Institute for Public Policy Research

ENERGISING THE MARKET

A COUNTRY COMPARISON OF CONSUMER ENGAGEMENT IN THE RETAIL ENERGY MARKET

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SUMMARY

This briefing note reviews the main features of retail energy markets in five countries – Germany, Sweden, France, the US (California) and Australia - to extract relevant examples of consumer engagement in these countries that could be applied to the UK market. To achieve this, we suggest how approaches from other countries could be implemented in the UK, with a particular focus on the role Ofgem and Price Comparison Websites (PCWs) could play.

CONTEXT

According to a report for the EU's Agency for the Cooperation of Energy Regulators (ACER), the UK was ranked as having the third and fourth most competitive markets in the EU for electricity and gas respectively (IPA Advisory, 2015). The scoring is assessed based on a broad range of criteria, including market concentration, customer switching and pricing.

This may come as a surprise given that, compared to other industries, the level of consumer trust in the energy market is low – although it has recently risen slowly (Edelman, 2017). In a situation where the UK electricity and gas markets both score highly for competitiveness, but consumer trust is low to the point that a form of price cap is being considered by Ofgem (acting on government instructions) (Peachey, 2017), it becomes even more important to encourage consumers to participate in the market. The following research draws on experiences from the five other countries mentioned in order to put forward ideas for how this can be achieved.

METHODOLOGY

In order to evaluate the differences between the UK and the countries being evaluated, this briefing paper assesses each country according to five key criteria:

- an overview of the country's energy market including its market structure
- the level of government control over the energy market
- the consumer switching levels
- initiatives to encourage greater consumer engagement in their energy bills and the billing process in general
- the uptake of smart meters.

At the end of each comparison, we draw out some of the key lessons that the UK can take away from the country, before finally synthesising these findings into key conclusions and suggested methods for possible implementation into the UK energy market.

KEY FINDINGS

The main aspects of each country's energy markets are summarised and arranged according to the criteria identified in our methodology in Table 1:

TABLE 1

Country	Market overview	Government control	Switching levels	Engaging consumers	Smart meter uptake
Germany	Large PV penetration, particularly at domestic level	Deregulated; market authority; rent controls and long tenancies	Many municipal suppliers; modest switching levels; high customer satisfaction	Bundled utility services; large community energy market	Rollout for 2020 only for large energy consumers
Sweden	Heating mostly from district heat; small retail gas market	Deregulated; market authority	Many suppliers; high switching levels; high satisfaction; low comparability of new deals	State-owned PCW for electricity market; gas market too small	Rolled out for electricity since 2008; customers can request hourly billing
France	Electricity market dominated by state-owned EDF and nuclear	Both fuel prices largely regulated by government	Low switching levels; few suppliers; market tariffs emerging but controversial	Tempo tariff offers day-ahead off-peak energy	Rollout for 2021 to scale up dynamic pricing but inertia from EDF
US (California)	Three main utilities, controlled by State; similar CO2 goals to UK	Regulated retail prices and State-level strategic planning	Limited switching levels; new community aggregators disrupting this model	Net energy metering; incentives for domestic solar, renewables and battery storage	60 million planned for 2020, 8 million to date; plans to scale up time-of-use tariffs
Australia	Three large suppliers dominate; in midst of energy crisis	Some jurisdictions regulate default offers; others are market-based	Variable switching depending on state; generally low confidence and awareness	Some attracted by PV, battery storage and energy management tools	Delayed, expensive rollout in Victoria; optional, piecemeal elsewhere

Source: IPPR

From analysing the countries in Table 1, the following initiatives could be applicable and attractive to the UK retail market:

TABLE 2

Suggestion for UK	Country of Origin	Rationale	Implementation
Net energy metering	US (California)	Net energy metering provides a way for consumers to engage in energy produced from rooftop PV and reduce bills to zero	Consultation from Ofgem on technical feasibility of including net energy metering in current smart meter rollout
Increased domestic PV incentives	California; Germany; Australia	PV is an inherently local energy source with consumers in some countries preferring suppliers that can provide them	Could require raised feed-in tariffs for solar or net energy metering combined with other financing options for PV purchases (e.g. low-cost loans)
Time-of-use tariffs	France	As smart meter tariffs are rolled out, time-of-use tariffs provide consumers with the opportunity to take advantage of periods of low demand	Consultation from Ofgem with energy suppliers, including discussion
Community-level aggregators	California; Australia	As an alternative to time-of-use tariffs, consumers could delegate responsibility of finding cheaper deals to third parties	PCWs could start to provide and explain the function of these Third-Party Intermediaries (TPI) to consumers more frequently
Personal management solutions (e.g. apps, smart appliances)	Australia; Sweden	Could improve individual energy management and provide a selling point for new energy suppliers providing these solutions	PCWs could highlight these solutions as 'perks' or 'key features' during searches for energy deals
Ofgem to hold AND publicise all tariff deals	Sweden	Providing equal access to information to all consumers	Ofgem would have to ensure that they have timely access to all deals from all energy suppliers

Source: IPPR

GERMANY

Overview of energy market

The Germany energy market is characterised by its uptake of renewables, which has resulted in disruption to the energy system. In 2016, Germany had the second highest electricity prices in Europe (Eurostat, 2017), in large part driven by the government's *Energiewende* policy (IRENA, 2015), the set of principles pushing the uptake in solar PV.

However, as the energy market increases its share of renewable generation, the existing system involving Transmission System Operators (TSOs) is likely to shift towards a more distributed model that may cut out the need for TSOs altogether (Bayer, 2015).

Already 98 per cent of Germany's approximately 1 million solar PV farms are connected at the distributed local level (Fraunhofer ISE, 2017). This could be important for consumers by reducing the grid fee portion of household electricity bills, currently the highest component cost at 24 per cent (Thalman & Werhmann, 2017). In addition, though electricity prices are indeed high because of the increase in renewable generation like solar PV, this is partially offset by more energy efficient housing (Appunn, Bieler, & Wettengel, 2017).

Government control

A key difference between the UK and German energy markets derives from the private rented sector in Germany. Specifically, German tenants enjoy longer tenancies (11 years on average, with many being indefinite) and can only be evicted in limited circumstances. The private rental market made up around 40 per cent of all households in Germany in 2014, compared to around 20 per cent in the UK (Davies, Snelling, Turner, & Marquardt, 2017). Correspondingly, it is also possible to get a long-term fixed-price energy contract with suppliers, as they are less concerned with tenant mobility (How to Germany, 2017).

For energy specifically, GPKE (the German regulator) provides rules on transparent billing and for changing supplier. Basic suppliers must publish their basic tariff and supply customers in accordance with the 'Ordinance on Electricity Basic Supply'. The basic supplier is the supplier with the largest market share in a region.

The Market Transparency Authority for Electricity and Gas works with the Federal Network Agency and Federal Cartel Office to tackle insider trading and market manipulation between generation and supply companies in accordance with the REMIT EU legislation (Uwer & Zimmer, 2014).

Consumer switching levels

There are four main energy companies in Germany that, in 2014, controlled approximately 56 per cent of generating capacity (Bayer, 2015). The Big Four TSOs also own a large portion of the distribution networks (through concession contracts whereby municipalities rent out their network to the TSO for two years).

However, there are also over 800 Distribution System Operators (DSOs), around 700 of which are municipally owned. Though the 'Big Four' have shares in some of these companies, this is made difficult by the Federal Cartel Office (i.e. competition watchdog) (Bayer, 2015). Further, while few of these suppliers have national coverage, the average household in 2012 was could still choose from 72 energy suppliers (EC, 2014b).

It is estimated that between energy market liberalisation in 1998 and 2014, between 40 and 50 per cent of energy consumers switched supplier (Uwer & Zimmer, 2014). While this number is relatively modest compared to the number of suppliers available, it should be noted that this does not mean customers were dissatisfied. For example, in 2013, in both the electricity and gas sectors, Germany's customer service satisfaction was higher than in the UK (IPA Advisory, 2015), with the second lowest incidence of complaints in the EU (EC, 2014b).

Initiatives for engaging consumers

In Germany there is a distinction between 'warm' and 'cold' rent. With the former, services like heat and electricity can be bundled together with other utility services such as water and waste management (How to Germany, 2017). With cold rent, these generally have to be negotiated separately to the rent (Settle in Berlin, 2013).

In this sense, the bundling of energy services with other utilities risks creating a disincentive for customers to engage with their energy bills. This is particularly true given the long-term energy contracts that can be offered to consumers.

However, in contrast to this more rigid market, the proliferation of renewable energy at local level has turned many households into energy generators. In turn, this is starting to make consumers more actively engaged in their energy usage at a community aggregation level. For example, over 100 'bio-energy villages' have developed since the start of the *Energiewende* that develop their own heat and power (Accenture, 2013).

Smart meter uptake

As of this year, smart meters will be mandated only for large-scale consumers using more than 10,000kWh per year, due to cost-benefit concerns of a full rollout. This threshold will be lowered to those consuming 6,000kWh in 2020, accounting for 15 per cent of electricity consumers. While consumers will still have the option to purchase smart meters, the majority of consumers will not be obligated to have them (Kelly, 2017).

Lessons for the UK

The retail energy market in Germany is in a state of transition. In the current model, compared to the UK, many customers are switching relatively frequently with a relatively high level of customer service satisfaction in both gas and electricity. This is somewhat counteracted by a long-term, secure rental market with accompanying long-energy contracts, from which it can be difficult to switch.

However, in the emerging model, the increasing penetration of distributed renewable energy, particularly solar PV, has the opportunity to create more engaged consumers, with community energy schemes becoming increasingly common. This has also had the effect of diminishing the market share of Germany's 'Big Four' energy suppliers (Bayer, 2015). On the other hand, the smart meter rollout, which could be important in increasing levels of engagement, has not been rolled for the majority of consumers due to cost-benefit ratio concerns.

To some extent, the UK and Germany are heading in similar directions in terms of greater consumer engagement but with a more limited smart meter rollout in Germany. For the UK, this does not mean that the smart meter rollout should be stopped. Rather, the German retail market suggests a warning that if the UK is going to expand the penetration of renewable generation at the distribution level, it will likely need to ensure that smart meter specifications can accommodate the added complexity from balancing intermittency.

It is important to note that, currently, distributed renewables in the UK are at a lower level than in Germany making this concern less pressing. However, as this market grows it will be important for the UK to decide on the extent to which it wants to encourage customers to take a more active role in energy management or to leave this to a third-party aggregator. From the German experience to date, community level aggregation and a high number of local suppliers represents an emerging model upon which the UK could build.

SWEDEN

Overview of energy market

The retail gas market in Sweden is small compared to the rest of Europe. In the whole of West Sweden, the market supplies only around 41,000 customers – most of which are large industries and power plants – and only 65,300 domestic customers in Stockholm (Ei, 2016). This is because more than half of the heating market is serviced by district heating with over 20 per cent supplied by heat pumps (Skoldberg & Rydén, 2014).

In the Swedish electricity market there were 122 electricity suppliers as of 2015 (Ei, 2016) with the largest three controlling 44 per cent of the market share, including the state-owned Vattenfall (EC, 2014c). However, many of these suppliers are comprised of local or municipal suppliers who operate in a limited number of areas. Of these suppliers, only 68 operated in all four bidding areas for electricity contracts in Sweden (Ei, 2016).

Government control

The level of government control in Sweden is similar to that in the UK. While the transmission system is state-owned and operated by Svenska kraftnät (SvK), it is monitored by an overarching energy regulator, the Energy Markets Inspectorate (Ei). Ei also regulates and monitors the privately-owned distribution networks across Sweden and monitors the behaviour of the deregulated wholesale and retail markets (Ei, 2016).

Consumer switching levels

Sweden has some of the highest levels of consumer switching in Europe with around 10 per cent switching electricity supplier in 2015, a trend that has been consistent over the past six years (Ei, 2016). In addition, customer service satisfaction for the Swedish electricity market was among the highest in Europe (IPA Advisory, 2015).

To some extent, this satisfaction is difficult to quantify. In particular, while the electricity market may have high satisfaction level and high levels of switching, the heat networks supplying district heating frequently lend themselves to a natural monopoly, leaving consumers with no alternative to which they can switch (Emden, Aldridge, & Orme, 2017). In this regard, customer satisfaction may not necessarily be an indicator of greater switching habits.

Furthermore, there is an extent to which greater switching is not always a clear indicator of greater market competition. In particular, despite high switching rates, the comparability of offers between Sweden's suppliers has been described as poor (EC, 2014c). In this sense, it appears that there are relatively few disruptive new market entrants to the energy system in Sweden, despite a high propensity for switching.

Initiatives for engaging consumers

While Swedish regulator, Ei, established a price comparison website for electricity suppliers in 2008 (EC, 2014c), one does not exist for gas suppliers, in part due to the low market penetration of gas networks.

Smart meter uptake

Since 2009, an obligation by the Swedish government to provide monthly meter readings to households and hourly readings to industry has resulted in a full rollout of smart meters for electricity (EC, 2014c), the first country in Europe to achieve this. Since 2012, in order to encourage existing and future demand response services, DSOs in Sweden are required to provide hourly meter readings to any domestic customer requesting them.

Lessons for the UK

Sweden has a similar market structure to the UK but, in terms of customer switching, number of suppliers and smart meter rollout, is a more advanced market. While difficult to prove, it is likely that the levels of switching, and the availability of hourly data (if requested) are related, as consumers can make more informed decisions about the cost of their energy. For example, Ei reports that the fastest-growing tariffs sought by consumers were variable price contracts (Ei, 2016). With a greater number of suppliers entering the market and an emerging smart meter rollout in the UK, Sweden presents a positive template for what could be achieved.

Though this comparison has focused on the electricity market, the heat market, supplied largely by district heating and heat pumps, also suggests a future trajectory for the UK. District heating contracts in particular tend to be long-term

fixed-price contracts that are not well-suited to a liquid, competitive market (Bouw, 2017). Such considerations will be important when designing market regulation in the UK for these technologies in future.

FRANCE

Overview of energy market

The French energy market for both electricity and gas is dominated by single market players within a fully vertically integrated, regulated market structure. In the 2014 electricity market, the largely state-owned EDF accounted for 91.5 per cent of power generation, 100 per cent of the transmission network (through subsidiary RTE), 95 per cent of the distribution network and around 92 per cent of the retail market (EC, 2014). For gas, 85 per cent of gas was imported in 2013, two companies controlled the gas networks and Engie (which rebranded in 2015 and was previously GDF Suez) supplied 77 per cent of all domestic and 50 per cent of non-domestic gas (EC, 2014).

France has set a target to achieve 23 per cent final renewable energy consumption by 2023, which will precipitate a partial phase-out of some of its nuclear fleet (Steel, 2016). This will be challenging given that, in 2013, nuclear power accounted for around 75 per cent of all electricity generation, a technology that does not inherently support any customer engagement activities since it provides baseload power rather than intermittent generation which tends to require more flexible demand-side activities (OECD, 2016).

Government control

Though EDF is by far the largest electricity supplier in France, prices are regulated by the government to the extent that the company actually makes a loss on its domestic operations (French-Property, 2016). In addition, though Engie supplied 77 per cent of the domestic retail gas market in 2014, their gas prices are also similarly regulated (EC, 2014).

Consumer switching levels

Though it is possible to switch to alternative suppliers that offer market-based tariffs (French-Property, 2007), at the end of 2013, 92 per cent of all domestic customers remained on regulated tariffs (EC, 2014). Switching rates are consequently low in the electricity market. There is limited awareness of alternatives due to no systemic information provision on the differences and ability to switch between regulated and market prices (IEA, 2017).

Though an EU State Aid competition case forced France to phase out its regulated tariffs in both the electricity and gas markets for large and medium-sized non-residential customers, in March 2016, 90 per cent of residential/domestic customers remained on regulated tariffs in the electricity market. Despite plans to phase out regulated pricing in favour of market tariffs, these plans are controversial and have not yet been set out fully by the French government (IEA, 2017).

In the gas market, though historic supplier Engie still retains a large market share of customers, if the 11 alternative suppliers are measured by volume of gas supplied to the residential sector, their market share jumps to 58 per cent (IEA, 2017). However, this share is based on regulated pricing which still dominates the market.

Initiatives for engaging consumers

Though switching is limited, in the retail electricity market EDF offers three tariff options with various degrees of engagement from consumers required:

- the *Base* rate is a fixed rate
- the *Creuse* offers cheaper electricity during night-time off-peak
- the *Tempo* is a hybrid between time-of-use and the off-peak tariff, where the next day's tariff rate is published daily at 3pm (Norris, 2016).

Smart meter uptake

France has a smart meter rollout to be completed by 2021, in large part to develop more dynamic pricing options for tariffs. However, this decision has been taken more slowly than in some other European countries due to inertia from EDF, which will be one of the main energy companies driving the rollout (IEA, 2017).

Lessons for the UK

Of the countries compared in this paper, France is perhaps the most different energy market from the UK, insofar as it is dominated by a single state-owned company in the electricity market and a very small number of market players in the gas market. Options for switching are very limited due to a regulated and highly state-influenced retail market.

Furthermore, despite this regulation, both gas and electricity prices in the retail market were higher in France than in the UK in 2016 (Eurostat, 2017) (Eurostat, 2017b). While the gas market in France is starting to develop more competition, the energy market as a whole has yet to fully deregulate, and proposals for doing so remain controversial.

At the same time, even within this regulated market, tariff options like the Tempo rate could be applicable to the UK market, particularly for those more engaged consumers. Necessarily, the functionality of this type of tariff would be improved by smart meters and would therefore require greater penetration of this technology before being introduced at a large-scale. When thinking about future demand-side energy management, for more engaged energy consumers, this type of dynamic pricing could be an attractive alternative to third-party management of demand.

US (CALIFORNIA)

Overview of energy market

The Californian electricity market has a very different structure to the UK but is similar in both population size and renewable and emissions targets. In particular, California has a 33 per cent renewable electricity sales target for 2020 (CPUC, 2015) (similar to the amount required within the UK's EU 15 per cent renewable energy target (DECC, 2010)) and also an 80 per cent emissions reduction target on 1990 levels for 2050 (California Energy Commission, 2015).

However, unlike in the UK, California's electricity market is totally vertically integrated, with the exception of generation, where much of the power is supplied by independent generators. Within this structure, three Investor-Owned Utilities (IOUs) have traditionally dominated the market (Cook, 2013). However, this model is starting to be challenged by Community Choice Aggregators (CCAs) – entities created by cities or counties – that are supplying electricity outside this integrated market structure (St. John, 2017).

For the heating market – due to California's mild temperatures – heating generally makes up a small proportion (27 per cent compared to a 41 per cent US average) of a typical consumers' energy bill, with 14 per cent of homes in California having

no form of heating (EIA, 2009). As such, most of the lessons drawn from this comparison will focus on electricity.

Government control

Due to the vertical integration and domination of the market by California's 'big three' IOUs, the transmission, distribution and retail parts of the market are tightly controlled by the California Public Utilities Commission (CPUC). However, this level of control has allowed for more strategic planning on the future of the energy system (CPUC, 2017). As will be shown below, this is particularly true for the role the state envisages for consumers engaging with their energy bills.

At the same time the CPUC risks a retail price death spiral with utilities losing market share due to new market entrants like CCAs that are not vertically integrated. Under the current regulation, IOUs recover the costs of vast borrowing through volumetric ($/kWh) electricity sales. With greater numbers of customers 'defecting' to CCAs that do not have to recover costs from borrowing for large infrastructure, there is a risk that IOUs will have to increase prices to recover the same costs from a smaller base of customers (St. John, 2017). With CCAs being considered for cities with populations in the millions (CPUC, 2017) and prices rising for IOU customers, this in turn will drive more consumers towards CCAs resulting in the whole state sleepwalking into a competitive market.

Consumer switching levels

Though California still allows large industrial customers to choose their energy suppliers, since the Enron crisis of 2001, which saw prices skyrocket under a deregulated market, consumer choice has largely been removed since that time (Morey & Kirsch, 2016). As mentioned above, the advent of entities like CCAs has started to create a more competitive retail market. However, it should be noted that this is happening despite the current market structure rather than as a planned action and the CPUC is currently refining its regulatory framework to accommodate for these new market entrants (CPUC, 2017).

Initiatives for engaging consumers

From California's overarching renewable and climate change policy objectives, one of the mechanisms for delivering on targets has been through increased consumer engagement. In particular, incentives for self-generation (the Self-Generation Incentive Program (SGIP) and net energy metering (Go Solar California, 2017) – that credits accounts with solar PV when sending electricity back to the grid – have enabled consumers to manage their own energy use. Since 2007, more than 550,00 households have installed solar panels and there has been greater uptake of technologies like lithium ion battery storage through the SGIP (CPUC, 2017).

Smart meter uptake

California has a smart meter rollout planned for its 60 million customers by 2020, with more than 8 million currently in place. From a consumer perspective, the CPUC envisages that smart meters will enable a greater range of pricing options – in particular variable time-based rates – as well as a wider move towards a Smart Grid that provides greater flexibility (CPUC, 2017b). This is of course predicated on greater engagement from consumers in the first place but, with the increasing proliferation of domestic-level PV, this is increasingly becoming the case.

Lessons for the UK

In many ways, the Californian energy market represents an alternative timeline for the UK. In 2001, just as the UK was dissolving the government-run Central

Electricity Generating Board (CEGB) in a move towards a liberalised market (National Archives, 2001), the deregulated Californian market was backfiring with the Enron crisis, which saw electricity prices skyrocket (Ledgerwood & Taylor, 2016).

Jumping forward to 2017 and the markets are again beginning to shift. The now liberalised UK market is facing questions from its Competition & Market Authority over competitiveness of bills for consumers (CMA, 2016) just as California is seeing increased competition in its retail market due to new entrants like CCAs and Direct Access Providers (CPUC, 2017).

This does not mean that California's energy market is incomparable with the UK. Both regions have similar or the same low carbon policy targets, a smart meter rollout, and are both seeing increased challenges to incumbent energy suppliers that could generate greater competition in the retail market.

However, the UK could also learn from California in ways that are not limited by differences in market structure. In particular, though greater consumer choice between suppliers is only starting to re-emerge in California, greater consumer engagement in energy usage and consumer choice of tariff types is growing, through domestic solar and smart metering respectively.

AUSTRALIA

Overview of energy market

The Australian energy market is vertically integrated between generation and supply, with three companies servicing 70 per cent of small electricity customers and 80 per cent of small gas customers. However, this market share is decreasing with a number of 'second tier' retailers starting to emerge (AEMC, 2017).

The Australian energy market is currently undergoing a supply crisis with retail electricity prices increasing in 2016 in all jurisdictions apart from Victoria. This is caused, in part, by plant closures coupled with increases in wholesale gas prices (AER, 2017), but can also be explained by increasing penetration of renewable generation under Australia's large-scale renewable energy target (LRET). In particular, old generation plants cannot complete with LRET-incentivised generation resulting in closure, reduced capacity and increased costs as a consequence. As this trend continues, there is a risk that incumbent suppliers either exit the market or vertically integrate and thereby increase market concentration and decrease competition (AEMC, 2017).

It should also be stressed that, while three energy companies dominate the market, consumer behaviour and retail energy pricing can vary greatly between jurisdictions, as will be shown below (Oxera, 2016).

In November 2016 the Victorian Government announced an independent review of the electricity and gas retail markets in Victoria, we expect that report to be published as we go to print.

Government control

The AER runs an energy price comparison website for domestic and small business customers. In some jurisdictions, the price of standing offers – the default tariff for consumers who are disengaged from the market – are regulated, as these can often be more expensive than market rates (AER, 2017). In other markets, like Victoria, all offers are completely deregulated.

Consumer switching levels

According to behavioural insights research conducted by Oxera, self-reported annual switching rates in Australia are 23 per cent for residential customers and

29 per cent for small businesses, substantially higher than any other country compared in this briefing paper. However, it is important to point out that switching rates vary greatly across jurisdictions with 27 per cent switching in electricity and 28 per cent in gas in Victoria in 2014 compared to 0 per cent in Tasmania. This can partly be attributed to variations in market size as well as the number of available suppliers, with 21 electricity suppliers in Victoria and only 2 in Tasmania (Oxera, 2016).

Despite this high level of switching for some jurisdictions, it is also important to note that 39 per cent of customers in Oxera's surveys had expressed interest in switching but were not investigating, with one third expressing no interest in switching at all. Furthermore, while initiatives like Energy Price Factsheets (Australian Government, 2017) may help with consumer awareness by regulating the display of information, many did not feel confident that they had the right information to switch to a different supplier with only 1 per cent aware of their state-specific independent Price Comparison Websites (Oxera, 2016).

Initiatives for engaging consumers

Among the emerging energy suppliers in the retail electricity market, some companies are starting to offer more innovative products and services, including domestic solar PV and battery storage, mobile phone energy management and aggregated distribution services. In some cases, these offerings are also being made by property developers and third parties rather than energy suppliers, with a view to selling lifestyle benefits attributed to their packages on top of just the energy itself (AEMC, 2017).

In particular, solar panels have generally been popular, with around 20 per cent of consumers in a 2017 research survey saying they have solar panels, with a further 18 per cent saying they would definitely or be likely to install them in the next two years. In addition, 21 per cent of consumers said they would definitely or be likely to adopt battery storage in the next two years (AEMC, 2017).

Smart meter uptake

With the exception of Victoria, there is no nationwide mandated rollout, though smart meters are being offered by some suppliers. However, with both Victoria's rollout, which was undertaken between 2009 and 2014 (Moore, 2015) and with the more piecemeal approach of suppliers across the countries, uptake of smart meters have encountered several problems and criticisms. For Victoria in particular, delays and lack of incentives for distributors saw costs increase by AUS$400 million, coupled with insufficient engagement and consultation with customers, engendering a lack of trust in the programme (Moore, 2015). More generally, concerns have been raised recently about the security and privacy of two-way smart meters that potentially risk being hacked (Centre for Internet Safety, 2017).

Lessons for the UK

Australia is currently in the midst of an energy crisis due to a perfect storm of higher wholesale costs, retiring generation capacity and disruptive renewables that are speeding up this process. At the same time, and possibly motivated by these trends, switching rates in Australia are very high in some jurisdictions (and for those with low switching rates this may be more due to small market size).

In particular, there is an appetite for solar PV, battery storage and new demand-side management services. While emerging suppliers are starting to offer these packages and disrupt the market in the process, technology uptake of smart meters that would improve the functionality of these offerings has been less

smooth. This appetite is not universal however, and it is important to note that many consumers still lack confidence to switch suppliers in the first place.

For the UK therefore, there are lessons of caution and opportunity to draw from the Australian energy market. Regarding the supply crisis, the UK government is keenly aware of the need to ensure security of supply as new renewable generation is installed meaning this is less likely to be an issue. However, it can learn from Australia by promoting domestic energy solutions that include innovative energy management solutions, solar PV and battery storage. For technologies like smart meters, it will also be crucial to maintain and increase customer engagement in order to ensure trust in the nationwide rollout, particularly as many UK customers are similarly lacking in confidence that they have enough information on the energy market. Through this learning, it may be possible to achieve greater switching levels as parts of the Australian energy market have. Though it is likely that this switching is partly driven by the current price crisis, it is worth noting that the innovative products being provided by new suppliers offers consumers somewhere to switch to in the first place.

KEY FINDINGS

The retail energy markets of the countries compared in this briefing paper are at various stages of competitiveness, which in turn impacts on consumer choice of energy suppliers. In France and the US (California) for example, previously regulated markets with low levels of switching are starting to attract new market entrants. By contrast, Germany and Sweden have relatively high numbers of customers switching suppliers.

At the same time, greater switching does not necessarily imply greater competition. In Australia for example, despite high switching levels, the 'big three' energy companies are still dominant and prices are rising. Furthermore, as in Sweden, high switching does not necessarily mean the prices offered by new suppliers are significantly better.

For the UK then, an overarching message should be that, while greater numbers of energy suppliers can increase levels of switching, it is important to ensure that the markets within which they operate do in fact provide a range of competitive deals. One of the key ways of achieving this – from which the UK certainly can learn from other countries – is through greater consumer engagement. In particular, based on the analysis in this paper, the following examples could be well-suited to the retail energy market.

TABLE 2

Suggestion for UK	Country of Origin	Rationale	Implementation
Net energy metering	US (California)	Net energy metering provides a way for consumers to engage in energy produced from rooftop PV and reduce bills to zero	Consultation from Ofgem on technical feasibility of including net energy metering in current smart meter rollout
Increased domestic PV incentives	California; Germany; Australia	PV is an inherently local energy source with consumers in some countries preferring suppliers that can provide them	Could require raised feed-in tariffs for solar or net energy metering combined with other financing options for PV purchases (e.g. low-cost loans)
Time-of-use tariffs	France	As smart meter tariffs are rolled out, time-of-use tariffs provide consumers with the opportunity to take advantage of periods of low demand	Consultation from Ofgem with energy suppliers, including discussion
Community-level aggregators	California; Australia	As an alternative to time-of-use tariffs, consumers could delegate responsibility of finding cheaper deals to third parties	PCWs could start to provide and explain the function of these Third-Party Intermediaries (TPI) to consumers more frequently
Personal management solutions (e.g. apps, smart appliances)	Australia; Sweden	Could improve individual energy management and provide a selling point for new energy suppliers providing these solutions	PCWs could highlight these solutions as 'perks' or 'key features' during searches for energy deals
Ofgem to hold AND publicise all tariff deals	Sweden	Providing equal access to information to all consumers	Ofgem would have to ensure that they have timely access to all deals from all energy suppliers

Source: IPPR

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