

Building the utility of the future starts with customer focus

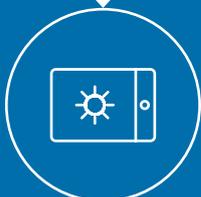
Competitive pressures and business model erosion are forcing utilities to reinvent themselves to stay relevant



A day in the life of a prosumer



The smartphone alarm goes off at 6 a.m. in the suburban home of a woman we'll call "Jo." As the sun rises in the sky, her rooftop solar panels start producing electricity and recharging her energy storage panel in the garage. Jo glances at her smartphone to check energy usage at her elderly mother's house across town to make sure all is as it should be, with alerts set to let her know if that changes. She loads her clothes into the washer, which is programmed to run during her peak solar production later in the afternoon. She then heads for the bathroom to shower and get ready for work, knowing that the water she uses will be reclaimed for local irrigation at a centralized community treatment plant.



On her way out the door, she receives an alert on her phone from the local utility letting her know that hot, humid weather today is driving high electricity demand and the utility will pay her a rebate for using less energy. With the push of a button on her smartphone, she agrees to participate in the load reduction event, which will automatically set her smart thermostat back in the afternoon when no one is at the house. The security system at her house is activated as she backs out the driveway and she sees the insulated cellular shades on her front windows close automatically to keep the house cool.



As she arrives at work, Jo is directed by an app on her phone to an open parking spot with a charging station for her electric vehicle. She plugs in the vehicle, which is programmed to charge during the lowest cost period of the day, with all EV charging costs appearing on her consolidated utility bill. Later in the morning at her home, the washer begins running on solar energy from her rooftop and her smart thermostat sets itself back six degrees to take advantage of the utility's load reduction program rebate. She receives a message that her home battery is fully charged, and her washer is running off her rooftop solar.



Her home, despite warm weather, is running on virtually zero net energy. At the end of the day, Jo packs up, leaves the office and gets into her fully charged electric vehicle for the drive home. The smart meter at Jo's house retrieves her location information to calculate her estimated time of arrival so that her home automation platform transitions her systems and appliances to "at home" status. Upon arrival at home, Jo checks her energy dashboard to see energy production versus consumption; data disaggregation from the smart appliances; savings from participation in the demand response event; energy and water consumption compared to neighbors; and a calculation of her overall savings for the day and month thus far.



That evening she receives an email from a smart appliance manufacturer warning her that the load shape of one of her appliances and the amount of reactive power it's drawing indicates the motor will likely fail soon, and that a service call should be scheduled, while an RF identification tag on a food item in her refrigerator alerts her that an expiration date is approaching. Because she already did her laundry, Jo also activates a transactive energy app on her smartphone to sell her excess solar generation to neighbors in her cul-de-sac the next day using a local power pool app running on a blockchain in her smart meter.

From energy efficiency to water conservation, the smart, connected home creates both competitive threats and new business opportunities for utilities in resource management and value-added services.

Utilities must become customer-obsessed

Jo is using technology to gain convenience, comfort, safety and security, while also saving money and contributing to a more sustainable future. And the technologies to do all that's described above and much more, are readily available today. Microsoft Co-Founder Bill Gates once observed that "We always overestimate the change that will occur in the next 2 years and underestimate the change that will occur in the next 10."

From telecom to banking to retail, this axiom has played out time after time in industries, organizations and even nation states. Technology and innovation have fundamentally disrupted long-standing business models and practices in ways we never thought of 10 or 20 years ago. These developments pose especially challenging questions for utilities that are working to define long-term growth strategies in a market of flat or even declining energy sales.

NRG's new service as described in the *Thinking Outside the Box* vignette is just one tangible example of how utilities can reinvent themselves to remain relevant, viable, and maintain their valuable customer franchises in the face of significant disruptive change. These challenges include the growth of distributed power generation; the increasingly

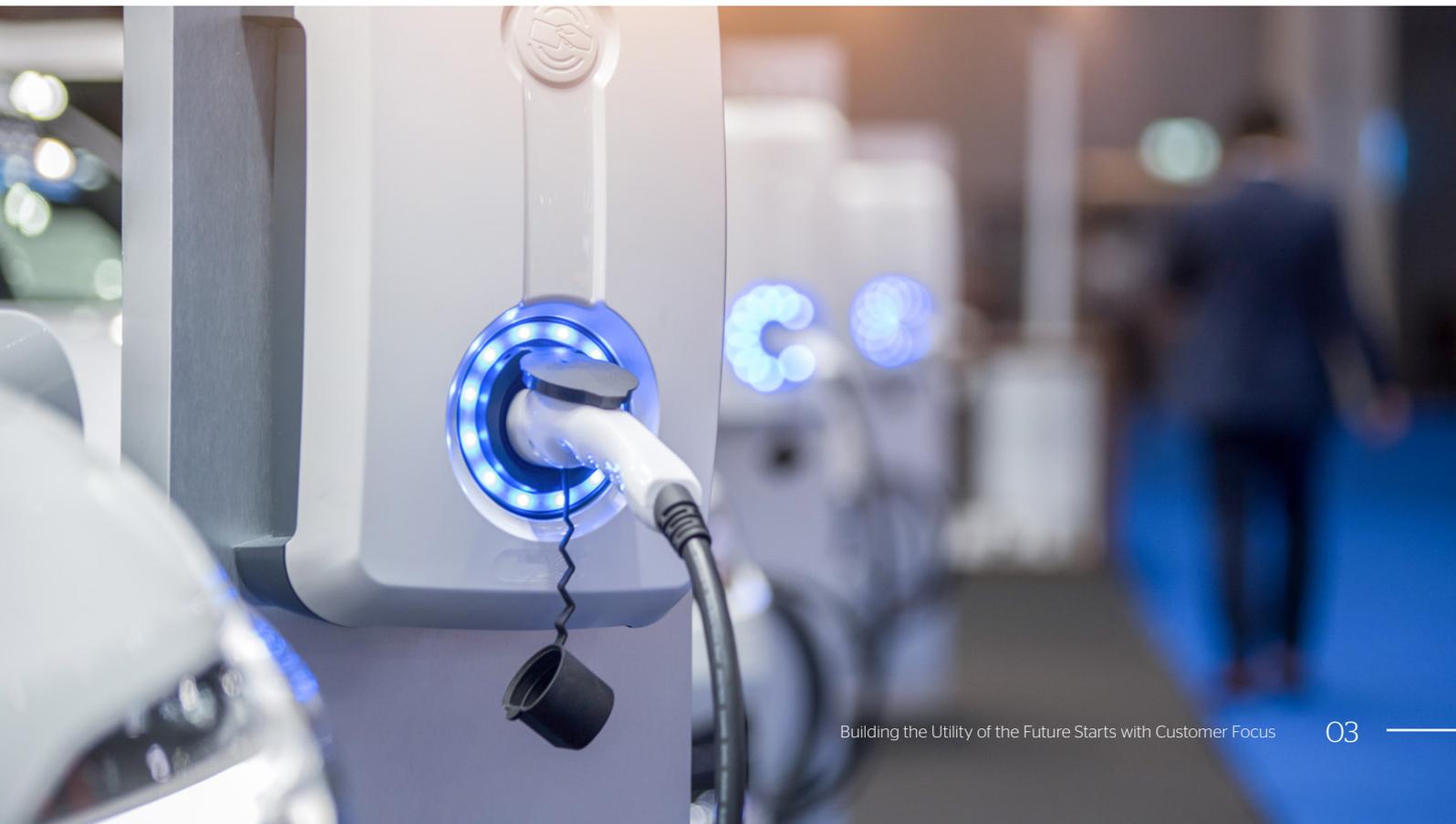
challenging economics of traditional power generation; integrating Distributed Energy Resources (DERs) into the power grid; meeting increased customer expectations; and driving regulatory change to create a business environment conducive to the transformation these business challenges require. In other words, how do we change these threats into opportunities?

While business conditions and drivers can vary from region to region, the industry consensus is that utilities must evolve well beyond their historic, regulated mandate of providing electricity in a safe, reliable and cost-effective manner to leverage their position as incumbents to deliver new value to customers as a trusted energy advisor. Instead of just selling kilowatt hours, progressive utilities are positioning themselves to offer value-added services that deliver comfort, convenience, reliability, sustainability and especially, energy cost savings.

Success in this transformation requires utilities to take a page out of the Amazon playbook and become "customer-obsessed," anticipating wants and desires, both stated and unstated. It's a future that includes cleaner DERs and more connected and personalized relationships with customers.

Thinking Outside the Box

NRG, an energy company, offers Go Stations in airports, convention centers and on university campuses. Customers can rent a portable charger, take it with them, charge their smartphone or laptop and return it afterward, all enabled by a near-frictionless customer experience at a sleek vending kiosk. If customers forget to return it, or decide to keep the charging pack, they're charged for purchasing the product. It's portable, mobile, distributed energy that meets a key customer need. It delivers new value to customers, builds brand identity, and provides a higher margin product/service for NRG.



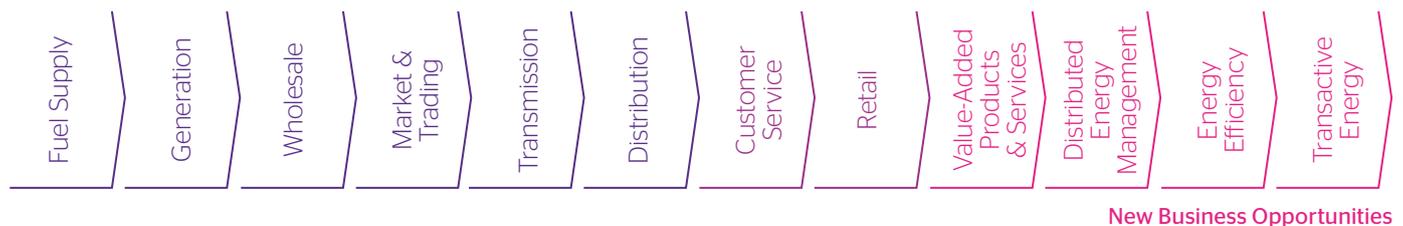
Technology drives transformation

In particular, the maturation and integration of artificial intelligence, machine learning and distributed/cloud computing into so many product categories are substantially lowering the barriers and costs for utilities to leverage these technologies to drive their transformation and long-term growth strategies. What's more, these technologies can now be scaled and applied across platforms to streamline merger and acquisition integration, to realize synergies, and to bring new products and services to market.

The rapid development and current piloting of blockchain as a key tool to enable a local, transactive energy marketplace is a great example of progressive utilities combining their domain expertise in energy trading and grid operations with new technology to create new opportunities for higher-margin products and services for their customers. As utilities look beyond the pilot phase for blockchain-enabled energy trading they will leverage the technology to support applications to manage EV charging, renewable energy credits and other new products and services critical to a transactive energy marketplace.

As we see from a day-in-the-life snapshot from Jo, the toolbox has plenty of technology in it to make this customer-centered vision a reality. It includes distributed generation; energy storage; electric vehicles; microgrids; smart meters, thermostats and appliances; home energy management systems; and programmatic tools such as time-variant pricing, demand response programs and energy efficiency.

Current Utility Business Models



Enabled by new technologies such as machine learning, artificial intelligence and distributed computing, forward-thinking utilities are implementing long-term growth strategies that extend beyond their traditional role of providing safe, reliable and affordable energy.



Operationalize smart asset management

There's a strong argument to be made that the greatest value potential for utilities within this increasingly diverse and distributed ecosystem of energy technologies lies in the intelligent management and coordination of these assets to optimize their effectiveness. In addition to delivering new value to the customer, this broader view also enables the utility to run a more reliable and efficient power grid, integrate more clean energy into the resource mix, and get more productivity and longer life from its assets.

For example, we know that installing rooftop solar can create problems or solve problems on the grid depending on the location. The ability to shave and/or shift peak load, whether through time-variant pricing or utilizing DERs, can deliver significant cost benefits by reducing dependence on peaking plants and costly spinning reserve. The ability to create and manage a local power pool to utilize excess solar generation can also protect transformers from overload and failure. In other words, embracing the customer as a partner in creating new value delivers benefits that ripple throughout the grid and all the way to the power plant. That's how utilities can monetize this opportunity to its fullest.

Thinking Outside the Box

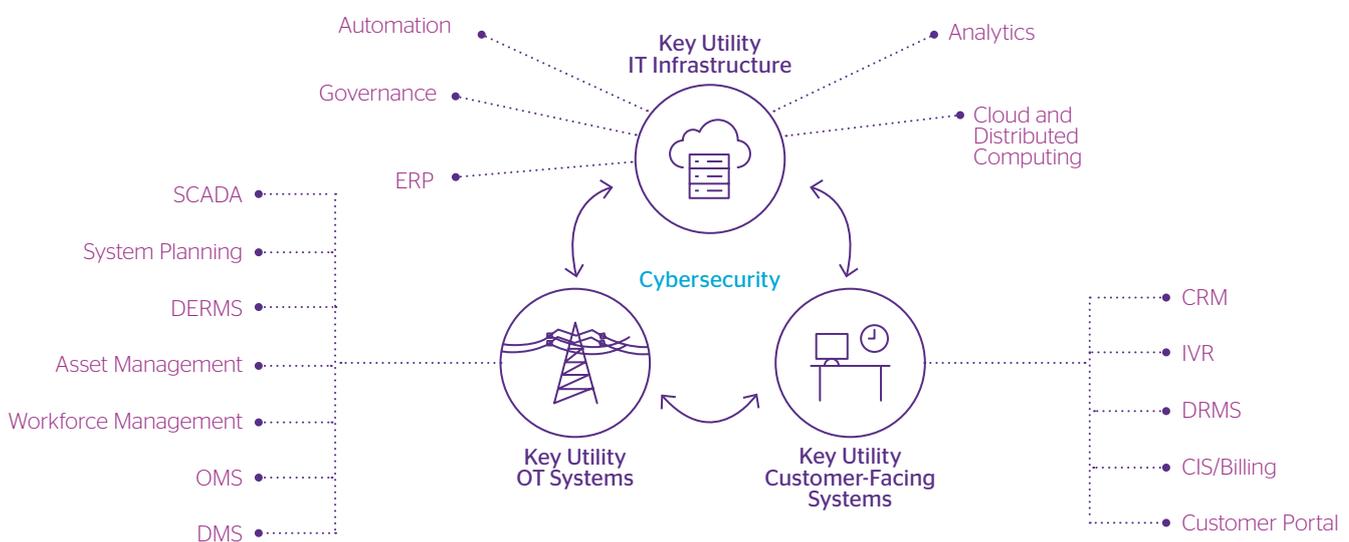
With one of the highest electric vehicle adoption rates in the country, San Diego Gas & Electric is implementing an ambitious program called "Power Your Drive" to expand electric vehicle charging infrastructure throughout the San Diego area. The program is innovative in two key ways. First, by providing discounted pricing, and in some cases no out-of-pocket charges for charging equipment, the program is expanding charging infrastructure for not only commercial properties but for multi-family housing as well, including economically disadvantaged neighborhoods. Second, the program also incorporates innovative time-of-use billing to incentivize charging during times of low energy demand and/or high clean energy production.

The move to customer centricity

As we saw with Jo and her smart home and lifestyle, delivering convenience, simplicity and clear value is the key to increasing adoption and creating loyal customers. On average, customers spend less than 10 minutes per year engaged with their utility and that's usually to report a power outage or complain about a high bill. Most utility executives believe their companies deliver a good customer experience. However, when surveyed, less than 1 in 10 customers agree with that assessment.

Creating new value for customers and capitalizing on new business opportunities require timely analysis of data from both operational and information technology systems, enabling utilities to optimize their use of DERs and control systems in response to rapidly changing grid and market conditions.

Integrating IT and OT Systems for Prosumer Enablement



Customer obsession begins with data

To close that gap, and to develop a long-term growth strategy for this new and challenging business environment, it's critical for utilities to develop a business plan and supporting technology roadmap that enable and empower "prosumers" with a seamless, low-friction experience.

That means investing in consumer engagement and analytics platforms capable of segmenting the customer population, leveraging valuable data from other systems (CRM, CIS, DRMS, EAM, Billing etc.) thereby enabling the utility to better understand its customers' needs and make the right offer at the right time, through the right channel. When executed effectively, this customer-centric strategy creates a new and virtuous

circle, referred to as a "customer experience multiplier," with multiple touchpoints and opportunities that drive new sales, customer loyalty and increased profitability.

But as the example of Jo shows us, the future is now. And the clock is ticking while competitive pressures mount. Utilities, with their incumbent positions and their large and increasingly converged OT and IT networks delivering loads of valuable data, are actually leaders in the IoT movement and in an enviable position to lead and reap the benefits from the digital energy revolution. Utilities are also strong contenders to lead the smart city movement, with smart energy and water providing the foundation.

Thinking Outside the Box

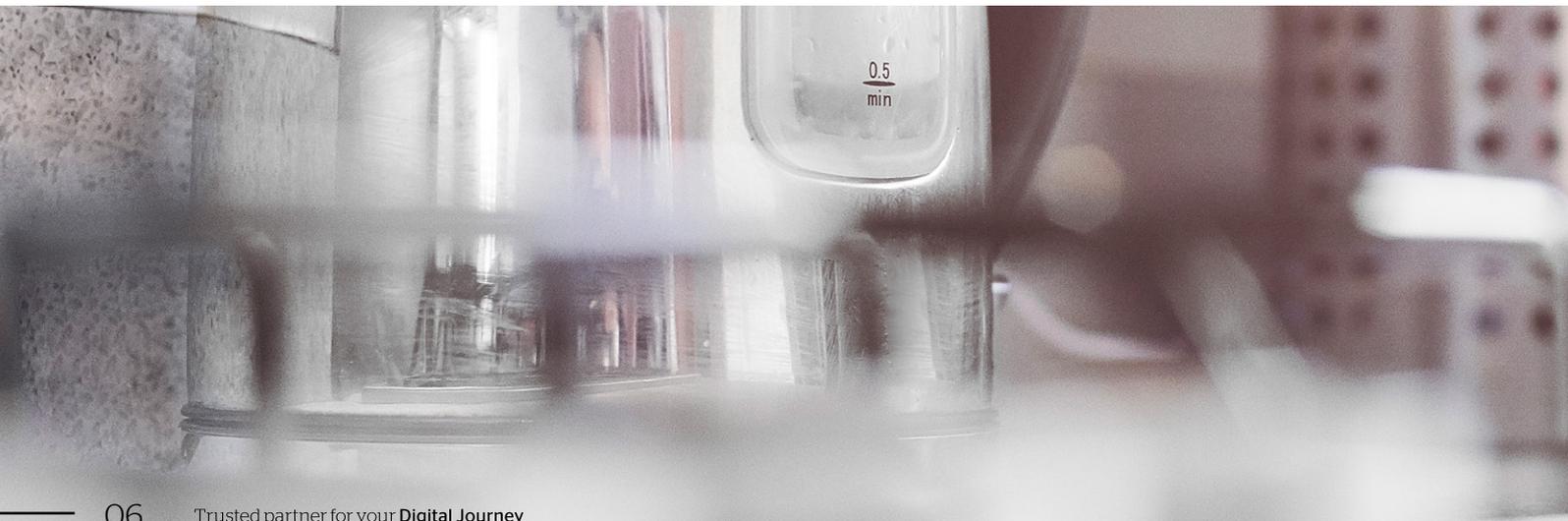
In its annual issue of the World's Most Innovative Companies, Fast Company magazine highlights one U.S. utility in its energy sector listing that actually helps its customers cut the power cord to the utility. Green Mountain Power, (GMP) headquartered in Vermont, actually helps its customers go "off the grid" by providing energy audits and delivering solar and energy storage technology for a flat monthly fee. For customers who want to stay connected to the grid as a backup, GMP offers a hybrid program that provides distributed generation and storage at the customer site, but adds "reliability as a service" for a fee. The upside for the utility is that with all these distributed energy resources in place, GMP is less dependent on costly, higher carbon-generating resources during times of peak demand.

Four principles of success

Transforming the customer experience is key to capitalizing on this opportunity. Customers are no longer passive ratepayers; they're seeking a more personalized experience that delivers clear value. Many want to optimize their energy consumption and costs, generate their own electricity, and reduce carbon emissions or contribute to other sustainability outcomes.

One of the key execution challenges utilities face is bringing legacy technologies forward into the digital age and stitching together the systems to deliver the data that enables a robust customer engagement platform and empowers the prosumer experience. At Atos, we see four core principles that are critical to success:

- Become wholly prosumer-centric, delivering 360° personalized services to customers and, in the future, smart devices.
- Provide intelligent, data-driven orchestration, enabling adaptation to market changes and evolving customer demands with a real-time, prescriptive approach.
- Adopt open platform foundations and real-time process automation to provide the best utility services at the lowest cost all while being ready to adapt or launch offerings.
- Implement a holistic cybersecurity strategy that spans the IoT, IT systems and retrofitting current grid OT.



Cybersecurity is critical in the prosumer era

The importance of cybersecurity in this transformation cannot be overstated. There will be hundreds of millions of intelligent connected devices ranging from utility smart meters and other grid devices to consumer-owned devices such as EVs, DERs, smart appliances and home energy management systems that provide potential new vectors for cyberattacks on the power grid. As the number of consumer-owned devices continues to grow, the digital prosumer will become an unintentional participant in exposing weaknesses in the grid and widening the surface area for potential cyberattacks.

These connected devices and assets raise the specter of malicious actors "weaponizing" energy demand by manipulating high-wattage appliances to create load spikes and supply-demand imbalances that could cause power quality issues and equipment failures on the distribution system or even cascading grid failures on a broader scale. Reinforcing OT security to monitor and secure these expanded areas of vulnerability is critical, especially as the likelihood of state-sponsored attacks such as Stuxnet, Black Energy and Industroyer is expected to continue.

Refocus on new technologies and customer service

There's no one-stop shop here. Success in this critical endeavor requires an ecosystem of capable partners, unified by a customer-centric vision and an ability to apply both utility domain expertise with innovations from other industries. It is not a destination but rather a continuing journey.

Jo's smart house and connected lifestyle didn't arrive all at once in a package on her doorstep, but rather in an incremental evolution made possible by innovative technology providers that took the steps to understand her needs and deliver solutions to meet those needs. It's a fundamental, time-honored formula for business success that seems so prosaic. But for utilities defining growth strategy in today's energy marketplace, leveraging new technologies while sharpening customer focus is job one.



About Atos

Atos is a global leader in digital transformation with 120,000 employees in 73 countries and annual revenue of € 13 billion. European number one in Cloud, Cybersecurity and High-Performance Computing, the Group provides end-to-end Orchestrated Hybrid Cloud, Big Data, Business Applications and Digital Workplace solutions through its Digital Transformation Factory, as well as transactional services through Worldline, the European leader in the payment industry. With its cutting-edge technologies and industry knowledge, Atos supports the digital transformation of its clients across all business sectors. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and operates under the brands Atos, Atos Syntel, Unify and Worldline. Atos is listed on the CAC40 Paris stock index.

Find out more about us
atos.net

Let's start a discussion together



For more information about Atos solutions for energy and utility companies, please visit:
<https://pages.atos.net/digital-utility/>
or email us at: info.na@atos.net

All trademarks are the property of their respective owners. Atos, the Atos logo, Atos Codex, Atos Consulting, Atos Worldgrid, Bull, Canopy, equensWorldline, Unify, Worldline and Zero Email are registered trademarks of the Atos group. Atos reserves the right to modify this document at any time without notice. Some offerings or parts of offerings described in this document may not be available locally. Please contact your local Atos office for information regarding the offerings available in your country. This document does not represent a contractual commitment. October 2018. © 2018 Atos