

# Utility Transformation in The Age of Resiliency, Business Continuity, Gray Rhinos

Decentralization, Digitization,  
and Decarbonization

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he utility as we know it will soon cease to exist. With the industry at the beginning of a massive digital transformation, utilities will become more dependent on technology and data to drive value, manage the grid, and enable decision making.

The future belongs to full-service providers that orchestrate an ever more complex, clean, distributed, mobile, and intelligent energy system. These organizations must do so while maximizing safety, reliability, and affordability. These are the key takeaways from Guidehouse (formerly Navigant) and Public Utility Fortnightly’s fifth annual “State and Future of the Power Industry report.”

No forward-looking discussion of the utility industry is complete without acknowledging that the coronavirus outbreak has ripped the rug out from under business-as-usual thinking. The pandemic has turned our collective eye toward business continuity planning and raised new questions about the role of technology in serving customers, maintaining operations, and keeping people safe.

Coupled with an energy transformation already underway, utilities need to approach the energy industry and its associated infrastructure differently, operating with agility, and relentlessly innovating.

While risk mitigation and adaptation are central to these efforts, the current pandemic is unique in its acute, short-term disruptive impact, and in its far-reaching implications on long-term investments. There is simply no blueprint.

### Prepare for More Complexity

Even before the coronavirus outbreak turned the global economy on its head, the Fourth Industrial Revolution – along with its attendant disruptive technologies – began initiating sweeping transformation across the power and utilities industry. At the same time, climate change continues to stalk critical physical infrastructure.

Related destructive weather events necessitate the acceleration of modernization initiatives aimed at simultaneously hardening critical energy infrastructure and accelerating sustainability across the energy system.

No matter how deep or prolonged the current economic downturn, the global economy will spring back. At the same time, the confluence of the aforementioned threats signals significant industry evolution in the decade ahead.

With this in mind, what are the critical next steps utility leaders need to take to capture value in the post-COVID era?

### Embrace Gray Rhinos and Business Continuity

While the survey and analysis for this year’s “State and Future of the Power Industry” report closed prior to World Health Organization’s declaration of a global health emergency on March 19, it will no doubt cast a long shadow over the next decade.

The good news? A recent Guidehouse COVID-19 business continuity survey of executives found that most remain optimistic. While short-term uncertainty remains high, most respondents are

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still confident in long-term fundamentals.

If anything, this finding indicates an eagerness to sustain investments in initiatives and infrastructure to keep pace with broader decentralization, digitization, and decarbonization trends.

Even so, if there is one critical takeaway from the current pandemic, it is that accounting for the effects of highly probable events needs to be central to strategic planning and investment prioritization going forward.

Whereas highly unpredictable black swan events invite complacency, the inevitability of so-called gray rhinos – highly probable, high impact yet neglected threats – require proactive scenario planning and flexible investment strategies.

Even before the coronavirus outbreak brought the global economy to a standstill, the estimated annualized cost of pandemics to the global economy was in the billions. As we have now experienced first-hand, COVID-19, climate change, and cyberattacks are anything but theoretical.

Utilities’ risk management practices will need to adapt in kind. This adaptation will require marrying the familiar controls-based practices for risks that jeopardize day-to-day operations with new and evolving enterprise risk management methods that focus on addressing risks to strategic objectives. Ultimately, this will require greater alignment between top-down organizational strategy and bottom-up risk identification and management.

Among other things, investments in greater automation and

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remote monitoring solutions go a long way toward mitigating the effects of the pandemic and speeding recovery. Fortunately, many of the technologies needed to support business continuity are available today.



### Ready Your Organization for the Energy Cloud

The global energy transformation will entail a shift away from a centralized, one-way, hub-and-spoke power grid to a far more distributed, two-way, and highly networked Energy Cloud.

Although policy and regulatory reform is an important driver of this transformation, customer demand and technology innovation are relentless instigators of disruption. Increasingly, customers seek choice, control, convenience, and cost-effective solutions that embrace a more sustainable and decarbonized future.

To address these needs, emerging Energy Cloud platforms like Smart Cities, Building-to-Grid, and Integrated Distributed Energy Resources (iDER) are rapidly becoming tomorrow's hubs of innovation and value creation in the post-COVID era.

According to Guidehouse Insights' estimates, by supporting a greater share of two-way value exchange across a far more diverse stakeholder ecosystem, Energy Cloud platforms have the potential to collectively drive more than one trillion dollars in new revenue creation across the global power industry within the next decade. Taking into account the effects of the coronavirus outbreak, this may be a conservative estimate.

The critical post-COVID question facing utilities – are they prepared to move fast enough?

### Define a Multipronged Strategy

This year's annual State & Future survey of utility executives underscored the growing threat to traditional utility business

models posed by clean energy and DER. Yet, the utility industry is behind on the business model innovation curve.

Only one in four major utilities in the U.S. have made meaningful progress in developing future-oriented business models, according to Guidehouse analysis. Only one in ten have done so proactively with little outside pressure from regulators, customers, or competition.

Going forward, it is more important than ever that utility leaders define a broader customer and sustainability (adaptation) mission for their organization. Utility leaders will need to make difficult decisions on which strategic initiatives, investments, and divestitures to pursue while facing a higher risk, more complex, and competitive operating environment. For example, forward-thinking utilities are moving beyond renewables and smart grid pilots and prioritizing electrification and connectivity at scale across the system.

The electrification of many systems is required to meet decarbonization targets, including heating and transportation. Utilities can offer key support to their customers in making this transition, including offering incentives and education to ensure the right decisions are made and that electric solutions are used most efficiently.

According to this year's study, a growing majority of utility executives are looking to orchestration-focused business models,



nontraditional revenue streams like transactive energy, and strategic partnerships to meet shifting customer demands head on.

Utility executives also indicated a willingness for their organizations to go beyond clean energy to address climate change threats more directly. Such signals are positive signs the industry is beginning to turn the corner on the step change required to drive transformation.

**FIG. 1****ENERGY CLOUD PLATFORMS**

Source: Deloitte

<b>Integrated DER</b>	<b>Transportation2Grid</b>	<b>Building2Grid</b>	<b>Internet of Energy</b>
Integrated DER platforms could support more than \$3-4 trillion in value within the next two to three decades.	By 2020, more than 6,000 GWh of electricity is expected to be consumed by plug-in EVs annually in the U.S., giving rise to Transportation2Grid.	Building2Grid means leveraging more than \$50 billion of anticipated investments in behind-the-meter integrated energy assets for residential and commercial customers within the next five years.	More than \$1 trillion in projected cumulative global revenue is at stake over the next decade across Internet of Energy platforms.
<b>Transactive Energy</b>	<b>Smart Cities</b>	<b>Neural Grid</b>	<b>Energy Cloud Orchestrator</b>
Transactive Energy platforms are expected to see billions of dollars in software-related investments, technology integration, and fees by 2030.	More than \$250 billion in cumulative investments focused on Smart Cities energy projects alone are anticipated through 2030.	Investments in Neural Grid infrastructure and emerging technologies through 2030 are expected to exceed \$700 billion.	... and orchestrators will be the fastest growing and most profitable business model category across the utility value chain by leveraging assets and customer networks.

While utilities indicate a willingness to evolve, regulatory constraints and risk-averse organizational culture continue to attenuate otherwise promising progress.

### Invest for the Future Today

Alongside the grim societal and economic reality visited upon us by the coronavirus outbreak is the very real challenge of maintaining and operating the grid. Shifting load profiles caused by a global workforce suddenly working from home present additional challenges.

Meanwhile, deferred infrastructure maintenance amplifies the potential impact of compounding risks – such as a Category 5 hurricane striking a major metropolitan area in the middle of social distancing efforts. Utilities will need to engage regulators and advocate for solutions that stay ahead of these risks.

The power sector is among the least digitally transformed industries in the global economy and among the most underinvested when it comes to infrastructure. While we are only seeing glimmers of the Energy Cloud today, evolution across the industry continues to accelerate. The energy sector faces a massive shortfall in infrastructure investment globally at precisely the moment it needs to ramp up technology integration and greatly improve operational sophistication.

Utilities do not need to fund the buildout of core infrastructure assets going forward; rather, they should concentrate their efforts on facilitating energy and non-energy transactions across the connected ecosystem.

Strategic investments in emerging Energy Cloud platforms

“ The power sector is among the least digitally transformed industries in the global economy. ”

– Dan Hahn



can provide an important signal to key stakeholders. Utilities will also need to work with regulators on measuring and rewarding outcomes instead of litigating inputs.

### Build an Orchestration-Ready Business

Several emerging Energy Cloud platforms sit at the confluence of investments in assets and technologies that will form the backbone of our future global economy. These are not only areas of energy-intensive infrastructure disruption at scale (cities, transportation systems, buildings) – they are opportunities to deliver dynamic products and services with a diverse ecosystem of stakeholders.

See Figure One.

In smart cities, for example, cross-sector coordination, a focus on citizens’ well-being, and climate adaptation offer a fertile test bed for new business models and customer-centric solutions.

While the provision of electricity remains critical to urban

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**PUF:** There's a healthy tension with the regulated companies and the public. What do you see as the fine line?

**Don Howell:** The General Counsel has to feel comfortable in that they have to tell the Commissioner sometimes bad news or what the law is in certain areas. It could be as broad as dealing with public record requests or interviews with journalists or all sorts of things. I interfaced a lot with all the requests for public records because the Commission creates tons of records when we do large utility cases.

I can only speak to the Idaho Commission, but we put all of our documents in any case on our public web page, except where privacy was of a concern or if the documents were of confidential nature because of exemptions to the public records law.

A person who wanted to engage or review certain documents or see what was going on in any case had to simply go

to the Commission's website and examine the case documents. That made my job and the job of the Commissioners a little bit easier, rather than producing and copying so many records the old-fashioned way.

**PUF:** What advice would you give a new Commissioner?

**Don Howell:** In my experience, most new Commissioners do not have a background in the utility industry. I used to say to new lawyers and Commissioners that it will take about two years to get up to speed.

So be patient; there is a lot to learn and the Staff, general counsel and other Commissioners will be good resources. Also, make plans to attend NARUC's workshop for new Commissioners and other educational conferences for subjects pertinent to utility regulation, such as regulatory accounting or financing. Relax and enjoy the journey. [PUF](#)

## Utility Transformation

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resilience, closely linked emerging industries like e-mobility are capturing a greater share of growth while piggybacking on investments in vehicle electrification, 5G, and charging infrastructure.

Enel X has demonstrated through a portfolio of investments and partnerships that such intersections can offer traditional energy companies a bridge into high growth-adjacent markets. Enel X's parent, Enel, is among a group of European energy companies leading the shift from intensive carbon-based generation to Energy Cloud innovation.

Propelled by long-term energy policy and broad shareholder

buy-in, several lessons learned may define a blueprint for U.S. utilities:

Define a low carbon trajectory toward 2050 or earlier; enhance design and be ready to scale – customers will demand it; and work with best-in-class partners to tackle the complexity of the challenges ahead.

Ultimately, orchestrating Energy Cloud platforms requires approaching the energy industry and its associated infrastructure differently. Technology is an enabler for improving resiliency and an accelerant for innovative business model design that can deliver new value to more sophisticated customers. For utilities, this means embracing a more diverse and dynamic competitive landscape to build infrastructure, operational, and business model resiliency in the post-COVID era. [PUF](#)

On July 9, 1802, Thomas Davenport was born in Vermont. He built the first direct current motor in the U.S. at age thirty-two. But invention of the motor made no money for Davenport. Running motors with batteries was too expensive. Sales didn't take off until the electric grid developed decades later to power motors. They say timing is everything.

Davenport was best known in his day for calling out Charles Page who had won a large federal government contract to build an electromagnetic locomotive. This boondoggle was made clear to all when the test run failed spectacularly. Page was deservedly credited though for exposing the greatest fraud of the mid-1880s. He investigated the Fox sisters who were enriching themselves performing public séances. Page publicized that the raps were not from the spirits but from the sisters themselves.

On July 13, 1977, the infamous New York power outage took place. A thousand fires, sixteen hundred looted stores, five hundred and fifty injured police officers, four thousand arrests. All this while the fear of the notorious Son of Sam murders magnified. A Bronx car dealership had fifty Pontiacs stolen. Films and books have recaptured the devastation and desperation. Among them, *The Bronx is Burning*, is about how the internecine battles of the New York Yankees eventually led to a championship and a city's redemption. And then there was, *Men in Black*, the late-nineties comedy, in which we learn that an alien caused the blackout as a bad joke.

On July 24, 1965, the controversial performance by Bob Dylan at the Newport Folk Festival took place, with electric amps. The organizer of the all-acoustic festival had criticized the Paul Butterfield Blues Band. Dylan's reaction: "Well, [expletive] them if they think they can keep electricity out of here, I'll do it." On a whim he said he wanted to play electric. Introduced by legend Peter Yarrow, Dylan's band performed Maggie's Farm, and Like a Rolling Stone to an audience of boos. It was said, Dylan "electrified one half of his audience, and electrocuted the other."