

Future energy retail markets: stakeholder views on multiple electricity supplier models in the UK

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Abstract

In the transition to smart, low-carbon energy systems, the energy retail market is evolving. Many non-traditional actors are beginning to offer services that can help accommodate distributed supply intermittency. At the same time, they provide greater choice for consumers through new electricity products, such as specialised supply for assets such as EVs and smart appliances, or democratising energy supply, e.g. through peer-to-peer energy trading and community energy schemes. This represents a shift from a supplier-centric energy system to one placing greater emphasis on the role of energy end-users. However, under the current ‘supplier hub principle’ governing the UK market, domestic consumers’ interaction with the energy system is mediated by a single licensed supplier, creating barriers for non-traditional business models.

This paper shares findings from eight semi-structured interviews conducted in summer 2020 with regulators, innovators, energy suppliers, and consumer advocacy groups on the future of the UK’s energy retail market and consumers’ relationship with it. The research focuses on one alternative to the supplier hub principle; ‘multiple supplier models’, which would enable consumers to have multiple electricity suppliers at the same time, engaging with non-traditional models whilst keeping their national-level supplier. Interviewees highlighted peer-to-peer energy trading, and community energy, as well as the ability to bundle supply with technologies such as electric vehicles or smart appliances as the most transformational use cases that multiple supplier models could facilitate. Although most interviewees felt that the current supplier hub model is not fit to support the energy transition, contention remains around how best to replace it. Findings offer insight into the challenges posed by the supplier hub principle; the advantages and disadvantages of permitting multiple supplier models; and the key aspects of interactions with multiple energy suppliers from the consumer’s perspective. This work contributes towards understanding the landscape of future supplier models and the challenges faced in transforming the energy retail market.

Introduction

The UK’s energy system must undergo fundamental changes to reach net zero carbon emissions by 2050 (House of Commons 2019). Visions of future energy systems typically feature increased deployment of low carbon generation close to where it will be used, as well as reducing demand through smart technologies, behavioural change, and business models that incentivise energy efficiency (BEIS & Ofgem 2017). Similar trends have been observed internationally (Schmid et al. 2020, Zhang et al. 2017, Sioshansi 2021). This brings new complexities to the energy market. The intermittency of many renewable energy sources creates challenges for balancing demand

with an increasingly volatile supply (Brijs et al. 2015), likely to be exacerbated by the rising prevalence of electric vehicles (EVs) and electrified heating and cooling. Furthermore, unlike the traditional, centralised model in which energy flows from a national system in one direction, in a decentralised system, energy can flow between consumers, or back to the grid. As such, decentralisation represents a shift towards energy users playing a more active role in managing energy demand (Parag & Sovacool 2016, Bauknecht et al 2019).

The energy retail market is evolving to encompass new business models that can help incentivise energy efficiency and accommodate distributed supply intermittency whilst empowering consumers. For example, under a ‘energy-as-a-service’ model, a company could offer consumers a fixed rate tariff for a promise to deliver a certain temperature in their home, a level of charge in their EV, or services from smart appliances, with the company selling flexibility back to the grid or installing retrofit measures to improve their profit margins (see e.g. Hall et al 2021). Households fitted with renewable generation assets could also sell surplus energy directly to other consumers in a model known as peer-to-peer energy trading (P2P) (Shipworth et al 2019). Markets are emerging for local energy suppliers, where locally-owned energy companies use local generation assets to provide electricity for their customers, often with additional social purpose (Wiersma & Devine-Wright 2014, Gui & MacGill 2018). New technologies are also creating opportunities for specialised suppliers to enter the energy market: EV manufacturers are expressing interest in providing energy supply and the rise of smart home technology is expected to catalyse a range of companies offering new value propositions around demand flexibility (Energy UK 2019, Sioshansi 2021).

These trends are redefining the role of energy suppliers. Traditionally, suppliers have acted as an interface between consumers and the energy system, with consumers contracting with one supplier at a time (Ofgem 2017a). This model is known as the ‘supplier hub’ and is enshrined in industry codes, regulations, and supplier licensing structures in the UK and many other countries (Ofgem 2017, European Commission 2020). However, as a plethora of new players enter the market, Ofgem – the UK energy market regulator – and others have been questioning whether the supplier hub model remains fit for purpose (Spence 2018, Ofgem 2017, Energy UK 2019, Bray et al 2021, CREDS 2021).

One proposed alternative is enabling consumers to buy electricity from more than one supplier at a time (Spence 2018). This is known as a ‘multiple supplier model’ or ‘multi-party supply’. Proponents of this model argue it can facilitate innovation and enable greater choice for consumers, without needing to completely overhaul market regulations (see Sioshansi 2021, Energy UK 2019, Spence 2018, Ofgem 2017). This paper outlines potential future landscapes of the energy retail market and the role that a multiple supplier model could play, from the perspective of diverse stakeholders. Whilst this paper focuses primarily on the UK context, where the discussions of multi-party supply have advanced furthest, findings are relevant to other liberalised energy markets. The paper has three main aims: 1) To understand challenges facing the UK energy retail market in light of emerging business models; 2) To identify use cases and characteristics of a multiple electricity supplier model considered to be most relevant by industry and policy makers; 3) To understand the benefits and challenges associated with a multiple electricity supplier model. To achieve these aims, expert interviewees were conducted in summer 2020 with eight interviewees representing key stakeholder perspectives. These included regulatory bodies, a consumer advocacy group, innovators, energy suppliers, and academia. The paper is structured as follows: section 2 provides an overview of the current UK regulatory context, drawing from literature to outline the current supplier hub model and the challenges that new business models present for it. It also describes the multiple supplier proposal in more detail. Section 3 outlines the methods and data used in this research. Section 4 presents and discusses the key themes that emerged in the expert interviews. Section 5 concludes by summarising the implications of the work, its limitations, and directions for future research.

Background

Beyond the supplier hub

Current regulations raise several challenges for energy market innovation. To obtain a supply license in the UK, suppliers must commit to certain obligations when they reach a threshold number of consumers. These include providing electricity to any customers in the country under the Universal Service Obligation, and to meet targets supporting the delivery of environmental and social policies (Ofgem 2017, 2019). Suppliers must also be party to all industry codes. This also creates challenges for models such as P2P energy trading, with uncertainty around the rights and obligations that non-professional sellers of energy should bear. Similarly, in the EU, a lack of clarity remains around the rights and obligations that should be borne by prosumers selling energy to their peers (de Almeida et al 2021). Obligations placed on energy suppliers represent a significant burden, particularly for non-traditional suppliers who may have a geographically limited or specialised target market, or whose principal interests lie outside the energy sector (Sandys et al. 2018, Spence 2018). These could include support of service-

based models which build in a focus on demand reduction. The expectation to fulfil functions of traditional energy suppliers may deter new market entrants or cause costs to be passed on to customers (Energy UK 2019).

In the UK, new models that challenge existing regulations can be tested in Ofgem's 'regulatory sandbox', which allows for time-limited trials outside of regulatory constraints (Ofgem 2018b). However, these trials inherently break current regulations, creating challenges for converting these pilots into commercially viable businesses. Actors offering innovative products and services can also partner with existing licensed suppliers, but this can result in weaker value propositions (Hall & Roelich 2016) and locks in market power for the larger supplier. For example, participation in certain kinds of community energy schemes currently requires all participants to switch to the licensed supplier working with the scheme. Although concerns about regulations stifling new market entrants are not new (Littlechild 2005), evidence from Ofgem's Innovation Link suggests the supplier hub model may be slowing down development of cleaner, smarter energy systems (Ofgem 2017).

There have been calls for dissolving the supplier hub model in favour of a new, bottom-up regulatory regime or principle-based regulation (see Sandys et al. 2018, Sandys & Pownall 2020, Energy UK 2019, CREDS 2021). Industry views, however, remain mixed (see Ofgem 2017). Whilst acknowledging the need for change, some stakeholders point to the benefits of the supplier hub model in terms of offering a simple, recognisable interface, facilitating consumer protection, and managing risk. Others believe the supplier hub model cannot support innovation in the energy market and several have explicitly advocated a multiple supplier model (see Ofgem 2017).

Already, regulatory changes have passed or are under review that begin to challenge the dominance of the supplier hub model, in the UK and internationally. These sit against a backdrop of broader, ongoing changes such as the introduction of mandatory half-hourly settlement and Ofgem's ongoing review of Electricity Network Access and Charging, and the Clean Energy Package and Project TERRE in the EU. In June 2022, a modification to the Balance and Settlement Code (BSC)¹ is expected to be implemented, which will allow behind-the-meter assets, such as EVs, heat pumps, and smart appliances, on a single premise to be metered individually (Elexon 2020b). Another modification currently under review looks to allow consumers to trade flexibility on the wholesale market through VLPs, without involving their supplier (Elexon 2020c). This is a departure from the current model where consumers can only obtain value from flexibility by engaging with offers provided by their supplier. There are similar trends in the EU, with the Renewable Energy Directive II enshrining the right for market participants to sell renewable energy directly to one another or through third parties. Combined, these developments create opportunities for energy demand reduction through demand-side response (DSR) and begin to unpick the supplier hub model that has a single supplier-consumer relationship at its core.

Multiple electricity suppliers

In 2018, a modification to the BSC that would have enabled multi-party supply to become a reality in the UK was proposed, known as P379 (Spence 2018). This would represent the most significant step toward implementing a multiple supplier model. The rationale for permitting multiple electricity suppliers is to allow competition for electricity behind-the-meter and enable market participation from a range of non-traditional suppliers (Spence 2018)². Under P379, the supplier for each customer's meter would become the 'primary' supplier, with continued responsibility for metering and other existing obligations. Consumers would also be able to contract with additional 'secondary' suppliers, who would supply of a portion of their electricity volumes. Under this arrangement, consumers could theoretically have as many secondary suppliers as they choose, without any need for partnerships or bilateral arrangements between suppliers.

Early industry reports on P379 anticipated wider benefits, including: savings on network management and reinforcement, and an increase in the deployment of smart energy technologies at the grid-edge; renewable technology usage; smart meter take-up; half-hourly settlement volumes; and increased consumer engagement (Energy UK 2019, Spence 2018). However, an independent cost-benefit analysis commissioned by Elexon (CEPA 2020) found these benefits to be uncertain and limited, given the lack of evidence for consumer demand for these

¹ The BSC is "a legal document which defines the rules and governance for the balancing mechanism and imbalance settlement processes of electricity in Great Britain" (Elexon n/d). Elexon is responsible for administering the BSC code company. Any party to the BSC can propose changes to it, which are then subject to review by the BSC panel and industry experts, with the regulator, Ofgem, being responsible for the final decision.

² It is technically possible to have multi-party supply if bilateral arrangements are made between two suppliers to split a meter, but the overhead costs of these arrangements make this uneconomical outside of large scale non-domestic supply. Consumers can already have different suppliers for their gas and electricity in the UK; this discussion focuses on the enabling of multiple suppliers for electricity specifically.

models and the evolution of alternative routes to market for some of the specialised energy products or market entrants from outside of the energy sector that could be enabled by P379. They identified three main categories of risks and unintended consequences – impacts on competition, impacts on consumer experience, and opportunity costs. The first, impacts on competition, related to challenges brought about by the increased risk and uncertainty for primary suppliers and the differentiation of responsibilities of primary and secondary suppliers. The second, impacts on consumer experience, related to new complexities introduced for consumers through a need to interact with multiple suppliers. The third, opportunity costs, related to the costs and resources required for the implementation of P379. Overall, the report concluded that the costs of P379 outweighed the benefits at that moment in time and the modification was withdrawn in 2021 (Exelon 2020a).

Speaking to the uncertainty noted in the P379 cost-benefit analysis, little academic work exists on the potential impacts of and demand for a move towards multiple suppliers. To date, only one study in the literature has explicitly explored multiple suppliers, focusing on the use case of local energy (Watson et al. 2020). This study used two nationally representative survey experiments in Britain to examine consumer willingness to engage with local energy in a multiple supplier model. Results showed a high degree of interest in adding on local energy options in a multiple supplier model and were more likely to engage with local energy scheme in a multiple supplier model than switch to entirely to a new local provider. However, it did not explore any other use cases or probe how characteristics of the relationship with multiple suppliers might influence consumers’ likelihood of engaging with the new services offered, for example whether dealing with multiple bills or new entities would deter engagement. Fell et al. (2019) also conducted a nationally representative survey experiment in the UK to test willingness to participate in P2P under various conditions, which included the proportion of electricity provided by the scheme, implying that the remainder would be provided by another supplier. Stated willingness to participate ranged from 52-66.8% across conditions. These results suggest that there is demand for local energy and P2P models enabled by multiple suppliers, however, these papers do not provide evidence about the broader impacts of a move towards multiple suppliers.

Although P379 has been withdrawn, the cost benefit analysis suggested that there would be value in reconsidering meter splitting, particularly in around five years’ time when the impact of half-hourly market settlement becomes clearer (CEPA 2020). Furthermore, its scope does not extend to the broader concept of multi-party supply, which might be facilitated under different arrangements in the future or in different national contexts. Outside of the UK, there has also been significant interest in piloting a similar model in New Zealand (Ara ake n/d), and the single supplier model has been acknowledged as a significant barrier to P2P trading and other market innovations in the EU (de Almeida et al 2021, Sioshansi 2021). This paper looks beyond the specific modification to focus on the broader concept of multi-party supply, and how the role of suppliers might change in future energy markets.

Methods and data

This paper used expert interviews to understand the key challenges and evidence gaps for multiple supplier models and future energy markets, from the perspective of those directly grappling with these challenges in the UK. Expert interviews bring several advantages over other methods such as document analysis. Given the novelty of multiple suppliers, little work directly addresses them, meaning that data for document analysis is limited. Expert interviews typically offer faster data collection than document analysis and allow for extraction of information specific to the research. Finally, direct access to experts involved in the decision-making process or with a commercial interest in multiple supplier models allows for more confidence that the aspects of multiple suppliers discussed are of interest to key stakeholders in the field, likely increasing the impact of the work.

Interviewees were purposively sampled, with the aim of covering a range of different stakeholders and perspectives. The perspectives targeted included: policy/regulation; large energy suppliers; challenger energy suppliers; non-energy actors interested in offering new business model propositions; energy system management; consumer interests/protection. Due to their extensive experience, some interviewees embody multiple perspectives, as outlined in the ‘long description’ in Table 1. For ease of reading, interviewees were assigned a short descriptor summarising their main role, which is used to refer to them throughout.

Table 1 - Description of interviewees

Short description	Long description
Innovator	Former director of innovation for a large supplier, now involved with multiple innovative companies and consultancies. Interest in block-chain enabled

	distributed energy resources (DERs), smart assets, and P2P
Academic	Background in regulation, academic with expertise in user-centric business models, also involved in consumer advocacy
Consumer advocacy group	Energy policy expert at a consumer advocacy group working closely with energy suppliers and consumers
Industry expert	Founder of a leading energy market consultancy. Background in policy and specialist in local energy.
Regulatory body	Specialising in innovation, senior position at a regulatory body
System management body	Expert practitioner working on energy codes and implementation of multiple supplier models
Challenger energy provider	Head of R&D for a medium size supplier interested in heat services and energy efficiency
Big 6 energy provider	Specialist in energy regulation working for a Big 6 energy provider in the UK

A semi-structured approach was taken, to allow interviewees space to express their views, whilst keeping the interview on topic. Interviews lasted 1 hour and, due to Covid-19 restrictions at the time of interviewing (July-September 2020), were conducted online. Interviewees were asked questions relating to the following topics: whether the supplier hub model is fit for purpose considering increasing decentralization and new consumer offerings; the key benefits and concerns about a multiple supplier model; the most commercially interesting and/or policy relevant new consumer offerings that could be enabled by a multiple supplier model; and how they expect the role and functions of energy suppliers to change in future energy markets. After the main interview, interviewees were also asked to give feedback on a proposed piece of research investigating the dimensions of an interaction with multiple suppliers likely to impact consumer engagement with a multiple supplier model. Interviews were recorded and detailed notes were taken. The interview notes were then coded inductively in NVivo, using thematic analysis to identify and categorise key themes. All coding was completed by a single, independent coder.

This study was approved by the UCL Energy Institute Ethics Lead.

Results and discussion

The supplier hub model – fit for the future?

In the first section of the interview, participants were asked whether they believe the supplier hub model is fit for purpose in light of emerging business models and decentralisation, and why or why not. Benefits and challenges of the current supplier hub model were also discussed.

There were mixed views on whether the supplier hub model is fit for purpose. The challenger supplier and Big 6 supplier both said that the supplier hub model is fit for purpose, whilst the consumer advocacy group, industry expert, academic, and innovator all concurred that the supplier hub model is unsuitable, not only in terms of supporting future business models, but also for the needs of the current energy system. Interviewees representing the regulatory and system management bodies both gave nuanced answers, suggesting that the supplier hub model fulfils the purpose it was designed for, but that the complexities of new energy markets are challenging this model. The Big 6 supplier felt that they are already able to provide different propositions under their supply license, noting that if a customer wanted their EV to be supplied directly from renewably sourced energy, their supplier could procure the energy from a generator and allocate it a particular customer. From the system management body's perspective, the supplier hub model serves the purpose required by their organisation, in that it ensures metering, data collection, and settlement arrangements function. The interviewee acknowledged, however, that this is a narrow perspective and does not consider the needs of other actors in the energy system.

Benefits of the supplier hub model

There was a degree of consensus that the supplier hub model offers a convenient construct for performing tasks necessary for the energy system to function. The regulatory and system management bodies both highlighted the key role played by suppliers in the energy system, from administration and cost recovery, to metering and achieving government policy objectives. The innovator referred to the supplier hub model as "*a convenient*

construct that the government can attach a lot of obligations to”, expressing the view that policy objectives related to fuel poverty would be better met through general taxation than through energy suppliers. The regulatory body also expressed concerns about the challenge of ensuring these policy objectives were met if this function were to be removed from the role of energy suppliers. This was also picked up by the academic and the innovator, as well as the two energy suppliers, who both mentioned the need to deliver on government obligations and comply with an extensive set of regulations. The consumer advocacy group similarly highlighted the purpose of the supplier hub model in offering a conduit for consumer protection and clear lines of accountability, particularly in terms of knowing who to contact when things go wrong. This sentiment was also expressed by the regulatory body, both the energy suppliers, and the academic.

Criticisms of the supplier hub model

For those who felt that the supplier hub model is not fit to support today’s markets, the main criticisms were that the system is outdated, overly complex, and embeds market power. Crucial to this is the supplier licensing framework – only licensed suppliers can sell energy and access consumer data. The consumer advocacy group spoke about how:

“by locking in large energy suppliers as centre of interacting parts of the market [the supplier hub model has] made sure that [large suppliers] maintain an enormous amount of market power. [...] Even when you’ve got energy suppliers that might be very excited about change and moving towards a new model or new way of doing things, there’s an enormous lag when it comes to incumbents [...] it’s just such a creakingly old system that there is little room for change – even quite minor changes, never mind the significant changes needed to meet net zero”

Similar issues were also mentioned by the innovator, who described how companies who wanted access to smart meter data had to go through a licenced supplier, even with the consumer’s explicit permission, giving suppliers the opportunity to block these requests. These comments were supported by the industry expert, who also spoke about the vicious cycle of embedded market power and the propensity for industry self-governance to obstruct changes in the sector that go against the interests of larger incumbents. The innovator and academic also discussed the complexity of current industry regulations and institutional relationships, acknowledging that the interwoven nature of the supplier hub model makes it tricky to unravel and replace.

In terms of its fitness for the future, the main criticisms of the supplier hub model pertained to its limited capacity to incentivise new business models that move away from kWh consumption-based sales and create new value propositions required for meeting net zero goals and incentivising energy demand reduction. This theme was highlighted by the academic, the regulatory body, the industry expert, the challenger supplier, and the innovator. The industry expert commented:

“We’ve had a protracted debate in industry about what I think is euphemistically called non-traditional business models particularly enabled by technology, whether it’s P2P, virtual markets, bundled supply, specialist supply, community energy – we have to find ways of embracing that but supplier hub prevents it”.

The academic spoke about the need to shift away from a “demand-led” model requiring over-building of generation to meet peaks, and towards a more “supply-led” system, where active, engaged consumers shift their demand to match supply:

“the current supplier hub model is the absolute opposite of that – the best performing businesses want to keep their customers as passive and non-switching as possible and keep things as simple as possible [...] most suppliers are set up on the same commodity trading model i.e. sell more of the same thing to make more money; it’s unattuned to them, especially measures around energy efficiency”.

The regulatory body and the challenger supplier both commented on the obligation to supply all consumers as a barrier to innovation, with the challenger supplier mentioning that they would like to offer a bespoke demand flex heat offering targeted at private homeowners, accompanied by tailored energy efficiency advice and equipment, but are unable to. The regulatory body similarly picked up on issues around facilitating exempt supply: the current licensing structures assume a simple, bi-lateral consumption relationship for the consumer, limiting opportunities to bring DERs to markets or for parties other than licensed suppliers to offer specialised supply. The system management body described how current multi-party supply arrangements must either contract through a licensed supplier, or are subject to extremely high overhead costs, making this prohibitively expensive for domestic end-users.

Another theme emerged around the creation and attribution of value. The regulatory body mentioned that need for the supplier hub model to reckon with the challenge of ensuring that value from DERs can be accrued and is attributed fairly. This theme was also touched on by the innovator:

“we must think very carefully about the balance between new business models and whether value can be accrued to the owner or the one who has rights of ownership or temporary rights of ownership through leasing and how they can get fair value for their rights.”

The regulatory body similarly commented that the supplier hub model makes it difficult for alternative propositions to break in, noting that, despite debates about flexibility, specialisation, and innovation, the current regime incentivises relatively homogenous energy projects. Figure 1 summarises the findings from this section.

Figure 1: Summary of themes relating to supplier hub model. A tick indicates that an interviewee mentioned and showed support for this theme or concept; a cross indicates that an interviewee mentioned but disagreed with this theme or concept.

	Mentioned by interviewee							
	Big 6 supplier	Challenger supplier	Regulatory body	Academic	Innovator	Industry expert	System management	Consumer advocacy
Benefits associated with supplier hub model								
Suppliers fulfil vital energy system functions (metering; administration)			✓				✓	
Clear mechanisms for volume allocation/settlement							✓	
Achieving government policy objectives	✓	✓	✓	✓	x			
Simplicity for consumers/consumer protection	✓	✓	✓	✓				✓
Innovation is possible within remit of current supply licensing structures	✓							
Meets the needs of licensed suppliers	✓	✓					✓	
Challenges associated with supplier hub model								
Antiquated, overly complex system				✓	✓	✓		✓
Embedded market power and industry self-governance leading to lock-ins and incumbents slowing down pace of change					✓	✓		✓
Supply license framework creates barriers for innovative models		✓	✓					
Limited incentives for new value propositions		✓	✓	✓	✓	✓		

The benefits and challenges of multiple supplier models

In the next section of the interview, participants discussed the possibility of allowing domestic consumers to have multiple suppliers; key benefits and concerns; the most policy-relevant and/or commercially exciting use cases of multi-party supply; and potential strategies for mitigating risks. The P379 modification was still under review at the time the interviews were conducted. Some discussion relates to the specifics of that modification, but the focus was on multiple suppliers more broadly.

Benefits of multiple supplier models

The main benefits of allowing multiple suppliers related to enabling innovation, stimulating market competition, and increasing choice and value for money for consumers. For the regulatory and code experts, a key benefit of the P379 modification was that it facilitated innovation without having to completely overhaul energy market regulations. Outside of P379, the regulatory body, the system management body, the industry expert, the innovator, the consumer advocacy group, and the academic all mentioned the ability of multiple supplier models to open the energy market for non-traditional business models and to bring new parties into energy markets. These models included disruptive behind-the-meter business models, as well as the ability to offer more bespoke service propositions, specialised supply, and to extract value from flexibility and the aggregation of smart assets. This in turn was said to have benefits for improving network efficiency, integrating DER, and responding to grid constraints by creating business models that incentivise DSR.

The regulatory body, the system management body, the industry expert, the innovator, the consumer advocacy group, and the academic all agreed that a key benefit of allowing multiple suppliers would be to increase market competition, resulting in more choice and better value for money for consumers. The consumer advocacy group and the academic both also spoke about the possibility of facilitating business models that drive deeper engagement with the energy market, with the consumer advocacy group commenting that:

“One of the key benefits is that there will be new innovative products available to consumers – these will provide support for changing behaviour, which we know is really needed but they will also be really desired by consumers in terms of living a greener lifestyle [...] when you look at the technologies going into apps which are specifically designed to be engaging – having a model which brings many more different types of firms and businesses into consumers’ homes could drive really positive engagement.”

They clarified, however, that the multiple supplier model would be a means to an end, rather than a policy goal itself.

Key use cases of multiple supplier models

In line with the findings of the P379 cost-benefit analysis (CEPA 2020), the key use cases that could be enabled by multiple suppliers fell into two broad categories: models enabling specialisation and models enabling localisation.

Energy as a service models based on specialist supply were mentioned by the academic, the challenger supplier, the innovator, the industry expert, the regulatory body, and the consumer advocacy group. The consumer advocacy group noted the ability to connect energy services with caring technologies and the potential for improved wellbeing outcomes from this. A commonly mentioned model was a heat as a service tariff (for example, paying for a 20-degree home) coupled with the installation of a heat pump or energy efficiency retrofits, separated from the rest of the customer's energy consumption. The academic described the possibility for this to facilitate models associated with energy efficiency:

“If I’m selling energy or heat as a service, as long as we’ve agreed a really clear service level agreement e.g. you’re happy to have your home between 19 and 21 degrees and you’re not going to open all your windows in winter, then I’ll give you a fixed price for that but I’ll do something clever in the market to minimise that input or the cost of that heat. This might be retrofit on your home to improve energy efficiency”.

Similar outcome-based models were mentioned for specialist EV tariffs. The challenger supplier also expressed an interest in offering bespoke heat tariffs, but with the caveat that there would be little benefit to them from not also supplying the rest of the consumer's energy.

Closely related to this was the concept of bundling, allowing non-energy companies to sell or lease products such as electric vehicles, heat pumps, smart fridges or other appliances, along with a bespoke tariff. This could open new pricing structures that would facilitate demand reduction and energy efficiency interventions. The innovator and industry expert both mentioned the possibility of specialist suppliers automating and aggregating the assets they supply (giving specific examples of EVs and smart fridges) across different properties and selling flexibility back to the grid. The innovator described the possibility for this to bring greater value for suppliers, as they could create a better deal by joining up all the EV chargers they have access to than trying to break the EV charging portion out of their customers' consumption. From the consumer's perspective, this could look like a specific tariff for heating, EV, or smart appliances. The innovator also proposed a smart, asset-based system, where, through automation and near-real-time settlement, each asset within the home is automatically settled and billed, with the ability to switch between suppliers on an hourly basis to whichever supplier achieves the optimal outcome at that moment in time, based on financial, carbon, or social goals. This bears similarity to a third type of use case identified in the cost-benefit analysis, which would allow consumers to opportunistically switch between wholesale indexed and fixed tariffs, depending on which would give them the best deal at the time (CEPA 2020). The innovator's suggestion, however, moves beyond financial value propositions.

The regulatory and system management bodies and the industry expert all also mentioned P2P energy trading and community or local energy projects as key use cases. These models were also mentioned by the Big 6 supplier as being possible through a sleeving or white label arrangement with a licensed supplier, without the need for multiple suppliers. However, the system management body pointed to the limitations of these current arrangements, mentioning that a notable use case of multi-party supply would be the ability to facilitate community energy projects without requiring that all participants switch to the same supplier, which has been a barrier to uptake in some case studies (Bray et al 2021).

Throughout these discussions, the consumer advocacy group noted that policy makers tend to focus on technology specific solutions, whereas consumers are more interested in offerings that improve their lives in tangible ways:

“it’s come through in survey after survey after survey, there’s a huge demand, and an enormous amount of commitment and passion in this country about moving to this new world of net zero, but no one feels like they’ve got an instruction manual or support to make those decisions. And that’s where the excitement really is, those people are thinking about multiple technologies, connection and ease.”

Risks, concerns, and mitigations

All interviewees except the industry expert and innovator mentioned complexity as a serious concern regarding multiple electricity suppliers. This had several dimensions: the two energy suppliers, the academic, the consumer advocacy group and the regulatory body articulated concerns related to complexity for consumers, in terms of knowing which of their suppliers to contact if something goes wrong and ensuring that there are clear mechanisms

for accountability. The possibility of confusion and additional hassle arising from multiple bills and new billing structures was also mentioned. The academic, and the Big 6 supplier also highlighted the potential for increased difficulty in comparing prices across tariffs. This could become even more complicated with bundling of tariffs and physical assets. The Big 6 supplier drew attention to the requirement for all suppliers to provide a price per unit for tariff comparison, pointing out that if large, primary suppliers were required to bear the brunt of costs, with secondary suppliers having much lighter business models, this could result in unequal footing between types of suppliers and mislead consumers looking for the lowest price. Both energy suppliers both also mentioned increased and unnecessary complexity in terms of creating new market arrangements that may be confusing for consumers used to simple bi-lateral arrangements and expressed scepticism about whether there would be consumer appetite for any of these new models.

The innovator's counter to the complexity argument was that consumers and their preferences evolve along with the choices they are presented with:

"People will say that's too complex for the consumer, I don't believe that. People become more sophisticated and you'll find that decent service providers will solve that complexity for them."

The consumer advocacy group suggested that one potential way to mitigate new complexities could be through the creation of an independent advisory agent. All interviewees also highlighted the possibility of new markets developing for intermediaries to manage the relationships between multiple suppliers, although questions were raised by the two suppliers and the system management body about how new actors might get value out of this role. The system management body suggests that intermediaries might eventually develop into a marketplace for secondary supply offerings, that consumers could use to find out about all the offerings available to them.

The Big 6 supplier, regulatory body, system management body, and the industry expert also mentioned the possibility of additional complexities in the switching process, for example the need to notify all their suppliers if a consumer chooses to switch. Another related problem is the risk of stranded assets associated with models that bundle technologies with energy tariffs. The regulatory body and the industry expert both mentioned the challenges of commercialising models that involve installing physical assets on site or significant investment into equipment – for example aggregation of smart flexible assets or energy-as-a-service models incorporating home retrofits. These might require a waiver from the right to switch until debt associated with that asset is paid off or locking consumers into longer contracts to justify suppliers' investment. Tackling this challenge will be crucial for enabling models supporting energy efficiency and retrofit. On a similar note, the consumer advocacy group highlighted the need to clearly distinguish between the debt associated with the asset itself and the energy tariff. They noted that bundling could result in a protection gap, as energy is regulated separately from the physical product. They also pointed to low uptake of the 2012 Green Deal to highlight consumers' fears of struggling to sell houses if debt were to be attached to a property through the installation of assets. There are parallels throughout this theme with calls from Sandys et al (2018, 2020), Energy UK (2019), and CREDS (2021) to move towards a form of 'principle-based' regulation that focuses on regulating the product or service provided, treating and regulating suppliers as retailers.

Another concern was the lack of incentives for large suppliers to offer multi-party supply, if they were to have increased risk and uncertainty about their supply volumes, whilst also losing some of their margin to secondary suppliers. This concern was most significant for both energy suppliers and the academic. The energy suppliers were also sceptical about how much profit could be made from the provision of specialised supply, with the Big 6 supplier noting that it would be likely larger suppliers would have to bear significant extra costs to support these new entrants:

"some of the smaller entities who are looking to be active in this market, they're telling us their projects and models, they were talking profits of a few pence per kWh. When you're trying to quote that in terms of a business model, that's quite a small amount of money to gain. The payback would be several years, if not decades, for some of these models, but they were thinking that they just want a piece of that revenue or margin [...] they certainly didn't want to bear any industry, regulatory costs, they'd want a primary supplier to act as a conduit and do everything for them which is clearly unfair for the large suppliers who would have to do that and haemorrhage some of their profit for nothing."

The academic also shared these concerns, noting that large suppliers would likely pass these costs on to secondary suppliers, pricing many new market entrants out of the market. In discussions about this concern, The regulatory body highlighted debates in the industry about whether to make provision for multi-party supply voluntary or mandatory. For the innovator and the industry expert, the answer to these concerns is market competition, with the idea that large suppliers unwilling to offer their consumers the opportunity to engage with multi-party offerings would lose out to those who do.

A final concern raised by the regulatory and system management bodies was the cost of implementation and how these costs might be distributed across the system. There would be significant costs associated with changing industry codes and billing and metering infrastructures, along with other challenges: prepayment meters would not work with multiple suppliers and in home displays also currently only allow for the display of a single tariff. The system management body noted that these could be overcome through technical solutions. The system management body also highlighted that, although it is likely that only a small portion of highly engaged consumers would engage with the offerings enabled by multiple suppliers, these costs would likely be born across the entire customer base. This would risk exacerbating existing inequalities between those who can and cannot afford to engage. Relatedly, broader concerns were discussed around how to recover costs most fairly and efficiently in the energy system, as well as the potential for negative distributional outcomes from time of use pricing. The system management body and the consumer advocacy group both raised the potential for geographic inequalities, for instance if offerings can only be provided in certain geographical contexts, or if grants are only available in specific regions.

Figure 2: Summary of themes relating to multiple supplier models. A tick indicates that an interviewee mentioned and showed support for this theme or concept; a cross indicates that an interviewee mentioned but disagreed with this theme or concept.

	Mentioned by interviewee							
	Big 6 supplier	Challenger supplier	Regulatory body	Academic	Innovator	Industry expert	System management	Consumer advocacy
Benefits of multiple supplier model								
Enable innovation without completely overhauling energy market regulations			✓				✓	
Allows new actors to enter energy market; increase market competition			✓	✓	✓	✓	✓	✓
Allows for models that integrate DER and improve network efficiency	x		✓	✓	✓			
Allows behind-the-meter innovation, specialisation, and value from flexibility	x	x	✓	✓	✓	✓		
Enables models that drive deeper engagement with energy				✓				✓
Challenges associated with multiple suppliers								
Complexity for consumers; additional hassle from multiple bills and points of contact	✓	✓	✓	✓	x		✓	✓
Difficulty in comparing prices across tariffs	✓			✓				
Increased complexity in market arrangements	✓	✓						
More complex switching process and potential for stranded assets	✓		✓			✓		✓
Increased costs and uncertainty for large suppliers	✓	✓		✓	x	x		
High upfront costs that could have negative distributional outcomes			✓				✓	✓

The role of suppliers in future energy markets

The final discussion focused on how what future energy markets might look like and how the role of energy suppliers is likely to change. There appeared to be two divergent pathways: one which sees the relationship between consumers and suppliers becoming increasingly important, with suppliers acting on behalf of their consumers to procure technologies and services that improve their lives and manage complexities. The other sees a proposition where suppliers perform system functions and have limited direct relationships with consumers, with that role being taken over either by technologies or third parties.

For the innovator, the supplier-consumer relationship will become much less relevant as smart technologies and decentralised energy propositions become more prevalent:

“The role of energy suppliers is not about consumer protection, it’s about making sure my house and all my devices are working, I can access the services that I want at the best price and ideally with the best net zero outcome. Best price, least damage.”

By contrast, the consumer advocacy group felt that the energy suppliers of the future should have much more focus on the relationship with the consumer, with an emphasis on partnership and positive communication of new products and choices in the energy system. This sentiment was echoed in comments made by the challenger supplier, who described the vision that they would like to see as one:

“where suppliers innovate, offer a different approach to customers, help them understand their energy use, become a trusted partner and engage with them on becoming more efficient and offering demand flex down the line”

They expressed concerns about an alternative path, where auto-switching companies become the main point of contact for the consumer and the role of the supplier becomes “*hollowed out*”, leading to poor outcomes for customer service. The Big 6 supplier outlined a similar potential future, where suppliers become little more than a billing function.

There was a marked difference between the attitudes of the Big 6 supplier and the innovator with regards to the role of supplier branding and recognition. The Big 6 supplier mentioned the possibility of very simple, low-cost ‘lite’ tariffs, that insulate the consumer from complexity, and rely on the trusted reputation of the supplier to sell the proposition. The theme of trust was also discussed by the consumer advocacy group, the regulatory body, and the academic, who all highlighted the need to understand who consumers would be willing to engage with and delegate services to. For the innovator, the branding of suppliers will become irrelevant in an asset focused market.

Conclusion

This paper used eight expert interviews to understand the challenges facing the UK energy retail market in light of decentralisation and the need to accelerate energy efficiency, and the key risks and benefits associated with enabling consumers to have more than one electricity supplier.

Across all interviewees except the two energy suppliers, there were concerns about the ability of the supplier hub model to serve the energy markets of the future. Nonetheless, there was a degree of consensus that the supplier hub model offers a convenient construct for performing tasks necessary for the energy system to function. Interviewees that expressed the need for the supplier hub model to evolve also recognised the difficulty in unravelling the many obligations and responsibilities attached to it. There were also clear concerns associated with a shift towards multiple suppliers. Some of these – for instance, the imbalance of responsibilities between primary and secondary suppliers – were specific to the P379 solution. Others, such as the additional complexity for consumers, are likely to be inherent to any form of multi-party supply, unless a market arose for intermediaries to help manage this complexity. Questions remain, however, around whether such intermediaries could extract value in a privatised market, unless they took the form of an independent, public-interest body, as suggested by the consumer advocacy group.

Relatedly, a theme throughout the discussions was the creation and attribution of value from new business models enabled by multiple supplier models. The two categories of use cases that could be enabled by multi-party supply, i.e., specialisation and localisation, are likely to have very different value propositions. From the consumer’s perspective, the main value associated with models aimed at enabling specialisation of supply would be the opportunity to save money through selling of flexibility or to improve their quality of life through energy services (e.g. heat-as-a-service; mobility-as-a-service etc.), without having to change their behaviour in other areas of their energy use. From the perspective of facilitating low-carbon and resilient energy systems, these models unlock additional flexibility through aggregation and the potential to accelerate retrofit and technologies related to the electrification of heat and transport. From this perspective, models aimed at localisation of supply, such as P2P and local/community energy scheme are also related to the integration of renewable DER into the grid. From the consumer’s perspective, these models also relate to non-financial value propositions, such as community, social, and environmental value (Adams et al 2021). There is already an extensive body of work examining the value propositions offered by new energy business models (e.g. Hall & Roelich 2016; Adams et al 2021; Britton et al 2019). However, it will be important to understand how the value proposition of the business model itself would interact with new relationships with multiple suppliers in order to predict the likely consumer uptake of these models.

Notably, there has been a drastic change in the European energy market since the interviews were conducted. Following disruptions of natural gas supply in 2021, rising wholesale prices resulted in numerous energy suppliers ceasing to trade, with 4,312,200 customers being displaced by the end of 2021 in the UK (Energy Shop 2019). In light of this, the challenge of transitioning to a low-carbon energy system has become even more vital, from both a carbon and consumer protection perspective (Citizens Advice 2022). With the likely increased volatility of energy markets going forwards, there is a need to consider how a market featuring multiple suppliers could be designed to insulate consumers from such shocks.

To address this limitation, future work could reach back out to the same interviewees and discuss how their views have changed with consideration of developments since the end of 2020. Another key limitation of this work is the small sample of eight interviewees. Although care was taken to ensure that a diverse range of organisations and perspectives were covered, due to time and resource constraints, only one person from each type of organisation was interviewed. For this reason, findings may be biased towards the views of the individuals

interviewed. Future work could involve additional interviews with additional representatives of the same organisations and from a wider range of organisations from each stakeholder perspective. Further work could also expand the focus to include comparisons with other international contexts.

Finally, there is a key evidence gap in assessing the value of multiple supplier models: there is very limited evidence on consumer appetite for these models and the additional complexities they bring to the energy market. The next stage of this work will turn to the consumer perspective and investigate demand for models enabled by multiple suppliers.

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