Retail Research into Customer Switching and Supply Disintermediation

Final Report

Disintermediation

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Contents

1. Introduction

1.1.1 Ofgem have engaged ESP Consulting, in consortium with VaasaETT, to review experience in the evolution of models for retailing electricity and gas elsewhere in the world. Retail energy markets internationally have seen new entrants emerging over recent years, not only to compete with traditional suppliers directly, but also to serve different customer needs in ways that disrupt the supplier-customer relationship. This is the specific focus for this review, which can be captured in the term "disintermediation". By this term, we refer to the changing relationship between end consumers and energy markets. To date, a customer has a relationship with a retailer of gas and/or electricity - who will be a licenced Supplier. These Suppliers act as intermediaries between customers and the various things necessary to delivery energy to that customer – in the main relating to the procurement of energy in wholesale markets, and paying for that energy to be delivered to the customer. This relationship between the customer and the markets is now changing in a number of ways including:

- Suppliers losing the prime relationship with the customer – with customers appointing a third party to choose a Supplier for them against some criteria (e.g. lowest price);
- Suppliers sharing their relationship with customers with other parties – notably Demand Response Aggregators; and
- Customers accessing the energy market more directly rather than relying on a Supplier to choose where energy is purchased.

1.1.2 The above changes are part of a process of democratisation and decentralisation where consumers, local producers, communities and even local networks become increasingly inter-connected, inter-dependent and empowered. Consumers may become producers and even owners of networks. Local producers may become suppliers. Consumers, producers and local networks can transact with each other with increasing control, independence and community, with the help of platforms and third parties, but without the need for companies that simply deliver the energy from producers to consumers.

1.1.3 The method followed for this engagement has been a combination of desk research, and interviews with organisations relevant to selected case studies which have drawn on the global footprint of VaasaETT and ESP Consulting. Updating and taking feedback from Ofgem throughout the process, our approach has involved the following steps:

- Initial high-level scan to identify candidate case studies;
- Meeting with Ofgem to confirm case studies to analyse in detail;
- Detailed research on selected cases, including stakeholder interviews and market research (see appendix for full list of sources);
- Workshop with Ofgem to present findings and take feedback for further research and input into deliverables; and
- Finalisation and distribution of deliverables.

1.1.4 Many new retail business models have emerged in GB and the other liberalised electricity and gas markets of the world over the past few years. What's more, the models are evolving, and new models are appearing with increasing frequency, driven by innovations and cost reductions in

technology, increased competition, and the decline of the traditional retail business case. Along with these new models has come an ever-increasing amount of supply disintermediation whereby the traditional supplier-consumer relationship is being disrupted. This is happening across most liberalised energy markets around the world, including GB.

1.1.5 Supply disintermediation in the GB energy market has already been seen in a number of forms. Most notably, the influence of price comparison websites in driving switching behaviour has become established for a segment of the market, and various automated switching models are emerging, including in combination with innovative services such as consumption feedback information apps. There have also been various new entrant suppliers with innovative wholesale pass-through tariffs; home automation and demand aggregation models; community energy schemes; and distributed energy solutions that have stepped in between the customers and the traditional retail model.

1.1.6 In this report we identify cases that represent the breadth of supply disintermediation currently taking place around the world. We look at the impact of the disintermediation on the relationship between customers and the energy market and between the actors in the market. We look at what we know about where the cases are heading. Finally, we look at the challenges facing those cases, the transferability of those cases to GB (where they are not already existing in GB), and the regulatory policy implications that we may infer from the findings, in particular looking at any barriers that may exist to implementation in the GB market.

1.1.7 The remainder of this report is organised as follows:

- **Emerging trends:** A summary of some of the trends we see emerging in energy retail;
- **Nature of disintermediation**: How disintermediation relates to existing energy suppliers;
- **Disintermediation cases**: The main families of retail business models that exist or are emerging, and an assessment of regulatory barriers to their implementation in GB; and
- **Factors that impact innovation**: Where we discuss some of the factors that impact the evolution of new business models.

1.1.8 This report is one of two being produced by ESP Consulting and VaasaETT, with a separate report covering the treatment of disengaged customers.

2. Emerging Trends

2.1.1 While no one can predict precisely where innovation will take us, the trends in the market are revealing some very clear directions of travel, notably:

- **Commonality:** A number of factors ultimately drive a level of commonality in the offers from retailers, including:
  - **Consolidation:** Business models are combining with each other in order to gain synergies and harvest more value from each customer relationship. For instance, switching services, which have already progressed from price comparison to automated switching, are integrating consumption feedback and disaggregation services as they become customer advisories. Suppliers that enable customers to

purchase energy at market rates or offer 'eat all you can' tariffs are combining with smart home services in order to reduce customers' and suppliers' exposure to wholesale price and consumption volatility respectively. Community energy schemes and peer-to-peer services are incorporating home automation and demand side aggregation capabilities in order to capture the value of the flexibility within their networks; and

  - **Breadth of offer:** Most business models are trying to offer an ever broader set of offerings in order to develop a more comprehensive offering, to appeal to a broader customer base, and in order to drive new revenue streams. The outcome of all of this is that models are converging, albeit from different angles, and are heading in the direction of being all encompassing. Along with this trend is the parallel increase in the Internet of Things (connected devices) and data analytics.

- **Subscription and Membership:** There is a trend towards subscription and membership and the development of a holistic energy offering. In general, this is heading in the direction of an energy as a service model, where the customer has a relationship with a company that then takes care of a wide range of different energy services, of which the energy commodity may be included in the subscription price, or more likely, as a zero-margin subcontracted service; and
- **More to come:** When we look at both GB and the broader global trends in supply disintermediation, it is clear then that we have only seen the tip of the iceberg so far in GB. There are many models and offerings that have not yet reached GB shores and many more that we have been informed of in our research that are not yet in any market but are in the pipeline to be launched in the foreseeable future.

2.1.2 We believe that, in the near future, most of the offerings that are mentioned in this report, and many more besides, will be included in most business models. Models will become increasingly comprehensive, holistic, coordinated and advanced. They will connect devices, homes, electric vehicles, storage, distributed generation, communities and other distributed assets. They will become ever more intelligent (incorporating constantly improving data analytics and artificial intelligence), and they will become ever more automated, with simple customer interfaces which increasingly remove customers from the ever-greater complexity of the energy system to which they are connected.

3. The nature of disintermediation

3.1.1 There is a range of disintermediation that has been observed. In the fullest sense of the term, it could be argued that there are few cases of true disintermediation where the consumer-supplier relationship has been entirely interrupted. In fact, only where customers are off-grid (extremely rare and unlikely to happen to any significant extent in GB in the foreseeable future), or where communities own the local energy system, including generation, could full disintermediation be said truly to exist. This is essentially the case in the Elektrizitätswerke Schönau example in Germany, described later in this report.

3.1.2 In all other cases, the new business models can be said to be partially disintermediating the consumer-supplier relationship. They are at best decentralising the energy system, re-creating the role of the supplier (i.e. challenging the notion that the organisation responsible for the commodity supply is the customer's primary or even sole intermediary to the energy market), and empowering the customer, but they are not replacing the supplier. The reason for this is that the complexity of electricity supply is such that the customer cannot simply be provided access to centralised generation. An intermediary still needs to act as the balancing responsible party and trading risk is such that customers still require a party to act as a buffer. Essentially, therefore, whichever model is applied, the provider of that offering, even if it is presented as a platform, is still at the very least providing the balancing, trading and other complex and extensive (and necessarily so) regulatory compliance of a supplier.

3.1.3 In our opinion, the closest model to true disintermediation, other than the Elektrizitätswerke Schönau case mentioned above, is the enyway case, also from Germany, where small, local producers (and potentially also households) become suppliers as part of a peer-to-peer platform.

4. Selected Disintermediation Cases

4.1 Introduction

4.1.1 The new business models offer a very different and evolving role for the supplier (or whatever the intermediary should in future be called). The traditional relationship is one where the supplier purchases energy and sells onto the customer in such a way that the supplier's revenue and profit increase as the energy consumed by its customers increases. The supplier decides 100% on where the energy comes from and the customer simply accepts what they are given. The only control the customer has is to decide occasionally - if they want - from which supplier they buy, through switching supplier.

4.1.2 The new business models vary widely from this traditional relationship. Essentially there are five overlapping categories of new model relationships with very differing levels of disruption to the status quo:

- **Broker**: Models that are advisory and/or apply power of attorney to the relationship. They essentially aim to help the customer get a better deal by helping them select the right supplier and, in some cases also help the customer to reduce their energy costs in other way. These models reduce the need for customers actively to research and understand energy markets, and the extent to which Suppliers can profit from "disengaged" customers. Since the broker revenue model is typically not driven by kWh sales, these models are also separated from the traditional supplier paradox; they do not lose if the customer pays less or uses less energy;
- **Pass-through:** Models that enable customers to buy energy as if they were a supplier, from the wholesale market or direct from producers, typically at zero margin, but for a fee such as a subscription. These models, as with broker models, replace the traditional kWh supplier model with a relationship-based revenue model whereby the model's revenue does not decrease if the customer's consumption decreases. As such this leads to a customer-value

driven model and the services that evolve out of this type of model therefore tend to aim to lower a customer's energy costs;

- **Demand Control / Connected Home:** Models that provide customers with value from the control of their energy related devices, and/or the coordination of them to derive an as-independent-as-possible energy service (e.g. solar + storage + energy management);
- **Connected Assets:** Models that enable customers, prosumers (i.e. consumers who also have access to own small scale generation) and small local producers to buy and or sell between each other. This may for example be as a peer-to-peer platform, where the customer has an alternative route to market which enables them direct access and ability to trade with generators; and
- **Community Energy:** Community models whereby a real (as opposed to virtual) community is able to coordinate to take direct control of some aspect of their energy arrangement. This model has been attested in the form of local communities taking action and may include communities taking ownership of assets such as micro grids or launching their own supply business.

4.1.3 The new models in the market can be clustered into one of these five categories (from above) according to the mix of characteristics that comprise them. Cases within each category range, often quite widely, but follow a common theme. These can be seen in Figure 1 below. **Note:** the cases highlighted in red have been explored in more detail and are covered in separate case study documents.

Figure 1: New Business Model Case Characteristics and Categories

Cases	Jurisdiction	Key Model Characteristics															
		Supporting Platform	Alternative financing[1]	Innovative Tariffs	Power of Attorney	Feedback + Advice	DR[2] / Flexibility / VPP	Automation[3]	Energy as a Service	Internet of Things	Lifestyle + Comfort[4]	Sales + Trading	Network Autonomy	Electric Vehicles	VPP / Generation[5]	P-to-P[6]	Community	Micro grids
Broker																		
Flipper	GB	X			X													
June	NED	X	X		X	X												
Pass-through																		
Flick	NZ	X		X		X	X											
Home Control																		
RCG Lighthouse	Baltic								X									
Voltalis	FR	X	X				X	X										
British Gas + Hive	US, GB	X	X	X		X		X		X	X							
EDF Smart Home	FR	X	X	X		X	X	X		X	X							
Reposit Power	AUS	X		X		X	X	X			X	X						
Sunplug + EDF	GB	X	X	X				X			X		X					
GEO	GB	X	X			X	X	X		X	X		X					
Sonnen	AUS DE	X	X	X			X	X	X				X					
Tibber	NO	X	X	X		X		X		X		X	X	X				
Connected Assets																		
Swisscom Tiko	CH	X	X	X			X	X							X			
Fortum	FI	X	X	X		X	X	X							X			
Vandebron	NED	X		X								X				X		
Powerpeers	NED	X		X								X				X		
enyway	DE	X	X[7]	X								X				X		
Community Energy																		
Bristol Energy	GB	X		X													X	
RePower	AUS	X	X	X									X			X	X	
Sony	JP	X	-			X				X	X	X	X	X	X	X	X	X
Elektrizitätswerke Schönau	DE	-	X	X					X			X	X				X	X

[1] This alternative financing supports customers in adopting services and could relate, for example, to a subscription model whereby set-up costs are spread over a prolonged period
[2] Demand Response
[3] This relates to energy consumption and generation related decisions being automated on behalf of the customer
[4] This relates to models that focus on convenience, remote monitoring and control, and enhanced lifestyle benefits (e.g. such as buying and selling energy to neighbours)
[5] Virtual Power Plant
[6] Peer to peer
[7] Through cooperation with an associated business

4.2 Broker

4.2.1 The cases in this category are services which have taken the concept of price comparison tools to the next level, helping customers to ensure that they are not paying too much for their energy through automatically switching them to the lowest cost, or at least a good-choice supplier, on a regular basis, or whenever necessary. Sometimes customers pay a flat rate for such a service, such as in the case of Flipper in GB - in which case it is inferred that the broker is only incentivised to find the best deal for the customer. In other cases, the broker takes a commission from the supplier – in which case there can be claims that the broker may be less incentivised to be impartial. The last two of these cases are not described in this report as they are already known by Ofgem and well established in the GB market.

4.2.2 Where a broker's "fee" is not linked (e.g. by commission) to the products it recommends, the incentive is to deliver value to the customer without an accompanying incentive for the broker to sell more kWh. The greater the savings the broker can provide (and show evidence of) to the customer, the greater the cost-benefit for the customer from the flat rate that they are paying, and therefore the more likely they are to be willing to pay for the service.

4.2.3 These models are tending to develop from simple automated switching sites into energy cost management services. In the case of June, for instance, it has progressed additionally into an energy efficiency advisory role (consumption, feedback and advice) whereby the customer is provided with consumption disaggregation technology which enables June to advise the customer about specific, personalised ways in which they can save money, together with quantifiable estimates as to how much they may save. This evolution is putting these broker style models on a path towards providing a broader array of energy advisory, energy management, energy saving and other energy cost reduction offerings, based on a subscription-based revenue model.

4.3 Pass-through

4.3.1 An increasingly popular category of models recently has been one where suppliers position themselves as intermediaries between the customer and the wholesale market, or the producers of energy. Typically the offer is based around a software "platform" that allow customers to choose their provider of wholesale energy. In a sense, this is similar to the movement to "platform"-based products in UK Financial Services.[8]

4.3.2 In such models, such as Flick from New Zealand, the supplier charges a monthly subscription or similar, in order to supply customers at cost-price – essentially the cost of the energy procurement to the supplier. Since the supplier does not profit from the kWh sold, they are not motivated to sell more kWh to their customers, but rather to lower the customer's energy cost through helping them to use less energy. This model is able to succeed in an environment where customers have a lack of trust of energy suppliers, and Flick has been able to utilise this further through providing extensive consumption feedback information and advice to their customers to help them save energy.

4.3.3 These models expose end consumers to the risk associated with wholesale price volatility, as well as providing options to manage that risk. For example, suppliers such as Flick also provide customers

[8] For example, Hargreaves Lansdowne (and others) offer a self-managed pension, based on a platform where individuals can choose which unit trust or equities should form part of their pension.

real time insight so that they can respond to these price signals. This insight service allows customers to avoid price spikes which would otherwise threaten the popularity of the model.

4.3.4 This model has increased customer insight into their consumption and demand side responsiveness, and consequently is highly suitable for demand side automation and the resulting value that can come from demand side flexibility. The integration of connected home, storage, electric vehicles and even roof-top solar, among other things, are therefore all closely aligned services and likely to be connected to this model in future. This model is therefore well positioned as an intermediary service for a wide variety of subscription-based energy services beyond the simple supply of the energy commodity.

4.4 Home Control

4.4.1 The value of potential energy efficiency savings and flexibility is enabling new models to appear in many markets (in the case of flexibility wherever intermediaries have access to the value of that flexibility, which is the case in GB) and is enabling many new models to develop. These range from lighting as a service (e.g. RCG lighthouse) whereby a customer pays for lighting savings; to intermediaries that install technologies in customers' homes (for free in the case of e.g. Voltalis) to automate demand as a flexible asset that will save the customer money; to companies such as Reposit Power that combines solar, batteries and smart demand control in order to sell energy back to the grid when it is most valuable.

4.4.2 Once intermediaries are providing energy services that control the demand in the home or other connected home services, and earn their money from that, it is a short step to providing the energy itself as part of an energy as a service offering. At this point the level of disintermediation, which hitherto has only been partial (as the supplier remains the primary intermediary to the energy market and the energy service provider's role has been to incentivise energy usage behaviour and potential marketing of flexibility), would be extended fully. While there are no successful cases that we are aware of that have yet gone this far, we know of a number of parties that are planning to launch offerings of this type in the near future[9].

[9] The competitive nature of such offerings mean we are required to treat as confidential both the identity of the prospective providers and the details of their planned offers.

REGULATORY CONSIDERATION

A number of demand aggregators have highlighted that their investment in devices and capability for demand management is dependent on their being able to realise the value for that demand response in wholesale markets. They have acknowledged that the GB market access is amongst the best in Europe, with demand aggregators able to access contracts for Capacity, Reserve and Frequency Response - albeit this comes with associated costs of having metering of a suitable quality to record the response delivered accurately. However, they would also like to be able to access forward energy markets too.

Whilst demand aggregators' arguments have merit, their direct involvement in forward markets has a significant impact on other parties under the EU Target Model. The GB forward markets (including the Day Ahead Markets operated by EPEX and Nordpool) have largely emerged to meet the requirements of participants – rather than being imposed by regulation. The partial exception to this is the need to accommodate some specific requirements for coupling with the markets of other EU states. The key issues are that:

- These markets result in contracts that are later offset against meter values to determine a party's exposure to the Balancing Market;
- For a demand aggregator, these meters will be "balanced" against the contracts held by the relevant Supplier, as opposed to the aggregator. This would mean that, ultimately, a Demand Aggregator would have to "buy back" in the Balancing Market any energy it had sold in a forward market;
- Balancing Market Rules (in the Balancing and Settlement Code) would need to be changed to recognise forward contracts held by a Demand Side aggregator as different to those held by Generators and Suppliers; however:
  - It would increase the complexity in determining a robust "baseline" demand against which demand response is then measured – and so may increase the potential for gaming. It has significant implications in potentially stranding forward contracts a supplier has to cover the pre-reduced load of a customer;
  - Nothing in the market precludes demand side aggregators entering into bilateral forward agreements for their services; and
  - We do not believe that demand side response that can be sustained for more than a day can be credibly called demand side response. Given this, it would be surprising to see Demand Side Aggregators competing for contracts in markets any more forward than the day ahead stage.

  We are aware of a market where such a differentiated approach has been adopted – in France, suppliers buying energy marketed by demand aggregators must be compensated for their costs. An alternative is in the US, where a Supreme Court-upheld ruling by FERC (Order 745) stipulated that demand response providers must achieve the same price for load reduction as for actual generation. This is particularly appropriate under a US "Pool"-based system that allows participation at day ahead stage and is coincident with "gate closure", where generator bids to such markets are typically regulated to avoidable (fuel) costs.

4.4.3 The rapid development of Internet of Things (IOT)[10] and the connected home (offerings are characterised by a lifestyle benefit to customers) furthermore has also led to other automated offerings that combine energy savings / demand response with various other offerings such as convenience, home security and entertainment (e.g. EDF's smart home offering in France).

4.4.4 These connected homes enable the intermediary to lower the role of the energy commodity within the offering, turning the connected home into an energy + service that can eventually replace the energy as a commodity offering. In France, for instance, EDF's smart home + energy offering is a subscription service seen as a broader service for the future that goes beyond energy as a commodity. Once again, when the customer is paying for the broader service and the revenue from that broader service is large enough, the commodity no longer needs to be the revenue driver. This opens the door to new non-energy entrants to sell energy services and be agents for the energy commodity, without even needing to make a margin on the commodity itself. It also enables energy suppliers to act as an agent for the commodity rather than a supplier per se.

REGULATORY CONSIDERATION

It has been argued that a challenge facing the whole energy as a service future is the treatment of energy bundling, i.e. the combined product of energy supply and energy service products. There is evidence from some markets that bundling of energy creates a level of transparency that can lower commodity margins (as has happened in Norway where market-based tariff mark-ups are highly transparent) and thereby increase the need for competitors to compete for value from the broader service. There may therefore be a need to consider the potential benefits to disintermediated models that would arise from the bundling of energy and weigh these against the downsides that could arise, e.g. from a loss of flexibility of customer choice (if the customer has reduced option to switch supplier when also taking energy services as part of their bundle).

4.4.5 But there are also cases that focus more on the intelligence and sustainability of homes by combining a mix of generation, storage and home energy management (not necessarily all three, but typically so) and possibly other elements in order to enable the home to be, to some extent, self-sufficient while – in some cases – at the same time being apt at cooperating with the environment around it (e.g. interacting with the grid and / or electric vehicles). A very interesting example is Sonnen in Australia. Sonnen, supported by a back-office platform service provided by Energy Locals, offers a service that promises customers who have an appropriate solar system and Sonnen battery, a flat monthly rate (small monthly administration fee) for energy as long as they do not exceed a given amount of energy. The customer pays far less than they would normally pay, even with a solar system and battery, and in return Sonnen utilises the battery for grid stabilisation. This approach essentially increases the cost-efficiency of a solar-battery system for the customer and leaves the customer with a more autonomous system and lower energy bills. It also helps increase the uptake of more autonomous homes and instates Sonnen as the intermediary for the customer. They have, however, noted that the

[10] This refers to physical devices and appliances that have been interconnected with embedded computing devices and as such they can exchange data and be controlled in new ways.

roll out of such a model is easier in the Australian or German markets than in GB due to higher levels of financial incentives for domestic storage in those markets.

REGULATORY CONSIDERATION

These offerings have costs including the need for additional infrastructure in the home. To be attractive to end consumers, these costs need to have an offsetting benefit – in terms of a lower net cost of energy. Delivering this benefit relies on those customers being able to access revenue for the services they provide (e.g. reserve and spill generation) at a cost that is proportionate.

There are currently a number of specific areas which could act as barriers unduly to prevent this case from forming. These are:

- The ability to access wholesale markets for any flexibility unlocked in the home (see previous regulatory consideration box on page 11 for further information);
- Customers without export meters may not be able to realise Feed in Tariff payments, which as a result reduces their ability to realise the full value of solar installations at times of excess generation. This reduced ability acts as a barrier to access the full value potential of the technology, and therefore has potential to be significant; and
- Data access, particularly relating to smart meters. As discussed later in Section 5.5, the relative lack of clarity in GB versus other markets can become a detriment to entry and implementation.

4.4.6 One of the most advanced connected home cases in the market is currently a service called Tibber, a home automation and optimisation model that combines elements of prosumer, direct wholesale pass through, trading and peer-to-peer. Offered in Nordic markets, it is a retailer which enables the customer to be more sustainable, independent and more directly connected with the market, producers and other prosumers / consumers. It is driven by a vision to take commercial advantage of the emerging digitalisation of consumer behaviour in the energy industry through the use of a software solution, and thereby reinvent the way the utilities and the energy industry interact with the consumer.

4.4.7 More specifically, Tibber is a digital energy company with a smart platform that aims to reduce energy consumption through smart technology in consumers' homes. It is a solution that links together the technologies already in/at homes, (including PV, EVs and smart homes technology), with advanced analytics to inform customers, automate technology and simplify purchasing processes. This lowers customers' energy costs and makes their homes more sustainable and self-sufficient through coordinating their energy usage in response to wholesale energy price fluctuations. Customers can also buy directly from producers (bilateral contracts) and sell their excess energy to other Tibber customers.

4.4.8 Tibber acts as the retailer for the customer but makes money only from a subscription fee plus the actual cost of energy. No profit is made from the sale of kWh (they pass through the wholesale cost). The model of Tibber does not therefore benefit from consumers using more energy, but rather from

them saving energy and cost. Furthermore, because they are a balance responsible party, they have nothing to lose from demand response aggregation.

4.4.9 The service is therefore effectively a platform for the customer to become an active prosumer / consumer and purchaser /seller of energy in order to save money and reduce their CO2 footprint. If customers do not have the necessary smart infrastructure in their home in order to unlock sources of flexibility to market (e.g. smart thermostats or other smart devices for the home), Tibber will sell it to them, making money from the margins on the re-sale of the smart infrastructure.

4.4.10 This kind of service is likely to develop in future in close alignment with peer-to-peer and community models as well as the connection of various other network assets for the purpose of system flexibility. It is in fact well positioned to connect with most of the other models referred to in this report.

REGULATORY CONSIDERATION

Tibber and some other cases in this report have noted that they became a retailer through necessity rather than by choice. In order to provide services to the customer, they have necessarily included a supply service, often on a pure pass-through basis. As a result, in some of these cases there has been a need for these organisations to become a retailer. While there may be alternatives for such models (e.g. enter into a supply agreement with an established retailer), this or the direct route of obtaining a supply licence may be perceived as a barrier to entry, or at best an undesired complication that may deter new entrants in the GB market.

4.5 Connected Assets

4.5.1 By connecting together homes that have a mix of solar, storage, home energy management and other controllable resources, new virtual community models become possible. These models range from residential virtual power plants, such as those of Fortum and Swisscom, to peer to peer models. Arguably, the most disintermediating of these models are the peer to peer models such as PowerPeers from The Netherlands and enyway from Germany.

4.5.2 PowerPeers is a private many-to-many peer to peer residential community trading/retail platform that enables customers to know and choose exactly which peer they buy their energy from or sell their energy to. The platform replaces the supplier with a platform that essentially links customers to energy from individual household producers as well as other decentralised and centralised renewable sources of energy. The Powerpeers platform is responsible also for balancing, settlement, billing and other retail compliance responsibilities. The customer no longer needs to buy from a traditional supplier.

4.5.3 Enyway is a peer to peer marketplace (and platform) for green energy generated by prosumers and small scale local distributed producers whereby each producer, however small, has a supply agreement with each consumer and therefore effectively becomes a genuine supplier. Producers market and price themselves through the platform, and consumers choose and make a supply agreement with a producer. Enyway's platform and support enables and simplifies the whole process for the producers.

4.5.4 What this means, in terms of disintermediation, is profound in two key ways.

1) **Virtual community platforms replace suppliers**: Prosumers, whether they have their own generation on their roof, in their farm, on their small commercial roof top, or in a location that they own alone or as a group somewhere, can sell that generation to other community members, whether they are prosumers or just consumers, anywhere, anytime. The platform becomes the enabler, the community becomes the supplier (generator and consumer and controller of prices, service, terms and conditions), and while there needs to be balancing and retail compliance etc. (which the platform can handle[11]) the community is essentially empowered, in-control, and serving itself; and
2) **New intermediaries can sell their own energy for specific appliances or uses**: Using the same technology, it will soon be possible to isolate individual appliances and sell separately to each appliance, so a customer could for instance charge their phone with green power directly from one community or vendor wind turbines in a UK home, while maintaining an energy contract with one of the incumbent or other traditional suppliers. Likewise, an EV manufacturer may be able to sell its own generation for its customers, just for the use of the vehicle. Or a large international furniture seller, may be able to sell its own energy for use in the kitchens it sells. This will allow new intermediaries into the market to sell the generation they have, in a highly targeted way, for specific usage, to whomever they want, whenever they want. This is already technically possible based on the existing platforms and it is expected in the market in the foreseeable future, although is not covered specifically in the case studies where we have focused.

[11] Platform providers will have to assume a role of default supplier to the community. Whether they manage this themselves or contract directly with an established retailer, they will be responsible for meeting various supplier obligations. As in the Regulatory Considerations box at the end of paragraph 4.4.10, the need to perform this role may not be welcome, and therefore this could be perceived as a barrier to entry.

REGULATORY CONSIDERATION

There are four key regulatory considerations in facilitating the above model:

- **Micro-generation ownership model**: Some households own and produce clean power (e.g. solar) on their own rooftop. For others, they may only be able to own assets remotely (e.g. 'Tele-panels'). This link between property and own generation ownership has the potential to limit the ability of such models to grow and limit full participation of all consumers. This has the potential to form a barrier to full implementation, which may then need a review of mechanisms that facilitate remote ownership or leasing of solar panels;
- **Price formation:** The ability of individual households to market their own generated clean power at their chosen price (besides paying for the network connection and usage) can be used to ensure price signals are provided within communities. So long as platforms are able to develop to provide this, there are no regulatory barriers that should be able to prevent this;
- **Split meter visibility:** In the case of intermediaries selling appliance by appliance etc., there may be a challenge in identifying and metering supply to an electric (e.g. mobile) device as distinct from the regular energy contract based on a regular (fixed) electricity meter in a building. Proposed changes to the supplier hub model and from Elexon may reduce barriers to implementation of such arrangements. It is beyond the scope of this paper to analyse these changes, however it would be necessary to look at a cost benefit analysis of any such solution, particularly given that the solution would have to be very broad in order to be applicable to all suppliers; and
- **Accounting for any "net" imbalance:** In one sense these models are clubs where members can exchange electricity; where the production and demand in the club does not balance, the net will have to be bought or sold from the wider market. This is possible if the club is also a Supplier with the energy exchanges in the "club" being accounted for in the "Supplier Volume Allocation (SVA)" part of central settlement. However, there are some restrictions which could form barriers to implementation:
  - **GSP Group**: The "club" can operate within each GSP Group (broadly the geographical area of each licensed electricity distribution company) at a lower cost level and with fewer regulatory requirements. This is because at the GSP level, there is a simpler, consistent approach used to estimate the half-hourly demand of those customers that are not metered half-hourly and avoid additional charges arising from using the transmission network. To extend the club outside of this geography would therefore have implications on cost and practicality, which form a natural barrier to doing so;
  - **CVA generation**: There are limits on which generation can be settled through SVA, rather than CVA. It only applies to generators with a capacity of <50MW (lower in Scotland) that are embedded within the distribution network and are exempt from generation licensing obligations; and
  - **Export meters**: Where domestic customers want both to buy and sell electricity through the club (prosumers – that both produce and consume), they will need an export meter recognised by central settlements. Without such a meter, the central settlement will ignore any sale of electricity by that prosumer through the club – and deem that the relevant energy needs to be purchased from the wider wholesale market.

4.6 Community Energy

4.6.1 In their most basic form community suppliers (e.g. Bristol Energy) are essentially suppliers that are owned by real (as opposed to virtual) communities, for the benefit of communities. They enable the community to take control of the retail business. In this sense they disintermediate. However, they generally run on a traditional retail platform, white labelling the real retail provider behind them. In that sense they do not change the basic principles of the retail business.

4.6.2 The potential for such suppliers to move forwards and become community producers, networks and more, creates far more opportunity for disintermediation. Such evolutions may take place steadily, as has happened for instance in Australia with RePower, a community initiative where the community invests in generation schemes in partnership with local businesses to enable the community to own and benefit from generation; or more dramatically, as has happened for instance in Japan (e.g. Sony open energy system micro-grid in Okinawa) and arguably more comparatively in Germany with communities such as Elektrizitätswerke Schönau where the community has taken control of the entire local energy system, including network and generation assets, creating a truly community-based energy system. Not only does such an approach represent disintermediation in itself, but it also enables further disintermediation, since the community is consequently in control of who is allowed to participate in the system, be it in the form of local generators, energy service providers or otherwise. Essentially then, once the community is in control, disintermediation can be enabled based on consideration of value for the community, rather than commercial considerations of the impact on the status quo. Ownership of the existing network in GB would be considered akin to a localised form of re-nationalisation, and would therefore be a political decision, as indeed it originally was in Germany. However, ownership of a local micro-grid may be possible and would therefore fit into this model. It should be noted, however, that control of the grid is only part of the Elektrizitätswerke Schönau model and most of its benefits, would be realised regardless of such ownership.

REGULATORY CONSIDERATION

Community energy companies such as Bristol Energy are already possible in GB. In practice however, the most extensive solutions such as Elektrizitätswerke Schönau are not yet possible in the GB, the biggest barrier to which would be enabling a local community to take ownership of the local energy system. Grid ownership model reform would be a major shift for the GB market.

4.7 Regulatory barriers to GB adoption

4.7.1 The following table sets out a brief consideration of how each of the categories of model could be accommodated in the GB regulatory environment, as well as providing a brief summary of the regulatory issues associated with each.

Model Category	How can it be accommodated?	Issues
Broker	• Broker does not need to be licensed	• No Barriers
Pass Through	• Can be accommodated as a novel Supplier	"Supplier" will pick up other responsibilities in addition to being accountable for wholesale energy, notably: • Billing for Transmission and Distribution usage • Energy efficiency (ECO) responsibilities • Collection of levies • Identification and treatment of vulnerable customers
Demand Control / Connected Home	• UK allows for Demand Aggregators • Demands Aggregators can access revenue from Capacity and Balancing Services • Elexon are introducing changes so that Demand Aggregators can access the Balancing Market	• Demand Aggregators would like to be able to trade in forward markets.
Connected Assets	• Can be done as a Supplier • Most efficient if all assets are connected in same GSP Group	• Best if all relevant assets have to trade through the same Supplier • Production can also be sold through Central Volume Allocation (CVA); however, this is a more expensive option for those providers. • Any "prosumer" will need to have an export meter to be able to sell any net output to others. • Supplier will pick up other responsibilities in addition to being accountable for wholesale energy, notably: – Billing for Transmission and Distribution usage – Energy efficiency (ECO) responsibilities – Collection of levies – Identification and treatment of vulnerable customers
Community Energy	• Some elements can be done as a Supplier • Community energy companies can establish their own private networks	• Economics of private networks are questionable when there is an existing network.

4.7.2 The extent of any regulatory barriers to the adoption of these models we have discussed in GB are discussed further in the following paragraphs. Our general conclusion is that all of the above models can be accommodated within the existing GB regulatory regime, albeit there are some things that could make them easier.

4.7.3 Whilst we have raised a number of regulatory issues that could impact each of the model categories discussed above, none of these act as fundamental barriers to their adoption in GB. The regulatory issues emerge when the party implementing the model has to be accountable for the energy that traverses a customer's meter. This can be accommodated if that party becomes a licensed Supplier; however, the nature of the GB regulatory regime does impact the extent to which this can support or frustrate the deployment of these models. Notably:

- **Best at GSP Group level:** All electricity and gas markets have regulatory rules to ensure full accountability and settlement of energy that is produced and consumed within a network. This ultimately leads to some form of centralised settlement where flows across each meter on the system are assigned to one or more party, with measures to ensure those parties are paid, or pay for the entirety of those flows.

  In GB, these centralised settlement arrangements are operated by Elexon, and are known as the Balancing Market. The Balancing Market allows Suppliers to "net off" some generation against the consumption of their customers – leading to a number of benefits, including lower costs of metering and settlement. This "netting off":

  - Would enable the "connected assets" type offer;
  - Is carried out by having the relevant generation registered in Supplier Volume Allocation (rather than Central Volume Allocation); and
  - Can only work between generators and customers that are connected in the same GSP Group (i.e. to the same distribution system) and will only work for generators of up to 50MW (lower thresholds apply in Scotland).

- **Complex regulations:** In common with all liberalised energy markets, regulation of the GB energy market is complex. To a large extent, this complexity is unavoidable – and reflects the complexity of the underlying industry.

  Notwithstanding the unavoidable complexity in regulation, this complexity does restrict innovation, and the expansion of market models across national boundaries. A number of parties we have spoken to have highlighted this, and similar features have been observed for investment in electricity generation. There is a fixed cost to market entry – as any entrant will need to invest (time and/or professional advice) to understand the regulatory environment before it enters a market. For international investment in generation, this tended to drive investment towards countries where one or more of the following were true[12]:

  - **Low-Risk, Simple environment**: Regulations, and the risks associated with them, were simple and easy to understand. For example, this led to investment in countries

[12] ESP Consulting experience from previous engagements

where Generators could contractually secure their revenue[13], and countries where markets were transparent, low risk and easy to understand[14];

- **Similar to home**: The regulatory regime is very similar to that in a party's home country – lowering the cost and perceived risk of entering that market; and
- **Large Opportunity**: A country has a large number of customers that could benefit significantly from an offer, to the extent the entrant could expect to make money in delivering those benefits.

- **Requires diverse capabilities:** A Licenced Supplier is required to do a large number of things – in addition to being accountable for the energy consumed by a customer. This can act to restrict new-entrant innovators that may have good ideas and capabilities for managing wholesale energy costs, but be less strong for other areas of the Supplier requirements. Most notably, this would apply to obligations (e.g. ECO) to improve the energy efficiency of consumers.

5. Factors that support and frustrate innovation

5.1 Introduction

5.1.1 The various business models that lead to disintermediation in energy retail are each a result of innovation. This innovation is, itself, driven by a number of factors – some of which are controlled or directly influenced by energy regulators and policy makers. In the following paragraphs, we discuss these factors based on our own assessment of relevant factors. This discussion is organised into the following areas:

- **The nature of innovation:** A discussion of the nature of innovation, its impact on incumbents and its un-predictable nature;
- **Customers**: A discussion of the impact of customers on innovation – noting that any successful innovation ultimately needs to be used by a customer;
- **Technology:** A discussion of the trends we have observed in the emergence of technology innovations, and their absorption by the established industry; and
- **Regulatory:** A discussion of the main regulatory factors observed to date as influencing the evolution and up-take of new models.

5.2 The nature of innovation

5.2.1 The following paragraphs set out some of the key themes relating to the nature of innovation. This discussion is organised as follows:

- **Innovation overview:** Looking at the fact that innovation is driven both by the imagination of the innovator, as well as developments in the wider environment;
- **Convergence:** Noting that innovative models tend to be absorbed or otherwise merge; and

[13] This applied for investments in the Middle East and some African countries
[14] This was part of the rationale for the design of the "SEM" wholesale electricity market in Ireland

- **Incumbents:** Looking at the impact of incumbents on innovation.

Innovation overview

5.2.2 There are many apparent trends relating to the new business models in the market, but it needs to be borne in mind that the trends themselves are something of a moving target. There are two main reasons for this:

1) By definition, new models need to be imaginative to succeed. They typically aim to be different from what has come before them, at least in the market they are entering. We can imagine future needs and therefore some of the models of the future, but we cannot predict imagination; and
2) Models are often facilitated by innovations in technologies, regulatory changes in the market, or other market developments. The development of the market for electric vehicles, the efficiency of batteries and the creation of demand-side markets are just some of the forces driving recent models, for instance. We can predict many of these changes and therefore also some degree of the change in the trends of the models in the market, but the context is bound to change in the future also in ways and at speeds that no one can predict.

Convergence

5.2.3 Innovative energy retail models can initiate from any direction. They may start as add-on concepts to traditional retail businesses; as a price comparison service; an energy savings or convenience service; a community initiative; a simple solar installer; an attempt to go off-grid; and from any number of other initial perspectives. They may also come from other industries, notably from the IT, automobile and security sectors, but also from other sectors.

5.2.4 Before long, however, these very different players start eating into each other's territories, overlapping extensively. A price comparison site may initially offer power of attorney based automated switching and then expand to offering energy reduction advice. A solar installer offering home energy management may add storage; a company offering home energy management may expand to storage, car charging and demand response.

5.2.5 As models expand, they suck-in additional potential revenue streams and customer lifetime value, but they also fight for the same business, albeit in a market that is typically growing. In turn, they are pressured to expand into additional offerings and so the spiral of encroachment continues. Some players stick to their guns with a narrow focus, but the general trend is clearly one of convergence. While it would be excessive to expect all players eventually to offer everything in the market as a whole, it is definitely the case that players typically plan to offer everything that they are able to offer in the mid to longer term.

Incumbents

5.2.6 Most of the new model players are taking what could be considered a go-it-alone approach to a large extent, especially when it comes to relationships with the traditional or incumbent retail sector. They often seek and sometimes gain investment from them, and indeed are often established by them (in which case they are typically run very separately from the parent company), but otherwise are generally not partnering up that much with them.

5.2.7 Where partnership is key is between the new model players and their customers as well as the grids. Concerning customers, many of the new models are utilising innovative relationships relating to peer to peer, communities and even municipalities. These relationships are in turn supported by innovative asset ownership structures, ICT platforms, financing arrangements / schemes, and white labelling. Relationships are also emerging between the new models and IOT / connected home platform providers, providers of grid edge technologies (batteries, solar, heating, Blockchain etc.) and sources of finance. Links with the automotive sector and potential charging infrastructure networks are also emerging.

5.2.8 Concerning the relationship with grids, there is a strong and growing focus from more and more new models on the value of the flexibility within the consumption and demand control afforded by the model. Currently, this flexibility is only explicit within a relatively small number of offerings, but it is in the strategic plans of many more.

5.3 Customers

5.3.1 A key measure of the success of any innovation is the extent to which that innovation is adopted by customers. This is as true for innovation in energy retail as for other areas. The following paragraphs discuss some of the factors we have observed in gaining this customer acceptance of energy retail innovations. This discussion is organised as follows:

- **Need benefits quickly:** Relatively few customers are prepared to make a significant outlay on the promise of future benefits; and
- **Drivers of switching change:** With legacy models, the key benefit of switching supplier was to access energy at a lower price. New models introduce different benefits, which may change switching behaviour.

Need Benefits quickly

5.3.2 While some customers are willing to invest up-front in energy infrastructures such as roof-top solar, the general trend is to offer customers financing in the form of a subscription (sometimes in the form of a membership) or hire-purchase, for instance. It is clear that this approach in general is preferable for customers and vendors alike since it is easier to absorb for customers, leads to quicker uptake of the offering, and enables easier upsell at a later date.

Customer Switching under New Models

5.3.3 Unlike most normal customer switching between traditional suppliers (new entrants and incumbents alike) which is mostly price driven, customers switching to new models is based on a very different set of drivers. As a result, customers who have switched in the market to date are not necessarily by any means the same ones who will switch to the new models. In fact, there is evidence to indicate that many of the customers who have never switched supplier are a key target group for future models. It is important therefore, to ensure that:

- All customers, with particular focus on previously inactive customers, remain able to adopt new models, and indeed that new models are able to fulfil their potential in becoming an effective tool for engagement;
- Customers not served by a company offering a particular new product are nevertheless able to access information about emerging products; and

- Product offerings that commit customers for a period of time do not unduly inhibit innovation by preventing timely uptake of offerings arising from new models.

5.3.4 This is a particular challenge where new models involve the rollout of particular hardware or applications that reduce ease of switching and make the customer "stickier". The ability of a supplier to recover their costs in offering such a service needs to be balanced with the innovation benefits that come by allowing customers to switch to a new provider in order to access the new products. While the topic of "quicker switching" has been addressed in the context of traditional supply offerings, a similar topic may need to be addressed as new models emerge and new products become mature.

5.4 Technology

5.4.1 Many innovations in energy retail have technology at their heart. The following paragraphs discuss our observations in this area, with this discussion organised as follows:

- **Platforms:** We note the role of platforms in many recent innovations; and
- **Costs:** We note that technology costs tend to fall as those technologies mature, facilitating further adoption and innovation.

Platforms

5.4.2 Good IT platforms form an essential role in many new business models. Effective and efficient platforms can support complex offerings, can support multiple offerings, and ensure that costs are kept low – essential for new start-ups which typically have small scale and need to compete on price, and for models that require low transaction costs. They can also enable an ergonomic and reliable user experience. Good platforms also enable scalability.

5.4.3 An equally important aspect of platforms however, is that they can facilitate transferability of the model to other markets and other players. In fact, many new model companies see themselves as simply, or primarily, a demonstration exercise for a platform that they hope to sell to another company, for instance an investor, an incumbent supplier or a licensee in another market. The sale of the platform, in one form or another, can be seen as far more profitable for the entrepreneur, than to develop the model as-is. In fact, already there are platforms which have been rolled out in multiple market (for example, Powershop has progressively been rolled out from New Zealand into Australia and Great Britain[15]). There are also cases of platforms we have seen, that have up to 50 seriously interested licensees from around the world. With such transferability the speed of transference of models between markets is set to grow exponentially in the near future.

5.4.4 With more platforms emerging, there is a strong likelihood that as the market evolves a number will not become fully established. Some may sell out before they reach their potential – while some buyers may increase the synergies and therefore the potential of the model, many others will be bought by investors who lack the will or ability to take full advantage. In a market where most of the new entrants have aspirations to sell their platforms, where the platform is the mainstay of their revenue visions, there are also many players who will fall short of their plans and fade when the

[15] The Powershop model operates by selling customers specially designed, time-limited products. Central to this model is an engaging, simple to use online platform.

investment for the platform fails to arrive or when the entrepreneurs lose faith in the value of the platform. In any case many of the platforms should be seen as excess and are likely to fall by the way-side together with their businesses.

Costs

5.4.5 It is clear that many of the models are enabled and or driven by falling technology costs of for instance batteries, solar and EVs, as well as by improvements in technologies and platforms. Their success is also geared, in many cases, to increasing economies of scale, which will improve as uptake gathers pace and as the models are able to garner more offerings to or value from each customer.

5.5 Regulatory

5.5.1 The general message we have seen from the cases we have observed is that the present and future innovative models are possible within the present regulatory climate, albeit this typically requires the innovators to take on a number of unrelated roles (e.g. relating to meter provisions and energy efficiency). These additional roles contribute to the perceived complexity of regulation – cited by a number of innovators as a barrier to them deploying their ideas in GB.

5.5.2 Amongst companies offering new models there is a general consensus that regulation needs, wherever possible, to be simpler, not more extensive. (To demonstrate where simpler regulation can enable the emergence of new models, in the appendix we compare the GB and German markets, noting where supplier obligations are lower). Those we have spoken to have not identified any areas of the regulation that are unnecessary; however, it is true that the complexity of the regulation of energy markets can act as a barrier to entry (and hence innovation). Whilst this does not indicate a need for any immediate changes to GB energy market regulation, it is worth keeping in mind as any new regulations are developed.

5.5.3 The following paragraphs discuss three elements of the impact of regulation on the evolution of new models:

- **Data access**: A number of emerging models rely on obtaining and processing customer data. Data protection regulation notwithstanding, there are additional challenges specific to the GB market relating to access to smart meter data. In the box on the following page we explore this in more detail, using a specific case study (Tibber) and comparing it to the US Green Button data access solution;
- **Metering:** Whilst it is clear that some form of measurement is required to demonstrate the value delivered by a new model (leading to payment), the specification and cost of this measurement must be proportionate – lest it stifle the innovation; and
- **Incumbents:** It can be culturally more challenging to develop new business models in an existing organisation than in a new one. In addition, new models are both an opportunity and a threat to those existing players. Regulation has a role in encouraging existing players to innovate themselves, and in preventing them using their market position to prevent the evolution of (otherwise beneficial) innovations.

DATA ACCESS REQUIREMENT IN MORE DETAIL – TIBBER MODEL EXAMPLE

In 4.4.6, we covered Tibber in some detail. Tibber is one of the most advanced intelligent / connected home solutions in the world at present. But in order to attract customers and digitally recruit them, there is a need to access users' data (with their permission) in a simplified digital manner for the purposes of analytics in order to show the customer the value of the offering and in order to onboard them.

Historical consumption data and basic customer data is critical to this. In Norway, where Tibber is currently operating (in addition to Sweden), data access is considered a relatively easy hurdle to meet, since there is a central data repository (data is accessible for any customer from the associated grid company's database via links from the repository) as well as central and automated processes for handling customer data.

This is essentially similar to the 'Green Button' model in the USA, which is a standardised way for sharing and publishing the historic energy usage data of customers over the internet, and through world-wide-web applications. Not only does this mean that the switching process is easily handled, but it also enables searches for data that can be used for analytics.

While the GB smart meter data developments may make access to historic consumption data easier, there are still differences between the Nordic markets and GB. For example, Sweden has 100% roll out of smart meters, allowing third parties access to hourly measurements. This is not currently available for any players wishing to enter the GB market in the near future. Timely, available on request, cost effective data could perhaps be sufficiently provided sooner by approaches such as Green Button as an interim solution.

In the Nordic markets where Tibber operates, it is the combination of both the tools and rights to access data that enables the model. Without both of these elements in place in GB, models such as Tibber will not be able to offer customers the full range of functionality possible.

Need for (Smart) Metering and Settlement

5.5.4 In general, many of the models benefit from smart metering. The primary benefit is through enabling real, or near real time consumption measurement by time of use (half-hourly for the GB market). For some models, the absence of such measurement can be avoided, even though it would be optimal, while for other models it is considered essential. In any case, the typical consensus from models that require detailed (i.e. at least half-hourly) and timely consumption data is either that smart meters are preferred, or that an alternative to smart meters is necessary where smart meters are not installed (whereby the costs associated with the business case are increased). Where smart meters are installed, the intermittency of measurement and settlement should furthermore be as frequent as possible.

5.5.5 The use of half-hourly settlement will enhance the benefits of smart metering as it allows the customer (through its supplier or demand aggregator) to be exposed to half-hourly prices, and so realise the benefits of e.g. reducing load when prices are high.

5.5.6 Another metering-related barrier to some key models is the absence of the presence of a smart meter including export functionality or smart two-way (including export) meter. This is because the

most advanced models in the market tend to incorporate the sale of energy, either between the prosumer and the market, or between prosumers (peer-to-peer). Most producers have export meters and in the scale of the overall cost of setting up own generation such as roof-top solar, the cost of a smart export meter or replacing a smart meter with a two-way smart meter is arguably relatively insignificant. However, it may be considered by some prosumers without an export meter as an avoidable cost and can therefore, for some customers, act as a barrier to adoption of the model.

5.5.7 This can also lead to inefficient outcomes for society, for example where a prosumer without an export meter has no way to access the Feed in Tariff rate that would incentivise them to export. As a consequence, excess own generation may not be exported to benefit the wider community, but instead stored inefficiently in heating a hot water tank, or simply not used at all.

5.5.8 A key innovation we have observed in this area relates to the treatment of domestic demand response in a number of US markets. This is based on statistical sampling of customers that are on a specified scheme – meaning that full (and expensive) metering is only then needed for a subset of relevant customers. In our collection of case study documents, we have included one for how this approach works in the PJM wholesale market.

Influence of Incumbents in Driving towards New Models

5.5.9 Many of the new model players in the market are either subsidiaries or sub-offerings of incumbent or other traditional suppliers. For example, Powerpeers has been acquired by Vattenfall and was launched under their brand in 2016. Such players have either been established by the traditional suppliers or bought by them, mostly, it would seem, because such traditional suppliers see the new models as a possible way of the future and are aware of the weakening of the traditional model. As a result of such investments, it is possible that traditional players will be able to retain a level of influence and direction in innovations towards a future energy world. While this suggests that traditional players will be invested in and therefore support the transition to new models, the barriers to new entry that have previously been identified in the supply market due to incumbents' pre-existing customer-base and scale may also form a barrier to growth of new entrants offering new models.

Appendix A Comparison of GB and German Markets

A.1.1 The obligations on suppliers in GB are significant relative to the other markets. If we take Germany - the market with the most cases in this report - as a comparative example, we see far few obligations for suppliers than in GB. For instance, differences include:

- **Licensing:** In GB retailers must be licensed and follow the licensing agreement. In Germany there is no licence as such, but it is important to announce your business activities to the regulatory authority agency (BNetzA);
- **Energy efficiency:** In GB once a supplier has more than 250,000 accounts they must:

  a) contribute to the Energy Company Obligation (an energy efficiency programme);

  b) provide eligible customers with the Warm Home Discount (a fixed amount off their energy bill every winter); and

  c) manage customers' feed-in-tariff payments e.g. if they have solar PV on their roof.

  In Germany there are no such provisions or detailed energy obligation schemes for suppliers. However, there are general provisions with respect to the implementation of the Energy Efficiency Directive. The supplier must offer, as technically feasible and economically reasonable, a tariff which provides an incentive to save energy or control energy consumption, in particular load variable or daytime dependent tariffs. Suppliers must offer at least one tariff, for which the data recording and transmission is limited to the statement of total energy consumed within a certain period);
- **Vulnerable customer care**: In GB suppliers must keep a log of all vulnerable customers and have policies in place to help them. In Germany no log or special services are required as far as we know. Furthermore, there is no document that we know of describing obligations towards vulnerable customers. In fact, we are not aware of energy regulation specifying (for competitive suppliers) any special rules on accessibility for vulnerable customers (e.g. pensionable age, disabled, chronically sick) relating to requesting bills, debt repayment plans, issuing of pre-payment keys, or disconnections. Processes to meet the needs of vulnerable customers might include for example bills in braille or text relay service. In Germany, this is only facilitated to the extent that there are special rules for the basic service provider (Basic Supply Ordinance: Grundversorgungsver-ordnung), but these are not as extensive as GB requirements; and
- **Digital offerings**: There are more obligations in GB that may hinder a supplier going fully digital (a key objective for many new models). For instance, in GB suppliers must be accessible by phone and customers must be allowed to pay cash (e.g. at a post office). In Germany there is no such phone access requirement and the law requires only that the supplier has to offer two different forms of payment options.

A.1.2 These need to be considered alongside a number of other market differences, which include higher switching costs in GB, smart metering obligations (which is part of the role of network companies in Germany rather than suppliers) and the uncertainty surrounding smart metering roll-out and smart meter data access in GB. This can make the GB market seem a more daunting place to enter.

Appendix B Sources

In the following table, we set out the sources external to ESP Consulting, VaasaETT and Ofgem used in obtaining the information in this report.

Interview with Tibber CEO
Interview with Sonnen CEO
Interview with EWS representative
Interview with Voltalis CEO
Interview with enyway representative
Interview with Powerpeers CEO