



# Building Next Generation Utility

Energy Service Orchestrator

BY JAN VRINS AND MACKINNON LAWRENCE

**A**s the power and utility industry journeys further into the energy transformation, oil and gas majors, auto manufacturers, retail aggregators, consumer technology players, and others are aggressively deploying new products and services targeting the utility customer.

At the same time, utilities' control over their business of supplying energy services is being tested, and they face greater competition precipitated by evolving customer demand, technology innovation, and changing policies and regulations focused on decarbonizing the global economy. A rapidly emerging clean, distributed, intelligent, and mobile grid means more diverse competition, but it also offers new pathways for growth.

To realize growth, the utility must be willing and able to take on new roles such as energy as a service (EaaS) provider, network orchestrator, or a combination of both. The challenge is to do so while the existing business and regulatory model is scrutinized but evolves only incrementally in the short term.

As the most recent survey of utility executives and influencers by Navigant and *Public Utilities Fortnightly* shows,

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utilities will need to compete on two fronts simultaneously to stave off disruption. Seven out of ten survey respondents agreed that focusing on protecting current business models while also developing future business models supported by innovative customer value propositions will be critical for utilities to adapt to a more complex operating environment.

See Figure One.

This is a difficult challenge. Our research shows that utilities may no longer have the luxury of time to devise the perfect strategy, and forward momentum is critical. Here we describe three ways the game has shifted in 2019 and how utilities can

stay ahead of the energy transformation well into the next decade.

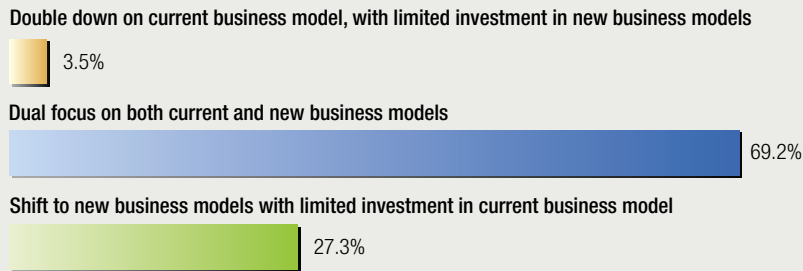
## No Ducking the DER Growth Curve

While debates on the future of the utility industry tend to pit the merits of baseload fossil generation like coal and natural gas against renewables like wind and solar, this past year marked a significant tipping point in which an accelerating shift from a centralized to a decentralized grid took center stage.

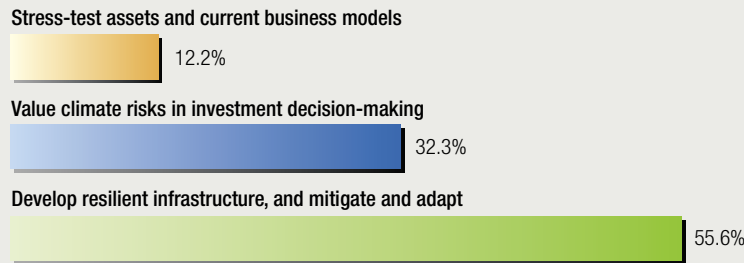
Our analysis of the distributed energy resources market shows new installed DER capacity from solar PV, distributed storage, EV charging, microgrids, flexible behind-the-meter consumption, and other demand-side resources surpassed new deployments of centralized generation capacity for the first time ever in the United States. While total installed centralized generation still dominates the resource mix, the DER universe is expanding quickly.

How to best tap into the value of a diverse portfolio of uncorrelated DER remains an open question. Duck curve analyses are useful for understanding grid imbalances caused

**FIG. 1 WHICH OVERALL STRATEGY SHOULD UTILITIES PURSUE?**



**FIG. 2 WHAT SHOULD UTILITIES DO TODAY TO ADDRESS CLIMATE CHANGE RISKS?**



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by one-off resources like solar PV, but the explosion of DER assets at the grid's edge requires leveraging a robust set of digital technologies like artificial intelligence, blockchain, and sophisticated platforms.

These can facilitate a more automated and responsive transactive environment where manual processes will be incapable of managing at the scale and complexity required of a two-way, decentralized, and dynamic Energy Cloud.

### From Passive Acceptance to Direct Liability

The past year saw climate change move from an abstract threat to a direct assault on the utility business. From potential liability in the wake of devastating hurricanes, wildfires, and floods

to shareholder requests for disclosing climate risks, it is clear that utilities will increasingly be held accountable to lead in adaption, preparation, and disaster recovery.

According to the National Oceanic and Atmospheric Administration, the past three years (2016-2018) have been historic, with the annual average number of billion-dollar disasters more than twice the long-term average.

Meanwhile, the absolute number and total cost of disasters are increasing over time. Exposed to this reality, utilities are focusing more investment on improving the resiliency of grid infrastructure.

With electricity generation responsible for more than a quarter of greenhouse gas emissions in the United States, more prudent utilities are going

even further to address causal factors. In both cases, large generation facilities with thirty-year payback periods are proving to be far riskier investments. Over thirty percent of respondents to our survey believe utilities need to value climate risk in their investment decision-making.

See Figure Two.

As a result, last year, we already saw an increase in investment toward DER assets like microgrids, VPPs, and EV fleets that combine resiliency and greater diversification across utility generation portfolios.

While utilities are beginning to incorporate climate change into their planning and generation investment decisions, we are only at the beginning of an acceleration of cleaner, distributed, and more resilient energy solutions integrated into the energy ecosystem. This requires sophisticated planning and orchestration to avoid stranded central station assets and suboptimal DER deployments.

### Goodwill and the Utility License to Operate

Meanwhile, energy consumers are demanding more value beyond safe, reliable, and affordable power.

Access to individualized products and services and the autonomy to choose among solutions factors heavily in consumer decision-making for behind-the-meter solutions. Consumers are also increasingly accustomed to having the flexibility to switch among competitive offerings as with cell phone subscriptions to cable TV, security, and streaming services to durable goods. Sustainability – encompassing clean power, greater efficiency, and green products in the energy space – is a key part of the emerging consumer value nexus as well.

With decarbonization momentum sputtering at the international level following the Paris Accord, cities, state

and local governments, and companies are stepping in to fill the void and meet customer demand.

While the U.S. federal government is stalled or on the sidelines with respect to implementing policies and regulations aimed at capping global temperature increase to 1.5 degrees Celsius above pre-industrial levels, nearly a hundred and fifty cities across the U.S., over three hundred localities, and over a hundred multinational companies have committed to a hundred percent renewable power and accelerated decarbonization of the economy.

For every five Americans, four live in urban areas across the United States. As key service providers to local government and corporate customers, utilities have much to gain through economic growth and greater customer retention by enabling a rapid clean energy transition as EaaS initiatives expand. EaaS could be a gateway to additional energy and non-energy products and services valued at more than one trillion dollars over the next decade, according to Navigant's analysis.

### **Moving Toward Implementation**

The energy transformation requires utilities to innovate and adapt at a far greater pace than ever before. Most challenging will be maintaining economies of scale as centralized assets increasingly give ground to DER and service individualization expands across the utility customer base.

We advise utilities to orient business model innovation around network

orchestration. This means moving beyond an asset or even service-based model to one that facilitates two-way value exchange across a network of asset owners, service providers, prosumers, and stakeholders traditionally aligned in ancillary markets.

Where to begin? First, utilities should position for scale around disruptive infrastructure investment trends like DER adoption, transportation electrification, and the digitization of cities. We see seven such infra-

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structure platforms emerging in the energy space where utilities can play: Integrated DER, Building-to-Grid, Transportation-to-Grid, Internet of Energy, Neural Grid, Transactive Energy, and Smart Cities.

Within each, concentrated demand, technology democratization, compounding innovation, and industry confluence provide opportunities for new value creation and scaling non-traditional revenue streams.

Second, once utilities have identified potential platform targets, we advise that they take stock of their asset and customer base to identify in which platforms they are most active. For example, a service territory devoid of concentrated urban centers may not be the best candidate for a smart cities play but may have the potential to convert

smart grid investments into a more robust neural grid platform. Any and all assets and customers within the utility territory are potential connections and value enablers across emerging energy platforms.

Third, utilities should appoint a cross-organizational team that will lead the development of projects and programs around new orchestration roles. The build-out of selected platform solutions should consider regulatory, customer engagement, operational, people,

and technology perspectives. Progress against outcomes and value streams needs to be measured and monitored through strong C-suite-led governance.

While the energy transformation continues to pick up pace, there remain substantial opportunities for growth and innovation across the power and utilities sector. For utilities facing disruptive threats, a focus on orchestration of stakeholder ecosystems and emerging platforms will enable deeper, more diverse, and expansive connections across the utility service network.

Short-term revenue opportunities, mid-term market share, and the long-term relationships with customers are at stake. With this in mind, have you asked your customers what they are envisioning and what they expect with regard to decarbonization and energy? 