

How could we buy energy in the smart future?

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Foreword

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Our energy system is undergoing a transformation thanks to smart technology.

The installation of smart gas and electricity meters in homes and small business is creating a platform from which innovation can take place in the way we all pay for and use our energy.

In this paper Dr Jeffrey Hardy sets out his thoughts on three new models by which British consumers might be able to buy their gas and electricity in the future.

This is a welcome contribution as it illustrates the huge increase in choices to be offered to consumers, some, as Dr Hardy suggests, as yet unimagined. From established brands to newer market entrants, smart technology is bringing more opportunity for innovation than ever and creating a catalyst to greater consumer empowerment and engagement.

Whatever develops as a result of the digital revolution taking place, further innovation is the greatest certainty.



Sacha Deshmukh
Chief Executive



Introduction



Dr Jeffrey Hardy

Our energy system, the thing that keeps us warm, fed, entertained, mobile and productive, is undergoing a quiet revolution. It's becoming cleaner and smarter. In the last three months of 2016 half our electricity came from low-carbon sources, such as wind, solar and nuclear power¹. Electric vehicles are becoming a norm rather than a curiosity. Smart devices are permeating all aspects of our lives - the other day I saw an advert for an internet connected hairbrush! In the future, our energy will be clean, smart and more bespoke to our lifestyles.

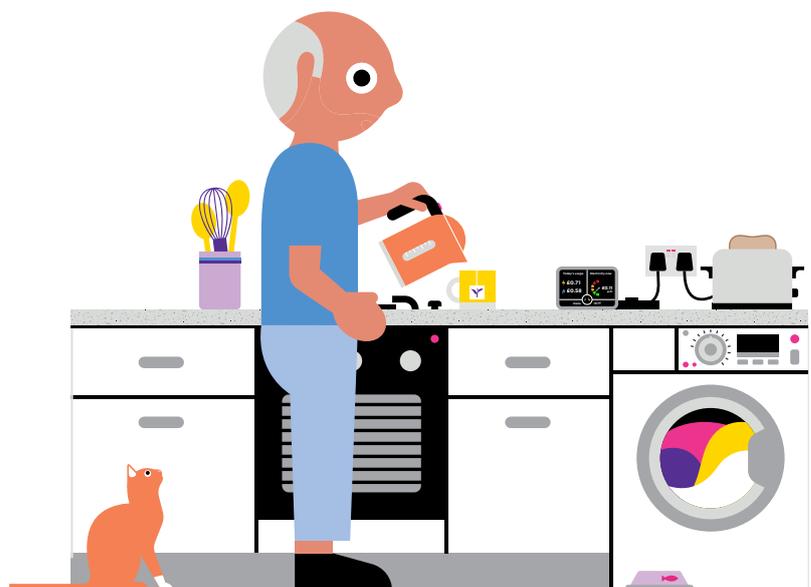
At the vanguard of this quiet revolution is the humble smart meter. The government told energy suppliers to install smart meters in 26 million homes in England, Wales and Scotland by 2020. Why? First, it empowers us all to take control of our energy use. Second, alongside other enablers, data from smart meters creates the opportunity to run our energy system in a smarter, more efficient and secure way. The National Infrastructure Commission thinks a smart power system could save consumers up to £8 billion a year by 2030².

Why such a big number? The main reason is that an energy system is most efficient when those who use energy do so when it is available, like when the sun is shining or the wind blowing. A smart energy system helps us do this by telling us, often via price, when it's a good time to use energy.

A smart energy system is a big opportunity for existing and new businesses. Today, our relationship with an energy supplier is simple

- we pay a price for each unit of electricity or gas we consume. The exception is time of use tariffs, like economy 7 or 10, where the price changes depending on the time of day. In the future, our relationship with energy businesses could be rather different.

In this essay, I'll examine three future energy business models³ that could emerge in a smart energy system. I'll explore what this means for consumers and how it could impact the energy system. I assume that these business models will be able to access smart meter data, as this is a key enabler. What I won't be exploring whether these models are possible within current market rules. That would take all the fun out of the exercise.



1 <https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes>

2 <https://www.gov.uk/government/publications/smart-power-a-national-infrastructure-commission-report>

3 A plan for the successful operation of a business, identifying sources of revenue, the intended customer base, products, and details of financing.

Peer-to-peer energy

What is it?

P2P customers directly buy, sell or swap electricity with each other. Accurate generation and consumption data, such as that from smart meters, is crucial to the model. This approach is increasingly common in other sectors, such as finance (e.g. Zopa) and accommodation (e.g. AirBnB).

An example of P2P energy is new Australian company called Power Ledger⁴, which is conducting a trial to allow customers with photovoltaic panels on their roofs to directly sell, at a price they set, their surplus energy to other local customers. No retailer is involved. They are using blockchain, which is a secure distributed database, to track the energy and financial transactions. Other examples are P2 Power⁵, based in New Zealand and sonnen⁶, based in Germany.

What does it mean for consumers?

P2P customers are directly engaged in the energy market. It could create new revenue for those with microgeneration technologies, such as photovoltaic panels. For those buying on the P2P market, it's an opportunity to buy power cheaper. It could encourage investment in home battery systems so that customers can buy and store energy when cheap and sell or use when expensive. In the absence of a clever intermediary to help customers, the P2P marketplace could be complicated, meaning those who understand it could benefit more.

What does it mean for the energy system?

It depends on the degree of penetration of P2P energy. If it remains niche, in that customers get most of their energy from a traditional supplier, with a bit on the side via P2P, then the energy system implications are minimal. At the other extreme, where P2P dominates the energy market, then it could drive massive rollout of microgeneration, battery and other technologies. It could signal the end to the traditional energy supplier model. It could cause our electricity system to reconfigure towards one that where most electricity is generated and distributed locally.

⁴ <https://powerledger.io/>

⁵ <https://p2power.co.nz/>

⁶ <https://www.sonnen-batterie.com/en-us/start>

Energy Service Company

What is it?

An ESCo delivers energy services to customers, such as comfort and illumination, rather than units of energy like a traditional supplier. A customer-ESCo relationship is usually long-term. The ESCo guarantees a saving in the customer's energy bill. It achieves this by installing energy efficiency measures, home energy management systems (HEMS) and other energy technologies at the customer's home. The customer pays the ESCo back out of the money they save on their energy bills. Thus, ESCos make no money unless the customer saves. Access to smart meter data gives the ESCo insight into customer energy use, allowing optimisation of home energy performance. This might include the ESCo controlling certain devices in homes, like fridges.

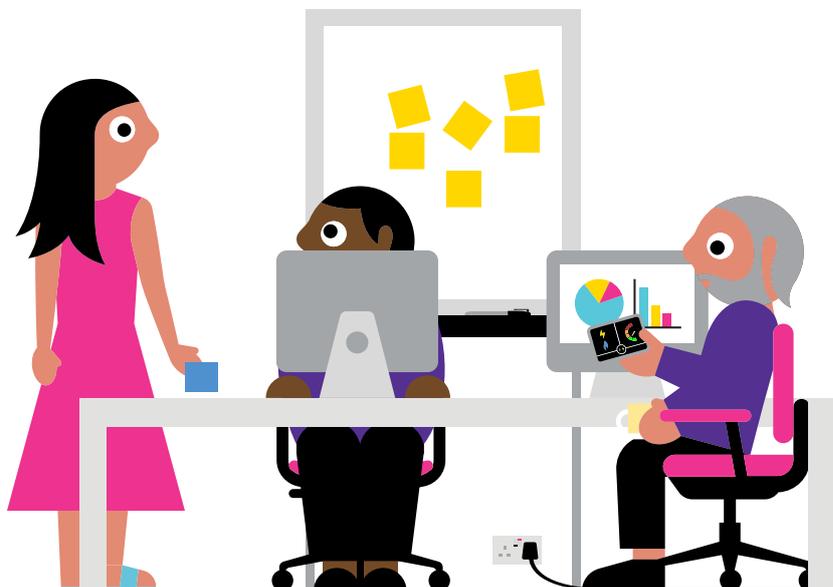
Whilst there are few ESCos serving domestic customers today, there are many serving industrial and commercial businesses. Germany and the United States both have well developed public and private sector markets, with hundreds of firms operating. Siemens⁷, Ameresco⁸ and E.ON⁹ are examples of companies operating in these markets.

What does it mean for consumers?

It entails a different customer-supplier relationship, which could take some getting used to. The customer would be paying for energy services rather than per unit of energy consumed. It also requires a longer-term contract than is typical today, to pay back the kit, like insulation and HEMS, that the ESCo installs in homes. The relationship could be bespoke to the customers' needs and situation, perhaps feeling more personal than the current relationship with energy companies.

What does it mean for the energy system?

ESCos could drive energy efficiency improvements in homes, reducing energy demand. They could drive rollout of home energy management systems, microgeneration technologies and energy storage (such as hot water tanks and batteries). ESCo could encourage or even control customer energy demand to avoid times when energy is expensive – this could make the energy system more flexible.



7 <http://www.ameresco.com/>

8 <http://www.ameresco.com/>

9 <http://www.eon.com/en/business-areas/renewable-energy-source/energy-services/service-scope-in-europe.html>

Third party control

What is it?

Here a customer grants power of attorney to a third party, such as a price comparison website, to take decisions on their behalf, like automatically switching energy supplier. This relationship could be across multiple aspects of lifestyle, including energy, broadband, landline and mobile phones and entertainment, such as TV package. Over time, informed by lifestyle data, such as that from smart meters, the third party could offer new services to customers. For example, they could offer to insulate your home because data shows it to be less efficient than similar properties.

An example of an existing automatic switching service is Savawatt¹⁰ in New Zealand, who claim “We take the hassle out of finding and switching you to a better power plan”. Savawatt switch customers as often as every six months, if there is a sufficient saving available.

What does it mean for consumers?

It could increase consumer engagement in energy, and other markets, driving competition amongst suppliers, leading to lower bills. Depending on how deep the customer-third party relationship becomes, there could be other effects. The relationship could be like that of an ESCo, described previously, where measures such as energy efficiency or energy generation and storage technologies are installed by the third party and paid back by the customer over time. Additionally, the third party could drive the rollout of smart home technologies such as home energy management systems, internet connected devices and possibly mobility services, such as car sharing or autonomous vehicles.

What does it mean for the energy system?

Third parties could increase consumer engagement in energy and other markets, driving competition leading to lower bills. Depending on how the business model evolved, it could have similar energy system impacts to ESCos. In addition, it could also drive the uptake of smart home technologies and flexible mobility solutions. Combining these together, the third party could offer a range of services to control customer energy demand to avoid times when energy is expensive – this could make the energy system more flexible.



¹⁰ <http://saveawatt.co.nz/>

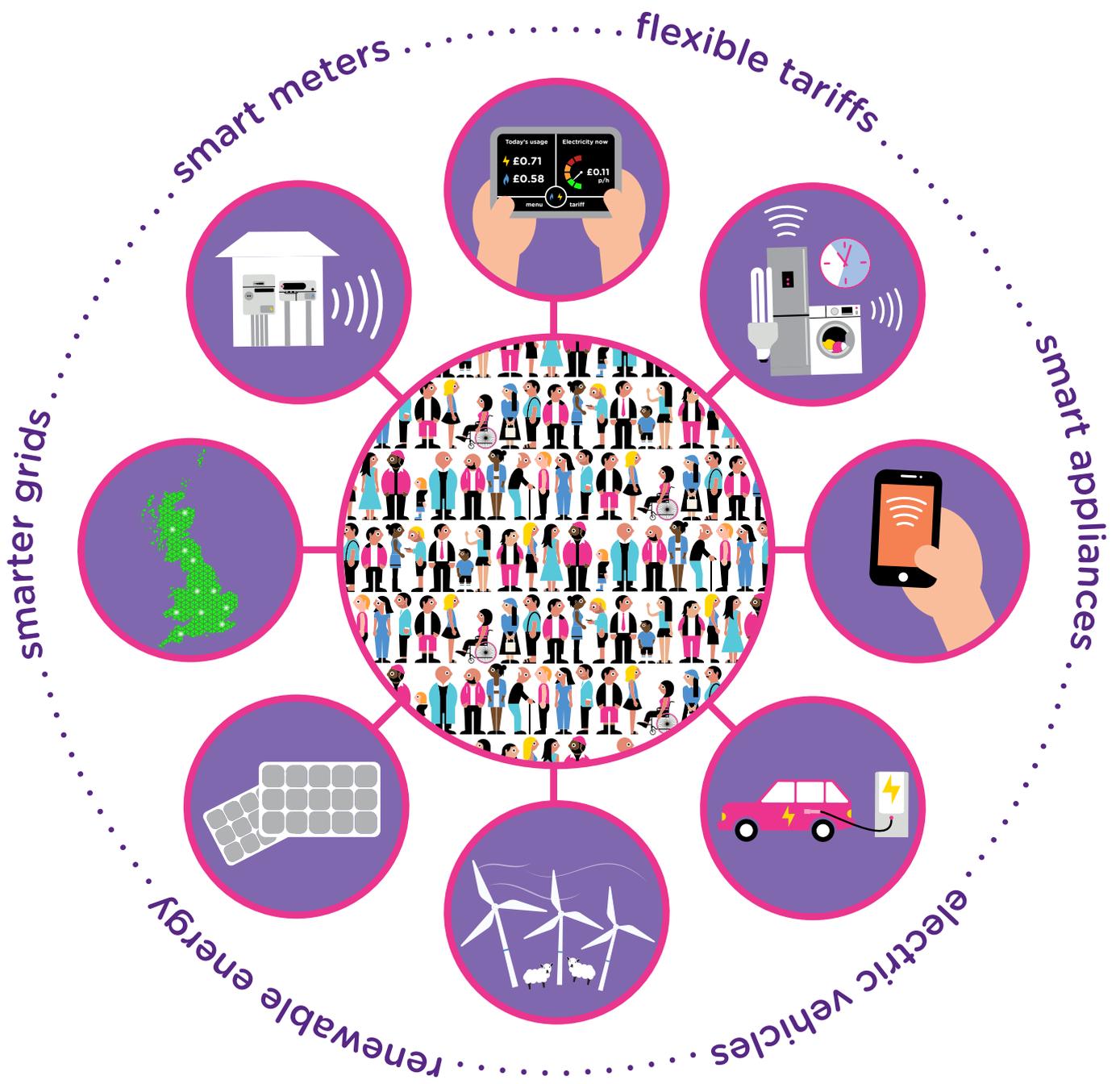
Conclusion

The problem with predicting the future is that you are inevitably wrong. Whilst we might not see exactly these sorts of businesses enter the market, the opportunity of smart meter data and emerging smart technologies creates favourable conditions for innovative approaches to energy supply.

When could these innovative approaches come to market? The seeds of many of these are already planted. For example, P2P and the automatic switching element of third Party Control are being trialled or are already in the market in Australia (Power Ledger) and New Zealand (Savawatt) respectively. As for ESCos, there is already a market for these services in the public and private sectors. A key enabler for all these models is access to good energy data and as such the smart meter rollout is a key step. As this rollout progresses over the next few years we could see more innovative businesses entering the market.

How engaged will consumers be in the future? The possibilities for greater engagement with a smarter energy system are considerable. How consumers choose to engage is up to them – in a smarter system, it is likely that someone will offer a service bespoke to your needs. Some might choose to take back control of their energy, acting as hands-on energy traders through P2P platforms. Others might want to build a long-term relationship with an ESCo, maximising important things, like personal comfort. Others might ask a third party company to engage on their behalf to avoid hassle and free up precious time.

Whatever happens, it is clear to me that our future relationship with energy is likely to be smarter, more personal and maybe even exciting.





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To find out more about smart meters please visit
smartenergyGB.org