

The Energy Customer Transformation

Investing in Platforms and Business Models

BY MACKINNON LAWRENCE AND JAN VRINS



Customer engagement has rocketed up the ranks of priorities for utilities and energy companies in recent years. In our third annual *State and Future of the Power Industry* report (June 2018 issue) in collaboration with *Public Utilities Fortnightly*, customers were the only other critical stakeholder for utilities, besides utility regulatory commissions, ranked at the top of the pack for importance to successfully navigate the industry transformation.

We are in the middle of an energy transformation defined by a wholesale shift away from the centralized hub-and-spoke model toward a network of distributed assets, customers, and value exchanges.

New energy products and services are delivered on customer-centric, digitally enabled platforms, and are generating much greater interactivity among market actors, including prosumers. These are increasingly restructuring power markets into a customer-centric networks of networks. At Navigant, we call this the Energy Cloud.

But how do utilities capitalize on this paradigm shift effectively when specific demands and preferences vary so wildly among customers? For residential customers, cost savings and reliability needs may look very different than they would to operators of data centers, large retail stores, or owners of EV fleets.

More importantly, how can utilities engage customers to deliver additional value when overall load growth has remained mostly stagnant in recent years? At the same time, more sophistication in client interaction is required due to higher levels of distributed energy resources (DER) and renewables as well as changing load shapes.

We are merely in the first phase of this transformation today. The opportunities to establish a competitive position in an increasingly crowded energy supply marketplace are many.

Meanwhile, technological innovation, new products and services enabled by digitization, and the rapid rise of electrification (transportation, buildings, industries) have unleashed a barrage of business model innovation. This is rewriting the rules for how electricity is generated and consumed well into the future.

The resulting utility customer ecosystem will be increasingly clean, intelligent, mobile, and distributed. According to more than half of respondents to our *State and Future of the Power Industry* survey, the power industry needs to adapt quickly as the customer value proposition continues to evolve with implications for everything from regulation to utility operations.

Capitalizing on these opportunities means recalibrating products and services to meet shifting customer value attributes, using new technologies and data, and bridging the two with business models that deliver new energy (and non-energy) solutions. The focus increasingly is on facilitating new Energy Cloud platforms with the flexibility to accommodate a rich ecosystem of stakeholders transacting across the network.

Value Shifts to the Edge of the Grid

The primary instigator of today's industry change is an

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unprecedented adoption of DER. According to Navigant Research, new DER deployments are already significantly outpacing new centralized generation capacity (thirty gigawatts of DER capacity globally versus just nineteen gigawatts of new centralized generation capacity in 2017). From solar PV to traditional generator sets, microgrids to hybrid solutions (solar plus storage), demand-side management to EV charging load, the DER ecosystem is composed of a diverse array of modular and variable solutions.

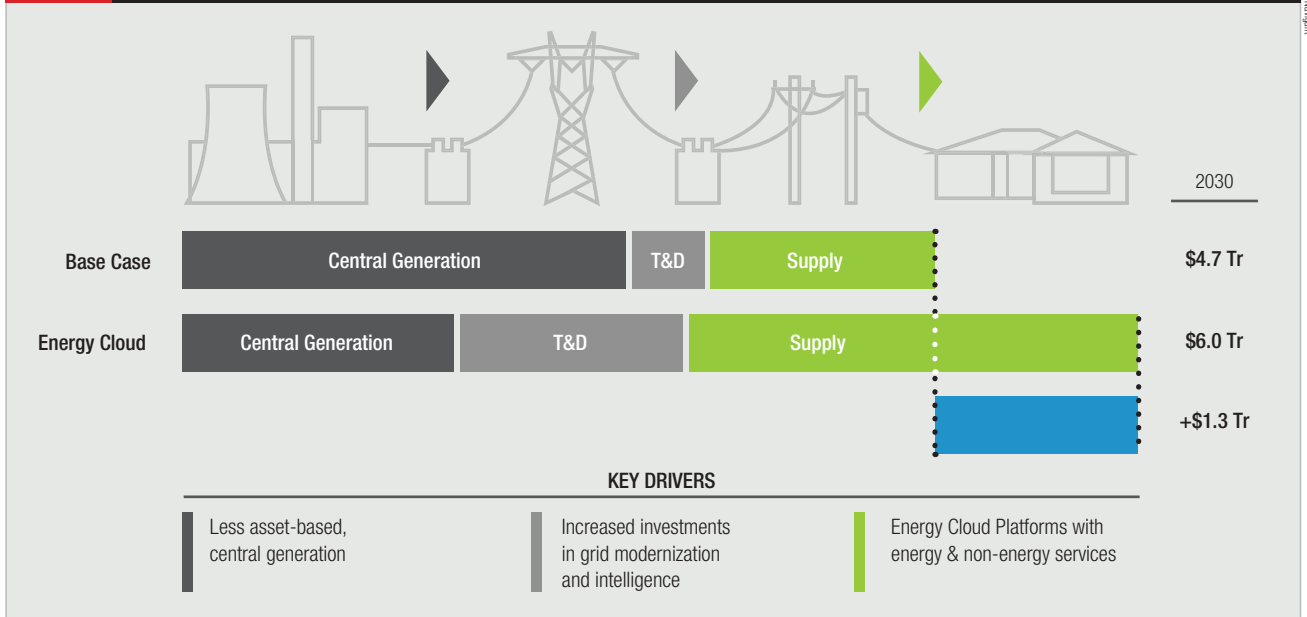
Of these, EV charging load is the most disruptive DER today requiring a different customer interface than standard utility service. At the same time, despite being distributed and mobile, EV charging load offers utilities the most attractive revenue growth potential going forward among DER.

When nearly four hundred industry stakeholders were asked which area among a dozen offered utilities the best opportunity to grow revenue and extend customer value, eighty-two percent selected electrification of transportation, the consensus pick. Electrification of transportation also ranked first among a dozen areas as offering the best way for utilities to prepare their organization for sustained future growth.

Our industry outlook supports this view. Navigant Research expects six terawatt-hours of U.S. EV charging load consumption by 2020. The U.S. charging services market is expected to reach at least a billion dollars in value. We also see electrification of

FIG. 1**VALUE SHIFT PROJECTION IN THE ENERGY CLOUD**

Source: Navigant



buildings (heating) and energy intensive industries (chemicals, mining, oil and gas) as new pathways for new load growth.

In addition to the promise of electrification, DER remains a disruptive threat for the traditional utility business on many levels. Combining both new demand from electrification and demand reduction associated with other DER, a fifty percent reduction in centralized generation demand by 2030 is not out of the question according to Navigant Research estimates.

The ripple effects caused by a fifty percent reduction in demand for centralized generation would be broadly felt, further undermining the financial viability of the cost-of-service business model that is dominant today.

toward the retail segment of the utility value chain. According to Navigant, at least one trillion dollars-worth of investment in new technology infrastructure, enabling technologies, and services are expected in 2030 across the supply segment of the utility value chain.

See Figure One.

Rethinking Customer Value

Gone are the days of the monolithic ratepayer. With DER growth, digitization, and electrification, the grid center of gravity continues to shift decidedly downstream. The result will be a far more dynamic and fragmented customer ecosystem.

From demand-side management to solar PV to intelligent behind-the-meter devices, energy customers have shown growing interest in controlling their electricity usage and spend, as well as when and what type of power they buy. The result is a customer base that is becoming more proactive, demanding more choice, and expecting more tailoring of services.

At the same time, today's customers are demanding more from their energy provider beyond electricity service. A growing percentage of utility customers are already intimately familiar with customer-centric business models offering



Good or bad, utilities are feeling the impact more acutely. Many are responding with investments in solutions that extend the traditional utility's solution portfolio.

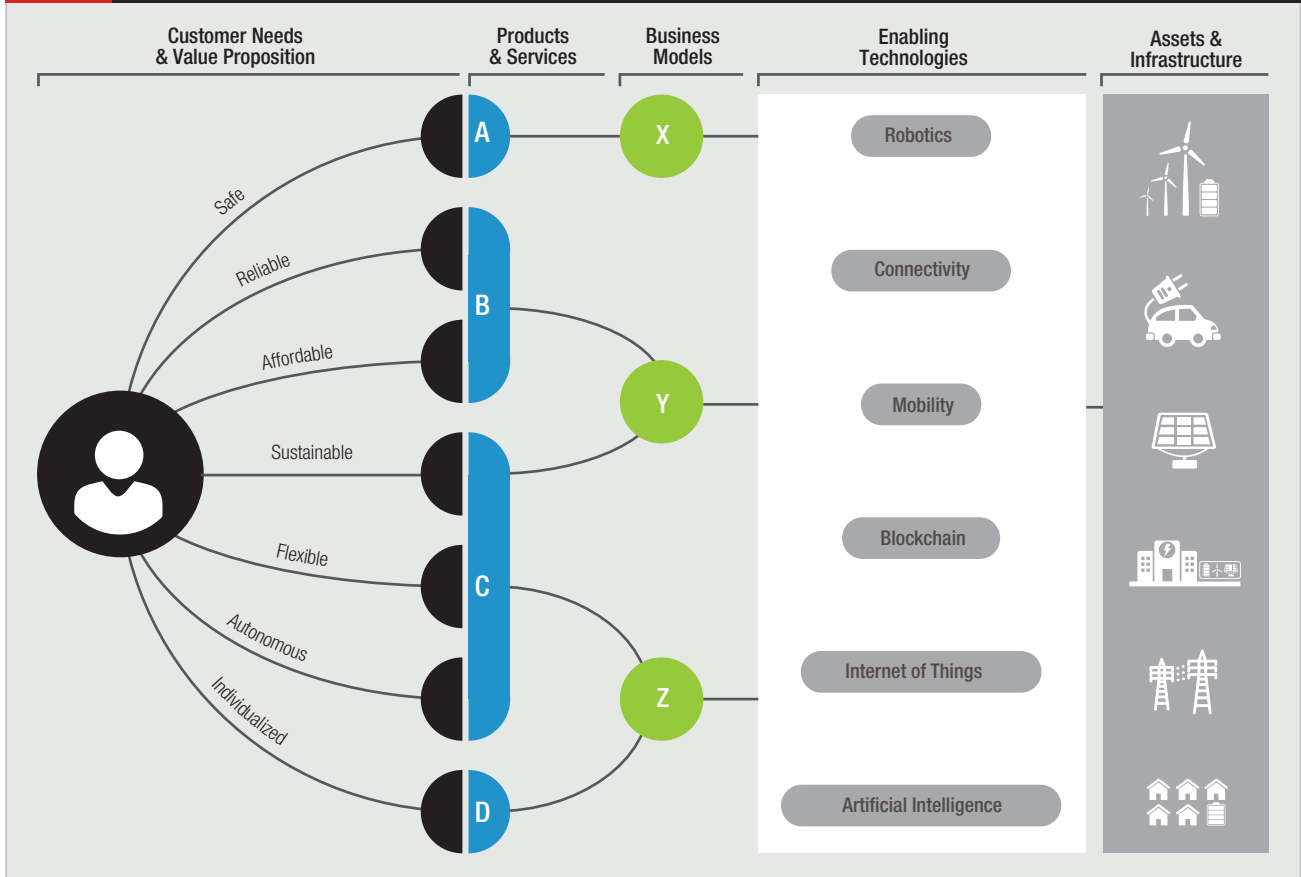
The result is a significant shift in value creation downstream

ing lifestyle solutions enabled through social and digital networks.

Amazon, Facebook, and Uber have all redefined how products and services can be accessed while also delivering an ecosystem of value-add services. First-time utility customers grew up with

FIG. 2

THE ENERGY CLOUD PLATFORM VALUE CREATION MODEL



the tools to manage engagement with their physical and digital worlds at their fingertips and will expect greater lifestyle integration from their energy providers.

As our industry survey shows, customer access to new energy and non-energy offerings was ranked at the top among several disruptive threats to the traditional utility business model.

Customer engagement patterns are shifting as well.

Similar to the financial industry in which three to four average customer touchpoints per month in the pre-digital era have increased to fifteen to twenty touchpoints per month in the post-digital era, the days of a once-a-month electricity bill are numbered. Ongoing conversations and numerous points of contact between utilities and customers are increasingly the norm.

From online, mobile, and social networks, changing tools for engagement enable multiple channels to reach customers. Customer engagement through strategies like smart energy technologies, energy disaggregation, and gamification of energy savings will blossom into a billion-dollar market by 2030. Coupled with visibility into real-time prices, improved customer engagement can increase loyalty and stickiness across the network.

Like their utility suppliers, commercial and industrial customers are facing similar pressures to keep pace with sustainable, innovative, and customer-centric business models. In turn, they are looking to their power supply to help deliver their

sustainability goals as they target further reductions to their carbon footprint and long-term climate risks.

Amazon, Whole Foods (now owned by Amazon), Google, Honda, Walmart, and other large energy buyers are establishing grid-independent (perhaps connected) sustainable energy solutions across their building portfolios. Led by Ikea and Apple, C&I prosumers could eventually gain access to wholesale markets in order to sell overcapacity renewables.

To stay competitive, energy companies and utilities will need to move beyond business models that cater to monolithic customer classes and embrace agile innovation strategies. This requires rethinking the conventional value attributes of service.

Safety, reliability, and affordability are no longer sufficient to retain customer loyalty. In an increasingly competitive market, organizations will also need to deliver sustainability, flexibility, autonomy, and individualization in their solutions to set themselves apart from competition.

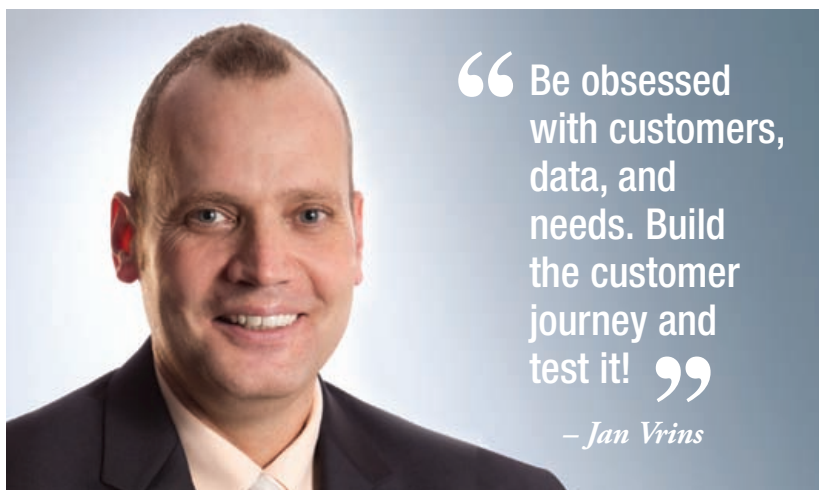
Investing in Energy Cloud Customer Platforms

Achieving customer centricity may start with recalibrating to an expanding value proposition, but innovative business models are the bridge that connects new products and services with assets and enabling technologies.

See Figure Two.

Among emerging business models in energy, those that share the characteristics of network orchestrator have attracted the most interest in recent years. Underscoring this point, a third of respondents to the State and Future of the Power Industry survey selected network orchestrator as the business model that utilities should pursue to remain competitive (the leading answer).

Network orchestrators deliver value through a combination of digital connectivity and relationships or network capital. Across the broader economy, network orchestrators generally own less assets, and instead, leverage digital connectivity to aggregate and leverage privately- or publicly-owned infrastructure for use by a network of participants.



Participants interact or transact directly for products, to build relationships, share advice, collaborate, and more. Network orchestrators generally deliver faster growth and maintain higher margins than asset, service, and technology provider business models.

In the power industry, the network orchestrator model uses improved connectivity across the Energy Cloud, harnessing enabling technologies to unlock value across a vast interconnected network of assets (such as DER).

Seven emerging Energy Cloud platforms are ripe for network orchestration in the power industry today. Examples such as integrated DER, transportation-to-grid, and smart cities describe emerging nodes of technology convergence, innovation, and digital connectivity across the distributed energy landscape.

Absorbing an increasing percentage of power flow across the grid, emerging customer-centric Energy Cloud platforms will see hundreds of billions spent in asset and services deployments, leading to a sharp increase in electric, services, and data transactions. Unlocking deep value through aggregation and controllability of these assets will be a hotly contested area in the years to come.

In sharp contrast to the linear model in place today in which electricity is delivered from centralized generation in

radial fashion to single-point end-customers, multidirectional interactivity and multi-stakeholder transactions will define the Energy Cloud era.

To capture value, utilities should start with their customer networks. Put the customer at the center of everything you do. Put technology in their hands. Use digital connectivity to enable interaction with an eye toward building value through relationships and connections.

Today's most profitable organizations are less a collection of resources and capabilities than a set of platforms. Value is increasingly created through the stickiness of a platform and integrated solutions rather than individual products.

Actors may play one or several roles across platforms, but those actors that control or facilitate the platform have greater opportunities to scale their business rapidly. In turn, these actors are more likely to insulate themselves from competition (and disruption).

Taking the Next Step

Billions of smart meters, smart thermostats, and smart devices are in operation and laying the groundwork for an Internet of Things revolution behind-the-meter. Solar PV and distributed storage costs continue to plummet and will be among the lowest cost sources of power within the decade.

Over a million EVs roam the streets globally, a number expected to more than double year over year. Take stock of the context in which your business operates today.

Imagine a world in which over fourteen thousand gigawatts of cumulative DER capacity is installed globally over the next two decades, at least one and half times as much as centralized generation.

Imagine each asset coupled with sensors, communications capabilities, and distributed computing capabilities, each connected resource, device, and node producing a torrent of data. Putting this data to work, utilities can provide better services to their customers, offer new products and services through sophisticated insights, and improve the operations of the grid.

Today, the viability of an economies of scale, steel-in-the-ground, one-way delivery model is fading. In its place, a highly distributed, networked, dynamic, and in some respects, more virtual energy ecosystem is emerging in which performance and choice command a premium.

How best to pursue these new energy opportunities, and more importantly, embrace agile innovation principles to capture new value streams? How best to adapt a model originally designed to deliver universal access to electricity? These are the exciting challenges facing the utility industry today.

Navigating the energy transformation will require executive commitment, a shift in mindset, innovation leadership, and people who have done this before in other industries. Bring them into your teams.

Really understand what your customers want and develop business models supported by new Energy Cloud platforms where the value is stacked to a broader client need, and does not depend on one individual product, service, or technology.

Finally, recalibrate your strategy, planning, and decision-

making to evolving customer value attributes. Be obsessed with customers, data, and needs. Build the customer journey and test it! Be relentless in building and leveraging new products and solutions for the emerging clean, intelligent, mobile, and distributed grid of the future.

Ultimately, the energy customer transformation will require a willingness to invest in platforms and business models that may ultimately cannibalize the existing utility business as we know it today. **PUF**

TEMPIO VOLTIANO

Alessandro Volta was born in Como, Italy and the Tempio Voltiano pictured here is a museum dedicated to him on Lake Como. Volta invented the first electric battery, the voltaic pile, arising from a scientific dispute with Luigi Galvani. Galvani experimented with frogs' legs and believed he had discovered a new form of "animal electricity," because he observed that the muscles of the dissected legs mounted on iron or brass hooks twitched when touched with another metal or hanged in an electric storm. Volta set out to disprove Galvani. Volta created the voltaic pile, alternating silver (or copper) and zinc discs stacked in brine, imitating the electric organ of the torpedo fish. He had produced the first sustainable source of electric current. Volta presented his invention in 1801 in Paris. It was a huge success and Napoleon Bonaparte showered Volta with gifts, including an appointment as count. Volta died in 1827 and in 1881 the term volt was officially adopted to designate the unit of electric potential and electromotive force.

Tempio Voltiano was featured on the back of the ten thousand lire bank note, with Volta's portrait on the front, prior to being replaced with the Euro. Galvani's animal electricity was the inspiration for Mary Shelley's Frankenstein.

