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Introduction

The Internet of Things is beginning to transform the Energy and Utilities sector, with customers, employees and assets all becoming increasingly connected. In the first of our series, we take a look into how the Connected Customer will drive change in the industry, and what energy companies should do to respond.

The traditional energy company is under threat from its own customers. Connected technology, micro-generation and advances in energy storage are helping empower a customer base, which has traditionally been quick to complain but slow to take control both of their energy use and supply. In the short term these developments present opportunities for selling additional products and services to that customer-base, but success in the longer term will depend on energy companies adapting to this new world and making themselves relevant to the customer – disrupt or be disrupted!



Delivering the value of the Connected Home

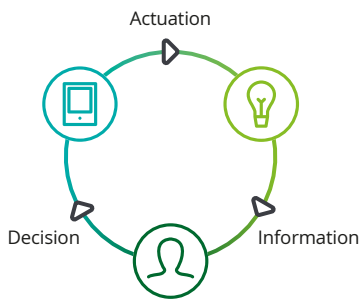
The Connected Home has started to take off in both consumers' minds and their living rooms. *The Deloitte Consumer Review: Switch on to the connected home* report suggests that 52 per cent of people own some form of connected device and 66 per cent agree that connected technology has the potential to transform their lives. Energy companies should be well placed to take advantage of this interest, given their central role in the home, and brands such as Hive and Nest have helped provide customers with an early, tangible example of how they could benefit from having connected devices in their home.

This interest, however, is yet to translate into serious market penetration. When you break down what technology people actually have in their home, the majority are entertainment devices, such as Smart TVs and games consoles. Our report above shows that connected thermostats, lighting and security, which have the potential to genuinely transform the way we live our lives, have a much lower penetration at 2-3 per cent.

So what's holding customers back? Cost is certainly a factor, but as is often the case, what's actually more important is the consumer's perception of value. Providers have yet to make a compelling case for consumers to invest. Beyond being able to control your lights or your thermostat from your phone, consumers aren't yet seeing the bigger picture – the promise of not just a connected home but an interconnected one, which delivers genuine value both by giving customers a single point of control and actually liberating them from that control by using the insight from multiple devices to drive intelligent automation.

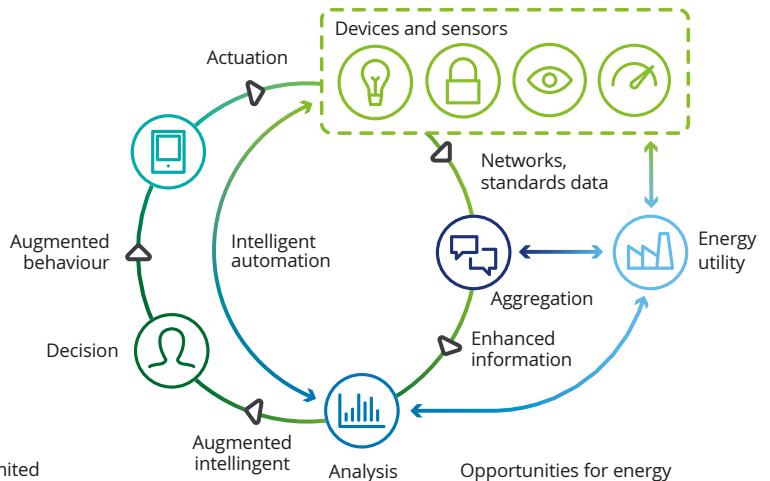
In practice this will mean different things to different people – from combining energy consumption and time of use data to make savings for the cost-conscious, to using motion sensors, connected lighting and alarm systems to provide security for a senior citizen and peace of mind for their relatives.

From basic remote control ...



The opportunity within this value chain is limited to connected homes customer management.

... to intelligent automation



Opportunities for energy utilities exist at every stage within this value chain

Source: Deloitte analysis

Energy companies are well placed to realise the true promise of the Connected Home and help move customers beyond basic remote control, but they need to be clear about where to play. Opportunities exist right across the value chain and each has different implications for the organisation. The most obvious opportunities relate to providing the technology itself and helping customers to get the best out of it:

- **Customer Management** – at the most basic level, selling, installing and supporting smart technology, such as thermostats and lighting, provides an incremental revenue stream to organisations increasingly under pressure on commodity margins. This is likely to be a relatively short-term strategy, however.
- **Home Service Management** – Delivering value to the customer depends on using the technology to its full potential. There are two key things that energy companies could do to help realise this:
 - *Acting as the integrator* – The Connected Home ecosystem is still very fragmented, with multiple organisations using divergent platforms for different technologies. Providing the software and apps to integrate devices and provide a single view helps energy companies start to ‘own the home’. There is likely to be competition in this space and virtual assistants such as Amazon Alexa and Google Home are starting to provide this point of integration.
 - *Providing insight and intelligent automation* – Combining information from connected devices with usage information gained through Smart meters and billing systems could provide energy companies with a unique advantage in the market. Energy companies could provide value and values-driven consumers with the insight they need to manage down their usage and also automate key parts of their lives, whether it’s turning off the lights or locking the door.

Organisations across sectors are all vying to ‘own the home’ and deliver home services. For many energy companies, a connected homes strategy is about building a broader, more lasting relationship with the customer, beyond that of commodity supplier. In spite of privatisation and the growth of competition, customers are still slow to move between suppliers. Government statistics show that in 2016, only 15 per cent of energy customers switched supplier¹ – the highest rate since 2010.

However, there are growing threats to this stability. OfGem have already introduced plans to share lists of customers on uncompetitive tariffs and as smart meters roll out, the data they provide could easily be used by competitors and new market entrants to analyse consumption and find the customer a better deal. Both of the major political parties have considered implementing caps on tariffs. Add to that a future where technology-enabled dynamic switching allows consumers to move suppliers within a day and the threat looks very real. Providing the customer with something beyond their energy is a good way of keeping your brand present in the customer’s home, even if they move their supply.

Consumers aren’t yet seeing the bigger picture – the promise of not just a connected home but an interconnected one, which delivers genuine value.

1. [<https://www.gov.uk/government/statistical-data-sets/quarterly-domestic-energy-switching-statistics>]

Distributed energy management – staying relevant in a changing world

If the Connected Home helps organisations remain relevant in today's world, what of the future?

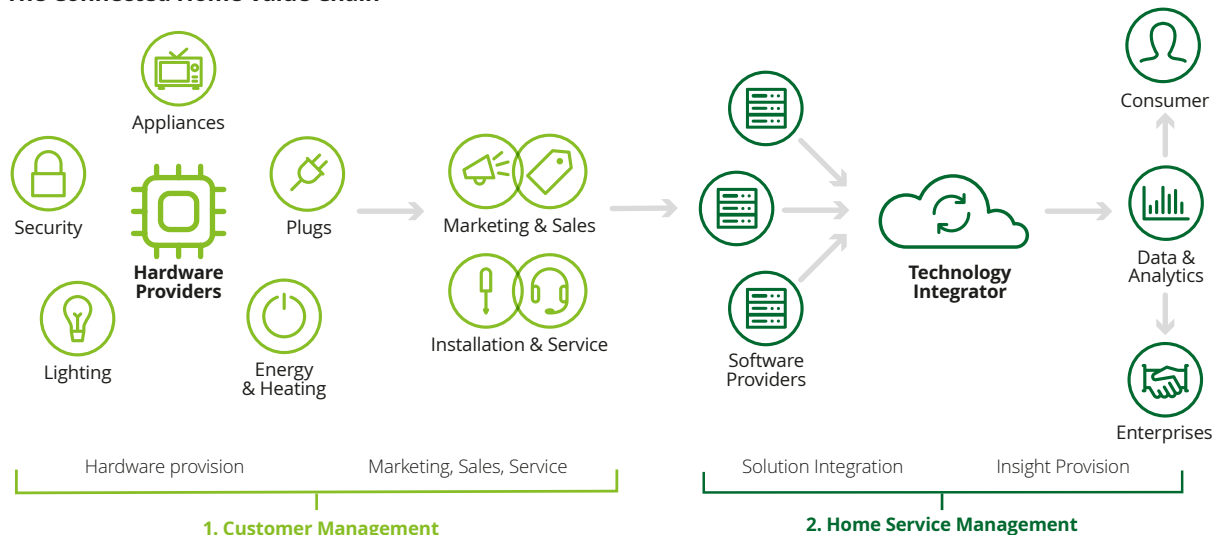
There are two big developments already in train, which could turn the energy industry on its head – micro-generation and storage. This has the potential to deliver a third and potentially more exciting opportunity for energy companies – Distributed Energy Management.

Improvements in roof top solar and other renewable technologies are bringing the dream of self-supply ever closer for the consumer. One of the main blockers to progress has been the ability to store the energy you create and use it at the right time – the sun generally shines when the homeowner is out at work, meaning that the energy you generate gets exported, while the energy you use in the mornings and evenings has to be purchased at higher, peak time prices. With recent changes to the feed-in tariff and renewable technology incentives, the business case for home owners to invest in micro-generation has become more tentative.

Battery storage has the potential to change that. Advances in technology means that companies like Tesla are now starting to sell batteries into the home, which can store energy during the day that the homeowner can use during peak time, presenting an opportunity for significant savings and, for some households, the potential to be off-grid for their regular consumption. The costs, even if they are beginning to fall, are still high. An installed battery and solar panels could cost the consumer in excess of £7,000, representing a significant upfront investment for the average household.

What could help make the case for investment in micro-generation is the potential that aggregating domestic batteries offers. While the existing feed-in tariff has already been cut, there are alternative potential sources of income emerging for micro-generators. As the intermittent renewables' share of the installed capacity increases, grids face significant challenges to balance supply and demand second-by-second, and there is a rapidly increasing need for faster response to more unpredictable and more frequent deviations from target frequency.

The Connected Home Value Chain



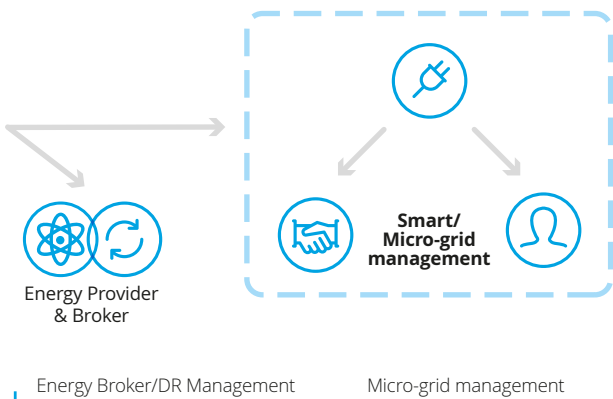
Source: Deloitte analysis

As batteries can provide such response in under a second, there is potential for householders to take advantage of the energy they generate and store. However, to participate in the balancing markets, generators need to be of a certain size (over 1MW for most services). Where an energy company can potentially help is in aggregating networks of batteries within people’s homes to provide a service to the grid and generate returns for the homeowner that would justify the upfront investment in solar PV, batteries and associated smart technologies.

If the future is one where domestic customers become micro-generators who sell excess energy back into the grid, the traditional energy retail business model is very likely to change. Today’s energy retailer’s core business is to buy energy from generation companies, sell it to customers and bill them for it. In the future, it might be the customers who are doing the selling to other customers who consume more than they generate - a business for example.

While the traditional ‘retail’ role might be under threat, given the energy company’s experience in trading, they are well placed to start acting on the customer’s behalf as an energy broker, helping them buy and sell in a dynamic and changing market. Few, if any, consumers want to be concerning themselves with tariff options and forward price curves and fewer still would relish exposure to trading risk. That highlights an opportunity for utility suppliers to redeploy their trading and hedging expertise to serve that underlying customer ambition to set and forget their utility provision.

Customers are already becoming more conscious of the energy they use, with environmental concerns and technology improvements such as Smart meters driving better energy efficiency. What micro-generation and trading does is to take this to the next step, where customers are conscious of the resource they have in their homes and their ability to not only save money but start to make it and the Connected Home will play a central role in helping them to manage that resource efficiently.



3. Distributed Energy Management

Developing the organisation to win in the new world

What then are the capabilities that energy companies need to build to operate in this new environment? Depending on what role you choose there are a number of capabilities which will help you deliver it – we focus here on four of the key ones:

Using service design to define your proposition

As we outlined earlier, the value proposition for the Connected Home isn't yet clear to the consumer. This may be in part due to the technology developing ahead of the customer's perceived need. Organisations need to take a step back from the technology and re-focus on customer journeys. Service design methods can help you do this, focussing on the customer and building a service around them rather than creating the technology and looking for someone to sell it to. A service design approach looks at the customer's fundamental wants, needs and challenges at each stage of their journey and designs a service that helps solve them.

Realising the data opportunity through analytics

The opportunity to deliver real value through connected technology lies beyond the technology itself and in the data that it delivers. Being able to do something impactful with that data depends on having the analytics capability to combine multiple sources of data. One approach often used is to Reveal, Enrich, Model. Reveal data on usage to both to your organisation and your customers using visualisation techniques, Enrich it with other sources of data, such as comparative benchmarks or even external factors such as the weather, and then Model scenarios using the insight you've gained – for example, would this customer want the heating and lights adjusted based on the expected weather?

Intelligent automation through cognitive computing

Having the data and insight is one thing, but doing something with it is something else. Moving beyond providing usage information and the ability to 'remote control' devices depends on cognitive computing capability. Machine learning will enable the Connected Home to make better decisions, taking into account the actions of the customer and their direct feedback.

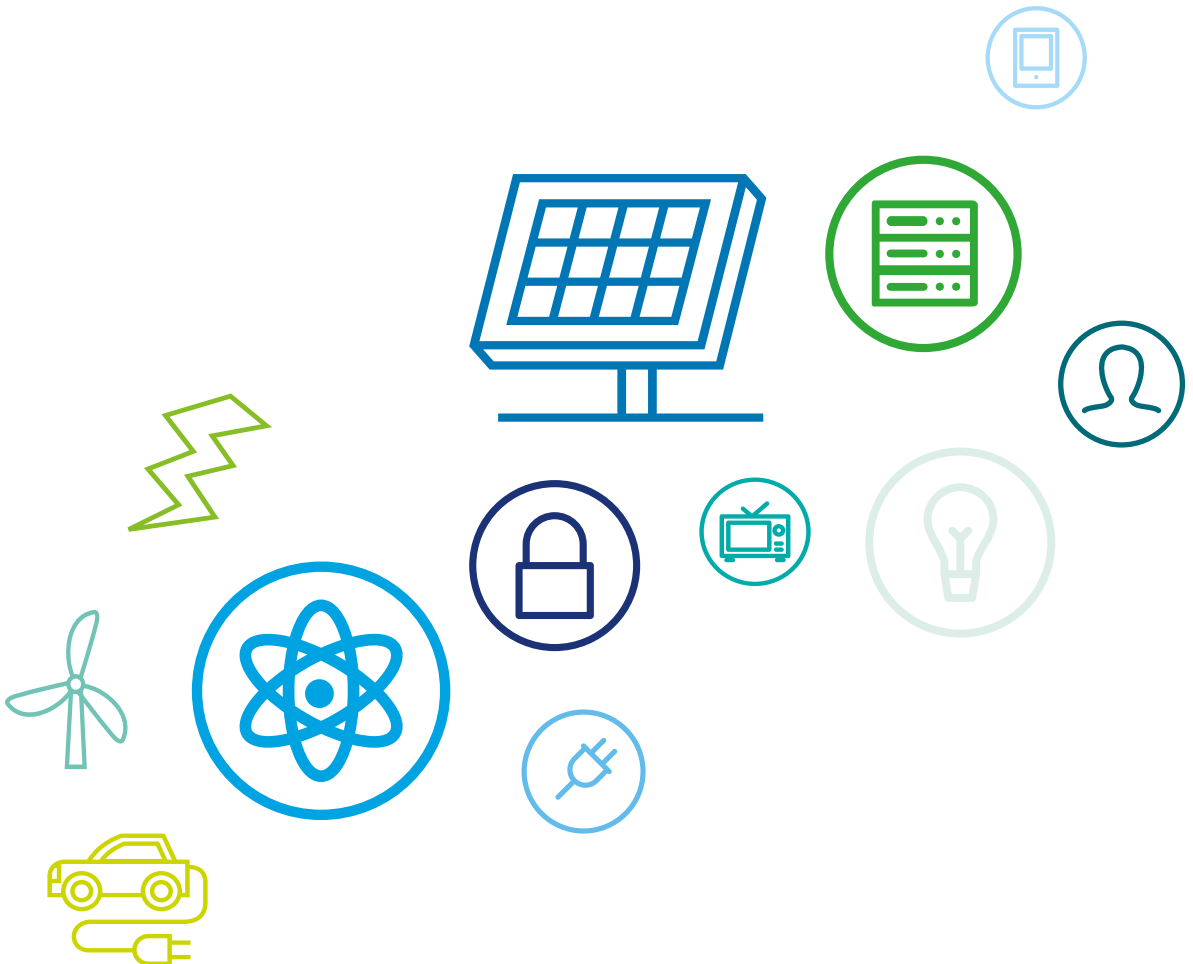
Enabling energy trading through Blockchain

Buying and selling energy across a wide network of micro-providers presents a major process and security hurdle. Blockchain technology provides a distributed platform through which digital tokens can be used to represent, transfer and exchange underlying assets securely using the strength of the shared network itself to validate the transaction and ultimately maintain a record of it securely. Where the traditional model requires a central organisation receiving and processing customer payments, a blockchain-enabled micro-grid of providers can trade with each other efficiently and securely, and energy companies could help to build that network and provide the technology to support it.



Building these capabilities will help set energy companies up for success; however they also need to build the right organisation and culture to deliver them, and this can often be even more challenging. Energy companies are not often thought of as innovators, but this is precisely what they need to become. Designing and delivering the opportunities that the Connected Home presents cannot be done by the traditional silos as they cut right across them, incorporating elements of retail, trading, wholesale and generation.

There are a number of different structures, which could apply. However, more fundamental to success will be a shift in culture, which for some in the sector will mean moving from being a risk-averse commodity supplier with a centralised, command and control structure to an agile, cross-functional innovative organisation.



Where next for energy companies?

Energy companies need to start to change now to be ready for a market that may be very different in the near future. The pace of technical change is growing exponentially and is highly likely to disrupt the industry, with new players and new business models coming into play. The Connected Home provides a stepping stone into this new world, helping energy companies to forge a new, more value-driven relationship with their customers. Every company needs to be able to answer the following questions:

The Connected Home provides a stepping stone into this new world, helping energy companies to forge a new, more value-driven relationship with their customers.



Contacts

Deloitte Digital's Energy and Resources team has worked with most of the UK's major energy and water companies. We understand the challenges these organisations face and are helping our clients address the changes they need to make, whether they are strategic, operational, cultural or technical. We can help you think through what the future may look like for your organisation and implement the people, process and technology changes needed to thrive in that future.

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