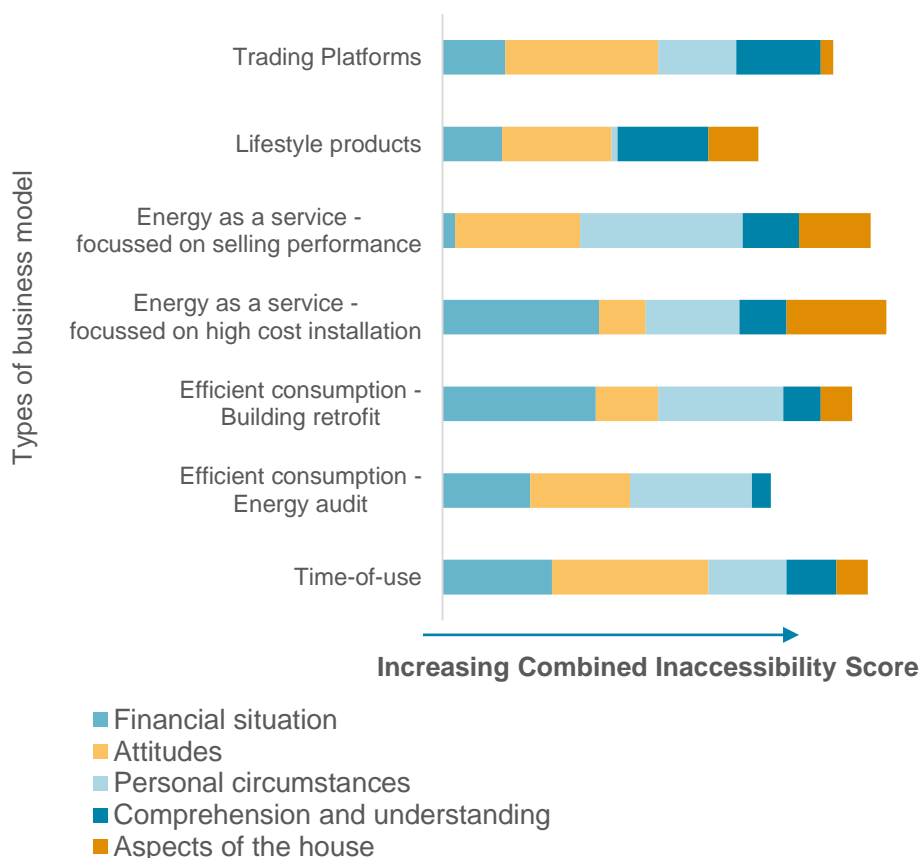
The types of consumers facing the greatest barriers to accessing future business model types varies for each business model type.

Combined Inaccessibility Score of business model

is calculated by combining:

- Height of the barrier
- Number of consumers who would face the barrier (customer characteristic prevalence)

For each barrier to each business model, the two scores are multiplied, and these are summed for each business model and customer characteristic type.



The highest combined inaccessibility scores are for: Time of Use business models

With barriers predominantly for people who:

- Have a low income or lack access to savings
- Hold attitudes that they do not trust companies or are not motivated to engage in the energy market.

Energy as a Service business models that focus on installing high cost equipment / insulation

With barriers predominantly for people who:

- Have a low income or lack access to savings
- Live in a house which is hard-to-treat or which is unsuitable or particularly expensive for the installation of a new heating system or insulation.

Energy as a Service business models that focus on selling comfort rather than kWh

With barriers predominantly for people who:

- Have personal circumstances such as time inflexibility or time pressure from other priorities, or who rent their home
- Hold attitudes that they do not trust companies or are not motivated to engage in the energy market.

Overcoming barriers to accessibility

Cross cutting barriers

The role for stakeholders in ensuring barriers can be overcome

- > Companies delivering business models
- > Policymakers
- > Other stakeholders

Cross-cutting business model barriers

The barriers which are common to all business models

There are some barriers that are common across all types of business models. Regardless of which business models win out in the future these will need to be addressed via policy, regulation or the businesses themselves in order to ensure that all groups have access to a good range of business models.

We have identified that barriers will manifest themselves differently depending on what business model is under scrutiny. However, **there is a clear group of cross-cutting barriers which are common to all.** (i.e. all the business model types will be impacted by them). If these barriers can be addressed with a common strategy, accessibility across all business model types could be improved as the market evolves.

This approach would support individuals facing multiple barriers in particular, these consumers are at risk of exclusion, and may find it harder to engage. A cross-business model approach would help to minimise the number of barriers any single consumer faces.

Cross cutting barriers include:

- Digital Exclusion
- Lack of energy market understanding
- Lack of trust
- Lack of motivation / being adverse to change
- Financial barriers




Cross-cutting barriers to business models 1/2

The lack of trust and financial barriers will be hardest barriers to overcome for new energy business models, and understanding how to motivate consumers to engage is a critical step in accessibility. Business models will need to be adaptive to appeal to a larger proportion of the market rather than just reward those who can afford to pay.

Barrier	Description	Height	Additional information	Business models most impacted
Lack of trust	Consumers are naturally risk averse when it comes to new business models. In the energy market, if you are not a familiar brand you have to build trust from scratch, and that can be a challenge. If you're an incumbent utility, you might not be popular with consumers or if you offer something "too good to be true" they may be untrusting of the offer.	● ● ● ● ●	The trust barrier may be easier for some companies to overcome than others. E.g. Tech giants, such as Amazon, or retailers, like IKEA who we see as having a high level of 'trust' amongst their existing customers.	Time of Use Trading Platforms Energy as a Service
Lack of motivation / being averse to change	Current energy system set up is easy to access for a vast majority of consumers. You pay for what you use and have a low cost heating system in place (relative to alternatives). Consumers have other priorities or are comfortable with the existing model so it could be challenging to build the engagement required for mass market change.	● ● ● ● ●	Energy not being a high priority for consumers or energy offers not being financially rewarding enough will be the two hardest elements of motivation to overcome. Consumers will need a meaningful reason to engage – or to even become educated on new business models as what they have today is comfortable and easy for most of them.	Time of Use Energy as a Service
Financial barriers	All new business models require some financial impact for consumers. Either in the form of an up-front payment for technology, or a long term contract or lease which is based on a reliable income. This is a barrier for accessibility for people who are low income earners, with poor credit ratings and with unpredictable monthly income.	● ● ● ● ●	Financial barriers will be most significant for business model that require high up-front investment such as Efficient Consumption focusing on building efficiency and long contract length for Energy as a Service business models focusing on installation of expensive technology.	

Cross-cutting barriers to business models 2/2

Some cross cutting barriers are easier to address, but still important to recognise. Digital and technology exclusion and energy market understanding can largely be overcome via additional measures from the business model provider and increasingly technology is providing the solution.

Barrier	Description	Height	Additional information	Business models most impacted
Lack of Energy Market understanding	Linked to motivation, consumers today have a limited understanding of how the energy market works as today's proposition hide the complexity. This means consumers do not understand why there is a need to adapt and change how they engage (e.g. flexibility is beneficial for the energy system but this alone is unlikely to be enough for a customer to want to engage).		Beyond the early adopters, the desire to change (either changing behaviour or how they buy energy) to support either the energy system as a whole, or through environmental concern will be a weak driver – so other incentives, likely financial, will be required.	Trading Platforms
Technology exclusion	Almost all new business models have a requirement to engage in some sort of new technology. This could be relatively 'low tech / basic' in the form of insulation, or simple heating controls or more complex requiring engagement with a new innovative heating system or energy storage.		Technology barriers should be relatively easy to overcome for most consumers. However it is important not to leave any set of consumers behind so will require careful thought to simplify technology commands, or provide instructions in formats tailored for different consumer types.	Energy as a Service Lifestyle Products
Digital exclusion	Almost all new business models have a digital element to them. This ranges from an app, voice control or the way in which you access the option to buy (e.g. online).		For the majority of consumers, digital barriers should be relatively easy to overcome. This will require some additional steps for business model providers – such as simpler versions or options to engage offline. For consumers who can't engage with technology e.g. no internet), this will be more complex.	All

How to overcome barriers to accessibility

The role for energy market stakeholders

Business model providers, policymakers and other related stakeholders have a key role to play in overcoming the accessibility barriers we have identified. While it is critical that business model providers adapt to address these issues as much as possible, recognising the role for others is important for future success. There are key roles for:



Business model providers

This is the role for the company that is delivering the business model to the end-user. This would likely include offers from existing or new entrant energy suppliers, technology manufacturers, large installation organisations and online retailers or tech giants.



Policymakers

There will be key roles for policymakers to oversee the emergence of new energy supply business models. These roles could take a number of forms. As these new business models become mainstream, there will be an increasing need for policy and regulation to protect consumers.



Other related stakeholders




There are a number of other stakeholders, such as bank and insurance providers, who could have a role in the development and engagement with new energy supply business models from outside of the energy industry.

In the following slides we explore the role of these stakeholders. Our view on the role of each stakeholder for each type of barrier is given in more detail in the accompanying [data tables](#).

How to overcome barriers to accessibility

The role for energy market stakeholders

There are a number of different areas where energy stakeholders can influence accessibility:

Stakeholder:	 Business model provider	 Policymakers	 Other related stakeholders
Areas where accessibility can be influenced:	<ul style="list-style-type: none"> ■ Making contract length sufficiently flexible or offering get-out clauses. ■ Provision of equipment and installation (at cost or for free) ■ Offering aftersales support ■ Improving how billing is structured ■ Improving how service offerings are delivered and priced ■ Finding ways to provide financial support to low income consumers ■ Offering additional support for customers who need it (in line with current requirements for suppliers to consider vulnerability) 	<ul style="list-style-type: none"> ■ Financial incentives that are paid on an on-going basis e.g. RHI / FIT (or another incentive to replace this after it ends) ■ Grants / low interest finance to pay for up-front costs ■ Regulation related to technology or building standards and consumer protection ■ Impartial advice or information provision e.g. awareness raising activities ■ Regulation related to consumer protection 	<ul style="list-style-type: none"> ■ Financial support e.g. Banks, credit unions, peer to peer lending and loan providers ■ Impartial consumer advice e.g. citizens advice ■ Consumer protection e.g. insurance companies, legal firms ■ Supply chain players e.g. local installers, training providers, merchants
Types of player involved:	<p>New energy market entrants have an opportunity to reshape how the customer engages: incumbents can struggle to challenge the status quo (although many are increasingly trying).</p>	<p>Policymakers should be able to ensure the right regulatory levers and financial incentives are available to support market action: If these conditions are met, the market will respond with offers that take advantage of them and improve access.</p>	<p>Financial support could be a key role, but consumer protection, education and awareness are also critical: With increasingly complex contracts and offers available, some sort of consumer protection and information will likely be important to prevent any mis-selling, or exploitation of vulnerable consumers.</p>

How to overcome barriers

Recommendations for business model providers 1/2

Business model providers themselves have a key role to play in addressing accessibility – particularly around the most difficult to overcome barriers – finance (both up-front and on-going) and attitudes (including motivation and trust).



Business
model
providers

Financial Situation

Financial circumstances including a lack of savings, or unreliable or low income can be overcome via:

- **Removal of the up front cost barrier:** this could be via free technology offers or via leasing where the cost of the technology is recouped via a fixed energy price or through leveraging incentives (e.g. the RHI)
- **Provision of flexible contracts / payment holidays:** For those who qualify but experience an unforeseen change in circumstances contracts need to allow for these consumers to manage their monthly payments in a way that ensures that they do not get into arrears.
- **Provision of appropriate ways to cancel or exit the contract:** Where consumers cannot continue with their payments, there needs to be suitable provision for them to exit the contract, without leaving them worse off than at the start.

The above will be easier to deliver more widely on lower cost technology (such as Lifestyle Products) as this can be easily recouped, bundled or removed from the house. For more expensive equipment required for some of the Energy as a Service models that we expect to emerge in the future this will be a significant and complex challenge.

Attitudes

Customer attitudes, namely motivation, trust and how much consumers 'value their control' are a critical barrier to uptake. Business model providers need to:

- **Clearly explain benefits of the offer** in language consumers really understand
- **Be honest about the real 'in-use' financial savings** that can be delivered, and demonstrate these with case-studies or real customer examples. Where possible, companies could provide personalised estimates based on a consumer's actual energy usage patterns.
- **Awareness raising or partnership with a 'trusted brand':** new market entrants will need to build trust in their brand by engaging with consumers. Likewise, big brand (e.g. Amazon or similar) who are entering the "home services" market could benefit from partnerships with energy companies who are 'trusted' to provide energy related products.
- **Deliver to their current consumers to build a high customer satisfaction rating:** social media, reviews and on-going support are all important, if companies provide good service, consumers will have a positive perception of them and increased trust.
- **Engage with different motivators:** companies may need to adopt different campaigns as appropriate to engage different types of consumers. Some consumers respond to special offers, or incentives – some are driven by climate change.
- **Provide guarantees or over-ride functions:** Ensure consumers maintain a level of control which they are confident with. This could be via setting specific times where they give up control, guarantees of temperature or override options and notification alerts.

How to overcome barriers

Recommendations for business model providers 2/2

On the other barriers, business model providers can play a significant role in addressing the challenges. It will be important for them to consider how to simplify technology to maximise accessibility and tailor the after-sales support they offer to different customer groups.



Business model providers

Comprehension and understanding

Some consumers may not be willing to engage because they lack understanding of the energy market or the technology that is required to opt in. This can be overcome by:

- **Simple user interface:** this could be in the home, online or via an app but it should have a set of basic easy to understand controls.
- **Different levels of information:** the interface or app should provide the most basic information first, and users can choose whether to engage further if this is motivating.
- **Instructions aimed at different types of user and accessible on all mediums:** a set of commands or basic instructions aimed at different levels of understanding.
- **Adequate customer protection / extended cooling off periods:** so consumers are confident to engage
- **Remote monitoring and aftersales support:** to reassure consumers everything is working as it should.

Attributes of the house

Some homes will not be suitable, so it may be that not all business models are universally available to consumers. Options here are limited but could include:

- **Bundle relevant energy efficiency improvements into the package where possible** – without imposing significant financial disadvantage on the homeowner.
- **Develop specific offers for hard-to-treat homes** –whereby they are not excluded from access to the good value supply if all relevant improvements that can be made have been made.
- **Offer incentives to encourage / reward consumers** who undertake measures to make their home more suitable.
- **Technology development and R&D:** there may be some scope to adapt technologies to fit small homes etc.

Personal circumstances

Personal circumstance can relate to a physical disability, changes in family make-up or work patterns and tenure. Adaptive business models could overcome this:

- **Consider what options can be available for renters or engage directly with landlords:** Some of the models could be offered direct to landlords, where upfront costs could be recouped through rent.
- **Flexible contracts:** if an option this could give consumers flexibility to opt in and opt out when their circumstances change.
- **Flexible Time of Use:** again to give options, can users flex when they are willing to opt in and out of Time of Use tariffs.
- **Physical adaptations to technology where required:** technology can be adapted to most disabilities, especially as voice control becomes mainstream.
- **Automation:** for those with limited time to engage, automating the process (e.g. Time of Use) around agreed parameters could support uptake.

How to overcome barriers

Recommendations for policymakers

Policymakers can influence the accessibility using a number of levers. Identifying the right financial incentives, regulation and education are the main aspects of any strategy, providing incentives that grow the market and information that can build trust and credibility among consumers.

Financial Situation

There are three main ways that policymakers can support financial accessibility:

- **Grants** – to provide full or part payment on the capital cost of equipment or home improvements at the time of install.
- **Ongoing financial incentives** – with a regular ongoing payment, guaranteed and accessible with assignment of rights
- **Provision of a low interest loan:** e.g. this was the ambition of the ‘Green Deal’ but some way of making finance available to all in an affordable way.

Different support will be appropriate to different types of consumers, e.g. grants should be targeted at low income households, while others (e.g. an approach like the Green Deal) should be targeted at consumers with more ability to pay

Attitudes / comprehension and Personal circumstances

There is a significant role that policymakers can play as a trusted advisor in both influencing the attitudes of consumers and building their comprehension and understanding of energy market issues

- **Information and education provision on digital and other technologies:** a neutral source of information to improve awareness of technologies
- **Awareness raising of energy issues and climate change:** so consumers understand more about why it is important to engage.
- **Consumer protection:** both in ensuring vulnerable groups are considered and in providing a central safety net and easy access to redress.
- **Installer standards and training:** Some central certification or trading mark (e.g. TrustMark) that guarantees quality.
- **High speed internet roll out:** to overcome any practical elements to digital exclusion.

Attributes of the house:

Regulation is an important role for provision for hard-to-treat homes and for different tenure homes. This could include:

- **Retrofit regulations:** enforcement of different heating types in properties that are upgrading their heating system. This could be an extension of the current Boiler Plus regulations.
- **Grants or incentives that specifically target hard-to-treat homes,** or specific types of home (e.g. landlords).
- **Rental regulations:** certain standards to be met in properties before they can be rented.
- **R&D funding or innovation funding:** to encourage development of technology to address the hard-to-treat sector.

Other:

- **Energy market regulation:** support for competition or legislate to ensure that energy suppliers consider particular vulnerable groups or income bands in their offers.



Policymakers

How to overcome barriers

Recommendations for other stakeholders

There is a clear market gap for a number of supporting activities. In particular options around financial support for those who want to manage the up-front cost themselves. Also impartial advice, consumer protection and insurances can be critical in overcoming the accessibility barriers.



Other related stakeholders

Financial Situation

There are potential roles for banks and other lenders to support future uptake and maximise accessibility:

- **Bank loans:** low cost loans or green loans related to energy efficiency improvements.
- **Credit unions and other lenders:** Potential to provide more flexible loans to consumers who cannot access bank finance – this needs to be carefully regulated.
- **Cash-back accounts or credit cards:** cash back options for ‘green consumers’ if they spend on energy related equipment or insulation etc.
- **Technology cost reductions:** Manufacturers should work to continue to create process efficiencies that could reduce the up-front cost of technologies.

Attributes of the house

There are some small steps for other stakeholders that could be important for overall market accessibility:

- **Training of installers:** so provision is not a challenge regardless of geography or location – ensuring a supply of reliable workforce who understand the relevant technologies (and can then recommend the right solutions to consumers).
- **Access to high speed internet:** telecoms and digital companies can play a role in the accessibility of broadband (which may be required for access to certain business model). Ensuring there are affordable options for all, and a mix of contract types and lengths.

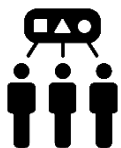
Attitudes / comprehension and personal circumstances

Outside of the energy related players there is a clear gap for consumer protection,

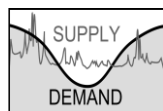
- **Information provision:** impartial information on what products, technology and contracts are suitable for different households and consumers.
- **Consumer protection and advice:** An independent body that can provide advice on consumer rights.
- **Trusted trader websites:** to make it easy for consumers to find and navigate the right traders for the products they wish to install.
- **Insurance:** products that consumers can choose to take out to guarantee they will not be out of pocket if their circumstances change, or a company they engage with disappears.
- **Advocacy:** to ensure the appropriate incentives or regulations are pursued, in particular in relation to any vulnerable groups that might need particular attention (e.g. disability groups / the elderly / low income households).

Conclusion

Key findings



Through this research we have identified 5 key groups of characteristics that could impact how accessible new energy supply models are to domestic consumers. These are related to 1) the attitudes of the individual 2) their financial situation 3) attributes of the house they live in 4) their personal situation and 5) their understanding and comprehension of technology or energy market issues. Financial situation, and attitudes are the most difficult of these to address and impact the largest number of consumers.



We have identified a core group of energy supply models we expect to be taken up in the future as the energy supply market transforms. These are Energy as a Service offerings, Time of Use Optimisation, Trading Platforms, Efficient Consumption and Lifestyle Products. We identify Time of Use Optimisation as the most important future supply model and therefore most likely to impact on the mass market.



We have found that there are bigger barriers to models which require consumers to make more changes to how they engage with their energy use. For example Time of Use has a higher number of barriers impacting a wider range of consumers, than some of the other business models where barriers can be more easily, or universally overcome.



We have identified what types of consumers are most susceptible to exclusion / accessibility barriers. This includes those who lack the skills to use apps or websites (as many new business models rely on being online), are not motivated to engage, and critically lack trust in energy companies or other delivery bodies.



We have identified a clear role for different energy stakeholders, including the business model provider, in overcoming these barriers in the way finance or contracts are provided. We recognise that there is a requirement for policymakers to provide the relevant protections and regulations, and for an independent advice-giver to fill the knowledge gap for consumers.

Conclusions and recommendations (1/3)

Education and awareness raising are critical for accessibility, and a mixture of information aimed at different consumers will be required to motivate, educate and inform them. This can be provided through a mixture of channels, but a clear gap exists for a “trusted advisor”.

Key finding:



Education and awareness raising actions start now:

Consumers have limited awareness today of both emerging energy technologies and the associated services or tariffs available to them. This will only get more complex into the future, so there is a real need for a ‘trusted advisor’ to step into the market to inform consumers. This ‘advisor’ could also be involved in raising awareness of energy supply models and the associated technologies, via education.

This role could encompass a number of market players: energy suppliers, technology manufacturers and installers will have a role, but an independent body (such as Citizens Advice) could be well trusted by consumers.

Examples of potential engagement activities

include: Online information portal, help-line or more general awareness raising over energy and climate to indirectly boost engagement. It could also involve more active engagement. e.g. linking customers to appropriately qualified installers.

There are different roles for different market players in awareness raising:

Energy Supplier



Energy suppliers are well trusted by consumers as suppliers of new technology as they are viewed as offering the best guarantees and on-going support. However they are not trusted when it comes to energy prices, so are unlikely to be viewed as a neutral source of information here.

Manufacturer



The manufacturer role will largely be around upskilling and engaging installers – who in turn can promote the right services and offerings to consumers. They may not be a trusted advisor to all consumers, as their brand here is not strong.

Other market player



Players entering the energy market from outside (e.g. retail and tech giants / telcos) will have more established customer brands and may be more trusted. However, information will likely be linked to products and services they sell, so may not be engaging for all consumers.

Independent advisor



Citizens Advice and other consumer organisations could be an effective “trusted advisor”. They could provide information tailored for different types of audience, and not tied to a particular business model or proposition.

Conclusions and recommendations (2/3)

Regulation by policymakers is going to be important for accessibility as the market develops. Regulations on building standards or technology will drive innovation of a range of business models for different types of consumer, while regulation around consumer protection will give consumers the confidence to engage.

Key finding:



Regulation will be required to open up the market:

Regulation by policymakers is likely to be a more important lever than financial incentives for prompting market innovation because it typically leads to faster change. While the financial incentives work for engaged consumers and will remain important for some poorer consumers, it is regulation that will force the issue with installers and the industry to bring these new business models to mass-market. The resultant increased demand for technology could help push costs down, support investment in installer training, and drive further business model development, all of which will ensure wider accessibility of the energy supply models that emerge. **Policymakers need to take action to ensure the right policy levers are being activated.**

For example, consumers would benefit from new innovative technologies to access some of the emerging business models, such as domestic battery storage to help consumers on Time of Use tariffs, and better insulated homes can help to enable Energy as a Service offerings. Policymakers can strengthen building regulations to increase the penetration of technologies, initially in new build, but later in retrofit.

Complex business models will require suitable consumer protection around them:

There is a high risk that consumers will not engage with complex business models or energy supply contracts. This is particularly likely in the near term where it is expected that consumers will associate a lot of risk with both the technologies, or the way they engage with energy suppliers or other business model providers. The complexity of some of the arrangements could also lead to a risk of mis-selling, and it is important that the risk of tying customers into unsuitable or poorly explained contracts is addressed.

There is a role for consumer protection or consumer advice. This can be in part filled by a formal regulator – that can ensure companies spell out the conditions of their contracts clearly, or have to adapt their models for consumers in vulnerable circumstances. It could also be a third party organisation that can support consumers via advice, or clear routes for redress if consumers feel they have been misled.

Conclusions and recommendations (3/3)

Overall it is clear that there is likely to be no one size fits all approach to accessibility of future business models and supply contracts. Bundling of offers and services will be a key way in which accessibility could be improved, offering options to tailor solutions to specific consumer types.

Key finding:



A combination of business models will be critical to maximise accessibility.

A combination of business models will be critical for a shift in how consumers engage with energy. Business models can influence the technologies in consumers' homes, how consumers communicate with their supplier and the type of long term supply contracts they engage with, but it is clear there will be no one size fits all approach so propositions need to ensure optionality for consumers. They also need to be available to consumers with a range of characteristics, although it is likely different offers will appeal to different consumers.

Role for business model providers (e.g. energy industry) primarily to carefully consider how to bundle their products and services in a way that has broad appeal.

Examples include: different contract lengths for different bundles, affordable early exit fees, transferable contracts that do not tie the customer in for a long period of time.

Bundling business models could provide the best solutions and will likely extend beyond energy in the future:

Bundling is a cross-cutting business model that can be an effective way of overcoming accessibility barriers. By packaging products and services together in a single offering, accessibility for consumers can be improved via:

- **Convenience & simplification** of ever-growing choices, both within energy, but also with other household services (e.g. via multi-service offerings)
- **Improved peace of mind & long term satisfaction** via tailored offers, fixed price contracts or flexible contracts depending on consumer circumstances.
- **Provision of exciting, novel and useful technologies** which consumers might not otherwise engage with, which is required for access.

Specific regulation may be needed to protect consumers from the risks of bundling where contracts across multiple sectors may confuse who has ultimate responsibility for explaining product offerings and providing protection.

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Appendix

- 1) Detail on each future energy supply business model
- 2) Detail on barriers to accessibility of each business model
- 3) Detail on Customer Characteristics
- 4) Data tables – Accompanying excel spreadsheet

Appendix 1: Detail on each future energy supply business model

- 1) [Time of Use optimisation](#)
- 2) [Lifestyle Products](#)
- 3) [Energy as a Service](#)
- 4) [Trading Platforms](#)
- 5) [Efficient Consumption](#)
- 6) [Bundling](#)

Time of Use optimisation

Business model overview

Time of Use optimisation is the leveraging of value from energy-use flexibility (i.e. electricity demand shifting) through customer Time of Use tariffs and end-customer energy usage.

Overview:

Time of Use optimisation is utilising varying energy prices to influence when customers use their energy. This can be achieved in an active or passive manner by the customer. The best Time of Use business models deliver financial benefits as part of a wider narrative and proposition that is based on something the customer already cares about e.g. renewable energy or energy efficiency. Moving forward, standalone Time of Use offerings will begin to look increasingly dated and will be superseded by products that bring together a range of benefits for the customer.

Why consumers are interested:

Time of Use business models are applicable to a large range of customer types. This business model has three primary customer benefits:

- **Choice** - Time of Use optimisation gives a choice in both how (active or passive), and who (energy supplier, third party etc.) consumers engage with.
- **Financial** - Time of Use optimisation can provide financial benefits to the customer through reduced energy bills
- **Low risk** – Time of Use optimisation is typically low risk and low cost to entry.

Core components to Time of Use optimisation

There are 4 core components to Time of Use optimisation:

- **Fixed period Time of Use tariffs** – these are tariffs which have a fixed structure to the different energy prices associated with the tariff (e.g. energy prices are lower during set times of the night)
- **Dynamic Time of Use tariffs** – these are tariffs which have a dynamic structure to the different energy prices associated with the tariff (e.g. electricity prices vary with the wholesale electricity price and therefore cannot be predicted far in advance)
- **Active customer enabled** – the customer manages their energy usage themselves to reduce energy bills
- **Passive customer enabled** – a third-party manages energy usage on the customer’s behalf to reduce energy bills

Given the nature of these four components, customers on fixed period Time of Use tariffs will generally be active, whereas customers on dynamic Time of Use tariffs will generally be passive.

Time of Use optimisation

Further explanation of the core components

1. Fixed period Time of Use tariffs

These Time of Use tariffs are not new to the energy industry and are well-known. These tariffs have a fixed structure to the different energy prices associated with the tariff. The most common example is the economy 7 tariff where you pay standard prices during the day, but cheaper prices for seven hours during the night. The difference in prices may be up to 50%, depending on the electricity supplier.

Example

OVO Energy's Better Energy economy 7 tariff charges customer (Southern Scotland) a unit price of 16.28 p/kWh during the day but only 8.01 p/kWh for 7 hours during the night²⁸.



2. Dynamic Time of Use tariffs

These Time of Use tariffs are new to the energy industry and are expected to become increasingly commonplace. These are tariffs which have a dynamic (variable) structure to the different energy prices associated with the tariff as the tariff is generally linked to the wholesale electricity price.

Example

Octopus's Agile tariff provides customers with access to half-hourly energy prices which are tied to the wholesale electricity price. Therefore the customer's energy prices rises and falls with the wholesale electricity price.



3. Active customer enabled

Customers are responsible for managing their own energy usage and are generally provided with tools to optimise their energy production, usage & storage themselves. The customer benefits from bill savings and greater control, however they take on greater risk as they have full responsibility for avoiding expensive time periods.

Example

In combination with a Time of Use tariff, **Dezera** offer end users a tool to optimise the timing of their own energy consumption, minimising their energy costs.



4. Passive customer enabled

A third-party manages energy usage on the customer's behalf to reduce energy bills & thus offer "lowest cost" supply. The customer benefits include a low level of engagement, low customer capital outlay and lower exposure to risk.

Example

Innowatio offer site optimisation, energy efficiency, access to wholesale market and participation in ancillary services in one package to reduce their customers' energy costs.



Time of Use optimisation

Future importance

Time of Use optimisation are of medium to high importance to the customer, energy networks and policymakers and therefore has a high overall importance rating

Delta-ee future importance rating: high.

We expected that Time of Use business models will become increasingly prominent in the UK over the next decade.

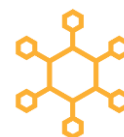
The primary driver behind this importance rating is the ability for this business model to help enable the electrification of mobility and heat.



Importance to the customer

Medium

Time of Use optimisation business models provide the customer with the potential of cheaper electricity. However, for some consumers the price may go up and some customers will not like the loss of control over when they use energy. Time of Use optimisation will enable greater decarbonisation of the UK (through increased electricity generation from renewables and electrification of mobility and heat) which is an important issue for many consumers.



Importance to the energy networks

High

Time of Use optimisation business model enable domestic demand side response. This will become increasingly important for the energy system over the next decade due to increasing electrification of mobility and heat. Time of Use tariff enabled demand side response will reduce the peak demand on the electricity grid thereby reducing the need for upgrading grid infrastructure (the cost of which will ultimately be passed on to consumers).



Importance to policymakers

High

The Time of Use optimisation business models are important for enabling future electrification of domestic heating and transport and significant share of electricity from renewable generation. These are key parts of the Government's strategy for meeting climate change targets set by the Climate Change Act and ongoing carbon budgets.

Lifestyle Products

Business model overview

Lifestyle Products are focused on improving the customer’s quality of life or experience by taking advantage of the increasing connectivity of our homes and devices.

Overview

The primary aims of Lifestyle Products are to create either tangible value for customers or to excite and engage them. The business models behind these products are dominated today by those that aim to deliver design-oriented ‘smart’ technology products (e.g. smart thermostats) to customers via the energy supplier route. These products are usually packaged up with tariffs or services and delivered through in-home devices and apps.

Why are consumers interested?

There are three primary reasons why consumers are engaging with Lifestyle Products:

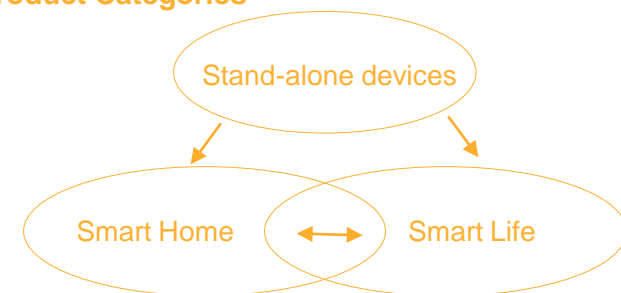
- **Control and convenience** – The more engaging offerings here all promise improved convenience and control over some aspect of the user’s life: e.g. energy consumption, indoor climate, wireless device charging.
- **Style** – The ‘style’ part of ‘lifestyle’ stands out as a constant theme with appealing items emphasising look, feel and intuitive modes of usage as much as their functionality.
- **Lure of new technology** – A significant number of the items here are being acquired by early adopters excited by the possibilities that new technology can offer.

Core approaches to Lifestyle Products

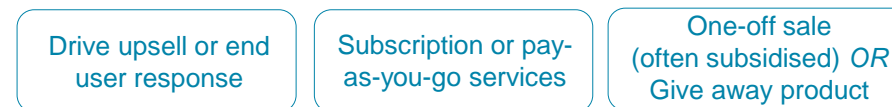
There are three core lifestyle product categories that apply across four different business models. It is difficult to define sharp boundaries between product categories because the market is relatively new - instead, they overlap significantly. Furthermore, the interplay between these product categories and business models is complex.



Product Categories



Product categories can feature in all business models



Business Models

Lifestyle Products

Further explanation of the three product categories

Stand-alone Devices

Usually selling to early-adopters as the 'latest tech' on top-end design products. Consumers purchase these products because they:

- Are 'cool' or beautifully designed
- Can solve their problems in a novel way e.g. saving them time or money
- Make their lives easier or give them more control via imaginative use of technology.

From this category, products can be developed out into Smart Home and/or Smart Life ecosystems.

Example

Sowee are a Subsidiary of EDF and supply energy and provide connected heating controls that automatically adjust heating based on comfort or budget.

Companies active in this space



Smart Home

Consumers here adopt multiple connected devices, both energy and non-energy related. Often, these branded 'mini-ecosystems' begin with energy but later extend into new markets. There is a potential dominance of tech giants such as Google, Apple and Amazon, but this potential dominance hasn't stopped utilities like British Gas and Eneco/Quby from entering the market

Example

Netatmo are a manufacturer & supplier of smart home products. They initially offered smart thermostats & weather stations, distinguished by their elegant design and have now expanded their global range to include security & smart watches.

Companies active in this space



Smart Life

This is an emerging category that overlaps and extends 'Smart Home', focussing on improving the consumers' life via the application of smart technology by, for example:

- Providing personal energy wallets for on-the-go electric vehicle charging (Share & Charge)
- Supporting an elderly family member via potentially life-saving alerts
- Monitoring lifestyle factors: noise levels, humidity (e.g. for asthma sufferers) & UV exposure.

Example

Witricity are US start-up developing cable free (i.e. wireless) charging for EVs and domestic electronics.

Companies active in this space



Lifestyle Products

Future importance

Lifestyle Products will have high future importance to the customer as they reach mass market status, however they are likely to be of negligible importance to the energy networks and therefore have a medium overall importance rating

Delta-ee future importance rating: medium

The primary driver behind this importance rating is the importance to the customer as we expect Lifestyle Products to reach mass market status in the future.



Importance to the customer

Medium/high

The enhanced control/convenience (e.g. remote control of one's heating) offered by Lifestyle Products coupled with the ability to improve the quality of life for all consumers - but especially those with additional needs (e.g. monitoring the lifestyle of older persons) - will result in Lifestyle Products having a fairly high future importance to consumers.



Importance to the energy networks

Low

Lifestyle Products are not expected to provide any benefit to the energy system.



Importance to policymakers

Low

Lifestyle Products offer the potential to reduce the need for other, more expensive, interventions which are funded by the state (e.g. house visits by a carer). However, they aren't expected to contribute to decarbonisation goals and therefore remain of low importance.

Energy as a Service

Business model overview

Energy as a Service business models focus on providing the use of a product/meeting a customer need (heating, cooling etc.) as a continued service offering, rather than a once-off product purchase.

Overview

Traditionally, business models have been more focused on the technology/equipment. The Energy as a Service business model moves away from this by providing a continued service offering, thereby placing the customer at the center of the business model.

Why are consumers interested?

Consumers are interested in these business models because of their emphasis of reduced risk exposure (manifesting as “hassle”) for customers:

- **Providing increased peace of mind** – risk around rising energy costs and maintenance transferred from the customer to the provider.
- **Minimal investment** - established return on investment metrics enable a business case for business to business and zero investment is attractive for consumers.
- **Improved customer experiences** – around independence, ease and speed of access.

Core approaches of Energy as a Service propositions

These three core approaches characterise how innovative business modes are creating value through Energy as a Service:

- **Asset leasing** – a finance agreement which removes the upfront capital cost barrier for the customer;
- **Selling efficient kWh** – an input based business model where the customer pays for the energy consumed rather than the hardware provided;
- **Providing an outcome** – an output based business model where the customer pays a unit price for each delivered instance of the promised outcome.

Within this report, we will be focussing on two approaches to Energy as a Service offerings:

- Energy as a Service **focussed on high cost installation**
- Energy as a Service **focussed on selling performance**

This split has been made as different barriers to accessing the business model apply to each of these propositions.

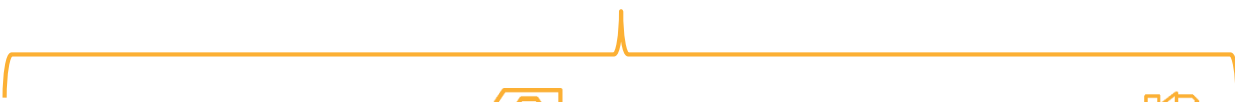
Energy as a Service

Further explanation of the types of proposition

Sub types of Energy as a Service proposition used in this report

Subtypes of Energy as a Service proposition as defined in Delta-ee's framework, upon which this work is based.

Energy as a Service focussed on high cost installation



Asset leasing



A finance agreement which allows the customer to obtain a new energy-consuming asset without the up front capital outlay i.e. procuring an asset and the associated maintenance / servicing.

Example

Thermondo (Germany) offer customers a leasing option where customers can have a new heating system installed at no up-front cost, financed through a 2-10 year 0% financing and servicing contract. They also offer an online sales platform for selling heating systems, including installation through a digital only experience.

Companies active in this space



Selling efficient kWh



The provision of an energy-using or energy-producing asset and/or energy efficiency measures, where the customer pays for the energy consumed and not for the technology(s) installed.

Example

St1 (Finland) install heat pumps for whole apartment blocks and sell kWh of heat to residents. St1 optimise the control of the heat pump based on smart-home sensors and algorithms, weather forecast and day-ahead hourly electricity prices. The contract length is typically 15 years (customers can buy out of the contract at any time).

Companies active in this space



Energy as a Service focussed on selling performance



Providing an outcome



The provision of a service / experience / result where the customer pays a unit price for each delivered instance of the outcome e.g. x laundry washes per month or a guaranteed building temperature of 21°.

Example

Beegy (Germany) control a household's energy system and guarantee a heat service at a fixed monthly price. The customers must buy equipment themselves (HP, PV, storage etc.) but Beegy takes on risk around variations in the customer's consumption and technical performance as most parts are guaranteed for twenty years.

Companies active in this space



Energy as a Service

Future importance

Energy as a Service is expected to be of at least medium importance to the customer, the energy networks and policymakers and therefore has a medium overall importance rating

Delta-ee future importance rating: medium

The primary driver behind this importance rating is the fact that the Energy as a Service business model will be of importance to all three categories (customer, energy system and policymakers). This level of importance is driven by our understanding that decarbonisation of heat is of high importance to policy makers as a key part of the Government’s strategy to meet carbon reduction commitments set out in the Climate Change Act and in the ongoing carbon budgets.



Importance to the customer

Medium to high

The Energy as a Service business models focussed on selling performance can help to simplify an increasingly complex future energy market; the consumer gets an agreed service while the company work out the best way to achieve this. Energy as a Service business models focussed on high cost installation enable customers to have new low carbon technology with a lower performance risk.



Importance to the energy networks

Medium

The Energy as a Service business models will enable the ability to reduce usage peaks by the company providing demand side response where it is most cost effective. This will reduce grid infrastructure upgrade requirements, especially when the service includes usage of electric heating technologies or electric car charging.



Importance to policymakers

Medium to high

The Energy as a Service business model is one method of reducing the barriers to decarbonization of heat. Heat as a Service propositions in particular aim to enable gas boilers to be replaced by low carbon heating technologies without consumers taking on the risk of these new technologies and being guaranteed the same (or improve) levels of comfort they have currently.

Trading Platforms

Business model overview

Trading Platforms are marketplace business models which transform the way in which stakeholders are connected and transactions occur

Overview

Marketplace business models are not products/services but rather transform or develop the actual marketplace within which these products/services are offered.

Traditionally, the only energy-related market choice a consumer could make was who their supplier was and what tariff they are on. We see that 'marketplace' business models provide consumers with more choice and the ability to make more informed decision, enabling them to become more active market participants. The mega-trends of 'connectivity' and 'digitalisation' are enabling a wider range of marketplace business models and accelerating their growth through more sophisticated infrastructure.

Why are consumers interested

- Marketplace business models provide an improved customer experience as well as financial benefits. The benefits are :
 - **Convenience** by providing services which are **quick, easy and hassle free** as well as allowing customer to **tailor their service** (e.g. state preferences).
 - **Financial** by potentially providing **additional revenue or lower energy bills** (these are often small/incremental and not a key appeal).
 - **Greater connection to where their energy is being generated** for example supporting local community energy initiatives

The four level model of Marketplace Operations

The new energy marketplace can be characterised by a four level model, where each level is more sophisticated than the previous one:

- 1. **Price comparison services** – simplest and most common type, focused on supplier switching.
- 2. **Auto-switching** – an automated version of level 1, with third party companies simplifying the task of finding the cheapest tariff (often based on smart meter data) and improving convenience for consumers.
- 3. **Trading platforms**– new environments that allow consumers to be matched directly with generators, thus minimising or entirely disintermediating traditional suppliers.
- 4. **Smart markets** – allows for a full range of services to be promoted, where energy may only represent the starting point of the conversation.

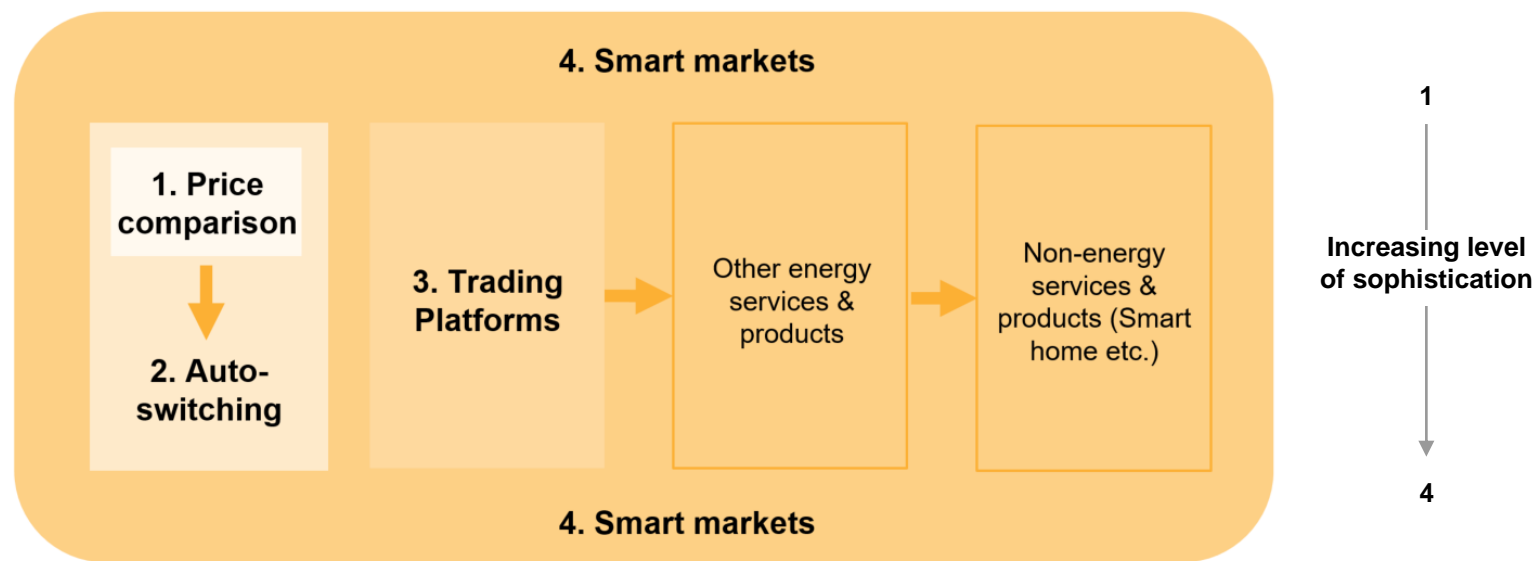
The relationships between the four levels vary – **the transition between layers is not necessarily linear**; while level 1 naturally leads to level 2, level 3 tends to originate as a standalone activity. We expect some level 3 business models evolving to level 4, however level 4 business models can be developed as a starting point which could even incorporate levels 1, 2 and 3.

In this report, we are focusing on 3) Trading Platforms.

Trading Platforms

Further explanation of the four level model

The four level model which characterises the new energy marketplace



- 1. Price comparison** - drives supplier switches and earn affiliate fees per switch, often entering other verticals as comparison capability is generalised. They are the most common and simplest of the four business model types.
- 2. Auto-switchers** – automated versions of price comparison services that improve the ease of use and convenience for users whilst increasingly marginalizing suppliers. In doing so, they tend to own the customer, sometimes charging them a fee per year and/or taking a share of savings.

3. Trading platforms - supplants traditional supplier role by allowing consumers to make choices about the source and type of generation they use. Emphasises consumer choice, localism and renewables and combines well with upsell of PV and similar 'behind the meter' generation

Focus for this work

- 4. Smart markets** – the most sophisticated level but also the least common. Smart markets deliver an ultra-flexible way to promote a wide range of services to a large customer base. In doing so, it locks the platform provider into the supply chain. Smart markets broaden out to offer consumers a flexible range of energy and even non-energy services that may include any, all or none of the previous levels.

Trading Platforms

Example companies active in the space

1. Price comparison

Example

Cheap Energy Club provides consumers with a full market energy comparison each month and notifies customers when a cheaper deal is available. This service can be accessed for free by the consumer (but commission is charged to suppliers).

Companies active in this space



2. Auto-switching

Example

Flipper provide customers with personalised market comparison reports and also automatically switches the customer to the lowest tariff available (as long as saving is minimum £50/year). This currently costs customers £25 per year.

Companies active in this space



3. Trading platforms

Example

Open Utility provides a first step towards peer-to-peer energy trading by facilitating matching between generators and consumers within a client's (utility's) portfolio.

Companies active in this space



4. Smart markets

Example

SmartKlub provides city-scale marketplaces alongside metropolitan authorities so that energy needs can be satisfied at an affordable cost. It aims to become the Groupon of energy services

Companies active in this space



Trading Platforms

Future importance

Trading Platforms are expected to be of low to medium importance to the customer, energy networks and policymakers. This is primarily due to the view that this is a relatively niche business model.

Delta-ee future importance rating: low

The primary driver behind this importance rating is the fact that Trading Platforms are not expected to be mass-market in the short-medium term and therefore their impact will be relatively small.



Importance to the customer

Low to medium

Trading Platforms provide consumers with increased consumer choice, potential cost savings on their energy bill (e.g. from auto-switching, peer-to-peer energy trading) as well as the opportunity to support local community energy systems.



Importance to the energy networks

Low

Trading Platforms could reduce demand on the energy system thereby placing less pressure on grid infrastructure. However, this impact is expected to be small as Trading Platforms are viewed as a niche business model.



Importance to policymakers

Low

Trading Platform interventions offer the potential to reduce the need for other, more expensive, low-carbon energy incentives which are funded by the state (e.g. feed-in tariffs).

Efficient Consumption

Business model overview

The goal of Efficient Consumption business models is to improve energy efficiency by monetising a reduction in energy usage – the ultimate win-win for consumers and providers

Overview

Efficient Consumption business models allow companies to offer innovative approaches to energy efficiency. These approaches are primarily data driven and/or novel commercial arrangements to help customers save energy.

This is the most established, mature business model category as the desire to reduce consumption has existed since consumers have been paying for energy.

The traditional approach has been to apply single physical measures to homes/operations e.g. double glazing, loft insulation etc. These have generally been carried out in isolation from each other and with a limited understanding of cause and effect. Furthermore, solutions were largely mandate driven (e.g. policy led as opposed to customer led) and not orientated around the consumers' individual needs with measures being generic, 'one-size-fits-all'.

Why are consumers Interested

Reducing wastefulness is the entry point for consumers. Two further benefits are:

- **Measuring to control** - the principle of customers knowing their usage will lead to 'better' energy habits for the customer.
- **Personalisation** – energy usage is personalised and has individual relevance for the customer.

Approaches to 'new energy' Efficient Consumption

There are two general approaches to 'new energy' Efficient Consumption business models:

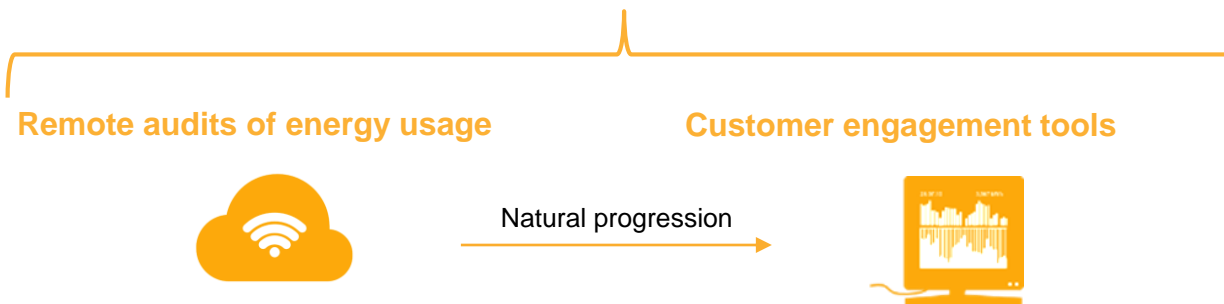
- **Efficient Consumption focussed on energy audit**
 - **Remote audits of energy usage** – these provide energy usage insights and can be performed without a sit visit
 - **Customer engagement tools** – this approach aims to educate consumers and generally has a strong behavioural focus
- **Efficient Consumption focussed on building efficiency**
 - **Complete building re-fits** – this approach aims to upgrade a home with a whole range of improvements

The market is increasingly dominated by **data analysis specialists providing expert solutions to utilities** who then attempt to apply them to their customer databases as 'business as usual'. In contrast, the complete building refit category is being **disrupted by expert retrofit service providers** who **emphasise a radical, physical approach**.

Efficient Consumption

Further explanation of the approaches to Efficient Consumption

Efficient Consumption focussed on energy audit



Remote audits of energy usage

This business model is based on consumption and other data derived from smart meters, bills, connected devices etc. Site visits are usually avoided for cost reasons unless absolutely necessary.

Example

FirstFuel provide customer-facing and utility-facing engagement platform and virtual energy auditing and advice via detailed data analysis and customer insight.

Companies active in this space



Customer engagement tools

This business model aims to influence end-users to reduce energy usage and/or carry out efficiency upgrades. It is often developed as a natural 'phase 2' to remote audits.

Example

Onzo are a UK data analytics SME which combines energy analytics with load disaggregation, behavioral and lifestyle patterns and probabilistic forecasting.

Companies active in this space



Efficient Consumption focussed on building efficiency

Complete building refits



Traditionally, this approach has focused on applying one or two energy efficiency measures at a time (e.g. insulation, boiler upgrade). More recently, there have been signs of a shift to 'whole property' upgrades, which tend to encourage innovation.

Example

BetterHome was established by several of Denmark's most well-known and trusted home improvement specialists and perform home renovations by approved installers.

Companies active in this space



Efficient Consumption

Future importance

Efficient Consumption business models are of at least medium importance to the customer, energy networks and policymakers. This is primarily due to them being important for reducing energy demand and popular in the future due to being a ‘win-win’ situation for all stakeholders.

Delta-ee future importance rating: medium

The primary driver behind this importance rating is that it is expected to occur at scale (due to the smart meter roll out) and it has a large potential upside (i.e. the potential to significantly reduce energy demand)



Importance to the customer

Medium

Efficient Consumption business models have the potential to reduce customers’ energy bills thereby providing financial savings. Furthermore, if material changes occur (i.e. renovations), a more comfortable home will result. However, efficient consumption business models focussed on building efficiency do not address the high upfront costs of entire home retrofit.



Importance to the energy system

Medium to high

Increasing energy efficiency will result in a reduced demand for energy thereby reducing the grid capacity required, resulting in cheaper infrastructure. The importance of this business model to the energy system is directly dependent on uptake rates.



Importance to policymakers

High

Efficient Consumption business models are of high importance to government as they can directly reduce energy consumption in the domestic sector and therefore help the UK to meet climate change targets.

Bundling

Business model overview

Bundled business models are based on offering a combination of products and/or services, packaged together into a single proposition

Overview

Bundling is not new, nor is it an inherently energy-centric technique as it can be applied to many markets. However, it does represent an important innovation trend at the end of the value chain. Bundling is a natural consequence as providers seek to evolve their business models due to:

- The downward pressure on commodity margins
- Desire to grow revenue from the customer end of the value chain
- Better understanding of customer needs via big data analytics

The primary goal of bundling for the company is usually to generate new income streams and thereby increase average revenue per customer. Additional benefit may also come in improved customer retention.

We are not focussing on this business model in this project as it cuts across all others

Why are consumers Interested

Bundling has the potential to provide consumers with three primary benefits:

- **Value for money** by providing additional products and services at a lower price than accessing them separately;
- **Simplification and convenience** by providing an integrated, one-stop-shop or deeply joined-up technology approaches;
- **Tailoring** via smart bundles that meet exact user lifestyle needs based on information the company has about the customer.

Core approaches to bundling

There are three core approaches to bundling:

- **Additional product or service** – simple bundles where a new product is typically added to an existing core offer
- **Multi products/service bundles** – comprising an integrated package of products often focused on value and simplicity
- **Smart bundles** – where bundled items ‘work together’ in a joined up way that ‘makes sense’ to consumers, to provide a coherent customer experience such as peace of mind or an easier life

Bundling

Further explanation of the three core approaches

Increasing level of bundle sophistication →

Additional product/service



The bundle involves adding new products or services to an existing core offer. From the customer's perspective it can be described as an 'opportunistic purchase' e.g. some products/services are discounted or free in return for buying the bundle.

Example

Anglian Water offers UK businesses a way to procure their gas and power alongside water supply and wastewater services, all from a single provider.

Companies active in this space



Multi product/service bundle



The core business model is orientated around a bundle/ecosystem/combination of product/services. From the customer's perspective it can be described as a 'simplification purchase' e.g. a bundle of products/services delivered in a fully integrated way.

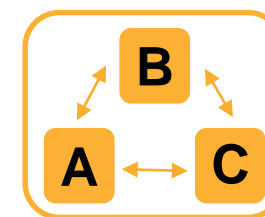
Example

Utility Warehouse provide multi-utility bundles which combine landline, mobile, broadband and energy services to deliver a simple, good value package for consumers.

Companies active in this space



Smart bundles

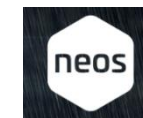


The bundled items 'work together' i.e. synergies between bundled items are exploited to create additional value pools. From a customer's perspective it can be described as a 'tailored purchase' e.g. the bundle helps customers manage their lives.

Example

HomeServe are a provider of domestic repair service bundles (including boilers, plumbing, electrical and insurance) where components work together to provide complete peace of mind.

Companies active in this space



Appendix 2: Detail on barriers to accessibility of each business model

Time of Use optimisation (1/2)

Barriers to business models

Overall the most significant barriers to Time of Use will be consumer's ability to change their behaviour. However for the business model to succeed, the correct incentive level and making smart technology accessible to the customer is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Ability to change behaviour due to an inflexible lifestyle	Consumers will need to avoid using energy at peak times if they are on a Time of Use tariff, otherwise their energy bills will increase. For some, this is not possible due to the needs of members of the household or due to their working patterns.	● ● ● ● ●	If a consumer cannot be flexible with their energy use, Time of Use tariffs could result in an increase in their energy bill.
Requirement to change behaviour (but a consumer not being the main energy user in the house)	The Time of Use tariff would require all people in the house to substantially change their behaviour in order to prevent an increase in their energy bill but in shared houses this is out of a single customer's control	● ● ● ● ●	The threat of higher cost unless everybody living in the house change their behaviour is likely to stop those living in shared houses from accessing this business model.
Upfront cost	A lack of high-energy usage equipment (e.g. EV charger) or equipment which can respond to price signals (e.g. smart washing machine) makes it difficult to optimise or automate usage. Furthermore, the more onsite energy generation and storage one has, the more flexibility the consumer has to optimize their energy usage. To best access Time of Use business models, households would need this technology, but the upfront cost could be prohibitive	● ● ● ● ●	Smart hardware, which is likely to have a high-upfront cost, makes it easier for the consumer to optimize their energy usage and take advantage of Time of Use tariffs. However, this is not fundamental to the business model
Lack of interest or motivation to engage	Consumers might have to manually change their behaviour in order to avoid the highest electricity price periods which requires high engagement	● ● ● ● ●	Optimising one's energy usage to take advantage of Time of Use tariffs requires customer engagement

Time of Use optimisation (2/2)

Barriers to business models

Overall the most significant barriers to Time of Use will be consumer’s ability to change their behaviour and their trust in companies. However for the business model to succeed, the correct incentive level and making smart technology accessible to the customer is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Lack of trust in companies	Consumer’s need to trust a third-party company to externally optimise their energy usage to fully take advantage of the Time of Use tariffs (e.g. automatically charging their EV when the electricity price is low). However, some consumers will be put off this as they don’t trust the companies (existing supply companies or new entrants) to undertake this role.	● ● ● ● ●	Consumer’s cannot make the most of Time of Use tariffs if they are not willing to relinquish control to a third-party for automation
Understanding of business model concept	Consumers need to understand that energy bills can go down as well as up before being placed on a Time of Use tariff	● ● ● ● ●	There is a risk that vulnerable consumers who don’t understand the business model concept could be exposed to higher energy prices
Perceived loss of control	To best take advantage of Time of Use tariffs, consumers need to be hands off and let a third-party take control of their energy usage. For some consumers this will be a barrier to engagement	● ● ● ● ●	Enabling a third-party to optimize one’s energy usage can result in a perceived loss of control

The suitability of a house to new technology and online accessibility were also identified as barriers, however these either affect a small subset of consumers or should be relatively simple to overcome via the business models e.g. via providing access to the tariff by phone as well as online. All barriers are listed in the [accompanying data tables](#).

Energy as a Service focussed on high cost installation (1/2)

Barriers to business models

Overall the most significant barriers to Energy as a Service focussed on high cost installation will be the upfront cost, household ownership and the consumer's credit rating. However for the business model to succeed, consumer trust in third-parties is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Upfront cost	Some Energy as a Service business models require consumers to purchase the technology or equipment and then it is up to the company to make them perform efficiently.	● ● ● ● ●	The efficient, high-performing equipment required by this business model usually has a high upfront cost.
Not owning a house	If the landlord is not open to this business model it is likely to exclude the tenant from accessing this business model as the equipment replaced is generally owned by the landlord.	● ● ● ● ●	Currently, there is low incentive for landlords to engage in energy and take on the risk associated with this business model.
Requirement for credit agreement for loan	Some Energy as a Service business models require equipment leasing and therefore consumers are likely to need to pass a credit check if the leasing is via a low cost loan.	● ● ● ● ●	One way to overcome the upfront cost barrier for consumers is to lease the equipment in the form of a low cost loan.
Lack of trust in companies	Consumers need to trust a third-party companies to externally optimise their energy usage to deliver energy in the most efficient manner.	● ● ● ● ●	Consumer's cannot access this business model if they can't relinquish control to a third-party to deliver the agreed-upon service.
Long term commitment	Some Energy as a Service business models requires consumer to commit to a long-term contract which can be risky for the consumer.	● ● ● ● ●	The threat of being locked into an unfavourable arrangement, particularly if the customer has a change in circumstances, is likely to be off-putting for many consumers.

Energy as a Service focussed on high cost installation (2/2)

Barriers to business models

Overall the most significant barriers to Energy as a Service focussed on high cost installation will be the upfront cost, household ownership and the consumer’s credit rating. However for the business model to succeed, consumer trust in third-parties is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Financial lock-in	To access this business model, consumer generally need to be financially committed for a period of time. This may not be possible for certain consumer groups.	● ● ● ● ●	Consumers with low credit ratings and circumstances not allowing them to be in a financial lock-in prevent them from participating in this business model.
Suitability of house to new technology	If the business model requires the selling of new equipment (e.g. a heat pump) the equipment might not be compatible with all house types. Furthermore, the house may not be favorable to business models reliant on high-energy efficiency (e.g. houses with solid walls).	● ● ● ● ●	If the technology cannot physically fit or causes some form of household disruption it will reduce consumer acceptance. Consumers with poor energy efficiency households may not be acceptable to the company.
Living in a remote location	Some Energy as a Service business models require the company to be responsible for the performance and maintenance of the technology which makes it hard to service households which are hard/expensive to reach.	● ● ● ● ●	Households in high density areas are more attractive to these companies as they are easy to reach and therefore reduce maintenance and service costs.
Lack of understanding of how technology works	If a consumers does not correctly understand a technology, they may believing that the technology is not working properly and therefore that the company is providing poor service.	● ● ● ● ●	This business model generally relies on new technology which can be hard for consumers to understand. Companies have a role in helping the consumer use new technology
Lack of digital literacy/engagement	The consumer needs to access their energy usage through technology (e.g. not just a switch at the boiler) which some consumers might find unappealing. Furthermore, this business model might be most easily accessible online.	● ● ● ● ●	Technology is increasingly being made more accessible but it is a constant barrier to certain consumer groups.

All barriers are listed in the [accompanying data tables](#).

Energy as a Service focussed on selling performance (1/2)

Barriers to business models

Overall the most significant barriers to Energy as a Service focussed on selling performance will be the household suitability and consumer's perceived loss of control. However, consumer trust in third-parties is critical for the business model to succeed.

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Suitability of house to new technology	It may not be economically viable for a service company to guarantee providing a certain outcome/service (e.g. keeping a home at 21°C) if the house is unsuitable (e.g. houses without loft insulation).	● ● ● ● ●	Energy service providers may not accept customers with low efficiency houses
Perceived loss of control	Consumers, whilst having control of their outcome/service (e.g. house temperature), will have no control over how that temperature is delivered	● ● ● ● ●	This is a drastic change in how our heating is currently delivered with consumers having full control of the device which is delivering the heat
Lack of trust in companies	Consumers need to trust a third-party (company) to externally deliver the agreed-upon outcome/service in order for this business model to work	● ● ● ● ●	Consumers cannot access this business model if they can't trust the company to deliver the promised outcome/service
Not owning the house	If the landlord is not open to this business model it is likely to exclude the tenant from accessing this business model as the equipment required to deliver the service is generally owned by the landlord	● ● ● ● ●	Currently, there is low incentive for landlords to engage in energy, reducing tenant's access to this business model
Change in situation within the same house	If a contract is based on the delivery of a set outcome/service (e.g. 8 hours per day at 21 °C) then the contract will need to change if household circumstances change (e.g. having a baby, becoming ill etc.). The offer may be much more expensive based on the resulting different usage pattern.	● ● ● ● ●	Consumers who are susceptible to changing household circumstances are more likely to be excluded from this business model

Energy as a Service focussed on selling performance (2/2)

Barriers to business models

Overall the most significant barriers to Energy as a Service focussed on selling performance will be the household suitability and consumer’s perceived loss of control. However, as with Energy as a Service focussed on high cost installation, for the business model to succeed, consumer trust in third-parties is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Living in a remote location	Outcome/service based business models require the company to be responsible for the performance and maintenance of the technology which makes it hard to service households which are hard/expensive to reach	● ● ● ● ●	Households in high density areas are more attractive to these companies as they are easy to reach and therefore reduce maintenance and service costs
Lack of digital literacy/engagement	The consumer needs to access their energy usage through technology (e.g. not just a switch at the boiler) which some consumers might find unappealing. Furthermore, this business model might be most easily accessible through online mediums	● ● ● ● ●	This business model generally relies on new technology which can be hard for consumers to understand
Concern that contract will not meet consumer’s needs	Consumer’s energy needs are diverse and dynamic, therefore attempting to meet them with a simple outcome/service based offering is a complex goal	● ● ● ● ●	The acknowledgement of this complex goal may result in consumer concerns with the business model which will act as a barrier
Understanding of business model concept	Providing an outcome/service is a very unfamiliar concept in the energy industry which may result in consumer’s struggling to understand the concept	● ● ● ● ●	A lack of consumer understanding for something as critical as household energy will reduce consumer acceptability and therefore act as a barrier

All barriers are listed in the [accompanying data tables](#).

Efficient Consumption focussed on energy audit

Barriers to business models

Overall the most significant barriers to Efficient Consumption focussed on energy audit will be the how the consumer prioritises their energy consumption. However, for the business model to succeed, consumer engagement, trust in companies and ability to change their behaviour is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Energy not being a high priority compared to competing priorities	Consumers who have higher priorities than efficient energy consumption are unlikely to respond to Efficient Consumption prompts/nudges.	● ● ● ● ●	Consumers order their actions based on their priorities.
Lack of interest/motivation to engage	This business model requires continual engagement from the consumer as consumers might have to continually alter their behaviour. This is a strong barrier if the consumer does not believe that their energy bill is too high.	● ● ● ● ●	Increasing the efficiency of one's consumption is likely to require some sort of long-term behavioural change.
Lack of trust in companies	This business model requires a large amount of data to be collected and analysed by a third-party, hence consumers may find this business model intrusive.	● ● ● ● ●	If the consumer is not comfortable with third-parties having access to their data this business model is inaccessible.
Ability to change behaviour or degree of flexibility	The aim of this business model is to instigate behaviour change to increase efficient energy consumption, however this is not always possible for consumers.	● ● ● ● ●	If consumer's cannot be flexible with their energy use this business model is inaccessible.

The upfront cost of energy consumption monitoring equipment or recommended new technology, a lack of digital literacy and understanding of the business model concept were also identified as barriers, however these barriers are relatively simple to overcome via the business models e.g. the company provide the energy consumption monitoring equipment (as it should be relatively low cost) or provide access to the business model by phone as well as online. All barriers are listed in the [accompanying data tables](#).

Efficient Consumption focussed on building efficiency (1/2)

Barriers to business models

Overall the most significant barrier to Efficient Consumption focussed on building efficiency will be the upfront cost of a household retrofit. However, for the business model to succeed, consumer priorities and motivation is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Upfront cost	The typical household retrofit is expensive and therefore it is likely to be inaccessible to certain consumer groups.	● ● ● ● ●	Typical retrofits have a prohibitively high upfront cost.
Energy not being a high priority compared to competing priorities	Consumers who have higher priorities than efficient energy consumption are unlikely to go through the hassle of household retrofits.	● ● ● ● ●	Consumer's actions are based on their priorities.
Lack of interest/motivation to engage	A high motivation to become energy efficient is required as retrofits typically have long payback periods.	● ● ● ● ●	Household retrofits require long-term financial commitment and therefore a high level of motivation to engage.
Restriction on changes that can be made	Houses that are listed buildings or in protected areas (more common) will either have added restrictions for what retrofit work can be done or will be more expensive to retrofit.	● ● ● ● ●	The extra effort and/or cost to retrofit certain household types will act as a barrier.
Long term commitment	Consumers who undertake household retrofits generally need have security that they will be living in that house for the long-term.	● ● ● ● ●	Being locked into an unfavorable arrangement or a change of consumer circumstance are risks to long-term commitment.

Efficient Consumption focussed on building efficiency (2/2)

Barriers to business models

Overall the most significant barrier to Efficient Consumption focussed on building efficiency will be the upfront cost of a household retrofit. However, for the business model to succeed, consumer priorities and motivation is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Not owning a house	Typically people need to live in the house they own to be able to make decision about retrofitting it	● ● ● ● ●	It is highly unlikely that the tenant will be the decision maker when it comes to household retrofits
Understanding of business model concept	Household retrofits are typically big decisions, therefore the consumer requires clear understanding of the energy efficiency improvements and associated cost savings to accept this business model	● ● ● ● ●	Consumer's need to understand the payback periods before accepting this business model
Requirement for credit agreement for loan	The high upfront cost required to retrofit one's household means it is likely that credit will be required	● ● ● ● ●	One way to overcome the upfront cost barrier for consumers is in the form of a low cost loan
Living in a remote location	It is likely that the more remote the household is, the more expensive the retrofit will be	● ● ● ● ●	Household location can add to the upfront cost barrier
Lack of digital literacy/engagement	This business model is typically accessed through the internet or a digital avenue	● ● ● ● ●	Technology is increasingly being made more accessible but it is a constant barrier to certain consumer groups

All barriers are listed in the [accompanying data tables](#).

Trading Platforms (1/2)

Barriers to business models

Overall the most significant barrier to peer-to-peer trading will be the consumer's priorities and the their level of energy literacy. However, for the business model to succeed, creating a sense of energy autonomy for the consumer is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Energy not being a high priority compared to competing priorities	This business model requires customers to actively engage (for a period of time) in the energy market and therefore energy must be a consumer priority	● ● ● ● ●	Consumer's order their actions based on their priorities
Lack of energy literacy to use the technology or software	Consumer's are likely to be shielded from the complex software behind this business model but are likely to require sufficient understanding of energy to adequately participate in an energy marketplace	● ● ● ● ●	In order to make good initial decisions in the marketplace and fully benefit from this business model, consumers are likely required to have certain level of energy literacy
Not having control over energy demand	It is likely that the energy purchasing will be autonomously conducted based on algorithms, therefore the consumer may feel like they have no control over their energy purchasing	● ● ● ● ●	One of consumer's primary attractions to this business model is the social aspect of energy trading (i.e. I can buy my energy from my neighbour), however if this is performed autonomously it is likely to become a barrier
Lack of interest / motivation to engage	This business model is a step-change in how energy is traditional bought by households and therefore requires a certain level of interest or motivation for the consumer to engage in this business model. It is also possible that there is no cost benefit which reduces the likelihood of consumer engagement	● ● ● ● ●	The consumer needs to be engaged enough to sign up to this business model

Trading Platforms (2/2)

Barriers to business models

Overall the most significant barrier to peer-to-peer trading will be the consumer’s priorities and the their level of energy literacy. However, for the business model to succeed, creating a sense of energy autonomy for the consumer is critical

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Upfront cost	To fully participate in this business model, consumers need to be prosumers and therefore require hardware (microgeneration or storage) which comes with an upfront cost	● ● ● ● ●	To most benefit from this business model and feel fully engage, high capital hardware is required
Lack of trust in companies	This business model requires energy trading to be performed autonomously and therefore consumer’s need to trust a third-party (company) to do this in their best interests	● ● ● ● ●	In addition to the primary function of this business model being performed autonomously, consumer data is also required
Lack of digital literacy / engagement	The consumer needs to access their energy supply through technology (e.g. not just a switch at the boiler) which some consumers might find unappealing. Furthermore, this business model might be most easily accessible through online mediums	● ● ● ● ●	This business model generally relies on new technology which can be hard for consumers to understand
Suitability of house to new technology	Certain households are more suitable for microgeneration than others. For this business model, the more suitable the household, the better	● ● ● ● ●	As with the upfront cost barrier, to most benefit from this business model and feel fully engage the consumer must be a prosumer
Perceived loss of control	Fear of not knowing what to do or who to talk to if something goes wrong. There is a risk that peer-to-peer business models or similar could take households out of the remit of existing protection providers	● ● ● ● ●	Steps can be taken to ensure that all consumers are protect

All barriers are listed in the [accompanying data tables](#).

Lifestyle Products (1/2)

Barriers to business models

Overall the most significant barrier to Lifestyle Products will be the consumer's ability or willingness to commit to a subscription as well as their trust in the company offering the product

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Financial lock in / fixed monthly payment	In this business model, it is likely that products will be given away as part of a subscription products which will lock consumers into a fixed payment arrangement	● ● ● ● ●	Consumers circumstances not allowing them to be in a financial lock-in prevent them from participating in this business model
Lack of trust in companies	One aspect of this business model is monetising the data acquired from the customer. This may be a barrier to some consumers	● ● ● ● ●	If the consumer is not comfortable with third-parties having access to their data this business model is inaccessible
Lack of interest / motivation to engage	As this business model typically provides 'nice to have' propositions, the consumer needs to be attracted by the proposition to engage	● ● ● ● ●	If the consumer cannot see a substantial benefit they are unlikely to engage with this business model
Suitability of house to new technology	This business model requires a high level of connectivity and up-to-date products which may render some households unsuitable	● ● ● ● ●	For example, some households might not be compatible (thick walls block wireless signals) or radiator valves not being suited to smart TRVs

Lifestyle Products (2/2)

Barriers to business models

Overall the most significant barrier to Lifestyle Products will be the consumer's ability or willingness to commit to a subscription as well as their trust in the company offering the product

Hardest barrier to overcome



Easiest barrier to overcome

Barrier	Description	Barrier height	Rationale behind barrier
Lack of digital literacy / engagement	The consumer needs to access their energy supply through technology (e.g. not just a switch at the boiler) which some consumers might find unappealing. Furthermore, this business model might be most easily accessible through online mediums.	● ● ● ● ●	This business model generally relies on new technology which can be hard for consumers to understand.
Lack of energy literacy to use the technology or software	This business model is typically user interactive and therefore the consumer may require a certain level of energy literacy to participate.	● ● ● ● ●	In order to not be make good decisions and benefit from this business model, consumers are likely required to have certain level of energy literacy.
Upfront cost	In order to avoid a subscription model and therefore financial 'lock-in', consumers may be able to purchase the product outright. However, this may prove to be expensive.	● ● ● ● ●	This modern technology may be too expensive for certain consumer groups.

The physical accessibility of the technology device was also identified as a barrier, however this barrier is relatively simple to overcome via the business models e.g. creating devices which are accessible to certain consumer groups or creating all inclusive technologies. All barriers are listed in the [accompanying data tables](#).

Appendix 3: Detail on Customer Characteristics

Financial situation




Consumer characteristics

Consumer group	Characteristic	Description of those likely to be affected	Proportion of population affected*	Customer Characteristic Prevalence score
Financial situation	Unpredictable monthly income	Consumers who do not have a stable/predictable monthly income	6% of all employment contracts do not guarantee a minimum number of hours ¹ and 3% of all people in employment are on zero-hours contracts ¹	● ● ● ● ●
	Poor credit score	Consumers who have been denied credit or have not be granted the requested credit rate	30% have either been declined for credit, or been put off because they thought their application would be rejected ³	● ● ● ● ●
	Insufficient savings for large upfront cost	Consumers who have do not have access to sufficient cash savings for a significant capital outlay	57% of UK adults have no cash savings or savings of less than £5,000 ² including 33% only have savings between £1 - £1,999 ²	● ● ● ● ●
	Only just financially managing	Households with low income (less than 60% of the UK's median income after housing costs) or no access to savings	19% of households ⁴ or 21% of households ²⁶ defined as low income after housing costs: 26% of working age adults have no savings ²⁶ . 35% of UK adults are 'in difficulty' or 'surviving' financially ² <i>see reference report glossary for definition of these terms</i> (we expect these to be overlapped, and therefore classing in the range 20 – 35% of UK households (score 3/5))	● ● ● ● ●
	Existing high cost not a motivation	Consumers who have sufficiently high disposable income resulting in a lack of motivation to reduce energy costs	29% of households state their energy bill is the bill they worry most about being able to afford ⁵ and 30% of consumers are either very or fairly worried about paying for their energy bills ⁶	● ● ● ● ●

See [References](#) for source data

Comprehension and understanding

Consumer characteristics

Consumer group	Characteristic	Description of those likely to be affected	Proportion of population affected	Customer Characteristic Prevalence score
Comprehension and understanding	Digital exclusion	Consumers who do not have internet or smart phone access	10% of households do not have access to the internet ⁷ and 21% of the UK population do not have at least one of the digital skills – see reference report for description of the digital skills ⁹	
	Lack of confidence with new technology	Consumers who lack technical skills for unfamiliar technology	Based on 78% of adults do have access to a smart phone ⁸	
	Lack of energy market understanding	Consumers who are not familiar with the energy market	14% of energy customers don't understand their energy bill ¹⁰	

See [References](#) for source data

Personal circumstances

Consumer characteristics

Consumer group	Characteristic	Description of those likely to be affected	Proportion of population affected	Customer Characteristic Prevalence score
Personal circumstances	Energy not being a high priority compared to competing priorities	Consumer's whose other issues in life (e.g. children, finances, work) are prioritized above energy	29% of households state their energy bill is the bill they worry most about being able to afford ⁵ and 30% of consumers are either very or fairly worried about paying for their energy bills ⁶	● ● ● ● ●
	Complex energy needs	Consumers with unusual circumstances (e.g. health issues, large families, families with young children)	15% of households contained a carer in 2009/10 ¹¹ and the number of carers has increased by 5.2% between 2011 and 2017 ²⁷ . 15% of households are families with children under 6 ¹² . 2% of households contain six or more people ¹³ . <i>We have assumed this category applied to 20 – 35% of UK households due to some overlap</i>	● ● ● ● ●
	Time inflexible	Consumers with lack of flexibility due to work circumstances or personal circumstances (e.g. health, family etc.)	For 19% of people in employment, shift work is their main job ¹⁴ . 15% of households contained a carer ¹¹ . 15% of households are families with children under the age of 6 ¹² . <i>Rating assumes some overlap between these</i>	● ● ● ● ●
	Unsettled circumstances	Consumers with a reasonable chance that their housing circumstances may change	17% of occupied households were rented from a private landlord ¹⁵	● ● ● ● ●
	Rental sector	Consumers who are renting the house they live in	35% of occupied households were rented from either a private or social landlord ¹⁵	● ● ● ● ●
	Shared houses	Consumers who live in a multi-occupancy household	4% of the population are singles aged 18-64 who live in a shared house where the other occupiers are not relatives ¹⁶	● ● ● ● ●
	Physical accessibility	Consumers who have any sort of physical limitation on engaging with technology	Physical disability should not be a business model barrier given technical solutions exist. We expect that willingness to engage rather than ability to will be more of a factor to consider in relation to this point.	● ● ● ● ●

See [References](#) for source data

Attributes of the house




Consumer characteristics

Consumer group	Characteristic	Description of those likely to be affected	Proportion of population affected	Customer Characteristic Prevalence score
Attributes of the house	Geographically remote	Consumers who are located in remote, hard to reach areas	1% of the population live in 'sparse setting'. 3.1% of the population live in 'rural hamlets and isolated dwellings' ¹⁷ .	● ● ● ● ●
	Small dwelling that doesn't fit a heat pump or other low carbon heating tech	Consumers whose households which have insufficient usable floor space	31% of households have less than 70m ² of usable floor space ¹⁸ .	● ● ● ● ●
	Hard-to-treat homes	Consumers whose households are not able to be cost-effectively addressed with staple energy efficiency measures	8% of households have hard-to-treat cavity walls. 26% of households have hard-to-treat solid walls. 15% of households have hard-to-treat lofts. ¹⁹	● ● ● ● ●
	Poor thermal efficiency	Consumers in households with poor energy ratings	5% of households had an energy performance rating of F or G ¹⁹ .	● ● ● ● ●
	Restricted development	Consumers who live in listed households and therefore unsuitable for any sort of upgrade/development	0.8% of households are listed by Historic England ²⁰	● ● ● ● ●
	Not suitable for microgeneration	Consumers whose households are unsuited to on-site energy generation	45% of homes are unsuitable for solar PV installations ²¹ .	● ● ● ● ●
	Poor signal houses	Consumers whose households do not have indoor coverage for mobile data services	15% of households do not have indoor coverage for mobile data services ²²	● ● ● ● ●

See [References](#) for source data

Attitudes

Consumer characteristics

Consumer group	Characteristic	Description of those likely to be affected	Proportion of population affected	Customer Characteristic Prevalence score
Attitudes	Lack trust	Consumers who do not trust energy companies to treat their customer's fairly	33% of energy customers do not trust their energy company to 'treat [them] fairly in their dealings with [them]' ²³	
	Value their control	Consumers who do not feel comfortable not being in complete control of their heating system	51% of consumers (survey respondents) were uncomfortable with a third-party controlling their heating system ²⁴	
	Not motivated to engage	Consumers who are not motivated to save energy or engage in the energy market	29% of households state their energy bill is the bill they worry most about being able to afford ⁵ and 30% of consumers are either very or fairly worried about paying for their energy bills ⁶	

See [References](#) for source data

Appendix 4: Scoring example

Scoring example

for Efficient Consumption focussed on energy audit

Barriers and barrier height scoring are given [on this slide](#) and consumer characteristic scoring are taken from across [slides in Appendix](#). Full tables for all barriers and business models are in the [data tables](#).

The same scoring approach is used for all consumer characteristics and for all other business model types

Barrier	Barrier height score	Characteristic which would make consumers susceptible to barrier	Customer prevalence score	Combined Inaccessibility Score
Energy not being a high priority compared to competing priorities	5	May be families with small children, caring responsibilities, money pressures, long working hours etc.	4	20
Lack of interest/motivation to engage	4	People who are not motivated to save energy or to engage in the energy market	5	20
Lack of trust in companies delivering prompts	4	People who are untrusting of companies	3	12
In-ability to change behavior or degree of flexibility	4	People with fixed routine or energy needs. May be households with young children, people with disabilities, people on tightly specified shifts	4	16
No perceived cost benefit so no motivation to engage	4	People who have high income or low monthly outgoings	5	20
Person responsible for choosing supplier is not in full control of how energy is used in the home (likely related to Tenure)	3	People who live in a multi-occupancy house (such as a shared house or student house), people (most likely rental or social housing) who buy their energy as part of a package	1	3
Upfront cost of hardware needed for accurate analytics	1	People who have a low income, with high monthly outgoings, without access to savings	3	3
Awareness of business model concept	1	Consumers who are not familiar with the energy market	2	2
Upfront cost required to respond to prompts e.g. that a new fridge is needed	1	People who have a mid-low income, without access to large savings	5	5
Lack of digital literacy preventing finding business model	1	Typically people who are older, are on a low income, have disabilities	2	2
Lack of digital literacy preventing engagement with business model	1	Typically people who are older, are on a low income, have disabilities	2	2
Combined barrier height score: (x-axis on graphs)	29	Combined consumer prevalence score: (y-axis on graphs)	36	Total Combined Inaccessibility Score: (sum of column) 105

Appendix 5: Data tables

The analysis for this project was mainly done in Excel, and we are providing this file for reference. It includes:

1. Compiled business model table
2. business model accessibility analysis
3. Assigning customer characteristics
4. Actions to improve accessibility