Looking ahead: future market and business models

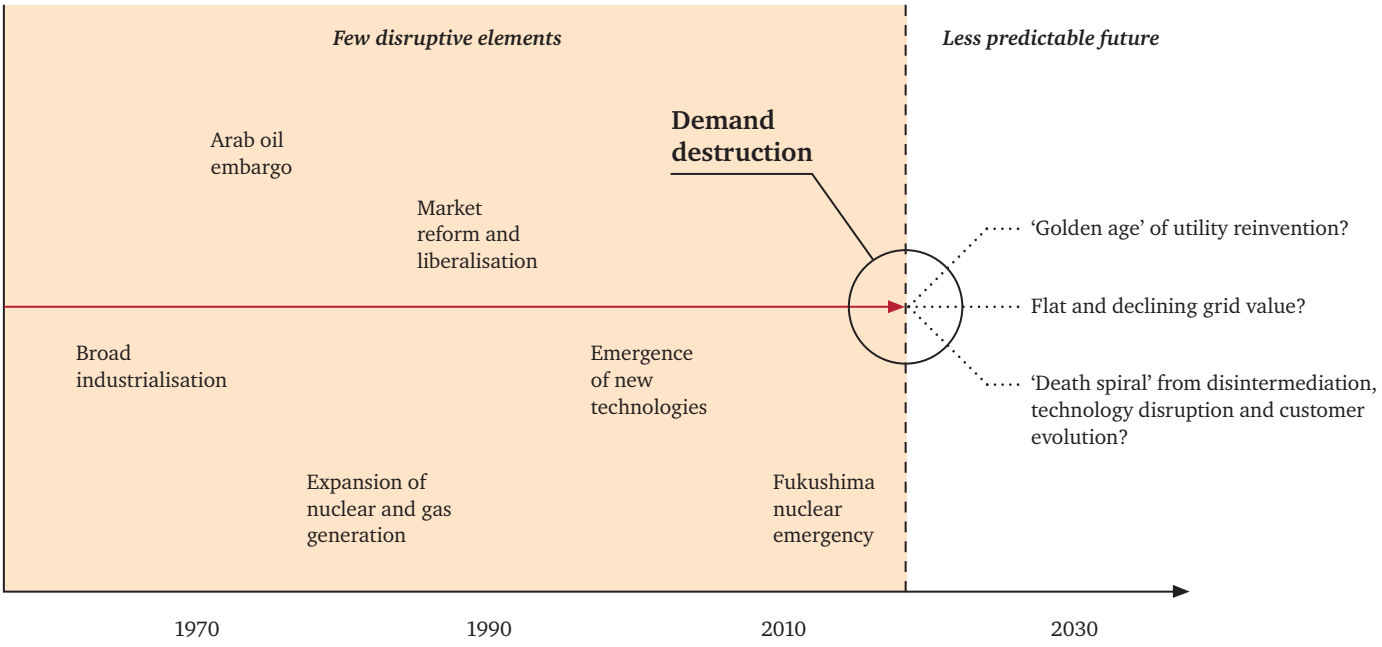
No-one can predict the future but it is important that companies take a clear view on the ways in which their marketplace is likely to evolve and their company's place in the various different possible scenarios.

PwC's energy transformation programme includes joint activities with companies to support their future strategies and map out the risks and opportunities involved.

At its heart, this means addressing key questions such as:

- What will future market design look like?
- What are the implications for my company's purpose, role and positioning?
- What are the business models that I need to pursue?
- What are the implications for people and operational change?
- What will existing and new competitors be doing?
- How best to continue to deliver shareholder value throughout the transformation process?

Figure 2: The power sector has reached an inflection point where its future direction is much less predictable



Future utility business models

Companies need to determine the future direction of their own markets, how these markets are affected by technological advancement and what this means for their business strategies. While the urgency of their responses may vary by location and value chain presence, we believe companies can't afford to wait as the next decade is crucial.

Within the next decade we anticipate that step-change milestones will be reached in at least some of the key disruptive technologies – grid parity of solar distributed generation, lower cost and mass-scale storage solutions, vibrant and secure micro-grids, attractive electric vehicle options and ubiquitous behind-the-meter devices. In this new technology-enabled, customer-engaged marketplace, companies need to define their desired purpose (see figure 3). We foresee a distinction between energy suppliers, integrators, enablers and optimisers with different points of focus along the value chain.

Incumbents and new entrants need to ask themselves how they intend to position themselves as market participants, i.e. the 'role' they will play in market development, customer engagement and business execution. Companies have distinct options on this spectrum ranging from 'passive and market-following' to 'innovative and market-making'. Defining the future role of the entity is fundamental to shaping the business model to deliver on aspirations.

In defining future business models, companies need to first understand and challenge their company purpose and positioning in the markets of the future. We call this 'blueprinting the future' and it consists of several fundamental steps, starting with defining *'where to play'* in terms of business segments, markets, products and, services (see figure 4). Core, adjacent and growth market participation areas are assessed based on attractiveness, capability to compete and potential for profitable success. Next comes assessing *'how to play'* in these selected areas, which defines the go-to-market strategies to be adopted by participants in pursuing their market aspirations, e.g. new products, innovative unbundled pricing.

We then focus on the most important dimension of the blueprint, *'how to win'*. This element defines the particular tailored approach that is most appropriate for a company to achieve competitive market success, e.g. partnering or channel expansion.

Figure 3: Future role evolution

Emergent roles	Energy Supplier	Integrator	Enabler	Optimiser
	'Asset-focused'	'System-focused'	'Value-focused'	'Insight-focused'
Primary segment focus	Generation	Transmission/ distribution	Distribution/ customer	Customer
	• 'Have to do' if asset heavy or short in supply	• 'Will do' regardless of new area participation	• 'Should' migrate into depending on role	• 'Could' evolve into as new business models mature
Key focus areas	• Ensuring *assets are optimised* in the market to match price signals • *Achieving the right balance* of asset-based and notional transactions within risk parameters	• Facilitating *grid interconnection* with other transmission developers • Extending the *deployment of technologies* or equipment into the distribution network	• Enhancing the *value of the grid* to all stakeholders • Addressing how to *leverage technology* to enhance system performance and customer engagement	• Enabling customers to better leverage *behind-the-meter* technology • *Broader engagement* with the customer by providing value through advanced data analytics

To fully evaluate the above choices, companies need to examine their current core capabilities against the type and level necessary to effectively compete and prosper in a more decentralised and disaggregated marketplace. In particular, incumbents and new entrants need to take stock of which capabilities are distinctive and differentiable, e.g. asset management or regulatory prowess, and which may need to be developed or strengthened, e.g. innovation or commerciality.

The energy value chain of the future will be more interconnected than ever before. This value chain forms an integrated ecosystem of unique elements that are highly interrelated, notwithstanding the specific focus of these individual elements (see figure 5). Incumbents will need to focus on extending beyond independent views of each value chain element into a more integrated view of how these elements can interact with each other in the future, e.g. how the benefits of increased knowledge about system performance can bridge the gap to enhance the customer experience. Non-traditional entrants will need to determine how they interact between incumbents and customers in a manner that does not 'island' assets or 'diminish' customer relationships. Just as we are now entering the era of the 'connected customer', we are also seeing the broader emergence of the integrated grid.

Figure 4: 'Blueprinting the future'

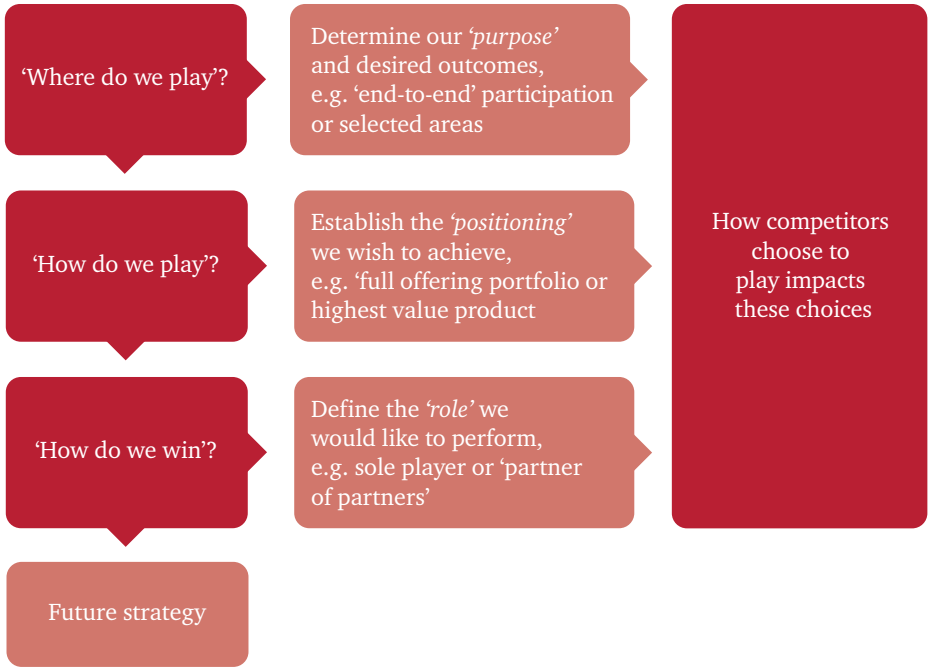
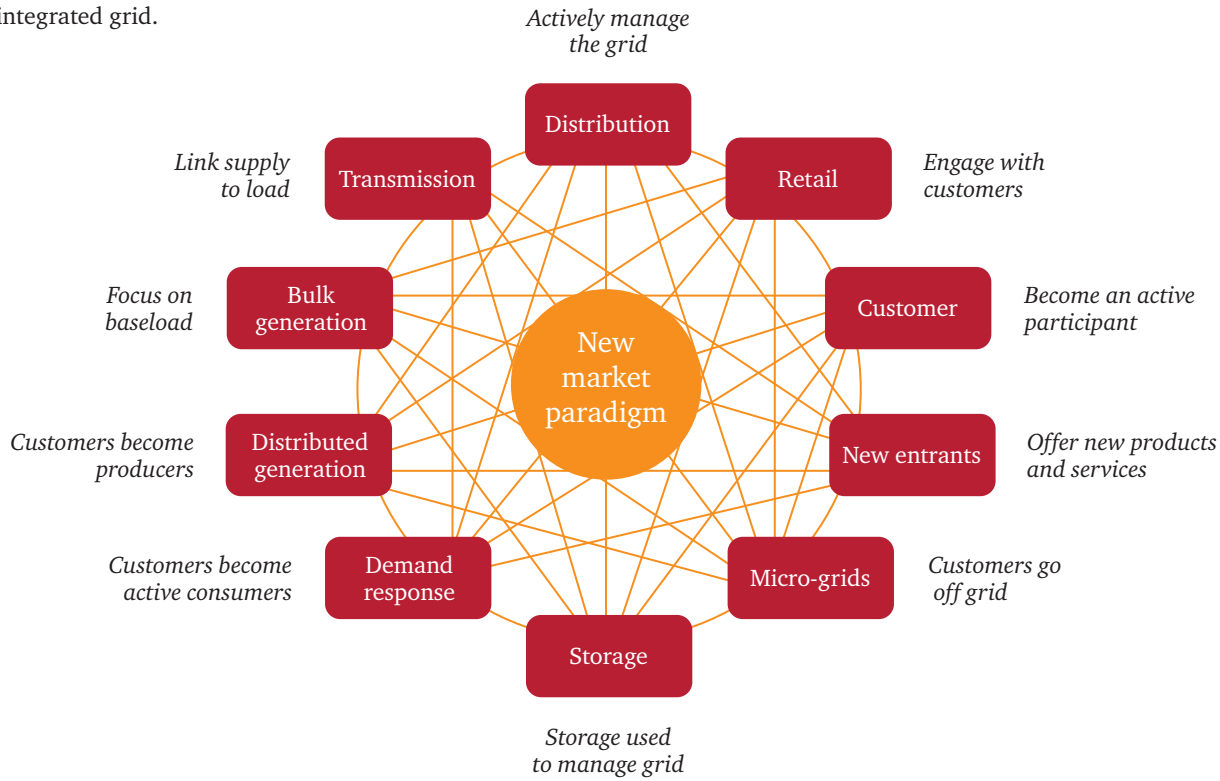


Figure 5: A networked model



The range of future business models

Much comment has been directed at the business model of the future. We do not believe there will be a single winning business model but rather that there will be a range of business models that will deliver success in the new market environments. Just as we see a number of transformational market models, we see a range of business models that build on existing models or fill new service or product needs. We outline eight business models which we believe will emerge individually or in combination (see figure 6). These individual business models cover the full power sector value chain; each has individual characteristics and several are based on integration and/or collaboration with non-traditional partners.

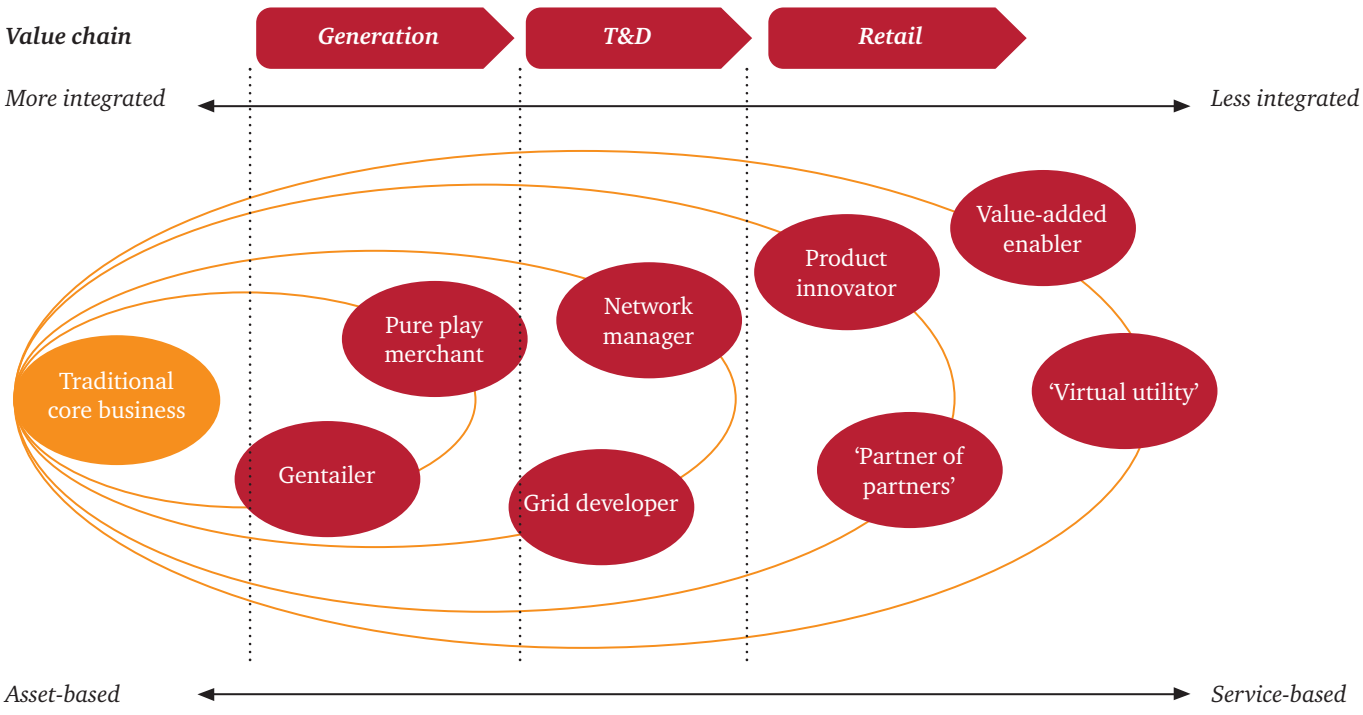
Some market participants – incumbents or new entrants – may be prevented from playing in all segments, while others may seek to specialise in selected segments or integrate into broader market areas. Whatever the case, the adopted business model(s) need(s) to be tailored to enable companies to succeed in three key ways – strategically, financially and competitively.

Traditional core model

Alternative business models of the future may be very different from the traditional model that dominated power and gas delivery for decades. In the past, operating an integrated utility from generation through to customer supply was well understood because the utility controlled the entire value chain. However, this model has been supplanted in many countries through market restructuring and may be rendered further obsolete through the convergence of distributed technology and customer engagement.

In this traditional model, both tangible assets and franchise customers were considered important to preserve the benefits of physical integration, economies of scale and access simplicity. As policies encouraging competition emerge, to take advantage of market options or regulatory mandates, specific segments of the value chain became available for specialisation and for new entry. Now, unbundling opportunities are starting to extend deeper into the value chain and enable more specialist participation.

Figure 6: Business model choices



In the traditional model, making money was easy to understand – invest and earn a return on invested capital. In emerging business models, although we consider that this feature may still apply in selected segments, we believe a greater emphasis will be placed on obtaining higher margin from prices/revenues rather than cost reduction to get higher earnings and profit growth.

Depending on how a traditional utility thinks the electricity industry may evolve in its country/region and what market models may emerge, it needs to evaluate where to play across the value chain. Should a traditional utility leverage multiple business models? And if so, which ones and how should they transform their business to be successful?

We have identified eight alternative business models, which we describe below with respect to their scope, rationale, basis for competition, and source of earnings (see figure 7). This should help utilities think through which business model options might be right for them and the key decisions required to enable them to develop their new market position in sufficient time.

"Beyond the traditional model, we foresee eight different future business models that could emerge either individually or in combination."

Figure 7: Business model elements

Business models	*Business focus*	*Business alignment*	*Profitability basis*
Traditional core business	Assets – customers	Generation – T&D – retail	ROIC
Gentailer	Assets – customers	Generation – retail	Competitive margin
Pure play merchant	Assets	Generation	Competitive margin
Grid developer	Assets	Transmission	Regulated ROIC
Network manager	Assets	Transmission – distribution	Regulated ROIC
Product innovator	Customers	Retail	Competitive margin
'Partner of partners'	Customers	Retail	Competitive margin
Value-added enabler	Customers	Retail	Competitive margin
'Virtual' utility	Customers	Distribution – retail	Competitive margin

1
Gentailer model

Relevance for transformative market scenarios

Green command and control	*Low*
Regional supergrid	*Medium*
Ultra distributed generation	*High*
Local energy systems	*Low*

Description

A gentailer utility operates at both ends of the value chain by owning generation assets and selling retail energy to customers in a competitive market. Gentailers pay a charge to transmission and distribution system operators to deliver this power and also buy and sell energy on the futures and spot markets to manage any forecast or real-time differences between load and supply. This business model is a by-product of the design of the local market and not relevant to all markets. Advantages of the gentailer model are that it provides a natural hedge for the business, i.e. a 'sink' for capacity when the generator is 'long' and a 'source' for the retail business when it is 'short'. A key risk to the gentailer model is that retail consumers may gradually switch to competitors or invest in behind-the-meter distributed energy resources, which could potentially strand part of the gentailer's generation assets over time.

Market/model examples

The gentailer model is typically applicable in markets where the generation and retail portions of the value chain are competitive and the transmission and distribution companies operate as a regulated monopoly. Australia, the UK and New Zealand are countries that have successfully deployed this model. In New Zealand, the five major generators are also the top five retailers. This type of market development often has regulatory implications which are likely to influence future development of this business model.

This model has also developed in areas where traditional IPPs have moved into retail energy sales as energy markets have deregulated. NRG Energy and NextEra Energy are two examples of utilities operating in this model in the United States that developed or acquired retail capabilities to complement their generation positions.

Capabilities

On the generation side, a successful gentailer has strong capabilities in demand and market insights, project development, project finance and asset management. When planning to add new capacity, a gentailer applies its strong market knowledge to determine cost-competitive generation technology choices based on fuel markets, operating constraints and consumer preferences. On the retail side, a successful gentailer has strong capabilities in energy trading and hedging, origination and product development, pricing, customer acquisition and customer management. Strengths in these areas enable a gentailer to cost-effectively acquire and maintain customers while delivering higher margin services.

What utilities should do now

Monitor and understand the way different customer segments use smart technology and assess how to harness these preferences into mobile and/or tariff solutions. Identify potential partners to help develop behind-the-meter distributed energy resource business plans. Review make/buy decisions to support their asset position and investment requirements under alternative market scenarios to determine what generation products to offer in the future. Invest in understanding customer segmentation and what that means for switching rates and retaining the most profitable customers.

Maximising competitive position against potential competitive threats

Gentailer actions	*Competitor threats addressed*	*Future gentailer profitability drivers*
• Develop a behind-the-meter distributed energy resource business, organically or through networks partnerships or acquisitions • Increase customer engagement via new energy management solution offerings and intelligent tools • Develop alternative pricing packages and approaches that provide greater optionality or risk/reward tariffs to customers	• High penetration of customer or third-party owned behind-the-meter distributed energy resources • Regulatory change enabling transmission and distribution operators to develop, own, and operate distributed energy resources • New entrants offering products/services that increase customer engagement in managing their energy needs through mobile tools or social media	• Offer, bundle, price, and cost-effectively deliver a wide range of energy products (low cost, high renewables, local premise-based generation etc.) with selected value-enhancing partners • Energy trading approaches to hedge business risk • Cost-effectively plan, develop, finance, construct, and operate the right asset mix

2
Pure play merchant model

Relevance for transformative market scenarios

Green command and control	*Medium*
Regional supergrid	*Medium*
Ultra distributed generation	*Medium*
Local energy systems	*Low*

Description

A pure play merchant utility owns and operates generation assets and sells power into competitive wholesale markets at market clearing prices, or through negotiated bilateral contracts with other generators or large industrial consumers. This entity occupies a very narrow portion of the value chain and competes within the riskiest part of the business when markets are volatile and positions are uncovered. Assets are built and financed by investors on a speculative basis, pre-contracted in part or in full or acquired from another generator. Pure play merchants have traditionally developed baseload or peaking plants with mature generation technologies from gas, which also enables participation in ancillary grid services markets. However, wind merchant plants have increased in popularity over the last decade and solar merchant plants are starting to emerge.

Market/model examples

Merchant players prefer liquid markets with rising and/or high peak wholesale energy prices and high price volatility. Examples include deregulated regions like Texas, California and New England in the US and countries in emerging markets like Chile. Areas with low natural gas and coal prices are typically not well suited for merchant players because these low-cost inputs often depress wholesale energy prices and do not provide significant 'spread' for merchants to leverage.

Capabilities

Similar to a gentailer, a successful pure play merchant utility has strong capabilities in demand and market insights, project development, project finance and asset management. Additionally, a successful player has strong market origination, trading, hedging and risk management capabilities, including the ability to execute a variety of complicated purchase and sales agreements (e.g. using derivatives) that effectively lock in the price of fuel and electricity to eliminate as much market risk as possible. As more low-carbon energy enters a market, mitigating market risk becomes more challenging because market prices become more volatile, so a merchant's strategy needs to be flexible and adaptive.

What utilities should do now

Implement world-class operational procedures to minimise costs of operations, manage price and volume risk exposure. Develop robust investment plans to create a balanced generation portfolio, either across technologies or markets. Investigate alternative products to offer from the generation portfolio to mitigate against market change or merit order structure.

Maximising competitive position against potential competitive threats

Merchant actions	*Competitor threats addressed*	*Future merchant profitability drivers*
• Assess feasibility of expanding capacity of traditional fossil fuel plants with solar or energy storage to expand ability to play using same grid interconnection • Explore options for developing distribution level or behind-the-meter projects (e.g. solar, charging infrastructure). • Evaluate investment to enhance plant operational capabilities to capture value of flexible thermal capacity	• High penetration of behind-the-meter distributed energy resources and solutions like demand response that reduce peak demand • Development of disruptive grid-level solutions such as energy storage that compete with merchant generators • Development of ultra-efficient generation and excellence in operations	• Identification of profitable regions for future merchant potential and key early investments (e.g. land) • Ability to cost-effectively plan, develop, finance, construct, and operate the right asset mix • Strong analytics and energy trading capabilities to hedge business risk

3
Grid developer model

Relevance for transformative market scenarios

Green command and control	*High*
Regional supergrid	*High*
Ultra distributed generation	*Low*
Local energy systems	*Low*

Description

This utility acquires, develops/constructs, owns and maintains transmission assets that connect generators to distribution system operators. In most cases, it operates as a natural monopoly, although there may be multiple grid developers within a single market. Some grid developers seek to build new transmission lines to connect remote renewable generation to load centres, while others will also maintain lines and infrastructure that have been in operation for years. If a grid developer operates in a wholesale electricity market, it must manage the stability of the power system in real time and coordinate electricity supply and demand to avoid imbalances and supply interruptions.

Grid developers must constantly assess the ability of their systems to adequately meet current and future needs and plan cost-effective system upgrades to meet those needs, usually governed by regulation which may incorporate incentive mechanisms. Where these transmission developers construct or maintain assets with an organised regional transmission operator present, close coordination with that operator is necessary to achieve grid coordination and support the regional market model.

Market/model examples

Grid developers are typically established by regulation in areas with existing infrastructure. Examples of this model include transmission system operators (TSOs) in Europe and independent system operators (ISOs) in the US. Additionally, new grid developers may be formed in areas that lack sufficient transmission infrastructure between generation and load centres.

For example, a grid developer may be created to build and operate transmission lines between remote generation assets like a hydropower facility or wind farm and a distant urban area, or to provide new transmission infrastructure where there are transmission constraints. Examples of the newer grid developers in the US include Electric Transmission Texas (ETT) and Clean Line Energy Partners.

Capabilities

A successful grid developer has a very strong operating track record and excellent capabilities in designing, operating and maintaining high-voltage transmission lines and supporting infrastructure.

In wholesale markets, they have very strong capabilities for managing electricity demand and supply in real time and in ensuring reliability standards are fulfilled. Grid developers are also very good at engaging with key stakeholders, including landowners, communities, local and state officials, customers and equipment suppliers to facilitate siting and permitting. Newer grid developers typically have strong relationships with investors and joint venture partners to enable access to low-cost capital and to leverage creative financing and ownership arrangements. As remote generation capacity increases and a larger proportion of connections are made at distribution network levels, the number of interfaces a grid developer needs to manage will increase and the obligations and responsibilities will become more complex to oversee.

What utilities should do now

Identify new locations (within their own market or in new markets) for large-scale renewable generation, flexible thermal generation and associated transmission build. Work with alternative owner classes, e.g. financial sponsors, to shape market bidding processes where competitive transmission protocols will exist in the future. Review existing contracting and procurement procedures to assess whether they are maximising value for money, risk allocation and whether they reflect regulatory settlements. Streamline grid connection processes to improve resource productivity and lower operating costs. Consider whether alliances with DSOs may provide economics of scale and increased scope for new investment.

Maximising competitive position against potential competitive threats

Grid developer actions	*Competitor threats addressed*	*Future grid developer profitability drivers*
• Develop close relationships with distribution system operators and regulators to support large-scale generation growth plans • Convince investment partners to invest in large scale, low-cost renewable project developments that require new transmission to urban areas • Implement world-class operational procedures to improve cost-effectiveness and develop new forms of contracts with generators, load managers and the supply chain that incentivise strong performance and cost management	• High penetration of distributed energy resources in urban areas combined with strong distribution system operators and micro-grids, reducing the need for transmission support • Other grid developers obtaining first-mover advantages in new markets • Regulatory imposed incentives where risks cannot be managed by the grid developer alone	• Access to low-cost capital • Partnering with generation developers to expand project access • Robust operations to cost effectively manage transmission and infrastructure upgrades • Identification of profitable regions for future expansion • Innovative contracting with the supply chain to manage risks

4 Network manager model

Relevance for transformative market scenarios

Green command and control	*Low*
Regional supergrid	*Medium*
Ultra distributed generation	*High*
Local energy systems	*Medium*

Description

A network manager operates transmission and distribution assets and provides access to their networks to generators and retail service providers. Similar to some incumbent grid developers, they typically operate as natural monopolies. Network managers also manage power stability in the network in real time and coordinate electricity supply and demand to avoid imbalances and supply interruptions.
A new role for network managers is emerging in the area of an ISO-like entity that will assume responsibilities as a 'distribution system operator' and have specific, expanded responsibilities for network integration of incumbent systems and distributed energy resources. As distributed generation increases, the opportunity for an entity to manage all interfaces between local energy systems and traditional distribution grids increases.

Market/model examples

The network manager models typically exist in regions where the generation and retail portions of the value chain are competitive and the transmission and distribution companies operate as a regulated monopoly. Australia, the UK and New Zealand are countries that have successfully deployed this model, though with the expansion of distributed generation and micro-grids, we expect this role to expand and become more relevant in many global regions.

Capabilities

Similar to grid developers, network managers have strong capabilities in designing, constructing, operating and maintaining transmission and distribution lines and supporting infrastructure. They also have strong capabilities for managing electricity demand and supply in real time and integrating power from different central and distributed generation resources. These network managers also have deep skills in system operations data analytics that can enable insight into asset and network performance and optimisation. These capabilities are provided through the deployment of 'smart grid technologies' that utilise multiple sensors to monitor and collect system performance data to enable enhanced analysis of power flows, equipment failure risks and asset deterioration.

What utilities should do now

Invest in the evolution of the network and the deployment of 'smart grid technologies' throughout the system. Move toward the next stage of 'big data' management and the analytical evaluation of power quality, equipment failure, circuit risks and investment priorities. Anticipate the deployment of distributed energy resources, i.e. storage, micro-grids, distributed generation, electric vehicles, etc., and prepare for integration into the network and management of all deployed resource impacts. In some markets, instigate discussions with the regulator to develop and implement appropriate mechanisms to facilitate the new services. Implement world-class operational procedures to manage costs.

Maximising competitive position against potential competitive threats

Network manager actions	*Competitor threats addressed*	*Future network manager profitability drivers*
• Work with regulators to approve investments focused on advancing system capabilities (smart grid) • Harden the infrastructure through targeted investment • Advance reliability standards and awareness • Develop partnerships with distributed generation developers to install, operate and manage network connections	• High penetration of behind-the-meter distributed energy resources and micro-grids, reducing the need for a network manager to deliver power • Regulatory mandates that create an independent entity that assumes traditional DSO roles	• Access to low-cost capital • Investment recovery mechanisms • Data analytics systems • Predictive failure software • Distributed energy resource integration

5
Product innovator model

Relevance for transformative market scenarios

Green command and control	*Low*
Regional supergrid	*Low*
Ultra distributed generation	*High*
Local energy systems	*High*

Description

A product innovator is a company that offers electricity as well as behind-the-meter products to customers. This model focuses on expanding the role of the energy retailer and changing the level of customer expectations. We expect behind-the-meter products to evolve into a mix of retail supply packages, e.g. the provision of 'green energy' options, the development of service and pricing 'packages' that offer more flexibility to customers and the provision of behind-the-meter smart devices, e.g. power monitors, smart thermostats. The products offered will empower the connected customer to manage its energy control and provide a link to the network to advance insights into consumption patterns and impacts on network stability. We anticipate that many product innovators will seek to be active players in electric vehicle charging, the provision of premises-based infrastructure and the management of roof-top solar and fuel cell markets.

Market/model examples

The product innovator model will be most relevant in markets where the regulatory framework allows choice and the level of customer acceptance of new technologies and products is high. A market with a high penetration of distributed energy will be attractive for a product innovator who can help provide products that enable or complement distributed energy. Examples of product innovators that have moved beyond pure energy supply include Direct Energy and TXU Energy in the US and Powershop in New Zealand.

Capabilities

A successful product innovator will be highly effective at customer acquisition and retention as well as cross-selling products. Keeping operating costs competitive will be essential to preserving an acceptable margin. To this end, the product innovator needs competitive contracts with energy suppliers and other operational efficiencies, and contracts with technical asset providers for customer support and management of faults. A key question is whether the product innovator can succeed in offering a compelling set of products at the right price. Companies participating in this space will need exceptional skills in customer knowledge, product development, channel management, pricing and product bundling. Product innovators will also need robust customer data analytics and buying propensity insights to shape the right offerings to the market.

What utilities should do now

Focus on knowing their customers' needs, their customers' willingness to pay for solutions, and the value of their own brand. Assess whether a new brand would be more successful, perhaps through partnering with a product provider or creating a separate business unit (or corporate structure). Market research will provide views of what product expansions have been successful or failed in different markets in the past, and the potential products that could be offered in smart homes or through mobile devices. We expect that companies will enter into discussions with providers from other markets, e.g. Google Nest, to discuss how to partner around customer product development and provisioning, rather than default to automatic competition.

Maximising competitive position against potential competitive threats

Product innovator actions	*Competitor threats addressed*	*Future product innovator profitability drivers*
• Develop a compelling product suite including everything from the commodity to the home device • Develop opportunities for superior products that integrate with other needs, such as home or building security or automation • Invest in data analytics tools to develop excellence in customer acquisition and retention • Enhance brand reputation to support product expansion	• Multiple new entrants offering a range of new energy products to customers • Incumbents and new entrants innovating on specific customer offers • Regulatory change enabling retail energy sales • Bundling of offerings to enhance product attractiveness • New tariffs offering risk/reward opportunities for customers	• Keep customer acquisition costs low and operating costs overall low (e.g. attractive energy supply contracts or own energy supply) • Diversify the product portfolio beyond commodity products to preserve margin • Establish partnerships to enhance product range • Focus on retention of profitable and high-volume customers and minimise switching

6
'Partner of partners' model

Relevance for transformative market scenarios

Green command and control	*Low*
Regional supergrid	*Low*
Ultra distributed generation	*High*
Local energy systems	*High*

Description

Incumbent utilities will need to assess whether they have the requisite experience and portfolio breadth to address future customer needs for products and services. A 'partner of partners' utility is a company that offers not only standard power and gas products and associated services, but also a range of other energy-related services, from life-cycle EV battery change-out, to home-related convenience services like new service set-up coordination, to management of net metering-driven grid sell-back. These services can be provided solely by the utility but are more likely to gain customer acceptance when they can be bundled through an expanded relationship with high quality branded providers, like Vivint, OPower, Honeywell, GE, Tesla or Solar City.

Market/model examples

The 'partner of partners' model is most relevant in markets where there is a high proliferation of energy technology and choice and customers are seeking ways to simplify their lifestyle while lowering upfront costs. A market with a high penetration of distributed energy is attractive for a 'partner of partners' who can help provide simple and innovative service-based solutions. One example of a 'partner of partners' model is NRG Energy in the US, with its eVgo and Sunora offerings. Few utilities have embraced this model as it involves non-traditional partnership arrangements.

Capabilities

A successful 'partner of partners' will be highly effective not only at customer acquisition, but also provide superb service delivery. A distinguishing characteristic of these companies will be their ability to innovate in a manner that customers would not expect from their traditional power retailer. These companies will also possess deep customer insights and a commitment to satisfy customers across all touchpoints. A 'partner of partners' may find that many customers want a simple, low upfront cost approach, enabling these utilities to not only install but also continue to own certain assets, for example installing and then servicing a solar system, or installing and continuing to manage energy management equipment. One challenge will be for companies to determine the most appropriate brand with which to go to market, overcoming customers' perceptions of the constraints on services that can be successfully offered by a utility company.

What utilities should do now

Evaluate brand strength to understand constraints and the need for innovative partnerships. Invest in data analytics products to understand customer needs and demand elasticities. Identify potential partners with complementary technology or customer management products and services and engage in introductory conversations. Understand the impact of new products and services on customer switching, margins and long-term growth objectives.

Maximising competitive position against potential competitive threats

'Partner of partners' actions	*Competitor threats addressed*	*Future 'partner of partners' profitability drivers*
• Develop a compelling suite of services and identify the right solution provider partners • Create a range of relationships with solution partners • Expand the range of channels to market that can be leveraged • Develop bundles of offerings targeted at the connected customer • Enhance brand value	• Increasing choice and complexity in the market in terms of technologies and providers • Multiple new entrants offering range of new energy and associated services to customers • Incumbents and new entrants innovating on service delivery models • Regulatory change enabling retail energy sales	• Keep cost of service low, e.g. cross-selling multiple products to a single customer • Keep customer satisfaction high by establishing clear customer service standards, pinpointing and quickly addressing customer pain points, and offering a wide range of innovative yet convenient services

7 Value-added enabler model

Relevance for transformative market scenarios

Green command and control	*Low*
Regional supergrid	*Medium*
Ultra distributed generation	*High*
Local energy systems	*High*

Description

A value-added enabler leverages its fundamental capacities for information management to expand the role that a utility can provide on behalf of its customers. While many customers seek to gain more control over energy consumption or more choice with respect to energy supply, these customers do not share a uniform desire to always be 'hands-on' in making decisions regarding their energy use patterns. Many customers are 'inert', i.e. they do not easily adapt to the existence of choice or accept the role of 'high touch' in energy management. This is where an incumbent can play a new and valuable role that is difficult for other providers to fulfil. Utilities collect and manage massive amounts of data from two primary sources – system operations and customer load. These data provide insights into energy usage patterns that are valuable to the customer and from sources that a customer cannot access. Thus, the utility has the ability to become a value-added energy manager for customers given the 'customer knowledge' it possesses and the customers' lack of desire to perform these same activities themselves.

Market/model examples

Most utilities have performed value-added roles that are knowledge-based in the past, specifically around energy efficiency programmes or energy management in industrial processes. The level of knowledge-based energy management anticipated in this model, however, dramatically extends the scope and scale of these activities into the mass market to a much deeper level.

Manufacturers such as Honeywell and Mitsubishi are focused on addressing certain control elements, like power monitors and smart thermostats. Others, such as Google Nest, are playing in a similar vein with the objective of providing customers a 'set and forget' experience, leveraging their massive data centres to provide real-time and predictive energy consumption data. This space is relatively wide open to utilities, particularly if they understand how to leverage system and customer data to provide premise and action-based insights and solutions. Utilities may also benefit from constraints on third party data usage under data privacy laws, enabling them to offer solutions or to become a partner of choice for solution providers.

Capabilities

Managing large amounts of data in a manner where insights can be rapidly gleaned to guide customer energy decisions and behaviours will be fundamental to success in this business model. In addition, skills in customer education and decision guidance will be key to delivery of value to the customer. Beyond these analytical and interface capabilities, utilities will need to provide a customer experience where value is readily demonstrated so that customers feel comfortable sourcing their energy decision-making to a utility rather than a non-traditional entrant. Utilities will need to demonstrate to customers that they can keep personal data secure and risks of data leakage are remote.

What utilities should do now

Utilities looking to become a value-added enabler need to harness the data that they already possess and determine how to extract value from this information. These companies will need to invest in additional information technology capacity to support, leverage and protect this data. Customer acceptance of the utility in a non-traditional role will require both a campaign to expand customer awareness and appropriate dialogue with regulators to establish the parameters of the value-added services to be provided.

Maximising competitive position against potential competitive threats

Value-added enabler actions	*Competitor threats addressed*	*Future value-added enabler profitability drivers*
• Build-out 'big data' platforms • Educate customers on energy management options • Design innovative methods for sharing customer benefit • Deploy data synthesis methods and tools • Develop data security protocols • Enter into partnerships with data managers to improve competitive position	• Low-priced/free behind-the-meter devices • Regulatory change preventing utilisation of customer data • Leverage of third-party brand for market entry	• Robust data analytics systems • Pricing mechanisms for performance • Decision tools for customer adoption • High quality data security management systems and protocols

8
Virtual utility model

Relevance for transformative market scenarios

Green command and control	*Low*
Regional supergrid	*Low*
Ultra distributed generation	*High*
Local energy systems	*High*

Description

A virtual utility can aggregate the generation from various distributed systems and act as the intermediary between and with energy markets. A virtual utility can also act as an integrator of non-traditional services provided to customers by third parties, e.g. distributed energy resources outside its traditional service territory. In this model, the utility does not own assets but merely provides integration services on behalf of the supplier, provider or performer. A primary focus of companies in this space is to optimise the sourcing of energy, with respect to costs, sustainability and customer needs, and to manage the distribution system. The virtual utility can also undertake demand-side management functions for commercial and industrial loads and smart residential appliances, to help balance demand and supply, either in the wholesale market or contracting with the TSO or DSOs.

Market/model examples

Markets with high penetration of generation connected at distribution level (Germany, US states of Hawaii and California) or a regulatory setting that offers a high degree of freedom for customer choice (US states of New York or Texas, the UK and Australia) are ideal for the virtual utility model. Island systems and remote systems are also ideal markets for this business model. Utilities may combine distributed generation with their own generation, providing a route to market for independent generators and expanding their own asset portfolios.

Capabilities

A successful virtual utility will be highly efficient at energy sourcing, managing or interfacing with local distribution networks, real-time balancing of demand and supply, and providing intelligent tools for managing customer engagement. Sustainability and increased reliability (back-up power) may be offered as additional products, beyond the traditional reliable and affordable grid power. To develop the additional capabilities, the virtual utility will need to build partnerships with developers, system integrators, energy service/energy savings companies (ESCOs), software/technology vendors and online energy marketplaces.

What utilities should do now

Companies wishing to become virtual utilities should develop an aggregation service offering to small, distributed generators, merchant generators and load reducers. Build capabilities to monitor development of innovative technologies and potential partners to leverage to expand solution offerings for the wholesale market and for balancing services. Additionally, they should determine pricing structures that provide appropriate incentives for the energy providers and a sufficient margin for their own operations. In some markets, utilities should instigate discussions with the regulator to develop and implement appropriate mechanisms to facilitate the new services.

Maximising competitive position against potential competitive threats

Virtual utility actions	*Competitor threats addressed*	*Future virtual utility profitability drivers*
• Participate in distributed generation and storage projects • Develop partnerships with technology-based providers • Increase customer engagement via intelligent tools • Define future roles for incumbents in concert with regulators	• High penetration of non-utility-owned distributed generation and storage systems • Regulatory change enabling retail energy sales • New entrants offering products/services that increase customer engagement in managing their energy needs	• Offer structure and pricing of a wide range of energy products (low cost, high renewables, local generation etc.) • Ability to trade energy (sourcing and consumption) • Partnering with key players across the energy value chain

Where do we go from here?

Utilities may choose from a range of paths to move forward from where they are today. But frankly, business model clarity may be difficult to achieve as a lot of uncertainty exists on how future markets may develop and mature. And multiple models may need to be deployed to meet diverse market needs or specific regulatory structures in various countries, or even jurisdictions. Companies will need to be agile in designing their future business model and recognise that an imperfect view of the future will likely lead to an unfinished product that evolves through time.

Regardless of the business model chosen, utilities need to understand how they can leverage their current business position and the external market to enhance their future competitive positioning. While not always obvious, companies have several levers that can be used to advance their readiness for the future and position themselves for success (see figure 8).

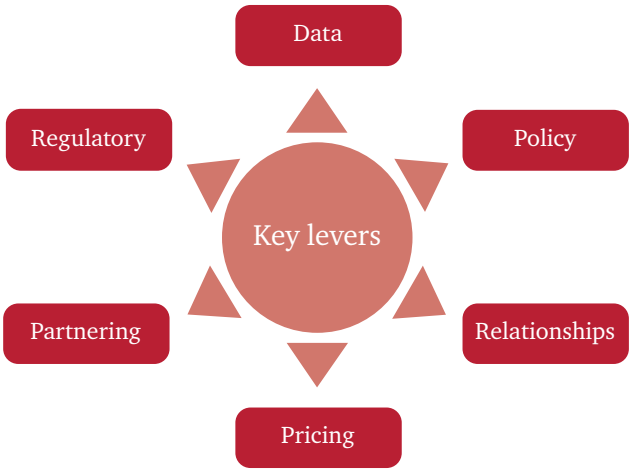
Incumbent companies may not be as nimble or focused as some new entrants. But they have a number of potential advantages with regard to data, policy, relationships, pricing, partnering and regulatory decisions. These can help leverage the successful development of their future business models. At the same time, it's important for companies to recognise that future markets are likely to create networks of participants in new partnerships and collaborations that become a norm of the go-to-market models.

Companies can take advantage of these levers to strengthen their starting point for defining their future roles and for subsequent market participation. For example, utilities already hold large quantities of data that have not been effectively utilised, giving them the opportunity to add value through better utilisation and communication of this data.

Similarly, utilities are a natural collaborator with regulators in the shaping of responsive policies to accomplish public interest objectives, including how to enable customers to achieve greater control and choice. Utilities are also attractive partners to new entrants that wish to offer high-value products but do not wish to support them in the manner customers are used to from their utility.

Utilities will need to determine 'where' it makes sense for them to participate in the future energy market and 'how' they can best position themselves for success. No single business model will be the panacea for utilities. Rather, they will have to be adaptive to the development of the marketplace and the evolution of the connected customer. Just as utilities are unsure of market direction, customers are equally uncertain of what really matters to them in energy decision-making. These gaps between foresight and expectations provide the 'open seas' where utilities can forge new business models that fundamentally reshape the historical relationship with customers and position incumbents for a broader and more value-creating future.

Figure 8: Future business model levers



Data
Ownership of grid and customer information can provide a knowledge platform that enhances the value proposition.

Policy
Mandates and legislation can shape the playing field and enhance the incumbent's ability to compete.

Relationships
The natural interfaces of the incumbent with customers, suppliers, stakeholders and other providers create a natural platform.

Pricing
Shifts in traditional cost-recognition models can provide greater certainty to cost recovery and additional flexibility to rate design.

Partnering
Enhanced creative and delivery capabilities can extend the incumbent's existing platforms and market reach.

Regulatory
Decisions can provide both offensive (exploit) and defensive (preserve) mechanisms to enhance market competitiveness.