

How utilities are reinventing themselves

By Ganesh Kalyanaraman

Customers share a bittersweet relationship with the utilities. While they want the lights to come on at the flick of a switch, they often do not have a clear realisation of what happens behind the scene. Most customers tend to picture their utility as a coal-devouring, smoke-spewing unit, indifferent to the environment and technology shifts. Contrast this with an organisation that presents a picture of clean energy, optimal efficiency and rapid technology adoption; so much so that it becomes a veritable benchmark for the other sectors. That is how utilities could surprise their customers in the future. Here are the five aces that utilities have up their sleeve.

'Things' on the grid: The Internet of Things (IoT) is growing rapidly and utilities are one of the faster adopters. Many 'things', such as transmission and distribution line sensors, intelligent electronic devices (microprocessor-based controllers of power system equipment, such as circuit breakers, transformers and

capacitor banks), storage for bulk transmission wholesale services and phasor measurement units (PMUs) reside at the edge of the grid, collect critical information and transmit it back over advanced low latency wide area measurement systems (WAMS) for supervisory control and data acquisition systems (SCADA) to process.

Together, they provide grid operators advanced capabilities such as faster than real-time control and monitoring of assets, network simulation, improved load modeling, forecasting tools, probabilistic vulnerability assessment and enhanced visualisation required for a highly safe, secure and reliable grid. As it turns out, advancements in drone, robotic, automation and artificial intelligence (AI) technologies could not have come at a better time.

Virtual power plants: Virtual power plants (VPP) are small distributed power stations such as wind farms, combined heat and power (CHP) units, photovoltaic systems and small hydropower plants. These are aggregated

through advanced sensor and communication technologies with a control and visualisation platform at the control centre and are utilised to curtail peak loads. This, along with smart grid investments, is revolutionising the way utilities are thinking about distribution operations. VPPs provide efficient ways to include demand response, distribution generation or even the ability to localise demand response to address grid-specific issues. Utilities will increasingly rely on this concept to augment capacity in the future. This promises to fully realise the customers' potential on the grid.

Alternative generation: Globally, 147 GW of renewable generation came online in 2015 - the largest annual addition ever. More than twice as much money was spent on renewables than on coal and gas powered generation (\$130 billion in 2015). Utilities are also experimenting with several exciting technologies to move away from over dependence on fossil fuels such as storing concentrated solar energy as molten salt and using the stored heat to create steam and generate electricity; tapping into the earth's internal heat that can possibly generate 10 times as much power as conventional geothermal energy plants; generating methane from bio waste with the help of microbes. Utilities are indeed spearheading the charge towards a cleaner and sustainable energy future.

Elevated consumer engagement: Expect utilities to ride the consumer electronics wave (connected appliances, home automation solutions, smart home building technologies and so on) to deliver consumer engagement levels typically associated with industries such as banking and retail. With technology-enabled 'intimacy', instead of customers picking suitable services, utilities will offer tailored solutions/

services such as electric vehicle (EV) charging plans and energy services such as renewable generation, storage solutions and so on. In future, the 'omni-connected' relationship between utilities and customers may even negate traditional engagement channels such as call centres.

New business models: Envision the ability to transact electricity at a community level with your neighbours or the ability to use or lend your capacity to generate for greater grid optimisation, get better ROI on investments with grid utility and build a collaborative as against a transactional relationship with your utility. Your utility would make this possible and compensate you based on the true utility of your contribution to the larger grid operation.

The future would be significantly different, not just in the way we perceive utilities, but also in the way we transact with them and consume their services. Utilities would be a major force in shaping a collaborative ecosystem and driving environmental leadership, becoming rightful exemplars of high safety standards and technology-enabled efficiency.



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