
Utility of the future

A customer-led shift in the electricity sector



*An Australian
context*

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As little as five years ago electricity was something that most people and, to a lesser extent businesses, took for granted and cared little about. In marketing terms electricity was a 'low involvement' product. Now that power prices are rising and climate change is widely accepted, almost everyone has a view on the energy sector and what it does well and, more importantly, what it doesn't. These views are many and varied – some customers are very loyal and will never change supplier for any service whether that is for energy or for banking whereas others are always searching for the best and cheapest deal. Others are looking for the best service and are prepared to pay a little more for this. On top of this consider the introduction of new technologies and new value chain participants that will assist customers to take control of their energy management and increasingly their power generation and energy storage. These customer and technology factors will shape the electricity market of the future. Utilities will need to respond to the changing needs of the market or risk losing relevance or even more drastically their right to survive. Those that respond will preserve or increase enterprise value, those that don't face a very bleak future and their own 'Kodak moment'. In the majority of cases there will be radical changes to business and operating models.

At PwC we contend that the utility of today is outdated and is struggling to meet the needs of its customers while maintaining acceptable returns to shareholders. The so-called 'death spiral'¹ is a prime example. Traditional large scale power utilities are losing relevance as customers take greater control of their own energy supply needs. To survive and prosper the 'utility of the future' will have to provide much more than reliable energy supply – it must respond to a diverse range of customer, business and community demands and do so in a rapidly changing regulatory and technological environment. The utility of the future is unlikely to control the value chain but will need to enable or facilitate customer energy solutions – they will become 'energy enablers'.

Five value drivers will be fundamental in the future utility market:

- 1** Customers are looking to take control over their energy supply and demand – they will look to manage their energy far more effectively than they can today.
- 2** Power generation and networks will be transformed – the energy value chain is currently subject to disruption, and this will accelerate over the next five years – those that innovate will protect and increase their value.
- 3** The role of the utility will transform into that of a service company that enables 'energy solutions' and in many cases 'home solutions' – this will require major transformation of business and operating models.
- 4** Data will play a dominant role in the future energy value chain – new value will be found within the data underlying customer energy usage patterns.
- 5** Governments and regulators will need to reshape energy and related services markets to keep pace with customer and 'energy enabler' needs.

¹ A number of commentators in Australia, Europe and the US have used this phrase to describe the falling consumption and increasing tariff dynamic.

This report

The customer wants a dependable service at a fair and reasonable price. Until recently, the customer has not always been front-of-mind for industry participants. However, recent forces and trends reveal the growing power of the customer in shaping the future of the industry. No single industry participant will be able to meet all the needs of this increasingly demanding customer. In developing a guiding strategy for the future of the industry, all links in the value chain must be examined to help better understand the role that they might play and the value at stake. Creative destruction based on changing customer behaviour and new technology has been the norm in most industries in recent times, and the same pattern has now become abundantly clear in the energy industry.

PwC work with our power & utility clients to help them with these types of challenges, transform their businesses, grow their revenues and reduce costs. We have helped utilities develop new strategies, build new operating models, new organisations and new ways of managing to create superior customer and investor value. It is this work which inspires our power and utilities team and drives us to deliver more innovation and more value for our clients.

This paper outlines what we have learned through this work and our research, and articulates how we believe the utilities industry will be transformed over the next 10 years. We will not provide a view on who will be the winners and losers, although we do expect that customers will ultimately benefit.








It has been many decades since the need for innovation has been so acute in the energy sector.

Recent and emerging trends

Figure 1 below summarises our view on the emerging global trends in the utility industry:

Figure 1: Global trends in the electricity industry. The foundation of the electricity marketplace is shifting with multiple global trends reshaping the power sector.

 <p>Transformation of the electricity sector</p>	<ul style="list-style-type: none"> • Decentralised power, technological changes and a different customer outlook are leading to a transformation of the electricity environment • Electricity utility companies need to adapt their business models to stay profitable and to succeed in the future • New services will emerge and new players will disrupt the existing value chain • Reduced demand in many developed economies
 <p>Disruptions to electricity supply channels</p>	<ul style="list-style-type: none"> • Distributed generation and disconnections from the grid via self-generation are a threat to the electricity utility business model • These technologies pose a threat to the centralised utility model but depend on technological developments and cost decreases • Changing fuel price relativities are radically altering utility company behaviour
 <p>Influence of technologies on the energy supply chain</p>	<ul style="list-style-type: none"> • Solar PV, electric vehicles, battery storage, energy efficiency, demand-side management and smart grid technology head the list of technological developments • New technologies have the potential to compare with utility-provided services and impact centralised power generation and networks
 <p>Impact of the new energy customer</p>	<ul style="list-style-type: none"> • Consumer preferences are changing to control energy supply, usage, service standards and costs • Customers are becoming more mobile and socially and digitally interconnected • Customers are dissatisfied with utility service levels and increasing prices. • Data analytics and agile strategy will become core competencies
 <p>Changing tasks and roles of regulators</p>	<ul style="list-style-type: none"> • Policy-makers have the difficult task of balancing supply availability, affordability, proximity and environmental impact • Wide-ranging reforms to market design/planning/governance framework • Changing approach to economic regulation and revenue setting

Source: PwC Analysis

Combine the global trends in Figure 1 with the following Australian trends and it is little wonder that customers are looking for more control over their energy supply. There is a heightened sense of change on the horizon, as indicated by:

- **Rising distribution costs** now represent 37% of the total household bill and will account for 81% of the continuing increases in household energy costs over the next four years.²
- **Demand for electricity** as reported by AEMO has fallen (5-7% CAGR since 2010), but the peak demand trend is more complex – in some states it has continued to increase, but more slowly.
- **Increasing distributed generation**, including solar PV (photovoltaic), which is now present on more than 1.2 million Australian homes and producing over 3.3GW per annum. However, while technological change and economies of scale have driven down costs, government has also reduced the financial incentives for household investment in PV. But the trend is still towards more distributed generation on the network.
- **Energy storage is rapidly becoming an economic option** in more than just niche applications. This factor alone has the potential to change one of the fundamental assumptions underlying power market and power system design: that electricity cannot be stored. As battery storage technology becomes more commercially viable, customers will be able to combine solar PV generation and storage, enabling them to offset usage during peak tariff periods rectifying the current asymmetry between solar generation and energy consumption patterns.
- **Customer churn continues** in those states where retailing is deregulated, and has regularly topped 20% per annum.
- **Industry consolidation and vertical integration** in the National Electricity Market (NEM): the competitive parts of the industry – generation and retail – continue to consolidate, and three vertically integrated players ('gentailers') dominate.
- **SMART meters** or Advanced Metering Infrastructure (AMI) are almost completely rolled out in Victoria, with other States likely to adopt a market or 'opt in' approach. This technology threatens to be a 'game changer' in the utility sector in Australia and across the globe as it has been in New Zealand, some parts of Canada and the US and a number of European countries. This technology facilitates greater control for consumers and utilities.
- **Time-of-use tariffs** have now been available to residential Victorian customers since September 2013 and are likely to be introduced in other States in the next 12-24 months.

² Australian Energy Market Commission, Electricity Price Trends Final Report, 2012-2015



Tomorrow's 'Energy Enabler'

The following table summarises the key differences between today's utilities and our view of tomorrow's energy enablers:

	Energy Enabler	Today's utility
Service orientation	Customer-centric	Mixed
Service offerings	Broad with multiple services bundled	Narrow
Retail pricing	Deregulated with bundled pricing/incentives in place – some will have moved on from time-of-use tariffs	Deregulated in some States and Territories with movements to time-of-use tariffs – very few bundles or incentives
Network pricing	Pricing of services/solutions in line with what customers value	Small fixed charges and majority volume based with no energy management incentives
Network Regulation	Highly intrusive	Moving towards intrusive
Innovation	Core value	Engineering/technically oriented
Agility and responsiveness	Proactive	Reactive
Value added services	High orientation	Low orientation
Ownership	Private sector	Mix public and private sector
Economic development	Community centric	Capital centric
Predominant business model	Ownership with increased use of joint ventures/strategic alliances	Ownership
Government policy	Bi-partisan supported model which facilitates competitive market for energy and related services	Mixed messages and lack of bi-partisan support
Community engagement	Holistic	Public Safety and Environment Protection oriented

Customer centricity will drive major changes

We expect customer centricity to be a major influence on the strategies of utilities and indirectly on market structures. We anticipate industry structure shifts will occur. We expect to see business and operating model changes within utilities. We envisage a true battle for the energy ‘wallet’ across the value chain.

There are economic drivers for both network businesses and retailers to develop highly customer centric businesses and to ‘compete’ for customer attention. Let’s take network businesses – it is essential that they are able to keep customers connected to the network to protect asset value – if current take-up trends of solar PV continue, if battery storage becomes economic and if demand side management remains a key feature for business and domestic customers there is a real risk that the ‘death spiral’ will have a negative impact on enterprise value within distributors over the next 10 years. But we do not expect distributors to stand still – they must build or possibly regain customer confidence and offer a new range of services to counter these challenges. We expect this to be largely in the area of the provision of energy supply solutions such as bundled solar PV and network storage solutions (using both batteries and grid) as well as the traditional regulated network services. We see distributors looking to prevail upon the hearts and minds of the traditional retail space, subject to regulatory constraints – a key question will be whether or not retailers and distributors will face-off and effectively compete for customer wallet share at some level or whether the current value chain separation will continue. We expect to see more innovative solutions for transport fuelling which will see new services and incentives created for electric vehicles and for natural gas vehicles (eg recent AGL announcement on long haul truck refuelling facilities).

We expect the bulk of the value in this space to be captured by current data and content players rather than traditional utility companies.

We expect to see metering and data services become a very open market offering and there will be major competition from energy retailers, telcos, ISPs and other technology players. We expect the bulk of the value in this space to be captured by current data and content players rather than traditional utility companies³.

Let’s turn to utility retail businesses – this will prove to be a real battleground for market share. It already is in Victoria and NSW and will become increasingly so across Australia. Traditionally the view has been the big will survive and the game was all about economies of scale. We contend that in the future it will be the customer centric who will survive.

We have seen large growth rates in innovative solution take-up – whether that is the high growth rates for specialist retailers in Australia or the very well documented take up of solar PV or the creation of innovative business models such as Virtual Power Plants and Demand Aggregators in overseas markets. This strongly suggests that innovative customer centric offerings will be appealing to the market and it has not been about economies of scale but about responding to customer needs in agile ways. Retailers will need to respond to changes in network business service models – whether that is by re-bundling network offerings or delivering alternative services possibly through other joint venture or alliance partner models. In addition the battle for home services is yet to play out. Telcos want to own the home, ISPs are adding energy services to their offerings and insurance companies offer a variety of home services. One thing is for sure – customers rely on ‘trust’ and ‘referral’ when it comes to service providers. We contend that retail utility players who are better able to translate this trust to other adjacent services will create new customer and shareholder value.

³ More than a quarter (27%) of respondents to PwC’s 13th global utilities CEO survey said the biggest competitive threat could come from companies with strong brands outside the sector.

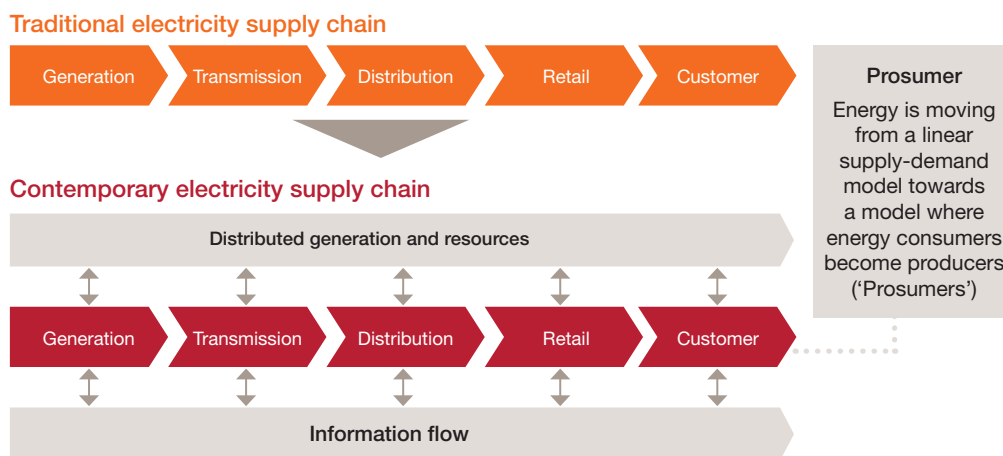
Industry structure

The value chain in the electricity industry has not experienced substantial change for many years and, in some cases, many decades (see Figure 2 – top). Since the introduction of competitive wholesale markets, the most significant developments have been retail competition, some tariff deregulation and, more recently, increases in large-scale renewable and distributed generation including rooftop solar generation (supported by policy changes).

Traditionally, generation, transmission and distribution requirements were forecasted based on a predictable increase in consumption. The market for electricity was highly transactional in nature. Customers did not have easy access to information or an understanding of alternative methods of supply and therefore consumed what was distributed to them. Generation was typically a one-way path with few competitors in the market. The generator decided on the generation mix which was typically characterised by fossil fuel fired generation, and to a lesser extent renewable energy.

The foundation of the marketplace is shifting with multiple global and regional trends reshaping the utilities sector. The industry is increasingly recognising that to stay profitable and to succeed in the future, companies will need to adapt their business models to respond to an environment that could be transformed by significant changes such as distributed generation, technological changes and a different customer outlook. A range of new technologies are emerging that have the potential to compete with utility-provided services and impact centralised power generation. Solar PV, battery storage, geothermal energy sources, wind, electric vehicles with enhanced storage, smart meters and smart grids head the list of technological developments.

Figure 2: Comparing the traditional and contemporary electricity supply chains



Source: PwC Analysis

Energy suppliers will be converted step by step into energy enablers, making sure that power from distributed and renewable energy sources are ideally integrated into the traditional generation mix. These trends will impact all utility company's asset management, capital and operating expenditure requirements and energy mix. It will be critical for utilities to focus attention on adapting traditional generation to a more contemporary model where the generation portfolio will be better balanced with the more volatile needs of 'prosumers' (see Figure 2 – bottom).

Strategic responses

We see the following as likely strategic responses from energy enablers to combat the various forces impacting performance within today's utilities and help prepare them to become tomorrow's energy enablers:

1. Development of new strategies based on privileged assets and distinctive capabilities.
2. Customer offerings becoming more aligned to household and business needs.
3. Business and operating model transformations for existing utilities.
4. Provision of value added services (eg energy management services) becoming core for customers.
5. New energy enablers enter the market

These changes are not in the distance; they are already starting to happen.

Future energy enablers will be many and varied. We already see new entrants in niche retailers, gentailers and innovative businesses such as virtual power plants beginning to emerge. The barriers to entry have lowered as customer preferences have moved away from blindly supporting big brands. While there will remain a role for the large utilities that generate, transport and retail energy to business and domestic customers, they will not all have the same shape as they do today. They will be leaner, with many different product lines and multiple channels to the customer. To maximise investor value they will be constantly redesigning 'content' and 'bundles' to remain relevant to an increasingly demanding and diverse customer base. These changes and the power of choice will be essential to appeal to generation Y and generation Z who will collectively dominate the workforce within the next 10 years.

Customer energy contracts will greatly favour the customer – suppliers will have little choice in the matter! There will of course be contract terms and conditions which will be used to 'lock in' customers but they will be able to be sourced from a great many types of energy enablers. There will be more competition and new bundles of services on offer that will meet customer desires. In some cases this will see customers paying more for certainty of supply. In other cases we see the distinct possibility that costs will reduce for customers. We expect that new tariffs and service bundles will be in place within the next three years, which will lead to changes in the way that services are offered to customers and the manner in which customers and businesses will manage their energy costs. This will mark a major, transformational shift for both the utility sector and customers.

Renewable generation will continue to grow in Australia and globally. The direction that emerges from the 2015 COP21 UN climate change meeting in Paris, coupled with the conclusion of the RET review and – presumably – the abolition of the carbon price, will provide much needed certainty to capital markets. While, we cannot forecast the future of the RET, we are of the view that certainty is almost more important than quantum for investors. For the purposes of this paper we assume that the existing RET policy settings will remain in place albeit with potentially lower 2020 targets, but with one notable exception – the biennial RET review provision will be abolished – this will be important for investor certainty. We take AEMO's most recent consumption forecasts as the most likely scenario, which will see at least some thermal generation plants mothballed. As has been widely speculated, there will need to be policy settings in place that provide investors in these plants with certainty on outcomes otherwise investors will look elsewhere.

Ultimately the level of closure versus investment in new plant and the fuel mix will influence the cost of generation and most likely lead to increases in wholesale prices above today's levels (absent any carbon price). Absent demand growth, this type of movement at the big end of the generation supply chain (ie switching thermal for renewable generation) will create opportunities in other parts of the generation supply chain. We expect small scale solar PV and battery storage to become increasingly cheaper which will drive innovative solutions and service bundling at this end of the market. We expect to see higher self-sourcing of supply by commercial customers which will follow what is already happening in the US where commercial PV can generate electricity at prices much lower than traditional forms of energy. Wholesale gas prices will increase, as most expect, which will place further pressure on domestic and business energy pricing. Gas fired generation may well be the big loser in this equation. Just have a look at Europe where similar generation policy settings have seen the closure of major gas generation plants including some new plants.⁴

4 "How to lose half a trillion euros" - The Economist, October 2013

Changes in business and operating models for existing utility players

Over the last 20 years the Australian utility sector has essentially been broken into separate value chain segment specialities and business models have largely followed the value chain of generation, transmission, distribution and retail. One major exception has been the predominance of the ‘gentailer’ model which has been adopted by all of the big three utilities in Australia. It has also been the underlying logic to the recent merger of the government-owned generator and retailer in Western Australia. This aligns with models in place in Europe and the UK. This model has seen the formation of some alliances and joint ventures but this has typically been at operational levels (eg network contractors for distributors or back/middle office services for gentailers) or in the case of fully vertically integrated energy companies has been at the upstream end of the value chain. The key question will not be whether there will be change to these business models but what changes will occur⁵.

We see all utility companies concerned about productivity and about the challenges of growing shareholder value from a market where demand is falling and where there is overcapacity of supply. When we add to this the prospect of customers effectively competing with utilities to source supply there is a compelling case for transformational change. This change will occur soon.

We expect to see new entrants in the market. We envisage many more joint ventures and alliances forming and further consolidation in the utility sector. In 10 years we expect to see some large vertically integrated utilities in place with some possibly having re-integrated network businesses (subject to changes in regulation). We also anticipate these larger players to have entered the data services market – this is most likely to be done in conjunction with other players such as data and content providers in an alliance structure. Some argue and we agree that the telco and ISP sector will become forces in the energy market in coming years – we are already seeing some entering the market and providing some forms of service bundling.

The existing shape of the energy retail business will not survive in its current state, given the atrophy of retail growth in traditional markets. Retail will turn into a channel fight focused on reducing the cost to serve and improving service and choice, which will pose major threats to utilities. If it is assumed that the customer is central to success, then precisely meeting customers’ service needs will become the most important success factor. The question will then become what is the most effective and efficient way to provide service to customers in the way that they want it? This could lead to utilities’ retail component being subsumed into other large-scale retail engines such as data service providers and other in-home services including telcos. There may be many more suppliers of energy, some with retail front-ends and some without, including third party brokers as we have seen in health insurance in recent years with iSelect.

Generation and trading will be more agile functions and major drivers of value. Power purchase agreements for generator output with long-term offtake and pricing certainty will be challenging to maintain as retailers will be exposed to uncertain loads in the face of increased distributed generation. Contracting for long-term demand will become increasingly difficult as time passes given viable alternative sources of supply will almost certainly become available within 10 years. This will see generation assets as increasingly riskier and drive higher return needs for those risks which in turn will most likely lead to new debt and equity investors entering the sector with innovative ideas on how best to extract value from generation assets.

When we add to this the prospect of customers effectively competing with utilities to source supply there is a compelling case for transformational change. This change will occur soon.

⁵ In PwC’s 13th annual global utilities CEO survey, 41% of utility CEOs saw business models transforming while a further 53% saw business models changing significantly

We expect to see continued heavier economic regulation of transmission and distribution services. This will act to push prices lower but with some major asset replacement programs underway or commencing over the next 10 years this will be a constant challenge for regulators and governments. In response to this regulatory 'squeeze' network businesses will look to adjacent markets to find new sources of value. This will be a quest for unregulated revenues and profits – this has been pursued in the past to varying levels of success – this time the strategies must be different and will most likely have a focus on their core customers – those connected to their network assets. This will see a new form of relationship emerge between network businesses and customers and will create real tension with retailers who will also be looking to offer new service bundles to the same customers. The key will be who has ownership and operational control of distributed generation assets – these will be the swing factor in who can provide the most innovative services for customers.

New players and services in the market

We are already seeing new entrants emerging to capitalise upon the uncertainties within the value chain and the uncertainties in the minds of customers seeking the best possible energy solutions:

- **Non-traditional energy providers** will appear. Some of these will be large scale and may include telcos and high street retailers. Others will be smaller scale, providing specialist services (eg business only) and agile business models. We may see the emergence of 'white label' retailers, but we expect these to be spun out of larger existing utilities in much the same way that low-cost airlines have spawned from within traditional airline brands. Perhaps the ancillary revenue model of these low cost airlines will prevail where, in some cases, over 30% of all revenue is sourced from 'add on' products and services
- **Transactions** involving some smaller players are expected to occur within the next few years in order to better match customer and trading book profiles. We also expect successful innovation-based utility businesses being absorbed or forming alliances with other companies from outside the traditional utility sector.
- **International technology companies** as well as service-centric 'niche' players are certain to play a more significant role in Australian and in Asian energy markets. As battery storage, electric vehicles, fuel cells and other emerging technologies become more mainstream, so will the energy providers that champion their causes. In Europe companies such as Next Kraftwerke are already taking share and creating innovative solutions for their customers and investors by developing 'Virtual Power Plants' which delivered over 2 TWh in 2013. There are some parallels with gas storage technologies.
- **Data services and content** will play a much larger role in the energy market in the next 10 years. Google has already formed an energy company, global technology companies have taken positions in metering services, and we expect it to be only a matter of time before telcos, ISPs and the like look to enter the sector, given the numerous similarities in the existing and likely future operating models.
- **Smart grids, smart meters and customer energy management 'gadgets'** are only the beginning of what is possible. Already we can control our home electronics and entertainment via our smart phones and tablets – why not our energy usage on a minute-by-minute basis?

Role of government, regulators and market operators

- **Governments** have an enormously important role to play. Policy settings must provide long-term stability for the industry while giving customers the ability to make the choices that suit them. These policy settings must obtain bipartisan support to underpin local and offshore investment in the sector.
- **Regulators** of network businesses will certainly be more intrusive than they are today. Their potential to wield more power has already been laid out in the latest changes to the AER's roles and responsibilities. This will create increased tension on returns in the deregulated utility sector. On a more positive note we expect retail pricing to be completely deregulated across Australia within a few short years.
- **Market operators** have an ongoing responsibility to facilitate effective and efficient markets. The potential for markets to intersect and the ever-increasing presence of new technologies and business models will see the need for much quicker responses to market issues and streamlining market reform processes. This will require new disciplines from all market participants on market rule and framework reform.

Provision of information services will become the norm within energy companies

Traditionally, utility companies have traded in energy commodities of one form or another. While this will continue to be a major driver of value in the future, data services and a broader services portfolio will become part of the mainstream for utility companies and energy services companies.

It is no accident that Google and other technology and content companies have recently acquired energy companies – there is great option value in these transactions. Utilities have a very valuable asset at their fingertips: the meter data from millions of smart meters and multiple smart grids. This data shows the patterns of individual, household, suburb, town, city and country usage. Consider the vast bank of data available for analytics when all customers are connected to the electricity network via smart-grid. We estimate there will be approximately 160 billion data points produced annually when all current NEM customers are connected to smart-grids, almost 50 billion per annum in Victoria alone. We are already hearing of the value of this data in crime investigation and fraud prevention. While these may be alarming statistics for those concerned about data privacy we contend that the benefit of allowing access to this data and creating value for customers is potentially very large.

The development of analytics capabilities within utilities, which today is generally of a low to moderate standard, or via alliance partners will be a core capability in the future. The ability to predict customer behaviour based on meter data will be of enormous value to network businesses for better managing assets and predicting outage risks. Furthermore, this data will be very useful and valuable to others such as advertisers and media companies and to appliance manufacturers. All of these types of potential end users will pay to receive insights from meter data.





What are future investors looking for?

With the fall in value of global utilities due to generation overcapacity and increased commodity trading affecting in-country profits, where will investors look for better returns in the next 10 years?

As we have alluded to earlier we see movements in the risk/reward outcomes for the various assets in the energy value chain. Network businesses and generation assets will become riskier propositions in future given the risk of competition from 'prosumers' and new entrants. This will drive up costs of capital which may see these assets less valuable for current shareholders whether they are in government or private hands. This will probably lead to new investors entering the market or at the very least will see an increase in the risk appetite for existing shareholders. This type of risk/reward shift has already seen one set of global investors exit Australia with initial investors in privatised energy assets in the 1990s having now exited.

In our recent annual global review of Power and Renewable Deals⁶ we observed that traditional utility investors are predominantly looking to invest for the long term. However new investors are entering the market. We are seeing venture capitalists and private equity investing, district heating and cooling projects being facilitated by governments and we are also seeing global investors such as Berkshire Hathaway becoming active. We expect to see small crowd-funded energy companies emerge in Australia within the next three years.

This more diverse investor universe will capitalise upon the shifting risk profiles in the sector. We see venture capital playing where it plays best – at the leading or bleeding edge of technology (eg battery storage, virtual power plants and niche solutions). We see private equity investing in poor performing businesses in the same way that they typically have in other industries. For the traditional long term utility investor there is a real conundrum right now – they must support the creation of new value via new services but this may increase the relative riskiness of the company. Consequently these investors will seek higher returns to balance this risk. In an environment where customers are increasingly taking control and looking to drive prices downwards this will be quite challenging. This will also create a conundrum for economic regulators.

A central issue will be the decisions governments make about maintaining their shareholdings in major utilities. We do not see that it is viable for governments to retain ownership of utilities over the next 10 years and beyond. These assets provide too many capital recycling opportunities for governments in an infrastructure-demanding era where balance sheet constrained governments have limited alternative funding capacity.

⁶ PwC's Power and Renewables Deals 2014 outlook and 2013 review

How will customers benefit from the energy sector transformation?

The main benefit to customers will be the ability to exercise choice even more freely than they can today. While many already have a choice of retailer, this power of choice will extend to the source of electricity and, at the extreme, will allow some customers to become self-sufficient particularly in remote areas and those at the extremities of existing networks. This has major implications for electricity contracts and will also lead to new innovations in customer engagement, pricing models and other ways in which utilities manage their businesses and, most importantly, their assets. It also opens up the need for asset owners to require exit fees and asset value guarantees from customers in order to invest – this has been the case at the industrial and commercial end of the market for some time but this will almost certainly become a reality at the domestic level.

Business customers will have the opportunity to take an active or passive role in the market – flat tariffs and asset-based term sheets will be a thing of the past, since these options only favour the energy company from a risk mitigation perspective. Businesses will have better visibility over the trading opportunities available to them. Very large companies will develop their own energy management capability, for example IKEA has developed the capability to manage its own energy needs.

Other developments to the advantage of the customer:

- **Contracts with customers** for their own-source energy will take a different shape. At both the domestic and business level, own-source generation and storage will be used to manage peak demand as a matter of course. Energy companies and customers will recognise the value this provides in terms of avoided infrastructure costs and will be happy to pay to connect their ‘generators’ and manage their own needs using the best technology available to them so they can maximise their supply and commercial results. At the same time customers will need to make conscious choices about the services they require from the grid with a range of services likely to be available from relatively inexpensive ‘always on’ connections to an expensive ‘emergency back-up’ for those that choose to virtually disconnect from the grid.
- **New optimisation tools** will be available to customers to trade into the market rather than having flat-rate contracts, expediting the innovation required to pull down costs for new technologies such as storage and fuel cells. We will see community energy ventures emerge that will be self-sufficient and may well morph into small-scale energy companies.
- **Demand aggregators** will play a significant role in the market as they have started to do in the UK and Europe. We expect these future Australian aggregators will force retailers to offer innovative lower cost service and supply bundles.
- **Some energy companies will be fully vertically integrated and some will be niche providers**, but tariffs and contracts that incentivise customers to manage their demand more effectively will remain. There will be greater collaboration across the utility value chain to develop tariff models and contracts that drive efficient long-term asset management decisions.
- **New solutions** will emerge that enable customers to optimise their energy positions.



How do today's utilities transform into tomorrow's 'energy enablers'?

For the innovative and brave we see more opportunities than risks in the current and future energy market. The measure of success will be the development of good business strategies and their successful execution. The normal drivers of business apply.

In our view, the keys to transforming today's electric utilities into tomorrow's 'energy enablers' are:

- The development of stable long term government policy and establishment of a truly deregulated and open national electricity supply and services market.
- Customers becoming the centre of the utility organisation – develop excellent customer understanding, with a particular emphasis on the emerging power of social media to underpin new customer-centric corporate strategies.
- Creating value from the vast amount of data collected and created – utilise the best possible data management and analytics tools to support all major business decisions.
- Improving productivity and asset management – have a clinical focus on asset value, and manage assets via customer-centric frameworks.
- Be part of the new utility technology revolution and create options for the future – build out agile and innovative business models optimising the use of new and emerging technologies.
- Developing and continually refining agile and lean operating and business models focused entirely on executing customer and other strategies.

Perhaps the most impactful of these will be the emergence of new corporate strategies centred on the satisfying the needs of customers and the establishment of new supporting business and operating models.

Industry participants who succeed over the next decade will not be the ones who blame the market or external events. It will be those who best respond to the ever changing needs of customers and who best work with policy-makers, market operators and regulators. These will prosper and build the 'utility of the future'.

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